UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF KENTUCKY
COVINGTON DIVISION

THE COMMONWEALTH OF KENTUCKY, Plaintiff, UNITED STATES OF AMERICA, Plaintiff-Intervener TIM GUILFOILE, Plaintiff-Intervener v. SANITATION DISTRICT NO. 1 OF NORTHERN KENTUCKY, Defendant.	)	Civil Action No. 2:05-CV-199 (WOB)

AMENDED CONSENT DECREE

The Parties to this Amended Consent Decree, which amends, supersedes and replaces the original Consent Decree entered in this matter by the Court on April 18, 2007, the Commonwealth of Kentucky by and through its Energy and Environment Cabinet (hereinafter the "Cabinet"), the United States of America, on behalf of the United States Environmental Protection Agency (hereinafter "EPA") and Sanitation District No. 1 of Northern Kentucky (hereinafter the "District") state:

I. RECITALS

1. The Cabinet is charged with the statutory duty of enforcing Kentucky Revised Statutes ("KRS") Chapter 224 and the regulations promulgated pursuant thereto, and has been authorized to administer the National Pollutant Discharge Elimination System ("NPDES") pursuant to Section 402(b) of the Federal Water Pollution Control Act, as amended ("Clean Water Act" or "CWA"), 33 U.S.C. § 1342(b).

2. EPA is charged with the statutory duty of enforcing the CWA pursuant to 33 U.S.C. § 1251 et seq., and the regulations promulgated pursuant thereto, and specifically the NPDES program set forth in Section 402 of the CWA, 33 U.S.C. § 1342.

3. The District is a sanitation district organized and established pursuant to KRS Chapter 220. Pursuant to KRS Chapter 220, the District is responsible for management, collection, transmission and treatment of sanitary wastewater. In addition, the District is responsible for implementation of a regional stormwater management program for the municipal separate storm sewer systems ("MS4") formerly owned by over thirty municipalities in Northern Kentucky. Pursuant to KRS Chapter 220, the District assesses service fees to implement the sanitary and stormwater programs.

4. The District owns and operates a regional wastewater collection Sewer System in Boone, Campbell, and Kenton counties in Northern Kentucky. The wastewater collection system consists of separate sanitary sewer systems ("SSS") and combined sewer systems ("CSS"). The wastewater collection system transports wastewater to wastewater treatment plants ("WWTPs") owned and operated by the District.

5. This Amended Consent Decree addresses sanitary sewer overflows ("SSOs"), Unpermitted Discharges, and discharges from the District's combined sewer

overflow outfalls ("CSO Outfalls") which are currently identified, or identified in the future, in any Kentucky Pollutant Discharge Elimination System ("KPDES") permit issued to the District, and requires the District to finalize, develop, submit and implement plans for the continued improvement of the SSS, the CSS, and the WWTPs.

6. The Cabinet initially filed this action on October 7, 2005 against the District pursuant to Section 505 of the CWA, 33 U.S.C. § 1365, and KRS Chapter 224. EPA filed its motion to intervene as of right and complaint in intervention under Section 505(c)(2) of the CWA, 33 U.S.C. § 1365(c)(2), alleging that the District violated and continued to violate Section 301 of the CWA, 33 U.S.C. § 1311. Concurrently with the filing of those complaints, the Cabinet and EPA lodged the original Consent Decree addressing SSOs, Unpermitted Discharges, and discharges from the District's CSO Outfalls, relating to the violations alleged in the complaints. All Parties agree that this Court has jurisdiction over this civil action pursuant to the CWA, and under the provisions for supplemental jurisdiction in 28 U.S.C. § 1367 for claims pursuant to KRS Chapter 224. The Cabinet's claims arise under the powers and duties set forth in KRS Chapter 224.10-100. EPA's claims arise under the powers and duties set forth in Section 309 of the CWA, 33 U.S.C. § 1319.

7. Pursuant to KPDES Permit No. KY0021466 for the Dry Creek Wastewater Treatment Plant ("DCWWTP"), the District is required to implement combined sewer overflow ("CSO") controls for the CSS in accordance with EPA's 1994 CSO Control Policy, 59 Fed. Reg. 18688 ("CSO Control Policy") and the Commonwealth of Kentucky's CSO control strategy. The KPDES permit for the DCWWTP requires the District to implement the nine minimum controls ("NMC") delineated in EPA's CSO Control Policy.

EPA's CSO Control Policy also provides for the development and implementation of a CSO Long-term Control Plan ("LTCP").

8. The Cabinet and the United States contend that SSOs and Unpermitted Discharges are violations of the CWA, Kentucky's statutes and regulations implementing the CWA, and KPDES permits issued for the District's WWTPs. The Cabinet and the United States also contend that Section 402(q)(1) of the CWA, 33 U.S.C. § 1342(q)(1), requires the District to develop a LTCP and implement measures to abate the impact of CSOs on water quality in waters of the United States.

9. The Parties agree and recognize that the process for the District to comply with its KPDES permits and upgrade its SSS, CSS and WWTPs is an ongoing and evolving effort from the assessment process to the design and construction of necessary infrastructure to meet permit conditions. This process requires efforts that include, but are not limited to, characterizations, modeling, assessments, engineering design studies, implementation of compliance measures, and construction projects that will adequately ensure the District's compliance with permit conditions under applicable law. The Parties recognize that it will take the District many years to implement these efforts and that this Amended Consent Decree is the appropriate mechanism for controlling these efforts.

10. Until 1995, the operation and maintenance of the wastewater collection systems in Northern Kentucky was the responsibility of over thirty (30) cities and three (3) counties.

11. As a result of revisions to portions of KRS Chapter 220 in 1995, the District acquired the wastewater collection and treatment systems of over thirty (30) cities within the three (3)-county jurisdictional boundaries of the District. In 1996, the District took

over responsibility for the sanitary wastewater system in Boone County from the Boone County Water and Sewer District. In 1999, the cities of Independence and Alexandria also consolidated their sanitary wastewater facilities with those of the District.

12. Through the consolidations, the District maintains that it assumed responsibility for addressing a large amount of inflow and infiltration ("I/I") that impacted the various municipal wastewater systems. In some areas, the capacity issues were so severe that the Cabinet had imposed a moratorium on any development until such time as the sources of the I/I could be addressed and upgraded treatment capacity provided. Through the consolidations of the wastewater collection systems in Northern Kentucky, the District went from operating one (1) major treatment plant and approximately 120 miles of sewer lines in 1995, to operating over 1,500 miles of sewer lines, an additional 100-plus pump stations, and numerous small treatment plants, inherited from over thirty municipalities and districts, by 2000.

13. The District's sanitary sewer service area currently covers approximately 187 square miles and serves approximately 104,500 customer accounts. The District's wastewater system consists of approximately 1,610 miles of combined and separate sewers, three (3) major wastewater treatment plants, four (4) other wastewater treatment plants, 123 pump stations, and 15 flood pump stations.

14. In early 2003, the District also assumed responsibility under the KPDES Phase II stormwater program for serving as a regional stormwater management agency for over thirty MS4s. In March 2003, the District obtained coverage under a Phase II Municipal Separate Storm Sewer System general KPDES permit (KYG000020) for the MS4s.

15. The Parties entered into the original Consent Decree to address the claims arising from the District's alleged violations as set forth in the complaints, and to agree to the performance of certain specified projects and to the completion of certain plans, characterizations, modeling, assessments, engineering design studies, implementation of compliance measures and construction projects on or before dates certain to eliminate SSOs and Unpermitted Discharges, and to address discharges from the District's CSO Outfalls, as set forth in this Consent Decree.

16. Pursuant to Section IV.C of the original Consent Decree, the District obtained EPA and Cabinet approval of its NMC Compliance Plan; Capacity, Management, Operations and Maintenance ("CMOM") programs; and Pump Station Plan. The District represents that it has been implementing those plans and programs since the respective approval dates and shall continue to implement those plans and programs as enforceable requirement of this Amended Consent Decree, which are delineated below.

(a) NMC Compliance Plan prepared pursuant to the criteria of Paragraph 35 of the original Consent Decree, was jointly approved by the Cabinet and EPA on July 6, 2008;

(b) CMOM program self-assessment prepared pursuant to the criteria of Paragraph 36 of the original Consent Decree and the CD ROM disk attached to the original Consent Decree as Exhibit B was jointly approved by the Cabinet and EPA on May 14, 2008;

(c) CMOM Grease Control Program prepared pursuant to the criteria of Paragraph 36(a) of the original Consent Decree and Exhibit C

attached to the original Consent Decree was jointly approved by the Cabinet and EPA on January 8, 2008;

(d) CMOM Pump Station Operation Plan for Backup Power prepared pursuant to the criteria of Paragraph 36(b) of the original Consent Decree was jointly approved by the Cabinet and EPA on May 14, 2008;

(e) CMOM Sewer Overflow Response Plan ("SORP") prepared pursuant to the criteria of Paragraph 36(c) of the original Consent Decree was jointly approved by the Cabinet and EPA on November 10, 2009; and

(f) Pump Station Plan prepared pursuant to the criteria of Paragraph 37 of the original Consent Decree for the pump stations in Exhibit E attached to the original Consent Decree was jointly approved by the Cabinet and EPA on May 14, 2008.

17. The District completed the Initial Watershed Program Project List set out in Exhibit D of the original Consent Decree with the exception of the Western Regional – Richwood Sewer and Force Main which the Cabinet/EPA agreed to remove from Exhibit D. This project is, however, scheduled to be completed by March 31, 2019. The District represents that the cost of the Initial Watershed Program Projects was over $403 million.

18. The District has implemented and completed the pump station upgrades set out in Exhibit E of the original Consent Decree with the exception of the remedial measures for the Lakeview Pump Station. The District represents that the cost of these upgrades was over $105 million. Although the Lakeview Pump Station overflow has not been

completely eliminated, since 2005, the District represents that it has completed projects to eliminate 98 percent of the average annual overflow volume of SSOs from this pump station. The Cabinet and EPA jointly approved a substitute project in lieu of, and to allow delay in, completing the remainder of the Lakeview Pump Station Project in a letter dated May 13, 2013. The substitute project, the Ash Street Pump Station Project, obtained the necessary permits and approvals, but the approvals and certain necessary property condemnations for the sewer line routing are currently being challenged in state court, which the Parties agreed constituted a *force majeure* event under the original Consent Decree. The completion of the Ash Street Pump Station Project is addressed in Appendix C, attached to this Amended Consent, as discussed below.

19. Pursuant to Paragraph 39 of the original Consent Decree, the District prepared a Watershed Plan that delineated an approach for remediating CSOs and SSOs. The Watershed Plan was approved by EPA and the Cabinet on February 14, 2014. The District established in the Watershed Plan a design basis for CSO and SSO projects as more particularly described in Appendix A, attached to this Amended Consent Decree, including design storms, levels of service, and other parameters that will remain applicable to designs of further projects under this Amended Consent Decree. The District began implementing projects in the draft Watershed Plan in 2010, prior to formal Watershed Plan approval. As a result of the District's completion of initial watershed program projects set out in Exhibit D of the original Consent Decree and projects delineated in the initial phase of the Watershed Plan, the District has made substantial progress in remedying CSOs and SSOs. Since 2005, the District represents that it has eliminated approximately 155 million gallons of annual average CSO discharges and approximately 124 million gallons of annual

average SSOs at a cost of over $500 million. However, much work still remains to be done. Over the last five (5) years from 2013 through 2017, SD1 has released an annual average of over 131.2 million gallons of SSOs from pump stations and manholes in its Sewer System into waters of the U.S. and into residential areas where human contact is likely. SD1 has also discharged, an annual average of 1.76 billion gallons of CSOs, most of which discharged into primary contact recreation waters.

20. The District intends to continue to enhance the Watershed Plan through the review and application of new technologies, continuous improvement of model calibrations, and deployment of real time coordinated control and monitoring systems for assets to maximize performance and smart systems to cost effectively meet level of service and water quality objectives.

21. Pursuant to the original Consent Decree, the District submitted to the Cabinet and EPA a financial capability and affordability analysis for completion of the Watershed Plan by the Consent Decree deadline of December 31, 2025. The District's analysis concluded that completing the remaining work under the approved Watershed Plan by the December 31, 2025 deadline established in Paragraph 39(b) of the original Consent Decree would result in a high economic burden for ratepayers and was beyond the District's financial capacity.

22. Based upon the Parties' respective financial and rate model analyses, the Parties have agreed upon amendments to the original Consent Decree, as set forth herein, that will provide for progress and completion of remedial measures required by the original and Amended Consent Decree.

23. The Kentucky General Assembly enacted KRS Chapter 220.035 which grants the judges/executive of the Fiscal Courts in Boone, Campbell, and Kenton Counties, Kentucky certain powers to review and approve the District's land acquisitions, construction of capital improvements, service charges and user fees, and budgets. In 2011, the Kentucky General Assembly enacted KRS Chapter 220.542(3) which also requires that service charge, rate or user fee increases that are greater than five (5) percent of the previous charge, rate or user fee must first be approved by two (2) of the three (3) Fiscal Courts in Boone, Campbell, and Kenton Counties, Kentucky before the increased service charge, rate or user fee may be adopted by the District's Board. In 2011, the Kentucky General Assembly also enacted KRS 220.542(4) which further requires that the District's service charges, rates or user fees shall not be increased more than once in a twelve-month period.

24. Pursuant to Section VII of the original Consent Decree, the District paid a civil penalty in the amount of $476,400, of which $338,200 was paid to the Cabinet and $138,200 was paid to the United States, in consideration of the settlement of the Cabinet and EPA claims.

25. Pursuant to Sections VIII and IX of the original Consent Decree, the District completed supplemental environmental projects ("SEPs") and State Environmental Projects in further consideration of the settlement of the Cabinet and EPA claims. The District represents that the total expenditures for the SEPs and State Environmental Projects, which were described in Exhibits G and H to the original Consent Decree, exceeded $636,000.

26. The District neither admits nor denies the alleged violations of the CWA and Kentucky water quality laws and regulations as set forth above and in the complaints, but accepts civil liability for those violations under the terms and conditions of this Amended Consent Decree.

27. The Parties agree, without adjudication of facts or law, that settlement of the Cabinet's and the United States claims in accordance with the terms of this Amended Consent Decree are in the public interest and have agreed to entry of this Amended Consent Decree to resolve the claims stated in the complaints.

NOW THEREFORE, in consideration of the recitals listed above and in the interest of settling and resolving all civil claims and controversies involving the alleged violations described above and in the complaints before taking any testimony and without adjudication of any fact or law, the Parties hereby consenting to the entry of this Amended Consent Decree; and the Court hereby finding that settlement of the claims alleged without further litigation or trial of any issues is fair, reasonable and in the public interest and the entry of this Amended Consent Decree is the most appropriate way of resolving the claims alleged, IT IS HEREBY ORDERED, ADJUDGED, and DECREED as follows:

II. JURISDICTION AND VENUE

28. This Court has jurisdiction and supplemental jurisdiction over the subject matter of this action, and over the Parties hereto, pursuant to Sections 309 and 505 of the CWA, 33 U.S.C. §§ 1319, 1365 and 28 U.S.C. §§ 1331, 1345, 1355, and 1367. Venue is proper in the Eastern District of Kentucky pursuant to Section 309 of the CWA, 33 U.S.C. § 1319, and 28 U.S.C. §§ 1391 and 1395(a).

III. APPLICATION AND SCOPE

29. The provisions of this Amended Consent Decree shall apply to and be binding upon the Parties to this action, and their agents, employees, successors, and assigns, as well as to all persons acting under the direction and/or control of the District, including firms, corporations, and third parties such as contractors engaged in implementation of this Amended Consent Decree. This Amended Consent Decree supersedes and replaces the original Consent Decree.

30. The District shall provide a copy of this Amended Consent Decree to any consultant or contractor selected or retained to perform any activity required by this Amended Consent Decree.

IV. REMEDIAL MEASURES

A. DEFINITIONS

31. "Capacity, Management, Operations, and Maintenance" or "CMOM" shall mean, for the purpose of this Amended Consent Decree only, a flexible program of accepted industry practices to properly manage, operate and maintain sanitary wastewater collection and transmissions systems, investigate capacity-constrained areas of these systems, and respond to SSO events.

32. "Combined Sewer Overflow" or "CSO" shall mean, for the purpose of this Amended Consent Decree only, any discharge from any outfall currently identified, or identified in the future, as a combined sewer overflow or CSO in any District KPDES permit.

33. "Combined Sewer Overflow Outfall" or "CSO Outfall" shall mean the outfalls from which CSOs are discharged to waters of the United States.

34. "Combined Sewer System" or "CSS" shall mean the portion of the District's Sewer System designed to convey municipal sewage (domestic, commercial and industrial wastewaters) and stormwater runoff through a single-pipe system to the District's DCWWTP or Combined Sewer Overflow Outfalls.

35. "Sanitary Sewer Overflow" or "SSO" shall mean, for the purpose of this Amended Consent Decree only, any discharge to waters of the United States from the District's Sewer System through point sources not specified in any KPDES permit, as well as any release of wastewater from the District's Sewer System to public or private property that does not reach waters of the United States, such as a release to a land surface or structure that does not reach waters of the United States; provided, however, that releases or wastewater backups into buildings that are caused by blockages, flow conditions, or malfunctions in a building lateral, or other piping or conveyance system that is not owned or operationally controlled by the District are not SSOs for the purposes of this Amended Consent Decree.

36. "Sanitary Sewer System" or "SSS" shall mean all portions of the District's Sewer System that are not part of the District's combined sewer system. The SSS does not include any non-District owned sewer systems.

37. "Sewer System" shall mean the wastewater collection, retention, and transmission system owned or operated by the District designed to collect and convey municipal sewage (domestic, commercial and industrial) to the District's WWTPs or CSOs which is comprised of the SSS and CSS.

38. "Unpermitted Discharge" shall mean any discharge to waters of the United States from the District's Sewer System or WWTPs through a point source not specified

in any KPDES permit or from the District's WWTPs which constitutes a prohibited bypass (as set forth in 401 KAR 5:065, Section 1; 40 C.F.R. § 122.2; and 40 C.F.R. § 122.41(m)(4)).

B. OBJECTIVES

39. It is the express purpose of the Parties in entering this Amended Consent Decree to further the objectives of the CWA, as stated in Section 101 of the CWA, 33 U.S.C. § 1251, and to eliminate SSOs and Unpermitted Discharges and to address discharges from the District's CSO Outfalls in the manner set forth in this Amended Consent Decree. All plans, reports, construction, remedial maintenance, and other obligations in this Amended Consent Decree or resulting from the activities required by this Amended Consent Decree, and under an amendment to this Amended Consent Decree, shall have the objective of insuring that the District complies with the CWA, all applicable federal and state regulations, and the terms and conditions of the District's KPDES permits, and that the District meets the objectives of the CSO Control Policy.

C. MANAGEMENT PROGRAMS

40. The District shall continue to implement the NMC Compliance Plan and CMOM Programs that were prepared and approved by EPA and the Cabinet pursuant to the original Consent Decree, as provided in Paragraph 16 above, and any subsequent amendments thereto jointly approved by EPA and the Cabinet.

D. UPDATED WATERSHED PLANS

41. (a) Within 12 months of final entry of this Amended Consent Decree, the District shall prepare and submit to the Cabinet/EPA for review and joint approval, an Updated Watershed Plan, consistent with the requirements outlined in this Amended

Consent Decree and with the approved design storm and typical year rainfall data used in developing the initial Watershed Plan approved on February 14, 2014, as more particularly set forth in Appendix A, attached hereto. Additional Updated Watershed Plans shall be submitted for Cabinet/EPA review and joint approval at least once every ten (10) years thereafter until termination of this Amended Consent Decree. The District shall have the right to submit an Updated Watershed Plan to the Cabinet/EPA for review and joint approval at any time, including, by way of example, to address new or amended financial affordability or capability guidance, total maximum daily loads ("TMDLs"), or technology-based standards for municipal sewer and treatment systems.

(b) Updated Watershed Plans may incorporate by reference the portions of an approved Watershed Plan or Updated Watershed Plan, including design storm bases and level of service determinations, that are not being revised. This Amended Consent Decree does not preclude the District from proposing revisions to the nature or scope of projects included in prior Watershed Plans. Unless otherwise inconsistent with this Amended Consent Decree, the District shall continue to implement the Watershed Plan approved February 14, 2014, until an Updated Watershed Plan is approved. Any approved Updated Watershed Plan shall continue in effect until the Cabinet/EPA approves a subsequent Updated Watershed Plan.

(c) Each Updated Watershed Plan shall include components for a LTCP and a Sanitary Sewer Overflow Plan ("SSOP"). The District shall develop Updated Watershed Plans for the purpose of the reduction and control of discharges from CSO Outfalls consistent with the CSO Control Policy, the elimination of capacity-related SSOs and Unpermitted Discharges in the Sewer System, and the improvement of water quality in the

receiving waters, taking into account, as deemed appropriate, EPA's Integrated Municipal Stormwater and Wastewater Planning Approach Framework. In preparing Updated Watershed Plans, the District shall implement a prioritization scheme for remedial measures to achieve compliance with the CWA based upon such factors as environmental impact, public risk, regulatory requirements, the degree of water quality improvement expected to be achieved, public input, and cost effectiveness. The District shall consider conventional, innovative or alternative designs as part of each Updated Watershed Plan, including but not limited to: sewer rehabilitation, sewer replacement, sewer separation, relief sewers, above ground or below ground storage, high rate treatment in the CSS, illicit connection removal, remote wet weather treatment facilities in the CSS, real-time decision support systems, cognitive hydraulic response system models that capture naturally occurring variances in time and intensity of rainfall at different locations throughout the sewershed, and other appropriate alternatives. Designs shall be based on sound engineering judgment and shall be in accordance with generally accepted engineering design criteria, and may include interim remedial measures to reduce pollutant loading and improve water quality in the short term while alternatives for final remedial measures are being developed, evaluated, and implemented.

(d) In addition, the District may develop the LTCP component of Updated Watershed Plans in conjunction with a watershed based approach providing for the evaluation of water pollution control needs on a watershed management basis and the coordination of CSO control efforts with other permitted point sources and nonpoint source control activities. This watershed based approach may allow for a demonstration of attainment of water quality standards by the District's CSOs considering natural

background conditions and pollution sources other than CSOs through any TMDLs developed by the Cabinet.

(e) The LTCP component of each Updated Watershed Plan shall conform to the CSO Control Policy, and, in developing the LTCP component, the District shall use as guidance EPA's "Guidance for Long-Term Control Plan," EPA 832-B- 95-002, September 1995. The SSOP component of each Updated Watershed Plan shall specify projects to eliminate capacity-related SSOs and Unpermitted Discharges. Each Updated Watershed Plan shall include expeditious and prioritized schedules, deadlines and timetables for projects that will bring the District's CSOs into full compliance with the water quality standards criteria listed for the CSO demonstrative approach or the presumptive approach, and that will eliminate SSOs and Unpermitted Discharges, as soon as practicable based on sound engineering judgment but in no event later than January 1, 2040. Updated Watershed Plans submitted within 10 years after final entry of this Amended Consent Decree shall provide detailed plans for all projects to be implemented in the next ten (10) years after approval and preliminary plans for projects to be implemented thereafter to achieve the objectives of this Amended Consent Decree. Updated Watershed Plans submitted 10 years or more after final entry of this Amended Consent Decree shall provide detailed plans for all projects to be implemented through January 1, 2040. Detailed plans for projects in an Updated Watershed Plan shall include a detailed description of each project's scope and components, the timeline for completion of each project, and the express purpose of each project in terms of eliminating specifically identified capacity-related SSOs and Unpermitted Discharges and/or addressing specifically identified CSOs. Preliminary plans for projects in an Updated Watershed Plan shall include a general

description of the type of project to be implemented, a preliminary timeline for completion of each project, and the express purpose of each project in terms of eliminating specifically identified capacity-related SSOs and Unpermitted Discharges and/or addressing specifically identified CSOs.

(f) In order to measure its progress towards compliance with this Amended Consent Decree and the Updated Watershed Plans to address CSOs and capacity-related SSOs, the District is committed to achieving percentage milestones of volumes of combined sewage in the CSS eliminated and/or captured for treatment and percentage milestones of SSO volumes eliminated as set forth in Paragraph 43 below through implementation of the projects set forth in the Updated Watershed Plans. To accommodate achieving these percentage milestones, the District shall have the flexibility to propose to EPA and the Cabinet for its review and approval alterations, modifications and/or replacement of projects in an Updated Watershed Plan, including the relative priority of and/or deadlines for such projects, that may become necessary to ensure achievement of these percentage milestones based upon engineering, environmental, logistical, or other appropriate factors. The Cabinet/EPA shall provide for prompt and expedited review of such alternate project plan submittals as the circumstances warrant to accommodate the District in meeting its overflow reduction goals and provide its approval/disapproval pursuant to Section VI. of this Amended Consent Decree.

(g) The LTCP component of Updated Watershed Plans shall meet the following goals:

1. Ensure that if CSOs occur, they are only as a result of wet weather conditions (this goal shall include addressing those discharges

resulting from the District's compliance with the requirements of the United States Army Corps of Engineers' Ohio River Flood Protection System Pumping Operations Manual, dated 1954 and revised 1988);

2. Bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA; and

3. Minimize the impacts of CSOs on water quality, aquatic biota, and human health.

(h) The LTCP component of each Updated Watershed Plan shall also include, at a minimum, the following elements:

1. The results of any evaluation of water pollution control needs on a watershed management basis and the coordination of CSO control efforts with other permitted point sources and nonpoint source control activities and a demonstration that the District's CSOs comply with water quality standards considering natural background conditions and pollution sources other than CSOs through those TMDLs finalized by the Cabinet up until 90 days prior to submittal of an Updated Watershed Plan;

2. The results of characterization, monitoring, modeling activities, and the application of design parameters, which may include design parameters previously approved in a prior Watershed Plan, as the basis for selection and design of effective CSO controls (including

controls to address those discharges resulting from the District's compliance with the requirements of the United States Army Corps of Engineers' Ohio River Flood Protection System Pumping Operations Manual, dated 1954 and revised 1988);

3. The results of an evaluation of peak flow treatment capacity for the DCWWTP and any WWTP that will receive additional flow based on any LTCP project beyond that flow evaluated in a prior Watershed Plan. In preparing such an evaluation, the District shall use as guidance the EPA publications "Improving POTW Performance Using the Composite Correction Approach," EPA CERI, October 1984, and "Retrofitting POTWs," EPA CERI, July 1989;

4. A report on the public participation process;

5. Identification of how the LTCP addresses sensitive areas, including drinking water intakes, as a high priority for controlling overflows

6. A report on the cost analyses of the alternatives considered, including a financial capability assessment taking into consideration EPA's "Combined Sewer Overflows Guidance for Financial Capability Assessment and Schedule Development," EPA 832-B-97-004, February 1997, Financial Capability Assessment Framework for Municipal Clean Water Act Requirements (November 24, 2014), and other guidance that EPA or the Cabinet may issue on affordable rate and financial capacity considerations

for wastewater utilities, taking into account the economic capability and the differing characteristics of the communities the District serves;

7. Operational plan revisions to include long-term CSO controls;

8. Maximization of treatment at the District's existing WWTPs for wet weather flows;

9. Identification of, and an implementation schedule for, the selected CSO controls; and

10. A post-construction compliance monitoring program adequate to ascertain the effectiveness of CSO controls and to verify compliance of the District's CSOs with water quality-based CWA requirements.

(i) The SSOP component of each Updated Watershed Plan shall include, at a minimum, the following elements:

1. The results of an evaluation of WWTP peak flow treatment capacity for WWTPs that will receive additional peak flow based on any SSOP project beyond that flow evaluated in a prior Watershed Plan. In preparing such evaluation, the District shall use as guidance the EPA publications "Improving POTW Performance Using the Composite Correction Approach," EPA CERI, October 1984, and "Retrofitting POTWs," EPA CERI, July 1989.

2. A map that shows the location of all known capacity-related SSOs and Unpermitted Discharges.

3. The map shall include the areas and sewer lines that serve as tributary to each capacity-related SSO and Unpermitted Discharge. Smaller maps of individual tributary areas also may be included to show the lines involved in more detail.

4. A description of each capacity-related SSO and Unpermitted Discharge location that includes:

   i. The frequency of the event;

   ii. The annual volume of the event;

   iii. A description of the location of the event, *e.g.*, manhole, etc.;

   iv. The receiving stream, if applicable;

   v. The immediate area and downstream land use, including the potential for public health concerns;

   vi. A description of any studies to investigate the event that were conducted within five (5) years of plan submission, that are being conducted at the time of plan submission, or that is proposed for the future; and

   vii. A description of any rehabilitation or construction work that was conducted within five (5) years of plan submission, that is being conducted at the time of plan submission, or that is proposed for the future to remediate or eliminate the capacity-related SSO or Unpermitted Discharge.

5. A prioritization of the capacity-related SSO and Unpermitted Discharge locations identified above, based primarily on the

frequency, volume and impact on the receiving stream and upon public health, and in coordination with any remedial activity performed pursuant to the CMOM Programs and any other component of a Watershed Plan and an evaluation of water pollution needs on an integrated watershed management basis. Based upon this prioritization, the District shall develop projects and expeditious schedules for design, initiation of construction and completion of construction for each project, and shall include the express purpose of each project in terms of eliminating specifically-identified capacity-related SSOs and Unpermitted Discharges.

42. If Updated Watershed Plans identify any permitted point sources or nonpoint sources, other than CSOs and SSOs, that are contributing to water quality impairment, the Watershed Plans shall also identify planned control measures, if any, that the District plans to utilize and shall provide implementation schedules for these controls. If a control on these other sources of pollution is to be implemented to offset the level of CSO controls or to delay the elimination of an SSO or Unpermitted Discharge, other than through a final TMDL developed by the Cabinet, the Watershed Plan shall identify the means by which the District intends to insure that the control is implemented.

43. As stated above, to measure its progress towards compliance with this Amended Consent Decree and the Updated Watershed Plans to address CSOs and capacity-related SSOs, the District is committed to achieving percentage milestones of volumes of combined sewage in the CSS eliminated and/or captured for treatment and percentage milestones of SSO volumes eliminated as set forth in this Paragraph. The Updated

Watershed Plans shall include a detailed description of how these percentages will be achieved within the milestones set forth below. The methods and baseline conditions for measuring these volume percentages are set forth on Appendix B, attached hereto.

(a) For CSOs, the District shall achieve by the specified milestone dates below no less than the percentage of combined sewage volumes in the CSS eliminated and/or captured for treatment as follows:

Milestone Date	Percentage
July 1, 2023	67%
January 1, 2029	75%
July 1, 2034	80%
January 1, 2040	85%

The percentage values set forth in this paragraph for milestone dates January 1, 2029 and July 1, 2034 may be amended with joint approval of the Cabinet and EPA if the District demonstrates in an Updated Watershed Plan submittal that amended percentage values are warranted and justified under the criteria of Paragraph 41 based upon the nature and circumstances of the projects proposed.

(b) For capacity-related SSOs, the District shall achieve by the specified milestone dates below SSO volumes no more than the percentage of baseline SSO volume as follows:

Milestone Date	Percentage of Baseline SSO Volume
July 1, 2023	80%
January 1, 2029	25%
July 1, 2034	10%

January 1, 2040 0%

44. The District shall develop within the first Updated Watershed Plan to be submitted pursuant to Paragraph 41 of this Amended Consent Decree public participation procedures for involving the affected public in decisions being made in Updated Watershed Plans and shall follow the publication procedures of KRS Chapter 424 prior to submittal of a proposed Updated Watershed Plan to the Cabinet/EPA for approval, to obtain public input on such draft plans. The District may also hold informal workshops and other informational meetings to solicit input from the public and the Cabinet/EPA in the decision-making process. The number and format of such informal workshops and meetings shall be left to the District's discretion. The District may, in its discretion, also form interest groups for each Watershed that may include members of the public, businesses, and/or governmental agencies that will be kept advised of progress on Watershed Plans through annual meetings.

45. KRS 224.16-040(9) provides that when approving long-term control plans for wet weather discharges from combined or separate sanitary sewer systems, or enforcing provisions of the federal Water Pollution Control Act, 33 U.S.C. §§ 1251 et seq., the Cabinet shall consider, among other factors, the attainability of water quality standards and the development of wet weather standards. The District intends to request that, pursuant to 402(q) of the Clean Water Act and KRS 224.16-040(9), the development of the Updated Watershed Plans be coordinated with the Cabinet's review and appropriate revision of water quality standards and implementation procedures on CSO-impacted waters to ensure that CSO discharges remaining after implementation of the planned control program will

not preclude the attainment of water quality standards or the receiving waters' designated uses.

46. The District shall implement the interim projects identified on Appendix C, attached hereto, as a requirement of this Amended Consent Decree to ensure ongoing progress in achieving the goals of this Amended Consent Decree while the Updated Watershed Plan referenced in Paragraph 41 is under development and review. The listed interim projects on Appendix C that are identified as having construction be the phase to be completed, with the exception of the Ash Street Pump Station and Force Main and Gravity Sewer Project, shall be completed by December 31, 2020. The Ash Street Pump Station and Force Main and Gravity Sewer Project shall be completed by May 1, 2021 in accordance with the Cabinet/EPA's prior *Force Majeure* determination, unless a further *Force Majeure* extension or a substitute project is jointly approved by EPA and the Cabinet with a different compliance deadline. The District estimates that the interim projects on Appendix C that are identified as having construction be the phase to be completed will cost approximately $50 million and will reduce approximately 17% of the baseline SSO volume and will reduce, treat and/or capture an additional 2% of the baseline CSO volume as described in Paragraph 43 above.

V. REPORTING REQUIREMENTS

47. **Semi-Annual Reports.** The District shall submit to the Cabinet/EPA a Semi-Annual Report no later than sixty days after the end of each six-month calendar period ending June 30 and December 31. The first such report shall be submitted to the Cabinet/EPA no later than sixty days after the first full six-month calendar period after entry of this Amended Consent Decree. The Semi-Annual Report covering the six-month

calendar period ending June 30 may be submitted along with or a part of the Annual Report set forth below. The Semi-Annual Report shall include the date, time, location, estimated volume, estimated duration, receiving water (if any), cause and actions taken to respond to and repair or otherwise resolve the cause of all SSOs and dry weather CSOs occurring in the most recently completed six-month calendar period. For reported SSOs, the Semi-Annual Report shall also identify any project that may be included in Appendix C of this Amended Consent Decree or in an Updated Watershed Plan that is designed to eliminate that SSO. The Semi-Annual Report shall also include such information in a tabulated electronic format.

48. **Annual Reports**. The District shall submit each year to the Cabinet/EPA an Annual Report that describes the District's progress in complying with this Amended Consent Decree during the previous fiscal year ending June 30. The Annual Report shall be submitted no later than 60 days after the end of each fiscal year period. The Annual Reports shall include, at a minimum:

(a) A description of projects and activities conducted during the previous year to comply with the requirements of this Amended Consent Decree, in Gantt chart or similar format;

(b) An accounting, both for the current calendar year and cumulatively, of the reduction in volume and in number of occurrences of SSOs and Unpermitted Discharges and the volumes of combined sewage in the CSS, including the District's progress towards achieving the requirements for the percentage of volumes of combined sewage in the CSS eliminated and/or captured for treatment and the percentage of capacity-related SSO volumes eliminated as set forth in Paragraph 43 of this Amended Consent Decree;

(c) The anticipated projects and activities that will be performed in the successive calendar year to comply with the requirements of this Amended Consent Decree, in Gantt chart or similar format;

(d) A summary of the CMOM and asset management program implementation shall be included in the fiscal year report, including a comparison of actual performance measures that have been established in those programs; and

(e) Any additional information necessary to demonstrate that the District is adequately implementing its Updated Watershed Plans as set forth in Section IV.D above.

VI. REVIEW OF SUBMITTALS

49. The Cabinet/EPA agree to expeditiously review and comment on submittals that the District submits to the Cabinet/EPA for approval pursuant to the terms and provisions of this Amended Consent Decree. If the Cabinet/EPA cannot complete its review of a submittal within ninety days of receipt of the submittal, the Cabinet/EPA shall so notify the District before the expiration of the ninety-day review period. If the Cabinet/EPA fail to approve, provide comments or otherwise act on a submittal within ninety days of receipt of the submittal, any subsequent milestone date set forth in the submittal that is dependent upon such action by the Cabinet/EPA shall be extended by the number of days beyond the ninety-day review period that is used by the Cabinet/EPA for review and approval of the submittal.

50. Upon review of submittals that the District is required to submit to the Cabinet/EPA for approval pursuant to the terms and provisions of this Amended Consent Decree, the Cabinet/EPA may jointly: (1) approve the submittal in writing, in whole or in part, or (2) in the event the submittal is not approved in whole, provide written comments

to the District identifying any deficiencies. Upon receipt of any Cabinet/EPA comments identifying deficiencies, the District shall have sixty days to revise and resubmit the submittal to the Cabinet/EPA for review and approval, subject to the District's rights under the dispute resolution provisions of this Amended Consent Decree. Upon resubmission, the Cabinet/EPA shall jointly approve or disapprove the revised submittal. If the resubmission is disapproved, the Cabinet/EPA may require further revisions to the submittal by the District, subject to the District's rights under the dispute resolution provisions of this Amended Consent Decree, or may deem the District to be out of compliance with this Amended Consent Decree for failure to timely submit the submittal in compliance with the requirements of this Amended Consent Decree and may assess stipulated penalties pursuant to this Amended Consent Decree, subject only to the District's rights under the dispute resolution provisions of this Amended Consent Decree. Upon Cabinet/EPA approval of all or any part of an Updated Watershed Plan developed under Paragraph 41 of this Amended Consent Decree, the Updated Watershed Plan, or any approved part thereof (provided that the approved part is not dependent upon implementation of any part not yet approved), shall be incorporated into this Amended Consent Decree and shall become an enforceable requirement of this Amended Consent Decree.

VII. STIPULATED PENALTIES

51. For failure to Timely (as hereinafter defined in Paragraph 55 of this Amended Consent Decree) submit an Updated Watershed Plan, the Cabinet/EPA may jointly assess against the District a stipulated penalty in the amount of three thousand dollars ($3,000). For each day the District remains out of compliance for failure to timely

submit the above submittal, the Cabinet/EPA may jointly assess against the District a stipulated penalty of an additional five hundred dollars ($500) per day. This penalty is in addition to, and not in lieu of, any other penalty that could be assessed.

52. For each day the District fails to Timely complete projects in accordance with the schedule set forth in the approved Watershed Plan or any Updated Watershed Plan, NMC Compliance Plan, CMOM Programs Self-Assessment, or Pump Station Operation Plan for Backup Power, the Cabinet/EPA may jointly assess against the District stipulated penalties for each such project as follows:

Period Beyond Completion Date	Penalty Per Violation Per Day
1 - 30 days	$1,000
31 - 60 days	$2,000
61 - 120 days	$3,000
more than 120 days	$5,000

This penalty is in addition to, and not in lieu of, any other penalty that could be assessed.

53. For failure to Timely submit an Annual Report or Semi-Annual Report, the Cabinet/EPA may jointly assess against the District a stipulated penalty in the amount of one thousand dollars ($1,000) per day. This penalty is in addition to, and not in lieu of, any other penalty that could be assessed.

54. For the circumstances described below, the Cabinet/EPA may jointly assess against the District stipulated penalties as follows:

(a) For dry weather CSOs occurring after the date of the entry of this Amended Consent Decree, two thousand dollars ($2,000) per discharge (provided, however, that the

Cabinet/EPA shall not assess stipulated penalties for those discharges resulting from the District's compliance with the requirements of the United States Army Corps of Engineers' Ohio River Flood Protection System Pumping Operations Manual, dated 1954 and revised 1988, which shall be addressed under the LTCP components of the Watershed Plans).

(b) For any SSO at a pump station identified on Appendix D, attached hereto, five thousand dollars ($5,000) per SSO Event (as hereinafter defined in Paragraph 55 of this Amended Consent Decree) occurring after the date for completion of construction of projects for such pump station as identified on Appendix D. SSO Events at a pump station identified on Appendix D shall become subject to the stipulated penalties set forth in Paragraph 54.(e) below upon a demonstration by the District that no SSO Event has occurred at that pump station for a 12-month period following completion of the projects for such pump station.

(c) For any Recurring SSO (as hereinafter defined in Paragraph 55 of this Amended Consent Decree) at a SSO location identified on Appendix C, attached hereto, for which an interim project has been identified on Appendix C to eliminate such SSO, that occurs after the deadline for construction completion of such interim project as identified on Appendix C: $1,000 per SSO Event of less than 5,000 gallons, $2,000 per SSO Event of 5,000 gallons to 100,000 gallons, and $5,000 per SSO Event of more than 100,000 gallons.

(d) For any Recurring SSO at a SSO location identified in an Updated Watershed Plan and for which a specific project has been identified to eliminate such SSO location that occurs after the deadline specified in an Updated Watershed Plan for that SSO

location: $1,000 per SSO Event of less than 5,000 gallons, $2,000 per SSO Event of 5,000 gallons to 100,000 gallons, and $5,000 per SSO Event of more than 100,000 gallons.

(e) For any Recurring SSO other than those identified in Paragraphs 54.(b), (c) and (d) above that occurs more than twelve (12) months after entry of this Amended Consent Decree, $1,000 per SSO Event.

These penalties are in addition to, and not in lieu of, any other penalty that could be assessed.

55. For purposes of Paragraph 54 only, a "Recurring SSO" shall mean an SSO that discharges wastewater to waters of the United States and occurs in the same location more than once per twelve (12)-month rolling period. For purposes of Paragraph 54 only, a single "SSO Event" shall mean the total time period an SSO discharging wastewater to waters of the United States occurs at the same location and due to the same cause(s). For example, a collapsed pipe that results in an SSO discharging wastewater to waters of the United States on multiple days is a single SSO Event. For purposes of Paragraphs 51, 52 and 53 only, "Timely" when applied to a submittal by the District pursuant to this Amended Consent Decree shall mean submitted (*e.g.,* postmarked) no later than the deadline established in this Amended Consent Decree (or in a document approved pursuant to this Amended Consent Decree) and containing all of the elements pertaining to the submittal as set forth in this Amended Consent Decree (or in a document approved pursuant to this Amended Consent Decree). "Timely," when applied to the implementation of any project shall mean completed no later than the deadline established in this Amended Consent Decree (or in a document approved pursuant to this Amended Consent Decree) and in

accordance with the elements pertaining to such project as set forth in this Amended Consent Decree (or in a document approved pursuant to this Amended Consent Decree).

56. If the Cabinet/EPA determine to assess and demand a stipulated penalty, the Cabinet/EPA shall on a periodic basis jointly send the District written notice, including the amount of the stipulated penalty due. The District shall pay the stipulated penalty within thirty days of receipt of the notice. Fifty percent of each payment due shall be paid to the Cabinet and fifty percent shall be paid to the United States.

57. The District shall not be liable for stipulated penalties for SSO Events under Paragraph 54 above if the District demonstrates that the SSO Event was caused by an extraordinary natural catastrophe which is beyond human control such as an earthquake, a hurricane or a tornado; vandalism; a non-District contractor; or any act of a third party not working directly or indirectly on behalf of the District; and the District demonstrates that it has used all reasonable measures to prevent such SSO Event.

58. If the District believes the request for payment of a stipulated penalty is erroneous or contrary to law, it may invoke the dispute resolution provisions of this Amended Consent Decree. Invoking the dispute resolution provisions does not automatically excuse timely payment of the penalty or the continuing accrual of stipulated penalties, unless agreed to by the Cabinet and EPA or stayed by the Court. If the District invokes the dispute resolution provisions of this Amended Consent Decree under these circumstances, the District shall deposit the amount of the stipulated penalty into an escrow account bearing interest on commercially reasonable terms, in a federally-chartered bank. Upon final resolution of the dispute by the Cabinet and EPA, or the Court, the District shall, within five (5) days thereof, serve written instructions directing that the escrow agent,

within fifteen days thereof, cause the monies in the escrow account to be paid to Cabinet and the United States in accordance with the procedures set forth in Paragraph 59 below, or returned to the District, depending on the outcome of the dispute resolution process. The District's failure to make timely payment of stipulated penalties, either to the Cabinet, the United States or to an escrow account pursuant to this Paragraph, shall constitute an additional violation of this Amended Consent Decree.

VIII. PAYMENT OF PENALTIES AND STIPULATED PENALTIES

59. Payment of all sums due to the Cabinet shall be by cashier's check, certified check, or money order, made payable to "Kentucky State Treasurer", and sent to:

Kentucky Department for Environmental Protection
Division of Enforcement
300 Sower Boulevard
Frankfort, KY 40601
Attention: Director

Payment of all sums due to United States shall be made by electronic funds transfer, in accordance with written instructions to be provided by the United States after entry of this Amended Consent Decree. The costs of such electronic funds transfer shall be the responsibility of the District. The District shall send a copy of the electronic funds transfer authorization form, the electronic funds transfer transaction record, and the transmittal letter to the Parties as specified in Paragraph 77 below. The transmittal letter shall reference the case name and DOJ Case No. 90-5-1-1-08591.

IX. DISPUTE RESOLUTION

60. Any dispute that arises under or with respect to this Amended Consent Decree shall in the first instance be the subject of informal negotiations between the Parties. The District shall invoke the informal dispute resolution procedures by notifying the

Cabinet and EPA in writing of the matters(s) in dispute and of the District's intention to resolve the dispute under these Paragraphs 60 and 61. The notice shall: (1) outline the nature and basis of the dispute; (2) include the District's proposed resolution; (3) include all information or data relating to the dispute and the proposed resolution; and (4) request negotiations pursuant to this Paragraph to informally resolve the dispute. The Parties shall then attempt to resolve the dispute informally for a period of thirty days from the date of the notice with the goal of resolving the dispute in good faith, without further proceedings. The period for informal negotiations shall not exceed thirty days from the date of the original notice of this dispute, unless the Parties otherwise agree in writing to extend that period.

61. If informal negotiations are unsuccessful, the position of the Cabinet and EPA shall control unless, within thirty days after the conclusion of the informal negotiation period, the District seeks judicial review of the dispute by filing with the Court and serving on the Cabinet and EPA a motion requesting judicial resolution of the dispute. The motion shall contain a written statement of the District's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and shall set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Amended Consent Decree. The Cabinet and EPA shall respond to the District's motion within thirty days. Either Party may request an evidentiary hearing for good cause. The burden of proof is on the District to demonstrate that its position on the matter in dispute meets the objectives of the Amended Consent Decree, any amendment to this Amended Consent Decree, the CWA and KRS Chapter 224. If the dispute is not resolved within the schedule identified for orderly implementation of the

Amended Consent Decree in the District's motion, the District may request additional time beyond compliance schedules or deadlines in this Amended Consent Decree that are dependent upon the duration and/or resolution of the dispute.

X. FORCE MAJEURE

62. The District shall perform the requirements of this Amended Consent Decree within the time limits set forth in this Amended Consent Decree unless the performance is prevented or delayed solely by events which constitute a force majeure.

63. A force majeure event is defined as any event arising from causes not reasonably foreseeable and beyond the control of the District or its consultants, engineers, or contractors which could not be overcome by due diligence and which delays or prevents performance as required by this Amended Consent Decree.

64. Force majeure events do not include unanticipated or increased costs of performance, changed economic or financial conditions, or failure of a contractor to perform or failure of a supplier to deliver unless such failure is, itself, the result of force majeure.

65. The District shall notify the Cabinet's Director of the Division of Enforcement and EPA's Chief of the NPDES Permitting and Enforcement Branch by telephone within ten (10) business days and in writing within fifteen business days after it becomes aware of events which it knows or should reasonably know may constitute a force majeure. The District's notice shall provide an estimate of the anticipated length of delay, including any necessary period of time for demobilization and remobilization of contractors or equipment; a description of the cause of delay; a description of measures

taken or to be taken by the District to minimize delay, including a timetable for implementing these measures.

66. Failure to comply with the notice provision shall be grounds for the Cabinet and EPA to deny granting an extension of time to the District. If any event is anticipated to occur which may cause a delay in complying with the terms of this Amended Consent Decree, the District shall promptly notify the Cabinet's Director of the Division of Enforcement and EPA's Chief of the NPDES Permitting and Enforcement Branch in writing within ten (10) business days of learning of the possibility of a force majeure event, if the event has not already occurred. The Cabinet/EPA will jointly respond in writing to any written notice received.

67. If the District reasonably demonstrates to the Cabinet and EPA that the delay has been or will be caused by a force majeure event, the Cabinet and EPA will extend the time for performance for that element of the Amended Consent Decree for a period not to exceed the delay resulting from such circumstances. Stipulated penalties shall not accrue for any such period of delay resulting from a force majeure event.

68. If a dispute arises over the occurrence or impact of a force majeure event and cannot be resolved, the Cabinet/EPA reserves the right to seek enforcement of this Amended Consent Decree and the District reserves the right to invoke the dispute resolution provisions of this Amended Consent Decree. In any such dispute, the District shall have the burden of proof that a violation of this Amended Consent Decree was caused by a force majeure event.

XI. COST OF SUIT

69. The Parties shall bear their own costs and attorneys' fees with respect to matters related to this Amended Consent Decree.

XII. CERTIFICATION OF SUBMISSIONS

70. In all notices, documents or reports submitted pursuant to this Amended Consent Decree, the District shall, by a responsible party of the District, as defined by 40 C.F.R. § 122.22, sign and certify each such notice, document and report as follows:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

XIII. RIGHT OF ENTRY

71. The Cabinet and EPA and their authorized representatives and contractors shall have authority at all times, upon the presentation of proper credentials, to enter the premises of the District to:

(a) Monitor the work required by this Amended Consent Decree;

(b) Verify any data or information submitted to the Cabinet or EPA;

(c) Obtain samples from any portion of the SSS, CSS or WWTPs;

(d) Inspect and evaluate any portions of the SSS, CSS or WWTPs;

(e) Inspect and review any records required to be kept under the terms and conditions of this Amended Consent Decree or any KPDES permit, the CWA, and KRS Chapter 224; and

(f) Otherwise assess the District's compliance with state and federal environmental laws and this Amended Consent Decree.

The rights created by this Paragraph are in addition to, and in no way limit or otherwise affect, the authority of the Cabinet or EPA to conduct inspections, to require monitoring and to obtain information from the District as authorized by law.

XIV. RECORD RETENTION

72. The District shall retain all data, documents, plans, records, and reports that relate to the District's performance under this Amended Consent Decree which are in the possession, custody, or control of the District or its consultants or contractors. The District shall retain all such materials for five (5) years from the date of origination. Drafts of final documents, plans, records, or reports do not need to be retained. This Paragraph does not limit or affect any duty or obligation of the District to maintain records or information required by any KPDES permit. At the conclusion of this retention period, the District shall notify the Cabinet and EPA at least one-hundred and twenty days prior to the destruction of any such materials, and upon request by any of these Parties, the District shall deliver any such materials to that Party.

XV. PUBLIC COMMENTS

73. The Parties agree and acknowledge that final approval of this Amended Consent Decree by the Cabinet and EPA, and entry of this Amended Consent Decree by the Court, are subject to the requirements of 28 C.F.R. § 50.7, which provides for notice of the lodging of this Amended Consent Decree in the Federal Register, an opportunity for public comment, and consideration of any comments. The District hereby agrees not to withdraw from, oppose entry of, or challenge any provision of this Amended Consent

Decree, unless the Cabinet or EPA has notified the District in writing that it no longer supports entry of the Amended Consent Decree.

XVI. CONTINUING JURISDICTION

74. The Court shall retain jurisdiction to effectuate and enforce the terms and conditions and achieve the objectives of this Amended Consent Decree, and to resolve disputes arising hereunder as may be necessary or appropriate for the construction, modification, implementation, or execution of this Amended Consent Decree.

XVII. SIGNATORIES

75. The signatories for the Parties certify that they are fully authorized to enter into the terms and conditions of this Amended Consent Decree and to execute and legally bind such Parties to this document.

76. The District's agent identified on the attached signature page is authorized to accept service of process by mail on the District's behalf with respect to all matters arising under or related to this Amended Consent Decree. The District agrees to accept service of process in that manner and to waive the formal service and notice requirements set forth in Section 505 of the CWA, 33 U.S.C. § 1365, and Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including but not limited to service of a summons.

XVIII. MISCELLANEOUS PROVISIONS

77. Unless otherwise specified, or as may be changed from time to time, all reports, notices, or any other written communications required to be submitted under this Amended Consent Decree by the District to the Cabinet and EPA shall be sent to following addresses:

As to Cabinet:

Director of the Division of Enforcement
Department for Environmental Protection
300 Sower Boulevard
Frankfort, KY 40601

For verbal notifications: Director, Division of Enforcement, (502) 564-2150.

As to EPA:

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Post Office Box 7611
Washington, D.C. 20044-7611
Reference DOJ Case No. 90-5-1-1-08591

Chief, NPDES Permitting and Enforcement Branch
Water Protection Division
U.S. Environmental Protection Agency,
Region 4
Atlanta Federal Center
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

For verbal notifications: Gracy R. Danois, Acting Chief, NPDES Permitting and Enforcement Branch, 404-562-9119.

78. All notices to the District required by this Amended Consent Decree shall be sent to Executive Director, Sanitation District No. 1, 1045 Eaton Drive, Fort Wright, KY 41017-9681, unless otherwise designated in writing by the District.

79. Notifications to, or communications with, the Parties shall be deemed submitted on the date they are postmarked and sent by certified mail, return receipt requested, or deposited with an overnight mail/delivery service.

80. This Amended Consent Decree is entered in full and final settlement of the civil claims for violations of KRS Chapter 224 and the CWA as alleged in the complaints filed by the Cabinet and EPA up through the date of entry of this Amended Consent Decree, but shall not affect rights or obligations not specifically addressed herein, as to which the Parties specifically reserve their rights. The Cabinet and EPA enter into this Amended Consent Decree, in part, based upon information supplied by the District. Nothing contained herein shall be construed to waive or limit any remedy or cause of action by the Cabinet or EPA based on statutes or regulations under its jurisdiction, and the District reserves its defenses thereto, except that the District shall not use this Amended Consent Decree as a defense. The Cabinet and EPA reserve their rights at any time to issue administrative orders or to take any other action it deems necessary, including the right to order all necessary remedial measures, assess penalties for violations or recover any response costs that may be incurred, and the District reserves its defenses thereto, except that the District shall not use this Amended Consent Decree as a defense.

81. This Amended Consent Decree shall not prevent the Cabinet or EPA from issuing, reissuing, renewing, modifying, revoking, suspending, denying, terminating, or reopening any permit to the District, including any necessary modifications to the District's KPDES permits for WWTPs to maintain consistency with the CSO Control Policy. The District shall not use this Amended Consent Decree as a defense to those permit actions.

82. The District waives its rights to any hearing on the matters addressed herein. Failure by the District to comply strictly with the terms of this Amended Consent Decree shall be grounds for the Cabinet and EPA to seek enforcement of this Amended Consent

Decree in this Court and to pursue any other appropriate administrative or judicial action under the CWA or KRS Chapter 224, and the regulations promulgated pursuant thereto.

83. Each separate provision, condition or duty contained in this Amended Consent Decree may be the basis for an enforcement action for a separate violation and penalty pursuant to the CWA and KRS Chapter 224, upon the failure to comply with the terms of this Amended Consent Decree.

84. The terms and conditions stated herein are intended to be implemented as a whole and may not be challenged independently. Except as set forth below, this Amended Consent Decree may not be materially amended or modified except by written agreement of the Parties, and approval of this Court. Any material modification of this Amended Consent Decree shall be effective upon approval of the Court. Non-material modifications of the obligations of the Parties which do not significantly alter the terms of this Amended Consent Decree, such as changes to schedules or interim deadlines for any project to be implemented pursuant to a submittal required by this Amended Consent Decree, may be made in writing by the Parties. If the District is involuntarily divested of its existing authority or ability to comply with this Amended Consent Decree due to a final court order or an act of the Kentucky General Assembly, the District may seek to amend this Amended Consent Decree consistent with this Paragraph.

85. The District shall use its best efforts to seek and obtain the approval of the judges/executive of the Fiscal Courts in Boone, Campbell, and Kenton Counties, Kentucky of all land acquisitions, construction of capital improvements, service charges and user fees, and budgets that the District determines to be necessary to enable the District to comply with this Amended Consent Decree. The District shall also use its best efforts to

seek and obtain the approval of the Fiscal Courts in Boone, Campbell, and Kenton Counties, Kentucky of all service charges, rates and user fees that are greater than five (5) percent, that the District determines are necessary to enable the District to comply with this Amended Consent Decree. Such actions that require approval by the judges/executive and/or Fiscal Courts that the District determines are necessary to enable the District to comply with this Amended Consent Decree shall hereinafter collectively be referred to as "Rate Setting Actions". The District's best efforts shall include a thorough and good faith presentation to the judges/executives and/or Fiscal Courts of information with respect to what Rate Setting Actions are required to comply with this Amended Consent Decree and what Rate Settings Actions the District is proposing to undertake to comply with this Amended Consent Decree, including a detailed financial analysis of the costs of such Rate Setting Actions and the service charges, rates and user fees that the District determines to be necessary to pay for such Rate Setting Actions.

In the event that the judges/executive and/or Fiscal Courts do not approve Rate Setting Actions pursuant to KRS 220.035 or 220.542, or similar future state statutes regarding the District's rate setting authority, that the District determines to be necessary to enable the District to comply with this Amended Consent Decree (hereinafter "Denied Actions"), the District shall, within fifteen (15) days after such Denied Actions, notify the Cabinet and EPA of such Denied Actions pursuant to Paragraph 77 of this Amended Consent Decree. In this notice, the District shall set forth the circumstances surrounding the Denied Actions (including any service charge, rate or user rate fee increase proposed), an explanation for why such Denied Actions were necessary to enable it to comply with

this Amended Consent Decree, and a description of the best efforts it took to seek the approval of the Denied Actions by the judges/executive and/or Fiscal Courts.

In the event of Denied Actions, despite the District using its best efforts to seek and obtain such approval the Cabinet and EPA shall not seek to hold individual District Board members in contempt of Court and shall not seek stipulated penalties against the District to the extent the District is unable to comply with this Amended Consent Decree as a direct result of the Denied Actions. The District shall, however, continue to perform obligations under this Amended Consent Decree to the extent possible with any other Rate Setting Actions (including any service charge, rate or user fee increases) approved by the judges/executives and/or Fiscal Courts. While the occurrence of Denied Actions may affect the District's ability to comply with this Amended Consent Decree, the District shall remain obligated to perform all requirements of this Amended Consent Decree.

In the event of Denied Actions, despite the District using its best efforts to seek and obtain such approval, the Cabinet and EPA may move the Court to exercise its inherent authority under the CWA and other laws to ensure compliance with the Court's order and the protection of public health and the environment by ordering such actions as may be necessary, including the imposition of service charge, rate and user fee increases that the District determined are necessary to enable the District to comply with this Amended Consent Decree and including ordering the judges/executive and/or Fiscal Courts to approve Rate Setting Actions including all necessary service charge, rate and user fee increases. The District shall not take any action that could reasonably be construed to be in opposition to such a motion by the Cabinet and EPA. The Cabinet and EPA hereby reserve all of their rights to take any other actions under the law so as to ensure compliance with

the CWA, KRS Chapter 224 and this Amended Consent Decree that are not inconsistent with this Paragraph.

86. The Cabinet/EPA do not, by their consent to the entry of this Amended Consent Decree, warrant or aver in any manner that the District's complete compliance with this Amended Consent Decree will result in compliance with the provisions of the CWA or KRS Chapter 224 and the regulations promulgated pursuant thereto, nor with any permit. Notwithstanding the Cabinet's and EPA's review and approval of any plans formulated pursuant to this Amended Consent Decree, the District shall remain solely responsible for compliance with the CWA, the terms of KRS Chapter 224 and the regulations promulgated pursuant thereto, this Amended Consent Decree and any permit requirements. This Amended Consent Decree is not and shall not be construed as a permit, nor a modification of any existing permit, issued pursuant to Section 402 of the CWA, 33 U.S.C. § 1342, nor shall it in any way relieve the District of its obligations to obtain permits for its WWTPs and related operations or facilities and to comply with the requirements of any KPDES permit or with any other applicable state or federal law or regulation. Any new permit, or modification of existing permits, shall be complied with in accordance with applicable state or federal laws and regulations.

87. The provisions of this Amended Consent Decree shall apply to and be binding upon the District. The acts or omissions of the District's officers, directors, agents, servants and employees shall not excuse the District's performance of any provision of this Amended Consent Decree. The Cabinet and EPA reserve their rights to seek enforcement of this Amended Consent Decree against the District's successors and assigns and the District reserves its defenses thereto. The District shall give notice of this Amended

of the Updated Watershed Plans, and (c) completion of all work and implemented all the requirements in the NMC Compliance Plan, CMOM Programs Self-Assessment, Grease Control Program, Pump Station Operation Plan for Backup Power, SORP, projects listed in Appendix C, Watershed Plans, and Updated Watershed Plans, as required under this Amended Consent Decree or any amendment to this Amended Consent Decree. The Cabinet/EPA's determination that the Amended Consent Decree should be terminated shall be based on a consideration of whether all of the requirements listed above have occurred.

91. The District may request that the Cabinet/EPA make a determination that this Amended Consent Decree be terminated. Any such request shall be in writing and shall include a certification that the requirements listed in the above Paragraph have been met. The District shall serve a copy of any such request on the Cabinet through the office of its Secretary and EPA through the Director of the EPA Region 4 Water Division. If the Cabinet/EPA agree that the District has met all of the requirements listed above, the Cabinet/EPA and the District shall file a joint motion with the Court seeking an order terminating the Amended Consent Decree. If the Cabinet/EPA determine not to seek termination of the Amended Consent Decree because they determine that all of the requirements listed above were not met, they shall so notify the District in writing. The Cabinet/EPA's notice shall summarize the basis for its decision and describe the actions necessary to achieve final compliance. If the District disagrees with any such determination by the Cabinet/EPA, it shall invoke the dispute resolution procedures of this Amended Consent Decree before filing any motion with the Court regarding the disagreement.

Consent Decree to any purchaser, lessee or successor-in-interest prior to the transfer of ownership and/or operation of all or any portion of the Sewer System or a WWTP occurring prior to termination of this Amended Consent Decree, shall notify the Cabinet and EPA that such notice has been given, and shall follow all statutory and regulatory requirements for a transfer. Whether or not a transfer takes place, the District shall remain fully responsible for payment of all civil penalties, stipulated penalties, and for performance of all remedial measures identified in this Amended Consent Decree; provided, however, that if the District is involuntarily divested of its ownership or control over all or any portion of the Sewer System or a WWTP due to a final court order or an act of the Kentucky General Assembly, the District may seek to amend this Amended Consent Decree consistent with Paragraph 84.

88. By agreeing to the terms and conditions of this Amended Consent Decree, the District is not waiving any rights, claims or causes of action against third parties that it may have that arise from, or relate to the matters addressed in this Amended Consent Decree.

89. The Parties acknowledge and agree that the terms and conditions of this Amended Consent Decree are facility-specific and are designed specifically for the unique characteristics of the District's wastewater conveyance system and the factual circumstances of this case. The language of this Amended Consent Decree is specifically tailored for the District's system.

90. The Amended Consent Decree is subject to termination on the date that the District certifies that it has met all requirement of this Amended Consent Decree, including, without limitation, (a) payment of all stipulated penalties due, (b) submission and approval

XIX. APPENDICES

92. The following appendices are attached to and part of this Amended Consent Decree:

"Appendix A" is a description of the design storm and typical year rainfall data.

"Appendix B" sets for the methods and baseline conditions for measuring cumulative volume percentages.

"Appendix C" is a list and description of the Interim Remedial Projects.

"Appendix D" is a list of Pump Stations for purposes of stipulated penalties.

So ORDERED, this _____ day of _____, _____.

_____
UNITED STATES DISTRICT JUDGE

The undersigned consents to the entry of this Amended Consent Decree in *Commonwealth of Kentucky et al. v. Sanitation District No. 1 of Northern Kentucky*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR THE COMMONWEALTH OF KENTUCKY,
ENERGY & ENVIRONMENT CABINET:

2/20/2019
DATE

R. BRUCE SCOTT, Deputy Secretary

2/20/2019
DATE

CHRISTOPHER FITZPATRICK
Office of Legal Services
Energy & Environment Cabinet
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601
Telephone: (502) 782-7043
Facsimile: (502) 502-564-7484

The undersigned consents to the entry of this Amended Consent Decree in *Commonwealth of Kentucky et al. v. Sanitation District No. 1 of Northern Kentucky*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR SANITATION DISTRICT NO. 1 OF NORTHERN KENTUCKY:

2/19/19
DATE

ROBERT HORINE
President of the Board

2/19/19
DATE

ADAM C. CHANEY
Executive Director

THE UNDERSIGNED Party enters into this Amended Consent Decree, subject to the public notice requirements of 28 C.F.R. § 50.7, and submits it to the Court for entry.

FOR THE UNITED STATES OF AMERICA:

JEFFREY BOSSERT CLARK
Assistant Attorney General
Environment and Natural Resources Division
United States Department of Justice

WILLIAM A. WEINISCHKE
Senior Attorney
Environment and Natural Resources Division
United States Department of Justice
Post Office Box 7611
Washington, D.C. 20044
Telephone: (202) 514-5465
Facsimile: (202) 514-2583

ROBERT M. DUNCAN, JR.
United States Attorney
Eastern District of Kentucky

CHRISTINE CORNDORF
Assistant United States Attorney
Eastern District of Kentucky
260 West Vine Street, Suite 330
Lexington, KY 40507
Telephone: (866) 685-4848

The undersigned consents to the entry of this Amended Consent Decree in *Commonwealth of Kentucky et al. v. Sanitation District No. 1 of Northern Kentucky*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR THE UNITED STATES OF AMERICA:

3/5/19
DATE

MARK POLLINS
Division Director
Water Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

3/4/19
DATE

LOREN DENTON
Chief, Municipal Branch
Water Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

2/25/19
DATE

JAMES VINCH
Attorney
Water Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

The undersigned consents to the entry of this Amended Consent Decree in *Commonwealth of Kentucky et al. v. Sanitation District No. 1 of Northern Kentucky*, subject to the public notice requirements of 28 C.F.R. § 50.7:

FOR THE UNITED STATES OF AMERICA:

1/28/19
DATE

LEIF PALMER
Regional Counsel
United States Environmental Protection Agency
Region 4
61 Forsyth Street
Atlanta, Georgia 30303
Telephone: (404) 562-9542
Facsimile: (404) 562-9663

Of counsel:
PATRICK B. JOHNSON
Associate Regional Counsel
United States Environmental Protection Agency
Region 4
61 Forsyth Street
Atlanta, Georgia 30303
Telephone: (404) 562-9574
Facsimile: (404) 562-8078

APPENDIX "A"

DESIGN STORM AND TYPICAL YEAR RAINFALL DATA

Design storm:

As set forth in the initial Watershed Plan, as related to the elimination of SSOs, the design storm is a rainfall event for Region 3 with a recurrence interval of 2 years and a duration of 6 hours, as set forth in Table 4 on page 124, and time distributed for a first quartile storm in accordance with Table 10 on page 21 and applied over the sewer collection system per areal factors shown in Table 21 on page 36 of the "Rainfall Frequency Atlas of the Midwest" in Attachment A, under saturated antecedent moisture conditions, for the given area square miles as specifically set forth in Attachment B, or per areal reduction factors based upon an analysis of spatially and temporally varying rainfall from a statistically-equivalent rainfall period submitted to and jointly approved by the Cabinet/EPA.

Typical Year:

As set forth in the initial Watershed Plan, as related to control of CSOs to meet the 1994 CSO Control Policy, the volume of wastewater and stormwater in the combined sewer system is the result of the rainfall events that occurred in 1970, as recorded at the Cincinnati-Northern Kentucky International Airport, and represented by the hourly rainfall data provided below, and applied over the sewer collection system per areal factors shown in Table 21 on page 36 of the "Rainfall Frequency Atlas of the Midwest" in Attachment A, for the given area square miles as specifically set forth in Attachment B, or per areal reduction factors based upon an analysis of spatially and temporally varying rainfall from a statistically-equivalent rainfall period submitted to and jointly approved by the Cabinet/EPA.

Date	Time	Rainfall Intensity (inches/hr)
January 1, 1970	4:00 AM	0.01
January 1, 1970	5:00 AM	0.02
January 1, 1970	6:00 AM	0.01
January 1, 1970	7:00 AM	0.01
January 1, 1970	9:00 AM	0.02
January 1, 1970	10:00 AM	0.01
January 1, 1970	1:00 PM	0.01
January 2, 1970	5:00 AM	0.01
January 2, 1970	8:00 AM	0.01
January 2, 1970	9:00 AM	0.01
January 2, 1970	10:00 AM	0.01
January 2, 1970	11:00 AM	0.01
January 2, 1970	4:00 PM	0.02
January 3, 1970	4:00 AM	0.01

Date	Time	Rainfall Intensity (inches/hr)
January 3, 1970	5:00 AM	0.01
January 4, 1970	4:00 AM	0.01
January 9, 1970	1:00 AM	0.01
January 9, 1970	6:00 AM	0.01
January 11, 1970	7:00 AM	0.01
January 11, 1970	8:00 AM	0.03
January 11, 1970	9:00 AM	0.03
January 11, 1970	10:00 AM	0.04
January 11, 1970	11:00 AM	0.02
January 11, 1970	12:00 PM	0.01
January 11, 1970	3:00 PM	0.01
January 18, 1970	3:00 AM	0.02
January 18, 1970	4:00 AM	0.01
January 18, 1970	5:00 AM	0.01

Date	Time	Rainfall Intensity (inches/hr)
January 20, 1970	8:00 AM	0.01
January 20, 1970	9:00 AM	0.01
January 20, 1970	10:00 AM	0.01
January 20, 1970	11:00 AM	0.01
January 23, 1970	1:00 AM	0.02
January 23, 1970	2:00 AM	0.01
January 23, 1970	4:00 AM	0.01
January 23, 1970	5:00 AM	0.02
January 23, 1970	6:00 AM	0.01
January 23, 1970	9:00 AM	0.01
January 29, 1970	2:00 AM	0.37
January 29, 1970	3:00 AM	0.28
January 29, 1970	4:00 AM	0.05
January 29, 1970	5:00 AM	0.05
February 1, 1970	10:00 PM	0.03
February 1, 1970	11:00 PM	0.12
February 2, 1970	12:00 AM	0.1
February 2, 1970	1:00 AM	0.02
February 2, 1970	2:00 AM	0.08
February 2, 1970	3:00 AM	0.03
February 2, 1970	4:00 AM	0.07
February 2, 1970	5:00 AM	0.06
February 2, 1970	6:00 AM	0.03
February 2, 1970	7:00 AM	0.02
February 2, 1970	8:00 AM	0.01
February 2, 1970	9:00 AM	0.01
February 2, 1970	10:00 AM	0.02
February 2, 1970	11:00 AM	0.04
February 2, 1970	12:00 PM	0.08
February 2, 1970	1:00 PM	0.03
February 2, 1970	2:00 PM	0.04
February 2, 1970	3:00 PM	0.08
February 2, 1970	4:00 PM	0.02
February 2, 1970	5:00 PM	0.02
February 2, 1970	6:00 PM	0.01
February 2, 1970	10:00 PM	0.01
February 2, 1970	11:00 PM	0.01
February 3, 1970	1:00 AM	0.01
February 3, 1970	2:00 AM	0.01
February 3, 1970	7:00 AM	0.01
February 4, 1970	11:00 PM	0.02
February 5, 1970	1:00 AM	0.01
February 5, 1970	7:00 AM	0.01
February 5, 1970	9:00 AM	0.01
February 5, 1970	10:00 AM	0.01
February 7, 1970	12:00 PM	0.05
February 7, 1970	1:00 PM	0.06

Date	Time	Rainfall Intensity (inches/hr)
February 7, 1970	2:00 PM	0.05
February 7, 1970	3:00 PM	0.05
February 7, 1970	4:00 PM	0.03
February 7, 1970	5:00 PM	0.02
February 7, 1970	6:00 PM	0.01
February 7, 1970	7:00 PM	0.01
February 7, 1970	8:00 PM	0.01
February 8, 1970	10:00 AM	0.02
February 8, 1970	11:00 AM	0.01
February 8, 1970	3:00 PM	0.01
February 8, 1970	4:00 PM	0.02
February 8, 1970	5:00 PM	0.01
February 10, 1970	7:00 AM	0.01
February 11, 1970	7:00 PM	0.01
February 11, 1970	8:00 PM	0.01
February 14, 1970	5:00 AM	0.02
February 14, 1970	6:00 AM	0.04
February 14, 1970	7:00 AM	0.01
February 14, 1970	4:00 PM	0.03
February 14, 1970	5:00 PM	0.02
February 14, 1970	6:00 PM	0.04
February 14, 1970	7:00 PM	0.02
February 14, 1970	11:00 PM	0.01
February 15, 1970	12:00 AM	0.01
February 15, 1970	3:00 AM	0.02
February 19, 1970	9:00 AM	0.01
February 20, 1970	3:00 AM	0.01
February 25, 1970	4:00 AM	0.01
February 25, 1970	12:00 PM	0.01
March 1, 1970	9:00 PM	0.02
March 2, 1970	7:00 AM	0.14
March 2, 1970	8:00 AM	0.24
March 2, 1970	9:00 AM	0.04
March 2, 1970	10:00 AM	0.02
March 2, 1970	11:00 AM	0.06
March 2, 1970	12:00 PM	0.07
March 2, 1970	1:00 PM	0.09
March 2, 1970	6:00 PM	0.04
March 2, 1970	8:00 PM	0.14
March 2, 1970	9:00 PM	0.02
March 3, 1970	8:00 PM	0.03
March 3, 1970	9:00 PM	0.02
March 3, 1970	10:00 PM	0.05
March 3, 1970	11:00 PM	0.05
March 4, 1970	12:00 AM	0.01
March 4, 1970	2:00 AM	0.01
March 4, 1970	3:00 AM	0.08

Date	Time	Rainfall Intensity (inches/hr)
March 4, 1970	4:00 AM	0.1
March 4, 1970	5:00 AM	0.06
March 4, 1970	6:00 AM	0.05
March 4, 1970	7:00 AM	0.04
March 4, 1970	8:00 AM	0.08
March 4, 1970	9:00 AM	0.01
March 4, 1970	4:00 PM	0.1
March 4, 1970	5:00 PM	0.18
March 4, 1970	6:00 PM	0.02
March 10, 1970	8:00 AM	0.01
March 12, 1970	4:00 AM	0.01
March 12, 1970	5:00 AM	0.01
March 12, 1970	11:00 AM	0.01
March 12, 1970	12:00 PM	0.01
March 12, 1970	1:00 PM	0.04
March 12, 1970	2:00 PM	0.14
March 12, 1970	3:00 PM	0.11
March 12, 1970	4:00 PM	0.02
March 12, 1970	5:00 PM	0.01
March 12, 1970	6:00 PM	0.01
March 12, 1970	7:00 PM	0.04
March 12, 1970	8:00 PM	0.03
March 12, 1970	9:00 PM	0.02
March 12, 1970	10:00 PM	0.03
March 12, 1970	11:00 PM	0.02
March 13, 1970	12:00 AM	0.01
March 14, 1970	2:00 AM	0.01
March 15, 1970	12:00 AM	0.01
March 15, 1970	8:00 AM	0.02
March 15, 1970	9:00 AM	0.02
March 15, 1970	10:00 AM	0.01
March 17, 1970	4:00 PM	0.02
March 17, 1970	5:00 PM	0.04
March 17, 1970	6:00 PM	0.1
March 17, 1970	7:00 PM	0.12
March 17, 1970	8:00 PM	0.14
March 17, 1970	9:00 PM	0.12
March 17, 1970	10:00 PM	0.07
March 17, 1970	11:00 PM	0.01
March 18, 1970	12:00 AM	0.04
March 18, 1970	1:00 AM	0.03
March 18, 1970	2:00 AM	0.02
March 18, 1970	3:00 AM	0.01
March 20, 1970	1:00 AM	0.01
March 20, 1970	2:00 AM	0.01
March 20, 1970	3:00 AM	0.01
March 22, 1970	2:00 AM	0.02

Date	Time	Rainfall Intensity (inches/hr)
March 22, 1970	3:00 AM	0.02
March 22, 1970	4:00 AM	0.03
March 22, 1970	5:00 AM	0.03
March 22, 1970	6:00 AM	0.03
March 22, 1970	7:00 AM	0.03
March 22, 1970	8:00 AM	0.01
March 22, 1970	1:00 PM	0.01
March 22, 1970	2:00 PM	0.05
March 22, 1970	3:00 PM	0.01
March 22, 1970	4:00 PM	0.01
March 25, 1970	11:00 AM	0.05
March 25, 1970	12:00 PM	0.14
March 25, 1970	1:00 PM	0.17
March 25, 1970	2:00 PM	0.23
March 25, 1970	3:00 PM	0.07
March 25, 1970	4:00 PM	0.01
March 25, 1970	5:00 PM	0.02
March 26, 1970	1:00 AM	0.05
March 26, 1970	2:00 AM	0.15
March 26, 1970	3:00 AM	0.1
March 26, 1970	5:00 AM	0.05
March 29, 1970	1:00 AM	0.05
March 29, 1970	2:00 AM	0.04
March 29, 1970	3:00 AM	0.1
March 29, 1970	4:00 AM	0.05
March 29, 1970	5:00 AM	0.02
March 29, 1970	6:00 AM	0.02
March 29, 1970	8:00 AM	0.02
April 1, 1970	2:00 PM	0.02
April 1, 1970	3:00 PM	0.14
April 1, 1970	4:00 PM	0.15
April 1, 1970	5:00 PM	0.03
April 1, 1970	6:00 PM	0.03
April 1, 1970	7:00 PM	0.2
April 1, 1970	8:00 PM	0.11
April 1, 1970	9:00 PM	0.29
April 1, 1970	10:00 PM	0.23
April 1, 1970	11:00 PM	0.33
April 2, 1970	12:00 AM	0.27
April 2, 1970	1:00 AM	0.36
April 2, 1970	2:00 AM	0.19
April 2, 1970	3:00 AM	0.03
April 2, 1970	5:00 AM	0.01
April 4, 1970	8:00 AM	0.01
April 4, 1970	9:00 AM	0.01
April 6, 1970	7:00 AM	0.05
April 6, 1970	8:00 AM	0.08

Date	Time	Rainfall Intensity (inches/hr)
April 13, 1970	5:00 AM	0.08
April 13, 1970	6:00 AM	0.09
April 13, 1970	7:00 AM	0.04
April 14, 1970	3:00 AM	0.01
April 14, 1970	4:00 AM	0.03
April 18, 1970	9:00 PM	0.01
April 19, 1970	4:00 AM	0.04
April 19, 1970	5:00 AM	0.29
April 19, 1970	6:00 AM	0.11
April 19, 1970	7:00 AM	0.01
April 19, 1970	5:00 PM	0.01
April 19, 1970	6:00 PM	0.04
April 19, 1970	8:00 PM	0.02
April 19, 1970	9:00 PM	0.14
April 19, 1970	10:00 PM	0.15
April 20, 1970	12:00 AM	0.01
April 21, 1970	12:00 AM	0.01
April 23, 1970	12:00 AM	0.08
April 23, 1970	1:00 AM	0.03
April 23, 1970	3:00 AM	0.6
April 23, 1970	4:00 AM	0.01
April 23, 1970	6:00 AM	0.02
April 23, 1970	11:00 AM	0.01
April 23, 1970	12:00 PM	0.01
April 23, 1970	7:00 PM	0.02
April 23, 1970	8:00 PM	0.03
April 23, 1970	10:00 PM	0.08
April 23, 1970	11:00 PM	0.02
April 24, 1970	12:00 AM	0.45
April 24, 1970	2:00 AM	0.2
April 24, 1970	3:00 AM	0.17
April 24, 1970	4:00 AM	0.1
April 24, 1970	5:00 AM	0.18
April 24, 1970	6:00 AM	0.08
April 24, 1970	9:00 AM	0.01
April 24, 1970	10:00 AM	0.02
April 24, 1970	11:00 AM	0.05
April 25, 1970	9:00 PM	0.03
April 25, 1970	10:00 PM	0.05
April 25, 1970	11:00 PM	0.05
April 26, 1970	12:00 AM	0.02
April 27, 1970	3:00 PM	0.15
April 27, 1970	4:00 PM	0.18
April 27, 1970	5:00 PM	0.07
April 28, 1970	5:00 AM	0.05
April 29, 1970	5:00 PM	0.14
April 29, 1970	6:00 PM	0.27

Date	Time	Rainfall Intensity (inches/hr)
April 29, 1970	7:00 PM	0.01
April 29, 1970	8:00 PM	0.32
April 29, 1970	9:00 PM	0.05
May 1, 1970	3:00 PM	0.2
May 1, 1970	9:00 PM	0.01
May 1, 1970	10:00 PM	0.02
May 2, 1970	12:00 AM	0.01
May 2, 1970	1:00 AM	0.01
May 2, 1970	4:00 AM	0.01
May 2, 1970	5:00 AM	0.02
May 2, 1970	6:00 AM	0.01
May 2, 1970	7:00 AM	0.03
May 2, 1970	8:00 AM	0.01
May 10, 1970	11:00 AM	0.01
May 11, 1970	7:00 PM	0.13
May 11, 1970	8:00 PM	0.03
May 12, 1970	7:00 PM	0.01
May 13, 1970	12:00 PM	0.01
May 13, 1970	2:00 PM	0.01
May 14, 1970	9:00 PM	0.02
May 15, 1970	11:00 PM	0.1
May 16, 1970	12:00 AM	0.1
May 16, 1970	12:00 PM	0.01
May 16, 1970	7:00 PM	0.01
May 16, 1970	8:00 PM	0.07
May 16, 1970	9:00 PM	0.01
May 25, 1970	3:00 PM	0.02
May 25, 1970	5:00 PM	0.38
May 25, 1970	6:00 PM	0.01
May 25, 1970	7:00 PM	0.62
June 1, 1970	4:00 PM	0.41
June 2, 1970	4:00 PM	0.05
June 2, 1970	8:00 PM	0.05
June 2, 1970	9:00 PM	0.36
June 2, 1970	10:00 PM	0.12
June 2, 1970	11:00 PM	0.01
June 3, 1970	11:00 AM	0.04
June 3, 1970	12:00 PM	0.37
June 3, 1970	1:00 PM	0.03
June 3, 1970	4:00 PM	0.01
June 3, 1970	5:00 PM	0.01
June 3, 1970	7:00 PM	0.01
June 3, 1970	8:00 PM	0.02
June 3, 1970	9:00 PM	0.02
June 3, 1970	10:00 PM	0.03
June 3, 1970	11:00 PM	0.02
June 4, 1970	12:00 AM	0.01

Date	Time	Rainfall Intensity (inches/hr)
June 4, 1970	1:00 AM	0.03
June 4, 1970	2:00 AM	0.01
June 4, 1970	3:00 AM	0.05
June 4, 1970	4:00 AM	0.08
June 4, 1970	5:00 AM	0.04
June 4, 1970	10:00 PM	0.38
June 4, 1970	11:00 PM	0.87
June 5, 1970	12:00 AM	0.13
June 5, 1970	1:00 AM	0.01
June 5, 1970	8:00 PM	0.33
June 5, 1970	9:00 PM	0.01
June 5, 1970	10:00 PM	0.04
June 5, 1970	11:00 PM	0.08
June 6, 1970	5:00 AM	0.01
June 13, 1970	6:00 AM	0.02
June 13, 1970	7:00 AM	0.28
June 13, 1970	8:00 AM	1.23
June 15, 1970	1:00 AM	0.01
June 15, 1970	2:00 AM	0.01
June 21, 1970	5:00 AM	0.01
June 26, 1970	3:00 PM	0.06
June 26, 1970	4:00 PM	0.45
June 26, 1970	9:00 PM	0.02
July 3, 1970	9:00 AM	0.02
July 3, 1970	10:00 AM	0.01
July 8, 1970	2:00 PM	0.59
July 8, 1970	3:00 PM	0.05
July 8, 1970	4:00 PM	1.17
July 8, 1970	5:00 PM	0.39
July 8, 1970	10:00 PM	0.05
July 9, 1970	4:00 PM	0.02
July 19, 1970	4:00 PM	0.02
July 19, 1970	7:00 PM	0.02
July 19, 1970	8:00 PM	0.09
July 19, 1970	9:00 PM	0.04
July 20, 1970	12:00 AM	0.23
July 20, 1970	5:00 AM	0.01
July 20, 1970	6:00 AM	0.51
July 22, 1970	10:00 PM	0.01
July 22, 1970	11:00 PM	0.03
July 23, 1970	1:00 AM	0.02
July 23, 1970	2:00 AM	0.03
July 23, 1970	3:00 AM	0.01
July 23, 1970	4:00 AM	0.01
July 23, 1970	5:00 AM	0.01
July 23, 1970	6:00 AM	0.01
July 27, 1970	5:00 PM	0.05

Date	Time	Rainfall Intensity (inches/hr)
July 31, 1970	2:00 AM	0.01
July 31, 1970	3:00 AM	0.01
July 31, 1970	5:00 AM	0.01
July 31, 1970	6:00 AM	0.04
August 3, 1970	9:00 AM	0.01
August 3, 1970	10:00 AM	0.1
August 3, 1970	11:00 AM	0.01
August 3, 1970	1:00 PM	0.24
August 8, 1970	6:00 PM	0.01
August 8, 1970	7:00 PM	0.02
August 8, 1970	8:00 PM	0.01
August 9, 1970	2:00 AM	0.01
August 9, 1970	3:00 AM	0.24
August 9, 1970	4:00 AM	0.12
August 9, 1970	6:00 AM	0.01
August 9, 1970	8:00 AM	0.08
August 9, 1970	9:00 AM	0.01
August 9, 1970	10:00 AM	0.01
August 9, 1970	1:00 PM	0.03
August 9, 1970	3:00 PM	0.06
August 9, 1970	8:00 PM	0.01
August 9, 1970	9:00 PM	0.04
August 9, 1970	10:00 PM	0.14
August 9, 1970	11:00 PM	0.07
August 10, 1970	12:00 AM	0.01
August 12, 1970	11:00 AM	0.02
August 12, 1970	3:00 PM	0.12
August 12, 1970	4:00 PM	0.02
August 13, 1970	2:00 PM	0.02
August 17, 1970	7:00 AM	0.02
August 19, 1970	1:00 PM	0.4
August 19, 1970	2:00 PM	0.02
August 20, 1970	6:00 PM	0.01
August 20, 1970	7:00 PM	0.42
August 22, 1970	3:00 PM	0.05
August 22, 1970	4:00 PM	0.5
August 30, 1970	12:00 PM	0.1
August 30, 1970	1:00 PM	0.02
September 3, 1970	8:00 AM	0.01
September 3, 1970	5:00 PM	0.05
September 3, 1970	6:00 PM	0.21
September 3, 1970	8:00 PM	0.03
September 4, 1970	10:00 PM	0.01
September 4, 1970	11:00 PM	0.13
September 5, 1970	12:00 AM	0.01
September 7, 1970	6:00 AM	0.01
September 7, 1970	7:00 AM	0.08

Date	Time	Rainfall Intensity (inches/hr)
September 7, 1970	8:00 AM	0.02
September 8, 1970	4:00 PM	0.54
September 13, 1970	9:00 PM	0.05
September 14, 1970	5:00 PM	0.01
September 14, 1970	6:00 PM	0.01
September 18, 1970	9:00 AM	0.13
September 18, 1970	10:00 AM	0.05
September 21, 1970	3:00 PM	0.09
September 22, 1970	8:00 PM	0.4
September 22, 1970	9:00 PM	0.01
September 22, 1970	11:00 PM	0.01
September 24, 1970	4:00 PM	0.13
September 24, 1970	5:00 PM	0.34
September 25, 1970	6:00 AM	0.44
September 25, 1970	7:00 AM	0.19
September 25, 1970	8:00 AM	0.09
September 26, 1970	2:00 PM	0.52
September 26, 1970	3:00 PM	0.04
September 26, 1970	4:00 PM	0.02
September 26, 1970	5:00 PM	0.01
September 26, 1970	7:00 PM	0.01
September 26, 1970	8:00 PM	0.04
September 26, 1970	9:00 PM	0.05
September 26, 1970	10:00 PM	0.03
September 26, 1970	11:00 PM	0.02
September 27, 1970	1:00 AM	0.03
September 27, 1970	2:00 AM	0.03
September 27, 1970	3:00 AM	0.02
October 8, 1970	5:00 PM	0.03
October 8, 1970	8:00 PM	0.01
October 9, 1970	8:00 PM	0.04
October 9, 1970	9:00 PM	0.06
October 9, 1970	10:00 PM	0.1
October 9, 1970	11:00 PM	0.04
October 10, 1970	12:00 AM	0.04
October 10, 1970	1:00 AM	0.02
October 12, 1970	9:00 AM	0.02
October 12, 1970	10:00 AM	0.03
October 12, 1970	12:00 PM	0.03
October 12, 1970	1:00 PM	0.01
October 12, 1970	5:00 PM	0.01
October 12, 1970	6:00 PM	0.02
October 12, 1970	7:00 PM	0.04
October 12, 1970	8:00 PM	0.05
October 12, 1970	9:00 PM	0.04
October 12, 1970	10:00 PM	0.01
October 12, 1970	11:00 PM	0.01

Date	Time	Rainfall Intensity (inches/hr)
October 13, 1970	12:00 AM	0.09
October 13, 1970	1:00 AM	0.1
October 13, 1970	2:00 AM	0.02
October 14, 1970	1:00 AM	0.02
October 14, 1970	2:00 AM	0.1
October 14, 1970	3:00 AM	0.16
October 14, 1970	4:00 AM	0.1
October 14, 1970	5:00 AM	0.05
October 14, 1970	5:00 PM	0.04
October 14, 1970	7:00 PM	0.01
October 15, 1970	12:00 PM	0.01
October 20, 1970	1:00 AM	0.02
October 20, 1970	2:00 AM	0.05
October 20, 1970	3:00 AM	0.07
October 20, 1970	4:00 AM	0.11
October 20, 1970	5:00 AM	0.17
October 20, 1970	6:00 AM	0.13
October 20, 1970	7:00 AM	0.02
October 20, 1970	10:00 AM	0.02
October 20, 1970	11:00 AM	0.02
October 20, 1970	12:00 PM	0.07
October 20, 1970	1:00 PM	0.01
October 20, 1970	2:00 PM	0.02
October 20, 1970	3:00 PM	0.07
October 20, 1970	4:00 PM	0.04
October 20, 1970	5:00 PM	0.03
October 20, 1970	6:00 PM	0.04
October 20, 1970	8:00 PM	0.01
October 20, 1970	9:00 PM	0.06
October 28, 1970	4:00 PM	0.01
October 28, 1970	5:00 PM	0.01
October 29, 1970	2:00 AM	0.01
October 29, 1970	4:00 AM	0.01
October 29, 1970	5:00 AM	0.02
October 29, 1970	6:00 AM	0.01
October 29, 1970	7:00 AM	0.02
October 29, 1970	10:00 AM	0.01
October 29, 1970	11:00 AM	0.01
October 29, 1970	1:00 PM	0.02
October 29, 1970	2:00 PM	0.04
November 2, 1970	4:00 AM	0.02
November 2, 1970	5:00 AM	0.13
November 2, 1970	6:00 AM	0.01
November 2, 1970	7:00 AM	0.01
November 2, 1970	8:00 AM	0.08
November 2, 1970	9:00 AM	0.1
November 2, 1970	10:00 AM	0.1

Date	Time	Rainfall Intensity (inches/hr)
November 2, 1970	11:00 AM	0.03
November 2, 1970	1:00 PM	0.01
November 9, 1970	4:00 PM	0.02
November 9, 1970	5:00 PM	0.07
November 9, 1970	6:00 PM	0.1
November 9, 1970	7:00 PM	0.01
November 10, 1970	1:00 AM	0.01
November 10, 1970	2:00 AM	0.02
November 14, 1970	3:00 AM	0.01
November 14, 1970	7:00 AM	0.01
November 14, 1970	8:00 AM	0.05
November 14, 1970	9:00 AM	0.06
November 14, 1970	10:00 AM	0.12
November 14, 1970	11:00 AM	0.06
November 14, 1970	12:00 PM	0.04
November 14, 1970	1:00 PM	0.02
November 14, 1970	2:00 PM	0.02
November 14, 1970	3:00 PM	0.02
November 14, 1970	4:00 PM	0.01
November 14, 1970	6:00 PM	0.02
November 14, 1970	8:00 PM	0.01
November 14, 1970	9:00 PM	0.01
November 14, 1970	10:00 PM	0.01
November 14, 1970	11:00 PM	0.01
November 15, 1970	12:00 AM	0.02
November 15, 1970	9:00 AM	0.01
November 19, 1970	10:00 PM	0.04
November 20, 1970	12:00 AM	0.15
November 20, 1970	1:00 AM	0.54
November 20, 1970	2:00 AM	0.15
November 20, 1970	3:00 AM	0.01
November 20, 1970	7:00 AM	0.03
November 22, 1970	9:00 AM	0.01
November 29, 1970	4:00 PM	0.13
December 3, 1970	7:00 AM	0.01
December 3, 1970	9:00 PM	0.05
December 11, 1970	1:00 PM	0.08
December 11, 1970	3:00 PM	0.01
December 11, 1970	4:00 PM	0.03
December 11, 1970	5:00 PM	0.03
December 11, 1970	6:00 PM	0.07
December 11, 1970	7:00 PM	0.01
December 12, 1970	12:00 AM	0.06

Date	Time	Rainfall Intensity (inches/hr)
December 12, 1970	1:00 AM	0.08
December 12, 1970	2:00 AM	0.09
December 12, 1970	3:00 AM	0.09
December 12, 1970	4:00 AM	0.08
December 12, 1970	5:00 AM	0.07
December 12, 1970	3:00 PM	0.01
December 16, 1970	4:00 AM	0.03
December 16, 1970	5:00 AM	0.06
December 16, 1970	6:00 AM	0.11
December 16, 1970	7:00 AM	0.06
December 16, 1970	9:00 AM	0.04
December 16, 1970	10:00 AM	0.15
December 16, 1970	11:00 AM	0.03
December 16, 1970	12:00 PM	0.07
December 16, 1970	6:00 PM	0.02
December 16, 1970	7:00 PM	0.1
December 16, 1970	8:00 PM	0.03
December 16, 1970	9:00 PM	0.09
December 16, 1970	10:00 PM	0.06
December 21, 1970	5:00 AM	0.04
December 21, 1970	6:00 AM	0.05
December 21, 1970	7:00 AM	0.02
December 21, 1970	8:00 AM	0.05
December 21, 1970	9:00 AM	0.06
December 21, 1970	4:00 PM	0.01
December 21, 1970	6:00 PM	0.01
December 21, 1970	9:00 PM	0.1
December 21, 1970	10:00 PM	0.05
December 21, 1970	11:00 PM	0.12
December 22, 1970	12:00 AM	0.18
December 22, 1970	1:00 AM	0.05
December 22, 1970	2:00 AM	0.08
December 22, 1970	3:00 AM	0.08
December 22, 1970	4:00 AM	0.02
December 23, 1970	2:00 AM	0.47
December 23, 1970	3:00 AM	0.09
December 23, 1970	4:00 AM	0.16
December 23, 1970	5:00 AM	0.02
December 25, 1970	4:00 PM	0.01
December 25, 1970	5:00 PM	0.01
December 27, 1970	10:00 AM	0.01
December 27, 1970	11:00 AM	0.01

Note: All dates/times not specified represent zero (0) inches of rain for that day and one hour time interval.

ATTACHMENT "A" TO APPENDIX "A"

EXCERPT FROM "RAINFALL FREQUENCY ATLAS OF THE MIDWEST"

Bulletin 71
(MCC Research Report 92-03)

RAINFALL FREQUENCY ATLAS OF THE MIDWEST

by Floyd A. Huff and James R. Angel

Midwestern Climate Center
Climate Analysis Center
National Weather Service
National Oceanic and Atmospheric Administration

and

Illinois State Water Survey
A Division of the Illinois Department of Energy and Natural Resources

1992

Bulletin 71
(MCC Research Report 92-03)

RAINFALL FREQUENCY ATLAS OF THE MIDWEST

by Floyd A. Huff and James R. Angel

Title: Rainfall Frequency Atlas of the Midwest.

Abstract: This report presents the results and methodology of an intense study of rainfall frequency relationships throughout the Midwest (Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin). Using primarily 275 long-term daily reporting stations from the National Weather Service (NWS) cooperative network supplemented by 134 daily reporting stations with shatter records, rainfall amounts have been determined for recurrence intervals from 2 months to 100 years and for durations of 5 minutes to 10 days. The results are presented as maps and as climate division averages in tabular form. Several special raingage networks were used to develop relationships between amounts for 24 hours and less. This report also examines the time distributions of heavy rainfall over time, and other storm characteristics such as storm orientation and movement. The assumption of spatially independent observations between stations is also discussed.

Reference: Huff, Floyd A., and James R. Angel. Rainfall Frequency Atlas of the Midwest. Illinois State Water Survey, Champaign, Bulletin 71, 1992.

Indexing Terms: Climatology, heavy rainfall, hydroclimatology, hydrometeorology, Midwest, extreme value distributions, climate change.

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STATE WATER SURVEY DIVISION
JOHN T. O'CONNOR, Chief

2204 GRIFFITH DRIVE
CHAMPAIGN, ILLINOIS 61820-7495

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Table 10. Median Time Distributions of Heavy Storm Rainfall at a Point

	Cumulative storm rainfall (percent) for given storm type			
Cumulative storm time (percent)	*First-quartile*	*Second-quartile*	*Third-quartile*	*Fourth-quartile*
5	16	3	3	2
10	33	8	6	5
15	43	12	9	8
20	52	16	12	10
25	60	22	15	13
30	66	29	19	16
35	71	39	23	19
40	75	51	27	22
45	79	62	32	25
50	82	70	38	28
55	84	76	45	32
60	86	81	57	35
65	88	85	70	39
70	90	88	79	45
75	92	91	85	51
80	94	93	89	59
85	96	95	92	72
90	97	97	95	84
95	98	98	97	92

Table 4. Sectional Mean Frequency Distributions for Storm Periods of 5 Minutes to 10 Days and Recurrence Intervals of 2 Months to 100 Years in Kentucky

Sectional code (see figure 1 on page 4)

01 – Western *03 - Eastern*
02 - Central *04 - Bluegrass*

Rainfall (inches) for given recurrence interval

Section	Duration	2-month	3-month	4-month	6-month	9-month	1-year	2-year	5-year	10-year	25-year	50-year	100-year
01	10-day	2.57	3.09	3.56	4.19	4.82	5.24	6.27	7.74	8.94	9.99	10.60	11.12
01	5-day	2.18	2.61	2.95	3.42	3.94	4.28	5.09	6.35	7.42	8.90	9.82	10.53
01	72-hr	1.94	2.28	2.58	2.99	3.44	3.74	4.50	5.53	6.41	7.62	8.67	9.68
01	48-hr	1.80	2.11	2.35	2.72	3.13	3.40	4.09	5.10	5.90	6.92	7.84	8.74
01	24-hr	1.71	1.98	2.17	2.51	2.85	3.10	3.75	4.66	5.39	6.38	7.19	8.09
01	18-hr	1.60	1.86	2.04	2.36	2.68	2.91	3.53	4.38	5.07	6.00	6.76	7.60
01	12-hr	1.49	1.73	1.89	2.19	2.48	2.70	3.26	4.05	4.69	5.55	6.26	7.04
01	6-hr	1.28	1.48	1.62	1.88	2.13	2.32	2.81	3.49	4.04	4.78	5.39	6.07
01	3-hr	1.09	1.27	1.39	1.60	1.82	1.98	2.40	2.98	3.45	4.08	4.60	5.18
01	2-hr	0.99	1.15	1.26	1.46	1.66	1.80	2.17	2.70	3.13	3.70	4.17	4.69
01	1-hr	0.80	0.93	1.02	1.18	1.34	1.46	1.76	2.19	2.53	3.00	3.38	3.80
01	30-min	0.63	0.74	0.80	0.93	1.06	1.15	1.39	1.72	1.99	2.36	2.66	2.99
01	15-min	0.46	0.54	0.59	0.68	0.77	0.84	1.01	1.26	1.46	1.72	1.94	2.18
01	10-min	0.36	0.42	0.45	0.53	0.60	0.65	0.79	0.98	1.13	1.34	1.51	1.70
01	5-min	0.20	0.24	0.26	0.30	0.34	0.37	0.45	0.56	0.65	0.77	0.86	0.97
02	10-day	2.52	3.03	3.50	4.11	4.73	5.14	6.03	7.45	8.68	9.86	10.57	11.05
02	5-day	2.03	2.43	2.75	3.19	3.67	3.99	4.78	6.00	7.04	8.39	9.35	10.22
02	72-hr	1.79	2.10	2.38	2.76	3.17	3.45	4.20	5.26	6.22	7.50	8.46	9.37
02	48-hr	1.67	1.96	2.18	2.53	2.91	3.16	3.88	4.82	5.65	6.82	7.75	8.75
02	24-hr	1.62	1.88	2.06	2.38	2.70	2.94	3.49	4.34	5.10	6.22	7.09	7.96
02	18-hr	1.52	1.77	1.93	2.24	2.54	2.76	3.28	4.08	4.79	5.85	6.66	7.48
02	12-hr	1.41	1.64	1.79	2.07	2.36	2.56	3.04	3.78	4.44	5.41	6.17	6.93
02	6-hr	1.21	1.41	1.54	1.78	2.02	2.20	2.62	3.26	3.82	4.66	5.32	5.97
02	3-hr	1.03	1.20	1.32	1.52	1.73	1.88	2.23	2.78	3.26	3.98	4.54	5.09
02	2-hr	0.94	1.09	1.20	1.39	1.57	1.71	2.02	2.52	2.96	3.61	4.11	4.62
02	1-hr	0.76	0.88	0.97	1.12	1.27	1.38	1.64	2.04	2.40	2.92	3.33	3.74
02	30-min	0.60	0.70	0.76	0.88	1.00	1.09	1.29	1.61	1.89	2.30	2.62	2.95
02	15-min	0.43	0.51	0.55	0.64	0.73	0.79	0.94	1.17	1.38	1.68	1.91	2.15
02	10-min	0.34	0.40	0.43	0.50	0.57	0.62	0.73	0.91	1.07	1.31	1.49	1.67
02	5-min	0.19	0.22	0.24	0.28	0.32	0.35	0.42	0.52	0.61	0.75	0.85	0.96
03	10-day	2.22	2.67	3.08	3.62	4.17	4.53	5.41	6.67	7.69	8.93	9.68	10.40
03	5-day	1.82	2.17	2.46	2.85	3.28	3.56	4.26	5.21	6.04	7.11	7.99	8.86
03	72-hr	1.60	1.88	2.13	2.46	2.83	3.08	3.68	4.61	5.41	6.36	7.15	7.99
03	48-hr	1.48	1.73	1.93	2.23	2.57	2.79	3.37	4.19	4.86	5.76	6.49	7.23
03	24-hr	1.41	1.64	1.79	2.07	2.36	2.56	3.05	3.76	4.36	5.15	5.78	6.44
03	18-hr	1.33	1.54	1.69	1.95	2.22	2.41	2.87	3.53	4.10	4.84	5.43	6.05
03	12-hr	1.23	1.43	1.56	1.81	2.05	2.23	2.65	3.27	3.79	4.48	5.03	5.60
03	6-hr	1.06	1.23	1.34	1.56	1.77	1.92	2.29	2.82	3.27	3.86	4.34	4.83
03	3-hr	0.90	1.05	1.15	1.33	1.51	1.64	1.95	2.41	2.79	3.30	3.70	4.12
03	2-hr	0.81	0.95	1.04	1.20	1.36	1.48	1.77	2.18	2.53	2.99	3.35	3.74
03	1-hr	0.66	0.77	0.84	0.97	1.10	1.20	1.43	1.77	2.05	2.42	2.72	3.03
03	30-min	0.52	0.61	0.66	0.77	0.87	0.95	1.13	1.39	1.61	1.91	2.14	2.38
03	15-min	0.38	0.44	0.48	0.56	0.63	0.69	0.82	1.02	1.18	1.39	1.56	1.74
03	10-min	0.30	0.35	0.38	0.44	0.50	0.54	0.64	0.79	0.92	1.08	1.21	1.35
03	5-min	0.17	0.20	0.22	0.25	0.29	0.31	0.37	0.45	0.52	0.62	0.69	0.77

7. SPATIAL CHARACTERISTICS OF HEAVY RAINSTORMS IN THE MIDWEST

Data from dense raingage networks operated by the Illinois State Water Survey have supported numerous studies of the spatial distribution characteristics of heavy rainstorms such as those in this report. Key results from several of these studies have been abstracted from published reports and technical papers and included here for the convenience of the user. They provide pertinent information for both hydrological designers and systems operators. Although based on Illinois data, the relationships are considered generally applicable to the Midwest.

Relation Between Point and Areal Mean Rainfall Frequency

Knowledge of the frequency distribution of areal mean rainfall is pertinent to the efficient design of hydraulic structures such as dams, urban storm sewers, highway culverts, and water-supply facilities. In the United States, a relatively large amount of data is available on the frequency distribution of point rainfall, but there is little information on the frequency distribution of areal mean rainfall. Consequently, there has been a need to determine how the mean rainfall frequency distributions for small areas about a point are related to the point frequency distributions.

Hershfield (1961) presented area-depth curves for estimating areal mean rainfall frequencies from point rainfall frequencies. Information was provided for areas ≤400 square miles and for storm durations of 0.5 to 24 hours. The relations were developed from limited raingage network data and apparently considered applicable throughout the United States. Huff (1970) used data from dense raingage networks in Illinois to provide similar relationships more applicable to the Midwest for storm durations of 0.5 to 48 hours. Results are summarized in table 21.

Storm Shape

Runoff characteristics in heavy storms are influenced by the shape and movement of the storms. Two studies have been made to determine the shape characteristics of heavy rainstorms in Illinois. In one study, data from 260 storms on a dense raingage network in central Illinois were used to investigate shapes on areas of 50 to 400 square miles (Huff, 1967). Storms were used in which areal mean rainfall exceeded 0.50 inch. In the other study, historical data for 350 heavy storms having durations up to 72 hours were used in a shape study of large-scale, flood-producing rain events. These were storms in which maximum 1-day amounts exceeded 4 inches or in which 2-day and 3-day amounts exceeded 5 inches (StoutandHuff, 1962).Storms encompassed areas that ranged from 200 to 10,000 square miles.

The study of historical storms indicated that the rain intensity centers most frequently had an elliptical shape. The ratio of major to minor axis tended to increase with increasing area enclosed within a given isohyet; that is, the ellipse becomes more elongated. Within limits employed in the study, no significant difference in the shape factor occurred with increasing storm magnitude or with durations ranging from a few hours to 72 hours.

In the network study, elliptical patterns were found also to be the most prevalent type, but the heaviest storms tended to be made up of a series of rainfall bands. Intensity centers within these bands, however, were most frequently elliptical. From these two studies, a mean shape factor was determined that can be used as guidance in hydrologic problems in which storm shape is a significant design factor. The shape curve is shown in figure 19 for areas of 10 to 1,000 square miles. For those interested, the curve can be continued to 10,000 square miles because storms up to this size were included in the historical storm study.

Table 21. Relation Between Areal Mean and Point Rainfall Frequency Distributions

Storm period (hours)	*Ratio of areal to point rainfall for given area (square miles)*					
	10	*25*	*50*	*100*	*200*	*400*
0.5	0.88	0.80	0.74	0.68	0.62	0.56
1.0	0.92	0.87	0.83	0.78	0.74	0.70
2.0	0.95	0.91	0.88	0.84	0.81	0.78
3.0	0.96	0.93	0.90	0.87	0.84	0.81
6.0	0.97	0.94	0.92	0.89	0.87	0.84
12.0	0.98	0.96	0.94	0.92	0.90	0.88
24.0	0.99	0.97	0.95	0.94	0.93	0.91
48.0	0.99	0.98	0.97	0.96	0.95	0.94

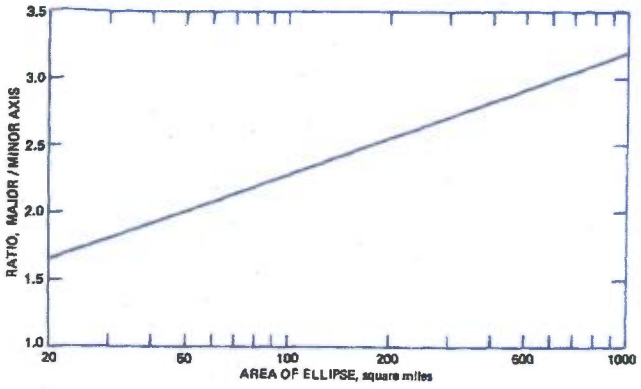

Figure 19. Mean shape factor for heavy storms

Storm Orientation

An important consideration in any region is the orientation of the major axis of heavy rainstorms. For example, if the axes of heavy rainstorms tend to be parallel to a river basin or other area of concern, then the total runoff in this region will be greater, on the average, than in a region perpendicular to most storm axes. The orientation of the storm axis also provides an indication of the movement of the major precipitation-producing entities embedded in any large-scale weather system. Because most individual storm elements have a component of motion from the west, an azimuth angle ranging from 180 to 360° was ascribed to each storm. Thus, if a storm had an orientation of 230°, the orientation was along a line from 230 to 050° (southwest to northeast).

No significant difference was found between the orientation of storms when they were stratified according to mean rainfall and areal extent. Table 22 shows the distribution in 260 heavy storms having mean rainfall exceeding one inch over a contiguous areas ≤10,000 square miles (Huff and Semonin, 1960). This distribution is considered typical for heavy storms in Illinois and the Midwest. Other studies have supported the results shown in table 22 (Huff and Vogel, 1976; Vogel and Huff, 1978).

Table 22. Orientation of Heavy Rainstorms

Azimuth (degrees)	*Storms (percent)*	*Azimuth (degrees)*	*Storms (percent)*
180-215	4	276-295	20
216-235	6	296-315	12
236-255	30	316-335	6
256-275	21	336-360	1

Heavy rainstorms were found to be oriented most frequently from west-southwest to east-northeast through west to east or west-northwest to east-southeast (table 22). The median orientation of the 260 storms used in deriving table 22 was 265° (nearly west to east). In general, it has been found that the orientations of very heavy storms tend to be nearly west to east. Heavy, but less severe storms, are usually oriented west-southwest to east-northeast or west-northwest to east-southeast. Moderately heavy storms, especially those of short duration (1 to 3 hours), are frequently oriented west-southwest to east-northeast or southwest to northeast.

Storm Movement

In the Midwest, heavy rainstorms are usually produced by one or more squall lines or squall areas traversing a basin or other area of interest. Each system (squall line or squall area) consists of a number of individual convective entities, usually thunderstorms, and these entities have a motion that is strongly related to the wind field in which they are embedded. These entities are often referred to as raincells. Network studies of the motion of heavy raincells (Huff, 1975) have provided the frequency distribution of cell movements shown in table 23. The most frequent raincell movements are from west-southwest through west to west-northwest (240-299°), which accounts for 42 percent of the total number analyzed in the Huff study. Of the total, 84 percent exhibited motion with a westerly component.

Table 23. Frequency Distribution of Heavy Raincell Movements

Azimuth (degrees)	*Storms (percent)*	*Azimuth (degrees)*	*Storms (percent)*
180-209	6	0-29	4
210-239	16	30-59	2
240-269	22	60-89	2
270-299	20	90-119	2
300-329	13	120-149	2
330-359	7	150-179	4

ATTACHMENT "B" TO APPENDIX "A"

RELATION BETWEEN AREAL MEAN AND POINT RAINFALL FREQUENCY DISTRIBUTIONS AS APPLIED TO OCTOBER 2017 HYDRAULIC MODEL AREAS

Model Area	Areal Reduction	Area (square miles)
Dry Creek	0.91	73.4
Eastern Regional	0.97	7.0
Western Regional	0.93	40.5
Taylorsport	0.96	14.0
Bromley	0.93	40.0

APPENDIX "B"

BASELINE SSO VOLUME FOR THE 1970 TYPICAL YEAR

For the purposes of determining compliance with Paragraph 43 of this Amended Consent Decree as it relates to percentage milestones of SSO volumes remaining, the baseline SSO volume of 115.441 MG shall be used, based on the District's October 2017 hydraulic model using the 1970 typical year rainfall data and areal reduction factors as set forth in Appendix A (or utilizing the 1970 typical year rainfall data and spatially and temporally varying rainfall factors in lieu of the Appendix A areal reduction factors, subject to approval of a study to determine such factors as part of the approval of the Updated Watershed Plan).

CALCULATION OF CSS PERCENT ELIMINATED AND/OR CAPTURED

For the purposes of determining compliance with Paragraph 43 of this Amended Consent Decree as it relates to achieving percentage milestones of volumes of combined sewage in the CSS eliminated and/or captured for treatment, the following formula will be utilized:

$$\text{Percent Capture} = \frac{(TCF - CSO)}{TCF} \times 100$$ where,

TCF — Total Combined Flow – The volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis is the sum of flow in the CSS due to rainfall derived inflow and infiltration (RDII), rainfall/runoff, and the typical dry weather flow that enters the CSS during wet weather as represented by the District's most current hydraulic model utilizing the 1970 typical year rainfall data and areal reduction factors as set forth in Appendix A (or utilizing the 1970 typical year rainfall data and spatially and temporally varying rainfall factors in lieu of the Appendix A areal reduction factors, subject to approval of a study to determine such factors as part of the approval of the Updated Watershed Plan) plus any flow that has been eliminated from the CSS through separation or other means since April 18, 2007. The modeled TCF, using the 1970 typical year rainfall data and Appendix A areal reduction factors, equals 4,388 MG as of October 2017 without accounting for flow eliminated from the CSS through separation or other means since April 18, 2007. The Updated Watershed Plan to be submitted within 12 months of final entry of this Amended Consent Decree pursuant to Paragraph 41.(a) shall include an updated TCF calculation as of October 2017 which will account for flow eliminated from the CSS through separation or other means since April 18, 2007.

TCF = RDII + rainfall/runoff + eliminated flow + dry weather flow

CSO — Combined Sewer Overflow - The annual overflow volume from the CSS that does not receive the minimum treatment specified in Section II.C.4.a. of the CSO Policy, as determined by the District's most current hydraulic model utilizing the 1970 typical year rainfall data and areal reduction factors as set forth in Appendix A (or utilizing the 1970 typical year rainfall data and spatially and temporally varying rainfall factors in lieu of the Appendix A areal reduction factors, subject to approval of a study to determine such factors as part of the approval of the Updated Watershed Plan). The modeled CSO volume, using the 1970 typical year rainfall data and Appendix A areal reduction factors, equals 1,516 MG as of October 2017.

MODEL CALIBRATION

The terms set forth herein shall have the meaning of the defined terms set forth in the approved Watershed Plan or any Updated Watershed Plan. If any term is not defined in the approved Watershed Plan or any Updated Watershed Plan, then said term shall have the meaning ascribed to it in the CSO Policy. On an annual basis the hydraulic model will be updated to reflect any improvements made since the previous years' model update. The hydraulic model will be calibrated on an ongoing basis by comparing actual field flow measurements to model predicted flows resulting from changes in the systems, including but not limited to improvements made within the systems or population changes. As the sewer system expands or as population in the sewer system increases, flows adjustments will be represented by expanding the reaches of the model or by the ongoing calibration effort. All changes and improvements to the hydraulic model and calibration records shall be maintained and made available for Cabinet/EPA review.

APPENDIX C

COMBINED SEWER OVERFLOW CONSTRUCTION PHASE PROJECTS						
PROJECT TITLE & DESCRIPTION	VOLUME REDUCED IN TYPICAL YEAR (MG)	VOLUME REDUCED IN TYPICAL YEAR (MG) PRIOR TO 12/31/20	STRUCTURES IMPACTED	TOTAL PROJECT CAPITAL COST (M$)	PHASE TO BE COMPLETED PRIOR TO 12/31/20	ESTIMATED CONSTRUCTION COMPLETE DATE
Jacob Price Sewer Separation - 2,700' 12" thru 30" pipe. This project will install new pipe on 9th and 10th Streets in Covington from Greenup to the Licking River. This project will reduce CSOs along the Licking River	8.00	8.00	Multiple	$ 1.50	Construction	12/31/19
Aqua on the Levee Sewer Separation - 1,500' 48" & 30" pipe sewer separation and direct flow to the Ohio River. Pipe installation is primarily on Washington Street. This project will reduce CSOs on the Ohio River west of the Licking River	5.00	5.00	Multiple	$ 0.70	Construction	12/31/20
Church St. Sewer Separation - appr. 2,000' sewer separation. New pipe install on Gail, Janet, Valley View, Primrose, & Sunset Streets. This project will reduce CSOs along the Banklick Creek near the Licking River	5.00	5.00	Multiple	$ 1.80	Construction	3/31/19
River Water Intrusion Program Phase I - Outfall Flapgates at 7 locations. This project will reduce CSOs on the Ohio River west of the Licking River	80.00	80.00	Work to be performed on DIV-1730008, 1730029, 1710084, 1710098, 1490027, 1470052, 1440053	$ 2.00	Construction	12/31/20

COMBINED SEWER OVERFLOW PLANNING/DESIGN PHASE PROJECTS						
PROJECT TITLE & DESCRIPTION	VOLUME REDUCED IN TYPICAL YEAR (MG)	VOLUME REDUCED IN TYPICAL YEAR (MG) PRIOR TO 12/31/20	STRUCTURES IMPACTED	TOTAL PROJECT CAPITAL COST (M$)	PHASE TO BE COMPLETED PRIOR TO 12/31/20	
Covington 8th St. Sewer Separation - appr. 2,000' sewer separation. Project will be on 8th Street in Covington from Madison to the Licking River. This project will reduce CSOs on the Licking River	5.00	0.00	Multiple	$ 1.70	Design	
Saratoga and Washington Sewer Separation - Remove sanitary laterals from each street and reconnect to a parallel pipe which is primarily sanitary This project will reduce CSOs on the Ohio River west of the Licking River.	2.00	0.00	Multiple	$ 1.00	Design	
Bromley Pump Station Capacity Increase - Mechanical & Electrical Control Upgrade. This project will reduce CSOs on the Ohio River west of the Licking River by making better use of the wet well capacity and the start and stop controls for each of the pumps.	30.00	0.00	Multiple	$ 38.40	Design	
River Water Intrusion Program Phase II - Outfall Flapgates at 16 locations. This project will reduce CSOs along the Ohio River east of the Licking River	60.00	0.00	Work to be performed on Div - 1850150, 0880017, 0880004, 0910064, 0910005, 0930075, 0930041, 0930026, 0930014, 0980036, 1420032, 1420028, 1480116, 1480097, 1480103, 1480012	$ 5.00	Design	
River Water Intrusion Program Phase III - Outfall Flapgates at 5 locations. This project will reduce CSOs along the Licking River	60.00	0.00	Work to be performed on DIV - 0610006, 0620031, 0630001, 0770006, 0650084	$ 2.00	Planning	
River Water Intrusion Program Phase IV - RS 47.0' to 51.5' Outfall Flapgates at 16 locations. This project will reduce CSOs on both the Licking River and the Ohio River	60.00	0.00	Locations to be determined	$ 5.00	Planning	
Bromley Pump Station Capacity Increase - Additional Pumps. This project will increase the capacity of the Bromley Pump Station to 60 MGD and will reduce CSOs on the Ohio River west of the Bromley Pump Station	TBD	0.00	Multiple	$ 40.00	Planning	

SEPARATE SEWER OVERFLOW CONSTRUCTION PHASE PROJECTS						
PROJECT TITLE	VOLUME REDUCED IN TYPICAL YEAR (MG)	VOLUME REDUCED IN TYPICAL YEAR (MG) PRIOR TO 12/31/20	STRUCTURES IMPACTED	TOTAL PROJECT CAPITAL COST (M$)	PHASE TO BE COMPLETED PRIOR TO 12/31/20	ESTIMATED CONSTRUCTION COMPLETE DATE
Lakeside Park Sewer Capacity Upgrade - 2,500' 24" & 18" pipe. Pipe installation on Hudson Ave. from Dixie Hwy to the dead end of Hudson.	0.00	0.00	inadequate infrastructure	$ 4.00	Construction	6/30/19
Bullittsville Force Main Capacity Upgrade Phase I & II - 2,000' of the existing 12" force main will be replaced. In addition, 10,000' of existing force main will be cleaned on the interior to increase flow capacity.	0.00	0.00	deteriorated infrastructure	$ 2.70	Construction	12/31/19
Richwood Pump Station & Force Main - Capacity increase of pump station and installation of 17,800' of 20" force main. This project will redirect flow from the Lakeview Pump Station to the Western Regional Facility. This project is located in southern Kenton County.	1.58	1.58	MH2300123 MH2300121	$ 4.30	Construction	3/31/19
Elsmere Corridor Capacity Upgrade - 8,700' of 30", 24", & 18" pipe installation - capacity upgrade. This project is located in Kenton County upstream of the Narrows Rd. Pump Station. Project is along existing creek and will transfer flow to the Narrows Rd. Pump Station. Gravity piping upgrade to eliminate multiple SSOs.	3.41	3.41	MH2100106 MH2100129 MH2100002 MH2070019 MH2090063 MH2090008 MH2110001	$ 6.30	Construction	12/31/20
Wilder Pump Station Capacity Upgrade - increase capacity of existing pump station	0.00	0.00	Deteriorated infrastructure	$ 1.00	Construction	12/31/20
Allen Fork Pump Station Capacity Upgrade - increase capacity of existing pump station	0.01	0.01	MH2390002	$ 0.40	Construction	12/31/20

SEPARATE SEWER OVERFLOW PLANNING/DESIGN PHASE PROJECTS						
PROJECT TITLE	VOLUME REDUCED IN TYPICAL YEAR (MG)	VOLUME REDUCED IN TYPICAL YEAR (MG) PRIOR TO 12/31/20	STRUCTURES IMPACTED	TOTAL PROJECT CAPITAL COST (M$)	PHASE TO BE COMPLETED PRIOR TO 12/31/20	
New Bristow Road Pump Station & Force Main - New Pump Station & Force Main located in southern Kenton County along the Banklick Creek. This project will remove approximately 4,000 acres of tributary area to the Lakeview Pump Station and redirect the flow to Western Regional	1.37	0.00	MH2300123 MH2300121	$ 48.00	Planning	
US 27/AA Highway Improvements - 9,600' of 12" & 14" force main, 7,000' 18" gravity sewer, Centerplex PS capacity upgrade. This initial phase is along the AA Hwy from the Centerplex Pump Station to the Riley Rd. Pump Station. (Phase I to turn Wolpert PS to Riley Rd. PS)	0.00	0.00	Required to ultimately redirect Wolpert Pump Station	$ 6.90	Planning & Design	
US 27/AA Highway Improvements - 6,200' of 12" & 14" force main and New Rocky View PS. New gravity pipe from Cold Springs Crossing Pump Station to the new Rocky View Pump Station. (Phase II to turn Wolpert PS to Riley Rd. PS)	0.00	0.00	Required to ultimately redirect Wolpert Pump Station	$ 4.90	Planning	
US 27/AA Highway Improvements - 3,900' of 12" force main, 3,400' 12" gravity sewer, and upgrade Wolpert PS capacity and new force main and gravity pipe from the Wolpert Pump Station to the Cold Springs Crossing site. (Phase III, Final Phase, to turn Wolpert PS to Riley Rd. PS)	0.07	0.00	MH 1920007 MH 1920086	$ 1.10	Planning	
Bullittsville Pump Station Capacity Upgrade & Storage EQ at PS site	0.11	0.00	MH 2370003	$ 4.40	Design	

ASH ST CSO AND SSO ELIMINATION PROJECT TO BE COMPLETE BY 5/1/21					
Ash St. CSO Elimination (Ash St) 7 MGD Pump Station & 27,000' 20" Force Main	1.00	0.00	MH0010220	$ 3.50	Construction
Silver Grove SSO Elimination (Ash St) 7 MGD Pump Station & 27,000' 20" Force Main	15.00	0.00	MH0020008 MH0020007 MH0020006 MH0020032	$ 22.50	Construction

Projects labeled as construction will have completed pipe and other infrastructure and will be in service

Projects labeled as design will have completed detailed drawings capable of being publicly bid

Projects labeled as planning will have completed a study that will indicate infrastructure locations, routes, and sizing, and will confirm impacts of SSOs or CSOs. A detailed design and construction schedule will be established. Planning will identify likely easements or property acquisition to be obtained and will address any permitting issues that need to be considered during the design and construction process. A planning effort will identify risks and other potential unknowns that would need to be considered during both design and construction. These studies are anticipated to be accomplished by one of the nationally recognized consultants that currently have a Master Services Agreement with SD1.

APPENDIX D

A. Completion of construction of remedial measures by no later than 12/31/10 at the following Pump Stations:

1. Ripple Creek
2. Alex-Licking
3. Reily Road No. 1
4. Harrison Harbor
5. Sunset
6. South Park
7. Taylorsport
8. Highland Acres

C. Completion of construction of remedial measures by no later than 12/31/15 at the following Pump Stations:

1. Crestview
2. Kentucky Aires
3. Union
4. South Hampton
5. Allen-Fork