SD1
Managing Northern Kentucky's
Wastewater and Storm Water

July 30, 2017

Director of the Division of Enforcement
Department for Environmental Protection
300 Fair Oaks Lane
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

Ms. Denisse Diaz, 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. 39 describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of April 1, 2017 June March 30, 2017. The report also contains an outlook for the upcoming calendar quarter period of July 1, 2017 through September 30, 2017.

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 859-547-1318 or by e-mail at bellerman@sd1.org.

Best regards,

Brian Ellerman
Acting Executive Director

BE/wck
Enclosures

Sanitation District No. 1
July 30, 2017

Consent Decree
Quarterly Report No. 39
(April 1, 2017 through June 30, 2017)

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CERTIFICATION

Consent Decree Quarterly Report No. 39
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.

Brian Ellerman
Acting Executive Director

7-28-17
Date

COMMONWEALTH OF KENTUCKY

COUNTY OF Kenton)ss.

The foregoing instrument was acknowledged before me this 28 day of July, 2017 by Brian Ellerman, Acting Executive Director of Sanitation District No. 1.

Angela M. Cook
NOTARY PUBLIC

Kenton County, Kentucky

My commission expires: 9-1-20

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CONSENT DECREE
QUARTERLY REPORT NO. 39

July 30, 2017

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

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LIST OF ACRONYMS AND ABBREVIATIONS

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
ID#	Identification Number
NWS	National Weather Service
SD1	Sanitation District No. 1
SORP	Sewer Overflow Response Plan
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, 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 April 1, 2017 through June 30, 2017. This report also contains an outlook for the upcoming calendar quarter period of July 1, 2017 through September 30, 2017.

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 subsequent 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 its Initial Watershed Projects. A request to remove a project (Western Regional – Richwood 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 EPA. SD1 submitted its final Initial Watershed Projects Annual Report on June 7, 2013.

Pump Station Operation Plan for Backup Power

As shown in Appendix B, SD1 has 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, 20 have been permanently eliminated and 107 have fully implemented backup power solutions to mitigate overflows due to 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 in the collection systems.

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 that are not a result of wet-weather capacity issues, including releases from pump stations. 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.

- *Dry-Weather CSOs*: Dry-weather discharges from the combined sewer system.

- *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 in the private service lateral or public main line. Building backups can be determined to be associated with the 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 200 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, as of January 2016, at 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 volumes estimation. 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 70 flow meters and 25 rain gauges throughout the year, which are used to continuously update and refine 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 has collected rainfall data from a series of 23 rain gauges located across the system, to simulate the wet weather that occurred between April 1, 2017 and June 30, 2017. The results of the model simulations have been summarized and included in this report as estimates of the frequency and total volume of the overflow locations within SD1's service area. These results are not a summary of observed or confirmed activations, but are a confident estimate of the overflow statistics based on the calibrated and verified models.

Precipitation Data

Rainfall statistics are an important component of overflow reporting, as rainfall conditions represent an uncontrolled variable impacting 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
(April 1, 2017 through June 30, 2017)

Month	Approximate # of Storm Events[1]	Rainfall (in)
April	11	5.16
May	11	6.21
June	10	5.19
Total	**32**	**16.56**

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

From 1951 to 2005, the average of cumulative rainfall depth at CVG for the second quarter is approximately 12.09 inches. The NWS's recorded cumulative rainfall depth for the second quarter of 2017, 16.56 inches, is approximately 37 percent more than the 50-year average. The second quarter of 2017 also produced approximately 18 percent more rain than the typical year's (1970) second quarter.

The remainder of this section reports overflows that occurred throughout SD1's service area between April 1, 2017 and March 30, 2017. Annual comparisons and a cumulative accounting of the rainfall recorded at CVG and SD1's overflows, from January 2008 through the current reporting period, 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 constructed bypasses are also included in this section. Sanitary Sewer Overflows are classified as Recurring if evidence of overflow is observed at least twice in a twelve month period. A single observation of overflow evidence at a manhole is classified as Inactive SSO, until overflow evidence is

confirmed more than once during a twelve month period. An Inactive SSO will generally be under investigation for a minimum two years. Inactive SSOs may also be suspected or predicted hydraulic model overflow points, where no visual evidence of overflow has been found in the field. All Inactive SSOs are investigated until they are confirmed to be either Recurring or Eliminated.

Recurring Wet-Weather SSOs

Modeled activation and volume statistics of SD1's 134 Recurring SSOs for the current reporting period can be found in Appendix D. The Recurring SSO list is updated annually in the first 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 revisions to the Recurring SSO list.

During the second quarter of 2017, SD1 performed approximately 302 post-wet-weather inspections at approximately 155 locations in the separate sanitary system. Overflow evidence was found with approximately 111 of the 302 post-wet-weather inspections. There were six storm events that prompted the inspections during the second quarter. The storm dates and locations of the largest recorded rainfall depths are provided below:

- April 16, 2017 – 2.34 inches in the City of Dayton
- April 28-29, 2017 – 2.54 inches in the City of Union
- May 4, 2017 – 1.51 inches in the City of Fort Thomas
- May 9, 2017 – 1.14 inches in the City of Covington
- June 18, 2017 – 1.40 inches in Boone County
- June 22-23, 2017 – 4.25 inches in Boone County

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

In addition to the 134 Recurring SSOs, there are 14 pump stations listed in the Consent Decree that have historically experienced recurring wet-weather capacity issues.

As previously described, Lakeview Pump Station is the only pump station listed in the Consent Decree that has a metered bypass to calculate overflow volumes. 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 in the last quarter.

Table 2.2 Discharges from Consent Decree Pump Stations, due to Lack of Capacity during Wet Weather
(April 1, 2017 through June 30, 2017)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Lakeview	2	257,000
Alex-Licking	0	0
Allen Fork	2	11,900
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	**4**	**268,900**

Gray shading denotes where remedial measures have been completed for Exhibit E pump stations.

Allen Fork Pump Station

SD1 documented the elimination of the Recurring SSO at the Allen Fork Pump Station, located at Manhole ID# 2390002, in Quarterly Report No. 30. The elimination of the Recurring SSO was ahead of the December 31, 2015 deadline for construction of remedial measures, provided in Exhibit E of the Consent Decree.

In the second quarter of 2017, the Allen Fork Pump Station experienced two SSOs due to lack of capacity during wet weather. The first overflow occurred on April 29, following a two-day storm that produced 2.54 inches of rain. The second overflow occurred on June 23, following a two-day storm that produced 4.25 inches of rain. SD1 did not provide initial notifications of these SSOs, because visual evidence of the spills at Manhole ID# 2390002 could not be immediately confirmed during the rain events. However, both SSOs were subsequently confirmed with SCADA data, flow monitoring, and post-wet-weather inspections.

On June 21, 2017, a local power failure faulted one of the three pumps at the Allen Fork Pump Station. Upon inspection of the pump, it was determined that the fault could not be corrected by SD1's maintenance crew. The pump was removed from service and sent to the manufacturer for repair. The Allen Fork Pump Station only had two pumps in service during the June 23 storm event that caused an overflow at Manhole ID# 2390002.

It has since been determined that it may be more cost effective to upgrade the pumps at the Allen Fork Pump Station than to repair the failed pump. SD1 is currently in the process of securing a design contract for the pump upgrades. During the design and procurement of new pumps, a temporary portable pump has been installed at the Allen Fork Pump Station to assist with peak wet-weather flows.

Additionally, SD1 will begin construction of the Burlington Reroute project in August of 2017. The project will redirect flows from more than 70 homes in the Allen Fork sewershed directly to the Burlington Pump Station, which will further improve wet-weather capacity at the Allen Fork Pump Station.

SD1 will maintain its redundant flow monitoring and post-wet-weather inspection routines during the implementation of these improvements at the Allen Fork Pump Station to ensure overflow activity is reported and classified accurately.

Recurring 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 pump stations throughout the service area for recurring wet-weather capacity issues. There are currently five pump stations not listed in the Consent Decree that have experienced recurring wet-weather capacity issues within the past two years. All five of pump stations were active in the second quarter of 2017.

The Highland Heights Pump Station has a flow meter installed in the bypass pipe to calculate discharge volumes. Discharge volumes from the other stations have been estimated using the Manning's Gravity Flow and Pipe Calculation with start/stop times provided by telemetry.

Table 2.3 provides a summary of the 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
(April 1, 2017 through June 30, 2017)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Bullitsville	1	4,700
Enzweiller	1	3,500
Highland Heights	11	2,314,700
Keavy	1	9,600
Mafred	1	5,600
TOTAL	**15**	**2,338,100**

Inactive Wet-Weather SSOs

One inactive wet-weather SSO was recorded, during the current reporting period. On June 23, 2017, following a two-day storm that produced 4.25 inches of rain, the Sand Run Pump Station discharged approximately 4,275 gallons at Manhole ID# 2400001, due to a lack of capacity. The overflow at the Sand Run Pump Station was the first since the 90,000-gallon storage tanks were installed in January of 2015. Further improvements to the Sand Run Pump Station forcemain and pumps are currently in design, with construction planned to begin in 2018.

2.2 SSOs Due to Operational Issues

This category of overflows includes discharges from SD1's sanitary sewer collection system and 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 possible.

During the current reporting period, SD1 observed 14 SSOs due to operational issues, resulting in a total estimated overflow volume of approximately 20,085,100 gallons.

On the following page, Figure 2.1 and Figure 2.2 respectively demonstrate the primary causes and estimated discharge volumes of the operational SSOs that were observed in the second quarter of 2017.

Figure 2.1 Occurrences of SSO due to Operational Issues, per Cause
(April 1, 2017 through June 30, 2017)

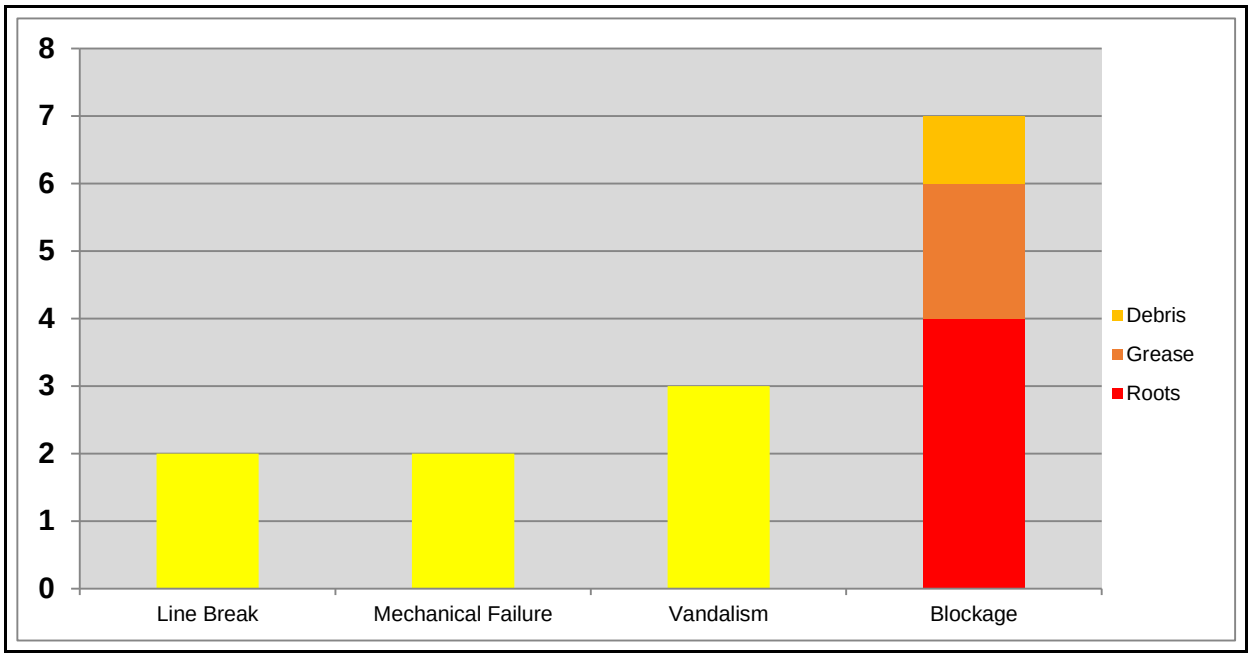
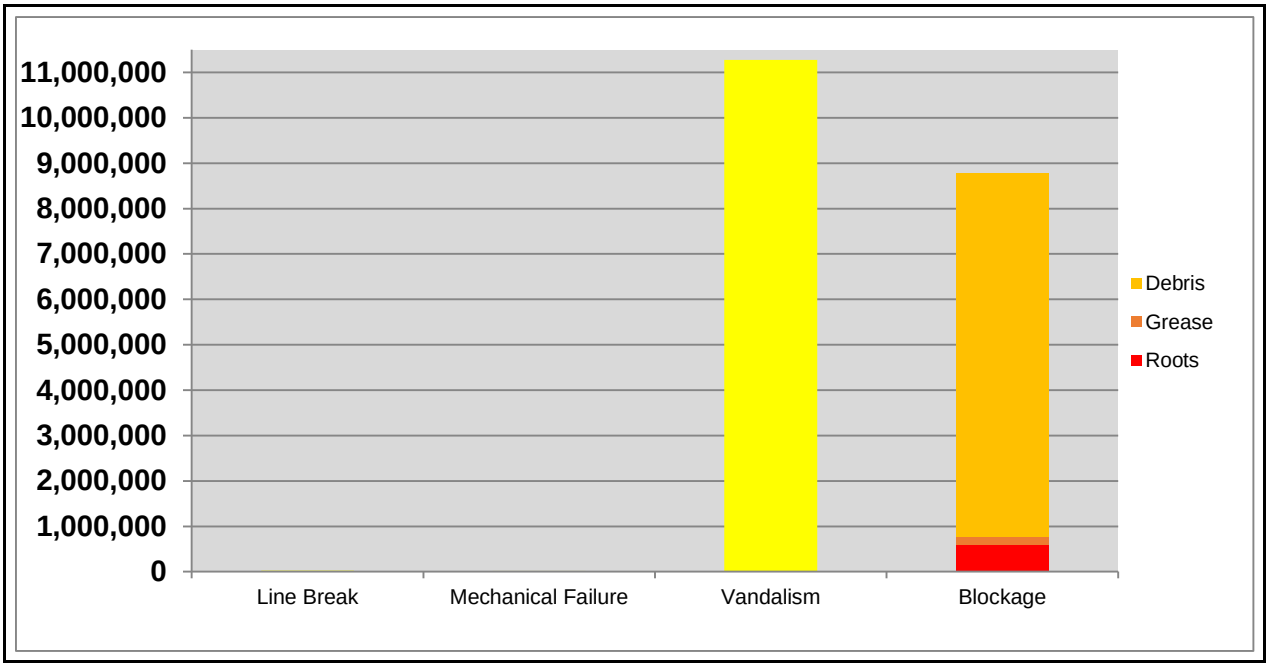


Figure 2.2 Gallons of SSO due to Operational Issues, per Cause
(April 1, 2017 through June 30, 2017)



The problems that led to these Operational SSOs were acted upon and corrected as soon as possible, in accordance with SD1's Sewer Overflow Response Plan (SORP). 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 asset failure. Observed overflow events are recorded in SD1's asset management database, 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, or improvement projects.

Vandalized Manholes in Elsmere

Three separate acts of vandalism on a 12-inch interceptor pipe in a remote location in the City of Elsmere, along the Bullock Pen Creek, spilled approximately 11,275,000 gallons of SSO. The three acts of vandalism were all committed within half of a mile of one another and were discovered on April 6, May 3, and June 19. At each of the three locations, manholes were found full of large tree limbs and rocks, which caused sewer blockages. Multiple manholes had to be excavated and replaced to remove the debris from the pipe.

To reduce the risk of vandalism in the same locations, SD1 replaced the standard manholes with watertight castings that have bolted-down lids. SD1 has also filed reports with the City of Elsmere Police Department, and is currently evaluating surveillance options along its easement.

The Kentucky Division of Water (KDOW) assisted SD1 with identifying the location of the first vandalized manhole on April 6, after SD1 reported suds and dead fish in the creek, near the Narrows Road Pump Station.

To illustrate the impact of the vandalism on Bullock Pen Creek, Figure 2.3 provides a photograph of the spill, as it was found on April 6, 2017 by KDOW.

Figure 2.3 SSO due to Vandalism
(April 6, 2017)

2.3 Wet-Weather CSOs

Included in Appendix E are the modeled activation and volume statistics of SD1's 95 CSOs, for the second quarter of 2017.

In the City of Newport, the submerged outfall of CSO 0630061 (KY0021466 – Outfall 83) beneath the riverbank has become blocked. Until the outfall can be repaired or replaced, no wet-weather CSO activation will be reported at this location. SD1's model indicates that CSO 0630061 would have activated 14 times and discharged 2.24 million gallons during the second quarter, were it not blocked. The model also indicates that as a result of the blockage, wet-weather activity will be elevated at CSO 0640090 (KY0021466 – Outfall 24) on Washington Street and CSO 0770096 (KY0021466 – Outfall 28) on Saratoga Street.

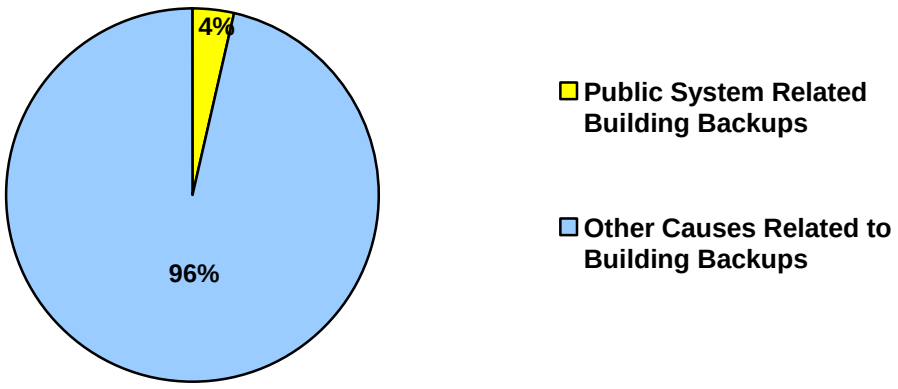
2.4 Dry-Weather CSOs

During the current reporting period, there was one dry-weather CSOs observed by SD1. On June 8, 2017, SD1 found a closed valve in Gate Structure ID# 1440149, near the Kennedy St Flood Station, in the City of Covington. The closed valve caused flows from an adjacent apartment building at 323 Kennedy Street to discharge to the To-Be Permitted CSO 1440207. It was determined that during the annual United States Army Corps of Engineers inspection of the flood control system on April 12, 2017, the valve was accidently left shut, because it has reversed threads. The total estimated dry-weather discharge volume from April 12, 2017 to June 8, 2017, per SD1's hydraulic model, is approximately 40,000 gallons.

2.5 Building Backups

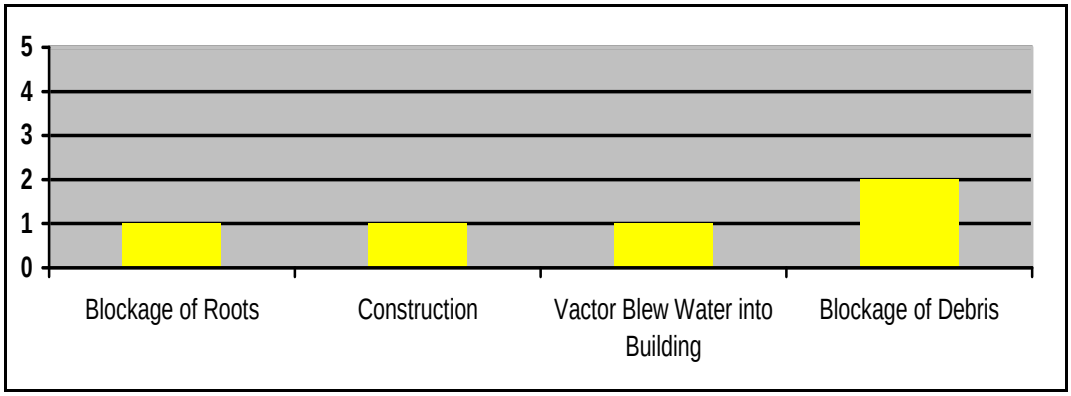
During the second quarter of 2017, there were approximately 134 building backups throughout SD1's service area. Of the 134 backups**,** approximately 5 were determined to be related to the condition or operation of the public sewers and 129 were caused by other issues, as shown in Figure 2.4. The building backups that were not related to the condition or operation of the public sewers, under normal circumstances, were caused by blockages in private service laterals and internal plumbing.

Figure 2.4 Building Backups: Public System vs. Other Causes
(April 1, 2017 through June 30, 2017)



The causes of the 5 building backups that were determined to be related to the condition or operation of the public sewer lines, under normal circumstances, are detailed in Figure 2.5.

Figure 2.5 Occurrences of Public System Related Building Backups per Cause
(April 1, 2017 through June 30, 2017)



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 that provides appropriate next actions for maintenance issues.

Building backups are recorded in SD1's asset management database, Lucity, and are periodically reviewed to identify if any trends or localized problem areas exist that warrant the need for a larger-scale inspection routine or improvement project.

APPENDIX A:

Consent Decree Compliance Schedule

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Consent Decree Compliance Schedule

	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 2017			
✓	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	0%	12/31/17	
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	0%	11/10/17	
	INITIAL WATERSHED PROJECTS			
✓	Complete Initial Watershed Projects (51 Total)	100%	12/31/14	06/06/12
Submit Initial Watershed Projects Annual Report				
✓	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 2017			
✓	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]
Submit NMC Annual Report				
✓	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	10%	09/04/17	

Updated: July 30, 2017

Consent Decree Compliance Schedule

	CONSENT DECREE ACTIVITY	PERCENT COMPLETE	DUE DATE	DATE OF COMPLETION
	PUBLIC PARTICIPATION			
✓	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
	PUMP STATION OVERFLOW ELIMINATION PLAN (PSOEP) – 2007 through 2017			
✓	Submit PSOEP	100%	10/18/07	09/18/07
Submit PSOEP Annual Report				
✓	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	0%	05/14/18	
	REPORTING – 2007 through 2017			
Submit Quarterly Report				
✓	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	0%	10/30/17	

Consent Decree Compliance Schedule

	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 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	57%	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.

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APPENDIX B:

Watershed Improvement Projects

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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 04/01/2017 to 06/30/2017	Planned Activity for 07/01/2017 to 10/30/2017
(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 2017	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 2017	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 2017	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 Post-Construction Monitoring	
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 Post-Construction Monitoring	
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 Post-Construction Monitoring	
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 2017	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 04/01/2017 to 06/30/2017	Planned Activity for 07/01/2017 to 10/30/2017
(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 Post-Construction Monitoring	
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 - n/a	Ph 2 - Construction	Ph 2 - Construction
Vernon Lane – Public & Private Source I/I Removal	Central	Combination of private I/I removal, sewer rehabilitation, manhole lining, and stormwater BMPs 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 - Finish Construction	Ph 2 - Complete and 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	Construction
Riviera Sewer Replacement	East	Replacement of approximately 2,450 LF of deteriorated 24-inch pipe in the Taylor Creek area	Reduce CSOs into Taylor Creek and address structural issues	Beyond 2018	n/a	Initial Design	Initial Design
		Replacement of approximately 350 LF of deterioriated 24-inch pipe. Upsize to 54-inch pipe.		2018	n/a	Final Design	Construction
		Emergency repair of approximately 1,300 LF of collapsed 24-inch pipe. Upsize to 54-inch pipe.	Replace collapsed ineterceptor and provide additional capacity.	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	n/a	Ph 3 - Construction	Ph 3 - Construction
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 2017	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 04/01/2017 to 06/30/2017	Planned Activity for 07/01/2017 to 10/30/2017
(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	

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: July 30, 2017

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.		

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Planned Activity for 2017
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	n/a	Permitting & Construction
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
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 2017	n/a	Aquifer characterization by USGS & Permitting
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 Ph3	Central	Additional stormwater offlaoding of 9 acres adjacent to Jacob Price Ph 1 redevelopment, including installation of BMP for WQ.	Reduce CSO by approximately 6.6 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.	Beyond 2017	n/a	Final Design and Construction
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.	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

Additional CSO and SSO Reduction Projects

Project Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Planned Activity for 2017
CSO Reduction						
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.	2016	n/a	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	Complete
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	n/a	Construction
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	n/a	Construction
Elsmere Corridor	Central	In the City of Elsmere, upsize approximately 6,600 feet of exisiting 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 1.87 MG of of wetw eather SSO in the typical year.	2020	n/a	Final Design
Lakeview Pipe Upgrades	Central	Approximately 85,000 feet of conveyance upgrades in the Lakeview sewershed, as decribed 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.	Beyond 2017	n/a	Initial Design
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 in the 2 year 6 hour event by approximately 1.4 MG, and eliminates six Recurring and Inactive SSOs.	2018	n/a	Construction
43rd St and Decoursey Ave	Central	Evaluate and improve hydraulics in existing 18" main in south Covington.	Eliminate recurring basement backups in approximately 10 homes.	Beyond 2017	n/a	Initial Design

Updated: July 30, 2017

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: 07/30/17

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**

Pump Station Overflow Elimination Plan

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Activity for 04/01/2017 to 07/30/2017	Planned Activity for 08/01/2017 to 10/30/2017
Pump Station Overflow Elimination Projects					
Alex-Licking	East	12/31/2010	2008	Complete	Complete
Allen Fork	North	12/31/2015	2014	Complete	Complete
Ash Street	East	12/31/2018[1]	n/a	In-Progress	Construction
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] *Anticipated completion date has been provided.The approved deadline for completion of the construction is two years after obtaining a cleared site certificate.*

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

Updated: July 30, 2017

APPENDIX C:

Annual and Cumulative Overflow Data

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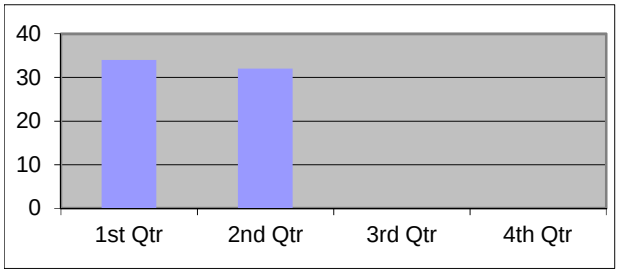
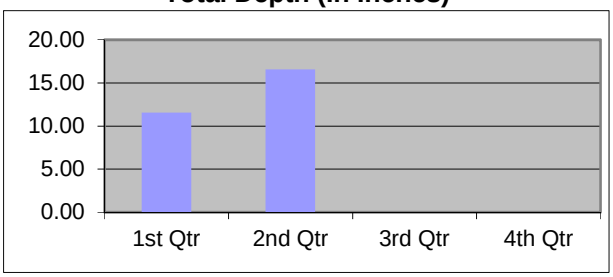
Cumulative Overflow Data
January 1, 2017 through June 30, 2017

Rainfall at CVG

Total Occurrences

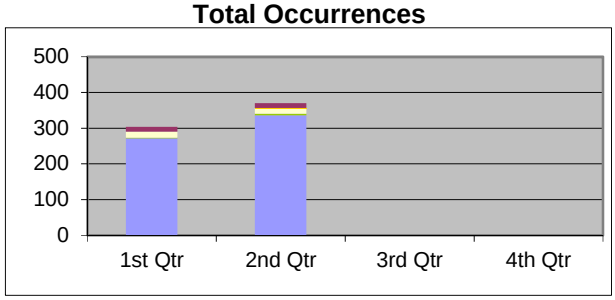


Total Depth (In Inches)

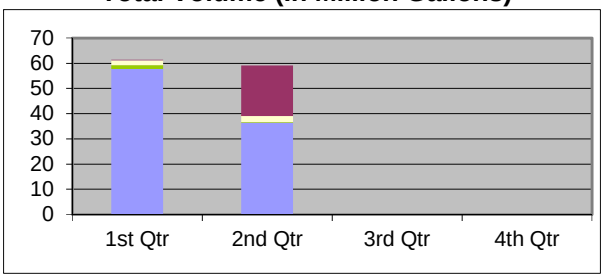


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



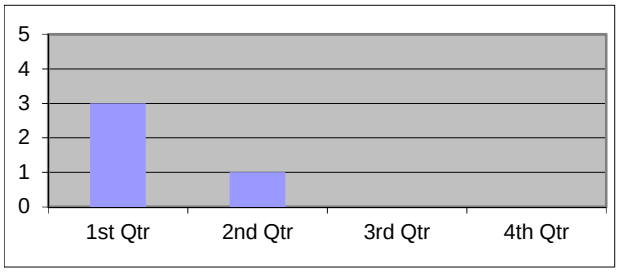
Total Volume (In Million Gallons)



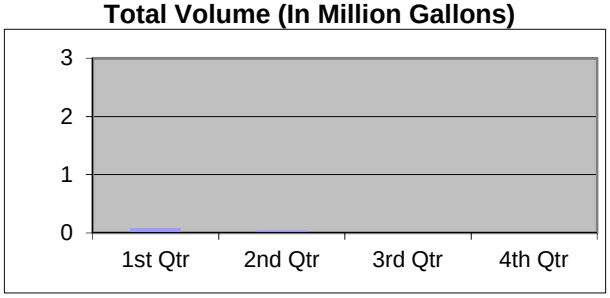
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Non-CD Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

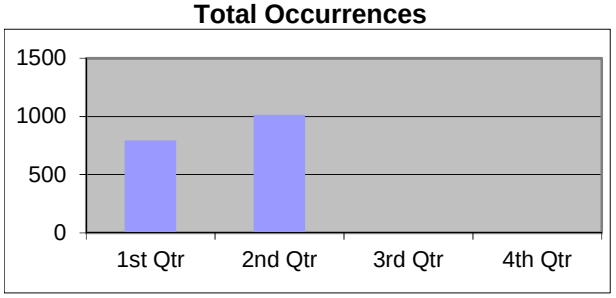


Total Volume (In Million Gallons)

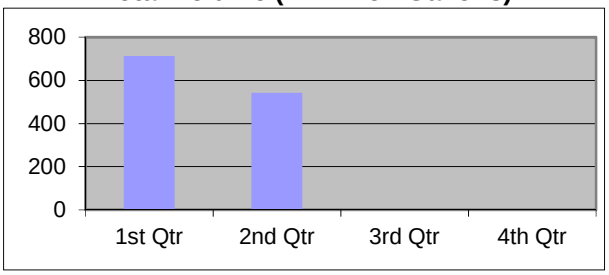


Wet Weather CSOs

Total Occurrences

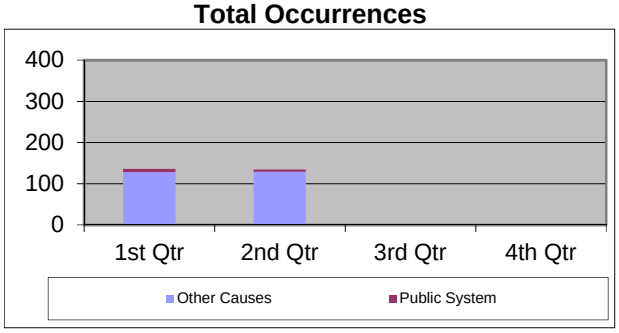


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



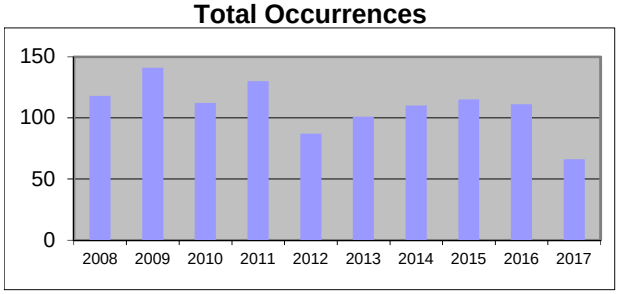
2017 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	66	28.110	inches
Recurring WW SSOs	645	100.026	MG
Inactive WW SSOs	1	0.004	MG
Operational SSOs	27	20.376	MG
Dry Weather CSOs	4	0.118	MG
Wet Weather CSOs	1804	1253.670	MG
Building Backups (Other Causes)		257	
Building Backups (Public System)		13	

Updated: July 30, 2017

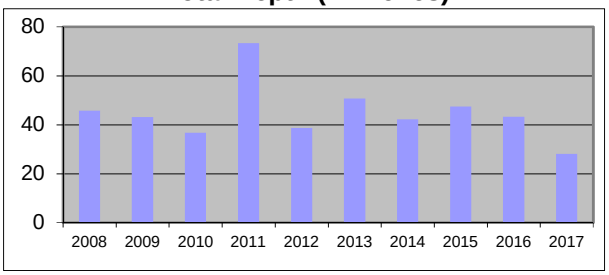
Annual Cumulative Overflow Data
2008 through 2017-Q2

Rainfall at CVG

Total Occurrences

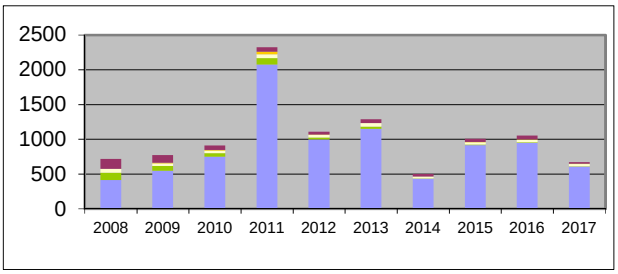


Total Depth (In Inches)

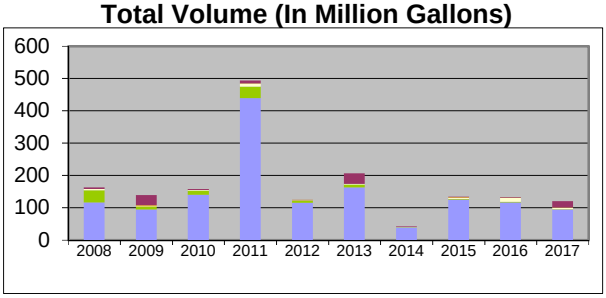


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



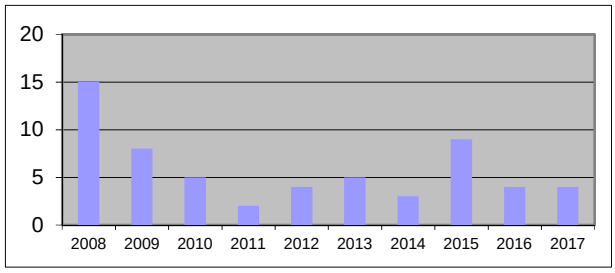
Total Volume (In Million Gallons)



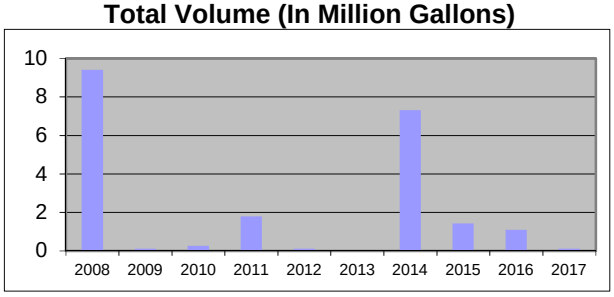
- Recurring WW SSOs
- Recurring WW CD Pump Station Overflows
- Recurring WW Other Pump Station Overflows
- Inactive WW Overflows
- SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

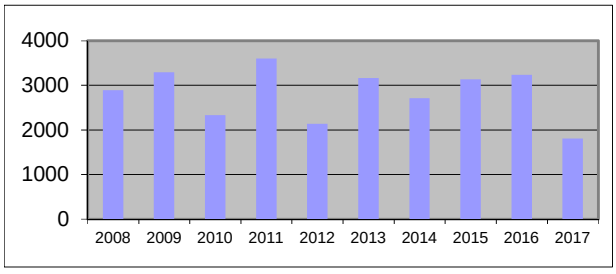


Total Volume (In Million Gallons)

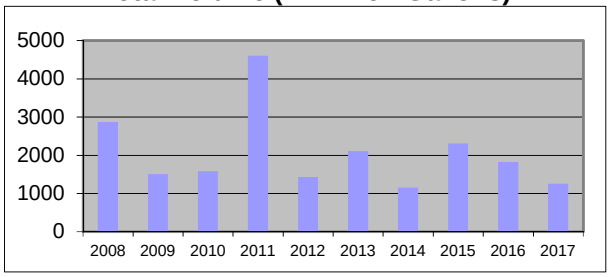


Wet Weather CSOs

Total Occurrences

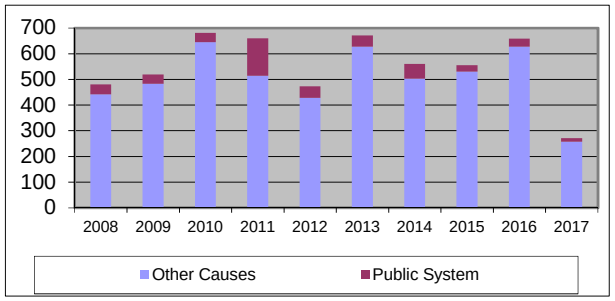


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



Change from 2016 to 2017 Q2			
	Occurrences	**Volume**	
Rainfall	-45	-15.11	inches
Recurring WW SSOs	-347	-30.549	MG
Inactive WW SSOs	-5	-0.035	MG
Operational SSOs	-29	18.521	MG
Dry Weather CSOs	0	-0.971	MG
Wet Weather CSOs	-1428	-565.64	MG
Building Backups (Other Causes)	-370		
Building Backups (Public System)	-18		

Updated: July 30, 2017

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	9	1.97
2	0020007	Silver Grove	Campbell	9	0.13
3	0020008	Unicorp Campbell County	Campbell	9	0.09
4	0020030	Silver Grove	Campbell	0	0.00
5	0020032	Unicorp Campbell County	Campbell	3	0.53
6	0020050	Unicorp Campbell County	Campbell	0	0.00
7	0040003	Fort Thomas	Campbell	4	0.15
8	0050022	Fort Thomas	Campbell	3	0.04
9	0060001	Unicorp Campbell County	Campbell	3	0.17
10	0060002	Unicorp Campbell County	Campbell	3	0.20
11	0060004	Unicorp Campbell County	Campbell	2	0.33
12	0070044	Highland Heights	Campbell	2	0.05
13	0110010	Highland Heights	Campbell	4	0.38
14	0120018	Highland Heights	Campbell	0	0.00
15	0120019	Highland Heights	Campbell	0	0.00
16	0150003	Wilder	Campbell	0	0.00
17	0150005	Wilder	Campbell	0	0.00
18	0150009	Wilder	Campbell	6	1.46
19	0150063	Wilder	Campbell	4	0.01
20	0150065	Wilder	Campbell	5	0.82
21	0150086	Fort Thomas	Campbell	4	0.40
22	0150356	Southgate	Campbell	0	0.00
23	0150399	Wilder	Campbell	7	2.11
24	0200003	Fort Thomas	Campbell	0	0.00
25	0220056	Fort Thomas	Campbell	4	0.08
26	0220058	Fort Thomas	Campbell	4	0.09
27	0230008	Fort Thomas	Campbell	0	0.00
28	0230016	Fort Thomas	Campbell	3	0.02
29	0250002	Fort Thomas	Campbell	0	0.00
30	0260002	Fort Thomas	Campbell	2	0.01
31	0270020	Fort Thomas	Campbell	0	0.00
32	0270026	Fort Thomas	Campbell	6	0.21
33	0270062	Fort Thomas	Campbell	0	0.00
34	0270103	Fort Thomas	Campbell	0	0.00
35	0280001	Fort Thomas	Campbell	3	0.02
36	0280073	Fort Thomas	Campbell	0	0.00
37	0330005	Fort Thomas	Campbell	0	0.00
38	0360004	Dayton	Campbell	0	0.00
39	0380005	Fort Thomas	Campbell	5	0.11
40	0390007	Fort Thomas	Campbell	3	0.05
41	0400002	Fort Thomas	Campbell	7	0.49
42	0400017	Fort Thomas	Campbell	1	0.00
43	0400034	Fort Thomas	Campbell	3	0.05
44	0410010	Fort Thomas	Campbell	4	0.08
45	0410019	Fort Thomas	Campbell	5	0.16
46	0410036	Fort Thomas	Campbell	1	0.00
47	0430006	Newport	Campbell	6	0.09
48	0440074	Fort Thomas	Campbell	2	0.02
49	0490035	Newport	Campbell	1	0.00
50	0490039	Newport	Campbell	1	0.01
51	0490137	Newport	Campbell	3	0.02
52	0500047	Newport	Campbell	3	0.32

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
53	0530083	Newport	Campbell	6	0.35
54	0530119	Newport	Campbell	2	0.11
55	0860001	Wilder	Campbell	28	14.10
56	0860003	Wilder	Campbell	0	0.00
57	0860016	Wilder	Campbell	0	0.00
58	1010002	Fort Thomas	Campbell	4	0.08
59	1010027	Fort Thomas	Campbell	3	0.06
60	1090069	Edgewood	Kenton	2	0.00
61	1110067	Erlanger	Kenton	2	0.07
62	1110161	Erlanger	Kenton	0	0.00
63	1110174	Elsmere	Kenton	0	0.00
64	1110226	Elsmere	Kenton	0	0.00
65	1190012	Erlanger	Kenton	2	0.10
66	1220016	Erlanger	Kenton	2	0.09
67	1220054	Erlanger	Kenton	2	0.28
68	1230019	Erlanger	Kenton	0	0.00
69	1240008	Erlanger	Kenton	5	0.08
70	1240012	Erlanger	Kenton	0	0.00
71	1330022	Park Hills	Kenton	1	0.00
72	1550036	Fort Mitchell	Kenton	0	0.00
73	1550053	Fort Mitchell	Kenton	2	0.03
74	1560016	Fort Mitchell	Kenton	1	0.02
75	1560074	Fort Mitchell	Kenton	0	0.00
76	1560092	Fort Mitchell	Kenton	4	0.11
77	1560121	Fort Mitchell	Kenton	1	0.01
78	1590006	Lakeside Park	Kenton	0	0.00
79	1690043	Fort Wright	Kenton	3	0.02
80	1690072	Fort Wright	Kenton	0	0.00
81	1700025	Park Hills	Kenton	0	0.00
82	1730086	Unicorp Kenton County	Kenton	2	0.44
83	1730100	Crescent Springs	Kenton	2	0.03
84	1730103	Fort Mitchell	Kenton	1	0.04
85	1760047	Edgewood	Kenton	3	0.19
86	1760048	Edgewood	Kenton	3	0.15
87	1790003	Crescent Springs	Kenton	1	0.01
88	1830020	Unicorp Boone County	Boone	0	0.00
89	1830067	Unicorp Boone County	Boone	1	0.00
90	1850140	Covington	Kenton	9	0.27
91	1850141	Covington	Kenton	13	0.90
92	1860108	Taylor Mill	Kenton	3	0.06
93	1870013	Covington	Kenton	0	0.00
94	1870014	Covington	Kenton	0	0.00
95	1920086	Cold Spring	Campbell	2	0.02
96	1920097	Cold Spring	Campbell	2	0.08
97	1920163	Cold Spring	Campbell	0	0.00
98	1930008	Southgate	Campbell	3	0.07
99	1930010	Southgate	Campbell	3	0.16
100	1940006	Fort Wright	Kenton	2	0.26
101	1940022	Fort Wright	Kenton	0	0.00
102	1940023	Fort Wright	Kenton	1	0.00
103	1940038	Fort Wright	Kenton	2	0.02
104	1940039	Fort Wright	Kenton	3	0.12

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
105	1940044	Fort Wright	Kenton	2	0.12
106	1950010	Fort Wright	Kenton	2	0.37
107	1950016	Fort Wright	Kenton	2	1.08
108	1950036	Fort Wright	Kenton	2	0.43
109	1950092	Fort Wright	Kenton	0	0.00
110	1990018	Covington	Kenton	2	0.59
111	2090008	Elsmere	Kenton	5	0.18
112	2100002	Elsmere	Kenton	2	0.11
113	2100036	Elsmere	Kenton	2	0.03
114	2100037	Elsmere	Kenton	1	0.00
115	2100057	Elsmere	Kenton	3	0.09
116	2100106	Elsmere	Kenton	2	0.17
117	2100128	Elsmere	Kenton	0	0.00
118	2100129	Elsmere	Kenton	12	1.22
119	2110002	Elsmere	Kenton	3	0.14
120	2110006	Elsmere	Kenton	2	0.05
121	2120001	Elsmere	Kenton	2	0.06
122	2130027	Erlanger	Kenton	0	0.00
123	2130028	Erlanger	Kenton	0	0.00
124	2160006	Fort Mitchell	Kenton	1	0.01
125	2170097	Crestview Hills	Kenton	2	0.02
126	2280010	Unicorp Kenton County	Kenton	0	0.00
127	2280023	Unicorp Kenton County	Kenton	2	0.24
128	2290001	Crescent Springs	Kenton	1	0.01
129	2300011	Erlanger	Kenton	2	0.04
130	2300019	Erlanger	Kenton	2	0.30
131	2300121	Independence	Kenton	5	1.28
132	2300123	Unicorp Kenton County	Kenton	5	0.79
133	2301274	Erlanger	Kenton	0	0.00
134	2370003	Unicorp Boone County	Boone	2	0.07
			TOTAL	336	36.35

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	10	1.04
2	0030031	KY0021466 - Outfall 10	5	0.06
3	0200069	KY0021466 - Outfall 11	13	0.44
4	0330100	KY0021466 - Outfall 12	1	0.00
5	0340050	KY0021466 - Outfall 14	7	0.31
6	0340051	KY0021466 - Outfall 13	7	0.12
7	0360079	To Be Permitted	7	1.40
8	0540157	To Be Permitted	18	0.62
9	0540156	To Be Permitted	17	0.70
10	0540158	To Be Permitted	5	0.12
11	0550134	To Be Permitted	4	0.09
12	0570089	KY0021466 - Outfall 16	6	15.72
13	0570090	KY0021466 - Outfall 17	4	3.27
14	0600094	KY0021466 - Outfall 18	13	0.61
15	0600096	To Be Permitted	11	0.24
16	0600097	KY0021466 - Outfall 19	14	2.79
17	0600104	To Be Permitted	6	0.05
18	0610071	KY0021466 - Outfall 21	16	9.18
19	0610072	KY0021466 - Outfall 20	11	0.55
20	0620075	KY0021466 - Outfall 23	19	4.42
21	0620077	KY0021466 - Outfall 22	13	0.34
22	0630054	To Be Permitted	0	0.00
23	0630061	KY0021466 - Outfall 83	0	0.00
24	0640090	KY0021466 - Outfall 24	22	62.59
25	0650054	To Be Permitted	3	0.01
26	0650090	KY0021466 - Outfall 26	10	3.55
27	0650098	To Be Permitted	7	4.90
28	0650100	KY0021466 - Outfall 25	10	0.22
29	0660085	To Be Permitted	11	0.41
30	0690059	To Be Permitted	1	0.02
31	0690067	To Be Permitted	10	0.08
32	0730129	To Be Permitted	26	1.10
33	0770096	KY0021466 - Outfall 28	17	2.75
34	0790084	KY0021466 - Outfall 31	28	6.44
35	0790086	KY0021466 - Outfall 29	22	31.28
36	0840111	To Be Permitted	4	0.61
37	0840112	To Be Permitted	20	1.09
38	0840116	KY0021466 - Outfall 27	29	3.22
39	0870078	KY0021466 - Outfall 33	6	0.46
40	0870079	KY0021466 - Outfall 34	31	5.44
41	0880081	KY0021466 - Outfall 36	21	11.41
42	0880082	KY0021466 - Outfall 35	8	0.57
43	0890081	To Be Permitted	0	0.00
44	0910065	KY0021466 - Outfall 38	23	47.13
45	0910066	To Be Permitted	0	0.00
46	0910068	KY0021466 - Outfall 37	12	14.29

Overflow Activity: 04/01/17 - 06/30/17

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
47	0910084	To Be Permitted	14	0.39
48	0930102	KY0021466 - Outfall 43	0	0.00
49	0930103	KY0021466 - Outfall 42	3	0.05
50	0930104	KY0021466 - Outfall 40	3	0.24
51	0930105	KY0021466 - Outfall 41	27	11.74
52	0930106	KY0021466 - Outfall 39	1	0.00
53	0960063	KY0021466 - Outfall 45	9	1.71
54	0960064	KY0021466 - Outfall 44	3	0.06
55	0980073	KY0021466 - Outfall 46	8	0.16
56	0980080	KY0021466 - Outfall 47	6	0.14
57	0980081	KY0021466 - Outfall 48	28	19.74
58	1320112	To Be Permitted	0	0.00
59	1350155	KY0021466 - Outfall 49	4	0.13
60	1380132	To Be Permitted	2	0.07
61	1380146	To Be Permitted	1	0.03
62	1420141	KY0021466 - Outfall 50	17	0.44
63	1420142	KY0021466 - Outfall 51	26	26.49
64	1420144	KY0021466 - Outfall 52	5	0.06
65	1420145	KY0021466 - Outfall 53	5	0.09
66	1420146	KY0021466 - Outfall 54	0	0.00
67	1420147	KY0021466 - Outfall 55	1	0.02
68	1440204	KY0021466 - Outfall 59	7	0.13
69	1440206	KY0021466 - Outfall 61	17	1.37
70	1440207	To Be Permitted	17	0.17
71	1440209	KY0021466 - Outfall 56	29	34.69
72	1440508	KY0021466 - Outfall 60	11	0.58
73	1470089	KY0021466 - Outfall 62	2	0.23
74	1470093	KY0021466 - Outfall 63	24	19.25
75	1480185	To Be Permitted	10	1.07
76	1480187	KY0021466 - Outfall 30	24	145.06
77	1490132	KY0021466 - Outfall 65	6	0.98
78	1490172	KY0021466 - Outfall 64	0	0.00
79	1500131	KY0021466 - Outfall 66	18	4.87
80	1510133	To Be Permitted	0	0.00
81	1710114	KY0021466 - Outfall 69	7	0.25
82	1710116	KY0021466 - Outfall 68	23	6.52
83	1710119	KY0021466 - Outfall 70	11	2.08
84	1710121	KY0021466 - Outfall 71	7	1.20
85	1710124	KY0021466 - Outfall 72	7	1.77
86	1720109	KY0021466 - Outfall 73	12	6.94
87	1730259	KY0021466 - Outfall 75	11	1.36
88	1730262	To Be Permitted	0	0.00
89	1730263	KY0021466 - Outfall 74	11	1.14
90	1840130	To Be Permitted	15	1.01
91	1850158	KY0021466 - Outfall 76	9	6.89
92	1870193	KY0021466 - Outfall 78	16	0.56

Overflow Activity: 04/01/17 - 06/30/17

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
93	1870194	KY0021466 - Outfall 79	8	0.18
94	1880090	KY0021466 - Outfall 81	10	1.06
95	1880091	KY0021466 - Outfall 80	9	1.23
		TOTAL	1012	541.79

Threshold for model activation is 0.01 MGD and 0.001 MG