SD1
Managing Northern Kentucky's
Wastewater and Storm Water

January 30, 2014

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

Chief, Water Program Enforcement Branch
Water Management Division
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 describes SD1's compliance with Consent Decree Case No. 2:05-cv-00199-WOB for the period of October 1, 2013 through December 31, 2013. The report also contains an outlook for the upcoming calendar quarter period of January 1, 2014 through March 31, 2014. An annual review of 2013, with comparisons to previous years, is included in the report, as well.

A certification as required by the Consent Decree is also enclosed (Consent Decree paragraph 38).

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 859-578-6762 or by e-mail at drager@sd1.org.

Best regards,

David E. Rager
Executive Director

DER/wck
Enclosures

Sanitation District No. 1
January 30, 2014

Consent Decree
Quarterly Report No. 25
(October 1, 2013 through December 31, 2013)

CERTIFICATION

Consent Decree Quarterly Report No. 25
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.

David E. Rager
Executive Director

Date 1/30/14

COMMONWEALTH OF KENTUCKY

)ss.

COUNTY OF Kenton

The foregoing instrument was acknowledged before me this ~~29~~ 30 day of January, 20 14 by David E. Rager, Executive Director of Sanitation District. No. 1.

Angela M. Cook
Notary Public
Kentucky, State at Large
Comm. Exp. 07-30-16
Notary ID 471543

NOTARY PUBLIC

Campbell County, Kentucky

My commission expires: 7-30-16

CONSENT DECREE
QUARTERLY REPORT NO. 25

January 30, 2014

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
CSO	Combined Sewer Overflow
CVG	Cincinnati-Northern Kentucky International Airport
EPA	U.S. Environmental Protection Agency
LDSAP	Large Diameter Sewer Assessment Program
PLC	Programmable Logic Controller
SD1	Sanitation District No. 1
SSO	Sanitary Sewer Overflow
WRWRF	Western Regional Water Reclamation Facility

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. This 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 October 1, 2013 through December 31, 2013. This report also contains an outlook for the upcoming calendar quarter period of January 1, 2014 through March 31, 2014.

1.3 Consent Decree Compliance Schedule

A comprehensive compliance schedule for meeting the requirements of the Consent Decree can be found in Appendix A. Additionally, 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. SD1 has also incorporated the status of the projects proposed in the first five years of the revised Integrated Watershed Plan, which was submitted on March 31, 2011, into Appendix B.

Initial Watershed Projects

As shown in Appendix B, SD1 has completed the initial watershed projects. A request to remove initial watershed project Western Regional – Richwood project C-039-00 was included in the revised Integrated Watershed Plan submitted on March 31, 2011. Approval of the request was granted in a letter dated May 13, 2013 from the Kentucky Department of Environmental Protection and the United States Environmental Protection Agency. The letter can also be found in Appendix B. SD1 submitted its final Initial Watershed Projects Annual Report on June 7, 2013.

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, 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.

- *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 or collapse 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 estimates of overflow activity:

- Field inspections are conducted after wet-weather events to identify activations and determine cleanup needs. This inspection program has been in place since 2005 and is expanded as warranted for ongoing reporting and sewer overflow response cleanup. SD1's Collection Systems - Asset Maintenance crews continue to perform routine inspections after rain events at prioritized recurring, inactive, and suspected SSO locations to understand and verify overflow activity. This is part of SD1's ongoing efforts to characterize and verify overflows throughout the collection systems, ensure they are categorized accurately, and cleaned up after rain events. Proper characterization of the overflows ensures that the hydraulic models that SD1 utilizes are maintained and improved upon, which will help identify the most appropriate and effective solutions.

- Simple hydraulic estimating with the Manning's Gravity Flow and Pipe Calculation is used to report overflows from pump stations with constructed bypasses, and industry standard volume estimation techniques and calculations are used for spills or any witnessed overflows from a manhole. The only exception to this calculation methodology is at the Lakeview Pump Station, which has a metered bypass pipe. This method has been used historically for reporting purposes, and its results are included in this Quarterly Report.

- SD1's collection systems 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 separate sewer systems, that was utilized to update the calibration and validation of the 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. In addition to the use of the models for planning future capital improvements, the models are also being used to provide information about the current performance of SD1's system. Based on the results of the model calibration and verification, SD1 has developed a highly calibrated hydraulic model that provides an accurate representation of the sewer system. This tool allows SD1 to have confidence in the results of the overflow volumes from the sewer system and to provide estimates of the overflow locations within the system for quarterly reporting purposes. In addition, the model is updated on a quarterly and annual basis to incorporate the latest data gathered from ongoing SSO inspections and characterization, targeted flow monitoring, sewer inspections, GPS surveys, discovered infrastructure, and record drawings of completed capital projects and private developments. This process ensures that the model is kept up-to-date and accurately reflects the current state of the collection system. This approach is consistent with SD1's commitment to provide the best available information on overflow activity within these reports.

For this submittal, SD1 has collected rainfall data from a series of 21 rain gauges located across the system to simulate the rainfall that occurred between October 1, 2013 and December 31, 2013 within the hydraulic models. 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 system for this period. For the modeled locations, 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 model.

SD1 actively realigns and optimizes field and modeling activities on a continual basis through regular inspections and flow monitoring, in order to verify model simulations against actual field conditions. This ensures the continual improvement of modeling accuracy and precision. Field verifications improve model predictions by correcting and minimizing discrepancies found with observed conditions. The ongoing refinement and

calibration of SD1's modeling tools provide accurate estimations of overflow location, activity, and volume. The frequent inspection and flow monitoring processes are also used to calibrate and update the model to reflect capital improvements to SD1's collection system.

Modeled overflow activity reported in this submittal incorporates the current system improvements, including the Western Regional Conveyance System and the Western Regional Water Reclamation Facility. The Kentucky Aire Pump Station elimination was completed in December of 2013, however the modeled overflow statistics will not reflect this improvement until Consent Decree Quarterly Report No. 26, due on April 30, 2014.

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 will constantly vary over time, with or without system improvements, due to natural variations in rainfall patterns and the associated groundwater 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 the previous quarter also requires careful review of the rainfall associated with each quarter, in order to understand the relative impact of 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.

Table 2.1 Summary of Storm Events
(October 1, 2013 through December 31, 2013)

Month	Approximate # of Storm Events[1]	Rainfall (in)
October	10	5.65
November	7	2.20
December	10	4.91
Total	**27**	**12.76**

[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 rainfall volume from 1951 through 2005 at CVG is approximately 9.2 inches. For further comparison, the typical year (1970) used for

system characterization is approximately 8.1 inches of rainfall during the fourth quarter. SD1's recorded volume of rainfall for the fourth quarter of 2013, 12.76 inches, is approximately 39 percent greater than the historical 50-year average and 58 percent greater than the typical year.

The remainder of this section reports overflows that occurred throughout SD1's service area during the period of October 1, 2013 through December 31, 2013. A cumulative accounting of SD1's overflow activity from January 2008 through the current reporting period and an annual comparison of the 2008 through 2013 overflow activity can be found in Appendix C.

2.1 SSOs Due to Wet Weather Capacity Issues

As previously described, this category includes recurring and inactive overflows from SD1's sanitary sewer system due to lack of capacity during wet weather. This 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 have been observed to overflow 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.

Recurring Wet-Weather SSOs

Modeled activation and volume statistics for SD1's 179 recurring wet-weather SSO locations (for the current reporting period) can be found in Appendix D. Updates to the locations of SD1's recurring wet-weather SSOs are reported on an annual basis to include any revisions based upon the field inspection and hydraulic modeling programs. The updates are included in the first quarterly report of every year. Therefore, any revisions to the current recurring wet-weather SSO list will be published in Consent Decree Quarterly Report No. 26, due on April 30, 2014.

Recurring Pump Station Overflows

In addition to the 179 recurring wet weather SSOs, there are also 14 pump stations identified in the Consent Decree that have historically documented recurring wet-weather capacity issues. Table 2.2 lists each of the 14 pump stations identified in

Exhibit E of the Consent Decree, and demonstrates their wet-weather SSO occurrences during the current reporting period.

Three of the 14 pump stations listed in the Consent Decree discharged a total of 8 times in the current reporting period, due to the lack of capacity during wet weather. An estimated total overflow volume of 2,676,400 gallons was discharged during the 8 occurrences.

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Table 2.2 Discharges from Consent Decree Pump Stations Due to Lack of Capacity during Wet Weather
(October 1, 2013 through December 31, 2013)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Allen-Fork	0	0
Crestview	4	15,950
Kentucky Aire	1	1,450
Lakeview	3	2,659,000
Alex-Licking	0	0
Harrison Harbor	0	0
Highland Acres	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	**8**	**2,676,400**

Gray denotes where required improvements have been made to pump stations.

As previously mentioned, SD1 uses the Manning's Gravity Flow and Pipe Calculation to estimate discharged volumes from pump stations. The only exception to this calculation methodology is at the Lakeview Pump Station, which has a metered bypass pipe.

On November 17, 2013, Lakeview Pump Station discharged an estimated volume of 1,045,100 gallons that was due to a combination of lack of capacity during wet weather and equipment malfunction. During a storm that produced 1.4 inches of rain in approximately 12 hours, the programmable logic controller (PLC) failed to activate one of four sets of pumps. The PLC was manually overridden to activate the pump

set. The error in the PLC was immediately reviewed and corrected to avoid future equipment malfunctions of this nature. For this incident, the total overflow volume metered at the bypass was spilt between lack of capacity during wet weather and equipment malfunction. SD1's hydraulic model was used to determine the approximate volume of overflow due to lack of capacity during wet weather as 470,000 gallons; this volume is included in Table 2.2. The remaining 575,100 gallons calculated at the bypass meter is accounted for as an equipment malfunction in Section 2.2 SSOs Due to Operational Issues.

Pump Stations Not Listed in Consent Decree for Lack of Capacity during Wet Weather

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. During the current reporting period, five pump stations not listed in the Consent Decree experienced capacity issues during wet weather. Table 2.3 lists each pump station, and demonstrates the wet-weather SSO occurrences for the fourth quarter of 2013...

Table 2.3 Discharges from Pump Stations Not Listed in the Consent Decree Due to Lack of Capacity during Wet Weather
(October 1, 2013 through December 31, 2013)

Name of Pump Station	Number of Wet-Weather Related Discharge Occurrences	Total Estimated Volume (gallons)
Enzweiler	2	6,330
Highland Heights	8	992,400
Keavy	1	2,160
Mafred	3	16,620
Sunset	1	7,950
TOTAL	**15**	**1,025,460**

Inactive Wet Weather SSOs

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

2.2 SSOs Due to Operational Issues

As previously mentioned, this category of overflows includes discharges from SD1's sanitary sewer system that are not a result of wet-weather capacity issues. Many of

these are one-time, dry-weather occurrences caused by temporary system issues or mechanical failures that are investigated and corrected as soon as possible.

During the current reporting period, there were a total of 12 SSOs due to operational issues throughout SD1's service area with a total estimated overflow volume of 685,200 gallons. Figure 2.1 demonstrates the primary causes of the overflows and Figure 2.2 demonstrates the corresponding volumes.

Figure 2.1 Occurrences of SSO Due to Operational Issues per Cause
(October 1, 2013 through December 31, 2013)

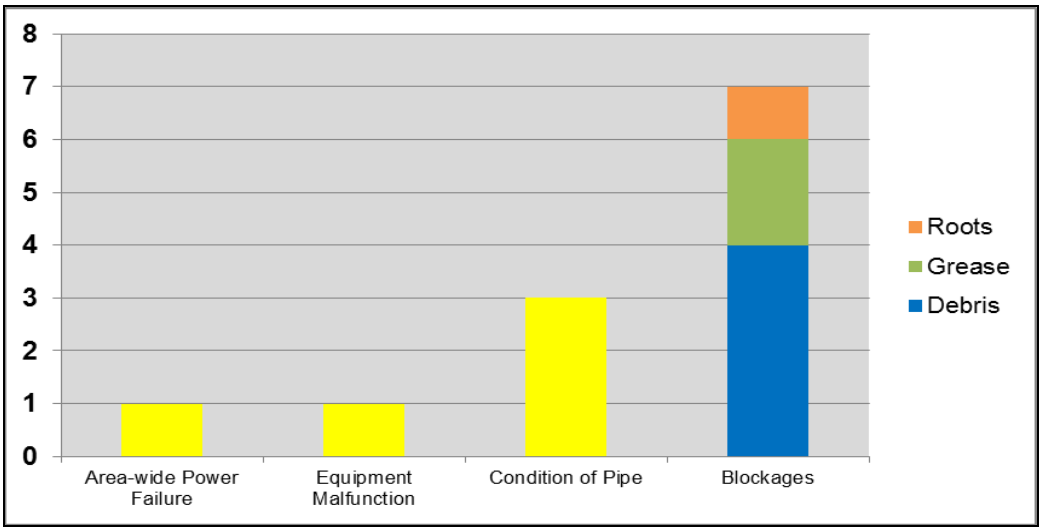
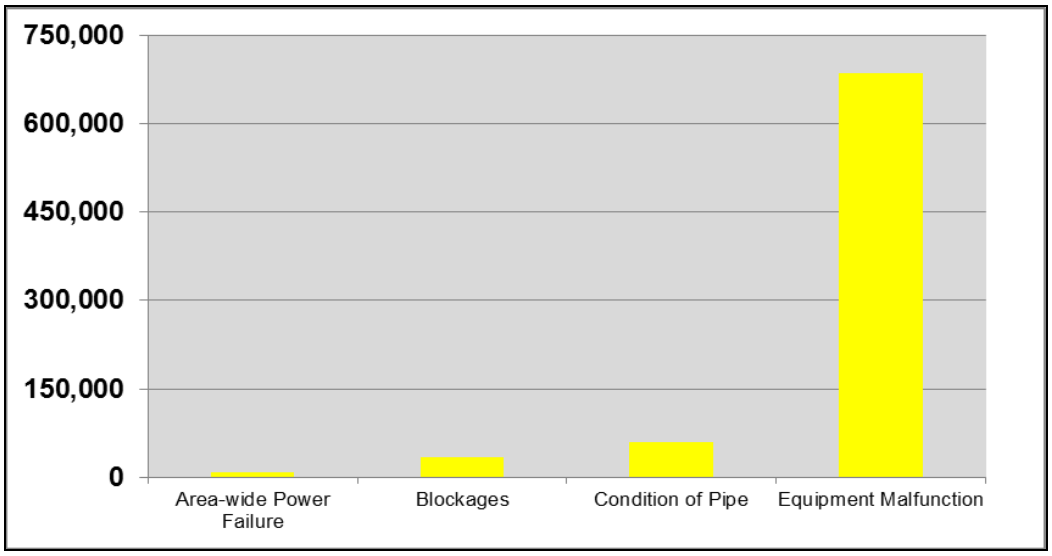


Figure 2.2 Gallons of SSO Due to Operational Issues per Cause
(October 1, 2013 through December 31, 2013)



These SSOs were immediately acted upon and the problems repaired. The sewers where blockages occurred were put into 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 cause of the blockages.

The Twin Lakes Pump Station, which was impacted by the area-wide power failure, is scheduled to receive a permanent backup pump in 2014, as indicated in the Pump Station Backup Power Plan in Appendix B.

All overflow events are recorded in Lucity and are periodically reviewed to identify if any trends or localized problem areas (such as past overflows or proximity to recurring SSOs) exist that warrant the need for a larger-scale inspection or rehabilitation project.

2.3 Wet Weather CSOs

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

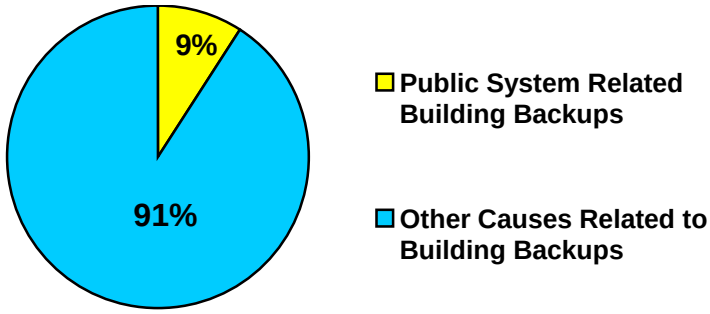
2.4 Dry Weather CSOs

During the current reporting period, there were no observed dry-weather discharges from the combined system.

2.5 Building Backups

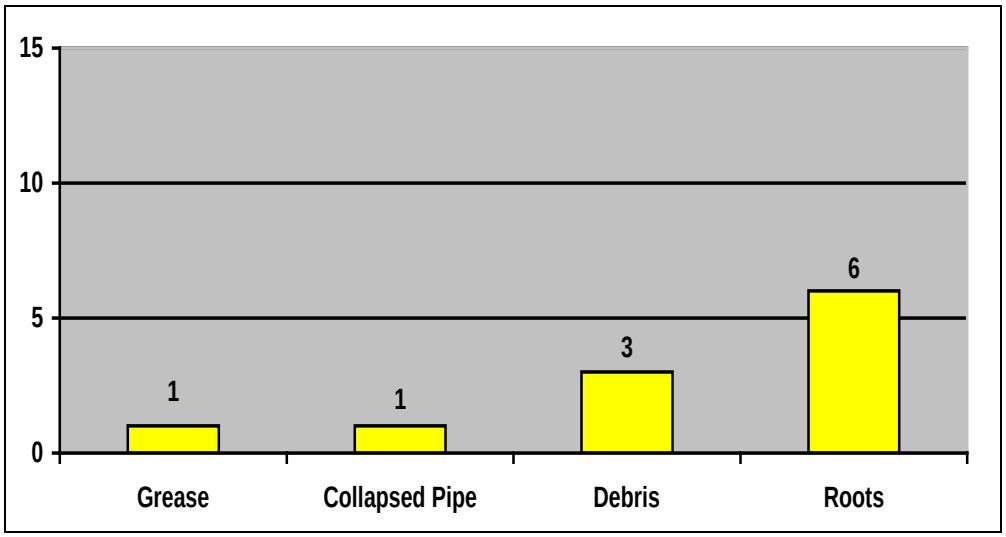
During the current reporting period, there were approximately 119 building backups throughout SD1's service area. Of these 119**,** approximately 11 were related to the condition or operation of the public sewers and 108 were caused by other issues, as shown in Figure 2.3. The building backups determined not to be related to the condition or operation of the public sewers, were caused by blockages in private service laterals and internal plumbing issues.

Figure 2.3 Building Backups: Public System vs. Other Causes
(October 1, 2013 through December 31, 2013)



Causes of the approximate 11 building backups determined to be related to the condition or operation of the public sewer lines are detailed in Figure 2.4 below.

Figure 2.4 Occurrences of Public System Related Building Backups per Cause
(October 1, 2013 through December 31, 2013)



The sewers where these 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 permanently address the cause 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 warrants the need for a larger-scale inspection routine, rehabilitation, or repair project.

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 considered in this analysis is also provided, as each represents an uncontrolled variable that significantly impacts SD1's wet weather CSO and SSO activity. In general, focus on 2012 and 2013 data are included for detailed comparison in year-to-year statistics, while data prior to 2012 is included for historical reference. Additional summary comparisons of SD1's overflow data can be found in Appendix C.

3.1 Summary of Precipitation Data

As previously mentioned in Section 2, CSO and SSO activations and volumes will constantly change over time, with or without system improvements, due to natural variations in rainfall patterns, the 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 rainfall volume data in Tables 3.1 and 3.2 are based on total rainfall data recorded at the Cincinnati-Northern Kentucky International Airport (CVG). The storm event data is based on an estimate of the number of events observed at the rain gauges within the SD1 system. An event is defined as a period of time where rainfall is bracketed by at least seven hours of no rainfall. The daily precipitation statistics in Figures 3.1 and 3.2 are derived from daily rainfall totals measured by a rain gauge at CVG. The historical annual average rainfall from 1950 to 2005 at CVG is 41.05 inches, according to the National Weather Service.

Table 3.1 Rain Events and Total Rainfall by Quarter (2010 through 2013)

	2010			2011			2012			2013		
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	33	7.82	0.24	33	11.92	0.36	22	9.69	0.44	28	9.31	0.33
2nd	35	14.53	0.42	43	29.12	0.68	19	9.04	0.48	31	14.39	0.46
3rd	18	4.13	0.23	31	13.37	0.43	21	10.13	0.48	15	14.17	0.94
4th	26	10.19	0.39	23	18.85	0.82	25	9.75	0.39	27	12.76	0.47
Total	112	36.67	0.33	130	73.26	0.56	87	38.61	0.45	101	50.63	0.50

Table 3.2 Rain Events and Total Rainfall Change from 2012 to 2013

	Change from 2012 to 2013	
Qtr.	**# of Storm Events**	**Rainfall (in)**
1st	6	-0.38
2nd	12	5.35
3rd	-6	4.04
4th	2	3.01
Total	**14**	**12.02**

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Figure 3.1 Daily Precipitation (2010 through 2013)

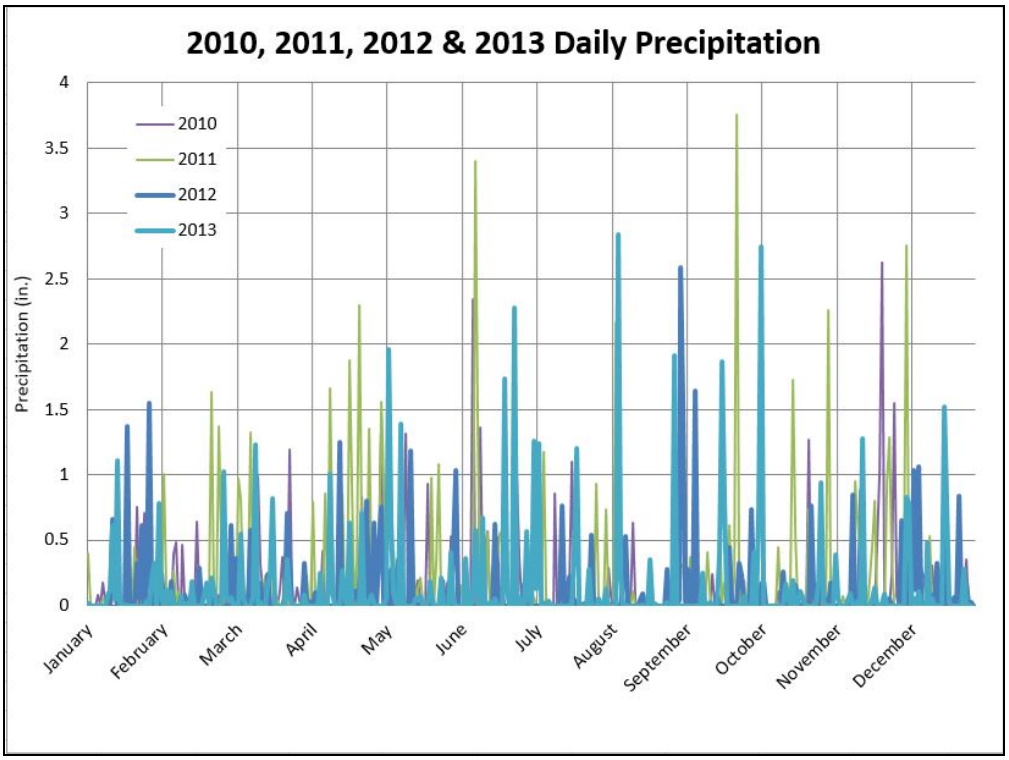
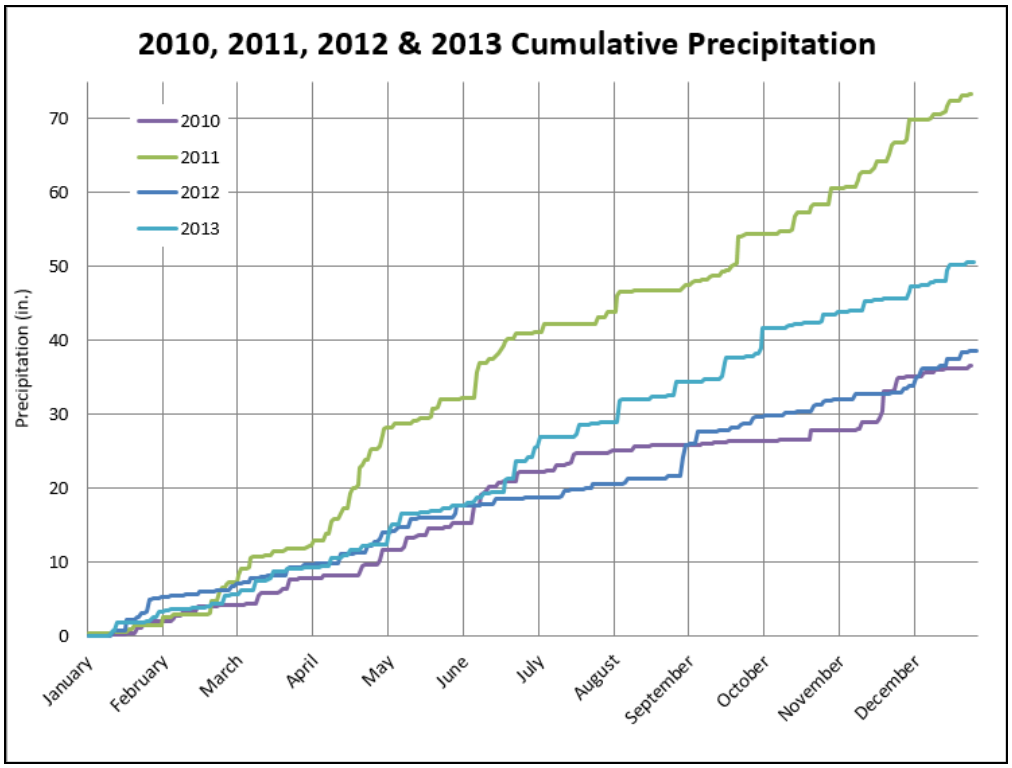


Figure 3.2 Cumulative Precipitation (2010 through 2013)



A review of the rainfall data shows the number of rainfall events and the annual rainfall total increased from 2012 to 2013. The annual rainfall total of 50.6 inches in 2013 is higher than would be expected, and is approximately 24 percent greater than the typical year rainfall of 40.8 inches. Reviewing rainfall over the past four years shows that totals in 2012 and 2010 tracked very close to the typical year rainfall, and 2011 was an exceptionally wet year. In fact, 2011 had the highest ever recorded annual cumulative rainfall. While 2013 rainfall did not approach the 2011 total, the average storm amount compares closely with 2011 and is larger than average. The average storm amount in the typical year is approximately 0.40 inches per storm. The 2013 average storm is 0.50 inches per storm, which is 25 percent higher than average. A discussion and summary of the above presented information and how it relates to changes in overflow frequency and volume is included in Section 3.2 of this report.

River Water Intrusion

SD1's system is influenced in multiple ways by the local Ohio River stage level. In addition to increasing groundwater levels that cause additional infiltration to occur, SD1's system operation is also impacted when the river stage is above 41 feet, as shown in Figure 3.3. When the Ohio River reaches the Army Corps of Engineers' specified river stages during flood conditions, CSO outfall flood gates 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 to operate by the Army Corps of Engineers to protect the 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 eliminating river water intrusion through a program to install duckbill-style check valves on CSO outfalls, effective up to river levels of 47 feet.

Table 3.3 shows the number of days each quarter that the river stage exceeded 41 feet from 2010 to 2013. The Ohio River is at or above 41 feet for 26 days of the year, based upon the daily river stage average from 1970 to 2005.

Figure 3.3 Daily River Stage (2010 through 2013)

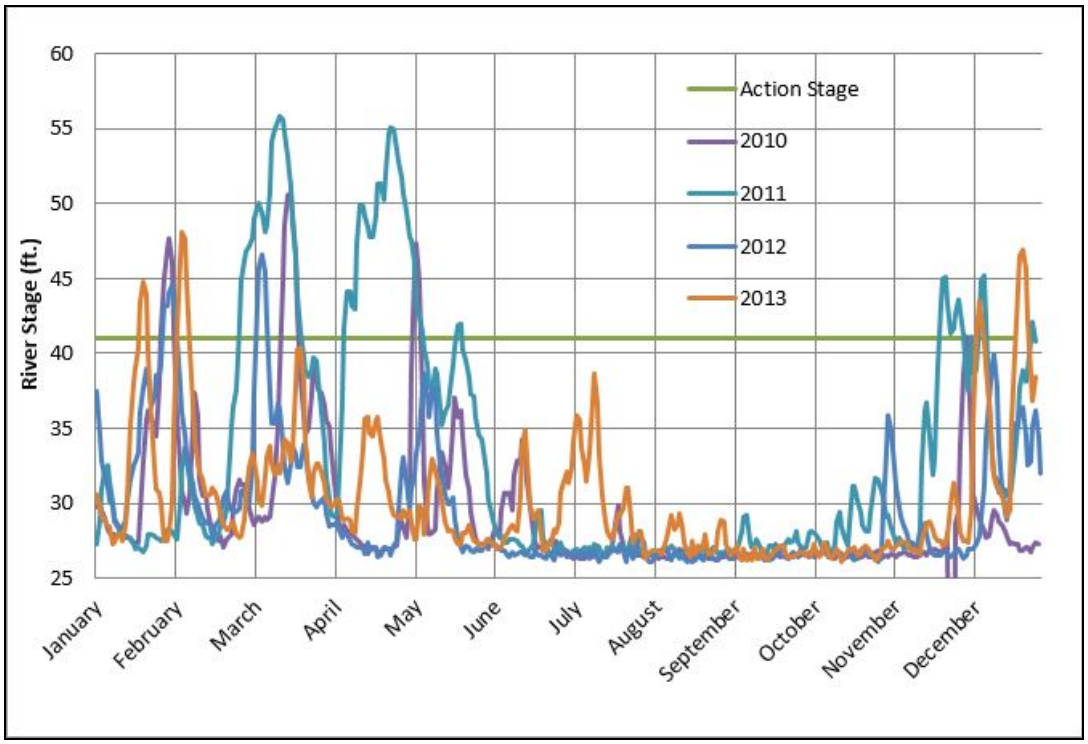


Table 3.3 Number of Days Ohio River Stage Level above 41 Feet (2010 through 2013)

Quarter	2010	2011	2012	2013
1	13	25	11	8
2	3	33	0	0
3	0	0	0	0
4	1	16	0	8
Total	**17**	**74**	**11**	**16**

In 2013, the Ohio River stage level of 41 feet was exceeded on 16 days. With the exception of 2011, the last four years are very similar in the total number of days the river was at flood stage level. As was previously mentioned, historic rainfall amounts in 2011 yielded much higher river levels that year. Exceedances in 2013 all occurred during the first and fourth quarters. A further discussion and summary of the above presented information and how it relates to changes in CSO overflow frequency and volume is included in Section 3.4 of this report.

3.2 Review of SSOs Due to Wet Weather Capacity Issues

3.2.1 Recurring Wet Weather SSOs

Tables 3.4 and 3.5 provide a summary of the number of activations and corresponding volume of recurring wet weather SSOs from 2008 through 2013, including recurring wet-weather overflows that occurred at pump stations.

Table 3.4 Recurring Wet Weather SSOs by Quarter (2008 through 2013)

	2008		2009		2010		2011		2012		2013	
Qtr.	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)
1st	285	103	152	26	128	30	428	106	340	52	132	23
2nd	211	39	175	24	351	55	1,097	232	129	8	281	23
3rd	24	2	147	20	123	14	256	23	427	43	491	62
4th	56	14	177	35	134	41	441	124	171	20	330	66
Total	**576**	**158**	**651**	**105**	**736**	**140**	**2,222**	**485**	**1,067**	**123**	**1,234**	**174**

Table 3.5 Recurring Wet Weather SSOs Change from 2012 to 2013

	Change from 2012 to 2013	
Qtr.	**Activations**	**Volume (MG)**
1st	-209	-29
2nd	152	15
3rd	64	19
4th	159	46
Total	**166**	**51**

Recurring wet-weather SSO activations were up 15 percent and volumes were up 40 percent from 2012 to 2013. The increase is attributable to SD1's service area experiencing moderate drought in 2012 and higher than average rainfalls in 2013. In addition to there being more storm events in 2013 than 2012, the average storm event produced approximately 10 percent more rainfall in 2013 than in 2012. This is an indication that the increased SSO activations and volumes are a direct result of an

increase in peak flows due to more intense storms. Higher rainfall totals also drove groundwater levels higher which contributed to increased SSO volume and activations in 2013.

The end of 2013 marked SD1's first fully operational year of the Western Regional Water Reclamation Facility (WRWRF). Increased capacity provided by WRWRF, and the associated collection system improvements, is having a direct impact on SSO volume reduction. The total recurring wet-weather SSO volume in 2013 was approximately 174 million gallons. Hypothetical model runs conducted for 2013, without the Western Regional Improvements, predicted 291 million gallons of wet-weather SSO volume. Therefore, according to SD1's current hydraulic model, 117 million gallons of wet-weather overflow volume was avoided in 2013, due to the Western Regional Improvements. In its revised Integrated Watershed Plan, submitted on March 31, 2011, SD1 predicted the Western Regional Improvements would reduce SSO volume approximately 59.7 million gallons in the typical year. While SD1's service area experienced approximately 24 percent more rainfall in 2013 than the typical year, modeled volume reductions due to the Western Regional Improvements in 2013 were approximately 96 percent greater than the typical year prediction provided in SD1's Integrated Watershed Plan. To illustrate the 2013 reductions related to the Western Regional Improvements, a map has been included in Appendix F that shows predicted volume reductions in green (16 locations) and predicted eliminations in yellow (7 locations).

SD1 is also focusing on smaller, higher priority wet-weather CSO and SSO projects that address public health concerns in localized neighborhood areas. Although the overflow volume reductions for these projects are not expected to be as significant as the Western Regional Improvements, the reduction in the number of wet-weather SSOs and CSOs through implementation of these projects is critical to improving both public health and water quality in Northern Kentucky. These projects are being implemented as part of the 5-Year Improvement Program. Updated progress on the status and expected benefits of all 5-Year Improvement Program projects are available in Appendix B. Projects completed in 2013 include:

- City of Covington: Main Strasse Gateway Biofiltration Swale
- City of Covington: Madison Avenue Rain Garden

- Dry Creek Waste Water Treatment Plant Headworks Improvements
- Kenton County Public Library: Mary Ann Morgan Branch Rain Garden
- Lakeview Pump Station Pump Replacement

3.2.2 Inactive Wet Weather SSOs

SD1 has performed wet-weather SSO investigations since 2005, but has only tracked inactive wet-weather overflow occurrences for inclusion in the Quarterly Reports since the beginning of 2009. In 2011, a total of 36 inactive overflows were identified with an estimated overflow volume of 1.24 million gallons. During 2012, SD1's wet weather investigations identified a total of 1 inactive overflow with an estimated overflow volume of 2,000 gallons. Most of the inactive overflows identified in 2011 were verified by routine wet weather SSO inspections, and were added to the Recurring SSO list. The verification accounts for the sharp decline in inactive wet-weather SSOs. SD1 did not record any observed inactive SSOs during 2013, indicating thorough hydraulic understanding of the system has led to less SSO locations that were previously unknown.

SD1 anticipates that the number of activations and volumes for this category of overflows will vary year-to-year, depending on the size of the rain events that occur and the activity of the structures being investigated. Unlike other overflow categories, inactive overflows are generally under investigation as suspected or predicted hydraulic model overflow points in the collection system that must be confirmed.

The wet-weather investigation crew meets annually to compare the overflow field inspection data against the modeled results to identify improvements that may be needed in the hydraulic model, additional flow monitoring that may be required, and additional sewer inspection needs. This is part of SD1's ongoing effort to characterize and verify overflows throughout the collection system, ensure overflows are categorized accurately and cleaned up after rain events, and ensure that the model is continually updated with the latest field and flow monitoring information, so that it is accurately predicting and reporting what is occurring in the collection system. Proper characterization of overflows ensures that the hydraulic model that SD1 utilizes is kept up-to-date and improves upon its accuracy to aid in identifying the most appropriate and effective solutions for eliminating recurring SSOs.

3.3 Review of SSOs Due to Operational Issues

Table 3.6 provides a summary of the number of activations and corresponding volume of SSOs due to operational issues from 2008 to 2013.

Table 3.6 SSOs Due to Operational Issues (2008 through 2013)

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
Change from 2012 to 2013	**17**	**32.86**

The sharp increase in SSOs due to operational issues from 2012 to 2013 is a result of a series of mechanical failures and line breaks, complicated by extreme wet weather, during the pump replacement project at Lakeview Pump Station. Approximately 98 percent of the SSO volume is attributable to six incidents related to construction and the startup of the new pumps. For more detailed descriptions of the incidents, refer to Consent Decree Quarterly Reports No. 24 and No. 25. The other major incident in 2013 was an act of vandalism. Without these seven occurrences, there would be no increase in the total volume from 2012 to 2013, which indicates SD1's maintenance programs continue to successfully minimize SSOs due to operational issues within the collection systems.

SD1 uses a metric called Wastewater Collection System Integrity, from the American Water Works Association's 2007 Annual Survey Data & Analyses Report, to measure how its annual SSOs due to operational issues compare to the rest of the wastewater utility industry. The industry benchmark for the top quartile in the South is 3.8 overflows per 100 miles of collection system piping, per year. SD1 has 1,575 miles of collection system piping, which equates to an annual top-quartile benchmark of 60 SSOs due to operational issues. As shown in Table 3.6, SD1 has been in the industry's top-quartile for the last two years and near the top quartile for the two previous years. In 2013, SD1 had 5 fewer SSOs due to operational issues, as compared to the industry benchmark for top quartile. Table 3.7 demonstrates SD1's commitment to continually improve the

performance of its collection systems, through regular assessment, maintenance, repair, and replacement.

Table 3.7 O&M and Rehab/Replacement Activities (2008 through 2013)

O&M Activity	2008	2009	2010	2011	2012	2013	Total
Manholes Inspected	5,985	4,688	1,285	1,852	1,871	1,109	**16,790**
Manholes Repaired	485	332	315	288	615	278	**2,313**
Manholes Replaced	55	59	83	30	42	24	**293**
New Manholes Installed[1]	26	53	37	48	52	34	**250**
Sewer Lines Cleaned - Feet	706,441	530,303	657,709	375,303	511,118	606,622	**3,387,496**
Sewer Lines Inspected (Initial and Follow-up) - Total Feet	1,414,803	1,411,818	1,076,042	977,575	1,153,870	1,327,328	**7,361,436**
Sewer Lines Rehabilitated Feet - (CIPP)[2]	953	2,251	29,528	84,417	41,195	64,841	**223,185**
Sewer Lines Repaired and Replaced - Feet[1]	18,442	17,658	25,826	11,020	27,400	10,316	**110,662**
Misc. Sewer Line Repairs - Count	45	40	8	9	4	0	**106**

[1]*Does not include manholes installed or lines repaired or replaced as part of CIP projects or new development.*
[2]*SD1 entered into a cured-in-place-pipe lining contract, which account for increases in lineal footage rehabilitated 2010 through 2012.*

3.4 Review of Wet Weather CSOs

Table 3.8 provides a summary of the number of activations and corresponding volume of CSOs occurring from 2008 through 2013. Table 3.9 provides the quarterly differences in modeled activation and volume between for 2012 and 2013.

Table 3.8 Recurring Wet Weather CSOs by Quarter (2008 through 2013)

	2008		2009		2010		2011		2012		2013	
Qtr.	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)	Activations	Volume (MG)
1st	943	1,798	607	266	456	426	600	1,097	640	547	588	471
2nd	899	685	1,244	436	971	435	1,538	2,029	650	196	1063	351
3rd	542	119	828	397	461	279	795	319	781	353	879	666
4th	504	267	610	403	444	435	705	1,152	621	328	633	618
Total	**2,888**	**2,869**	**3,289**	**1,502**	**2,332**	**1,575**	**3,638**	**4,597**	**2,692**	**1,424**	**3,163**	**2,106**

Table 3.9 Recurring Wet Weather CSOs Changes from 2012 to 2013

	Changes from 2012 to 2013	
Qtr.	**Activations**	**Volume (MG)**
1st	-52	-76
2nd	413	155
3rd	98	313
4th	12	290
Total	**471**	**682**

The number of CSO activations and volume increased from 2012 to 2013, primarily due to increased rainfall totals and additional days of high river occurrences. The number of storm events, cumulative rainfall, and average storm size all increased in 2013, compared to the previous year. Due to these factors, higher groundwater inflow contributed to the increased CSO volumes, particularly in the fourth quarter. These rainfall and river level increases led to approximately 50 percent more wet-weather CSO volume in 2013 than in 2012, and approximately 20 percent more wet-weather CSO activations. SD1's hydraulic model also indicates that approximately 220 million gallons of the total CSO volume for 2013 (about 10 percent) was directly related to high river events.

As has been previously mentioned, 2011 experienced record rainfall and high river level occurrences, leading to very high CSO volume and activations. The record setting

activity of 2011 carried over into early 2012, which made the first quarter of 2012 the only one that produced more rainfall than a 2013 quarter. CSO volume and activations for 2013 are slightly higher than 2010 and 2012, but 2013 experienced less activation than 2009 and less volume than 2008.

3.5 Review of Dry Weather CSOs

Table 3.10 provides a summary of the number of activations and corresponding volume of dry-weather CSOs that occurred from 2008 to 2013.

Table 3.10 Dry Weather CSOs (2008 through 2013)

Year	Total Number of Occurrences	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
Change from 2012 to 2013	**1**	**-0.087**

There was one more dry-weather CSO in 2013 than in 2012, but 84 percent less volume. Historically, 2013 marks the lowest annual dry-weather CSO volume recorded. The continued reduction of dry-weather CSO volume demonstrates the effectiveness of SD1's Nine Minimum Controls program and the various maintenance programs designed to eliminate dry-weather CSOs, and minimize their impact when they do occur. The following three SD1 maintenance programs have contributed this successful trend.

LDSAP - Diversion Subprogram

SD1's Large Diameter Sewer Assessment Program (LDSAP) has a subprogram dedicated to pipe assessment and maintenance in the vicinity of CSO diversions. The Diversion Subprogram began in early 2011 as a targeted inspection and cleaning strategy for pipes that are within a 1000-foot radius of all CSO diversions. The subprogram systematically and repeatedly assesses all lines upstream of the diversions, and produces appropriate next actions in the Continuous Sewer Assessment Program (CSAP). This level of proactive maintenance in the combined system has

improved SD1's ability to eliminate accumulating debris in critical areas and curtail dry weather CSOs. In 2013, SD1 inspected approximately 202,100 feet of pipe in the LDSAP Diversion subprogram and cleaned approximately 61,400 feet. Respectively, the LDSAP Diversion subprogram accounted for more than 15 percent of all 2013 inspections and more than 10 percent of all cleanings. Pipes that are cleaned as a part of this subprogram are reassessed, according to the CSAP logic, to determine the effectiveness of the preventative maintenance and evaluate potential sources of returning debris that may lead to dry-weather CSOs. SD1 anticipates inspecting another 68,600 feet of LDSAP Diversion pipes as follow-up CSAP next actions, during 2014.

Routine CSO Investigations

SD1's CSO investigation crew inspects each CSO outfall and its associated diversions after every rainfall event greater than half an inch. Additionally, the crew also inspects 134 CSO diversions on a weekly basis and 37 CSO diversions on a bi-weekly basis to monitor for conditions that may lead to dry-weather overflows. During these inspection routines, the CSO investigation crew visually looks for debris and blockages that may trigger a dry-weather overflow or would affect the ability of the diversion to maximize the flow entering the interceptor during rainfall. For a more detailed description of SD1's current CSO investigation program, reference Appendix F of the CMOM FY 2013 Annual Report, submitted on December 31, 2013.

Routine O&M Activities

SD1's CSAP prioritizes which sewers in the combined sewer system 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.

As part of SD1's Nine Minimum Control programs for solids & floatable control and the reduction of dry-weather CSOs, SD1 implemented an ongoing catch basin retrofit program to trap debris and an associated inspection and cleaning program. SD1 annually inspects each catch basin at least once and is continuing to gather data in order to develop a prioritized schedule for more frequent inspections and cleaning depending on the catch basin location. In addition, SD1 has constructed five grit pits along the Ohio River and Licking River interceptors to remove grit and other solids from

the sewers. These grit pits continue to effectively trap and remove debris from the interceptors and maximize flow to the treatment plant.

These activities, which are summarized in Table 3.11, ensure that the combined sewer system will perform as effectively as possible to maximize treatment of combined sewage and reduce the magnitude, frequency and duration of CSOs.

Table 3.11 Combined Sewer System O&M Activities (2008 through 2013)

O&M Activity	2008	2009	2010	2011	2012	2013	Total
Catch Basin Cleanings	1,211	888	786	1,392	1,431	832	**6,540**
Catch Basin Cleaning (Yards of Debris Removed)	N/A	427	469	525	466	630	**2,517**
Catch Basins Inspections[1]	2,057	3,328	4,075	4,125	3,765	4,004	**21,354**
New Catch Basin Installations	0	5	2	2	7	4	**20**
Catch Basins Replaced	159	224	140	90	105	40	**758**
Catch Basins Repaired	128	65	78	211	85	48	**615**
Grit Pit Cleaning (Yards of Debris Removed)	358	439	355	365	415	408	**2,340**

[1] *Includes basins owned by SD1, the State of Kentucky, municipalities, counties and privately owned basins.*

3.6 Review of Building Backups

Table 3.12 provides a summary of the building backups reported during 2008 through 2013.

Table 3.12 Building Backups: Public System vs. Other Causes (2008 through 2013)

Backup Cause	2008	2009	2010	2011	2012	2013
Public System	39	36	36	146	44	44
Other Causes	402	482	644	513	428	627
Total	**441**	**518**	**680**	**659**	**472**	**671**

The approximate number of building backups that were related to the condition or operation of the public sewer system remained the same from 2012 to 2013. However, the number of reported building backups due to issues unrelated to the public sewer system increased approximately 46 percent; an increase almost entirely attributable to a 100-year storm event in early July. The 44 building backups in 2013 determined to be related to the public system were due to the following:

- Blockage of roots (18 occurrences)
- Blockage of debris (8 occurrences)
- Collapsed pipe (7 occurrences)
- Blockage of grease (4 occurrences)
- Broken tee (2 occurrences)
- Construction activity (2 occurrences)
- Lack of capacity during wet weather (2 occurrences)
- Vactor truck blew water into the house (1 occurrence)

The sewers where these 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 permanently address the cause 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 warrants the need for a larger-scale inspection routine, rehabilitation, or repair 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 PENALTY			
✓	$14,000 for 9 DWOs, between April 18, 2009 through June 30, 2010	100%	1/9/2011	12/21/2010
	CIVIL PENALTY			
✓	Pay Civil Penalties to EPPC and US EPA	100%	06/18/07	06/18/07
	CMOM PROGRAM REQUIREMENTS – 2007 through 2014			
✓	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	0%	12/31/14	
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)		75%	12/31/2015	
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	0%	11/10/14	
	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	100%	06/07/13	06/06/13
	NMC PROGRAM REQUIREMENTS – 2007 through 2014			
✓	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	0%	09/04/14	

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 2014			
✓	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	0%	05/14/14	
	REPORTING – 2007 through 2014			
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	0%	04/30/14	
	Submit Quarterly Report 27	0%	07/30/14	
	Submit Quarterly Report 28	0%	10/30/14	

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
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			
	Complete all Consent Decree Compliance Measures	38%	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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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, 2014

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.		

Updated: January 30, 2014

Watershed Plan Projects: Five Year Program (2009 - 2014)

System-wide Programs

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2013 to 12/31/2013	Planned Activity for 1/01/2014 to 3/31/2014
(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 2014	n/a	Initial Design	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 2014	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 2014	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 Bioswalw	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	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	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	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 2014	n/a	Initial Design	Initial Design

Watershed Plan Projects: Five Year Program (2009 - 2014)

Specific Basin Projects

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 10/01/2013 to 12/31/2013	Planned Activity for 1/01/2014 to 3/31/2014
(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	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) Phase 1	Central	Disconnection of downspouts from approximately 130 homes, 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	n/a	Construction	Construction
Vernon Lane – Public & Private Source I/I Removal	Central	Combinbination of private I/I removal, sewer rehabilitation, manhole lining, and stormwater BMPs in	Eliminate Vernon Ln. SSO and improve water quality	Beyond 2014	n/a	Ph 1 Construction Ph 2 Final Design	Ph 1 Construction Ph 2 Final Design
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.	2015	n/a	Final Design	Final Design
Riviera Sewer Replacement	East	Replacement of approximately 4,100 LF of deteriorated 24-inch pipe in the Taylor Creek area	Reduce CSOs into Taylor Creek and address structural issues	Beyond 2014	n/a	None	None
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	Beyond 2014	n/a	In Progress	In Progress
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	2015	n/a	None	None

Other Committed Projects

CIP Title	Basin	Project Description	Target Project Benefit	Scheduled Completion Date	Actual Completion Date	Past Activity for 07/01/2013 to 09/30/2013	Planned Activity for 1/01/2014 to 3/31/2014
(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 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	

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Proposed Solution	Scheduled Completion Date	Actual Completion Date	Status as of October 2013
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
CIP Title	**Basin**	**Original Proposed Solution**	**Updated Proposed Solution**	**Scheduled Completion Date**	**Actual Completion Date**	**Status as of October 2013**
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	Evaluating Solutions	Study - 2008	2008	Complete
				2015	n/a	Evaluating Solutions
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	n/a	In Progress
Eagles Landing	West	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2013-2014	n/a	In Progress
Evergreen	Central	PS Elimination Study	Electrical hook up for portable generator	Study - 2008	2008	Complete
				2014	n/a	In Progress
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	n/a	In Progress
War Admiral	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2012 - 2015	2011	Complete
Blackstone	West	PS Elimination Study	Evaluating Solutions	Study - 2008	2008	Complete
				2015	n/a	Evaluating Solutions
Dublin Green No. 1	West	PS Elimination Study	PS Elimination	Study - 2008	2008	Complete
				2015	2012	Complete
Fowler Creek	West	PS Elimination	These stations will be eliminated after the Western Regional collection system is 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 16, 2014

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Proposed Solution	Scheduled Completion Date	Actual Completion Date	Status as of October 2013
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	n/a	2009	2009	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	n/a	2008	2007	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	n/a	2008	2007	Complete
Thornwilde	North	Permanent Generator	n/a	2008	2008	Complete
Bunning Lane	East	PS Elimination Study	Evaluating Solutions	2015	n/a	Evaluating Solutions
Kees	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2011	2011	Complete
Overlook	East	Permanent Generator	Evaluating Solutions	2015	n/a	Evaluating Solutions
Riverview Farms	North	Permanent Generator	Evaluating Solutions	2015	n/a	Evaluating Solutions
Stillwater	East	Permanent Generator	Evaluating Solutions	2015	n/a	Evaluating Solutions

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Proposed Solution	Scheduled Completion Date	Actual Completion Date	Status as of October 2013
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	n/a	In Progress
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	n/a	In Progress
Brushup Lane	West	Permanent Generator	PS Elimination	2012	2012	Complete
Carlisle Ave	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	n/a	In Progress
Cinnamon Ridge	West	Permanent Generator	Backup Dry Prime Pump with a Diesel	2012	2012	Complete
Cold Spring Crossing	East	Permanent Generator	Permanent Generator	2014	n/a	In Progress
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	n/a	In Progress
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	Evaluating Solutions	2015	n/a	Evaluating Solutions
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	Evaluating Solutions	2015	n/a	Evaluating Solutions
Harrison Harbor	East	Permanent Generator	Portable Generator	2009-2014	2011	Complete

Pump Station Backup Power Plan

CIP Title	Basin	Original Proposed Solution	Updated Proposed Solution	Scheduled Completion Date	Actual Completion Date	Status as of October 2013
Category 4 Projects (continued)						
Harvest Hill	Central	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	n/a	In Progress
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	Evaluating Solutions	2015	n/a	Evaluating Solutions
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	n/a	In Progress
Parkside No. 2	East	Permanent Generator	Electrical hook up for portable generator	2012	2012	Complete
Patton Street	Central	Dual Utility Power Feed	Evaluating Solutions	2015	n/a	Evaluating Solutions
Ria Vista	North	Permanent Generator	Electrical hook up for portable generator	2011	2011	Complete
Silver Grove	East	Permanent Generator	Evaluating Solutions	2015	n/a	Evaluating Solutions
St Annes	East	Permanent Generator	Backup Dry Prime Pump with a Diesel	2014	n/a	In Progress
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	n/a	In Progress
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 Proposed Solution	Scheduled Completion Date	Actual Completion Date	Status as of October 2013
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	Evaluating Solutions	2015	n/a	Evaluating Solutions
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	n/a	In Progress
CIP Title	**Basin**	**Original Proposed Solution**	**Updated Proposed Solution**	**Scheduled Completion Date**	**Actual Completion Date**	**Status as of October 2013**
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	n/a	In Progress

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
Total Complete	**83**
2014 Active Projects	15
Total Project Activity	**98**

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Pump Station Overflow Elimination Plan

CIP Title	Basin	Scheduled Completion Date	Actual Completion Date	Activity for 10/01/2013 to 12/31/2013	Planned Activity for 1/01/2014 to 3/31/2014
Pump Station Overflow Elimination Projects					
Alex-Licking	East	12/31/2010	2008	Complete	
Harrison Harbor	East	12/31/2010	*See PS Oveflow Elimination Annual Report May 11, 2009	Complete	
Highland Acres	West	12/31/2010	2010	Complete	
Riley Road No.1	East	12/31/2010	2009	Complete	
Ripple Creek	Central	12/31/2010	2010	Complete	
South Hampton	West	3/31/2013	2012	Complete	
South Park	North	12/31/2010	2010	Complete	
Sunset	Central	12/31/2010	2010	Complete	
Taylorsport	North	12/31/2010	2004	Complete	
Union	West	3/31/2013	2012	Complete	
Allen Fork	North	12/31/2015	n/a	In-Progress	In-Progress
Crestview	East	12/31/2015	n/a	Phase 1 - Sewer and MH rehab is complete. Private service rehab is under evaluation. Pump station improvement is in Final Design.	
Kentucky Aire	West	12/31/2013	n/a	Finish Construction	Complete
Lakeview	Central	12/31/2023[1]	n/a	In-Progress	In-Progress

[1] *Revised deadline approved in letter from Cabinet dated May 13, 2013.*

Updated: January 30, 2014

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APPENDIX C:

Cumulative and Annual Overflow Data

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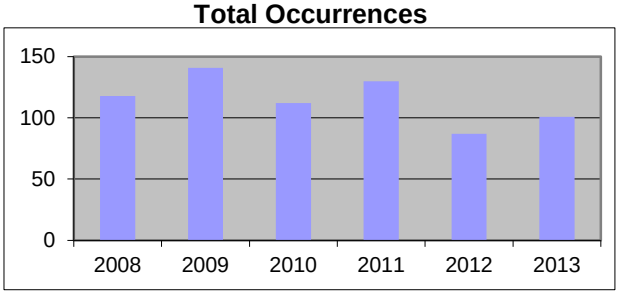
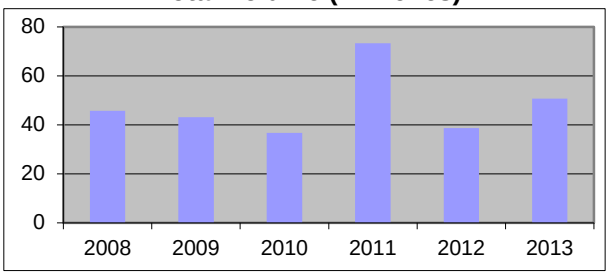
Annual Cumulative Overflow Data
2008 through 2013

Rainfall

Total Occurrences

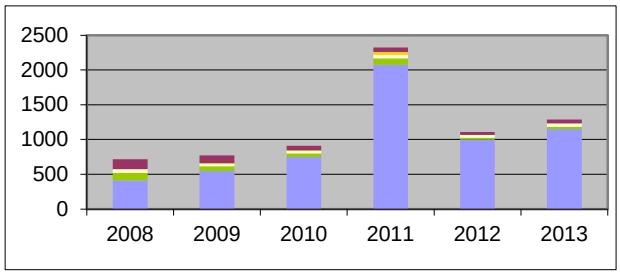


Total Volume (In Inches)

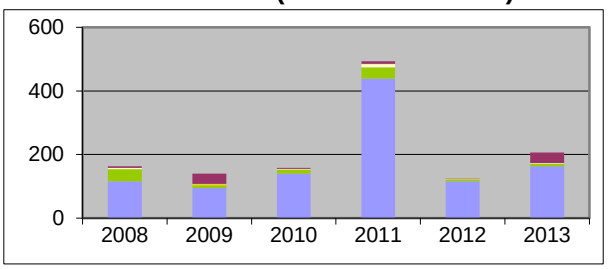


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



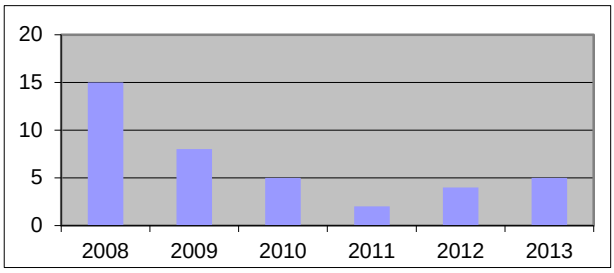
Total Volume (In Million Gallons)



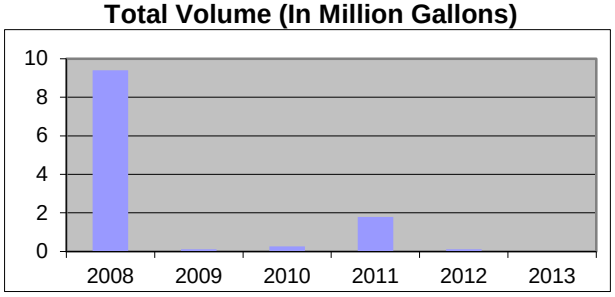
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

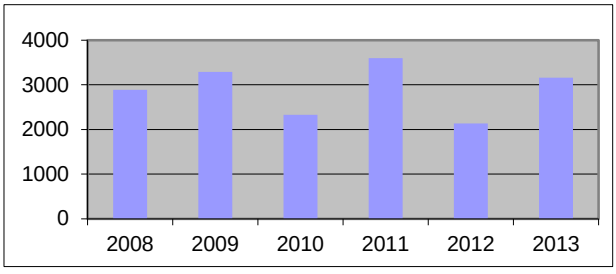


Total Volume (In Million Gallons)

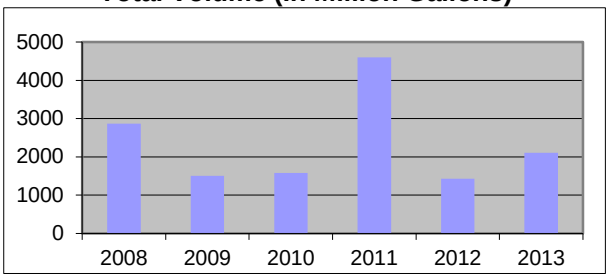


Wet Weather CSOs

Total Occurrences

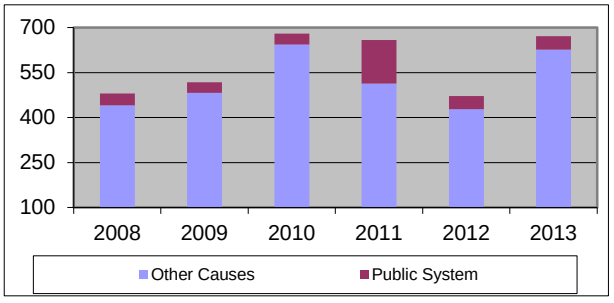


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



Change from 2012 to 2013			
	Occurrences	**Volume**	
Rainfall	14	12.02	inches
Recurring WW SSOs	166	50.371	MG
Inactive WW SSOs	-1	-0.002	MG
Operational SSOs	17	32.861	MG
Dry Weather CSOs	1	-0.087	MG
Wet Weather CSOs	471	681.68	MG
Building Backups (Other Causes)		199	
Building Backups (Public System)		0	

Updated: Januray 30, 2014

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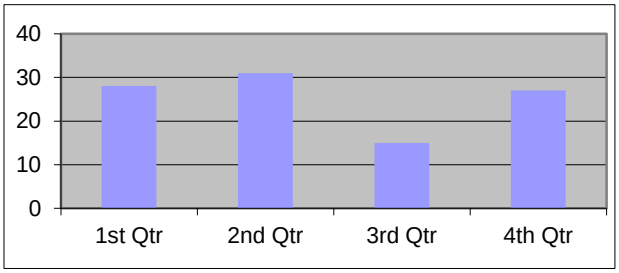
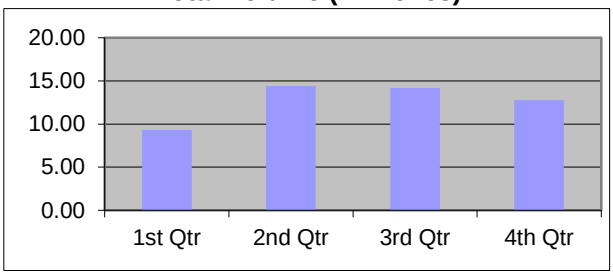
Cumulative Overflow Data
January 1, 2013 through December 31, 2013

Rainfall

Total Occurrences

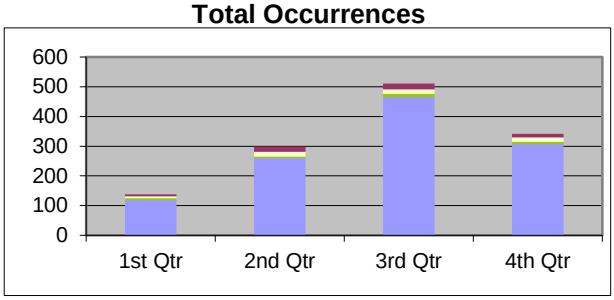


Total Volume (In Inches)

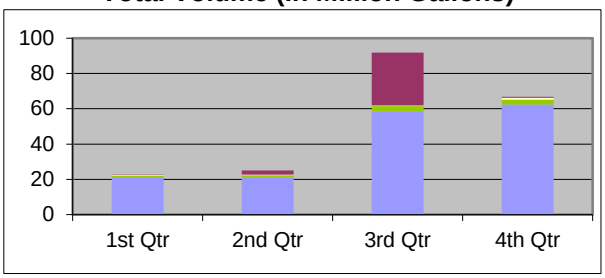


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



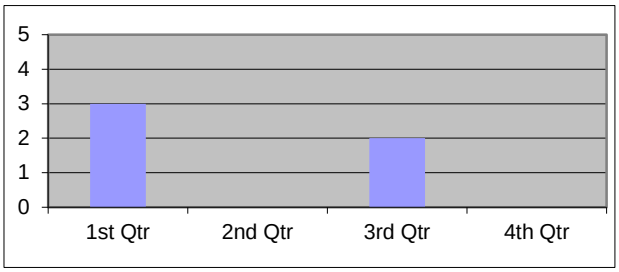
Total Volume (In Million Gallons)



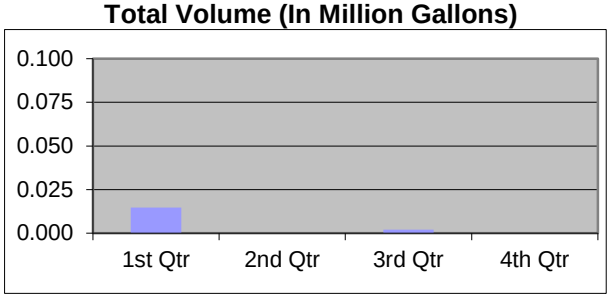
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

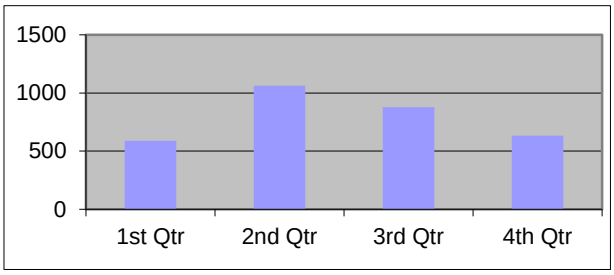


Total Volume (In Million Gallons)

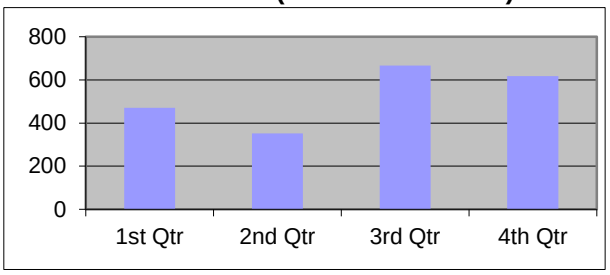


Wet Weather CSOs

Total Occurrences

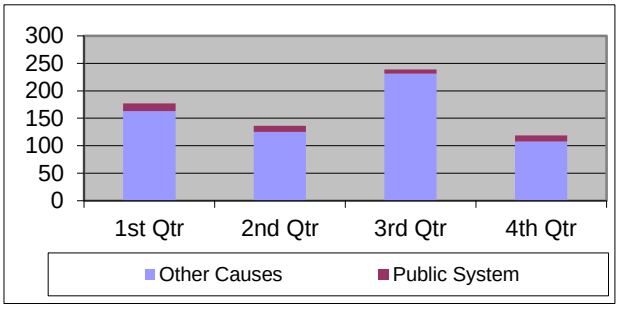


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



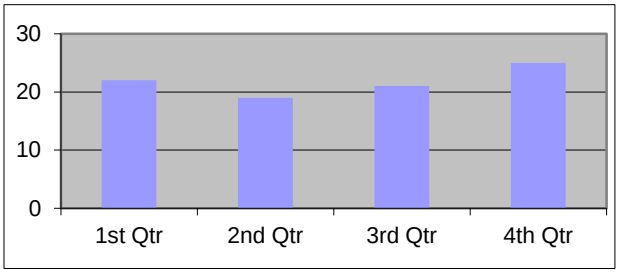
2013 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	101	50.630	inches
Recurring WW SSOs	1234	173.365	MG
Inactive WW SSOs	0	0.000	MG
Operational SSOs	55	33.176	MG
Dry Weather CSOs	5	0.017	MG
Wet Weather CSOs	3163	2106.240	MG
Building Backups (Not SD1)		627	
Building Backups (SD1)		44	

Updated: January 30, 2014

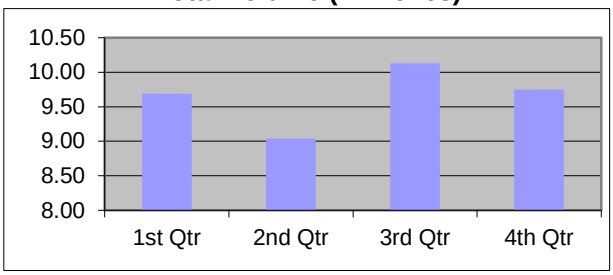
Cumulative Overflow Data
January 1, 2012 through December 31, 2012

Rainfall

Total Occurrences

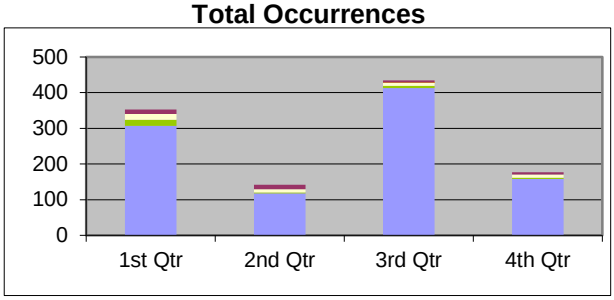


Total Volume (In Inches)

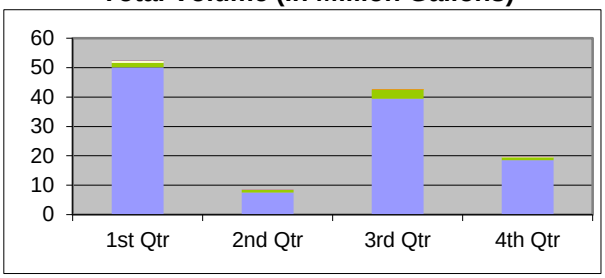


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



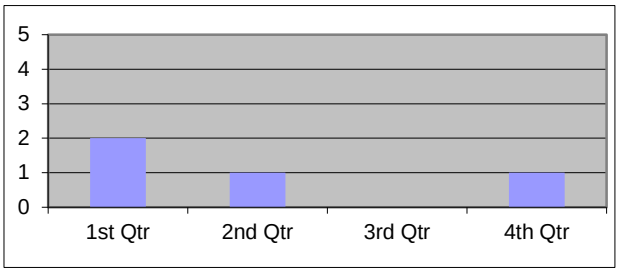
Total Volume (In Million Gallons)



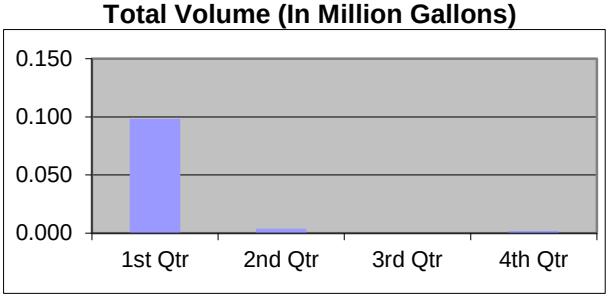
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

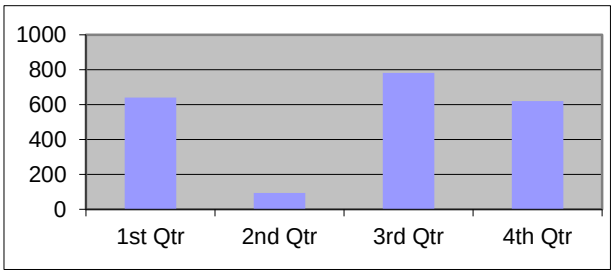


Total Volume (In Million Gallons)

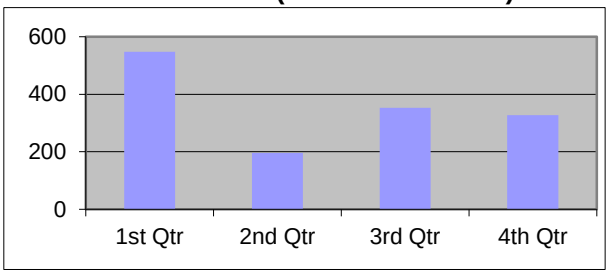


Wet Weather CSOs

Total Occurrences

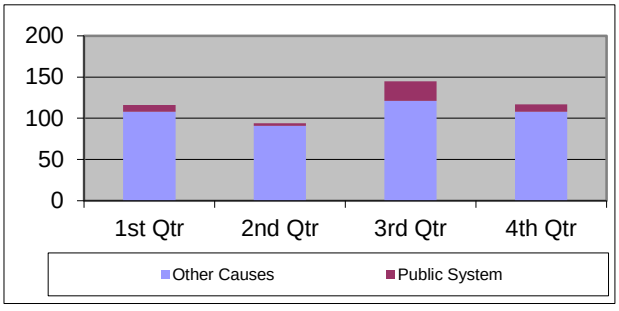


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



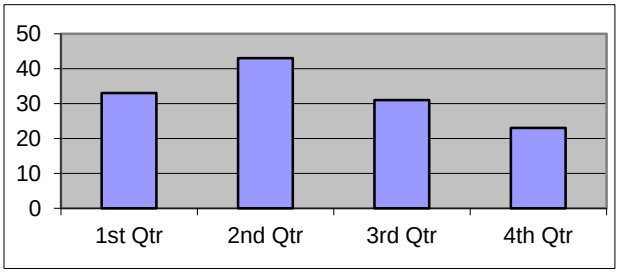
2012 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	87	38.610	inches
Recurring WW SSOs	1067	122.994	MG
Inactive WW SSOs	1	0.002	MG
Operational SSOs	38	0.315	MG
Dry Weather CSOs	4	0.104	MG
Wet Weather CSOs	2136	1424.560	MG
Other Causes		428	
Public System		44	

Updated: January 30, 2013

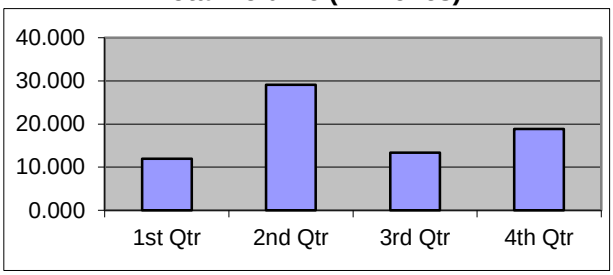
Cumulative Overflow Data
January 1, 2011 through December 31, 2011

Rainfall

Total Occurrences

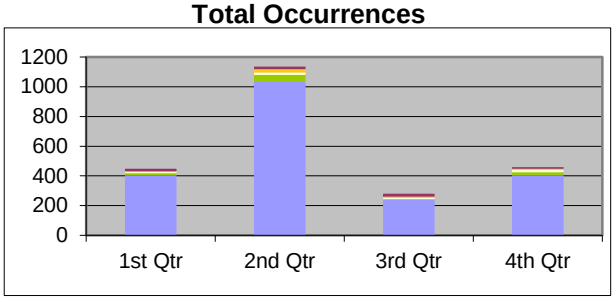


Total Volume (In Inches)

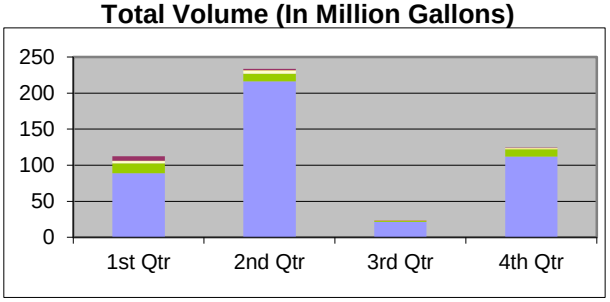


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



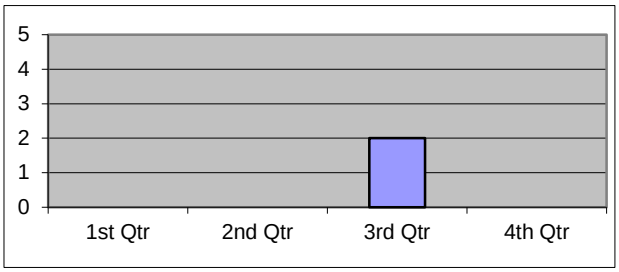
Total Volume (In Million Gallons)



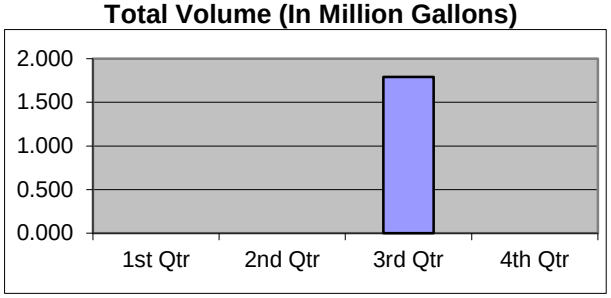
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

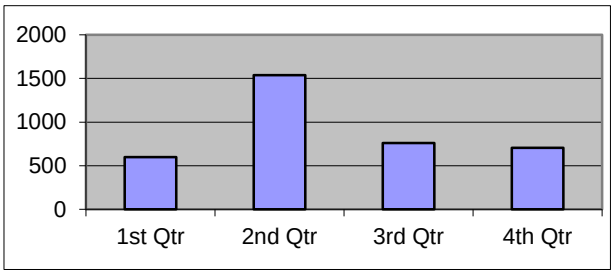


Total Volume (In Million Gallons)

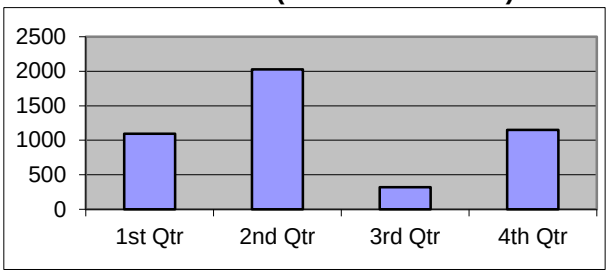


Wet Weather CSOs

Total Occurrences

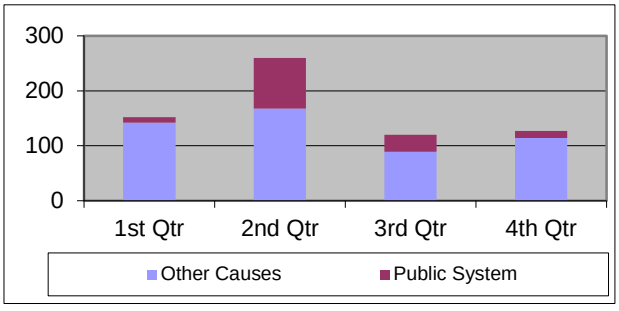


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



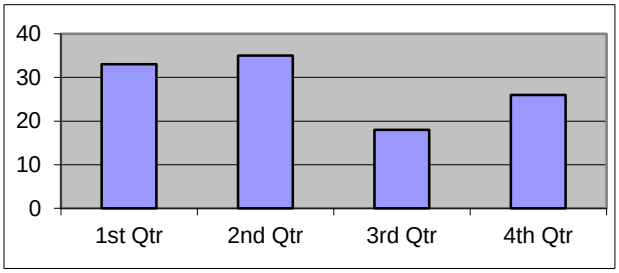
2011 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	130	73.260	inches
Recurring WW SSOs	2222	485.000	MG
Inactive WW SSOs	36	1.239	MG
Operational SSOs	66	8.030	MG
Dry Weather CSOs	2	1.790	MG
Wet Weather CSOs	3602	4596.340	MG
Other Causes		513	
Public System		146	

Updated: January 30, 2012

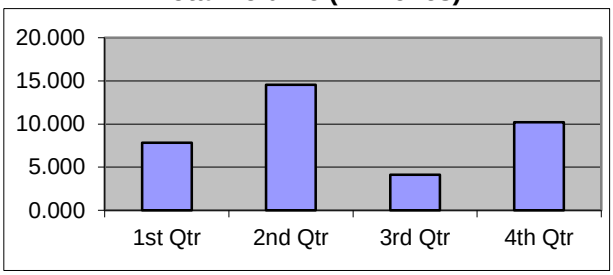
Cumulative Overflow Data
January 1, 2010 through December 31, 2010

Rainfall

Total Occurrences

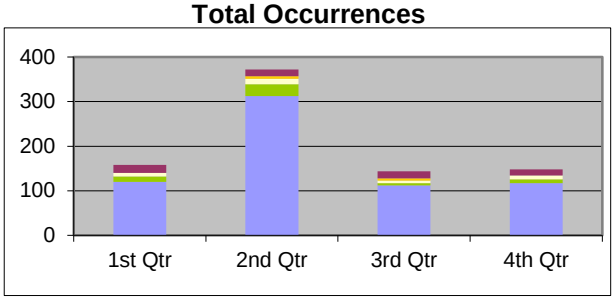


Total Volume (In Inches)

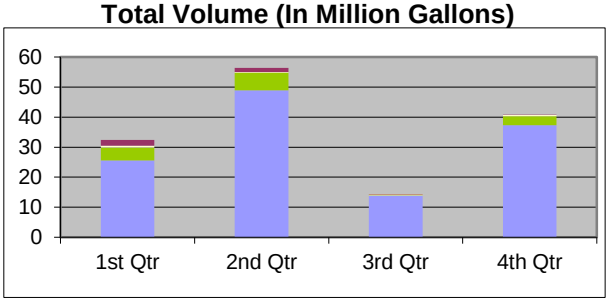


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



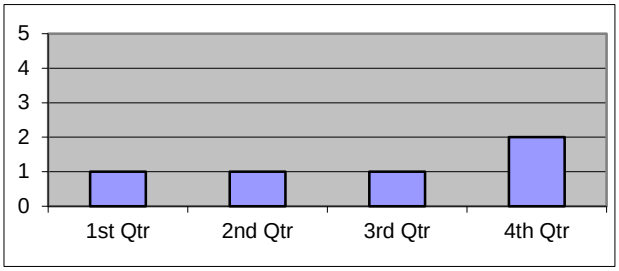
Total Volume (In Million Gallons)



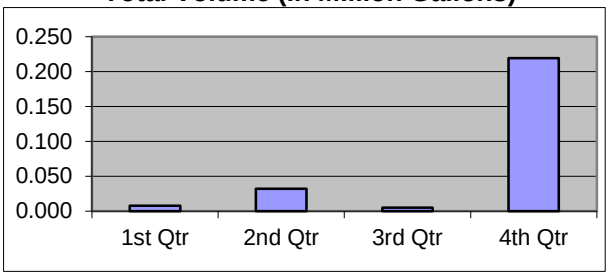
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

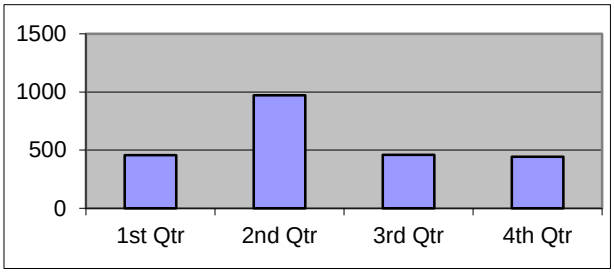


Total Volume (In Million Gallons)

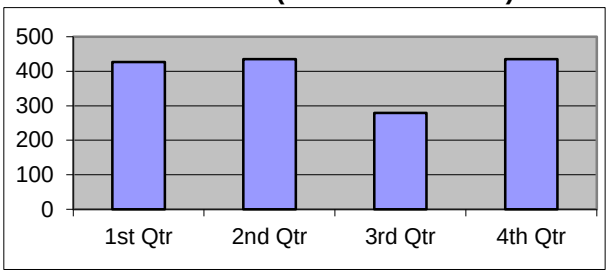


Wet Weather CSOs

Total Occurrences

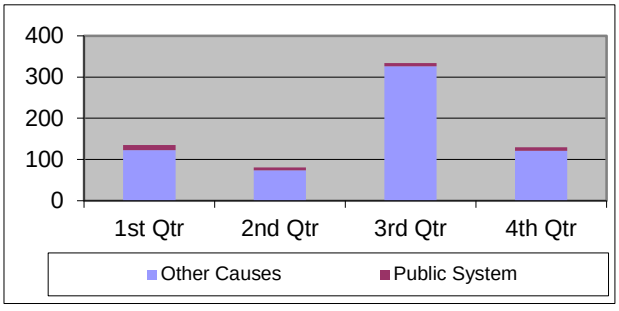


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



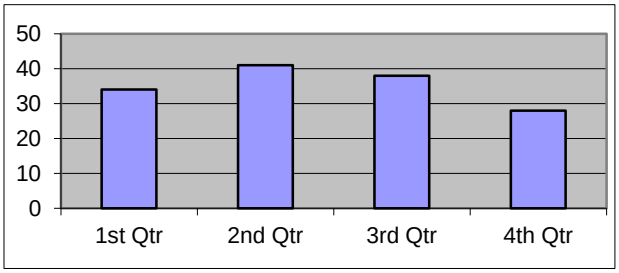
2010 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	112	36.670	inches
Recurring WW SSOs	748	140.280	MG
Inactive WW SSOs	11	0.064	MG
Operational SSOs	63	3.486	MG
Dry Weather CSOs	5	0.264	MG
Wet Weather CSOs	2332	1575.500	MG
Other Causes		644	
Public system		36	

Updated: January 25, 2011

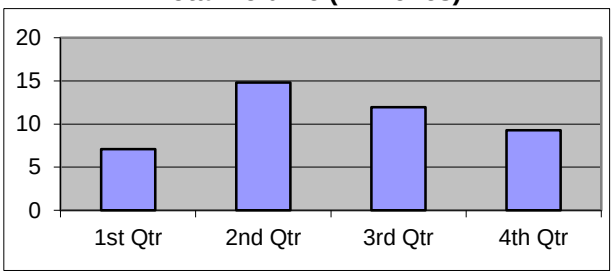
Cumulative Overflow Data
January 1, 2009 through December 31, 2009

Rainfall

Total Occurrences

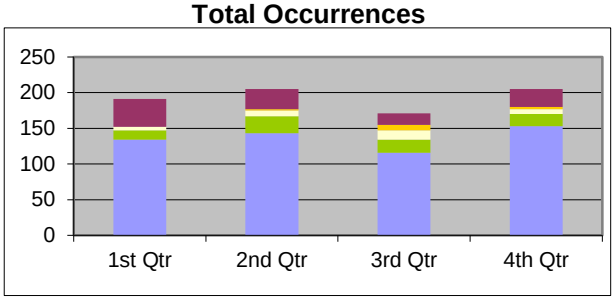


Total Volume (In Inches)

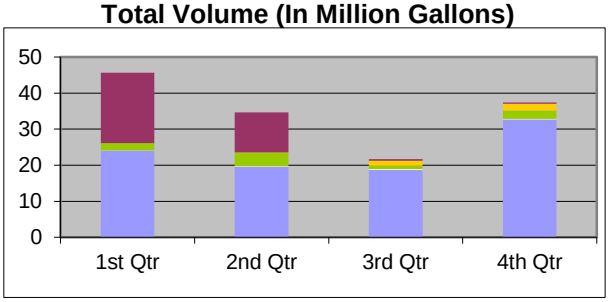


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



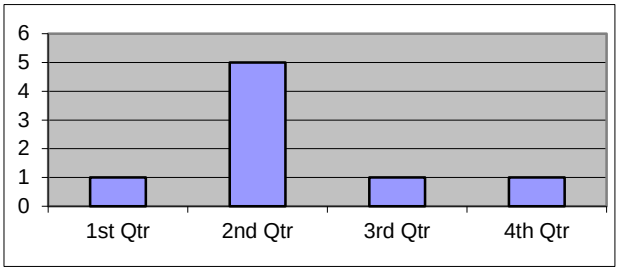
Total Volume (In Million Gallons)



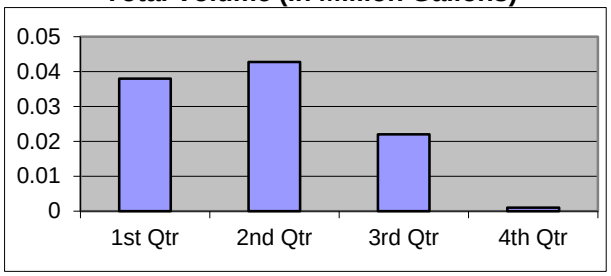
Recurring WW SSOs
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
Inactive WW Overflows
SSOs Due to Operational Issues

Dry Weather CSOs

Total Occurrences

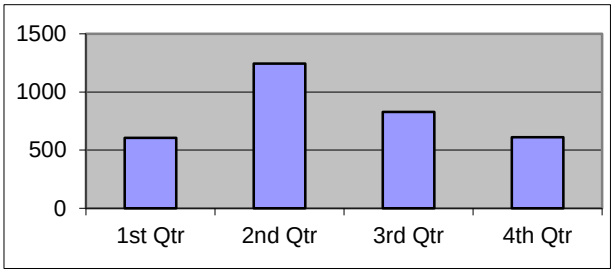


Total Volume (In Million Gallons)

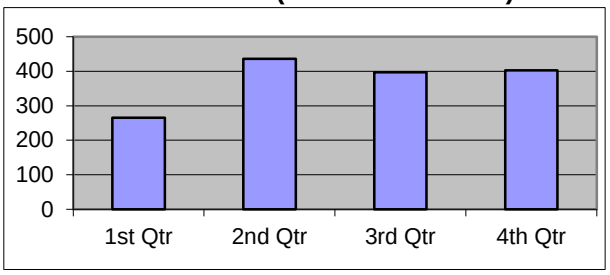


Wet Weather CSOs

Total Occurrences

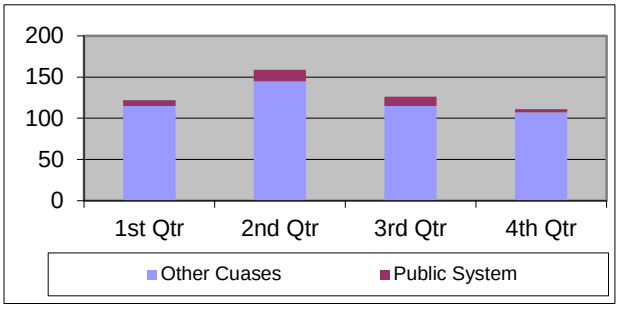


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



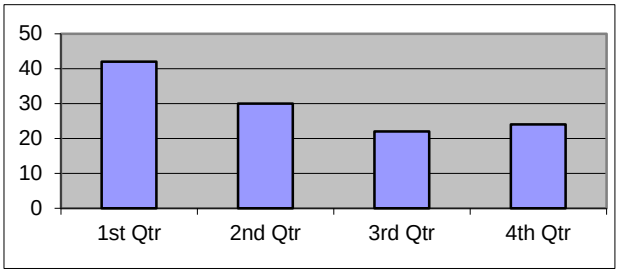
2009 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	141	43.11	inches
Recurring WW SSOs	651	105	MG
Inactive WW SSOs	13	3	MG
Operational SSOs	108	31	MG
Dry Weather CSOs	8	0.104	MG
Wet Weather CSOs	3289	1,502	MG
Other Cuases		482	
Public System		36	

Updated January 29, 2010

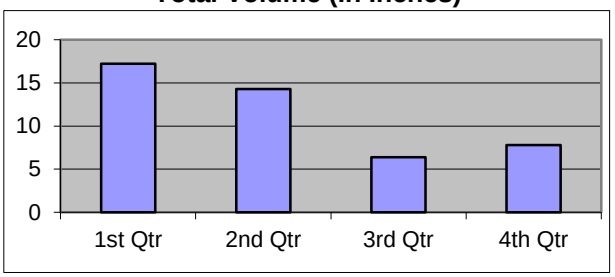
Cumulative Overflow Data
January 1, 2008 through December 31, 2008

Rainfall

Total Occurrences

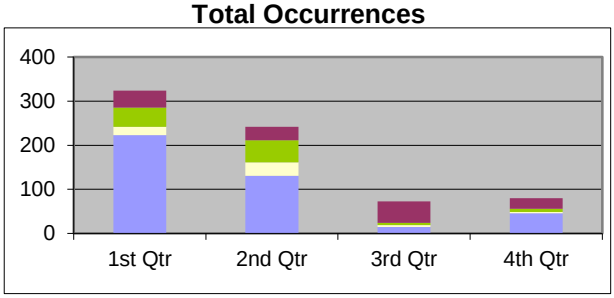


Total Volume (In Inches)

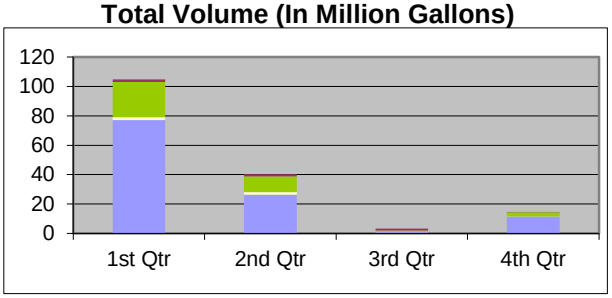


SSOs - Due to Wet Weather (WW) and Operational Issues

Total Occurrences



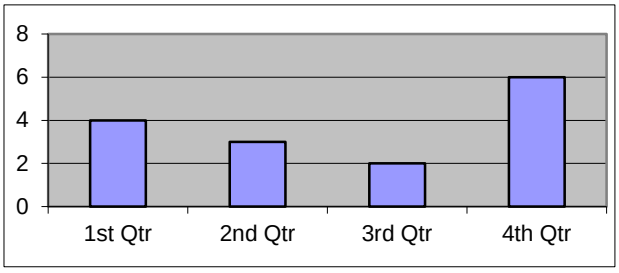
Total Volume (In Million Gallons)



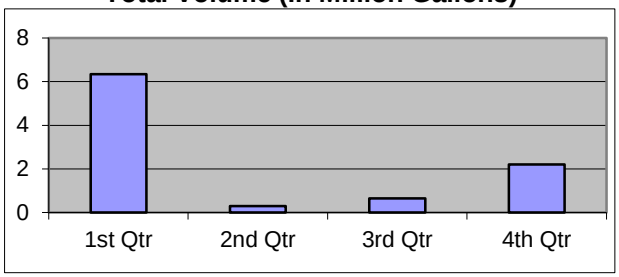
Recurring WW CD Pump Station Overflows
Recurring WW Other Pump Station Overflows
SSOs Due to Operational Issues
Recurring WW SSOs

Dry Weather CSOs

Total Occurrences

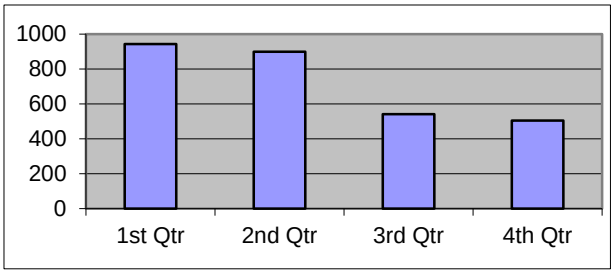


Total Volume (In Million Gallons)

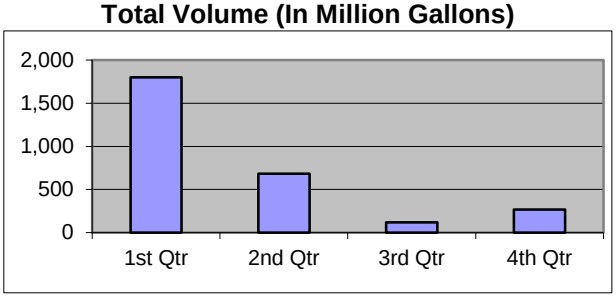


Wet Weather CSOs

Total Occurrences

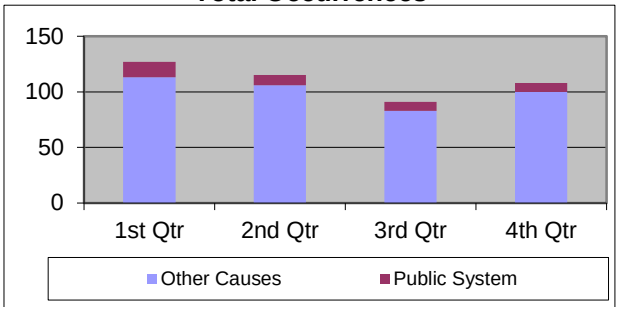


Total Volume (In Million Gallons)



Building Backups

Total Occurrences



2008 Overflow Summary			
	Occurrences	**Volume**	
Rainfall	118	45.66	inches
Recurring WW SSOs	576	158	MG
Inactive WW SSOs	N/A	N/A	
Operational SSOs	143	5	MG
Dry Weather CSOs	15	9	MG
Wet Weather CSOs	2888	2,869	MG
Other Causes		402	
Public System		39	

Updated January 29, 2010

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	3.96
2	0020007	Silver Grove	Campbell	7	0.25
3	0020008	Unicorp Campbell County	Campbell	7	0.17
4	0020031	Unicorp Campbell County	Campbell	2	0.09
5	0020032	Unicorp Campbell County	Campbell	2	0.01
6	0040003	Fort Thomas	Campbell	2	0.05
7	0050022	Fort Thomas	Campbell	2	0.16
8	0060001	Unicorp Campbell County	Campbell	2	0.22
9	0060002	Unicorp Campbell County	Campbell	2	0.02
10	0060004	Unicorp Campbell County	Campbell	2	0.08
11	0070044	Highland Heights	Campbell	0	0.00
12	0100002	Highland Heights	Campbell	4	0.36
13	0100003	Highland Heights	Campbell	2	0.15
14	0110002	Fort Thomas	Campbell	1	0.00
15	0110010	Highland Heights	Campbell	7	0.36
16	0120019	Highland Heights	Campbell	0	0.00
17	0150009	Wilder	Campbell	5	1.42
18	0150024	Southgate	Campbell	0	0.00
19	0150063	Wilder	Campbell	0	0.00
20	0150064	Wilder	Campbell	0	0.00
21	0150065	Wilder	Campbell	0	0.00
22	0150085	Fort Thomas	Campbell	0	0.00
23	0150086	Fort Thomas	Campbell	6	1.02
24	0150087	Fort Thomas	Campbell	1	0.01
25	0150356	Southgate	Campbell	0	0.00
26	0200003	Fort Thomas	Campbell	0	0.00
27	0220035	Southgate	Campbell	0	0.00
28	0220056	Fort Thomas	Campbell	1	0.02
29	0220058	Fort Thomas	Campbell	0	0.00
30	0220086	Southgate	Campbell	0	0.00
31	0230011	Fort Thomas	Campbell	0	0.00
32	0230016	Fort Thomas	Campbell	0	0.00
33	0250002	Fort Thomas	Campbell	0	0.00
34	0260001	Fort Thomas	Campbell	0	0.00
35	0270026	Fort Thomas	Campbell	2	0.05
36	0270062	Fort Thomas	Campbell	0	0.00
37	0270103	Fort Thomas	Campbell	0	0.00
38	0280001	Fort Thomas	Campbell	0	0.00
39	0280073	Fort Thomas	Campbell	0	0.00
40	0300035	Fort Thomas	Campbell	3	0.01
41	0330005	Fort Thomas	Campbell	0	0.00
42	0360004	Dayton	Campbell	0	0.00
43	0380005	Fort Thomas	Campbell	3	0.03
44	0390007	Fort Thomas	Campbell	0	0.00

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
45	0400002	Fort Thomas	Campbell	6	0.22
46	0400017	Fort Thomas	Campbell	0	0.00
47	0410010	Fort Thomas	Campbell	4	0.09
48	0410019	Fort Thomas	Campbell	3	0.10
49	0410036	Fort Thomas	Campbell	0	0.00
50	0440074	Fort Thomas	Campbell	0	0.00
51	0530083	Newport	Campbell	6	0.29
52	0860001	Wilder	Campbell	12	19.47
53	0860003	Wilder	Campbell	0	0.00
54	0860016	Wilder	Campbell	0	0.00
55	1010002	Fort Thomas	Campbell	0	0.00
56	1010025	Fort Thomas	Campbell	2	0.01
57	1010027	Fort Thomas	Campbell	0	0.00
58	1040060	Independence	Kenton	0	0.00
59	1090069	Edgewood	Kenton	4	0.01
60	1110025	Erlanger	Kenton	2	0.01
61	1110051	Erlanger	Kenton	2	0.16
62	1110067	Erlanger	Kenton	3	0.38
63	1110161	Erlanger	Kenton	2	0.02
64	1110164	Erlanger	Kenton	2	0.02
65	1110174	Elsmere	Kenton	2	0.01
66	1110275	Elsmere	Kenton	0	0.00
67	1110294	Erlanger	Kenton	3	0.08
68	1190012	Erlanger	Kenton	4	0.84
69	1220016	Erlanger	Kenton	2	0.05
70	1220054	Erlanger	Kenton	3	0.86
71	1240008	Erlanger	Kenton	6	0.38
72	1240012	Erlanger	Kenton	1	0.01
73	1550053	Fort Mitchell	Kenton	0	0.00
74	1560016	Fort Mitchell	Kenton	0	0.00
75	1560019	Fort Mitchell	Kenton	0	0.00
76	1560074	Fort Mitchell	Kenton	0	0.00
77	1560092	Fort Mitchell	Kenton	0	0.00
78	1570025	Fort Mitchell	Kenton	1	0.09
79	1600029	Lakeside Park	Kenton	0	0.00
80	1600050	Lakeside Park	Kenton	0	0.00
81	1610102	Fort Mitchell	Kenton	2	0.48
82	1690043	Fort Wright	Kenton	2	0.02
83	1690072	Fort Wright	Kenton	0	0.00
84	1700008	Covington	Kenton	0	0.00
85	1700025	Park Hills	Kenton	0	0.00
86	1730103	Fort Mitchell	Kenton	2	0.16
87	1750076	Independence	Kenton	0	0.00
88	1760047	Edgewood	Kenton	4	0.81
89	1760048	Edgewood	Kenton	4	0.71
90	1790003	Crescent Springs	Kenton	2	0.01
91	1830020	Unicorp Boone County	Boone	0	0.00
92	1830067	Unicorp Boone County	Boone	0	0.00
93	1850140	Covington	Kenton	2	0.01

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
94	1850141	Covington	Kenton	6	0.28
95	1860108	Taylor Mill	Kenton	0	0.00
96	1870013	Covington	Kenton	0	0.00
97	1870014	Covington	Kenton	0	0.00
98	1920086	Cold Spring	Campbell	2	0.00
99	1920097	Cold Spring	Campbell	2	0.05
100	1940006	Fort Wright	Kenton	4	0.80
101	1950014	Fort Wright	Kenton	4	2.33
102	1950232	Fort Wright	Kenton	0	0.00
103	1960002	Fort Wright	Kenton	5	1.33
104	1990018	Covington	Kenton	0	0.00
105	1990028	Covington	Kenton	1	0.28
106	1990032	Unicorp Kenton County	Kenton	0	0.00
107	2040040	Edgewood	Kenton	0	0.00
108	2070019	Elsmere	Kenton	2	0.58
109	2090008	Elsmere	Kenton	6	0.90
110	2100002	Elsmere	Kenton	2	0.24
111	2100007	Elsmere	Kenton	0	0.00
112	2100036	Elsmere	Kenton	2	0.08
113	2100037	Elsmere	Kenton	1	0.01
114	2100057	Elsmere	Kenton	2	0.07
115	2100106	Elsmere	Kenton	2	0.66
116	2100126	Elsmere	Kenton	2	0.09
117	2100128	Elsmere	Kenton	0	0.00
118	2100129	Elsmere	Kenton	4	3.01
119	2110001	Elsmere	Kenton	4	0.52
120	2110002	Elsmere	Kenton	2	0.38
121	2110006	Elsmere	Kenton	1	0.02
122	2120001	Elsmere	Kenton	2	0.12
123	2120041	Elsmere	Kenton	2	0.06
124	2130027	Erlanger	Kenton	2	0.20
125	2130286	Erlanger	Kenton	2	0.01
126	2150050	Crestview Hills	Kenton	0	0.00
127	2160004	Fort Mitchell	Kenton	3	0.02
128	2160005	Fort Mitchell	Kenton	3	0.01
129	2170006	Crestview Hills	Kenton	3	0.33
130	2170008	Crestview Hills	Kenton	2	0.09
131	2170013	Lakeside Park	Kenton	1	0.02
132	2170097	Crestview Hills	Kenton	2	0.03
133	2280010	Unicorp Kenton County	Kenton	0	0.00
134	2280011	Unicorp Kenton County	Kenton	4	0.25
135	2280016	Independence	Kenton	3	0.27
136	2290001	Crescent Springs	Kenton	1	0.06
137	2300016	Erlanger	Kenton	0	0.00
138	2300019	Erlanger	Kenton	4	0.67
139	2300121	Independence	Kenton	5	3.30
140	2300123	Unicorp Kenton County	Kenton	6	2.71
141	2301219	Erlanger	Kenton	5	5.73
142	2301274	Erlanger	Kenton	0	0.00
143	2360024	Unicorp Boone County	Boone	0	0.00

Recurring Wet Weather SSOs					
No.	**MHID**	**City**	**County**	**Model Predicted Overflow Activations**	**Model Predicted Overflow Volume (MG)**
144	2410387	Unicorp Boone County	Boone	2	0.11
145	0150399	Wilder	Campbell	7	1.01
146	0270020	Fort Thomas	Campbell	0	0.00
147	0360074	Dayton	Campbell	0	0.00
148	0370001	Fort Thomas	Campbell	1	0.02
149	0370009	Fort Thomas	Campbell	0	0.00
150	0400034	Fort Thomas	Campbell	0	0.00
151	0430006	Newport	Campbell	6	0.10
152	0490039	Newport	Campbell	0	0.00
153	0500047	Newport	Campbell	2	0.03
154	0870037	Covington	Kenton	3	0.74
155	1110226	Elsmere	Kenton	0	0.00
156	1120029	Erlanger	Kenton	0	0.00
157	1190001	Erlanger	Kenton	2	0.01
158	1210018	Erlanger	Kenton	0	0.00
159	1230019	Erlanger	Kenton	0	0.00
160	1230036	Erlanger	Kenton	0	0.00
161	1560102	Fort Mitchell	Kenton	0	0.00
162	1610053	Fort Mitchell	Kenton	0	0.00
163	1610054	Fort Mitchell	Kenton	0	0.00
164	1700006	Ludlow	Kenton	2	0.03
165	1730100	Crescent Springs	Kenton	2	0.10
166	1770062	Erlanger	Kenton	0	0.00
167	1930007	Southgate	Campbell	2	0.03
168	2020035	Taylor Mill	Kenton	4	0.64
169	2020203	Covington	Kenton	4	0.07
170	2090063	Elsmere	Kenton	1	0.08
171	2130026	Erlanger	Kenton	0	0.00
172	2130028	Erlanger	Kenton	0	0.00
173	2150090	Crestview	Campbell	0	0.00
174	2160006	Fort Mitchell	Kenton	2	0.00
175	2350173	Unicorp Kenton County	Kenton	0	0.00
176	2370003	Unicorp Boone County	Boone	3	0.21
177	2390002	Unicorp Boone County	Boone	1	0.07
178	2400001	Unicorp Boone County	Boone	1	0.02
179	2450001	Alexandria	Campbell	0	0.00
			TOTAL	307	62.51

Threshold for model activation is 0.01 MGD and 0.001 MG

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	7	0.75
2	0030031	KY0021466 - Outfall 10	0	0.00
3	0200069	KY0021466 - Outfall 11	6	0.30
4	0330100	KY0021466 - Outfall 12	0	0.00
5	0340050	KY0021466 - Outfall 14	6	0.18
6	0340051	KY0021466 - Outfall 13	6	0.09
7	0360079	To Be Permitted	6	0.84
8	0540009	To Be Permitted	9	0.26
9	0540044	To Be Permitted	8	0.26
10	0540158	To Be Permitted	1	0.01
11	0550134	To Be Permitted	1	0.02
12	0570089	KY0021466 - Outfall 16	3	6.02
13	0570090	KY0021466 - Outfall 17	1	0.14
14	0600094	KY0021466 - Outfall 18	8	0.40
15	0600096	To Be Permitted	5	0.04
16	0600097	KY0021466 - Outfall 19	7	1.18
17	0600104	To Be Permitted	1	0.00
18	0610071	KY0021466 - Outfall 21	10	10.18
19	0610072	KY0021466 - Outfall 20	4	0.17
20	0620075	KY0021466 - Outfall 23	13	2.61
21	0620077	KY0021466 - Outfall 22	7	0.08
22	0630054	To Be Permitted	0	0.00
23	0630061	KY0021466 - Outfall 83	6	0.47
24	0640090	KY0021466 - Outfall 24	16	78.83
25	0650054	To Be Permitted	0	0.00
26	0650090	KY0021466 - Outfall 26	6	2.24
27	0650098	To Be Permitted	6	6.70
28	0650100	KY0021466 - Outfall 25	4	0.04
29	0660085	To Be Permitted	0	0.00
30	0690059	To Be Permitted	0	0.00
31	0690067	To Be Permitted	0	0.00
32	0730129	To Be Permitted	18	0.58
33	0770096	KY0021466 - Outfall 28	8	0.70
34	0790084	KY0021466 - Outfall 31	21	4.59
35	0790086	KY0021466 - Outfall 29	19	22.36
36	0840111	To Be Permitted	0	0.00
37	0840112	To Be Permitted	11	1.11
38	0840116	KY0021466 - Outfall 27	17	2.10
39	0870078	KY0021466 - Outfall 33	2	0.41
40	0870079	KY0021466 - Outfall 34	21	11.50
41	0880081	KY0021466 - Outfall 36	22	9.73
42	0880082	KY0021466 - Outfall 35	4	0.57
43	0890081	To Be Permitted	0	0.00
44	0910065	KY0021466 - Outfall 38	19	76.50
45	0910066	To Be Permitted	0	0.00
46	0910068	KY0021466 - Outfall 37	11	22.14
47	0910084	To Be Permitted	6	0.25

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
48	0930102	KY0021466 - Outfall 43	0	0.00
49	0930103	KY0021466 - Outfall 42	2	0.01
50	0930104	KY0021466 - Outfall 40	2	0.00
51	0930105	KY0021466 - Outfall 41	17	8.00
52	0930106	KY0021466 - Outfall 39	0	0.00
53	0960063	KY0021466 - Outfall 45	4	0.46
54	0960064	KY0021466 - Outfall 44	1	0.00
55	0980073	KY0021466 - Outfall 46	4	0.05
56	0980080	KY0021466 - Outfall 47	1	0.00
57	0980081	KY0021466 - Outfall 48	21	18.56
58	1320112	To Be Permitted	0	0.00
59	1350155	KY0021466 - Outfall 49	1	0.01
60	1380132	To Be Permitted	4	0.07
61	1380146	To Be Permitted	0	0.00
62	1420141	KY0021466 - Outfall 50	8	0.23
63	1420142	KY0021466 - Outfall 51	22	28.04
64	1420144	KY0021466 - Outfall 52	0	0.00
65	1420145	KY0021466 - Outfall 53	0	0.00
66	1420146	KY0021466 - Outfall 54	0	0.00
67	1420147	KY0021466 - Outfall 55	1	0.03
68	1440204	KY0021466 - Outfall 59	3	0.01
69	1440206	KY0021466 - Outfall 61	10	0.92
70	1440207	To Be Permitted	0	0.00
71	1440209	KY0021466 - Outfall 56	26	34.95
72	1440508	KY0021466 - Outfall 60	3	0.12
73	1470089	KY0021466 - Outfall 62	2	0.15
74	1470093	KY0021466 - Outfall 63	10	22.82
75	1480185	To Be Permitted	8	0.84
76	1480187	KY0021466 - Outfall 30	18	184.91
77	1490132	KY0021466 - Outfall 65	5	0.66
78	1490172	KY0021466 - Outfall 64	0	0.00
79	1500131	KY0021466 - Outfall 66	10	2.97
80	1510133	To Be Permitted	0	0.00
81	1710114	KY0021466 - Outfall 69	4	0.20
82	1710116	KY0021466 - Outfall 68	13	6.20
83	1710119	KY0021466 - Outfall 70	7	3.12
84	1710121	KY0021466 - Outfall 71	7	1.53
85	1710124	KY0021466 - Outfall 72	7	2.22
86	1720109	KY0021466 - Outfall 73	11	8.16
87	1730259	KY0021466 - Outfall 75	7	1.34
88	1730262	To Be Permitted	2	0.01
89	1730263	KY0021466 - Outfall 74	10	1.20
90	1840130	To Be Permitted	7	0.45
91	1850158	KY0021466 - Outfall 76	27	20.45
92	1870193	KY0021466 - Outfall 78	8	0.70
93	1870194	KY0021466 - Outfall 79	4	0.05
94	1880090	KY0021466 - Outfall 81	5	3.08

Wet Weather CSOs				
No.	CSO ID	KPDES Permit #	Model Predicted Activations	Model Predicted Overflow Volume (MG)
95	1880091	KY0021466 - Outfall 80	5	1.00
		TOTAL	633	617.87

Threshold for model activation is 0.01 MGD and 0.001 MG

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APPENDIX F:

Map of Western Regional Impacts on 2013 SSO Volumes

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Western Regional Impacts
Wet-Weather SSO Volume Savings for 2013

Model Predicted Wet-Weather SSO Volume	
Pre-Western Regional	Post-Western Regional
267.2 MG	163.3 MG