SD1
Managing Northern Kentucky's
Wastewater and Storm Water

January 30, 2019

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

Chief, Environmental Enforcement Section
Environmental and Natural Resources Division
U.S. Department of Justice
601 D Street NW
Washington, DC 20005
DOJ Case No. 90-5-1-1-08591

Mr. Daniel J. O'Lone, Acting Chief
NPDES Permitting and Enforcement Branch
U.S. Environmental Protection Agency, Region 4
Atlanta Federal Center
61 Forsyth Street, S.W.
Atlanta, Georgia 30303

Re: Consent Decree Case No. 2:05-cv-00199-WOB

To Whom It May Concern:

Pursuant to the above-referenced Consent Decree, Sanitation District No. 1 (SD1) is required to submit quarterly reports that demonstrate SD1's compliance with the Consent Decree:

42. Quarterly Reports. The District shall submit to the Cabinet/EPA a quarterly report that describes the District's progress in complying with this Consent Decree for the previous quarter no later than thirty days after the end of each calendar quarter. The first such report shall be submitted to the Cabinet/EPA no later than thirty days after the second full quarter after entry of this Consent Decree.

Information contained within the enclosed Quarterly Report No. 45 describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of October 1, 2018 through December 31, 2018. The report also contains an outlook for the upcoming calendar quarter period of January 1, 2019 through March 31, 2019. Additionally, an annual review of 2018 and comparisons to previous years are included in the report.

A certification, as required by the Consent Decree (paragraph 68), is also enclosed.

To the best of my knowledge and belief, the enclosed report is true, accurate, and complete, and further demonstrates SD1's commitment to the mission of protecting and enhancing the water resources and quality of life in Northern Kentucky.

If you have any questions or concerns, do not hesitate to contact me at 859-578-7465 or by e-mail at achaney@sd1.org.

Best regards,

Adam Chaney
Executive Director

AC/wck
Enclosures

Sanitation District No. 1
January 30, 2019

Consent Decree
Quarterly Report No. 45
(October 1, 2018 through December 31, 2018)

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CERTIFICATION

Consent Decree Quarterly Report No. 45
Consent Decree Case No. 2:05-cv-00199-WOB

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.

Adam Chaney
Executive Director

1/30/19
Date

COMMONWEALTH OF KENTUCKY

)ss.

COUNTY OF Kenton

The foregoing instrument was acknowledged before me this 30 day of January, 20 19 by Adam Chaney, Executive Director of Sanitation District No. 1.

Angela M Cook
NOTARY PUBLIC

Kenton County, Kentucky

My commission expires: 9-1-20

Angela M. Cook
Notary Public
Kentucky, State at Large
Comm. Exp. 09-01-2020
Notary ID 562735

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CONSENT DECREE
QUARTERLY REPORT NO. 45

January 30, 2019

Sanitation District No. 1
1045 Eaton Drive
Ft. Wright, KY 41017

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LIST OF ACRONYMS AND ABBREVIATIONS

AWWA	American Water Works Association
Cabinet	Kentucky Energy and Environment Cabinet
CSAP	Continuous Sewer Assessment Program
CSO	Combined Sewer Overflow
CVG	Cincinnati-Northern Kentucky International Airport
EPA	U.S. Environmental Protection Agency
KDOW	Kentucky Division of Water
NWS	National Weather Service
O&M	Operations and Maintenance
SCADA	Supervisory Control and Data Acquisition
SD1	Sanitation District No. 1
SSO	Sanitary Sewer Overflow

SECTION 1. INTRODUCTION

1.1 Purpose

This Quarterly Report is submitted to fulfill the requirements of Sanitation District No. 1's (SD1) Consent Decree as entered on April 18, 2007. The Consent Decree is a legal agreement with the U.S. Environmental Protection Agency (EPA) and the Kentucky Energy and Environment Cabinet (Cabinet). The purpose of the Consent Decree is to address sanitary sewer overflows (SSOs) in SD1's sanitary sewer system and combined sewer overflows (CSOs) in the combined sewer system, in an effort to improve water quality throughout SD1's service area. Specifically, Consent Decree Section V Reporting Requirements, states that:

> **42. Quarterly Reports.** The District shall submit to the Cabinet/EPA a quarterly report that describes the District's progress in complying with this Consent Decree for the previous quarter no later than thirty days after the end of each calendar quarter.

1.2 Report Period

Information contained within this report describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of October 1, 2018 through December 31, 2018. This report also contains an outlook for the upcoming calendar quarter period of January 1, 2019 through March 31, 2019.

1.3 Consent Decree Compliance Schedule

A comprehensive compliance schedule for meeting the requirements of the Consent Decree can be found in Appendix A. A more detailed listing of the projects and activities conducted to comply with the requirements of the Consent Decree, including schedules, project updates for the current reporting period, and planned activity for the following quarter can be found in Appendix B.

Additionally, Appendix B provides a schedule of the projects proposed in the first five years of the Watershed Plans for Northern Kentucky, as well as status updates on CSO

and SSO reduction projects that have not been formally proposed in the Watershed Plans. The Watershed Plans were submitted on March 31, 2011, approved by the Cabinet and EPA in a letter dated February 14, 2014, and resubmitted March 14, 2014 with agreed to revisions, as requested in the February 14, 2014 letter.

Initial Watershed Projects

As shown in Appendix B, SD1 has completed the Initial Watershed Projects. A request to remove a project (Western Regional – Richwood project C-039-00) was included in the revised Watershed Plans, submitted on March 31, 2011. Approval of the request to remove the project was granted in a letter dated May 13, 2013 from the Cabinet and the EPA. SD1 submitted its final Initial Watershed Projects Annual Report on June 7, 2013.

Pump Station Backup Power Plan

As shown in Appendix B, SD1 completed the Pump Station Operation Plan for Backup Power, before the Consent Decree deadline of December 31, 2015. SD1 submitted its Pump Station Operation Plan for Backup Power on December 14, 2007 and received regulatory approval on May 14, 2008. Of the 127 pump stations identified in the plan, 15 were permanently eliminated, and 112 have fully implemented backup power solutions to mitigate overflows during power failures.

The schedule provided in Appendix B of this report only identifies 110 pump stations, because 17 of the 127 pump stations that required backup power were completed prior to the approval of the plan in 2007. The 17 projects that were identified as complete in Table 3.1 of the Pump Station Operation Plan for Backup Power, submitted on December 14, 2007, are not included in the final schedule provided in Appendix B of this report.

SECTION 2. OVERFLOW DATA

This section of the Quarterly Report presents SD1's estimates of overflow activity.

Overflow Categories

For reporting and system performance measurement purposes, SD1 has categorized sewer overflows throughout the service area into five distinct categories:

- *SSOs Due to Wet-Weather Capacity Issues*: Recurring and Inactive overflows from SD1's sanitary sewer system, due to a lack of capacity during wet weather. This category includes wet-weather discharges at pump stations that may or may not have a constructed bypass. Overflows are determined to be "Recurring" if they have been observed to overflow twice in a running twelve month period. Overflows are determined to be "Inactive" until they occur more than once in a running twelve month period. Inactive overflows are generally under investigation as suspected or predicted hydraulic model overflow points in the collection system.

- *SSOs Due to Operational Issues*: Overflows from SD1's sanitary sewer system, including pump stations that are not a result of wet-weather capacity issues. Many of these are one-time, dry-weather occurrences caused by temporary system issues that are investigated and corrected as soon as practicable.

- *Wet-Weather CSOs*: Wet-weather discharges from the combined sewer system that occur no later than 48 hours after any storm event. Wet-weather CSOs may also be caused by high river impacts.

- *Dry-Weather CSOs*: Dry-weather discharges from the combined sewer system that occur 48 hours after any storm event, during normal river conditions.

- *Building Backups:* The release of raw sewage from a service lateral into a building in SD1's service area. Building backups can be caused by several factors, such as constrained capacity during wet weather, or a blockage or collapse in the private service lateral or the public main line. Building backups can be determined to be associated with the operation of public sewer system, or can be due to other causes beyond the control of SD1.

Quantitative Estimates

SD1 uses three general methods for developing quantitative overflow estimates:

- Field inspections are performed after wet-weather events to identify evidence of activations. This inspection program has been in place since 2005 and is adjusted, as needed, for record keeping and sewer overflow response cleanup.

SD1's Collection Systems Department and Infrastructure Capital Planning Department perform routine inspections after rain events at prioritized Recurring and Inactive SSO locations to confirm overflow activity, and assess the need for sewer overflow response cleanup. Generally, SD1 conducts post-wet-weather inspections of SSOs when cumulative rainfall depth exceeds one inch or two inches for a single storm event. Most SSOs are inspected in the one-inch storm event. Less active SSOs, as determined by modeling and inspection histories, are inspected in the two-inch storm event. Similarly, all CSOs are inspected when the combined sewer system experiences half an inch of cumulative rainfall in a single storm event. Immediately following a storm event, SD1's network of wireless rain gauges is used to determine which sewersheds were impacted, and if enough rain fell in a specific sewershed to warrant field inspections. Inspection routes are fixed to sewersheds, to better account for variation in storm magnitude and intensity across the District's approximate 190 square-mile service area. Political boundaries and average rainfalls are not used to determine when and where inspections are performed. If an isolated region of the service area experiences rainfall that triggers an inspection, SSO assessment efforts are focused only on the portion of the collection system that may be impacted. This continuous and precise inspection effort to verify overflow activity throughout the collection system ensures accurate record keeping, appropriate cleanup response, and characterization of capacity issues for wet-weather modeling. The field-based characterization of overflows ensures that the hydraulic model SD1 utilizes is effectively maintained and improved upon, which helps identify the most appropriate solutions for mitigation.

- Simple hydraulic estimating, using the Manning's Gravity Flow and Pipe Calculation, to report overflows from pump stations with constructed bypasses, and industry standard volume estimations techniques and calculations are used for spills or for any witnessed overflow from a manhole. The only exceptions to this calculation methodology are at the Lakeview Pump Station and the Highland Heights Pump Station. These two pump stations have flow meters in the bypass pipes that are used as the primary sources of overflow volume estimations. If a flow meter malfunctions at one of these pump stations during an overflow, the Manning's Gravity Flow and Pipe Calculation will be used as the default method of

volume estimation. These methods have been used historically for reporting purposes.

- SD1's hydraulic models are used for quarterly activation and volume estimations of wet-weather CSOs and SSOs. SD1 completed a year-long flow monitoring program in 2008, consisting of more than 245 flow meters and 45 rain gauges installed throughout the combined and separated systems, to update the calibration of SD1's system-wide hydraulic models. This calibration was undertaken to provide a model network that could confidently be used as an accurate tool in preparing SD1's Watershed Plans. Currently, SD1 maintains approximately 60 flow meters and 23 rain gauges throughout the year, which are used to continuously update the models and investigate capacity issues. Additionally, the models are being used to provide information about the current performance of SD1's system on a quarterly basis. With the historical and current flow monitoring and inspection data, SD1 maintains its highly calibrated network of hydraulic models to provide an accurate representation of the collection system. These modeling and monitoring tools confidently provide estimates of overflow activations and volumes from the sewer systems as a result of wet weather. The models are continuously revised to incorporate rehabilitation and maintenance activities, completed capital projects, private developments, data gathered from GPS surveys, and mapping of discovered infrastructure. This process ensures that the models are kept up-to-date and accurately reflect the current collection system. This approach is consistent with SD1's commitment to provide the best available information on overflow activity.

For this submittal, SD1 collected rainfall data from its network of 23 rain gauges located across the service area, to simulate the wet weather that occurred between October 1, 2018 and December 31, 2018. The results of the model simulations have been summarized and included as an estimate of the frequency and total volume of the overflow locations within SD1's collection system for this period. These results are not a summary of observed or confirmed activations, but are a confident estimate of the overflows predicted by SD1's calibrated and verified models.

Precipitation Data

Rainfall statistics are an important component of overflow reporting, as weather conditions represent an uncontrolled variable that impacts SD1's wet-weather CSO and SSO activity. Quarterly CSO and SSO activations and volumes change over time, due to natural variations in rainfall patterns and antecedent moisture conditions. Over time, SD1 expects system improvements to show a clear trend in reduced overflow activity. However, reviewing overflow reports for any individual quarter, relative to previous quarters, also requires careful review of the rainfall associated with each period, in order to understand the impact of shifting rainfall patterns. For this reason, storm event summaries are included in all overflow reporting submittals. The data in Table 2.1 is from the Cincinnati-Northern Kentucky International Airport (CVG) rain gauge, maintained by the National Weather Service (NWS), in northeast Boone County.

Table 2.1 Summary of Storm Events at CVG, per National Weather Service
(October 1, 2018 through December 31, 2018)

Month	Approximate # of Storm Events[1]	Rainfall (in)
October	6	1.27
November	13	4.92
December	8	5.20
Total	**27**	**11.39**

[1] A storm event is defined as at least 0.01" of rain with a minimum inter-event time of 7 hours.

The historical average of fourth quarter cumulative rainfall depth from 1951 through 2005 at CVG is approximately 9.23 inches. For further comparison, the typical year (1970) produced approximately 8.05 inches of rainfall during the fourth quarter. The NWS's recorded cumulative depth of rainfall for the fourth quarter of 2018, 11.39 inches, is approximately 23 percent more than the historical average and approximately 41 percent more than the typical year's fourth quarter.

The remainder of this section provides updates on overflows that occurred throughout SD1's service area during the period of October 1, 2018 through December 31, 2018. A cumulative accounting of SD1's overflow activity throughout 2018 and annual comparisons from 2008 through 2018, can be found in Appendix C.

2.1 SSOs Due to Wet Weather Capacity Issues

This section summarizes the Recurring and Inactive overflows from SD1's sanitary sewer system, due to lack of capacity during wet weather. Wet-weather discharges at pump stations that may or may not have a constructed bypasses are also included in this section. Sanitary Sewer Overflows are classified as Recurring if evidence of overflow is found at least twice in a twelve month period. Sanitary Sewer Overflows are classified as Inactive until evidence of overflow is confirmed more than once in a twelve month period. An Inactive SSO is generally under investigation for at least two years as a suspected or predicted hydraulic model overflow point in the collection system, until it is confirmed as a Recurring SSO or is eliminated.

Recurring Wet-Weather SSOs

For the current reporting period, modeled activation and volume statistics of SD1's 132 Recurring SSOs, can be found in Appendix D. The Recurring SSO list is updated annually in the April Quarterly Report to reflect the latest information from ongoing system characterization, based upon field inspections, flow monitoring, and hydraulic modeling. The variation in annual precipitation also influences the year-to-year changes to the Recurring SSO list. A detailed list of structure numbers and transaction descriptions for the revisions made to the current Recurring SSO list can be found in Quarterly Report No. 42, submitted on April 30, 2018. Forthcoming revisions to the current Recurring Wet-Weather SSO list will be published in Quarterly Report No. 46, due on April 30, 2019.

During the fourth quarter of 2018, SD1 performed approximately 282 post-wet-weather inspections at approximately 167 Recurring and Inactive SSO locations. Approximately 60 of the 282 post-wet-weather inspections confirmed overflow evidence or high river impacts. There were two storm events that prompted these post-wet-weather SSO inspections. The storm dates and the largest recorded rainfall depths in the service area are provided below:

- October 31 – 1.42 inches in the City of Erlanger, Kenton County
- December 1 – 1.89 inches in the City of Alexandria, Campbell County

Recurring Wet-Weather SSO Pump Stations Listed in the Consent Decree

In addition to the 132 Recurring SSOs, there are also 14 pump stations identified in the Consent Decree that have historically documented recurring wet- weather capacity issues.

As previously described, the Lakeview Pump Station is the only pump station listed in the Consent Decree that has a metered bypass to calculate overflow volumes. All other overflow volumes at pump stations listed in the Consent Decree are estimated using the Manning's Gravity Flow and Pipe Calculation with start/stop times provided by telemetry.

Table 2.2 lists each of the 14 pump stations identified in Exhibit E of the Consent Decree, and demonstrates their observed wet-weather SSO occurrences and estimated discharge volumes for the fourth quarter of 2018.

Table 2.2 Discharges from Consent Decree Pump Stations Due to Lack of Capacity during Wet Weather
(October 1, 2018 through December 31, 2018)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Lakeview	5	5,062,575
Alex-Licking	0	0
Allen Fork	0	0
Crestview	0	0
Harrison Harbor	0	0
Highland Acres	0	0
Kentucky Aire	0	0
Riley Road	0	0
Ripple Creek	0	0
South Hampton	0	0
South Park	0	0
Sunset	0	0
Taylorsport	0	0
Union	0	0
TOTAL	**5**	**5,062,575**

Gray denotes where required capital improvements have been made to eliminate pump station SSOs.

Lakeview Pump Station Operational Failure during Wet Weather

During the fourth quarter of 2018, operational issues persisted with one of Lakeview Pump Station's four pump sets. Electrical failures and recurring pump faults at one pump set during heavy rain contributed to the wet-weather SSOs documented in Table 2.2. Additionally, ongoing pump issues and forcemain at the Narrows Road Diversion Pump Station diverted excess peak flows to the Lakeview Pump Station. While the primary cause of the SSOs in Table 2.2 were determined to be a lack of capacity during wet weather, the operational failures contributed to larger spill volumes. The operational issues at both stations are currently under evaluation for permanent solutions.

Wet Weather SSO Pump Stations Not Listed in the Consent Decree

In addition to tracking the recurring wet-weather SSOs at the pump stations listed in the Consent Decree, SD1 continuously monitors all other pump stations throughout the service area for recurring wet-weather capacity issues. During the current reporting period, SD1 observed wet-weather SSOs at two pumps stations that are not listed in the Consent Decree. At the two pump stations, a total of nine separate occurrences spilled approximately 6,991,502 gallons of wet-weather SSO.

Table 2.3 provides a summary of the fourth quarter activity at each Recurring SSO pump station that is not listed in the Consent Decree.

Table 2.3 Discharges from Recurring SSO Pump Stations Not Listed in the Consent Decree, due to Lack of Capacity during Wet Weather
(October 1, 2018 through December 31, 2018)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Bullitsville	1	1,533
Highland Heights	8	6,989,969
TOTAL	**9**	**6,991,502**

The estimated overflow volumes provided for the Highland Heights Pump Station have been calculated with a flow meter that's installed in the bypass pipe. All other pump station overflows are estimated using the Manning's Gravity Flow and Pipe Calculation with start/stop times provided by telemetry.

Inactive Wet-Weather SSOs

No inactive wet-weather SSOs were observed by SD1 during the current reporting period.

2.2 SSOs Due to Operational Issues

This category of overflows includes discharges from SD1's separate or combined sanitary sewer systems that are not a result of wet-weather capacity issues. Many of these are one-time occurrences caused by temporary system failure or mechanical failures, in dry or wet weather, that are investigated and corrected as soon as possible.

During the fourth quarter of 2018, there were a total of 10 SSOs due to operational issues throughout SD1's service area. A total estimated overflow volume of 718,550 gallons discharged during these incidents.

These SSOs were immediately acted upon and the problems repaired as soon as possible. The sewers where structural or maintenance failures occurred were put into or updated in the Continuous Sewer Assessment Program (CSAP) to be inspected and cleaned as determined by the CSAP logic, which also provides appropriate next actions to permanently address the causes of the failure. All overflow events are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas exist that warrant the need for increased inspections, new preventative maintenance routines, repairs or rehabilitation projects.

Figure 2.1 demonstrates the primary causes of the overflows and Figure 2.2 demonstrates the corresponding total estimated overflow volume of each category of operational failure.

Figure 2.1 Occurrences of SSO Due to Operational Issues per Cause
(October 1, 2018 through December 31, 2018)

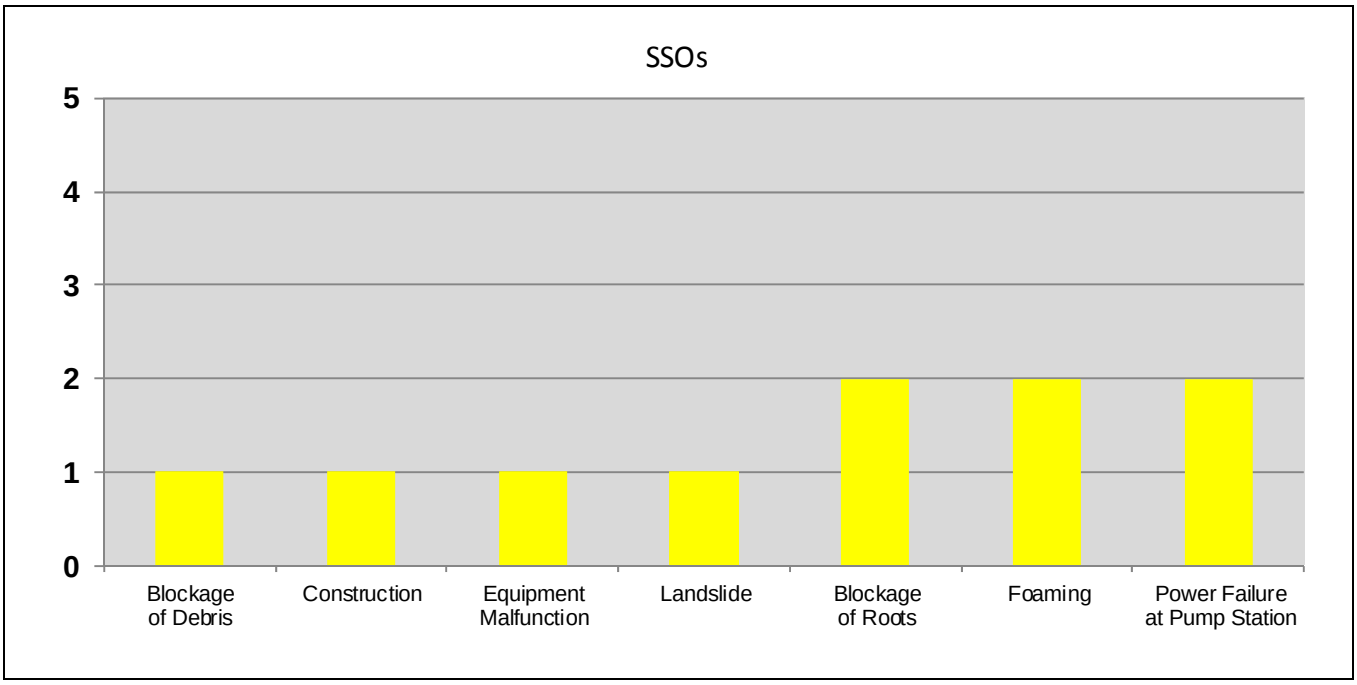
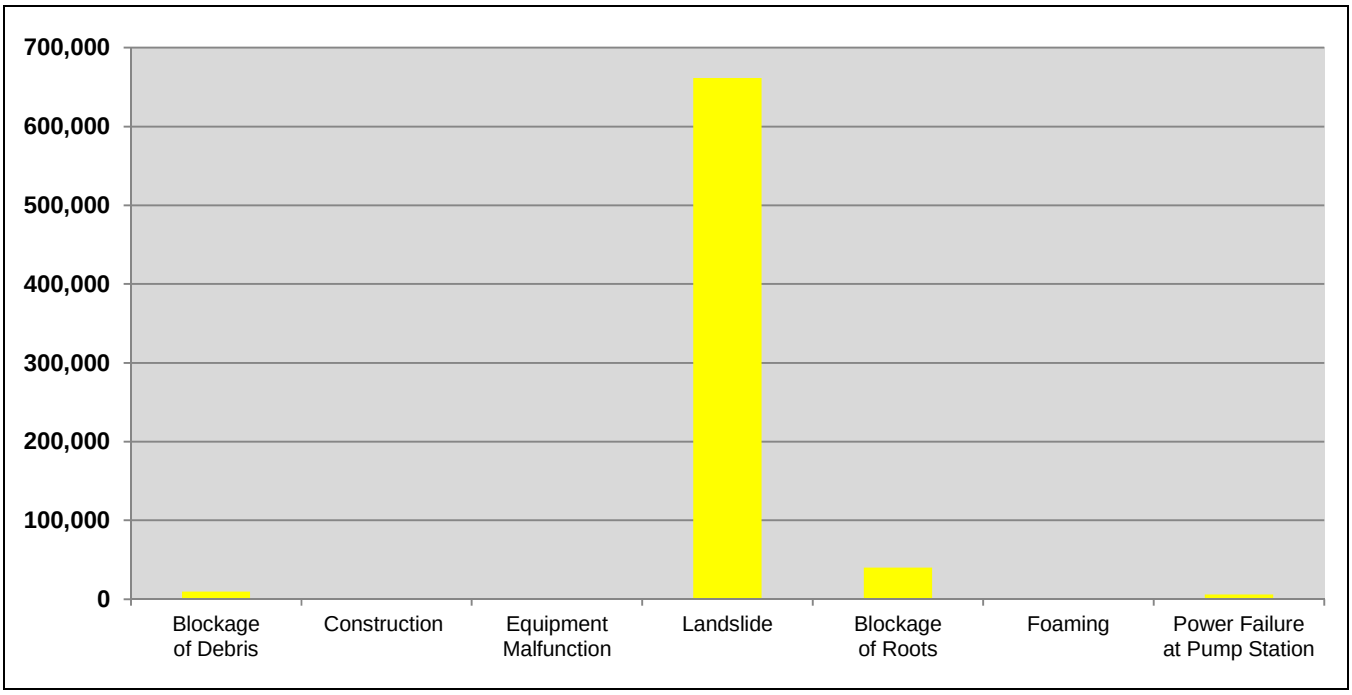


Figure 2.2 Gallons of SSO Due to Operational Issues per Cause
(October 1, 2018 through December 31, 2018)



2.3 Wet Weather CSOs

Included in Appendix E are the modeled activation and volume statistics for SD1's 95 CSOs. These data were generated from the hydraulic modeling program previously described in Section 2.1.

2.4 Dry Weather CSOs

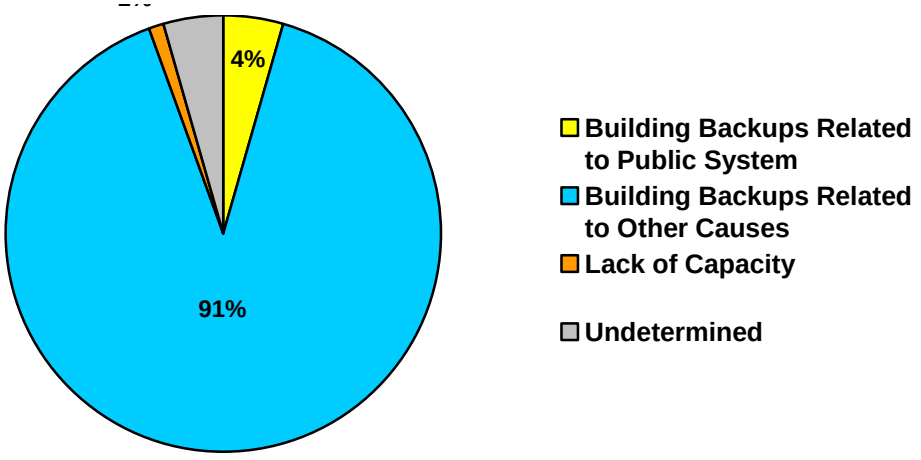
No inactive dry-weather CSOs were observed by SD1 during the current reporting period.

2.5 Building Backups

During the current reporting period, there were approximately 90 building backups recorded throughout SD1's service area. Of these 90 backups**,** approximately four were related to the condition or operation of the public sewers, during normal conditions. Approximately 81 backups were due to blockages in private laterals or internal plumbing issues. One backup was determined to be due to a lack of capacity during wet weather. The causes of four backups were undetermined.

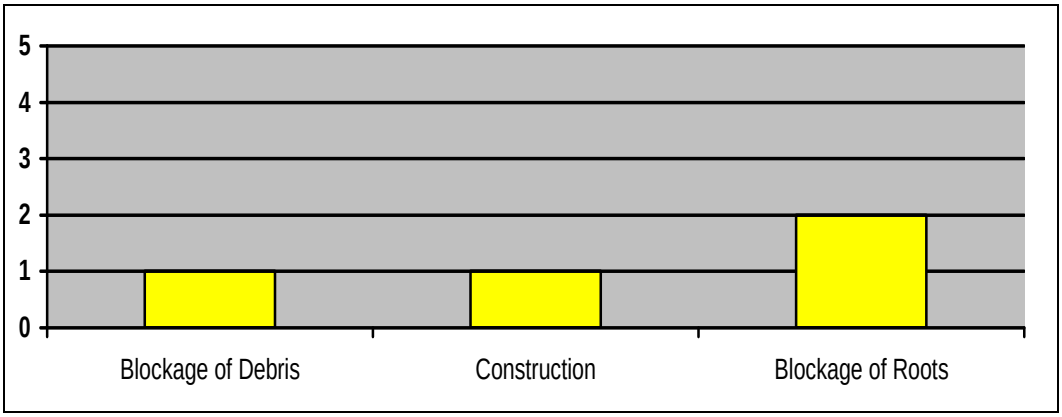
Figure 2.3 illustrates the proportion of backups related to specifically to SD1's operations and other causes.

Figure 2.3 Building Backups: Public System vs. Other Causes
(October 1, 2018 through December 31, 2018)



The causes of the four building backups determined to be related to the condition or operation of the public sewer lines are detailed in Figure 2.4.

Figure 2.4 Occurrences of Public System Related Building Backups per Cause
(October 1, 2018 through December 31, 2018)



The sewers where blockages occurred were put into or updated in SD1's CSAP to be inspected and cleaned, as determined by the program logic, which also provides appropriate next actions to proactively address the causes of the blockages.

All building backups are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas exist that warrant the need for increased inspections, new preventative maintenance routines, repairs or rehabilitation projects.

SECTION 3. ANNUAL REVIEW OF OVERFLOW DATA

The activities, programs and projects SD1 implements are intended to reduce the frequency and volume of SSOs and CSOs throughout SD1's service area. These efforts include Capacity, Management, Operations and Maintenance programs, implementation of the Nine Minimum Controls for CSOs, and various capital improvement projects. As a means to gauge the benefits of these efforts, this section accounts for the reductions or increases in annual overflow activity from year to year and provides an analysis as to what has contributed to these changes. Rainfall and Ohio River stage level data are also provided, as each represents an uncontrolled variable that significantly impacts SD1's wet-weather CSO and SSO activity. In general, focus on weather and river conditions are included for the last four years, with year-to-

year changes between 2017 and 2018, while older overflow and operational data are included for historical reference. Additional summary comparisons of SD1's overflow data, since 2008, can be found in Appendix C.

3.1 Summary of Precipitation Data

As previously described in Section 2, overflow activations and volumes will constantly change over time, with or without system improvements, due to the natural variations in rainfall patterns, associated groundwater levels, and antecedent moisture conditions. Therefore, SD1 must take into consideration the influence of precipitation to determine the actual impact of system improvements.

Rainfall Conditions

The cumulative rainfall depth data in Tables 3.1 and 3.2 are based on total rainfall data recorded at the Cincinnati-Northern Kentucky International Airport (CVG) by the National Weather Service (NWS). The storm event data is based on an estimate of the number of events observed at the rain gauges within the SD1 system. A storm event is defined as a period of time where rainfall is bracketed by at least seven hours of dry weather. As of 2017, the historical average for annual cumulative rainfall at CVG is 42.52 inches, according to the NWS.

Table 3.1 Rain Events and Total Rainfall by Quarter (2015 - 2018)

	2015			2016			2017			2018		
Qtr.	# of Storm Events	Rainfall (in)	Avg. Storm (in)	# of Storm Events	Rainfall (in)	Avg. Storm (in)	# of Storm Events	Rainfall (in)	Avg. Storm (in)	# of Storm Events	Rainfall (in)	Avg. Storm (in)
1st	22	10.47	0.48	24	10.57	0.44	34	11.55	0.34	30	13.82	0.46
2nd	36	12.49	0.35	36	10.15	0.28	32	16.56	0.52	31	10.59	0.34
3rd	31	9.77	0.32	31	13.65	0.44	23	10.55	0.46	22	18.56	0.84
4th	26	14.65	0.56	20	8.85	0.44	21	11.22	0.53	27	11.39	0.42
Total	115	47.38	0.41	111	43.22	0.39	110	49.88	0.45	110	54.36	0.49

A storm event is defined as at least 0.01" of rain with a minimum inter-event time of 7 hours.

Table 3.2 Rain Events and Total Rainfall Change from 2017 to 2018

	Change from 2017 to 2018	
Qtr.	**# of Storm Events**	**Rainfall (in)**
1st	-4	2.27
2nd	-1	-5.97
3rd	-1	8.01
4th	6	0.17
Total	**0**	**4.48**

The daily precipitation statistics, provided on the following page in Figures 3.1 and 3.2, are also derived from daily rainfall totals maintained by the NWS rain gauge at CVG.

Figure 3.1 Daily Precipitation (2015 - 2018)

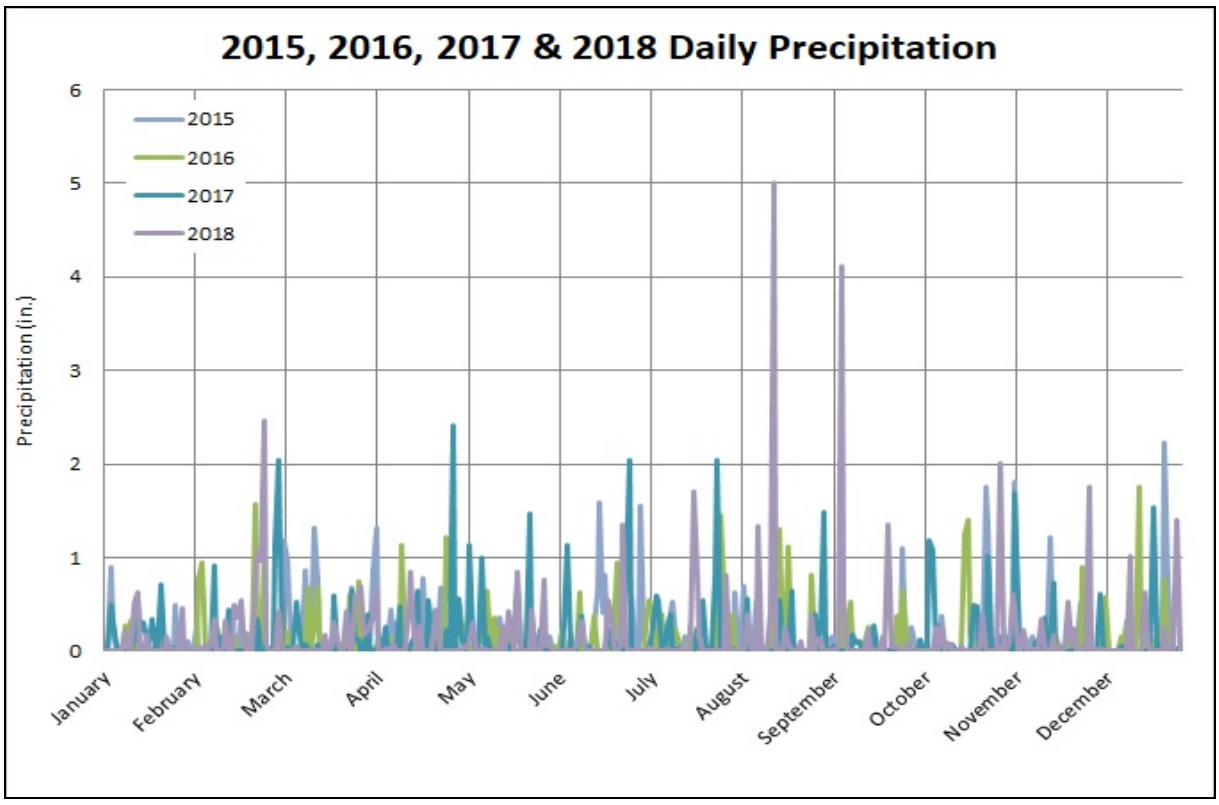
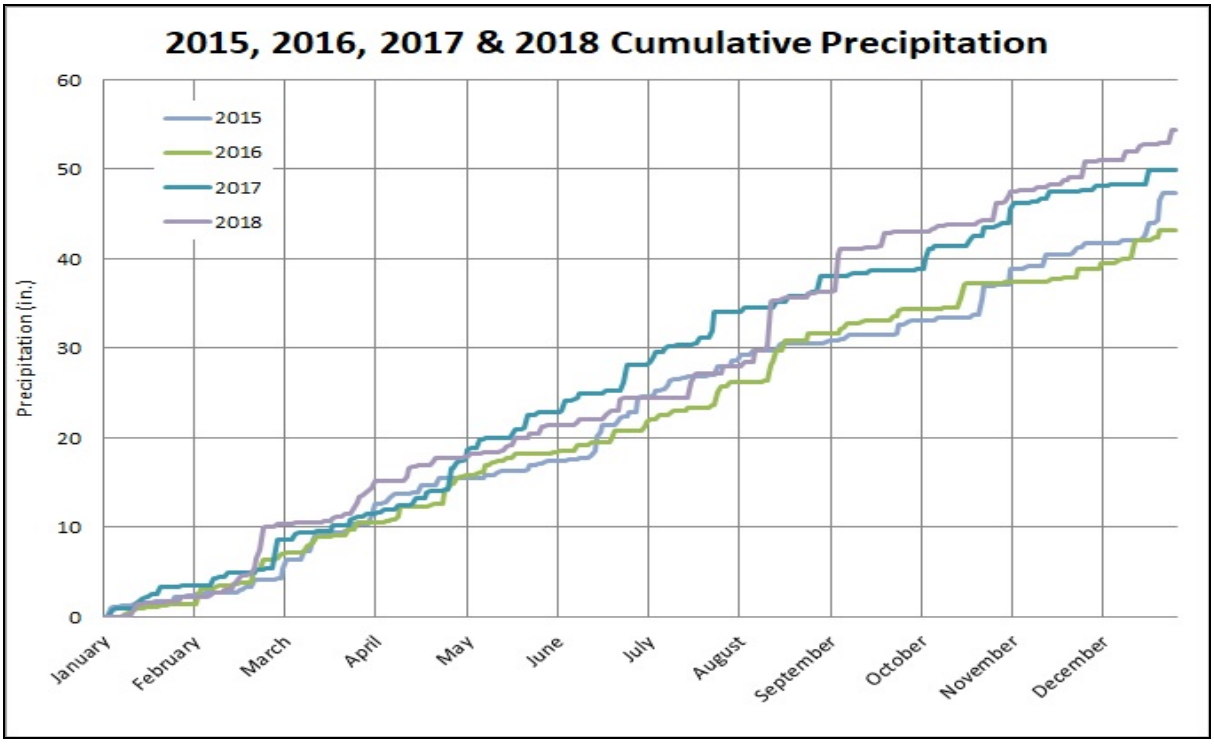


Figure 3.2 Cumulative Precipitation (2015 - 2018)



The cumulative depth of rainfall in 2018 at CVG was 53.36 inches, which is approximately 9 percent more than the total recorded at CVG in 2017 and approximately 33 percent more than the typical year of 1970.

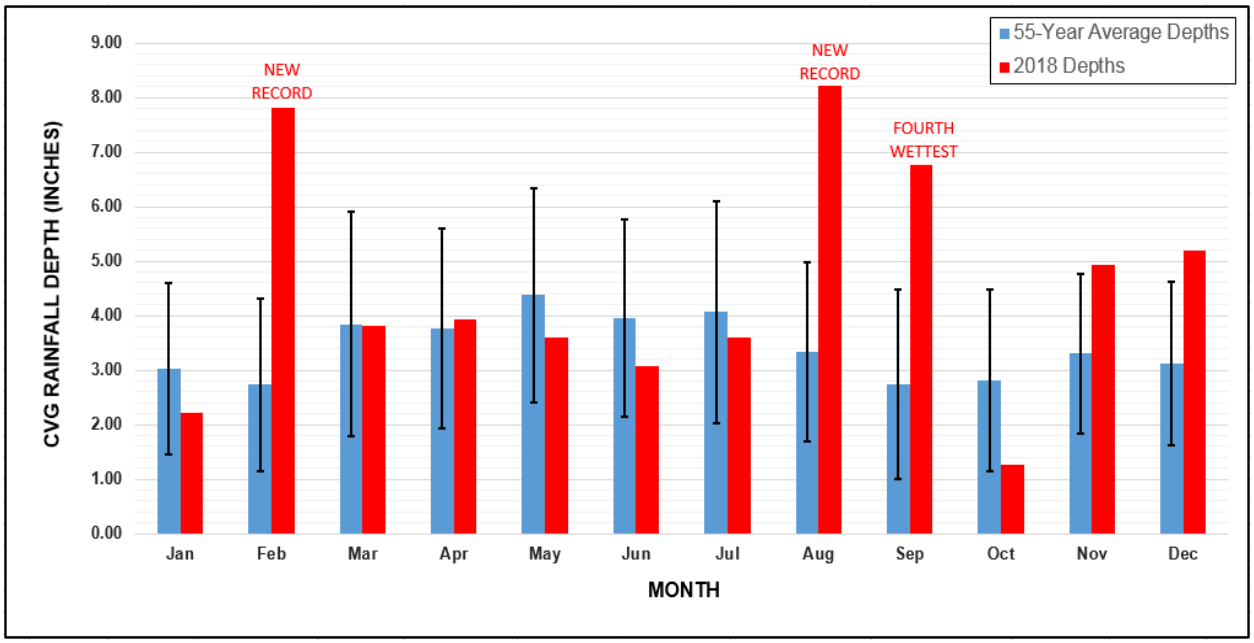
The number of rainfall events per year over the past three years are nearly identical. However, on average, the intensity of the rain events have significantly increased each year. The average storm in 2018 produced approximately 0.49 inches of rain, which is approximately 9 percent more than the average event in 2017 and 25 percent more than the average event in 2016. Additionally, the average storm in 2018 produced approximately 23 percent more the typical year's average storm event of 0.4 inches.

New Rainfall Records in 2018

The typically drier months of February and August both set new records for cumulative rainfall in 2018. February produced approximately 7.80 inches and August produced approximately 8.21 inches at CVG. Additionally, the month of September was the fourth wettest on record at CVG.

Figure 3.3 illustrates that five of the monthly cumulative rainfalls in 2018 exceeded the standard error of the historical data collected at CVG between 1951 and 2005.

Figure 3.3 Average Monthly Rainfall and 2018 Monthly Rainfall at CVG

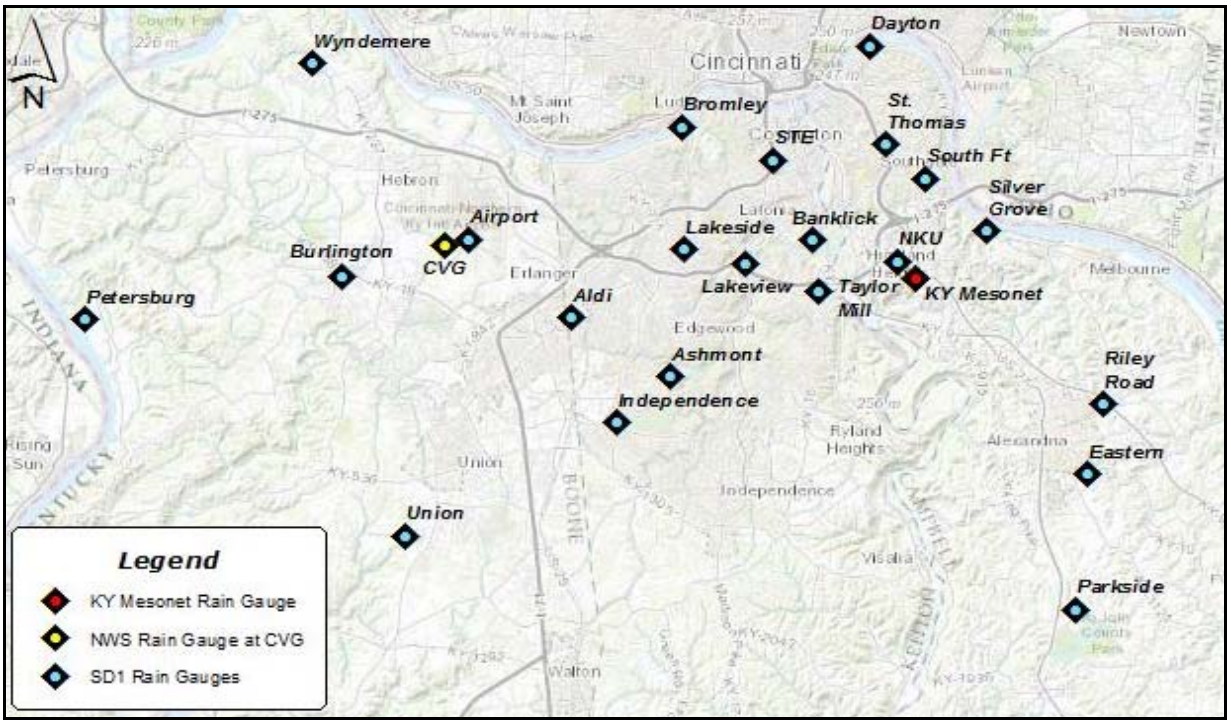


Geographic Variation of Storm Magnitudes and Intensities in 2018

While the CVG rain gauge maintained by the NWS generally represents rainfall across all of SD1's service area, it is important to note that isolated storm events captured by the SD1 rain gauge network and other weather stations can vary significantly in magnitude and intensity. In addition to SD1's rain gauge network, the Kentucky Mesonet weather station in the City of Highland Heights provides another reliable source of rainfall data, as it is the official source of weather and climate data for the Commonwealth of Kentucky and is associated with the NWS. For the sake of maintaining continuity in the standardized reporting of rainfall statistics, this and all other Quarterly Reports tally only the cumulative rainfall depths and event durations recorded by the NWS rain gauge at CVG. However, all modeled overflows are products of the rainfall simulated by the data collected with the SD1 rain gauge network.

Figure 3.4 provides clarification on the locations of all SD1, NWS, and state-owned rain gauges that are used for modeling and reporting purposes.

Figure 3.4 Rain Gauge Locations



The 2018 cumulative rainfalls and intensities recorded at the rain gauges illustrated in Figure 3.4 are summarized further on the following page in Table 3.3.

Table 3.3 details the variations in the maximum return periods of 2018 for each SD1 rain gauge, as compared to maximum return periods recorded at CVG in 2018. Maximum returns are color coded to better illustrate the spatial variation in rainfall intensities across the SD1 service area. Return periods more frequent than the 2-year are color coded in blue, green, and yellow. Return periods less frequent than 2-year are color coded in orange, red, and gray.

In 2018, the CVG rain gauge was a reasonable representative of system-wide rainfall, however, it did not match the maximum return periods for smaller event durations in certain parts of the service area. In particular, there were numerous storm events recorded in Kenton and Campbell Counties that exceeded the 25, 50, and 100 year returns that were not recorded by the CVG rain gauge in Boone County. These variations indicate greater intensities over shorter durations in parts of the SD1 service area. Additionally, some parts of the SD1 service area saw less cumulative rainfall and less intense rain events than what the CVG rain gauge recorded in 2018.

Table 3.3 Variation in 2018 Cumulative Rainfall and Maximum Return Periods

Rain Gauge	Total Rainfall	Maximum Return Period						
	(in)	15 -Min	30 -Min	1-HR	3-HR	6-HR	12-HR	24-HR
Airport	53.25	< 5 yr	< 5 yr	< 5 yr	< 2 yr	< 5 yr	< 2 yr	< 25 yr
Aldi	50.91	< 1 yr	< 9 mth	< 1 yr	< 1 yr	< 2 yr	< 2 yr	< 10 yr
Ashmont	52.65	< 5 yr	< 2 yr	< 10 yr	2 yr	< 5 yr	< 10 yr	< 25 yr
Banklick	54.16	< 5 yr	< 10 yr	< 25 yr	< 5 yr	< 2 yr	< 5 yr	< 25 yr
Bromley	48.43	< 6 mth	< 9 mth	< 9 mth	< 9 mth	< 2 yr	< 2 yr	< 25 yr
Burlington	53.93	< 2 yr	< 2 yr	< 9 mth	< 9 mth	< 2 yr	< 2 yr	< 25 yr
Dayton	50.96	< 5 yr	< 2 yr	< 5 yr	< 5 yr	< 2 yr	< 2 yr	< 5 yr
Eastern	54.57	9 mth	< 9 mth	< 9 mth	< 9 mth	< 5 yr	< 10 yr	25 yr
Florence	43.41	< 9 mth	< 9 mth	< 9 mth	< 6 mth	9 mth	< 1 yr	< 10 yr
Independence	51.45	9 mth	< 9 mth	< 5 yr	< 2 yr	< 5 yr	< 10 yr	< 25 yr
Lakeside	46.84	< 1 yr	< 6 mth	< 1 yr	< 2 yr	< 2 yr	< 2 yr	< 10 yr
Lakeview	46.57	< 2 yr	< 5 yr	< 5 yr	< 2 yr	< 2 yr	< 5 yr	< 25 yr
NKU	46.83	< 5 yr	< 25 yr	< 100 yr	< 25 yr	< 10 yr	< 10 yr	< 10 yr
Parkside	56.07	< 5 yr	< 5 yr	< 2 yr	< 1 yr	< 5 yr	< 10 yr	< 25 yr
Petersburg	52.44	5 yr	< 10 yr	< 10 yr	< 2 yr	< 2 yr	< 5 yr	< 25 yr
Silver Grove	55.85	< 5 yr	< 25 yr	< 50 yr	< 10 yr	< 5 yr	< 5 yr	< 10 yr
South FT	55.00	< 5 yr	< 10 yr	< 10 yr	< 2 yr	< 2 yr	< 5 yr	< 10 yr
St Elizabeth	54.01	< 5 yr	< 5 yr	< 5 yr	< 5 yr	< 5 yr	< 5 yr	< 10 yr
St Thomas	53.00	< 5 yr	< 5 yr	< 5 yr	< 5 yr	< 5 yr	< 2 yr	< 10 yr
Sunset	54.19	< 2 yr	1 yr	< 1 yr	< 9 mth	< 5 yr	< 10 yr	< 25 yr
Taylor	42.26	< 5 yr	< 2 yr	< 1 yr	< 9 mth	< 9 mth	< 6 mth	< 2 yr
Union	53.48	< 2 yr	< 2 yr	1 yr	< 9 mth	< 5 yr	< 10 yr	< 25 yr
Wyndemere	50.52	< 2 yr	< 2 yr	< 9 mth	< 9 mth	< 6 mth	< 9 mth	< 5 yr
CVG	54.36	-	-	< 2 yr	< 2 yr	< 5 yr	< 5 yr	< 25 yr

Return periods per Huff-Angel's 1992 Rainfall Frequency Atlas of the Mid-West (Bulletin 71)

Ohio River Impacts

SD1's combined sewer system is influenced in multiple ways by the local Ohio River stage level. In addition to elevated groundwater levels that cause infiltration to occur, river water begins to directly enter the system through some CSO outfalls at the river stage of 38 feet. Additionally, the Army Corps of Engineers prescribes flood control operations to be activated at a river stage of 41, as indicated by the green line in Figure 3.5. When the Ohio River reaches the Army Corps of Engineers' specified river stages during flood conditions, flood gates on the CSO outfalls are closed to isolate the sewer system from high river water. Other sewer system flood gates are opened or closed to isolate portions of the interceptor and combined sewers to re-route sewer flows to the flood pumping stations. The flood pumping stations and gates were designed by the Army Corps of Engineers to protect the river cities from flooding internally due to elevated river levels, or during rain events when the flows in the combined sewers cannot flow out into the river due to the elevated river levels. SD1 continues to work on reducing river water intrusion with a mitigation program using check valves or flap gates on CSO outfalls, effective up to a river stage of 47 feet.

Figure 3.5 Daily River Stage (2015 - 2018)

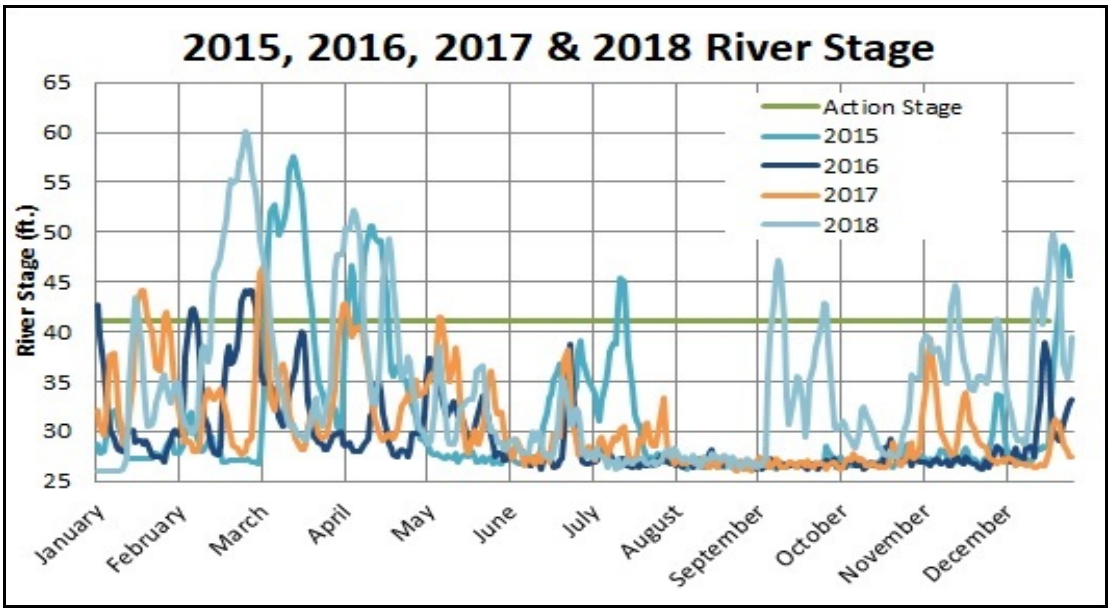


Table 3.4 shows the number of days, per quarter, that the river stage exceeded 41 feet from 2015 to 2018. On average, the Ohio River is at or above 41 feet for 26 days of the year, based upon the daily river stage readings from 1970 to 2005.

Table 3.4 Number of Days Ohio River Stage Level above 41 Feet (2015 - 2018)

Quarter	2015	2016	2017	2018
1	18	9	11	25
2	14	0	6	16
3	4	0	0	5
4	5	0	0	15
Total	41	9	17	61

In 2018, the Ohio River stage of 41 feet was exceeded for 61 days, or approximately 17 percent of the entire year. The maximum Ohio River stage reached in 2018 was approximately 57 feet, following the historically wet February. Every quarter of 2018 experienced multiple high river days, which is only the sixth time to have occurred since 1970. The abnormally high river conditions on the Ohio River had a significant impact on CSO volumes in 2018, which are provided in Section 3.4.

3.2 Review of SSOs Due to Wet-Weather Capacity Issues

3.2.1 Recurring Wet-Weather SSOs

Table 3.5 provides a summary of the approximate number of activations and approximate total volume of Recurring Wet-Weather SSOs from 2008 through 2018.

Table 3.5 Recurring Wet Weather SSOs by Quarter (2008 - 2018)

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
2008	Activations	285	211	24	56	**576**
	Volume (MG)	103	39	2	14	**158**
2009	Activations	152	175	147	177	**651**
	Volume (MG)	26	24	20	35	**105**
2010	Activations	128	351	123	134	**736**
	Volume (MG)	30	55	14	41	**140**
2011	Activations	428	1,097	256	441	**2,222**
	Volume (MG)	106	232	23	124	**485**
2012	Activations	340	129	427	171	**1,067**
	Volume (MG)	52	8	43	20	**123**
2013	Activations	132	281	491	330	**1,234**
	Volume (MG)	23	23	62	66	**174**
2014	Activations	66	247	109	40	**462**
	Volume (MG)	11	22	2	6	**41**
2015	Activations	141	224	217	381	**963**
	Volume (MG)	32	28	13	60	**133**
2016	Activations	256	131	466	136	**989**
	Volume (MG)	38	14	52	23	**127**
2017	Activations	290	356	152	239	**1037**
	Volume (MG)	61	39	11	34	**145**
2018	Activations	271	233	437	225	**1166**
	Volume (MG)	89	29	86	48	**252**

Generally, 2018 was a much wetter year than 2017, with more intense rain events and prolonged periods of high river days. Recurring wet-weather SSO activations increased by approximately 12 percent and total wet-weather SSO volume increased by approximately 74 percent over the previous year.

Table 3.6 provides a quarterly analysis of the approximate recurring wet-weather SSO changes from 2017 to 2018.

Table 3.6 Recurring Wet Weather SSO Change from 2017 to 2018

	Approximate Change from 2017 to 2018	
Qtr.	**Activations**	**Volume (MG)**
1st	-19	28
2nd	-123	-10
3rd	285	75
4th	-14	14
Total	**129**	**107**

The recent increases in annual cumulative rainfalls and storm intensities have caused a sharp increase in wet-weather SSOs over the past few years. However, SD1's model, SSO inspections, and the flow monitoring operations generally indicate a decreasing trend in SSO activations and total spill volumes, relative to the typical year.

Appendix F provides a quarterly wet-weather SSO volume trend that demonstrates a reduction of wet-weather overflow, despite an increasing trend in total rainfall.

3.2.2 Inactive Wet Weather SSOs

SD1 has performed wet-weather SSO investigations since 2005, but has only tracked Inactive SSO occurrences for inclusion in the Quarterly Reports since the beginning of 2009. In 2011, a total of 36 new Inactive SSOs were identified during a record rainfall year that produced more than 73 inches of rain. Most of the Inactive SSOs observed in 2011 were added to the Recurring SSO list in 2012. The Recurring SSO list peaked at 183 known locations shortly after the record rainfall year produced so many new Inactive SSOs. Inspections and subsequent revisions since the record rainfall year of

2011 indicate sharp declines from both of the Recurring SSO and Inactive SSO lists. There are currently 32 known Inactive SSOs that have observed overflow evidence at least once during a 12 month period, and 16 Inactive SSOs that are suspected spill points from modeling evidence. Additionally, there are 34 Inactive SSOs that previously had a status of Recurring, but did not have any evidence of recurring activity for two consecutive years. In total, there are 82 Inactive SSOs. All known or suspected Inactive SSOs are inspected routinely to verify wet-weather overflow activity and to determine if status revisions to Recurring or Eliminated are warranted.

SD1 anticipates that the number of activations and volumes for this category of SSO to vary from year to year, depending on the size and intensity of the rain events that occur and antecedent moisture conditions. Inactive SSOs will generally remain under investigation as suspected or predicted overflow points that must be confirmed with regular inspection or flow monitoring before status revisions are made.

2018 Inactive SSOs

SD1 recorded three new Inactive SSOs in 2018. Each were related to pump stations that were impacted by the historic rainfalls and river levels in the first half of the year. Two of the new Inactive SSO locations will remain on the Inactive SSO list to be monitored for a minimum of two years. One of the Inactive SSOs has already been revised to a Recurring SSO.

- Manhole 2340032 near the Wilder Pump Station
- Carlisle Pump Station
- Winter's Lane Pump Station No.2 (revised to Recurring SSO in the 3rd quarter)

3.3 Review of SSOs Due to Operational Issues

Historically, SD1 has used a metric called Wastewater Collection System Integrity, from the American Water Works Association's (AWWA) 2007 Annual Survey Data & Analyses Report, to measure how its annual SSOs due to operational issues compare to the rest of the wastewater industry in the Southern Region. SD1 has been in the top quartile (3.8 failures, per 100 miles of pipe, per year) for seven years in a row for the utilities AWWA surveyed in the Southern Region in 2007.

Table 3.7 provides an approximate summary of the number of activations and corresponding volume of SSOs due to operational issues from 2008 to 2018.

Table 3.7 SSOs Due to Operational Issues (2008 - 2018)

Year	Total Number of Occurrences	Total Volume (Million Gallons)
2008	143	5.05
2009	108	31.44
2010	63	3.49
2011	66	8.03
2012	38	0.32
2013	55	33.18
2014	39	1.35
2015	44	2.03
2016	56	1.86
2017	55	21.45
2018	46	1.48
Change from 2017 to 2018	**-9**	**-19.97**

3.4 Review of Wet Weather CSOs

The total wet-weather CSO volume increased by approximately 1,479 million gallons from 2017 to 2018, primarily due to record cumulative rainfalls in February and August, as well as three times more high river days. Overall, 2018 produced approximately 80 percent more wet-weather CSO volume than 2017, and approximately 9 percent more CSO activations.

On the following page, Table 3.8 provides an approximate summary of the number of activations and approximate total volume of CSOs that occurred from 2008 to 2018.

Table 3.8 Recurring Wet Weather CSOs by Quarter (2008 - 2018)

		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	**Total**
2008	Activations	943	899	542	504	**2,888**
	Volume (MG)	1,798	685	119	267	**2,869**
2009	Activations	607	1,244	828	610	**3,289**
	Volume (MG)	266	436	397	403	**1,502**
2010	Activations	456	971	461	444	**2,332**
	Volume (MG)	426	435	279	435	**1,575**
2011	Activations	600	1,538	795	705	**3,638**
	Volume (MG)	1,097	2,029	319	1,152	**4,597**
2012	Activations	640	650	781	621	**2,692**
	Volume (MG)	547	196	353	328	**1,424**
2013	Activations	588	1,063	879	633	**3,163**
	Volume (MG)	471	351	666	618	**2,106**
2014	Activations	484	846	848	528	**2,706**
	Volume (MG)	273	485	196	194	**1,148**
2015	Activations	420	1042	904	768	**3,134**
	Volume (MG)	752	591	333	654	**2,310**
2016	Activations	655	946	1149	482	**3,232**
	Volume (MG)	614	271	622	313	**1,820**
2017	Activations	792	1012	706	658	**3,168**
	Volume (MG)	712	542	190	400	**1,844**
2018	Activations	634	1028	1133	650	**3,445**
	Volume (MG)	1171	521	997	634	**3,323**

On the following page, Table 3.9 provides the quarterly differences in modeled activation and volume between for 2017 and 2018.

Table 3.9 Recurring Wet Weather CSO Change from 2017 to 2018

	Approximate Change from 2017 to 2018	
Qtr.	**Activations**	**Volume (MG)**
1st	-158	459
2nd	16	-21
3rd	427	807
4th	-8	234
Total	**277**	**1,479**

Appendix G provides a quarterly wet-weather CSO volume trend that demonstrates overflow reductions that are a result of SD1's capital improvement projects and effective O&M programs.

3.5 Review of Dry Weather CSOs

Table 3.10 provides an approximate summary of the dry-weather CSOs that have occurred from 2008 to 2018.

Table 3.10 Dry Weather CSOs (2008 - 2018)

Year	Observed Total Occurrences	Approximate Total Volume (Million Gallons)
2008	15	9
2009	8	0.104
2010	5	0.264
2011	2	1.790
2012	4	0.104
2013	5	0.017
2014	3	7.309
2015	9	1.416
2016	4	1.089
2017	5	0.120
2018	2	0.029
Change from 2017 to 2018	**-3**	**-0.091**

Historical Dry Weather CSOs

Two of the three dry-weather CSOs in 2014 were unavoidable discharges related to a landslide and a barge accident, and were confirmed to be probable Force Majeure events in a letter from the Cabinet and EPA dated November 24, 2014. The combined volume of the two Force Majeure dry-weather CSOs was 7,308,000 gallons.

In 2015, SD1 experienced dry-CSOs related to debris settling in the system, following historic high river conditions in the first half of the year. Additionally, the replacement of the collapsed Riviera Drive interceptor, along Taylor Creek, in the City of Bellevue contributed to recurring dry-weather CSO issues. Detailed descriptions of the collapse, the subsequent complications, and SD1's corrective actions were provided in Quarterly Reports No. 30, No. 32 and No. 33. Of the uncharacteristically high annual total of nine dry-weather CSOs, six were directly related to the collapse of the Riviera Drive interceptor and the emergency replacement project. Many of the complications that led to the six dry-weather CSOs during the reconstruction of the interceptor were unforeseeable, such as vandalism of the bypass pumping operations and excessive debris from historic high river conditions, which may qualify for Force Majeure consideration. In 2016, two additional dry-weather CSOs were observed during the replacement of the collapsed Riviera interceptor, due to mechanical failures of the bypass pumping operation.

2018 Dry Weather CSOs

SD1 recorded only two dry-weather CSOs in 2018, which is four less than the annual average since 2008. SD1's recent improvements to its CSAP maintenance logic and its commitment to regular CSO inspections have produced the lowest annual total of dry-weather CSOs on record.

3.6 Review of O&M Activities

SD1's CSAP prioritizes which sewers in the collection systems need inspection, cleaning, and repair or rehabilitation. Regularly scheduled O&M activities for key assets in the combined sewer system ensure that sewers are kept clean and unobstructed to reduce overflows or downstream blockages at the diversion locations.

Table 3.11 demonstrates SD1's commitment to continually improve the performance of its collection systems, through regular assessment, maintenance, repair, and replacement. All 2018 totals in Table 3.11 are subject to revision, as quality control on work order records closed in December of 2018 was still being performed during the production of this report.

Table 3.11 O&M and Rehab/Replacement Activities (2008 - 2017)

	Manholes Inspected	Manholes Repaired	Manholes Replaced	New Manholes Installed[1]	Sewers Cleaned (LF)	Sewers Inspected with CCTV (LF)	Sewers Rehabilitated (LF of CIPP)[2]	Sewers Repaired and Replaced (LF)
2008	5,985	485	55	26	706,441	1,414,803	953	18,442
2009	4,688	332	59	53	530,303	1,411,818	2,251	17,658
2010	1,285	320	96	39	455,110	1,095,080	29,528	27,157
2011	1,852	656	30	50	375,303	978,484	84,717	11,392
2012	1,871	407	38	49	462,281	1,204,988	51,100	31,391
2013	1,258	314	33	35	613,968	1,523,239	59,137	12,680
2014	524	200	12	32	683,140	1,435,544	32,782	8,323
2015	0	241	20	16	409,167	1,939,187	27,786	6,347
2016	0	307	16	30	366,237	1,526,407	46,237	7,296
2017	0	231	11	22	312,667	1,007,375	64,868	8,820
2018	0	232	12	21	402,808	891,404	33,007	9,825
Total	**17,463**	**3,725**	**382**	**373**	**5,317,425**	**14,428,329**	**432,366**	**159,331**

[1] *Does not include manholes installed or lines repaired or replaced as part of CIP projects or newly acquired private development.*

[2] *SD1 entered into a cured-in-place-pipe lining contract, which accounts for increases in lineal footage rehabilitated 2010 through 2012.*

On the following page, Table 3.12 summarizes the activities that ensure that the combined sewer system performs effectively. All 2018 totals in Table 3.12 are subject to revision in future reports, as quality control on work orders closed in December of 2018 was still being performed during the production of this report.

Table 3.12 Combined Sewer System O&M Activities (2008 - 2018)

	Catch Basin Cleanings	Catch Basin Cleaning (Cubic Yards of Debris Removed)	Catch Basin Inspections[1]	New Catch Basin Installs	Catch Basins Replaced	Catch Basins Repaired	Grit Pit Cleaning (Cubic Yards of Debris Removed)
2008	1,211	N/A	2,057	0	159	128	358
2009	888	427	3,328	5	224	65	439
2010	787	469	4,070	2	140	78	355
2011	1,392	525	4,125	2	90	211	365
2012	1,431	466	3,750	7	61	38	415
2013	1,393	630	4,072	5	59	59	408
2014	544	312	2,971	1	28	45	360
2015	1,408	450	2,066	0	18	65	213
2016	834	378	0	1	10	93	324
2017	507	312	2,457	2	17	44	225
2018	143	56	889	1	13	32	89
Total	**10,538**	**4,025**	**29,785**	**26**	**819**	**858**	**3,551**

[1] *Includes catch basins owned by SD1, KYTC, municipalities, counties and private. Includes recorded inspections for full condition assessment an d post-maintenance visual inspections.*

3.7 Review of Building Backups

Table 3.13 provides a summary of the building backups reported from 2008 to 2018.

Table 3.13 Building Backups: Public System vs. Other Causes (2008 - 2018)

Backup Cause	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Public System	39	36	36	146	44	44	57	25	31	24	35
Other Causes	402	482	644	513	428	627	514	530	634	461	465
Total	**441**	**518**	**680**	**659**	**472**	**671**	**571**	**555**	**665**	**485**	**500**

The number of building backups that were determined to be related to the condition or operation of the public sewer system increased by approximately 46 percent from 2017 to 2018, but remains slightly below average from the previous six years. The 35 building

backups recorded in 2018 that were determined to be related to the public system were due to the following:

- Blockage of roots (9 backups)
- Vactor truck blew water into building (8 backups)
- Vandalism (4 backups)
- Construction (3 backups)
- Defective pipe (3 backups)
- Landslide (3 backups)
- Blockage of debris (2 backups)
- Blockage of grease (2 backups)
- Defective structure (1 backup)

The sewers where blockages occurred were put into or updated in SD1's CSAP to be inspected and cleaned, as determined by the program logic, which also provides appropriate next actions to proactively address the causes of the blockages.

All building backups are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas exist that warrant further inspection, asset rehabilitation, or capital improvements.

APPENDIX A:

Consent Decree Compliance Schedule

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	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	ASSESSED STIPULATED PENALTIES			
✓	$14,000 for 9 DWOs occuring April 18, 2009 through June 30, 2010	100%	1/9/2011	12/21/2010
✓	$22,000 for 11 DWOs occuring July 1, 2010 through June 30, 2014	100%	1/2/2015	12/8/2015
	CIVIL PENALTY			
✓	Pay Civil Penalties to EPPC and US EPA	100%	06/18/07	06/18/07
	CMOM PROGRAM REQUIREMENTS – 2007 through 2019			
✓	Submit CMOM Program Self-Assessment	100%	10/18/07	10/17/07
✓	Submit Grease Control Program	100%	10/18/07	09/17/07
✓	Submit Pump Station Backup Power Plan	100%	04/18/08	12/14/07
✓	Submit Sewer Overflow Response Plan (SORP)	100%	10/18/07	10/09/07
Submit CMOM Annual Report				
✓	CMOM Annual Report 1	100%	12/31/07	12/28/07
✓	CMOM Annual Report 2	100%	12/31/08	12/19/08
✓	CMOM Annual Report 3	100%	12/31/09	12/18/09
✓	CMOM Annual Report 4	100%	12/31/10	12/21/10
✓	CMOM Annual Report 5	100%	12/31/11	12/21/11
✓	CMOM Annual Report 6	100%	12/31/12	12/31/12
✓	CMOM Annual Report 7	100%	12/31/13	12/31/13
✓	CMOM Annual Report 8	100%	12/31/14	12/31/14
✓	CMOM Annual Report 9	100%	12/31/15	12/31/15
✓	CMOM Annual Report 10	100%	12/31/16	12/31/16
✓	CMOM Annual Report 11	100%	12/31/17	12/29/17
✓	CMOM Annual Report 12	100%	12/31/18	12/31/18
	CMOM Annual Report 13	0%	12/31/19	
Phased Grease Control Implementation				
✓	Phase 1 Tasks	100%	01/08/09	01/08/09
✓	Phase 2 Tasks	100%	01/08/10	01/08/10
✓	Phase 3 Tasks	100%	01/08/11	01/08/11
✓	Phase 4 Tasks / Full Implementation	100%	01/08/12	12/31/11
Complete Pump Station Backup Power Projects (110 Total)		100%	12/31/15	10/30/15
Complete SORP Annual Review				
✓	SORP Annual Review 1	100%	05/14/09	07/10/09
✓	SORP Annual Review 2	100%	11/10/10	10/01/10
✓	SORP Annual Review 3	100%	11/10/11	11/10/11
✓	SORP Annual Review 4	100%	11/10/12	11/10/12
✓	SORP Annual Review 5	100%	11/10/13	11/08/13
✓	SORP Annual Review 6	100%	11/10/14	11/11/14
✓	SORP Annual Review 7	100%	11/10/15	11/10/15
✓	SORP Annual Review 8	100%	11/10/16	11/08/16
✓	SORP Annual Review 9	100%	11/10/17	09/05/17
✓	SORP Annual Review 10	100%	11/10/18	11/07/18
	SORP Annual Review 11	0%	11/10/19	
	INITIAL WATERSHED PROJECTS			
✓	Complete Initial Watershed Projects (50 Total)	100%	12/31/14	06/06/12
✓	Initial Watershed Projects Annual Report 1	100%	04/18/08	04/08/08
✓	Initial Watershed Projects Annual Report 2	100%	06/07/09	06/05/09
✓	Initial Watershed Projects Annual Report 3	100%	06/07/10	06/04/10
✓	Initial Watershed Projects Annual Report 4	100%	06/07/11	06/07/11
✓	Initial Watershed Projects Annual Report 5	100%	06/07/12	06/07/12
✓	Initial Watershed Projects Annual Report 6 (Final Submission)	100%	06/07/13	06/06/13
	NMC PROGRAM REQUIREMENTS – 2007 through 2019			
✓	Submit NMC Documentation of Compliance	100%	04/18/08	03/12/08
✓	Complete Additional NMC Compliance Activities (51 Total)	100%	04/18/09	4/18/09[1]
✓	NMC Annual Compliance Report 1	100%	09/04/09	05/11/09
✓	NMC Annual Compliance Report 2	100%	09/04/10	06/04/10
✓	NMC Annual Compliance Report 3	100%	09/04/11	06/21/11
✓	NMC Annual Compliance Report 4	100%	09/04/12	07/02/12
✓	NMC Annual Compliance Report 5	100%	09/04/13	09/04/13
✓	NMC Annual Compliance Report 6	100%	09/04/14	09/04/14
✓	NMC Annual Compliance Report 7	100%	09/04/15	09/04/15
✓	NMC Annual Compliance Report 8	100%	09/04/16	09/02/16
✓	NMC Annual Compliance Report 9	100%	09/04/17	09/02/17
✓	NMC Annual Compliance Report 10	100%	09/04/18	09/04/18
	NMC Annual Compliance Report 11	0%	09/04/19	

Updated: January 30, 2019

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	PUMP STATION OVERFLOW ELIMINATION PLAN (PSOEP) – 2007 through 2019			
✓	Submit PSOEP	100%	10/18/07	09/18/07
✓	PSOEP Annual Report 1	100%	05/14/09	05/11/09
✓	PSOEP Annual Report 2	100%	05/14/10	05/14/10
✓	PSOEP Annual Report 3	100%	05/14/11	05/13/11
✓	PSOEP Annual Report 4	100%	05/14/12	05/14/12
✓	PSOEP Annual Report 5	100%	05/14/13	05/14/13
✓	PSOEP Annual Report 6	100%	05/14/14	05/13/13
✓	PSOEP Annual Report 7	100%	05/14/15	05/14/15
✓	PSOEP Annual Report 8	100%	05/14/16	05/14/16
✓	PSOEP Annual Report 9	100%	05/14/17	05/12/17
✓	PSOEP Annual Report 10	100%	05/14/18	05/14/18
	PSOEP Annual Report 11	0%	05/14/19	
	QUARTERLY REPORTING – 2007 through 2019			
✓	Submit Quarterly Report 1	100%	01/30/08	01/30/08
✓	Submit Quarterly Report 2	100%	04/30/08	04/30/08
✓	Submit Quarterly Report 3	100%	07/30/08	07/30/08
✓	Submit Quarterly Report 4	100%	10/30/08	10/30/08
✓	Submit Quarterly Report 5	100%	01/30/09	01/30/09
✓	Submit Quarterly Report 6	100%	04/30/09	04/30/09
✓	Submit Quarterly Report 7	100%	07/30/09	07/30/09
✓	Submit Quarterly Report 8	100%	10/30/09	10/30/09
✓	Submit Quarterly Report 9	100%	01/30/10	01/29/10
✓	Submit Quarterly Report 10	100%	04/30/10	04/30/10
✓	Submit Quarterly Report 11	100%	07/30/10	07/30/10
✓	Submit Quarterly Report 12	100%	10/30/10	10/29/10
✓	Submit Quarterly Report 13	100%	01/30/11	01/28/11
✓	Submit Quarterly Report 14	100%	04/30/11	04/29/11
✓	Submit Quarterly Report 15	100%	07/30/11	07/29/11
✓	Submit Quarterly Report 16	100%	10/30/11	10/28/11
✓	Submit Quarterly Report 17	100%	01/30/12	01/30/12
✓	Submit Quarterly Report 18	100%	04/30/12	04/30/12
✓	Submit Quarterly Report 19	100%	07/30/12	07/30/12
✓	Submit Quarterly Report 20	100%	10/30/12	10/30/12
✓	Submit Quarterly Report 21	100%	01/30/13	01/30/13
✓	Submit Quarterly Report 22	100%	04/30/13	04/30/13
✓	Submit Quarterly Report 23	100%	07/30/13	07/30/13
✓	Submit Quarterly Report 24	100%	10/30/13	10/30/13
✓	Submit Quarterly Report 25	100%	01/30/14	01/30/14
✓	Submit Quarterly Report 26	100%	04/30/14	04/30/14
✓	Submit Quarterly Report 27	100%	07/30/14	07/30/14
✓	Submit Quarterly Report 28	100%	10/30/14	10/30/14
✓	Submit Quarterly Report 29	100%	01/30/15	01/30/15
✓	Submit Quarterly Report 30	100%	04/30/15	04/30/15
✓	Submit Quarterly Report 31	100%	07/30/15	07/30/15
✓	Submit Quarterly Report 32	100%	10/30/15	10/30/15
✓	Submit Quarterly Report 33	100%	01/30/16	01/29/16
✓	Submit Quarterly Report 34	100%	04/30/16	04/30/16
✓	Submit Quarterly Report 35	100%	07/30/16	07/29/16
✓	Submit Quarterly Report 36	100%	10/30/16	10/30/16
✓	Submit Quarterly Report 37	100%	01/30/17	01/30/17
✓	Submit Quarterly Report 38	100%	04/30/17	04/30/17
✓	Submit Quarterly Report 39	100%	07/30/17	07/30/17
✓	Submit Quarterly Report 40	100%	10/30/17	10/30/17
✓	Submit Quarterly Report 41	100%	01/30/18	01/30/18
✓	Submit Quarterly Report 42	100%	04/30/18	04/30/18
✓	Submit Quarterly Report 43	100%	07/30/18	07/30/18
✓	Submit Quarterly Report 44	100%	10/30/18	10/30/18
✓	Submit Quarterly Report 45	100%	01/30/19	01/30/19
	Submit Quarterly Report 46	0%	04/30/19	

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	STATE ENVIRONMENTAL PROJECTS			
✓	Setup 6 Separate Escrow Accounts	100%	10/18/07	10/18/07
✓	Conservancies	100%	04/18/12	04/18/12
✓	*Boone County*	100%	04/18/12	03/26/12
✓	*Campbell County*	100%	04/18/12	02/23/12
✓	*Kenton County*	100%	04/18/12	04/17/12
✓	Licking River Watershed Watch	100%	04/18/12	09/28/11
✓	Split Rock	100%	04/18/12	12/18/08
✓	Education Programs	100%	04/18/12	08/04/11
✓	State Environmental Project Completion Report	100%	06/17/12	06/15/12
	SUPPLEMENTAL PROJECTS			
✓	Supplemental Environmental Projects	100%	04/18/12	04/12/12
✓	SEP Completion Reports	100%	06/17/12	06/15/12
	WATERSHED COMMUNITY COUNCIL			
✓	Watershed Summit	100%	N/A	08/30/07
✓	Watershed Community Council Meeting 1	100%	N/A	11/27/07
✓	Watershed Community Council Meeting 2	100%	N/A	02/26/08
✓	Watershed Community Council Meeting 3	100%	N/A	05/20/08
✓	Watershed Community Council Meeting 4	100%	N/A	08/19/08
✓	Watershed Community Council Meeting 5	100%	N/A	11/18/08
✓	Watershed Community Council Meeting 6	100%	N/A	02/17/09
✓	Watershed Community Council Meeting 7	100%	N/A	05/20/10
✓	Watershed Community Council Meeting 8	100%	N/A	11/03/10
	WATERSHED PLANS			
Framework for Developing Watershed Plans				
✓	Obtain Public Input on Framework for Watershed Plans	100%	04/09/08	04/09/08
✓	Submit Framework for Watershed Plans	100%	04/18/08	04/17/08
First Round Watershed Plans				
✓	Obtain Public Input on First Round of Watershed Plans	100%	06/27/09	06/08/09
✓	*Public Comment Period (5/7/09-6/8/09)*	100%	06/08/09	06/08/09
✓	*Boone County Public Meeting*	100%	N/A	05/14/09
✓	*Campbell County Public Meeting*	100%	N/A	05/19/09
✓	*Kenton County Public Meeting*	100%	N/A	05/21/09
✓	Submit First Round of Watershed Plans	100%	06/30/09	06/30/09
✓	Resubmit First Round of Watershed Plans	100%	03/31/11	03/31/11
✓	Resubmit First Round of Watershed Plans - Revision	100%	10/03/13	10/01/13
✓	Final Submission of First Round of Watershed Plans	100%	03/15/14	03/14/14
Second Round Watershed Plans				
	Obtain Public Input on Second Round of Watershed Plans	0%	To Be Determined[2]	
	Submit Second Round of Watershed Plans	0%	To Be Determined[2]	
Third Round Watershed Plans				
	Obtain Public Input on Third Round of Watershed Plans	0%	To Be Determined[2]	
	Submit Third Round of Watershed Plans	0%	To Be Determined[2]	
	Consent Decree Compliance			
	Consent Decree Compliance - Percentage of Term Complete	65%	12/31/25	

[1] *Project schedules for three of the 51 projects were extended beyond 4/18/2009, as described in the 2009 NMC Annual Report. The three projects were complete as of December 2009.*

[2] *Deadline is dependent on the approval date of each Watershed Plan and the execution of the Amended Consent Decree.*

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APPENDIX B:

Watershed Improvement Projects

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Initial Watershed Projects

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Status
Initial Watershed Projects				
Strawberry PS Elimination	North	2006	2005	Complete
Beechwood Outfall Sewer Replacement	North	2007	2007	Complete
Eastern Regional - Contract 1--Pond Creek Force Main and Gravity Sewer to Eastern Regional WRF	East	2008	2007	Complete
Eastern Regional - Contract 2--Kahn's Gravity Sewer and Gravity Sewer to the Pond Creek PS	East	2008	2007	Complete
US 27 at Summit Assessment	East	2008	2006	Complete
Eastern Regional - Contract 4--Alex-Licking Gravity Sewer & Force Main to Contract 1	East	2009	2008	Complete
Eastern Regional - Contract 6--Pond Creek PS	East	2008	2007	Complete
Eastern Regional - Contract 8A--Alex-Licking PS	East	2009	2009	Complete
Parkside PS Relocation	East	2008	2007	Complete
Eastern Regional Water Reclamation Facility	East	2008	2008	Complete
Highland Heights PS Study	East	2006	2006	Complete
Wilson/Waterworks Road Relief Sewer Study	East	2008	2007	Complete
Pinehill/Skyview Terrace Sewer	East	2006	2005	Complete
Eastern Regional - Contract 7--Riley Road #2 PS	East	2009	2009	Complete
Eastern Regional - Contract 3--Riley Force Main and Gravity Sewer to the ERWRF	East	2009	2010	Complete
Western Regional - KDOT - Turkeyfoot Road Force Main	West	2006	2005	Complete
Western Regional - Union Sewer (North and South)	West	2013	2008	Complete
American Sign PS Rehabilitation	West	2008	2008	Complete
Allen Fork Collection System - Phase I Improvements	West	2009	2007	Complete
Duncan Drive Assessment Project	West	2007	2006	Complete
Western Regional - Sunnybrook Sewer	West	2013	2010	Complete
Western Regional - Gunpowder Interceptor Sewer	West	2013	2010	Complete
Banklick PS Screening Facility	Central	2006	2005	Complete
Stevenson Road Relief Sewer Project Phase II	Central	2006	2006	Complete
Latonia Combined Sewer Separation	Central	2009	2007	Complete
Licking River Sewer Crossing Study	Central	2007	2007	Complete
McMillan PS Removal	Central	2006	2005	Complete
Meyer Road PS Rehabilitation	Central	2008	2008	Complete
Macke PS Rehabilitation	Central	2008	2008	Complete

Updated: January 30, 2019

Initial Watershed Projects

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Status
Initial Watershed Projects				
Richwood PS Improvements	Central	2006	2005	Complete
Patton Street Sewer Study	Central	2006	2006	Complete
South Hills Outfall	Central	2008	2007	Complete
Grit Chamber Projects	Multiple	2010	2008	Complete
Fort Wright Illicit Discharge Removal	Multiple	2007	2006	Complete
Fort Wright Sanitary Sewer Rehabilitation Phase 1	Multiple	2007	2006	Complete
Fort Wright Outfall Sewer - Phase II	Multiple	2006	2006	Complete
Dry Creek Treatment Plant - Grit Removal Modifications	Multiple	2006	2005	Complete
Large Diameter Sewer Assessment Program - Phase III	Multiple	2007	2006	Complete
Brookwood Subdivision SSES Study	Multiple	2006	2006	Complete
Southern Kenton Drainage Study	Multiple	2007	2006	Complete
Wilson Road Sewer Assessment Project	Multiple	2006	2005	Complete
Apple Drive Sewer Outfall	Multiple	2006	2006	Complete
Bluegrass Swim Club Sewer Separation	Multiple	2008	2007	Complete
Eastern Regional – Sunset Pump Station and Force Main Improvements	East	2010	2010	Complete
Western Regional Conveyance System to Western Regional WRF	West	2013	2012	Complete
Western Regional Water Reclamation Facility	West	2013	2012	Complete
Western Regional - Narrows Road Diversion PS	West	2013	2012	Complete
Western Regional - Frogtown Interceptor Sewer (from Sunnybrook Dr. to Frogtown Rd.)	West	2014	2012	Complete
Western Regional - South Fork Gunpowder Interceptor Sewer and Rosetta Sewer	West	2013	2012	Complete
Western Regional - Turkeyfoot Industrial Road Force Main	West	2013	2012	Complete
Western Regional - Richwood Sewer and Force Main	West	Removed from Initial Watershed Projects. Approved in letter from Cabinet dated May 13, 2013.		

Watershed Plan Projects: Five Year Program

System-wide Programs

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2018 to 12/31/2018	Planned Activity for 01/01/2019 to 03/31/2019
(Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)							
Priority Inflow and Infiltration Source Identification & Removal Program							
Lakeview I/I Source Identification & Removal	Central	SSES activities and I/I removal in areas where found to be cost effecitve and feasible upstream of the Lakeview Pump Station	Reduce I/I and SSOs in Lakeview PS service area	Beyond 2019	n/a	Flow Monitoring, Modeling, and Initial Design	Flow Monitoring, Modeling, and Initial Design
Licking River Siphon Source Identification and Removal	Central	SSES activities and I/I removal in areas where found to be cost effecitve and feasible upstream of the Licking River Siphon	Reduce I/I and SSOs in Licking River Siphon area	Beyond 2019	n/a	Initial Design	Initial Design
Taylor Creek Source Identification and Removal	East	SSES activities and I/I removal in areas where found to be cost effecitve and feasible in the Taylor Creek area	Reduce I/I and SSOs in Taylor Creek area	Beyond 2019	n/a	Initial Design	Initial Design
Green Programs (DRIP & GrIPP)							
Boone Woods YMCA Detention Model	North	Partnership with Northern Kentucky University Center for Applied Ecology to retrofit a detention basin on Boone Woods YMCA property	Improve Water Quality	2010	2010	Complete	
City of Covington: 12th Street Bioswale	North	Partnership with City of Covington to install street planters leading to a bioswale and rain garden along 12th Street	Reduce CSO volume	2011	2011	Complete	
City of Covington: Main Strasse Gateway Biofiltration Swale	North	Partnership with City of Covington and Transit Authority of Northern Kentucky to install biolfiltration swales on city property at the Bakewell parking lot	Reduce CSO volume	2012	2013	Complete	
Notre Dame Academy Basin Retrofit	North	Partnership with Notre Dame Academy to retrofit an existing detention basin on school property	Reduce CSO volume	2009	2009	Complete	
City of Ft. Thomas: Rossford Park Rain Garden	East	Partnership with City of Ft. Thomas to install rain gardens at Rossford Park	Improve Water Quality	2012	2012	Complete	
City of Ft. Thomas: Memorial Parkway Bioswale	East	Partnership with City of Ft. Thomas to install a bioswale at the Northern Kentucky Water District property located along Memorial Parkway.	Improve Water Quality	2010	2010	Complete	
Kenton County School District: Turkeyfoot Middle School	Central	Partnership with Kenton County School District to install rain garden at Turkeyfoot Middle School	Improve Water Quality	2010	2010	Complete	
City of Covington: Madison Ave. Rain Garden	North	Partnership with City of Covington to install two rain gardens or street planters within the right-of-way along Madison Avenue	Reduce CSO volume	2013	2013	Complete	
Kenton County Public Library: Mary Ann Morgan Branch	North	Partnership with Kenton County Library to install rain gardens and permeable pavers on site at the Mary Ann Mongan Branch	Reduce CSO volume	2013	2013	Complete	
Demonstration Projects (Pilot Projects & Innovative Technology Testing)							
St. Elizabeth Detention Basin Retrofit	North	Modification of an existing dry detention basin located on property owned by St. Elizabeth Medical Center.	Reduce CSO volume in the Willow Run Sewershed	2009	2009	Complete	
Prisoner's Lake Rainwater Harvesting	North	Construction of a small storm water pumping station and force main to capture storm water runoff from Prisoner's Lake that will be re-used in an irrigation pond for a small public golf course.	Manage storm water entering the CSS	2010	2010	Complete	
Terraced Reforestation	North	Construction of a series of vegetated, terraced berms within the I-71/75 right-of-way in the City of Covington.	Manage storm water entering the CSS	2010	2011	Complete	
Watershed Controls Pilot Projects - Regional and Decentralized Controls							
Regional Project: Banklick Regional Wetlands	Central	Constructed wetland that treats flow diverted from Banklick Creek to reduce bacteria concentrations.	Improve water quality of Banklick Creek	2011	2011	Complete	
Decentralized Control Project	Central	Storm water control measures such as wetlands, biofiltration basins, and enhanced retention serving upstream drainage areas smaller than one square mile, but typically greater than five acres	Improve water quality of local streams	Beyond 2019	n/a	Initial Design	Initial Design

Watershed Plan Projects: Five Year Program

Specific Basin Projects

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2018 to 12/31/2018	Planned Activity for 01/01/2019 to 03/31/2019
(Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)							
Van Deren Sanitary Sewer Improvements	North	Sanitary and storm sewer improvements in a 100 home area to separate common manholes and remove illicit connections and I/I	Reduce SSOs and illicit discharges in Lakeside Park	2011	2011	Complete	
Avon Drive Sanitary Sewer Improvements	North	Replacement of 570 LF of 12-inch sewer with 24-inch pipe and installation of new storm sewer	Reduce SSOs in Lakeside Park	2010	2010	Complete	
Willow Run Direct Entry Point Bar Racks	North	Installed bar racks on 10 direct entry points where open storm channels discharge into sewer system	Reduce debris entry into system, maintain capacity and reduce blockages	2009	2010	Complete	
KYTC Basin - Green Infrastructure Retrofit	North	Conversion of traditional detention basin near I-75 to provide greater detention and infiltration by modifying the outlet structure and other improvements	CSO reduction, informs future green infrastructure design	2012	2011	Complete	
Lakeview PS Pump Replacement	Central	Replaceament of 8 pumps at the Lakeview pump station along with piping and electrical improvements to provide a reliable peak capacity of 22.5 MGD	Reduce SSOs at Lakeview PS and increase PS reliability	2014	2013	Complete	
Church Street (gray, green, and watershed controls)	Central	The separation of street load on six streets, new biofiltration basin and installation of approximately 1,300 linear feet of new 72-inch sewer.	Reduce CSO frequency and volume into Banklick Creek and improve structural integrity of sewer infrastructure.	2014	Ph 1 - 2015	Ph 1 - Complete Post-Contruction Monitoring	
				2018	Ph 2 - 2018	Ph 2 - Finish Construction	Ph 2 - Post-Construction Monitoing
Vernon Lane – Public & Private Source I/I Removal	Central	Combination of private I/I removal, sewer rehabilitation in area comprising approximatley 270 homes	Eliminate Vernon Ln. SSO and improve water quality	2014	Ph 1 - 2014	Ph 1 - Complete	
				2017	Ph 2 - 2017	Ph 2 - Complete	Post-Construction Monitoring
Ash Street PS and Forcemain	East	Construction of a new approximately 7 MGD pump station in Silver Grove and new force main to the Riley Rd. Pump Station in Alexandria. Also includes new force main to redirect flow from the Silver Grove PS to the Ash St. PS	Reduce overflows from Silver Grove CSO and SSO reduction in the Highland Heights PS and Silver Grove PS service areas.	2018	n/a	In-Progress	In-Progress
Riviera Sewer Replacement	East	Replacement of approximately 2,000 LF of deteriorated 24-inch pipe in the Taylor Creek area	Reduce CSOs into Taylor Creek and address structural issues	Beyond 2019	n/a	Initial Design	Initial Design
		Replacement of approximately 350 LF of deterioriated 24-inch pipe. Upsize to 54-inch pipe.	Replace collapsed ineterceptor and provide additional capacity.	2018	2018	Complete	Complete
		Emergency repair of approximately 1,300 LF of collapsed 24-inch pipe. Upsize to 54-inch pipe.		2016	2016	Complete	Complete
Lakeside Park – Public Sewer Rehab and Private Source Removal	North	Combinbination of private I/I removal, sewer rehabilitation/replacment and manhole lining, and stormwater BMPs where feasible in Lakeside Park	Eliminate SSOs in Lakside Park	2014	Ph 1 & 2 - 2014	Ph 1 & 2- Complete	
				2017	2018	Ph 3 - Complete	
Willow Run Dynamic Control Facility	North	Construction of a dynamic weir facility at the Willow Run overflow diversion to provide in-line storage	CSO reduction using in-line storage	Beyond 2019	n/a	Initial Design	Initial Design

Other Committed Projects

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2018 to 12/31/2018	Planned Activity for 01/01/2019 to 03/31/2019
(Schedules listed in this section are subject to change based on the approval of SD1's Watershed Plans.)							
Donnemeyer Improvements, Newport Pavilion Improvements, Bellevue Relief Sewer, Wilson/Waterworks Road, Covert Run	East	Multiple sewer projects including replacement with larger 18-30 -inch diameter sewers in the Taylor Creek area. Also included private source I/I removal	Reduce CSO and SSO in Taylor Creek area and address basement flooding	2011	2011	Complete	
Dry Creek WWTP Headworks Improvements	North	Construction of a new 110 MGD headworks facility at the Dry Creek WWTP	Increase reliability and wet weather treatment cpacity at Dry Creek WWTP	2013	2013	Complete	

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Activity for 2019
CSO Reduction						
Aqua on the Levee	East	In partnership with a developer to construct a 48" separate storm outfall through the Ohio River levee in Newport. Project will provide storm water offloading opportunity for 5 acres, and extended opportunity for 19 acres of additional offloading along Saratoga St. Maximum extent of offloading opportunity with new storm outfall will be 38 acres, including Washington St.	Reduce CSO volumes at Saratoga St and Washington St CSOs approximately 4 MG in typical year with proximal separation. Extended separation will provide approximately 7.5 MG reduction in typical year. The maximum extent separation will provide more than 17 MG of CSO reduction during the typical year.	2017	2018	Complete Post-Construction Monitoring
Bromley Pump Station Capacity Increase and Mechanical & Eletrical Upgrade	North	Improve the wet well to maximize capacity and the start/stop controls for each of the pumps.	Reduce typical year CSO volume by approximately 30 MG in the typical year at multiple locations along the Ohio river and Licking River.	2022	n/a	Initial Design
Catch Basin Retrofits C480-11	Central & North	Strategically disconnect catch basins in the CSS that are tied into the collection lines, main interceptors, or the regulating diversion MHs. Reconnect the catch basins to the wet-weather CSO outfall line, effectively removing the inflows from the CSS mainlines. Retrofit all reconnected CBs with solids and floatable controls.	Partial removal of street inflows in various areas of the combined system: Kenner St (Ludlow) = 2 CBs Adams St + Eastern Ave (Covington) = 3 CBs Garrard St + Riverside Dr (Covington) = 4 CBs Greenup St + Riverside Dr (Covington) = 2 CBs Pike St + Rohmann Ave (Covington) = 4 CBs Virginia Ave + 45th St (Covington) = 2 CBs Warren St (Covington) = 3 CBs	2011	2011	Complete
Covington Detention Basins	North	In partnership with the City of Covington, construct detention basins in the low lying areas of the Peasleburg neighborhood to mitigate flooding from peak storm events.	The detention basins will provide approximately 2.5 to 3.5 MG of typical year CSO reduction in the Willow Run system.	2015	2015	Complete
Eighth St. Combined Sewer Separation (Covington)	North	Construct 2,300 LF of separate storm sewer along the 8th St. corridor, in Covington, to offload approximately 11.8 ac of public streets and private property.	Reduce SD1's sixth largest CSO at 8th St.(CSO 1420142 - KY0021466 Outfall 51) from approximately 92.8 MG to 87.4 MG in the typical year.	2022	n/a	Initial Design
Hazen Street, Ludlow Separation	North	In partnership with the City of Ludlow, replace and reconfigure CSS catch basins to improve drainage.	Consolidates CSS catch basins on Hazen St and at the entrance of River's Breeze Condominiums. Extends the initial scope of disconnection in Ludlow, beyond what was identified in Figure 8.2a of the Watershed Plans. Full disconnection will be possible with a new 42" separate storm pipe on West St.	2013	2013	Complete
Injection Wells Pilot	North, Central, East	Disconnect catch basins in portions of the CSS in Ludlow, Covington, and Bellevue for deep well injection into the alluvium, in three pilot areas.	Reduce activations and volumes at the Adella St CSO (Ludlow), E 6th St CSO (Covington), and Patchen St CSO (Bellevue)	Beyond 2019	n/a	Pilot Study - Partnership with USGS
Jacob Price Ph1	Central	Stormwater offloading from approximately 7.5 acres of Covington Housing development	Reduce CSO approximately 5.5 MG in the typical year at Robbins St and 11th St CSOs.	2014	2014	Complete
Jacob Price Ph2	Central	Additional stormwater offlaoding of 9 acres adjacent to Jacob Price Ph 1 redevelopment.	Reduce CSO by approximately 5 MG in the typical year at the 8th St, 9th St, and 10th CSOs. The 9th St and 10th St CSOs are predicted to have no typical year activity following the completion of the project.	2019	n/a	Construction

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Activity for 2019
CSO Reduction						
Park Hills Separation	North	In partnership with the City of Park Hills, replace and locally separate CSS catch basins to improve drainage. Streets improved: Alhambra Ct, Exter Dr, Coram St, Harriet St, Irishrose Ln, Old State Rd, South Arlington Rd, Jackson St.	Removes catch basins from the local CSS and redirects to a drainage ditch. The ditch drains to Willow Run CSS, further downstream. This localized separation provides opportunity to completely remove the identified street flows from the Willow Run CSS with the replacement of the Brent Spence Bridge.	2015	2015	Complete
Rivercenter Separation	North	In partnership with the City of Covington, reconfigure existing catch basins in the intersection of Rivercenter Blvd, Johnson St, and 2nd St. Approximately 7 catch basins to be disconnected from CSS and reconnected to the Main St. CSO outfall.	The disconnection of 2.5 acres of street flow provides approximately 1.1 MG reduction of typical year CSO at Russell St and Main St outfalls. Extends opportunity to disconnect additional 20 acres of private property, with the redevelopment of the IRS building.	2018	2018	Complete
State Route KY9 Realignment	Central	In partnership with KY Transportation Cabinet, offload stormwater from the existing CSS on approximately 2.5 miles of newly realigned state route KY9, along the Licking River in Newport. KYTC's proposed 36" separate storm pipe will be upsized by SD1 to 60" to accommodate additional offloading in the future. Utilizes two existing CSO outfalls and requires the construction of one new separate storm outfall through the levee.	Reduces CSO volumes in the short term at 4th St, 9th St, 10th St, and 12 St CSOs by approximately 10 MG. Maximum extent of potential separation in Newport is approximately 167 acres with the new separate storm outfall, which will provide approximately 63 MG of CSO reduction. Project also rehabilitates all intersecting sanitary assets and eliminates discovered illicit connections to the CSO outfalls.	Southern Phase 2016	Southern Phase 2016	Southern Phase Complete
				Northern Phase 2020	n/a	Northern Phase Construction
Victory Ave Storm Sewer Improvement	Central	Construct a new 15" separate storm sewer to alleviate flooding of private property in south Covington.	Allows disconnection of four existing CSS catch basins that collect approximately 0.3 acres of street runoff. Reduces combined flows tributary to the Banklick PS and offloads to the Banklick Creek.	2016	2016	Construction
Water's Edge	East	Construct a new 36" separate storm sewer and disconnect existing CSS catch basins on Taylor Ave in Bellevue. Integrate BMPs for WQ. Four phases of offloading.	Reduce CSO volumes at Taylor Ave CSO and other local CSOs by approximately 6.1 MG in the typical year with Ph 1 and 15.68 MG with Ph 4. Improves flooding issues on Taylor and Eden Avenues.	2017	2018	Complete Post-Construction Monitoring
SSO Reduction						
Burlington Sewer Reroute	West	Near the Burlington Pump Station, construct 100 linear feet of 18" gravity sewer to reroute flows from the Allen Fork Pump Station to the Burlington Pump Station.	New sewer will remove approximately 70 homes from flowing to the Allen Fork PS and pipe them directly to the Burlington PS, improving wet-weather capacity at Allen Fork PS and making pumping operations more efficient.	2017	2018	Complete Post-Construction Monitoring
Bullitsville Pump Station Intermediate Improvements	West	Install 150,000 gallons of EQ storage and structural modifications to existing pump station to allow the operation of three new pumps.	Increase firm pumping capacity to 3.0 MGD. Reduce typical year SSO by 0.11 MG at Recurring SSO 2370003.	2023	n/a	Initial Design
Elsmere Corridor	Central	In the City of Elsmere, upsize approximately 6,600 feet of existing gravity main from Covered Bridge Rd to Raintree Ct, and approximately 1,900 feet of existing gravity main west of Central Row Rd and north towards Edwards Rd.	Upsizing the sewers will eliminate approximately 3.41 MG of wet either SSO in the typical year.	2020	n/a	Final Design Construction
Lakeview Pipe Upgrades	Central	Approximately 85,000 feet of conveyance upgrades in the Lakeview sewershed, as described in Watershed Plans Section 3.3.1.d.	Addresses remaining SSOs in the Lakeview sewershed after the redirection of portions of the sewershed to Western Regional Water Reclamation Facility, Lakeview Pump Station upgrades, I/I removal, and storage.	2020	n/a	Initial Design

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Activity for 2019
SSO Reduction						
Richwood Forcemain Reroute	West	Remove Richwood PS from the Dry Creek/Lakeview PS sewershed and reroute to Western Regional Water Reclamation Facility with a new 20" force main.	Reduces SSO volume 1.58 MG in the typical year at Recurring SSOs 2300123 and 2300121.	2018	2018	Complete Post-Construction Monitoring
US 27 & AA Highway Sewer Improvements	East	Relocate, redirect, and improve capacity of Cold Spring Crossing PS, and redirect flows from the Wolpert PS away from outfall sewer along Industrial Road and the Silver Grove PS to Eastern Regional Water Reclamation Facility.	Reduce activation and volume of Recurring SSOs along industrial Road and in the vicinity of the Silver Grove PS. Reduces typical year SSO by 0.11 MG.	2022-2024	n/a	Initial Design

Pump Station Overflow Elimination Plan

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Activity for10/01/2018 to 12/31/2018	Planned Activity for 01/01/2019 to 03/31/2019
Pump Station Overflow Elimination Projects					
Alex-Licking	East	12/31/2010	2008	Complete	Complete
Allen Fork	North	12/31/2015	2014	Complete	Additional Improvements to Burlington PS and Forcemain in Intital Design
Ash Street	East	5/01/2021[1]	n/a	In-Progress	In-Progress
Crestview	East	12/31/2015	2015	Complete	Complete
Harrison Harbor	East	12/31/2010	*See PS Oveflow Elimination Annual Report May 11, 2009	Complete	Complete
Highland Acres	West	12/31/2010	2010	Complete	Complete
Kentucky Aire	West	12/31/2013	2014	Complete	Complete
Riley Road No.1	East	12/31/2010	2009	Complete	Complete
Ripple Creek	Central	12/31/2010	2010	Complete	Complete
South Hampton	West	3/31/2013	2012	Complete	Complete
South Park	North	12/31/2010	2010	Complete	Complete
Sunset	Central	12/31/2010	2010	Complete	Complete
Taylorsport	North	12/31/2010	2004	Complete	Complete
Union	West	3/31/2013	2012	Complete	Complete
Lakeview	Central	12/31/2023[2]	n/a	In-Progress	In-Progress

[1] *Force majeure request for timeline of the Ash St. PS granted in letter dated April 11, 2018 from Cabinet and USEPA, due to ongoing legal challenges delaying easement acquisitions. Anticipated completion date has been provided, but may require further adjustment due to ongoing litigation.*

[2] *Revised deadline approved by Cabinet in a letter dated May 13, 2013.*

Updated: Januray 30, 2019

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 1 Projects (4 total projects)						
Alex Licking	East	Permanent Generator	n/a	2008	2008	Complete
American Sign	West	Permanent Generator	n/a	2008	2008	Complete
Riley Road	East	Permanent Generator	n/a	2009	2009	Complete
Sunset	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2010	2010	Complete
			PS Elimination	2013	2013	Complete
CIP Title	**Basin**	**Original Proposed Solution**	**Updated Solution**	**Scheduled Completion Date**	**Actual Completion Date**	**Final Status as of October 2015**
Category 2 Projects (21 total projects)						
Kahns	East	PS Elimination	n/a	2007	2007	Complete
Meadow Hill	Central	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2012 - 2015	2010	
Riley Road No. 1	East	PS Elimination	n/a	2009	2009	Complete
Riley Road No. 2						
Riverwatch PS	North	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2012 - 2015	2008	Complete
South Park Industrial	North	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008	2008	Complete
				2012 - 2015	2010	Complete
Wedgewood Dr	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2015	2015	Complete
Willow Bend No. 2	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2013	2013	Complete
Army Reserve	East	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2013-2014	2014	Complete
Eagles Landing	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2013-2014	2014	Complete
Evergreen	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2014	2014	Complete
Lamphill	East	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2011	2011	Complete
Mill House Crossing	Central	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008	2008	Complete
				2012	2012	Complete
Ridgefield	North	PS Elimination Study	Backup Dry Prime Pump with a Diesel	Study - 2008	2008	Complete
				2014	2014	Complete
War Admiral	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2012 - 2015	2011	Complete
Blackstone	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2015	2015	Complete
Dublin Green No. 1	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2015	2012	Complete
Fowler Creek	West	PS Elimination	These stations were eliminated after the Western Regional collection system became operational.	2013	2011	Complete
Gammon Calmet	West	PS Elimination		2013	2012	Complete
Gunpowder	West	PS Elimination		2013	2012	Complete
Union	West	PS Elimination		2013	2012	Complete

Updated: January 30, 2019

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 3 Projects (24 total projects)						
Airport Exchange Ind Park	North	Permanent Generator	n/a	2009	2009	Complete
Barrs Branch	East	Permanent Generator	Portable Generator	2009	2009	Complete
Cedar Point	East	Permanent Generator	n/a	2009	2009	Complete
Bullitsville	North	Permanent Generator	n/a	2008	2008	Complete
Catalpa	Central	Permanent Generator	n/a	2009	2009	Complete
Centerplex	East	Permanent Generator	n/a	2008	2008	Complete
Hempsteade	West	Permanent Generator	Permanent Generator	2009	2009	Complete
			PS Elimination	2011	2011	Complete
Highland Heights	East	Portable Generator	n/a	2009	2009	Complete
Dublin Green No. 2	West	Permanent Generator	n/a	2009	2009	Complete
Brookwood	East	Permanent Generator	n/a	2009	2009	Complete
Ky Aire	West	Permanent Generator	Permanent Generator	2008	2007	Complete
			PS Elimination	2014	2014	Complete
Levi	West	Permanent Generator	n/a	2008	2007	Complete
Maple Ave	Central	Permanent Generator	n/a	2009	2009	Complete
Sand Run	North	Permanent Generator	n/a	2008	2008	Complete
Saturn	West	Permanent Generator	n/a	2009	2009	Complete
Second Street	Central	Permanent Generator	n/a	2009	2009	Complete
Skyport	North	Permanent Generator	n/a	2008	2008	Complete
South Hampton	West	Permanent Generator	Permanent Generator	2008	2007	Complete
			PS Elimination	2012	2012	Complete
Thornwilde	North	Permanent Generator	n/a	2008	2008	Complete
Bunning Lane	East	PS Elimination Study	Electrical hook up for portable generator	2015	2015	Complete
Kees	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2011	2011	Complete
Overlook	East	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Riverview Farms	North	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Stillwater	East	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 4 Projects (50 total projects)						
Banklick	Central	Permanent Generator	n/a	2009-2014	2009	Complete
Cedar	Central	Permanent Generator	n/a	2009-2014	2009	Complete
Fowler Ridge	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Lassing Green	West	Permanent Generator	n/a	2009-2014	2009	Complete
Leathers Rd	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Marshall Rd	Central	Permanent Generator	n/a	2009-2014	2010	Complete
Mineola Pike	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Newport Steel Mill	East	Permanent Generator	n/a	2009-2014	2009	Complete
Paul Rd	East	Permanent Generator	Portable Generator	2009-2014	2010	Complete
Rosewood Lane	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2010	Complete
Shadow Lake	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2009	Complete
Wolf Rd	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2009	Complete
Air Park West	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Arbortech	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Arborwood	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Brandtly Ridge	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Brentwood	North	Permanent Generator	Electrical hook up for portable generator	2015	2014	Complete
Brushup Lane	West	Permanent Generator	PS Elimination	2012	2012	Complete
Carlisle Ave	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Cinnamon Ridge	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Cold Spring Crossing	East	Permanent Generator	Permanent Generator	2014	2014	Complete
Cold Spring Plaza	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Darma Ct	East	Permanent Generator	Electrical hook up for portable generator	2013-2014	2014	Complete
Deer Creek No. 1	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Deer Creek No. 2	North	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Eighth Street	Central	Connect to Grid Power	Permanent Generator	2015	2015	Complete
Gerrard Ave	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete
Golf Course	Central	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Hampton Ridge	West	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Harrison Harbor	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 4 Projects (continued)						
Harvest Hill	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
ICH	Central	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
IDI	North	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Independence Station Rd	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2009-2014	2011	Complete
Jefferson Ave	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete
Jericho Rd	Central	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Jonathan	West	Permanent Generator	Electrical hook up for portable generator	2015	2015	Complete
Litton	North	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Ohio Ave	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete
Orchard Estates	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Parkside No. 2	East	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Patton Street	Central	Dual Utility Power Feed	Permanent Generator	2015	2014	Complete
Ria Vista	North	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Silver Grove	East	Permanent Generator	Permanent Generator	2015	2015	Complete
St Annes	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Sycamore	West	Permanent Generator	PS Elimination	2015	2012	Complete
Taylor Mill Rd	Central	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Wilder	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete
Wyndemere	North	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Youell Rd	West	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Solution	Scheduled Completion Date	Actual Completion Date	Final Status as of October 2015
Category 5 Projects (6 total projects)						
Keavy	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2010-2015	2010	Complete
Meadow Lane	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2010-2015	2009	Complete
Cardinal Cove	North	Permanent Generator	Permanent Generator	2015	2013	Complete
Crestview	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2015	2015	Complete
Ripple Creek	East	PS Elimination Study	PS Elimination	2010-2015	2010	Complete
Winters Lane No. 2	East	Permanent Generator	Electrical hook up for portable generator	2014	2014	Complete
CIP Title	**Basin**	**Original Proposed Solution**	**Updated Solution**	**Scheduled Completion Date**	**Actual Completion Date**	**Final Status as of October 2015**
Category 6 Projects (5 total projects)						
Enzweiller	East	Permanent Generator	n/a	2012-2015	2009	Complete
Mafred	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012-2015	2009	Complete
Ridgeway	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012-2015	2009	Complete
Richwood	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Twin Lakes	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	2014	Complete

Progress Summary	Number
2007 Complete Projects	4
2008 Complete Projects	8
2009 Complete Projects	24
2010 Complete Projects	11
2011 Complete Projects	16
2012 Complete Projects	18
2013 Complete Projects	2
2014 Complete Projects	16
2015 Complete Projects	11
Total Complete	**110**

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APPENDIX C:

Annual and Cumulative Overflow Data

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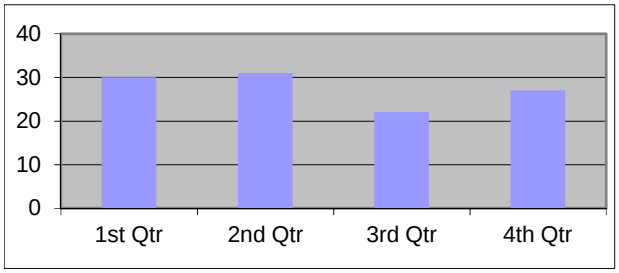
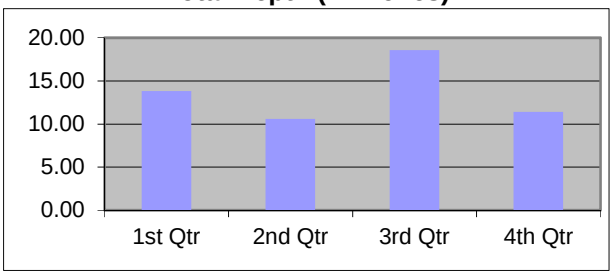
Cumulative Overflow Data
January 1, 2018 through December 31, 2018

Rainfall at CVG

Total Occurrences

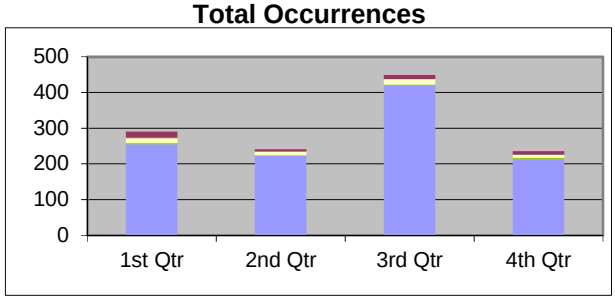


Total Depth (In Inches)

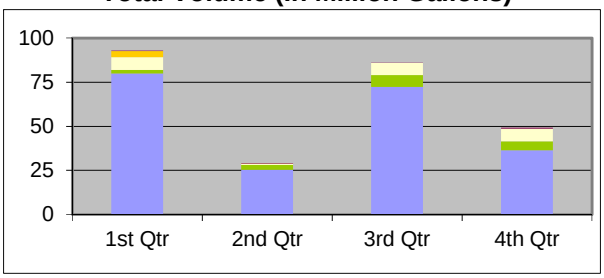


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



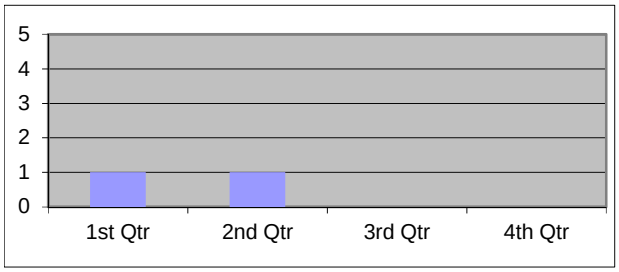
Total Volume (In Million Gallons)



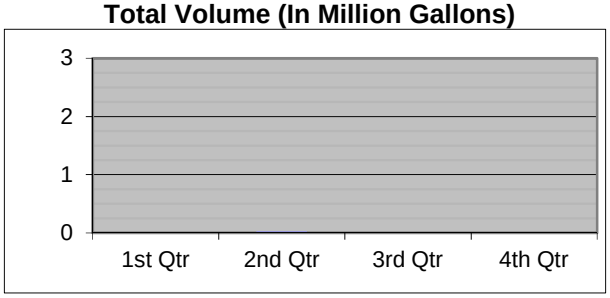
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Non-CD Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

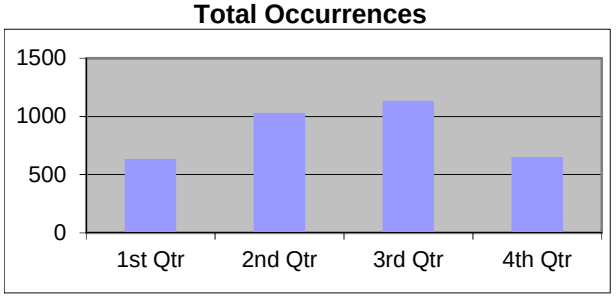


Total Volume (In Million Gallons)

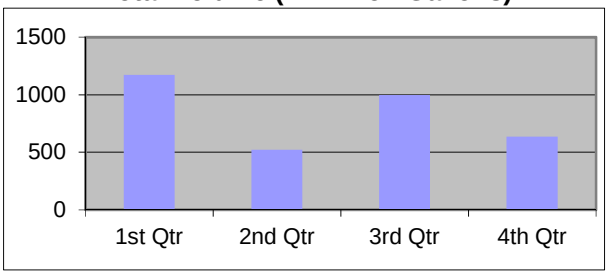


Wet Weather CSOs

Total Occurrences

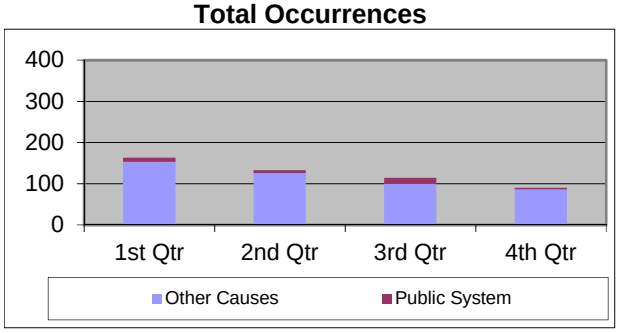


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



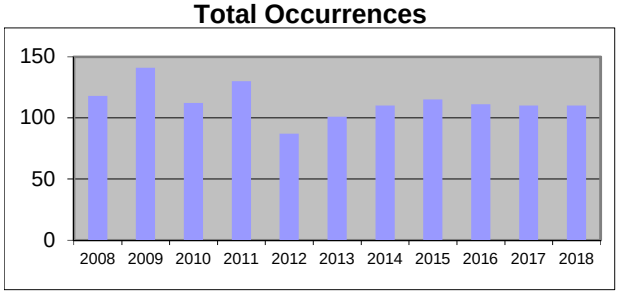
2018 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	110	54.360	inches
Recurring WW SSOs	1166	252.172	MG
Inactive WW SSOs	3	3.441	MG
Operational SSOs	46	1.476	MG
Dry Weather CSOs	2	0.029	MG
Wet Weather CSOs	3445	3321.549	MG
Building Backups (Other Causes)	465		
Building Backups (Public System)	35		

Updated: January 30, 2019

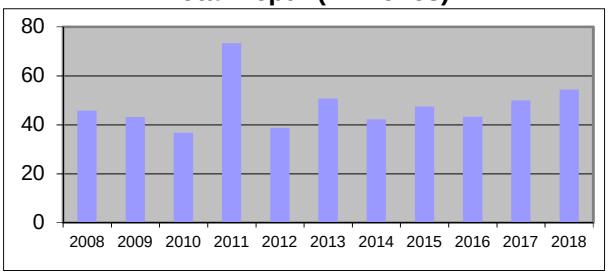
Annual Cumulative Overflow Data
2008 through 2018

Rainfall at CVG

Total Occurrences

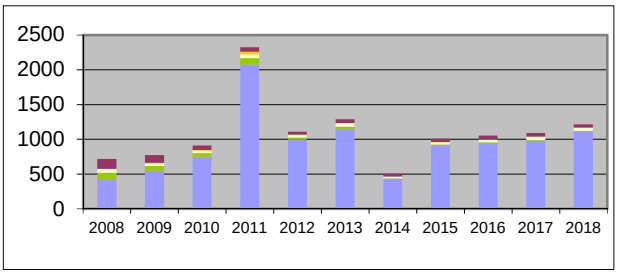


Total Depth (In Inches)

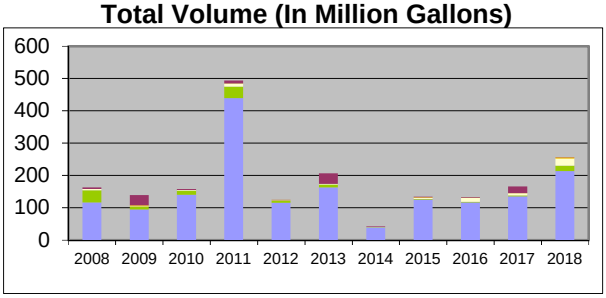


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



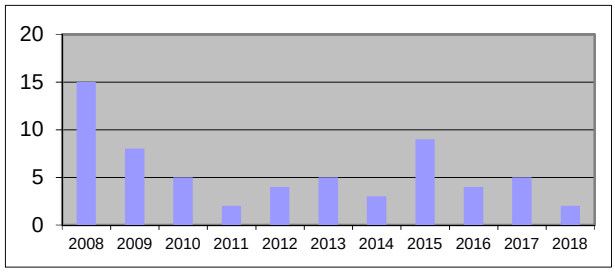
Total Volume (In Million Gallons)



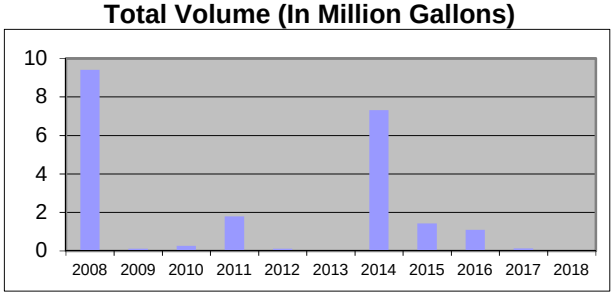
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

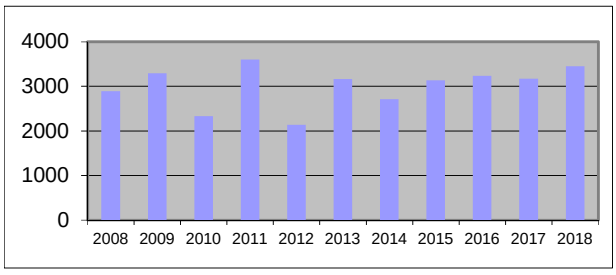


Total Volume (In Million Gallons)

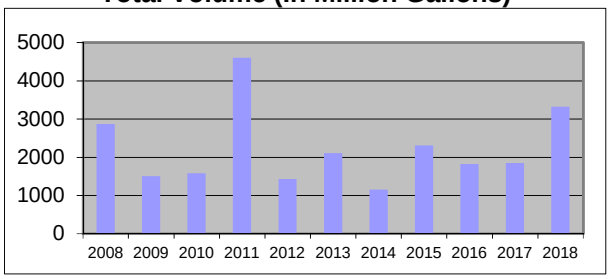


Wet Weather CSOs

Total Occurrences

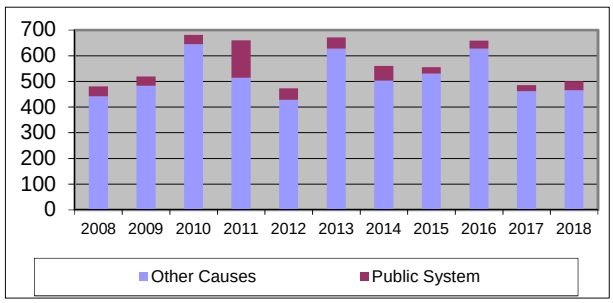


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



Change from 2017 to 2018			
	Occurrences	Volume	
Rainfall	0	4.48	inches
Recurring WW SSOs	130	107.338	MG
Inactive WW SSOs	2	3.437	MG
Operational SSOs	-9	-19.975	MG
Dry Weather CSOs	-3	-0.091	MG
Wet Weather CSOs	277	1478.22	MG
Building Backups (Other Causes)	4		
Building Backups (Public System)	11		

Updated: January 30, 2019

APPENDIX D:

Recurring Wet Weather SSOs

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Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
1	0020006	Silver Grove	Campbell	7	2.913
2	0020007	Silver Grove	Campbell	6	0.184
3	0020008	Unicorp Campbell County	Campbell	5	0.107
4	0020030	Silver Grove	Campbell	5	0.019
5	0020032	Unicorp Campbell County	Campbell	1	0.016
6	0020050	Unicorp Campbell County	Campbell	0	0.000
7	0040003	Fort Thomas	Campbell	0	0.000
8	0050022	Fort Thomas	Campbell	0	0.000
9	0060001	Unicorp Campbell County	Campbell	3	0.042
10	0060002	Unicorp Campbell County	Campbell	1	0.007
11	0060004	Unicorp Campbell County	Campbell	0	0.000
12	0070044	Highland Heights	Campbell	0	0.000
13	0110002	Fort Thomas	Campbell	0	0.000
14	0110010	Highland Heights	Campbell	6	0.433
15	0120019	Highland Heights	Campbell	0	0.000
16	0150003	Wilder	Campbell	0	0.000
17	0150005	Wilder	Campbell	0	0.000
18	0150009	Wilder	Campbell	0	0.000
19	0150063	Wilder	Campbell	2	0.003
20	0150065	Wilder	Campbell	4	0.112
21	0150086	Fort Thomas	Campbell	1	0.002
22	0150356	Southgate	Campbell	0	0.000
23	0150399	Wilder	Campbell	5	1.410
24	0200003	Fort Thomas	Campbell	0	0.000
25	0220056	Fort Thomas	Campbell	0	0.000
26	0220058	Fort Thomas	Campbell	0	0.000
27	0220086	Southgate	Campbell	0	0.000
28	0230011	Fort Thomas	Campbell	0	0.000
29	0230016	Fort Thomas	Campbell	0	0.000
30	0260002	Fort Thomas	Campbell	0	0.000
31	0270020	Fort Thomas	Campbell	0	0.000
32	0270026	Fort Thomas	Campbell	0	0.000
33	0270062	Fort Thomas	Campbell	0	0.000
34	0270103	Fort Thomas	Campbell	0	0.000
35	0280001	Fort Thomas	Campbell	0	0.000
36	0330005	Fort Thomas	Campbell	0	0.000
37	0360004	Dayton	Campbell	0	0.000
38	0380005	Fort Thomas	Campbell	0	0.000
39	0390007	Fort Thomas	Campbell	0	0.000
40	0400002	Fort Thomas	Campbell	6	0.141
41	0400017	Fort Thomas	Campbell	0	0.000
42	0400034	Fort Thomas	Campbell	0	0.000
43	0410010	Fort Thomas	Campbell	3	0.023
44	0410019	Fort Thomas	Campbell	2	0.020
45	0410036	Fort Thomas	Campbell	0	0.000
46	0430006	Newport	Campbell	5	0.094
47	0440074	Fort Thomas	Campbell	0	0.000
48	0490035	Newport	Campbell	0	0.000
49	0490039	Newport	Campbell	0	0.000
50	0490137	Newport	Campbell	0	0.000
51	0500047	Newport	Campbell	0	0.000
52	0530083	Newport	Campbell	5	0.158

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
53	0860001	Wilder	Campbell	27	15.783
54	0860003	Wilder	Campbell	0	0.000
55	0860016	Wilder	Campbell	0	0.000
56	1010002	Fort Thomas	Campbell	0	0.000
57	1010027	Fort Thomas	Campbell	0	0.000
58	1090069	Edgewood	Kenton	0	0.000
59	1110067	Erlanger	Kenton	4	0.482
60	1110161	Erlanger	Kenton	1	0.001
61	1110174	Elsmere	Kenton	1	0.002
62	1110226	Elsmere	Kenton	0	0.000
63	1210018	Erlanger	Kenton	0	0.000
64	1220016	Erlanger	Kenton	4	0.032
65	1220054	Erlanger	Kenton	5	0.169
66	1230019	Erlanger	Kenton	0	0.000
67	1240008	Erlanger	Kenton	6	0.308
68	1240012	Erlanger	Kenton	1	0.003
69	1330022	Park Hills	Kenton	0	0.000
70	1550036	Fort Mitchell	Kenton	0	0.000
71	1550053	Fort Mitchell	Kenton	3	0.020
72	1560016	Fort Mitchell	Kenton	0	0.000
73	1560074	Fort Mitchell	Kenton	0	0.000
74	1560092	Fort Mitchell	Kenton	3	0.027
75	1560121	Fort Mitchell	Kenton	0	0.000
76	1590006	Lakeside Park	Kenton	0	0.000
77	1610054	Fort Mitchell	Kenton	0	0.000
78	1690043	Fort Wright	Kenton	1	0.002
79	1690072	Fort Wright	Kenton	0	0.000
80	1700008	Covington	Kenton	0	0.000
81	1700025	Park Hills	Kenton	0	0.000
82	1730086	Unicorp Kenton County	Kenton	2	0.441
83	1730100	Crescent Springs	Kenton	0	0.000
84	1730103	Fort Mitchell	Kenton	0	0.000
85	1760047	Edgewood	Kenton	4	0.185
86	1760048	Edgewood	Kenton	4	0.060
87	1830020	Unicorp Boone County	Boone	0	0.000
88	1830067	Unicorp Boone County	Boone	0	0.000
89	1850140	Covington	Kenton	4	4.317
90	1850141	Covington	Kenton	13	0.987
91	1860108	Taylor Mill	Kenton	9	0.642
92	1870013	Covington	Kenton	0	0.000
93	1870014	Covington	Kenton	0	0.000
94	1920097	Cold Spring	Campbell	0	0.000
95	1920163	Cold Spring	Campbell	0	0.000
96	1930008	Southgate	Campbell	2	0.015
97	1940006	Fort Wright	Kenton	1	0.003
98	1940038	Fort Wright	Kenton	0	0.000
99	1940039	Fort Wright	Kenton	0	0.000
100	1940044	Fort Wright	Kenton	0	0.000
101	1950010	Fort Wright	Kenton	5	2.013
102	1950015	Fort Wright	Kenton	0	0.000
103	1950027	Fort Wright	Kenton	3	0.051
104	1950036	Fort Wright	Kenton	4	2.109

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
105	1950092	Fort Wright	Kenton	0	0.000
106	1960002	Fort Wright	Kenton	0	0.000
107	2020035	Covington	Kenton	2	0.043
108	2020203	Covington	Kenton	0	0.000
109	2090008	Elsmere	Kenton	6	0.210
110	2100002	Elsmere	Kenton	2	0.013
111	2100036	Elsmere	Kenton	0	0.000
112	2100037	Elsmere	Kenton	0	0.000
113	2100057	Elsmere	Kenton	1	0.002
114	2100081	Elsmere	Kenton	0	0.000
115	2100106	Elsmere	Kenton	4	0.051
116	2100156	Elsmere	Kenton	0	0.000
117	2110002	Elsmere	Kenton	4	0.051
118	2120001	Elsmere	Kenton	2	0.009
119	2120041	Elsmere	Kenton	0	0.000
120	2130027	Erlanger	Kenton	0	0.000
121	2160006	Fort Mitchell	Kenton	0	0.000
122	2170097	Crestview Hills	Kenton	0	0.000
123	2280010	Unicorp Kenton County	Kenton	0	0.000
124	2280011	Unicorp Kenton County	Kenton	0	0.000
125	2280023	Unicorp Kenton County	Kenton	2	0.229
126	2290001	Crescent Springs	Kenton	0	0.000
127	2300011	Erlanger	Kenton	1	0.008
128	2300121	Independence	Kenton	6	1.639
129	2300123	Unicorp Kenton County	Kenton	5	0.540
130	2301274	Erlanger	Kenton	0	0.000
131	2370003	Unicorp Boone County	Boone	2	0.262
132	2400001	Unicorp Boone County	Boone	0	0.000
			TOTAL	211	36.396

Threshold for model activation is 0.01 MGD and 0.001 MG

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APPENDIX E:

Wet Weather CSOs

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Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
1	0010220	To Be Permitted	6	0.427
2	0030031	KY0021466 - Outfall 10	3	0.020
3	0200069	KY0021466 - Outfall 11	6	0.222
4	0330100	KY0021466 - Outfall 12	0	0.000
5	0340050	KY0021466 - Outfall 14	0	0.000
6	0340051	KY0021466 - Outfall 13	5	0.031
7	0360079	To Be Permitted	4	0.139
8	0540157	To Be Permitted	11	0.122
9	0540156	To Be Permitted	10	0.151
10	0540158	To Be Permitted	0	0.000
11	0550134	To Be Permitted	0	0.000
12	0570089	KY0021466 - Outfall 16	6	9.880
13	0570090	KY0021466 - Outfall 17	1	0.014
14	0600094	KY0021466 - Outfall 18	4	0.021
15	0600096	To Be Permitted	1	0.003
16	0600097	KY0021466 - Outfall 19	7	0.694
17	0600104	To Be Permitted	0	0.000
18	0610071	KY0021466 - Outfall 21	15	7.042
19	0610072	KY0021466 - Outfall 20	3	0.021
20	0620075	KY0021466 - Outfall 23	16	1.717
21	0620077	KY0021466 - Outfall 22	0	0.000
22	0630054	To Be Permitted	0	0.000
23	0630061	KY0021466 - Outfall 83	1	0.009
24	0640090	KY0021466 - Outfall 24	24	116.769
25	0650054	To Be Permitted	0	0.000
26	0650090	KY0021466 - Outfall 26	5	0.579
27	0650098	To Be Permitted	1	0.019
28	0650100	KY0021466 - Outfall 25	0	0.000
29	0660085	To Be Permitted	3	0.009
30	0690059	To Be Permitted	0	0.000
31	0690067	To Be Permitted	6	0.051
32	0730129	To Be Permitted	17	0.438
33	0770096	KY0021466 - Outfall 28	0	0.000
34	0790084	KY0021466 - Outfall 31	57	17.824
35	0790086	KY0021466 - Outfall 29	19	32.554
36	0840111	To Be Permitted	0	0.000
37	0840112	To Be Permitted	16	1.025
38	0840116	KY0021466 - Outfall 27	21	1.244
39	0870078	KY0021466 - Outfall 33	0	0.000
40	0870079	KY0021466 - Outfall 34	21	7.544
41	0880081	KY0021466 - Outfall 36	26	10.933
42	0880082	KY0021466 - Outfall 35	0	0.000
43	0890081	To Be Permitted	0	0.000
44	0910065	KY0021466 - Outfall 38	28	89.794
45	0910066	To Be Permitted	0	0.000
46	0910068	KY0021466 - Outfall 37	14	18.077

Modeled CSO Activity: 10/1/18 - 12/31/18

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
47	0910084	To Be Permitted	1	0.017
48	0930102	KY0021466 - Outfall 43	0	0.000
49	0930103	KY0021466 - Outfall 42	1	0.002
50	0930104	KY0021466 - Outfall 40	1	0.015
51	0930105	KY0021466 - Outfall 41	23	7.402
52	0930106	KY0021466 - Outfall 39	0	0.000
53	0960063	KY0021466 - Outfall 45	9	0.930
54	0960064	KY0021466 - Outfall 44	1	0.004
55	0980073	KY0021466 - Outfall 46	3	0.015
56	0980080	KY0021466 - Outfall 47	2	0.017
57	0980081	KY0021466 - Outfall 48	22	16.253
58	1320112	To Be Permitted	0	0.000
59	1350155	KY0021466 - Outfall 49	0	0.000
60	1380132	To Be Permitted	1	0.017
61	1380146	To Be Permitted	0	0.000
62	1420141	KY0021466 - Outfall 50	1	0.012
63	1420142	KY0021466 - Outfall 51	24	47.453
64	1420144	KY0021466 - Outfall 52	1	0.006
65	1420145	KY0021466 - Outfall 53	1	0.006
66	1420146	KY0021466 - Outfall 54	0	0.000
67	1420147	KY0021466 - Outfall 55	0	0.000
68	1440204	KY0021466 - Outfall 59	1	0.020
69	1440206	KY0021466 - Outfall 61	13	0.830
70	1440207	To Be Permitted	8	0.059
71	1440209	KY0021466 - Outfall 56	32	30.278
72	1440508	KY0021466 - Outfall 60	4	0.064
73	1470089	KY0021466 - Outfall 62	0	0.000
74	1470093	KY0021466 - Outfall 63	17	18.403
75	1480185	To Be Permitted	8	0.703
76	1480187	KY0021466 - Outfall 30	25	171.313
77	1490132	KY0021466 - Outfall 65	1	0.002
78	1490172	KY0021466 - Outfall 64	0	0.000
79	1500131	KY0021466 - Outfall 66	13	3.193
80	1510244	To Be Permitted	0	0.000
81	1710114	KY0021466 - Outfall 69	0	0.000
82	1710116	KY0021466 - Outfall 68	14	1.967
83	1710119	KY0021466 - Outfall 70	8	0.809
84	1710121	KY0021466 - Outfall 71	1	0.053
85	1710124	KY0021466 - Outfall 72	1	0.054
86	1720109	KY0021466 - Outfall 73	12	4.188
87	1730259	KY0021466 - Outfall 75	6	0.264
88	1730262	To Be Permitted	0	0.000
89	1730263	KY0021466 - Outfall 74	10	0.462
90	1840130	To Be Permitted	5	0.102
91	1850158	KY0021466 - Outfall 76	8	9.443
92	1870193	KY0021466 - Outfall 78	6	0.426

Modeled CSO Activity: 10/1/18 - 12/31/18

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
93	1870194	KY0021466 - Outfall 79	0	0.000
94	1880090	KY0021466 - Outfall 81	5	1.109
95	1880091	KY0021466 - Outfall 80	4	0.227
		TOTAL	650	633.496

Threshold for model activation is 0.01 MGD and 0.001 MG

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APPENDIX F:

Quarterly Trends in Estimated Wet Weather SSO Volume and Total Rainfall during the Consent Decree

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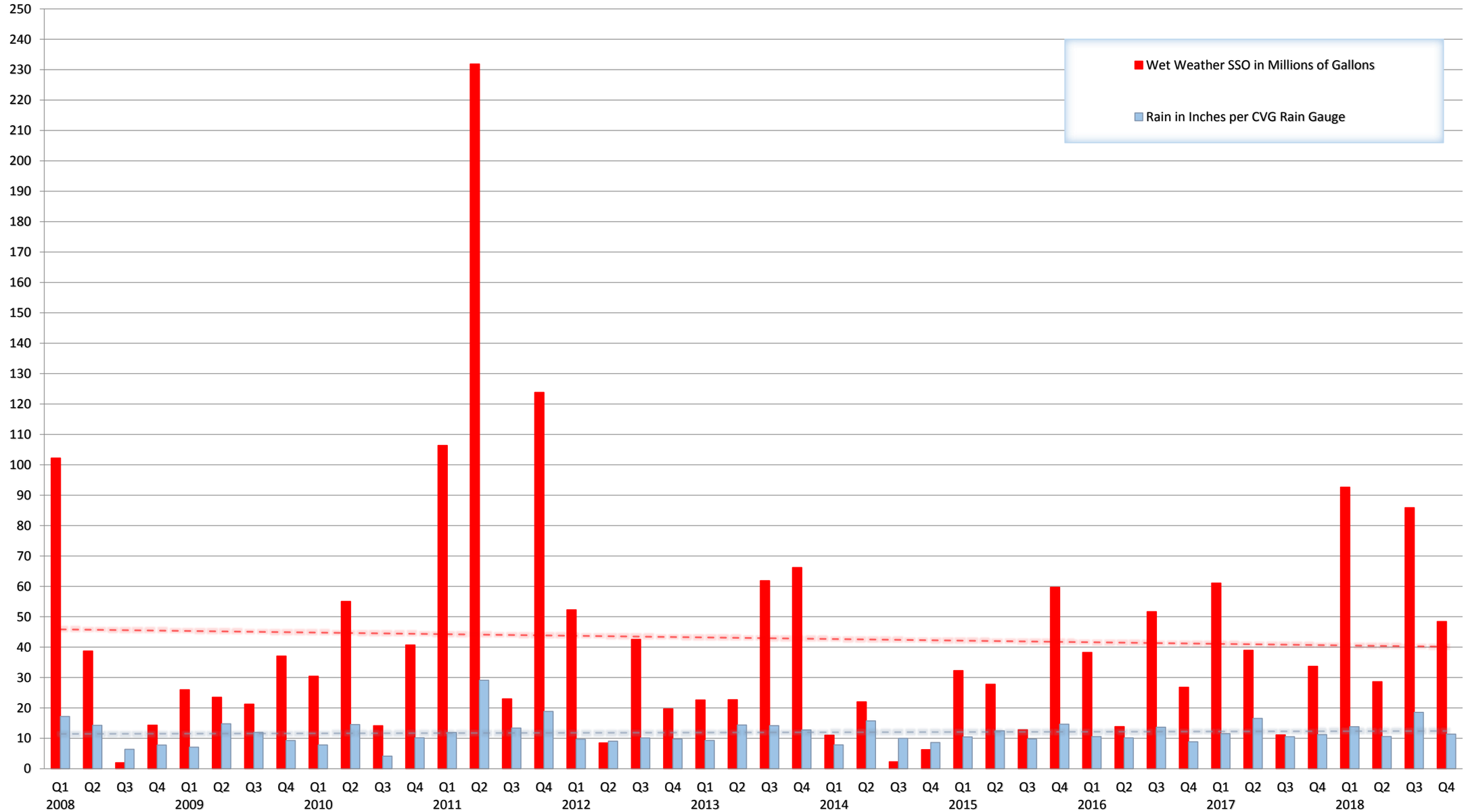
Quarterly Trends in Estimated Wet Weather SSO Volume and Total Rainfall during Consent Decree



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APPENDIX G:

Quarterly Trend in Estimated Wet Weather CSO Volume during the Consent Decree

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Quarterly Trend in Estimated Wet Weather CSO Volume during Consent Decree