



KANSAS CITY'S OVERFLOW CONTROL PROGRAM

ANNUAL REPORT

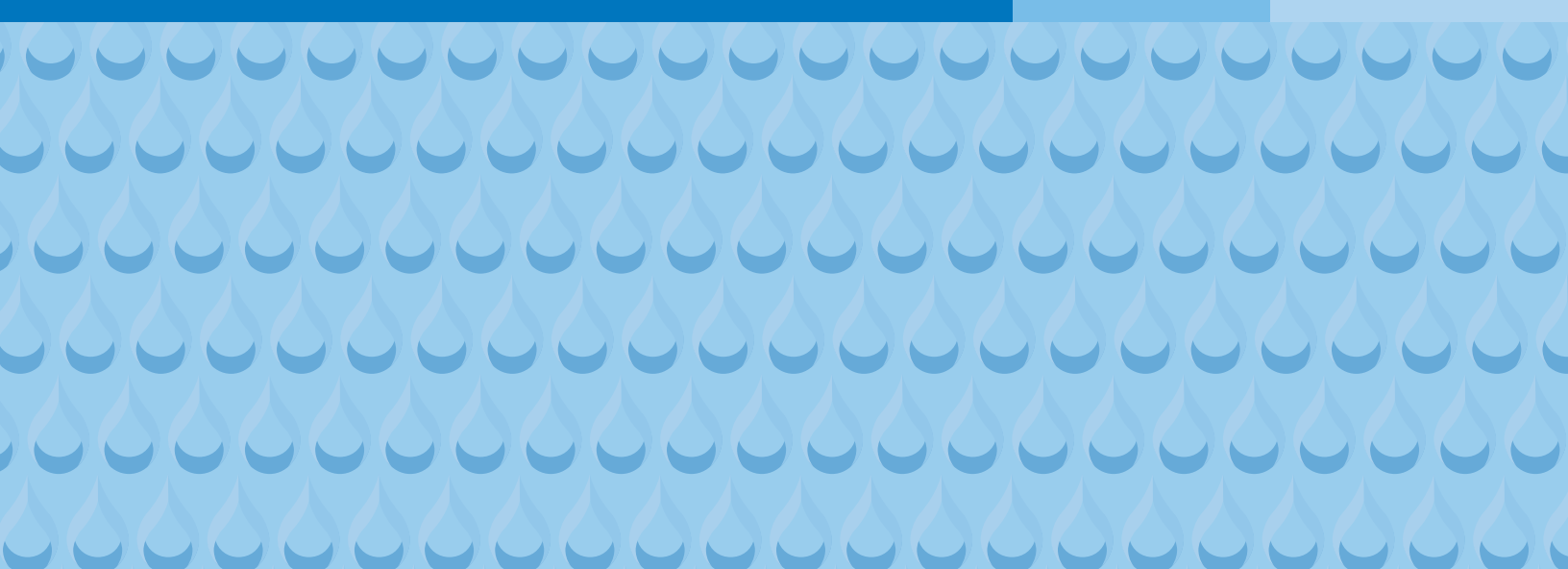
Reporting Period: January 1 to December 31, 2015



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I. ANNUAL REPORT PURPOSE AND SCOPE

On September 27, 2010, The United States District Court for the Western District of Missouri entered a consent decree in the case U.S. vs. The City of Kansas City, Missouri. The Consent Decree was amended by the parties and approved by the court on January 9, 2015. This Annual Report is submitted in accordance with Section IX.B of the Consent Decree and reflects the status of program implementation that occurred between January 1, 2015 and December 31, 2015.

In accordance with the Consent Decree's Section IX.A, this Annual Report also includes Kansas City's Semi-Annual Report on the progress of implementing control measures defined in Appendix A of the Consent Decree, as well as all other related activities.

II. KANSAS CITY'S OVERFLOW CONTROL PROGRAM

Individual elements of the City's Overflow Control Plan (Plan) became part of an enforceable document with the entry of a Consent Decree in United States District Court. The Consent Decree is a culmination of nearly a decade of negotiation between the City, U.S. Environmental Protection Agency (USEPA) and the Missouri Department of Natural Resources (MDNR) related to reducing overflows. The Consent Decree includes requirements for capital construction, management, operations and maintenance of the City's sewer systems.

The City and its regulatory partners have agreed to meet the objectives over a 25-year period from 2010 through 2035. The Plan involves a list of improvements that are structured to eliminate, or capture for treatment, approximately 88 percent of total wet weather flow in the combined sewer system and sanitary sewer overflows during a five-year, 24-hour rainfall event. This implementation is referred to as the Overflow Control Program (OCP).

The occurrence of combined sewer overflows is not uncommon in combined sewer systems and is authorized pursuant to the terms of two of the City's National Pollutant Discharge Elimination System (NPDES) permits (Westside WWTP and Blue River WWTP). NPDES permits are issued by MDNR to Kansas City and implemented by the Water Services Department (Water Services) at each treatment facility. Consent Decree components include:

- Capital projects targeted at reducing overflows through Combined Sewer Overflow (CSO) Control Measures and Separate Sewer Overflow (SSO) Control Measures;
- Nine Minimum Controls (NMCs) Plan targeted at operationally reducing and addressing combined sewer overflows through a series of minimum control efforts;
- Capacity, Management, Operation and Maintenance (CMOM) Plan targeted at reducing separate sewer system overflows by adequately operating and maintaining the sewer system;
- Post-Construction Monitoring Plan aimed at long-term monitoring and assessment of overflow reduction;
- Supplemental Environmental Project (SEP) Plan which includes the incorporation of best management practices and green infrastructure at two project locations, along with the initial SEP to reduce septic tank use in the sewered areas; and
- Implementation of disinfection at all six wastewater treatment plants.

III. KANSAS CITY'S SEWER SYSTEM OVERVIEW

Kansas City began building the basic sewer infrastructure that would allow the city to grow and prosper more than 150 years ago. Some of that infrastructure is still in use today.

Kansas City's overall sanitary sewer system comprises both combined and separate sewer systems totaling approximately 350 square miles. The combined sewer system consists of 58 square miles, primarily located in the oldest areas of the City. During moderate to heavy rainfall events, the system will reach capacity, overflow, and discharge a mixture of wastewater and rainwater directly to receiving streams and rivers. By implementing control measures in accordance with Kansas City's Consent Decree the occurrence of overflows will be reduced over time.

The remaining 292 square miles of Kansas City's sanitary sewer system are a separate system. A separate sanitary sewer system is only intended to collect and convey wastewater. Rainwater can enter the system, however, through leaky sewer pipe joints, broken sewer pipes, manholes, and illicit stormwater direct connections causing the system to overload during rainfall events. When this system exceeds its capacity, it too overflows a mixture of wastewater and rainwater. Kansas City does have one constructed sanitary sewer overflow (SSO) which is being eliminated as part of the Overflow Control Program.

IV. REPORTING PERIOD ACTIVITY

The following specific milestones, as laid forth in Consent Decree Appendices A and D, were met during the reporting period from January 1, 2015, through December 31, 2015. Work also continued on several other projects that began in previous reporting periods, including the continuation of inflow/infiltration reduction activities in areas north and south of the Missouri River. To-date, all Consent Decree schedule milestone dates have been met.

Activities performed during the reporting period associated with Nine Minimum Controls (NMC) and Capacity, Management, Operations and Maintenance (CMOM) as laid forth in Consent Decree Appendices B and C, respectively, are documented in this annual report and in accordance with Section IX.B. Requirements for NMC and CMOM were met for the reporting period.

1. Appendix A – Performance Measures

Northeast Industrial District Basin

- Green Infrastructure Pilot Project
 - Consent Decree Required Start Date – 2015
 - Actual Start Date – 2015

Middle Blue River Basin

- Relief Sewer: Diversion Structure 068 to Blue River Project
 - Consent Decree Required Start Date – 2017
 - Actual Start Date – 2015

Turkey Creek/Central Industrial District Basin

- OK Creek In-Line Storage Gates Project
 - Consent Decree Required Start Date – 2015
 - Actual Start Date – 2015

- Green Infrastructure Pilot Project
 - Consent Decree Required Start Date – 2015
 - Actual Start Date – 2015

Westside WWTP

- No-Feasible Alternative Analysis was submitted to and approved by USEPA in 2015

2. Appendix D – Post Construction Monitoring Program

Implement Flow Monitoring Program for the outfalls listed below. Flow monitoring was performed in accordance with the revised CSS Metering Plan approved by USEPA in December 2015.

- Outfall BR032 (started)
- Outfall BR033 – two meters (started)
- Outfall BR056 (started)
- Outfalls BR061-064, 066-067 (suspended)
- Outfall BR071-077 (suspended)
- Outfall W003 (suspended)
- Outfall W002 (suspended)

V. DATA MANAGEMENT AND PROJECT CONTROLS

Managing the large amount of data generated by OCP is a primary focus of Kansas City Water Services. In 2015, Water Services continued to increase and diversify the functionality of its Management Information System (MIS) to capture data pertaining to work activities, schedules, and budgets for all OCP projects. The MIS is currently being used to create and update project status reports, provide program financial summary information, and develop trends and forecast projections related to project costs and schedule information.

Also in 2015, Water Services expanded its schedule management practices utilizing Primavera scheduling tools. These practices enable staff members to more readily identify and update project schedule information more accurately, recognize potential project challenges and enhance project team coordination. The result of these proactive, problem-solving efforts is to reduce situations that threaten project scope, schedule, budget, and risk profile.

Another major effort undertaken during the reporting period was the accumulation of data related to sewer system network characterizations, manhole inspections, sewer cleaning, and CCTV work in eight basins throughout the City. Several terabytes of data were collected related to this work, and in 2015, Water Services began the process of storing this data in a virtual cloud. Water Services has also organized, categorized and distributed this information to design professionals involved with implementing projects associated with the program.

Updating the quality of the data associated with the program was another major initiative undertaken during the reporting period. For example, as CCTV information in the project areas was collected, that data was subjected to an extensive quality control process before it was associated with the department's GIS information. These updates improved the quality of GIS information to provide more accurate accounting of where system assets are located. At the end of 2015, data for six of the nine projects basins had been through this process and were incorporated into the city's GIS platform.

A final major data management initiative undertaken was the development of an application and website associated with the program's Private I/I Reduction Program. These data tools will enable design professionals performing private property building plumbing evaluations to record inspection information and schedule appointments with citizens who are eligible for the disconnection of prohibited I/I sources. At the end of the reporting period, the application was being tested by design firms involved with the Private I/I Reduction Program; it is scheduled to go live as the program goes forward in 2016.

VI. PUBLIC OUTREACH

A summary of public outreach activities for the City's OCP program completed between January 1 and December 31, 2015, is provided below. Additional information regarding these activities is in the discussion of NMC 7, which begins on page 30 in this report.

- Made 22 presentations to more than 900 citizens and stakeholders about OCP at neighborhood meetings, conferences, and workshops.
- Conducted 19 public meetings for approximately 275 citizens about OCP projects, which are discussed in more detail later in this report.
- Published OCP-related information on the Water Services website.

VII. IMPLEMENTATION OF OVERFLOW CONTROL MEASURES

a. Post-Construction Monitoring Program

Post-construction monitoring activities completed in 2015, as defined in Appendix D of the Consent Decree, are outlined later in this report beginning on page 65.

b. Green Infrastructure

i. **ADDITIONAL GREEN INFRASTRUCTURE PILOT**

Conceptual planning began in 2014 for an additional green infrastructure pilot project in Kansas City's 3rd Council District, which includes portions of the Northeast Industrial District basin. The design professional received a Notice to Proceed for this project in August 2015. Preliminary design is expected to complete in early 2016.

The project will demonstrate collaboration achieved through public-private partnerships. The locations of the proposed projects are:

- East High School
- Veterans Hospital and Linwood Green Park
- Avenues of Life Mattress Recycling Center

Each of the sites has been evaluated, and recommendations on the types and functions of green infrastructure that can be implemented were submitted to Water Services in December 2015. These green pilot locations will be evaluated further and one or more sites selected for advancement to preliminary and final design in 2016.

ii. **CONSENT DECREE GREEN INFRASTRUCTURE PROJECTS**

During the reporting period, Water Services made progress on two additional green infrastructure pilot projects required by the Consent Decree located in the Northeast Industrial District and the Turkey Creek/Central Industrial District basins. Water Services issued an RFQ/P in December 2015 for the projects.

See Table 1 that starts on page 9 for more information.

iii. **MIDDLE BLUE RIVER BASIN GREEN SOLUTIONS PILOT PROJECT**

In November 2015, Water Services completed administration of a three-year maintenance service contract in the pilot project area. Water Services' in-house green solutions maintenance crew assumed care of the maintenance work once the contract ended. The crew will provide a similar level of service to the original contract for a one-year trial period. Depending on the outcome of the trial period, the maintenance work may continue with Water Services' crew or be contracted out.

c. Compliance with Permits

The City strives to maintain compliance at all times with its current permits as they relate to the capacity of the WWTPs, capacity, management, operation and maintenance of the collection system and the stormwater system.

i. MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT

Part IV.B of the Missouri State Operating Permit MO-0130516 requires the City of Kansas City, Missouri to provide written notice of compliance or non-compliance with the schedule for permit implementation. The City submits yearly reports, with the most recent report covering the period of May 1, 2014 through April 30, 2015. The report documents the status of implementing the components of the stormwater management programs that are established as permit conditions and addresses the progress of required programs. As detailed in the latest report dated December 23, 2015, the City is in compliance for all interim milestones and final deadlines as identified in the permit schedule (Permit Part IV.A). The latest report is included in *Attachment B* of this report.

ii. DISCHARGE REPORTS

A collection of the required discharge monitoring reports for the wastewater treatment plants submitted to MDNR during 2015 is included in *Attachment A* of this annual report. The Wastewater Treatment and Wastewater Line Maintenance Divisions of the Water Services Department submitted these reports. These reports are a part of the Missouri State Operating Permits MO-0024911, MO-0024929, MO-0024961, MO-0048305, MO-0049531, and MO-0048313.

iii. MONTHLY OPERATING REPORTS

The City's Monthly Operating Reports, submitted as part of the City's current NPDES permits, are included in *Attachment B* of this annual report.

VIII. COMBINED SEWER OVERFLOW CONTROL MEASURES – APPENDIX A

Combined sewer systems (CSS) make up approximately 58 square miles running from the Missouri/Kansas state line on the west, 85th Street on the south, the Blue River on the east, and the Missouri River on the north. The area served by the CSS is subdivided into six principal basins: Brush Creek, Lower Blue River, Middle Blue River, Northeast Industrial District, Town Fork Creek, and Turkey Creek/Central Industrial District.

Field investigation activities for two neighborhood sewer rehabilitation projects are being completed through a Water Services OCP Program Management contract and city-wide sewer cleaning and closed circuit television (CCTV) inspection contract. The work consists of sewer system network characterization and manhole inspections, sewer cleaning, and CCTV inspection of sanitary sewers in the Brush Creek and Town Fork Creek combined sewer system basins. Field investigation activities are also being completed in the separate sewer system basins.

The City's 25-year Overflow Control Program is being implemented in three phases, each with a primary control strategy. The early years of the program include repairs to the existing sewer systems and pilot projects focused on developing and evaluating green infrastructure solutions. The middle years of the program will focus on maximizing the capacity within the existing system and analyzing the results of source volume reductions and pilot projects. The later years of the program will address necessary improvements to the City's wastewater treatment plants and construction of structural storage solutions which are currently planned as deep storage tunnels.

The status of the projects in the combined sewer system basins is summarized in *Table 1*. The combined sewer system has 18 active projects. Three (3) projects are currently in pre-design, meaning that the Request for Proposal/Qualification is in development. Eleven (11) projects are currently in design, and four (4) projects are bidding for construction contracts or construction is underway.

Table 1: Project Status - Combined Sewer System Basin (through December 31, 2015)

COMBINED SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015 Planned Completion Date			
<i>Brush Creek Basin</i>					
Neighborhood Sewer Rehabilitation	Neighborhood sewer rehabilitation work in the Brush Creek Basin has been split into two projects due to the size of the basin. These projects are being implemented to improve the reliability and performance of the combined sewer collection system and reduce basement backups. These projects involve identification of sewer system defects and the preparation of construction contract documents to rehabilitate sewer pipes that are 12-inches and smaller in diameter within the collection system.	100%	<u>15%</u> Feb. 2017	June 2019	12/31/2020
<i>Middle Blue River Basin</i>					
Distributed Storage: Outfall 059	Green infrastructure solutions are being implemented to reduce combined sewer overflows at Outfall 059. Three construction contracts have been issued for completion of the work.	100%	<u>100%</u> Sept. 2015	<u>Bidding</u> Sept. 2017	12/31/2017
Distributed Storage: Outfall 069	Green infrastructure solutions are being implemented to reduce combined sewer overflows at Outfall 069. Three construction contracts have been issued for completion of the work.	100%	<u>100%</u> Oct. 2015	<u>10%</u> Sept. 2017	12/31/2017
Neighborhood Sewer Rehabilitation	This project is being implemented to improve the reliability and performance of the combined sewer collection system and reduce basement backups. Two construction contracts have been issued for rehabilitation of manholes and sewer pipes that are 12-inches and smaller in diameter within the collection system.	100%	<u>100%</u> Jan. 2015	<u>35%</u> June 2017	12/31/2017
Sewer Consolidation: Outfall 063	The project involves the consolidation of piping, disconnection of inlets from the combined sewer system, and elimination of 15 of 18 diversion structures. The overall goal is to eliminate typical year overflows at Outfall 063 and reduce the number of overflows at Outfall 064. The project scope has been expanded to achieve total separation of storm inlets and sanitary sewers and integration of water main replacement work.	100%	<u>90%</u> Feb. 2016	Dec. 2017	12/31/2017

COMBINED SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015 Planned Completion Date			
<i>Middle Blue River Basin, continued</i>					
Sewer Separation: Outfalls 066 and 067	Design documents are being prepared for separation of approximately 270 acres of the combined system. The Consent Decree does not mandate separation of combined sewers upstream of Outfall 066; however this 10-acre area was added to the Project because of its proximity to Outfall 067, its small size, and the relatively small number of known stormwater inflow connections. Upon completion of separation work, both outfalls will become stormwater outfalls only.	100%	<u>35%</u> Dec. 2016	May 2019	12/31/2019
Sewer Separation: Diversion Structure 099	Design documents are being prepared for separation of 50-acres of combined sewers upstream of Diversion Structure 099. Green infrastructure best management practices (BMPs) have been incorporated to improve water quality of the separated stormwater flows. As a result of this project, Diversion Structure 099 will be eliminated. This project will be combined with the adjacent Sewer Consolidation: Outfall 063 project into a single construction project.	100%	<u>90%</u> Feb. 2016	Dec. 2017	12/31/2017
Relief Sewer: Diversion Structure 068 to Blue River	The project is being designed to reduce combined sewer overflows by eliminating typical year overflows at Outfall 068. A conceptual alternatives evaluation is currently underway. The conceptual recommendation is to replace the existing combined sewer system with a new 30-inch to 36-inch sewer from diversion structure 068 downstream to the Blue River Interceptor Sewer. It is estimated that approximately 9,400 linear feet of new sanitary sewers will be required to complete the project.	100%	<u>10%</u> Aug. 2016	July 2018	12/31/2018

COMBINED SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015		Planned Completion Date	
<i>Northeast Industrial District Basin</i>					
Sewer Separation: Diversion Structure 006	The project involves separation of 260 acres of combined sewer system by constructing approx. 12,600 feet of new sanitary sewers and eliminating Diversion Structure 006. The project will eliminate typical year overflows at Outfall 006. This project now requires a pump station and force main and has been separated into three (3) design bid projects: 1) Sewer Separation; 2) Private Sewer Separation; and 3) Pump Station and Force Main.	100%	<u>85%</u> April 2016	Oct. 2017	12/31/2017
Green Infrastructure Pilot Project	The green infrastructure pilot project will be designed to reduce combine sewer overflows and provide aesthetic, social and economic enhancements within the Northeast Industrial District. The design will include a tiered extended detention facility with wetland vegetation, permeable pavement, bioswales and open channel for conveyance.	RFP/Q to be issued early 2016	Oct. 2017	April 2020	12/31/2020
Gooseneck Arch Sewer Gates and Pump Station Improvements	The project consists of the design of an adjustable gate or inflatable dam inside a new gate structure situated over the 18 ft. by 21 ft. arch sewer to provide in-line storage of a combined sewer flow utilizing a real-time control (RTC) system and a new 4-MGD submersible pump station. The pump station will deliver the stored volume to the Blue River Interceptor through a new force main.	100%	<u>10%</u> Dec. 2016	Feb. 2018	12/31/2018
Neighborhood Sewer Rehabilitation	This project is being implemented to improve the reliability and performance of the combined sewer collection system and reduce basement backups. This project involves field investigations to identify and quantify sewer system defects and the preparation of construction contract documents to rehabilitate sewer pipes 12-inch and smaller in diameter within the collection system.	RFP/Q to be issued early 2016	Dec. 2017	May 2020	12/31/2020
<i>Town Fork Creek Basin</i>					
Neighborhood Sewer Rehabilitation	This project is being implemented to improve the reliability and performance of the combined sewer collection system and reduce basement backups. This project involves identification of sewer system defects and the preparation of construction contract documents to rehabilitate sewer pipes 12-inch and smaller in diameter within the collection system.	100%	<u>60%</u> May 2016	June 2018	12/31/2018

COMBINED SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015		Planned Completion Date	
Turkey Creek/Central Industrial District Basin					
Turkey Creek Pump Station Modifications	This project entails modifications to the Pump Station, which includes removal of five existing pumps and appurtenances; installation of three new pumping systems, including pumps to provide a firm capacity of 30 MGD; 480-volt motors and variable frequency drives; piping; and other mechanical and electrical controls and equipment. In addition, new bar screens and a new debris removal system (rock box) will be constructed.	100%	100%	<u>90%</u> March 2016	12/31/2016
CID In-Line Gates at Santa Fe Pump Station	The project is being performed to modify existing sluice gates at the Santa Fe Pump Station as necessary to facilitate the storage of wet weather flows in the existing upstream combined sewer system and to reduce the number of combined sewer overflows from Outfall 003 to the Missouri River. Construction documents are being prepared for modification of the in-line gates, including the addition of real-time SCADA control capabilities and establishment of gate operational criteria.	100%	<u>90%</u> March 2016	Jan. 2017	12/31/2017
Green Infrastructure Pilot Project	The green infrastructure pilot project will be designed to reduce combine sewer overflows and to provide aesthetic, social and economic enhancements within the Central Industrial District. The design will include the preliminary and final design, preparation of construction contract documents, bid phase services, and the preparation of opinions of probable cost.	100%	<u>Bidding</u> Oct. 2017	April 2020	12/31/2020
In-Line Storage: OK Creek Gates	This project entails the design of a new gate structure, with automatic control from water-level sensors upstream of the structure, to store up to 20 million gallons of combined sewer flow in the existing 17 ft. high x 18 ft. wide double-box culvert.	100%	<u>15%</u> Sept. 2016	July 2018	12/31/2018
Westside WWTP					
Westside Wastewater Treatment Plant	The RFQ/P for Phase 1 of the Wet Weather Treatment Facilities for the Westside WWTP is in development. Improvements will include grit removal and fine screening, along with wet-weather treatment and disinfection and be sized for a wet weather flow of 32 MGD. ⁱ	RFQ/P to be issued early 2016	Feb. 2018	June 2020	Not yet determined

ⁱ The original long-term control plan had indicated it would be a plant capacity expansion, but Water Services submitted a no feasible alternative (NFA) analysis for a 32-MGD Phase 1 High Rate Treatment (HRT) in late 2015. USEPA approved the NFA analysis and the Phase 1 of the HRT improvement in lieu of the WWTP expansion.

IX. SEPARATE SEWER OVERFLOW CONTROL MEASURES – APPENDIX A

Kansas City’s Separate Sanitary Sewer (SSS) system comprises nine drainage basins covering 292 square miles of the City. The four SSS basins north of the Missouri River are the Northern and Northwestern watersheds and the Line Creek/Rock Creek and Birmingham/Shoal Creek basins. The five SSS system basins south of the Missouri River are the Blue River North, Round Grove, Blue River Central, Blue River South and Little Blue River basins.

Much of the early projects and program strategy in the separate sanitary sewer basins involve reducing the amount of inflow and infiltration (I/I) entering the SSS to reduce overflows from the system. This reduction in I/I is achieved by reducing or eliminating points of direct rainwater inflow into the system and/or reducing rainwater infiltration through collection system defects. A combination of wet weather storage and treatment will be utilized to address system needs as outlined in the City’s Overflow Control Plan.

The status of the projects in the separate sewer system basins is summarized in *Table 2*. The separate sewer system has 10 active projects. Eight (8) projects are currently in design and two (2) projects currently under construction.

Table 2: Project Status – Separate Sanitary Sewer System Basin (through December 31, 2015)

SEPARATE SANITARY SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015 Planned Completion Date			
<i>Blue River Central Basin</i>					
I/I Reduction Area 1	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 1 of the Blue River Central Basin.	100%	<u>35%</u> June 2016	Oct. 2017	12/31/2018
I/I Reduction Area 2	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 2 of the Blue River Central Basin.	100%	<u>30%</u> July 2016	April 2018	12/31/2018
<i>Blue River North Basin</i>					
I/I Reduction	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in the Blue River North Basin.	100%	<u>45%</u> April 2016	Oct. 2017	12/31/2018

SEPARATE SANITARY SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015 Planned Completion Date			
<i>Blue River South Basin</i>					
87th Street Pump Station Rehabilitation	The project consists of rehabilitation of the pump station to restore capacity to 85 MGD. Work being performed includes replacement of bar screens; duty pumps and motors; controls; and multiple structural, mechanical, and electrical modifications to the pump station.	100%	<u>100%</u> Feb. 2015	<u>15%</u> Oct. 2016	12/30/2017
I/I Reduction - Areas 1 and 2	The project consists of the construction of approximately 5,000 feet of sewer replacement, installation of approximately 45,000 linear feet of CIPP, 800 feet of point repairs, 750 lateral connections, 16,000 feet of service line CIPP, 2 new manholes, and manhole rehabilitation. Construction of the rehabilitation measures will reduce Infiltration and Inflow (I/I) Reduction in Project Areas 1 and 2 of the Blue River South Basin.	100%	<u>100%</u> April 2015	<u>20%</u> Dec. 2016	12/31/2021
I/I Reduction Area 3	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 3 of the Blue River South Basin.	100%	<u>30%</u> Aug. 2016	July 2017	12/31/2021
I/I Reduction Area 4	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 4 of the Blue River South Basin.	100%	<u>10%</u> April 2017	May 2019	12/31/2021
I/I Reduction Area 5	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 5 of the Blue River South Basin.	100%	<u>10%</u> Nov. 2016	May 2018	12/31/2021

SEPARATE SANITARY SEWER SYSTEM		Pre-Design	Design	Construction	CD Due Date
Project Name	Description	Percent Complete through 12/31/2015		Planned Completion Date	
<i>Line Creek/Rock Creek</i>					
I/I Reduction Area 1	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 1 of the Line Creek/Rock Creek Basin.	100%	<u>35%</u> July 2016	Dec. 2017	12/31/2023
I/I Reduction Area 2	The project consists of the field investigations, data analysis, and preparation of construction contract documents for the implementation of rehabilitation recommendations of Infiltration and Inflow (I/I) Reduction in Project Area 2 of the Line Creek/Rock Creek Basin.	100%	<u>10%</u> Dec. 2016	Jan. 2018	12/31/2023

a. Private Inflow/Infiltration Reduction Program

In 2015, Water Services continued to develop a private I/I reduction program that will be implemented in conjunction with public sewer I/I reduction projects in select areas of each basin. The focus of the program is to disconnect illicit private I/I sources when it is cost-effective due to the excessive I/I flows into the sewer system. Approximately 55,000 properties are targeted for private I/I evaluation in the City’s SSS.

On January 29, 2015, members of a Mayoral-appointed Community Advisory Group participated in a Water Services presentation to the City Council. The presentation described the private I/I issue and outlined the group’s recommendations in a formal resolution. The Community Advisory Group formally requested the City Council to act upon their recommendations for the development of a Private Inflow and Infiltration Reduction Program. The City Council approved the request at the March 5, 2015, City Council meeting.

On May 28, 2015, a public comment meeting was held for area plumbers and developers to discuss proposed sewer use ordinance changes to enact and implement the private I/I reduction program. On June 25, 2015, the proposed sewer use ordinance changes were approved by the City Council.

In fall 2015, three design professional firms were selected to assist in implementation of the Private I/I Reduction Projects throughout the separate sewer system. Contracts with three design professional firms to work in the project areas will be issued in early 2016.

In December 2015, qualifications and proposed I/I source disconnect unit prices were received from seventeen (17) plumbing contractors for evaluation by the City. The plumbers that meet minimum qualifications will be invited to enter into an indefinite quantities/indefinite delivery (ID/IQ) facility maintenance contract with the City for completing private I/I source disconnections work.

X. SCHEDULED ACTIVITY FOR THE NEXT REPORTING PERIOD

The activities listed below are expected to occur during the next reporting period between January 1, 2016, and June 30, 2016. This list, however, should not be construed as an explanation of all activities that will occur in the first half of 2016. Certain Consent Decree and OCP activities (e.g., program management; NMC; CMOM; public participation; project planning; data management) will continue for the duration of the Consent Decree, but are not explicitly discussed in this section.

- Requests for Qualifications/Proposals for the following OCP projects will be developed and advertised for selection of design professionals:
 - Neighborhood Sewer Rehabilitation in the Northeast Industrial District Basin
 - Green Infrastructure Project – Northeast Industrial District Basin
 - Westside WWTP Wet Weather Treatment Improvements – Phase 1

- Requests for bids proposals will be advertised for selection of construction contractors for the following projects:
 - Distributed Storage at Outfall 059 Project (third construction bid package)
 - Distributed Storage at Outfall 069 Project (third construction bid package)
 - Sewer Pipe Consolidation: Outfall 063 Project and Sewer Separation: Diversion Structure 099 Project (bid together)
 - Sewer Separation: Diversion Structure 006 (three construction bid packages)
 - Neighborhood Sewer Rehabilitation: Town Fork Creek Project
 - CID In-line Gates at Santa Fe Pump Station Project
 - Blue River North I/I Reduction Project
 - Blue River South I/I Reduction Area 3 Project
 - Blue River Central I/I Reduction Area 1 Project
 - Blue River Central I/I Reduction Area 2 Project
 - Line Creek/Rock Creek I/I Reduction Area 1 Project

- Water Services will issue a Notice to Proceed to design professionals or construction contractors for the following OCP projects:
 - Green Infrastructure Pilot Project – Turkey Creek/Central Industrial District (design)
 - Green Infrastructure Pilot Project – Northeast Industrial District (design)
 - Neighborhood Sewer Rehabilitation: Northeast Industrial District Project (design)
 - Private Inflow/Infiltration Reduction Projects

- Work will continue on the projects shown in *Table 1* and *Table 2*.
- Flow monitoring will continue in accordance with the CSS Metering Plan approved by USEPA in December 2015.

XI. NINE MINIMUM CONTROLS – APPENDIX B

This section focuses on documenting Nine Minimum Controls (NMC) program accomplishments in 2015 in the combined sewer system area. *Table 3* identifies each of the NMC and summarizes work accomplished in 2015. Accomplishments for each control measure are explained in further detail in the applicable NMC section.

Table 3: 2015 NMC Accomplishments Summary

NMC	Description	Accomplishments
1	Proper Operation and Regular Maintenance Program	<ul style="list-style-type: none"> ✓ Conducted routine maintenance procedures ✓ Conducted routine inspection schedules ✓ Carried out the emergency response protocol and reported 64 dry weather overflows, 22 in the CSS ✓ Inspected flow regulating structures ✓ Conducted 141 miles of CCTV inspections ✓ Cleaned 152 miles of CSS interceptor and collection lines ✓ Received and responded to 3,292 3-1-1 Action Center calls about wastewater collection system
2	Maximization of Storage in the Collection System	<ul style="list-style-type: none"> ✓ Conducted 7,584 inspections of the CSS diversion structures ✓ Eliminated diversion structures 173 and 300 ✓ Began construction on 8 projects to reduce and/or eliminate inflows and encourage upstream detention ✓ Repaired Turkey Creek Pump Station to help reduce overflows to the Kansas River ✓ Rehabilitated Milwaukee Flood Station and sluice gate at Prospect Flood Station to optimize interceptor sewer capacity
3	Review and modification of pretreatment requirements	<ul style="list-style-type: none"> ✓ Inventoried non-domestic CSS discharges ✓ Inspected 66 non-domestic FOG sources ✓ Assessed non-domestic CSO discharge impacts ✓ Issued 20 violations for standards violations and self-reporting violations
4	Maximization of Flow to the POTW for Treatment	<ul style="list-style-type: none"> ✓ Contracted an In-Line Storage and Conveyance Operational Analyses using real-time control to optimize system storage and capacity
5	Elimination of CSOs during Dry Weather	<ul style="list-style-type: none"> ✓ Conducted 1,156 inspections of flow regulating structures to identify dry weather overflows ✓ Repaired 459 localized sewer defects ✓ Reported 22 dry weather overflows in the CSS ✓ Reported 8 dry weather overflows from CSOs ✓ Reported 2 pump station dry weather overflows ✓ Performed routine preventative cleaning of system

NMC	Description	Accomplishments
6	Control of Solids and Floatable Material in CSOs	<ul style="list-style-type: none"> ✓ Repaired or replaced 197 catch basins ✓ Cleaned 16,594 catch basins ✓ Conducted street sweeping of 14,227 lane miles ✓ Performed construction site erosion control at 34 city-contracted construction sites
7	Pollution Prevention Programs to Reduce Contaminants in CSOs	<ul style="list-style-type: none"> ✓ Conducted street sweeping ✓ Carried out Oil and Grease Management Program ✓ Conducted Solid Waste and Recycling activities ✓ Conducted Household Hazardous Waste Program ✓ Leaf and Brush Collection and Recycling ✓ Collected 130,829 tons of solid waste ✓ Conducted Public Education and Outreach Programs ✓ Made 22 presentations to more than 900 citizens and stakeholders ✓ Conducted 19 public meetings with approximately 275 residents
8	Public Notification	<ul style="list-style-type: none"> ✓ Provided CSO notification ✓ Distributed 39 media advisories for sewer overflows ✓ Conducted warning sign inspections
9	Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls	<ul style="list-style-type: none"> ✓ Identified and mapped CSO structures and outfalls ✓ Monitored water quality

a. NMC 1- Proper Operation and Regular Maintenance Program

i. ORGANIZATION

Kansas City operates and maintains its wastewater systems through its Water Services Department. The Wastewater Line Maintenance Division and the Wastewater Treatment Division are primarily responsible for the operation and maintenance (O&M) of the City's CSS. The Stormwater Maintenance Division is responsible for street cleaning activities in the CSS area.

The Wastewater Treatment Division is responsible for the O&M of the two wastewater treatment plants (WWTPs) within the CSS area (Blue River and Westside).

Several Line Maintenance sections within the Wastewater Line Maintenance Division are responsible for the O&M of the City's CSS including:

- Sewer Investigation/CCTV Inspection Sections;
- Sewer Cleaning Section; and
- Sewer Repair Section.

ii. RESOURCES

Water Services maintains adequate personnel and capital resources to maintain O&M activities throughout the CSS. Through the end of 2015, Water Services had 166 staff members in the Wastewater Line Maintenance Division.

In fiscal year 2015 (May 1, 2014 through April 30, 2015), the operating expenses for sewer operations were as follows:

- Wastewater Treatment and Pumping: \$24,438,632
- Sewer Maintenance: \$24,154,900
- Administration and General: \$22,042,757
- Industrial and Household Hazardous Waste: \$951,327

iii. LIST OF CRITICAL FACILITIES

Water Services maintains a list of critical CSS facilities, including diversion structures, flow splitters, and outfalls. Diversion structures divert excess wet weather flow to receiving streams. Often, several diversion structures direct excess wet weather flow to the same outfall. Flow splitters are structures that divide flows within the CSS, but do not direct flow to receiving waters (one or more flow regulating structures are downstream of the flow splitting structure, upstream of the receiving waters). *Attachment C* contains a list of critical facilities. Inspection intervals vary from three to 30 days, depending on the history of required cleaning. If inspections reveal the interval is not adequate, it is adjusted accordingly.

Attachment C lists the identification number, location, map number, and receiving stream of the CSOs and inspection intervals.

iv. CSO SEWER MAINTENANCE MANUAL

The Wastewater Line Maintenance Division adheres to requirements outlined in the CSO Operations and Maintenance Manual, found in hard copy at Water Services' offices. The manual provides requirements to personnel for the proper operation and maintenance of the CSS, including:

- Routine inspection schedules;
- Emergency response protocols;
- Dry weather overflow reporting procedures; and
- Training and safety practices.

v. LOG OF MAINTENANCE ACTIVITIES

Water Services currently uses the Hansen computerized maintenance management system (CMMS) to log maintenance activities. The system tracks

maintenance activities with work orders initiated from various sources, including customer complaints, 3-1-1 Action Center calls, and investigation activities. Work orders are prioritized based on the critical nature of the defect utilizing a system that categorizes each one into one of three levels of severity. They are closed out upon completion of the work. Work orders track parameters, including:

- Date initiated;
- Initiating party;
- Date completed;
- Line segment;
- General supervisor;
- All costs, including materials;
- Labor hours, including overtime; and
- Permitting.

Table 4 shows a summary of the maintenance activities performed in the combined sewer system during the reporting period.

Table 4: 2015 CSS Maintenance Activities

Activity	Quantity
Sewer- Main Stoppages Opened	114 work orders
Sewer- Main Repairs	459 work orders
Sewer- Manhole Repair/Resurfacing	158 work orders
Sewer- Water in the Basement	1,015 work orders
Sewer CCTV	141 miles
Sewer Cleaning	152 miles

vi. CLOSED CIRCUIT TELEVISION INSPECTION

The Wastewater Line Maintenance Division maintains a CCTV inspection program. The division utilizes both internal and subcontracted equipment to perform the work.

In 2015, approximately 141 miles of CSS were televised, which far exceeded the Consent Decree requirement of 39 miles for 2015. Documentation for mileage cleaned is stored in Hansen and verified using WinCan software.

vii. SEWER CLEANING

The Wastewater Line Maintenance Division conducts sewer cleaning activities in-house and manages work with external contractors.

Water Services maintains a fleet of sewer cleaning equipment including:

- Jet trucks;
- Jet-Vac trucks;
- Rodding machines;
- Easement machines; and
- Bucket machines.

Local contractors are sometimes used for specialized cleaning services on large diameter sewers through contractual agreements.

In 2015, approximately 152 miles of CSS were cleaned, which exceeded the Consent Decree requirements of 106 miles annually. This mileage is documented in Hansen.

viii. OVERFLOW AND BYPASS RESPONSE

The Wastewater Line Maintenance Division has a documented protocol to guide actions following a dry weather overflow in both the combined and separate sanitary sewer systems. When a triggering overflow is recognized, staff responds quickly to control the release of wastewater and perform appropriate cleanup tasks. This activity is documented by Wastewater Line Maintenance supervisors and reported to MDNR in accordance with the City's plan and permits. Copies of overflows reported to MDNR are included in *Attachment A*. In 2015, a total of 64 dry weather overflows were reported, 22 of which were in the combined sewer system.

ix. EMERGENCY CONTACT

The City maintains a 3-1-1 Action Center for reporting collection system problems. The Action Center can be reached by dialing 3-1-1 in Kansas City, Missouri, or by dialing (816) 513-1313 from cell phones. The Action Center is staffed from 7:00 a.m. to 7:00 p.m. during the regular business week. Emergencies can be reported outside of these hours via 3-1-1, which connects to dispatch after hours. In 2015, 3,292 3-1-1 calls related to wastewater collection system problems were received.

Emergency contact numbers are also posted on 88 combined sewer outfall signs. Each sign identifies the outfall by number and lists the emergency contact number. The signs solicit public reports of dry weather overflows. The emergency contact number directs the caller to the 3-1-1 Action Center. More information about the signs can be found in NMC 8 later in this document.

b. NMC 2- Maximization of Storage in the Collection System

i. COLLECTION SYSTEM INSPECTIONS

All CSO diversion structures and flow splitters are inspected and cleaned regularly to identify overflows, remove debris and blockages, assess the operational status of the structure, and make needed repairs. Inspection crews can readily view detailed structure information such as inspection logs, inventory sheets, schematics, profiles, and sectional views. Inspections of all diversion structures occur at intervals ranging from three to 30 days as shown in Attachment C. In 2015, 7,584 inspections of the CSS diversion structures were performed. Tracking logs are documented in Hansen.

ii. DIVERSION STRUCTURE MODIFICATION

Modification of diversion structures may be necessary after inspections or maintenance activities. Tracking of the modifications occurs in Hansen. Diversion Structure 173 and Diversion Structure 300 were eliminated in 2015.

iii. REDUCE AND/OR ELIMINATE INFLOWS AND ENCOURAGE LOCALIZED UPSTREAM DETENTION

The City actively identifies projects that have the opportunity to produce multiple benefits by integrating green solutions that reduce and/or eliminate inflows or provide localized detention. Obstacles, opportunities, and project development process recommendations will be identified upon completion of these projects so that future projects can provide greater environmental benefits.

Water Services staff members continually oversee and maintain green infrastructure improvements that are Water Services' responsibility. The Green Solutions Maintenance Crew, housed in the Preventative Maintenance Division, provides routine green infrastructure maintenance services, including trimming, mulching, and weeding. Water Services' Senior Landscape Architect and Landscape Technician (who was hired in July 2015) provide inspection and assist with coordinating maintenance activities.

1. Water Services Capital Projects

In addition to the OCP green infrastructure projects, Water Services has three (3) other green infrastructure projects currently in design and eight (8) projects under construction through the stormwater and wastewater divisions. These projects are intended to reduce inflows or provide solutions for localized flooding.

In 2015, construction began on the eight (8) projects listed in *Table 5* below. In addition, green infrastructure improvements are being evaluated for inclusion as part of other stormwater and wastewater projects currently in design.

As implementation of OCP continues, additional projects will be implemented that will aid in reducing and/or eliminating inflows. These projects will include private inflow source reduction including the disconnection of downspouts, sump pumps, and other sources of stormwater inflow from private property.

Table 5: Water Services Green Infrastructure Projects Under Construction (2015)

Property/Project Name	Description/Type
Marlborough 81 st Street and Chestnut	Rain Garden
N. Topping Avenue and 61 st Street (front yard)	Bioswale
N. Compton Road and Munger Avenue (front yard)	Bioswale
Swope Campus Parking Lot and Sustainable Stormwater Improvements	Pervious Pavements, Rain Gardens, Bioretention
Stillwell Detention (Universal Avenue and Stillwell)	Detention Basins with Native Plants
82 nd Street and Oldham Road	Detention Basin with Native Plants
29 th Street and Norton Avenue	Rain Garden and Bioswales with Native Plants
4736 N. Topping Road	Detention Basin with Native Plants

2. Other City-wide Green Infrastructure Efforts

Outside of Water Services, implementation of green infrastructure projects occurs in three primary ways: 1) through City capital project enhancements; 2) required private installations; and 3) voluntary private installations.

iv. UPGRADE/ADJUST PUMP OPERATIONS AT INTERCEPTOR LIFT STATIONS

Six pump stations are within the boundaries of Kansas City’s CSS. Four pump stations (Turkey Creek, Santa Fe, Northeast Industrial District (NEID), and Blue River) function as influent pump stations for the Blue River and Westside WWTPs. These pump stations are operated according to the Wet Weather Operating Plans defined in NMC 4.

OCP includes provisions for additional system storage and some sewer separation upstream of these stations to reduce overflow frequency. Two small pump stations in the CSS (12th and 15th Street stations) are operated to maximize storage in the upstream system during wet weather.

In 2015, repairs were made at the Turkey Creek Pump Station including the replacement of pumps, flap gate hinges, and bar screens. In addition, the level of the overflow wall was raised by 12” to prevent flow from bypassing/overflowing sooner. These repairs will help reduce the Kansas River from surcharging back into the station.

Contractors also repaired a sluice gate at the Prospect Flood Station and rehabilitated the Milwaukee Flood Station, which will help prevent the Missouri River from backing up into the NEID sewer.

v. REMOVAL OF OBSTRUCTIONS TO FLOW

Cleaning of existing interceptors to maintain available conveyance and storage capacity is a standard procedure performed by the Wastewater Line Maintenance Division. The division utilizes its crews and external contract cleaning crews on an as-needed basis to remove and prevent accumulation of debris and sediment that restrict the flow. This information is tracked in Hansen.

c. NMC 3- Review and Modification of Pretreatment Requirements

The Industrial Waste Division regulates non-domestic discharges. The division is responsible for implementing and enforcing Chapter 60, Article IV of the Kansas City Code of Ordinances and several city-wide programs, including:

- Federal Pretreatment Program;
- Surcharge Program for high strength wastewaters;
- Oil and Grease Management Program; and
- Annual review of pretreatment requirements.

These activities incorporate the following control measures:

- Inventory non-domestic CSS discharges - Identification of significant industrial users (SIUs).
- Assess non-domestic CSO discharges - Implementation of the surcharge program to evaluate the impact of non-domestic wastewater.
- Evaluate feasible modifications - Periodic review of pretreatment requirements as necessary. No pretreatment requirements were modified in 2015.

i. FEDERAL PRETREATMENT PROGRAM

The Industrial Waste Division's administration of the Federal Pretreatment Program is subject to regular review by MDNR and the USEPA, Region VII. An annual report of the City's Pretreatment Program activities is filed with MDNR in March of each year. The 2014 Industrial Pretreatment Program Annual Report was submitted to the MDNR on March 31, 2015, and can be found in *Attachment B*.

The report includes the following information:

- Companies in significant non-compliance;
- Inter-jurisdictional agreement status;
- Permit activity;

- Annual enforcement log; and
- Notices of violations.

The Industrial Waste Division identifies the regulated discharge flow volume, potential pollutants of concern, drainage basins, and the pump station(s) serving each SIU. According to the 2015 Industrial Pretreatment Program Annual Report, which will be submitted by March 31, 2016, there are 67 SIUs permitted under the program. Each SIU is inspected annually and monitored periodically for compliance with its wastewater discharge permit conditions.

ii. SURCHARGE PROGRAM

The Surcharge Program levies a surcharge fee for biological oxygen demand (BOD), total suspended solids (TSS), and/or fat, oil and grease (FOG) concentrations above that in “normal sewage” as defined in Chapter 60 of the City’s Code of Ordinances. Food handling operations such as restaurants are most affected by this ordinance. The surcharge program also makes SIUs aware of the effects their discharge has on the sewer system and encourages them to reduce their waste discharge through modifications or improved housekeeping procedures.

iii. OIL AND GREASE MANAGEMENT PROGRAM

The Oil and Grease Management Program, through training, outreach, inspections, and enforcement, encourages non-domestic sources to limit the discharge of fats, oils and grease (FOG) into the sanitary sewer system. The primary non-domestic sources of FOG discharges are restaurants.

Water Services’ Industrial Wastewater Division completes inspections of grease traps at food handling facilities. At the time of the inspections, facility personnel are informed about ordinance requirements regarding FOG discharges; if requirements are not met, there is a potential for enforcement actions. During the inspection, the inspector reviews cleaning records, outlines oil and grease best management practices, and may perform a sink test to determine if the lines are clogged with FOG. If a FOG issue is discovered during the inspection, the inspector will suggest one of the following maintenance improvement options:

- Shorter cleaning cycles
- Replacement of grease traps with grease interceptors

In 2015, there were 66 facility inspections and there were no enforcement actions taken as a result of those inspections. However, there were 20 enforcement actions taken mostly for standards violations and self-monitoring reports.

iv. REVIEW OF PRETREATMENT REQUIREMENTS

Every year, the Industrial Waste Division reviews the pretreatment program to determine whether changes are warranted. Economic and environmental impacts

are taken into account when evaluating potential changes. These include an assessment of the non-domestic discharges to the CSS and the impact of non-domestic discharges on CSOs. In 2015, no changes to the pretreatment program were warranted.

In 2015, as part of the development of the Wastewater Master Plan, an evaluation of the Industrial Pretreatment Program was completed and recommendations presented to Water Services and Industrial Waste Division for consideration.

d. NMC 4- Maximization of Flow to the POTW for Treatment

i. WASTEWATER TREATMENT PLANT (WWTP) PERFORMANCE AND FLOW CAPACITIES

Capacity studies were performed for both the Blue River WWTP and Westside WWTP in 2006.¹ Plant stress tests were also performed on both plants.² The studies compared flows processed during wet weather and dry periods to determine the relationship between performance and flow.

Field stress testing results at the Blue River WWTP indicate the maximum wet weather plant capacity is limited by secondary treatment capacity of 156 MGD. Stress testing has confirmed that 40 MGD is the peak capacity the Westside WWTP can process without affecting process performance. Water Services plans to convert the secondary treatment system over to activated sludge and increase wet weather capacity in the future as part of the Overflow Control Program.

In 2015, Water Services contracted an In-Line Storage and Conveyance Operational Analyses Project to use real-time control to optimize storage and conveyance, increase capacity of the collection system, and balance flows. The purpose of this balance is to utilize the capacity at pump stations and treatment plants throughout the Line Creek/Rock Creek, Brush Creek, and Turkey Creek basins to minimize CSO and SSO activations and volumes.

ii. WET WEATHER OPERATING GUIDELINES FOR WWTPs

1. Blue River WWTP

The Wet Weather Operating Guidelines for the Blue River WWTP summarize the operating procedures at the facility during wet weather events. The guidelines specify that the Blue River WWTP processes combined (primary plus secondary) wastewater only to the maximum capacity of the secondary treatment plant.

The operating guidelines indicate that the secondary treatment plant has a design capacity of 105 MGD and a total capacity of 140 MGD. The

¹ The Blue River Wastewater Treatment Plant Capacity Study dated March 2, 2006, and the Westside Wastewater Treatment Plant Capacity Study dated April 6, 2006.

² Technical memorandums titled Blue River Wastewater Treatment Plant Stress Test Report dated August 2008 and Westside Wastewater Treatment Plant Stress Test Report dated December 2007.

primary treatment capacity of 220 MGD is not achieved due to the capacity limitation of secondary treatment.

2. Westside WWTP

The Wet Weather Operating Guidelines summarize the procedure for operations at the facility during wet weather events. The guidelines provide the following recommended conveyance rates for wet weather pump stations:

- Turkey Creek PS - 11.4 MGD
- Santa Fe PS - 4.5 MGD
- Line Creek PS - 8 MGD

As improvements to the Turkey Creek Pump Station and wet weather facilities for the Westside WWTP are completed, Water Services will reevaluate the pumping rates from these three lift stations during wet weather to determine how much additional flow can be pumped and handled at the Westside WWTP.

e. NMC 5- Elimination of CSOs during Dry Weather

The Wastewater Line Maintenance Division actively works to eliminate dry weather overflows. The measures taken include:

- Routine preventative cleaning of system;
- Inspection to identify dry weather overflows;
- Correction of primary causes of dry weather overflows; and
- Notification to MDNR when a dry weather overflow occurs.

i. **FLOW REGULATING STRUCTURE INSPECTION**

Flow regulating structures in the CSS include diversion structures and flow splitters. Routinely, these structures are inspected to verify proper functioning. Diversion structures direct excess wet weather flows to receiving waters. The inspection interval varies for each structure and is based on historical records of performance and the sensitivity of the area surrounding the structure. Flow splitters are structures that divide flows within the CSS, but do not direct flow to receiving waters. *Attachment C* of this report lists the inspection intervals completed for each diversion structure and flow splitter in the CSS.

ii. DRY WEATHER OVERFLOW CORRECTIVE ACTION

Water Services implements dry weather overflow (DWO) corrective actions to address operational problems believed to be the cause of the overflows. The corrective actions include interceptor cleaning and sewer repair.

The Wastewater Line Maintenance Division's sewer repair program is responsible for repairing localized sewer defects linked to the occurrence of DWOs. Jet vacuum cleaning units remove materials that may restrict flow leading to blockages and DWOs at upstream locations. This action is taken immediately (as is practical) upon notification that a DWO has occurred.

In 2015, 459 localized sewer defects were repaired. A DWO at Outfall 049 was reported in 2015. The diversion structure from MHS 098-387 was subsequently eliminated by removing the structure and plugging the pipe which leads to Outfall 049.

iii. DRY WEATHER OVERFLOW NOTIFICATION

The Wastewater Line Maintenance Division notifies MDNR within 24 hours of discovery of a DWO. Within five days of the original notification, follow-up written reports are made. In all occurrences, the area around the overflow is cleaned and inspected for any debris or contaminants. If vandalism to manholes causes a DWO, the standard manhole covers are replaced with bolt-down covers to deter future vandalism. In 2015, 22 dry weather overflows in the CSS and eight (8) dry weather overflows from CSOs were reported to MDNR.

The Wastewater Treatment Division notifies MDNR of DWOs that occur at either pump stations or treatment plants within 24 hours of discovery. Within five days of the occurrence, a follow-up written report is submitted to MDNR.

In 2015, dry weather overflows occurred on the following days and locations:

- Burlington Creek Pump Station
 - May 18, 2015
- Turkey Creek Pump Station
 - September 24, 2015

Attachment A includes copies of these reports submitted in 2015.

f. NMC 6- Control of Solids and Floatable Material in CSOs

i. PREVENTING EXTRANEIOUS SOLIDS AND FLOATABLES FROM ENTERING THE CSS

Water Services and other City departments employ various measures that minimize extraneous solids and floatables from entering the CSS, including:

- **Street Sweeping** – Water Services sweeps streets on a routine schedule to reduce trash, silt and other debris on the streets. During 2015, Water Services swept a total of 14,227 lane miles throughout both the combined

and separate sewer system areas. The schedule for street sweeping runs from January 1 through December 31 each year; by the end of that time, street sweeping will have been conducted twice annually on all streets with curbs within the CSS area and once annually within the SSS area.

- **Repair and Clean Catch Basins** – To maintain the proper function of stormwater inlets, the Stormwater Line Maintenance Division performs catch basin cleaning and repairs through its Catch Basin Replacement Program. This information is stored and tracked in Hansen. In 2015, 16,594 catch basins were cleaned, and 197 were repaired or replaced.
- **Construction Site Erosion Control** – Soil erosion from construction activity can increase the quantity of turbidity, nutrients, metals and sediment in the sewer system and receiving waters. Sedimentation problems can potentially reduce the hydraulic capacity of sewer lines, leading to overflows. The implementation and enforcement of erosion control regulations can be an extremely effective method of reducing these constituents in the CSS. In 2015, the Stormwater Utility Division inspected 34 City-contracted construction sites that were one acre or larger in size for compliance with stormwater erosion control regulations.

Construction work is required to conform to the following City engineering and construction standards for all public or private work.

g. **NMC 7- Pollution Prevention Programs to Reduce Contaminants in CSOs**

Kansas City has a long-standing record of implementing pollution prevention measures and providing pollution prevention options to residents. The City continues to implement the following measures to help reduce pollution entering the combined sewer system and, in turn, the rivers and streams:

- Street sweeping (See NMC 6)
- Oil and Grease Management Program (See NMC 3)
- Solid Waste and Recycling
- Household Hazardous Waste Program
- Leaf and Brush Collection and Recycling
- Public Education and Outreach Programs

i. **SOLID WASTE AND RECYCLING**

Kansas City offers curbside pickup of solid waste, recycling, and bulky items to give residents a convenient way to dispose of unwanted waste and, ultimately, reduce illegal dumping. The City also manages three drop-off recycling centers used by businesses and residents of multi-family dwellings who may not have curbside recycling options available. In addition to these programs, the City also provides

services for cleanup of illegal dump sites, a drop-off facility for waste tires, and reduced cost dumpsters for neighborhood cleanups. The total amount of solid waste collected through City programs in 2015 is listed in *Table 6*.

Table 6: 2015 Amount of Solid Waste Collected

Waste	Quantity
Solid Waste	90,277 Tons
Recycling – Curbside	19,885 Tons
Recycling – Recycling Centers	666 Tons
Bulky Items	5,160 Tons
Leaf and Brush	11,007 Tons
Waste Tires	110 Tons
Household Hazardous Waste	675 Tons
Illegal Dumping Collected	3,049 Tons
TOTAL	130,829 Tons

ii. HOUSEHOLD HAZARDOUS WASTE PROGRAM

The household hazardous waste (HHW) program is hosted by Water Services and consists of two subprograms: an HHW drop-off facility and HHW mobile collection events. In 2015, the program served 31 communities, including Kansas City, from four counties in the region.

The HHW drop-off facility acts as a central location for providing a cooperative regional collection system for Missouri communities in the Kansas City metropolitan area. The facility accepts residential hazardous waste, including pesticides, herbicides, and fertilizers. It is open to the public on Thursdays, Fridays and Saturdays year-round, except City-observed holidays.

The Swap Shop is an ancillary facility of the drop-off facility where certain materials in good condition (such as paint) can be distributed and reused instead of being disposed. Operational hours for the Swap Shop are Tuesdays through Saturdays 9:00 am to 4:00 pm and Thursdays and Fridays 9:00 am to 6:00 pm. Drop off of household hazardous waste from participating communities occurs on Saturdays 9:00 am to 4:00 pm.

Mobile events throughout the City and the region provide convenient opportunities for proper disposal. These events typically occur on Saturdays from April 1 through October 31 and can be held in any city or county participating in the regional HHW program. The program provides a viable alternative to improper disposal in landfills, storm sewers, or sanitary sewer facilities. More than 3,012 vehicles were served at the mobile events in 2015.

In 2015, the program collected a total of 1,350,877 pounds (675 Tons) of HHW, including 689,048 pounds coming from Kansas City residents.

iii. LEAF AND BRUSH COLLECTION AND RECYCLING

The Leaf and Brush Recycling Program is a collaborative effort between Water Services and the City’s Public Works Department. Water Services is responsible for the collection of curbside leaf and brush, and the Public Works Department runs the drop-off facilities. Water Services collects leaf and brush from residents three times a year, once in the spring and twice in the fall, on regularly-scheduled trash pickup days at no charge. Residents are also allowed to drop off items at the drop-off facility.

The leaf and brush collected are composted or mulched by a local company and made available to residents for free or for a small fee. Removal of excess leaf and brush from residences curtails illegal dumping of these items down storm drains and into local creeks, streams, and rivers. In 2015, 11,007 tons of leaf and brush were collected and recycled.

iv. PUBLIC EDUCATION AND OUTREACH PROGRAMS

Water Services provides additional outreach and education to encourage residents and business owners to minimize or eliminate contaminants from entering the sewer system. Descriptions of outreach and education initiatives, including those that are part of the Overflow Control Program, are provided below.

1. Presentations, Conferences, and Tours

From January 1 through December 31, 2015, 22 presentations were made to more than 900 citizens and stakeholders about OCP, wastewater, and water quality. The presentations included groups such as professional associations, metropolitan planning and non-governmental organizations, and neighborhood groups. The following is a listing of the organizations and presentations given between January and December 2015:

- MORE² – January 8, 2015
- Marlborough Community Coalition – February 24, 2015
- Marlborough Community Coalition – March 24, 2015
- AWWA/MWEA Joint Annual Conference – March 31, 2015
- i-Build Showcase – April 14, 2015
- Northland Regional Chamber of Commerce: Planning and Development Committee – April 9, 2015
- Community Engagement University – April 21, 2015
- 1st Council District Problem Solving Meeting – May 12, 2015

- Wet Weather Partnership Conference – May 20, 2015
- Kansas City, Mo City Council: Transportation & Infrastructure Committee – May 21, 2015
- Center Planning and Development Council – May 26, 2015
- Kansas City, Mo City Council: Transportation & Infrastructure Committee – June 18, 2015
- Forester Media Webinar: Introduction to Pervious Pavements – July 8, 2015
- Missouri Chamber’s Environmental Conference – July 30, 2015
- Kansas City, Mo City Council: Transportation & Infrastructure Committee – August 13, 2015
- MWEA Stormwater/Watershed Management Conference – September 8, 2015
- Community Engagement University – September 15, 2015
- Waldo Tower Homes Association Meeting – September 22, 2015
- ICEA Great Rivers Conference – October 28, 2015
- Kansas City, Mo City Council: Business Session – October 29, 2015
- Mid-America Regional Council: BMP Operations and Maintenance Training – November 13, 2015
- Mid-America Regional Council: Sustainable Success Stories – December 4, 2015

Water Services offers educational tours of the Swope Campus Parking lot to interested groups. A total of 12 tours were conducted in 2015, including a project completion celebration with approximately 60 attendees, featuring educational booths on BMPs.

2. Public Meetings

Table 7 displays information about the public meetings held in 2015 in support of OCP projects. A total of 19 public meetings were held for OCP projects with approximately 275 residents in attendance. The public meetings listed below were held throughout the community, not just in the combined sewer system area.

Table 7: Public Meeting Information (2015)

Date	Project	Meeting Purpose	No. of Attendees
January 27, 2015	Target Green Marlborough Projects (Distributed Storage at Outfalls 059 & 069)	Project update	25
February 5, 2015	Sewer Consolidation at Outfall 063	Project informational meeting	7
February 10, 2015	Sewer Separation: Outfall 066	Project informational meeting	7
April 11, 2015	Target Green Marlborough Projects (Distributed Storage at Outfalls 059 and 069)	Open House; project update and input requested	50
April 21, 2015	Blue River Central I/I Reduction Area 1 Project	Project informational meeting	2
April 28, 2015	Blue River North I/I Reduction Project	Project informational meeting	5
May 12, 2015	Line Creek/Rock Creek I/I Reduction Area 1 Project	Project informational meeting	8
May 14, 2015	Blue River South I/I Reduction Area 4 Project	Project informational meeting	26
May 19, 2015	Blue River South I/I Reduction Area 3 Project	Project informational meeting	0
May 26, 2015	Blue River Central I/I Reduction Area 2 Project	Project informational meeting	7
June 23, 2015	Line Creek/Rock Creek I/I Reduction Area 2 Project	Project informational meeting	11
June 25, 2015	Blue River South I/I Reduction Area 5 Project	Project informational meeting	22
July 9, 2015	Brush Creek Neighborhood Sewer Rehabilitation Area 2 Project	Project informational meeting	30
July 14, 2015	Blue River South I/I Reduction Areas 1 & 2 Project	Pre-construction public meeting	10
July 16, 2015	Brush Creek Neighborhood Sewer Rehabilitation Area 1 Project	Project informational meeting	20
July 21, 2015	Middle Blue Neighborhood Sewer Rehabilitation Area 2 Project	Pre-construction public meeting	30
August 6, 2015	Northeast Industrial District Sewer Separation at Diversion Structure 006	Project update	1
September 15, 2015	Northeast Industrial District Sewer Separation at Diversion Structure 006	Project update	10
October 22, 2015	Target Green Marlborough Project – Distributed Storage at Outfall 069	Pre-construction public meeting	1

3. Target Green

Public outreach activities for the Distributed Storage at Outfall 059 Project and Distributed Storage at Outfall 069 Project were combined and the outreach is coordinated with other city departments. In the reporting period, Water Services provided project updates to the Marlborough Community Coalition, an overarching neighborhood group in the project area, at several of their regularly scheduled monthly meetings.

In April 2015, more than 50 area residents attended an open house to view updated project information about the Target Green Marlborough Project and other Water Services projects occurring in the area. Meeting attendees also talked to other city department and utility representatives about a variety of private property assistance programs being offered to the area's residents to promote private property investment. The city departments that participated include:

- City Manager's Office
- City Communications
- City Planning and Development
- Health Department
- Land Bank
- Neighborhood and Housing Services
- Parks and Recreation
- Public Improvements Advisory Committee
- Public Works – Capital Projects
- Public Works – Solid Waste
- Water Services

The purpose of this coordinated public education and outreach effort is to encourage residents to participate in programs that improve the neighborhood while protecting water quality, and reducing water/energy consumption. Some of the programs included:

- Lead paint abatement program
- Minor home repair program
- Paint program
- Historic preservation tax credits
- Brownfields assessment program
- Income-eligible weatherization assistance,

- Home rebate program for energy efficiencies upgrades
- Programmable thermostat program
- Land bank program
- Energy Sense Water Heater and Space Heating Rebate program
- Solid waste neighborhood clean-up program

4. Other Outreach

During the reporting period, Water Services continued to add project information on its website, including Overflow Control Program projects. The website (www.kcwaterservices.org/overflow-control-program) provides general information about the Overflow Control Program, and the Current Projects page contains project fact sheets. The fact sheets provide citizens information about a particular project, including what they should expect, why the project is being completed, and who they should contact with questions.

The Storm Drain Manhole Cover Design Contest invited local artists to design a manhole cover with a water quality message that would be placed on highly visible catch basins in both the combined and separate sewer systems. The winning design featured aquatic species and the message “THINK – Protect Your Water, Protect Our Home”. The manhole covers are in the casting process and will be installed early in 2016.

v. **NEWSLETTERS**

Water Services produces both internal and external newsletters for disseminating information to employees and customers respectively. The internal newsletter, titled “News on Tap,” is distributed to employees electronically and in hard copy on a monthly basis. Water Services included 20 articles on wastewater-related topics and initiatives in the employee newsletter in 2015.

The external newsletter, known as “What’s On Tap,” was sent to customers twice in 2015 along with their water bills.

The spring 2015 newsletter included the following wastewater-related topics:

- *KC Water Services Completes 2-Year, \$40M Northland Infrastructure Project*
- *Lawn Care Tips For Saving Money & Preserving Water Quality*
- *Spring Leaf & Brush Schedule*

The summer 2015 newsletter included an article about Water Services staff assisting with clean-up efforts in an OCP project area.

vi. KC GREEN TEAM

In 2008, four KC Green Teams were created under Administrative Regulation 5-5 Green Solutions and Sustainability: Education and Outreach, Green Infrastructure, Regulation and Policy, and Resource Management. To effectively execute the missions of each team, City staff members from various departments volunteer their time.

Between March and September 2015, Kansas City met monthly with nine local businesses and organizations in the Sustainability Circles project hosted by Bridging the Gap and Kansas City Power & Light. The purpose of the meetings was to create a sustainability action plan for the organization. The action plan for Kansas City was the revitalization of the two dormant Green Teams: Regulation and Policy and Resource Management. The two teams were tasked with looking at various sustainability initiatives related to water quality and quantity over the next five years, including permanent drainage easements and stream corridor maintenance programs.

1. Education and Outreach Team

The Education and Outreach Team (EOT) organizes a variety of events and activities to educate City staff and residents about green solutions and sustainability within City operations and the City as a whole. In 2015, the EOT continued the KC Green Neighborhood Recognition Program, which allows neighborhoods proactive in sustainability to receive recognition for their green initiatives. Neighborhoods can apply for the program and are scored based on their efforts in six categories: Natural Environment, Waste and Recycling, Transportation, Energy, Food and Urban Agriculture, and Water and Stormwater Management. Practices in the Water and Stormwater Management category include rain barrel use, planting and maintaining rain gardens, utilizing pervious pavement, and routing downspouts to green space. Depending on the number of homes implementing sustainable practices and the amount of collaborative special neighborhood projects, the neighborhoods are given a rating of Platinum, Gold, Silver, or Not Eligible. No applications were received for the program in 2015; additional marketing of the program will begin in 2016.

For Earth Day, April 22, 2015, the EOT hosted a series of neighborhood clean-up events throughout the City. Branded the KC Trash Bash, the events resulted in nearly 13 tons of trash removed from neighborhood streets and 48 tires collected. Water Services hosted a Trash Bash site outside their headquarters in partnership with the Swope Parkway/Elmwood Neighborhood Association; 35 Water Services employees assisted with the clean-up.

2. Green Infrastructure Team

The Green Infrastructure Team (GI Team) works to identify, track, encourage, and support new green infrastructure capital projects in Kansas City. This team is currently working to create a city-wide plan for maintenance and funding of city-owned green infrastructure for leadership review and to collaborate towards shared goals with other KC Green Teams and the City's LEED Committee.

Completed tasks during the reporting period include:

- Developed a city-wide green infrastructure inventory and map
- Created a shared network drive for design and construction resources for staff
- Outlined parameters for city-wide plan for maintenance and funding for city-owned green infrastructure

vii. **STORMWATER: FROM KC TO THE SEA**

Since 2010, Water Services has worked to educate local 4th through 6th-grade students through a curriculum titled *Stormwater: From KC to the Sea*. The five-day interactive curriculum teaches students how precipitation moves through a watershed, how stormwater becomes polluted, and how BMPs implemented on public and private property could improve water quality and reduce the quantity of stormwater entering the sewer system.

During 2015, 2,522 students from 33 schools throughout Kansas City participated in the program. The curriculum also received three awards during the reporting period:

- Local American Public Works Association's (APWA) award for Sustainability in Public Works
- National APWA award for Sustainability in Public Works
- Kansas City Industrial Council Sustainability Award

viii. **WE KC (WATER EDUCATION FOR KANSAS CITY)**

In 2015, Water Services launched the WE KC Program to expand the school age education program beyond *Stormwater: From KC to the Sea*. Through WE KC, Water Services will empower youth organizations and after school groups to make good water quality choices for their future through hands-on learning and facilitation of stewardship projects. The program provides the technical assistance, hands-on learning tools, and supplies groups need to implement their own water education programs. Through WE KC in 2015, Water Services assisted 15 groups with water quality related events, reaching 995 people.

ix. REGIONAL WATER QUALITY EDUCATION PROGRAM (RWQEP)

Water Services is one of the 24 local governmental organizations that contribute funding and staff time to a Regional Water Quality Education Program (RWQEP) sponsored by Mid-America Regional Council. RWQEP allows metro area cities to pool resources and provides a regional approach to raising public awareness about water quality issues affecting Kansas City for the benefit of both MS4 and combined sewer cities. The program accomplishes this through a bi-annual community survey, yearly media campaign, printed materials, and a grant program that funds projects designed to improve public understanding of the negative impacts of stormwater runoff.

The successful media campaign, “If It’s On The Ground – It’s In Our Water,” continued through the summer of 2015 with a focus on anti-litter and litter reduction strategies. For the fall and winter of 2015, the litter campaign was replaced with the “Blue Thumb-Planting for Clean Water” initiative. The roll out of this media campaign targeted gardeners and plant enthusiasts, encouraging them to plant native plants in their landscapes.

In November 2015, RWQEP hosted the “Installation and Maintenance of Stormwater BMPs,” a 1.5-day training course that covered a broad range of topics. The course was geared toward landscapers, subcontractors, and general contractors currently working with stormwater treatment BMPs and those wishing to gain experience with those systems. The training attracted 40 participants.

x. PARTNERSHIPS IN PUBLIC OUTREACH

1. Blue River Watershed Association (BRWA)

Water Services continued to work with the Blue River Watershed Association (BRWA), a nonprofit, grassroots community organization that engages Kansas Citians in protecting and restoring the area’s watersheds. The organization focuses its efforts on community education, environmental stewardship, and strategic partnerships.

Water Services provides staff to support the BRWA’s T.R.U.E. (Teaching Rivers in an Urban Environment) Blue Program, which trains and equips area teachers, students, and community members to establish school-based “stream teams” to monitor water quality in local streams. In 2015, Water Services staff continued to volunteer their time to mentor small groups of students as they collected water quality data in local streams.

Water Services also partnered with BRWA on their EPA Urban Waters Students Teaching River Education around the Metro (S.T.R.E.A.M.) Teams grant. Two Water Services employees volunteered their time to be student mentors throughout the five-month project and additional staff assisted with educational tours and programs.

2. Project Blue River Rescue

Project Blue River Rescue is an outreach event hosted by the Friends of Lakeside Nature Center, operated by the City's Parks and Recreation Department. The event is sponsored by MDNR and supported by many governmental entities and businesses. The City's Parks and Recreation, Public Works, and Water Services Departments continue to provide facilities, equipment, expertise and assistance with program coordination.

On March 28, 2015, approximately 750 volunteers participated in this event. Nearly 35 tons of trash and approximately 960 used tires were collected and disposed. In addition to trash removal, groups removed invasive honeysuckle from a one-acre site and planted native trees and shrubs along the Blue River.

h. NMC 8- Public Notification

i. **COMBINED SEWER OVERFLOW PUBLIC NOTIFICATION PLAN**

The City recognizes the need to notify the public when a CSO occurs and has developed a notification plan. The purpose of the plan is to inform and educate the public of potential overflows in the urban waterways during and following storm events. The goals of the public notification program are to:

- Notify citizens when overflows are likely to occur;
- Educate the public about the potential health impacts associated with overflows in waterways;
- Educate the public about the potential danger and health impacts of high waters in waterways during heavy rainstorms; and
- Enable citizens to take appropriate steps to protect themselves and their families from such hazards.

Water Services utilizes these methods to inform the public of the potential for CSOs:

- **Signs** – Two types of warning signs have been installed to notify citizens of the hazards of CSOs. The first type, a Pedestrian Warning Sign (PWS), has been posted at public access points to streams. It notifies citizens that the streams receive CSOs and to avoid contact with the water during and 72 hours after rainfall. For more information, citizens are encouraged to call the OCP information line that is staffed by Water Services employees.

The process of replacing and relocating PWS signs began in late 2014 and was completed in 2015. After completion of sign replacement and relocation, there are 107 PWS locations.

The second type of warning sign is posted at all outfall locations. The sign warns citizens to avoid contact with water and displays the City's Action

Center phone number so they can report dry weather overflows. The signs are printed in English and Spanish and are readable from a distance of approximately 20 feet. The Wastewater Line Maintenance Division is responsible for inspecting and maintaining the signs. Signs are inspected during overflow events and through routine inspections. A comprehensive CSS-wide outfall sign inspection was completed in the winter of 2014. A total of seven outfall signs were found to be damaged, and 10 were missing. Sign replacement was completed in 2015.

- **Media Advisories** – When a sewer overflow occurs during the recreation season, Water Services Communications distributes a media advisory to local media outlets. In 2015, 39 advisories were distributed.
- **Website** – In addition to providing notification directly to media outlets, the media advisories are also posted on the KC Water Services website at www.kcwaterservices.org/sewer-overflows-2/

i. NMC 9- Monitoring to Characterize CSO Impacts and the Efficacy of CSO Controls

The following sections summarize what has been completed to aid the City in assessing the effectiveness of the NMC and the control measures described in the Overflow Control Plan.

i. **MAPPING CSS DRAINAGE AREA DIVERSION STRUCTURES AND OUTFALLS**

All CSS drainage areas have been mapped and all diversion structures are inspected. As needed, maps are updated to include any changes to the diversion structures. Figure 1³ includes all of the current outfalls and diversion structures. Diversion structures 173 and 300 were eliminated and removed from this figure in 2015.

ii. **RECEIVING WATER BODIES AND DESIGNATED USES**

Kansas City's combined sewers overflow to numerous receiving streams. Primary receiving streams include the Kansas River, Missouri River, Blue River, and Brush Creek. Brush Creek is tributary to the Blue River, which is tributary to the Missouri River. The Missouri River at the Broadway Bridge in Kansas City drains a total of 484,100 square miles. That area includes 59,756 square miles of tributary to the Kansas River at De Soto, Kan. (approximately 30 miles upstream of the confluence of the Missouri River and Kansas River). All of Kansas City's CSS basins are eventually tributary to the Missouri River, though they represent only 0.01 percent of the total Missouri River tributary area at Kansas City. The Downtown Airport, Central Industrial District, and the Northeast Industrial District are each directly tributary to the Missouri River. The Turkey Creek basin is the only Kansas

³ Figure 1 and Figure 2 were originally included in the October 2008 report entitled "Capacity, Management, Operations and Maintenance Plan (CMOM) and Nine Minimum Controls".

City CSS basin tributary to the Kansas River. The remaining CSS basins in Kansas City (Lower Blue River; Brush Creek; Town Fork Creek; and Middle Blue River) are tributary to the Blue River.

Figure 2 shows streams that receive overflows from Kansas City's CSS and indicates the current recreational water quality standard designated by the State of Missouri (or by the State of Kansas, for the Kansas River). This figure defines (in blue) the CSS area directly tributary to the Missouri River (including those areas tributary via the Kansas River). It also shows all areas tributary to the Blue River. The map distinguishes between those tributary areas upstream of Kansas City's CSOs (e.g., upstream of the points marked with red stars), and areas directly tributary to those stream reaches that receive CSOs. Within the Blue River basin, areas directly tributary to those stream reaches that receive CSOs include both CSS (shown in yellow) and SSS (shown in green).

Of the total area tributary to the Blue River, 74 percent is located upstream of those reaches of the Blue River, and its tributaries are impacted by overflows from Kansas City's CSS. Kansas City's CSS serves 10 percent of the total area tributary to the Blue River. The remaining 16 percent of the Blue River tributary area is served by separate storm and sanitary sewer systems in Kansas City.

iii. DEVELOPMENT OF OVERFLOW OCCURRENCE ESTIMATES

The current performance of the CSS was estimated using computer models developed as part of the Overflow Control Plan. Water Services calibrated the models for sewer flow meter and rainfall data. The estimated overflow volume from Kansas City's CSS in a typical year is just over six billion gallons.

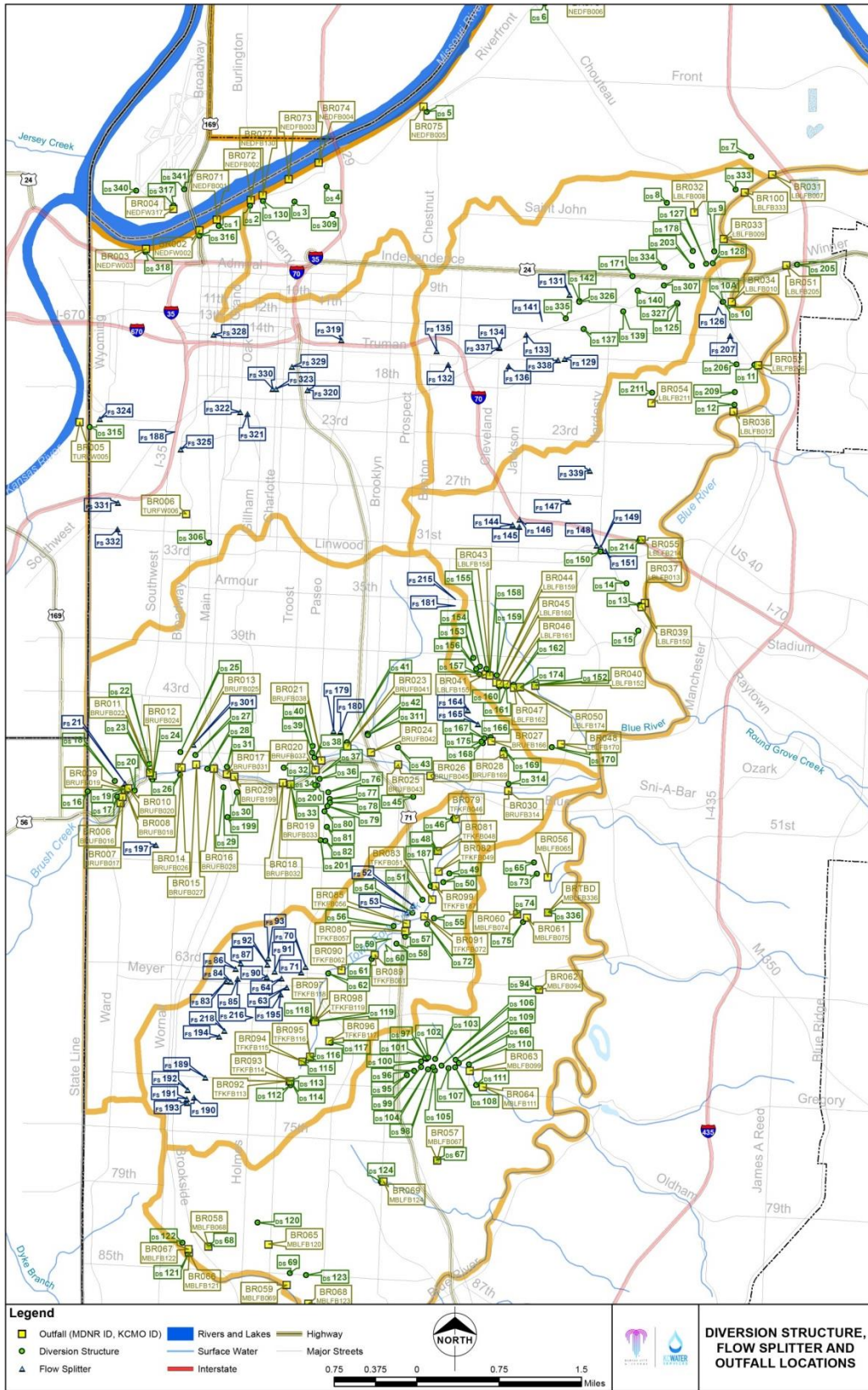
Overflow frequency varies significantly, both within the individual basins and across the City. The estimated average overflow frequency at the 87 outfalls south of the Missouri River is more than 20 times in a typical year. A complete summary of the overflow frequency, volume, and duration for each outfall is found in the supporting documentation included in the Overflow Control Plan.

iv. DEVELOPMENT OF A LONG-TERM MONITORING PLAN FOR THE OVERFLOW CONTROL PROGRAM

The City is implementing a Water Quality Monitoring Program (WQMP)⁴ that was developed to address the requirements of Section II, Water Quality Monitoring Plan of the Post-Construction Monitoring Program Performance Criteria, included as Appendix D of the Consent Decree. The WQMP is being implemented city-wide and addresses water quality in both the CSS and SSS areas. Summary results from the WQMP for 2015 as shown in Table 9 in Appendix D of this report.

⁴ Dated December 28, 2010

Figure 1: Diversion Structure, Flow Splitter, and Outfall Locations



XII. CAPACITY, MANAGEMENT, OPERATION AND MAINTENANCE PLAN PERFORMANCE CRITERIA – APPENDIX C

The following information is a summary of activities conducted in the reporting period to demonstrate compliance with the Capacity, Management, Operation and Maintenance (CMOM) program. The program aims at improving the ability of the utility to manage its separate sewer system and ultimately reduce the occurrence of sewer overflows and maintain compliance.

a. Collection System Management

i. ORGANIZATIONAL STRUCTURE

Water Services' organizational structure delineates job responsibilities, outlines opportunities for advancement, ensures effective employee to supervisor ratios, and guarantees adequate staff is in place to accomplish the mission and vision of the department. This structure is used during the annual budget process to determine staffing needs and allocate operational expenses appropriately. Water Services maintains job descriptions and organizational charts, effectively communicates job responsibilities to staff, and acquires and maintains the level of skills and abilities necessary to support the business needs of the organization.

Hiring for all vacant positions is handled through Water Services' Human Resources Division. Positions are posted internally city-wide to provide advancement opportunities for existing staff members. Water Services fills vacancies once the appropriate level of talent is found. At the end of 2015, there were 24 vacant positions in the Wastewater Line Maintenance division.

The organizational structure is evaluated during the annual budget process and through frequent communication between Human Resources personnel and the operating divisions of Water Services. In addition, members of the management team evaluate staffing needs throughout the year to address operational challenges that may not have been taken into consideration while developing the budget. The performance of all Water Services employees is evaluated using a formal performance review process. The Director and the Human Resources Manager are responsible for ensuring that Water Services' organizational structure and staffing meet department needs.

ii. COMMUNICATIONS AND CUSTOMER SERVICE

In 2015, Water Services communications staff continued to meet the unique needs of the many audiences the department serves. These audiences encompass:

- approximately 850 employees;
- 170,000 retail customers;
- 27 wholesale wastewater customers;
- local and national media outlets;

- neighborhood and civic groups;
- Mayor, City Council, City Manager, and City Departments; and
- State and Federal elected officials and governmental entities.

In 2015, Water Services improved internal business processes, enhanced employee training, and upgraded the customer information and billing system. A new customer payment portal was added to its website, which allows customers to more conveniently pay their bill, view water usage, schedule recurring payments, start or stop service, request a payment arrangement, and go paperless by enrolling in eBill. A mobile application is expected in early 2016 that will enable customers to perform many of the same self-service account functions that are available through the website from the convenience of a smartphone.

Communications staff members produce a newsletter (“What’s on Tap”), which is distributed in water bills, and also regularly update the Water Services website (www.kcwaterservices.org). Currently, the website supplies basic information on the Overflow Control Program and informs citizens of upcoming OCP projects.

iii. INQUIRIES, REQUESTS AND COMPLAINTS

The City tracks all customer service requests, and the primary point of contact for members of the public with requests or complaints is the City’s 3-1-1 Action Center. Calls to the Action Center are logged into a computer database that documents a description of the problem, location, caller identification, and contact data. An electronic ticket is then generated for routing to the appropriate City department. Complaints related to sanitary sewer or stormwater issues are routed to the Wastewater Line Maintenance staff by both phone and email. A supervisor scans each complaint and assigns them to an investigator to determine the nature of the problem. In 2015, the Action Center opened 3,292 cases for sewer related issues.

A work order is initiated if the Wastewater Line Maintenance Inspector finds that a problem is with a facility for which Water Services is responsible. Once the work is complete, the customer service ticket is closed out. In situations where Water Services repair activities require the involvement of other City departments, the appropriate departments are called in, and the associated costs are charged back to the Line Maintenance Division for work completed on their behalf.

Occasionally, a member of the public will call Water Services directly. If the call is related to an ongoing customer service ticket, the operator accesses the customer service database, looks up the matter and routes the call to the appropriate Wastewater Line Maintenance Supervisor.

iv. LEGAL AUTHORITY

The legal authority of Water Services rests in the City Charter of Kansas City, Missouri, which sets forth each of the City departments and defines their

responsibilities. Chapter 60 of the City Municipal Code defines the specific authority and responsibilities of Water Services regarding the sewer system.

Specifically, Chapter 60 of the Municipal Code provides the Department authority to do the following:

- Charge fees to all users of the sewer system, whether or not they reside within the City limits;
- Set rates for different classifications of sewer system users;
- Enter into agreements with communities outside the City limits for wastewater services;
- Measure and/or calculate the volumes of wastewater received from customers outside of the City limits;
- Solicit bids, select contractors and construct public sanitary and combined sewers;
- Set standards for the use of private septic tanks or cesspools, including the cleaning of the tanks and the disposal of collected materials;
- Maintain the approved pretreatment program pursuant to 40 C.F.R. Part 403 and the Current NPDES Permits;
- Prohibit the discharge of flammable or other hazardous materials into the sewer system;
- Regulate the release of oil and grease into the sewer system by setting acceptable discharge concentrations and setting surcharge rates for higher concentrations of discharged oil and grease;
- Require the pretreatment of waste from industrial or commercial users to protect the POTW;
- Require industrial or commercial users to report on their releases into the sewer system;
- Inspect the facilities of industrial or commercial users to determine the types and quantities of materials being released into the sewer system; and
- Implement the City's approved pretreatment program against any industrial or commercial users who violate the terms of the ordinance or permits issued.

In addition, Section 60-346 of the City's sewer user ordinance gives the City the authority to regulate the connection of private sewers to the public system by entering into contracts, assessing fees, requiring adherence to the City's Standard Specifications, and requiring bonds. The City has the authority to deny a building permit or sewer connection permit if it is determined the receiving sewers have inadequate capacity. The City has established Standard Specifications for the design and construction of new or upgraded sanitary and combined sewers.

Coordination between the Departments of Public Works and Water Services is required to regulate the connection of private sewers to the public system in accordance with Section 60-346 mentioned previously.

An established Enforcement Program provides the City the support needed to interpret, adapt, and enforce Water Services Rules and Regulations as needed, which helps control causes of SSOs. Causes may include I/I, corrosion, and blockage due to industrial waste and FOG. The Enforcement Program also provides the City the resources necessary to manage and implement the requirements set forth in the OCP, which will ultimately minimize overflows in the City's service area.

v. ACQUISITION CONSIDERATIONS

As part of the City's Acquisition Considerations Program, the design and construction of infrastructure acquired into the sewer system must comply with the City's technical specifications and construction standards. This program applies to prospective infrastructure from new construction and privately-owned systems being considered for a transfer of ownership to the City. The City has established a formal, written policy and guidelines for assuming ownership of preexisting infrastructure and ensures the performance of proper recordkeeping and documentation.

The program includes proactive measures to prevent the occurrence of I/I by inspecting new infrastructure to determine if it is properly designed, constructed, and installed, and by inspecting private sewers connecting to the public system to ensure they are watertight.

This program is primarily implemented and enforced through standard evaluation and inspection procedures. Located on the City's website, the City's standards (Design Criteria, Construction Specifications, and Standard Drawings) are a source of information for contractors and developers. City inspectors monitor new construction activities for compliance with City standards and specifications. Prior to accepting new infrastructure, City inspectors witness post-construction performance tests to assess the integrity of the infrastructure. The City's in-house inspectors are dedicated full time to monitoring construction activities of infrastructure to be dedicated to the City. This team of inspectors is within the City Planning and Development Department. Water Services works with City Planning and Development to ensure better coordination procedures.

The Permits staff (located in the City Planning and Development Department, Land Development Division) is responsible for issuing private development project permits for construction of public infrastructure, including storm and sanitary sewer improvements. The group, working under City ordinance, issues permits to those individuals and companies who have obtained the necessary insurance, bonds and construction plan approvals. The group also maintains public infrastructure records. The City provides unique file numbers to all public infrastructure construction plans, permits, and other pertinent records that are scanned and permanently stored.

The City Planning Development Services – Plans Management Division reviews and approves detailed plans required for permits. Upon submittal, the plans are reviewed for complete information and are then forwarded to the appropriate City departments for technical review and approval. The City issues permits once they receive all required approvals.

Such acquisitions are extremely rare and most likely will require custom procedures. Generally, the City follows the following procedure:

- City assigns a project manager to oversee potential acquisition activities.
- Owner of the infrastructure obtains and delivers to the City historical information on the infrastructure including proof of ownership, design guidelines, design calculations, as-built plans, specifications, rights-of-way, and any other information of interest.
- Owner obtains/performs a condition assessment (to be witnessed by the City).
- Owner tests the performance (to be witnessed by the City).
- City may determine whether the infrastructure will meet the desired conveyance need.
- City may require the owner to make improvements if needed, before assuming ownership.

vi. INFORMATION MANAGEMENT SYSTEM

The City maintains an Information Management System (IMS) that provides tools for tracking collection systems' performance, costs, and work orders and measures the effectiveness and efficiency of O&M activities.

In addition, the City continues to enhance its computer-based tools to manage and track collection system data. Standard operating procedures have been updated to ensure accurate documentation of pertinent collection system data and staff members' appropriate use of the IMS tools. The City continues to improve IMS training as mobile data units are deployed for data entry and research.

Collectively, IMS tools give staff members a well-defined, detailed understanding of how the collection system performs by monitoring, analyzing, and measuring their performance. The IMS tools help categorize and prioritize problems throughout the system so that staff members can make well-informed decisions regarding the allocation of resources and implement maintenance and rehabilitation activities that can minimize overflows.

Water Services continues to expand the IMS and share data among divisions in several locations around the City. For wastewater treatment and collection, the primary data system is Infor's Hansen work/service order, asset management and work crew assignment modules. Hansen combines the City's geographic information system (GIS) mapping with attribute tables, WinCan CCTV data

management system, and other software applications to help manage the large quantity of data processed on a daily basis. The following is a list of the relevant systems maintained and used during the 2015 reporting period:

- **GIS – ESRI ArcGIS:** Discussed in more detail below.
- **WinCan CCTV data management system:** Used to organize and store CCTV investigation information. WinCan stores digital video, still images and text data in a database format. The Division utilizes WinCan V8.24 with PACP coding.
- **Infor-Hansen System - CMMS:** Water Services is currently using Hansen 8.3 release 1404.
- **KWIK:** Used for Water, Wastewater, and Stormwater utility billing. Used to manage and bill approximately 170,000 customer accounts.
- **SCADA:** Used by the Water and Wastewater Treatment Divisions for data acquisition and signaling alarms.
- **Inventory Data Management – Interface Systems – Storeroom:** Used to manage supplies, track the quantity, cost, and physical location of spare equipment, parts, and material.
- **Mobile SR Tablet:** In-house developed web-based application to allow assignment of Hansen 8 service orders to be completed in the field in real-time with access to GIS, CIS, and Hansen 8 data via a secure connection. Tablets allow staff to close Hansen 8 service orders in the field and update Hansen within five (5) minutes, including the GIS that were allowable.

Water Services' Information Technology (IT) Division manages the PC network and applications specific to Water Services that includes the integration of various application programs to facilitate user and work needs at each location. The IMS interfaces are continually enhanced to improve efficiencies by automation based on work/problem code for work assignment and updates to the supporting system. Monitor tools have been added to review performance measures and provide real-time presorting to all of the Water Services divisions.

On an annual basis, the systems are evaluated to assess upgrade or replacement needs. In addition, an assessment is conducted to evaluate if an existing module can replace an older standalone system or process.

Water Services IT continues to work with each division to support the use of IMS in addition to providing training as requested with the core Water Services systems as new functionality becomes available or an enhancement is made. A combination of Water Services IT staff and vendor-provided maintenance teams provide oversight and support for Water Services IMS tools.

1. GIS Software

During the reporting period, Water Services continued to use the ESRI ArcGIS suite of products, including ArcGIS for Desktop for spatial data. In

Water Services, there are a moderate number of users of ArcGIS Desktop (split between water distribution, sewer collection, and stormwater collection) who create and maintain GIS data. A small number utilize ArcView to view the GIS and perform analysis. The remaining GIS users utilize ArcReader for viewing and plotting GIS data.

Field crews access GIS data via a secure connection from their mobile units based on user credentials. On a monthly basis, the GIS group refreshes the accessible GIS data.

GIS data contains asset type, material, size, install date, pipe elevation, and address information. These data fields also exist in Hansen, which is integrated with GIS, and allows staff members to spatially analyze data through open database connectivity. Hansen 8 also has built-in integration into ESRI GIS, which allows work/service orders to be created via GIS.

vii. GIS MAPPING

The purpose of Water Services' GIS Mapping Program is to ensure that an accurate and comprehensive inventory is maintained of the collection and transmission systems, to assemble and present the information in a manner conducive for use and to ensure that it is easily accessible by Water Services personnel that depend on the data. The City's online mapping system makes Water Services GIS data accessible to employees on the city-wide network.

Water Services' mapping software identifies several collection system components and attributes, including:

- Gravity sewer/force mains:
- Property lines/parcels
- Pipe attributes
- Manholes and other access points
- Diversion structures/flow splitters and outfalls
- Ownership of infrastructure
- Sewer easements
- Stormwater inlets
- Septic tanks
- Impervious surfaces
- Aerial photography
- Wastewater facilities (including pump stations, flood pump stations, and wastewater treatment plants)
- Green infrastructure

- Proposed new construction services
- Planimetric features (including contours, roads, surface water and land use)

Water Services continuously maintains comprehensive, accurate data in the GIS mapping system. Updates to the GIS are submitted by both internal crews and external consultants when routine field inspections or work in special project areas reveal changes or additions. These updates include new sewer extensions and sewer additions installed by contractors or identified by crews.

Digital maps generated from ArcGIS are available to field crews both in the office and via ArcReader or hard copies in the field.

Employees throughout Water Services utilize the system mapping tools and provide updates to inventory data. In addition to GIS edits by internal staff, the department obtains aerial photography from partnering GIS organizations. All relevant staff members receive training from IT personnel on ArcGIS and ArcReader. GIS administrators and users throughout Water Services evaluate the GIS Mapping Program on a continuous basis through monthly team meetings and frequent communication.

viii. SANITARY SEWER OVERFLOW REPORTING AND NOTIFICATION

The City maintains an SSO Reporting and Notification Program that ensures that discharges from the City's sewer system are documented, stored in a data management system, and properly reported to appropriate regulatory authorities. Water Services notifies the public, when appropriate, including persons with the potential to come in contact with the sewage. The program includes a listing of all building/private property backups discovered by or reported to the City that have occurred. Also included is the date of the building/private backup incident, location, source of notification (e.g., property owner, field crew), general cause(s) of the backup, and actions taken or suggested by the City to halt, mitigate, and prevent future incidents. The City follows its Current NPDES Permits for verbal and written notification to the NPDES permitting authority to inform them that an SSO has occurred.

Adherence to and compliance with the SSO Reporting and Notification Program plays a vital role in minimizing SSOs, supporting the City's community values, and minimizing the City's compliance and legal risks. Properly tracking and reporting SSOs provides Water Services staff with a better understanding of release point trends and root causes throughout the collection systems and enables decision makers to prioritize resources to cost effectively minimize SSOs. Continuous tracking of overflow occurrences leads to proactive prevention of SSO events.

The primary point of contact for members of the public with complaints is Kansas City's 3-1-1 Action Center. The Action Center is the principal way in which SSO overflows are reported to Water Services. A work order is initiated if a problem with a Water Services facility is identified upon receipt and investigation of a 3-1-1 service call.

A total of 1,500 calls related to SSOs were routed to the Wastewater Line Maintenance Division during 2015. The breakdown of SSO call types includes:

- Water in basement dry weather (W) – 1,191
- Water in basement wet weather (WR) – 309

In the event of a backup that resulted in the owner/tenant of the property calling 3-1-1 or calling Water Services Central Dispatch after hours, the City's Building and Private Property Response Plan comes into effect.

At the onset of the call, the consumer is asked a series of questions to determine the appropriate cleaning response. If the problem cannot be determined on the call, a Wastewater Line Maintenance Crew is dispatched to verify the condition of the City's sewer main and clean that section to ensure it is functioning properly.

If, as a result of the call, it is agreed upon that City involvement is necessary, a Hansen service request will be initiated. Either a Code 2 (Urgent) or a Code 3 (Emergency) prioritization will be given. In the case of a Code 2 event, a maintenance crew will respond as soon it is available. In the case of a Code 3 event, a maintenance crew will be dispatched on an emergency basis and will respond as soon as possible.

As a general rule of thumb, if there is water coming into the house from an outside source, the event would be categorized as a Code 3. If water is slowly draining, then it would most likely be a Code 2. If water comes up in the basement after using the facilities in the residence, it would most likely be a Code 2 event. If it is determined that the backup occurred due to issues on private property, a "Property Owners Responsibility letter" is given to the property owner with instructions and next steps to resolve the issue.

"Dry weather" backup complaints are documented as a "W" in the problem field on the Hansen caller log. Wastewater Line Maintenance Crews respond based on the Code 2 or Code 3 priority. "Wet weather" backup complaints are documented as a "WR" in the problem field on the Hansen caller log. Crews respond to all wet weather backup complaints as a Code 3 priority. Crews respond to inspect the city manholes for surcharge conditions. If a stoppage is found within the system, the crews will open it. If the sewer system is surcharging, a door hanger will be given to the property owner to inform them of the surcharge. The City will recommend that the owner contact a private plumbing company to install a backflow preventer at the property owner's expense.

Water Services strives to respond quickly to SSO complaints, controls the release of wastewater, and performs appropriate cleanup tasks; crews are dispatched 24 hours a day to investigate complaints. Water Services continually evaluates the SSO Reporting and Notification Program.

ix. PERMIT AUTHORITY NOTIFICATION

The Wastewater Line Maintenance Division notifies MDNR when a DWO occurs within 24 hours of discovery. Water Services completes follow-up written reports

within five days of the original notification. In all occurrences, the area around the overflow is cleaned and inspected for any debris or contaminants. In the case of DWOs caused by vandalism to the manhole, the standard manhole covers are replaced with bolt-down covers to deter future vandalism.

The Wastewater Treatment Division notifies MDNR when dry weather overflows occur at either pump stations or WWTPs within 24 hours of discovery. Water Services submits a follow-up written report to MDNR within five days of the occurrence. There were 64 dry weather overflows reported to MDNR in 2015 compared with 63 in 2014. See *Attachment A* for copies of all dry weather overflow reports submitted in 2015.

b. Collection Systems Operation

i. BUDGETING

The budgeting process provides adequate fiscal resources to the operating divisions to carry out their responsibilities. The Department's Division managers identify recommended staffing and funding levels, which are then adjusted based on City priorities.

Proper funding, budgeting, and planning are necessary for the Line Maintenance and Wastewater Treatment divisions to provide sufficient capital, labor, and equipment to complete CMOM activities as needed to ensure the minimization of overflows.

Division managers create budgets on an annual basis. The budget process covers project costs and revenue sources for five years. The managers submit their budget requests to Water Services Accounting staff members who review the requests, compile the budget and submit it to the Water Services Director for review and approval. The Director then presents it to the City Manager who, in turn, presents it to the Mayor and City Council for review and approval. Ultimately, the City Council approves the budget, which takes effect at the beginning of each fiscal year (May 1 through April 30).

ii. ENGINEERING

The purpose of Engineering within Water Services is multi-faceted, as it encompasses several functional business units. The business units are the coordinating entities behind many collection system activities, including new construction, construction inspections, rehabilitation and replacement, and capacity assessment and assurance. The business units confirm that new facilities are constructed according to standard construction specifications and do not contribute to future I/I problems and also provide inspection and oversight of rehabilitative work to ensure proper execution.

The various engineering business units have unique areas of collection system responsibility as follows:

- Planning is responsible for GIS mapping.
- Energy Management is responsible for negotiating utility contracts for pump station and treatment plant operations.
- Stormwater Management is responsible for the design of stormwater projects.
- Systems Engineering is responsible for the design of gravity sewer system improvements and general collection system planning for water distribution and wastewater collection systems.
- Facilities Plant Engineering is responsible for the design of all above ground structures including pump stations and wastewater treatment plants for water and wastewater supply, treatment and pumping facilities.
- OCP is responsible for development and implementation of the City's Overflow Control Program.
- Waterways is responsible for stormwater management projects that are funded jointly by other government agencies such as the Corps of Engineers.

Water Services performs all engineering activities under the supervision and direction of registered professional engineers. Staff members in the Engineering Division receive continuing education and training through industry seminars and workshops, as well as classes required to maintain PE licensure.

In addition, the City commonly uses engineering consulting firms and outside contractors to perform planning, design, and construction activities.

iii. **WATER QUALITY MONITORING**

Water Services has developed an integrated monitoring program intended to meet all water quality related objectives in a cost-effective manner as part of the Overflow Control Plan post-construction monitoring requirements set forth in Appendix D.

The Water Quality Monitoring Plan is divided into five sections:

1. Objectives and Rationale
2. Water Quality Monitoring Plan
3. Field Methods and Procedures
4. Quality Control
5. Resource Assessment

Water Services conducts sampling and analysis efforts for the Water Quality Monitoring Program in accordance with Water Services' OCP Quality Assurance Project Plan, Water Services Laboratory's Quality Assurance Manual, and Health and Safety Plan.

More information on the Water Quality Monitoring Program can be found in the Consent Decree Appendix D: Post Construction Monitoring Program Performance Criteria in this report.

iv. PRETREATMENT PROGRAM

The City continues to implement its approved pretreatment program pursuant to the Federal Register (40 C.F.R. Part 403) and the current NPDES permits. Information on the pretreatment program may be found in NMC 3. Submittals to MDNR associated with the pretreatment program can be found in *Attachment B*.

v. PUMP STATION OPERATIONS

The purpose of the Pump Station Operations Program is to ensure reliable operations of Water Services' wastewater pump stations and flood pump stations.

The department ensures reliable operations by:

- Conducting routine inspections
- Troubleshooting when situations arise
- Performing preventative maintenance
- Retaining appropriate records of pump station performance
- Remotely monitoring pump station operations through the use of remote dialers and a SCADA system

This program is executed in conjunction with the Pump Station Maintenance Program discussed later in this document. Routine inspections typically generate work orders for the maintenance crew and pump station operators are responsible for performing light maintenance work as needed.

In 2015, the North Bristol, South Bristol and First Creek Pump Stations were taken off-line. Water Services replaced all three pump stations with the new First Creek Pump Station, which was substantially complete in January 2015. In addition, modifications at the Line Creek Pump Station were completed.

Monitoring the reliability of pump stations through routine inspections, troubleshooting, and remote supervision decreases the chance of pump station failure that could potentially cause an overflow. Proper pump station operation also maximizes storage and ensures adequate capacity throughout the collection system, which may consequently prevent an overflow from occurring.

Wastewater Treatment Division operators visit each wastewater pump station (WWPS), flood pump station, and headworks pump station at WWTP sites on a regular basis. The visits occur at varying frequencies ranging from daily to three times per week for larger stations, to once per week for smaller stations. Visit frequency is based on a number of factors including manpower availability, facility size, complexity, criticality, reliability, and past maintenance history. Maintenance staff performs tasks needed to keep pump station equipment in serviceable

condition, perform preventative and emergency maintenance, plus other tasks needed to maintain the overall wastewater treatment system.

The pump stations include remote monitoring using telephone dialers and SCADA. In 2015, Water Services continued to implement a SCADA system program for the wastewater system. Water Services records pump station inspections in a log book, and inspection forms and data are archived.

At some of the larger stations, more extensive data is collected and filled out on worksheets, which are kept on clipboards at the site so that operators can easily scan the data for trends during their inspections.

Water Services has assigned operations crews and maintenance crews to pump station O&M activities. Seven operators are assigned to perform pump station rounds and station monitoring. Maintenance has two supervisors and 12 associates assigned full-time to mechanical investigation and repair activities at the stations. Maintenance also has crews available for electrical, instrument and controls, and HVAC repairs as needed.

The majority of training for pump station operators occurs through on-the-job experience. Water Services also provides considerable training through an in-house program in which staff is eligible to obtain continuing education credits required for certification.

vi. PUMP STATION MAINTENANCE

The purpose of the Pump Station Maintenance Program is to perform the necessary predictive, preventative, and corrective maintenance required to sustain the reliability of wastewater and flood pump stations and ensure that all pump stations throughout the service area are operating efficiently. This program is executed in conjunction with the Pump Station Operations Program to complete work orders generated from routine inspections, trouble calls, and preventative maintenance schedules. In 2015, 2,836 work orders were completed associated with maintenance of the City's 57 lift stations and 18 flood pump stations.

Maintaining the reliability of pump stations helps to decrease the chance of pump station failure that could potentially cause an overflow. Performing predictive and preventative maintenance helps to correct problems before they become an emergency situation and pump station reliability increases.

Crews perform regular maintenance at each of the pump stations. All pump station maintenance is performed based on planned weekly maintenance schedules or when an emergency occurs. Typical tasks include verifying normal operation of pumps and equipment, checking for sewage leaks, servicing equipment for proper operation, and other corrective and preventative maintenance. Each location has a log book and staff record work orders in the Hansen system.

Maintenance supervisors produce a weekly maintenance schedule and select specific projects based on crew availability, parts availability and the urgency of a particular repair. Since 2010, staff members have updated plans during a weekly

meeting between the pump station maintenance planners, operators, and maintenance supervisors to facilitate coordination. As a result, 90 percent of all work performed consists of scheduled maintenance. Control of backlog work has also improved since this process was initiated.

Hansen administration, procurement, and coordination consume the majority of the plant superintendent's time. Daily meetings with maintenance supervisors are conducted to communicate and coordinate the activities that need to be performed. Daily Maintenance Activity reports are emailed to plant personnel as warranted.

This program is evaluated consistently through daily team meetings and regular tracking of work orders. Tracking work orders in Hansen enables staff to identify patterns that may require further evaluation. All flood pump stations are inspected by the department on a quarterly basis, and the U.S. Army Corps of Engineers conducts annual audits.

vii. PUMP STATION EMERGENCIES

Water Services has emergency response procedures that crews follow for pump station emergencies. The department monitors the basic operations status via the SCADA alarm reporting and telephone dial-out systems, with each used as appropriate to the pump station location and equipment type. The SCADA system is monitored 24 hours a day, seven days a week by a certified plant operator (CPO) at the Blue River WWTP. The alarms received by the CPO indicate the type of equipment problem and permit the CPO to tailor responses. The CPO has guidelines that specify whom to call and when to call them based on the time of day, weather conditions and nature of the issue. Water Services also receives notification of trouble in the collection system from the public. External constituencies can hear an audible alarm or see a flashing red light at one of the pump stations and call Water Services' 24-hour response line to report trouble.

Water Services provides emergency response. The CPO has the authority to call in additional resources as needed, including either staff with electrical and mechanical expertise or a contract hauler. This system ensures that quick response is available 24 hours a day and improves employee accountability.

Additional assistance for pump station trouble calls may be summoned by the CPO. Skilled and/or general labor is available, as well as equipment operators and their respective equipment. The responder will determine labor and equipment needs during the initial assessment of the issue. Water Services works with an existing contractor to respond to pump station emergencies.

Work orders associated with pump station emergencies are completed and documented in Hansen. The success and effectiveness of Water Services' efforts are measured through a variety of performance indicators, such as response time, the effectiveness of remedies, and the number of well-trained personnel available to monitor and respond to pump station emergencies. The formal Emergency Response Plan is included as part of the City's 2010 Sewer Overflow Response Plan (SORP).

viii. FORCE MAINS

The Force Main Maintenance Program and Air Release Valve (ARV) Program consists of five elements: GIS, condition assessment, corrosion investigation, preventative maintenance, and documentation of maintenance activities.

Water Services initially inspect force main sewers in isolated areas through the use of infrared video/thermal imagery conducted as part of the annual aerial flyover contract. If an anomaly is found, field inspectors in the Wastewater Line Maintenance Division are sent out to determine if the anomaly was an active leak on the force main sewer. This program is discussed further in the Remote Sewer Inspection Program later in this report. The Line Maintenance Division also assists in the repair of force main breaks on a point repair basis.

The Blue River Wastewater Treatment Plant is responsible for the ARVs on the force main sewer. The inspection, maintenance, and contract work, is under their direct authority. The ARVs are checked annually at a minimum.

ix. SMOKE TESTING

The purpose of the Smoke Testing Program is to identify specific public and private sources of stormwater I/I into the SSS and CSS that can be eliminated or reduced through rehabilitation or repair. Smoke testing, along with CCTV inspection, manhole inspections, and flow monitoring comprise the Sanitary Sewer Evaluation Survey (SSES) program elements. Smoke testing helps to identify significant sources of stormwater I/I, including private service laterals and illegal connections such as downspouts and area drains. Smoke testing can also be used to determine the location of sewer main defects likely contributing I/I to the system.

The City has developed a standard protocol for smoke testing. Water Services keeps a hard copy of this protocol along with electronic copies. Water Services uses external contractors to perform the smoke testing activities as dictated by specific projects; the smoke testing protocols accompanies all requests for proposals for these projects. Data is analyzed and used for system improvements as outlined in the Collection System Maintenance section below.

In 2015, smoke testing was performed in approximately 275 miles of sewer to detect I/I sources in the public and private sectors. Each positively identified source was photographed and located using a GPS device. A defect feature class was created and is included in the geodatabase.

x. FLOW AND RAINFALL MONITORING

Flow and rainfall monitoring is being performed in conjunction with Appendix D of the Consent Decree. Additional flow and rainfall monitoring will be performed in individual sub-basins to aid in the design of proposed improvements.

Water Services has developed a standard protocol for flow and rainfall monitoring and data analysis. Once the flow and rainfall data is received, it is stored on a

server at Water Services and is reviewed by the Overflow Control Program team. The design professional conducts an analysis of the data for design of system improvements. Additional details and project-specific information on the flow monitoring program is described in more detail in Appendix D of this report.

xi. CCTV INSPECTION

The purpose of the City's CCTV Inspection Program is to visually assess the condition inside of the collection system. The program relies on the use of National Association of Sewer Service Companies (NASSCO) standardized ratings to characterize conditions. Currently, CCTV inspections are conducted to investigate a known trouble area and as a follow-up to line cleaning. Water Services has developed a standard protocol for CCTV inspections.

In 2015, the City televised approximately 337 miles of sewer lines, meeting the Consent Decree requirements of at least 105 miles annually for 2015. This mileage includes the mileage in the combined sewer system previously discussed in NMC 1. Water Services tracks CCTV inspection information in Hansen with information available from WinCan.

xii. REMOTE SEWER INSPECTION PROGRAM

The Remote Sewer Inspection Program is implemented to inspect remote portions of the sanitary sewer system in an economical and efficient manner to identify anomalies warranting further inspection. This is done through an aerial flyover that identifies and locates potential areas of ground seep into the watershed, specifically leaks from local underground sewer lines situated near or along the river, creeks and tributary streams in remote locations.

The entire 350 miles of the system's sewer lines and force mains are evaluated using the flyover process. The specialized equipment requires a small aircraft equipped with a video camera and thermal infrared/integrated GPS tracking. These tools detect temperature anomalies along remotely located portions of the collection system. The temperature anomalies indicate flow may be either exfiltrating or overflowing from the collection system, and that further investigation is necessary.

After the flyover is performed, the infrared footage is analyzed and adjusted to remove any known anomalies such as lights, animals or other obvious heat sources. For those heat sources that cannot be characterized, and that may be resulting from sewer system leaks, Water Services staff visually inspects those areas. If staff members discover a leak, a work order is issued for the repair.

A flyover was performed in January 2015 when 16 anomalies were discovered. Using the supplied GPS coordinates, the Wastewater Line Maintenance Division visually inspected the anomalies, and none were found to be related to sewers. Instead, they were the result of small ponds, dried up creeks with small pools of water, natural groundwater seepage, storm drainage pipes, excessive dog waste, animal carcasses, and other similar items.

c. Collection Systems Maintenance

i. MANHOLE REPAIRS

The purpose of the Manhole Repair Program is to ensure the structural integrity of manholes in the system, to reduce infiltration into manholes, to control odor problems at manholes, to increase accessibility to buried manholes, and to prevent public harm due to structural failures.

Manhole repairs often reduce infiltration into manholes. This helps ensure capacity exists for the conveyance of sanitary sewer flows. The Manhole Repair Program also addresses the structural integrity of manholes. This reduces the likelihood a manhole would structurally fail, causing blockage in the system that may trigger either SSOs or CSOs. The Manhole Repair Program also helps to minimize overflows by increasing the accessibility of buried manholes. Greater accessibility for inspection and maintenance activities will minimize overflows with maintenance related causes.

Activities associated with this program include the repair or replacement of manhole components in the upper three feet of the structure by the Wastewater Line Maintenance Division manhole repair crew or manhole replacement by a heavy repair crew. The division's manhole repair crew implements various types of repairs, including:

- Lid and ring replacement
- Lid grade adjustment
- Brick replacement

The repair crew does not repair manholes suffering severe structural failure. These manholes are typically removed and replaced by a heavy repair crew in the Line Maintenance Division. In 2015, staff inspected 10,382 manholes, and 169 manholes were repaired or replaced.

ii. MAINLINE SEWER REPAIRS

Actual physical repairs are made to the gravity sewer lines by the Line Maintenance Division. The repairs are performed to make upgrades and improvements to mainline sewers as needed to ensure adequate capacity, keep flow in pipes, reduce and eliminate I/I, and maintain the design conveyance of the pipes in the system.

Overflows are minimized by reducing the levels of I/I entering the system and by fixing deteriorating pipes that keep the flow in the collection system. A reduction in I/I levels leaves more system capacity available for the conveyance of sanitary sewer flow, eliminating one significant cause of overflows. Maintaining the pipe also removes restrictions that could potentially cause blockages and overflows and further helps ensure capacity.

The type of repair method used is dependent upon several factors including:

- Pipe size
- Pipe type
- Pipe location
- Flow
- Surface conditions
- Severity of I/I

The City utilizes several repair technologies, including:

- Open cut
- Cured in place lining
- Horizontal directional drilling
- Boring and jacking
- Tunneling
- Pipe bursting
- Slip lining
- Grouting of joints
- Point repairs

Work orders are prioritized based on available assessment information and sound judgment. Work orders associated with mainline sewer repairs are tracked and stored in Hansen. Repair work performed by in-house construction crews is entered into Hansen by Collection Systems personnel, and repair work performed by outside contractors is entered into Hansen by Engineering personnel.

Water Services employs repair crews; however, there is also a significant amount of mainline sewer repair work completed by outside contractors. The department also relies on outside contractors for construction work that requires either special equipment or expertise to perform. In-house inspectors monitor work conducted by outside contractors. Specifications for construction work are included in formal contracts used to manage outside firms.

In 2015, approximately 7,889 linear feet of sewer line repairs were performed as a part of OCP projects as well as Water Services' annual sewer repair contract.

iii. SEWER CLEANING

The two purposes of the Sewer Cleaning Program are to perform preventative maintenance cleaning on the gravity sewer system, and clean trouble or emergency areas. Preventative maintenance cleaning is intended to ensure that system design capacity is available and prevent non-structural blockages caused by either root intrusion or buildup of grease or debris. A large percentage of annual sewer cleaning is on lines that are part of a routine preventative maintenance schedule. Water Services conducts emergency cleaning in response to emergency calls. The remaining cleaning activities are unscheduled trouble or emergency calls.

City crews also perform corrective cleaning in response to stoppages, trouble calls, and city requests. If Water Services receives repeated trouble calls for a particular line segment, the line segment is placed on a frequent interval preventative cleaning cycle. CCTV inspection is completed in conjunction with all sewer cleanings. All sewer cleaning originates with a Hansen generated work order. Completed work is also tracked in Hansen.

The City performs both hydraulic and mechanical cleaning. Mechanical cleaning is performed using either a rod machine or a bucket machine. Hydraulic cleaning is performed using jetters.

Water Services stores all data related to the Sewer Cleaning Program in Hansen. Cleaning records include date, time and location information related to the cleaning, method of cleaning used, names of staff members who performed the cleaning, and any further actions that were initiated.

In 2015, the City cleaned approximately 383 miles of sewer lines, meeting the Consent Decree requirements of at least 283 miles annually. This mileage includes the mileage in the CSS area previously discussed in NMC 1.

iv. RESPONSE PLAN

The City's Building and Private Property Backup Response Plan was developed to provide procedures for response and preventative maintenance. The purpose of the plan is to restore the public sewer line to a functioning condition and perform any cleanup that may be required while working within the applicable laws of the City.

If, while conducting preventative cleaning activities, a basement backup occurs that is found to be the responsibility of Water Services, the property owner will be directed to contact the City's Claims Department. The Claims Department will hire a private contractor to perform the clean-up work. If there is a claim or lawsuit, then the law department works with the property owner to install a backflow device (if they choose to have the device installed). This installation would be located on private property, and Water Services is typically not informed if the homeowner elected to have the device installed or not.

d. Collection System Capacity

i. CAPACITY ASSESSMENT AND ASSURANCE

The City's current procedure for capacity assurance involves coordination with several City Departments and Divisions. The City Planning and Development Department (City Planning), Land Development Division reviews new development additions. The developer's engineering consultant is responsible for certifying that the proposed development will not overload the receiving sanitary sewer system. They must verify that the receiving trunk sewer was sized adequately according to APWA standards. They must also coordinate with Water Services when necessary to verify that the receiving pump station has sufficient capacity to handle the additional flows.

The City Planning Land Development Division has the authority to refuse authorizing the connection if there is a history of capacity issues or if the City has issued a moratorium on new connections in a specific area. City Planning is also responsible for reviewing plans and inspecting connections to the existing sewer system for a major infrastructure permit per Chapter 64 of the Code of Ordinance.

Water Services inspects the connections when new service line connections are requested and permitted. Water Services also inspects the installation of service lines on private property for 1-2 family residential structures, and building officials handle the inspections of the private service line installation on all other situations.

Public Works/Parks & Recreation inspects the right-of-way restoration associated with their excavation permits, and Public Works handles the traffic control inspections. Water Services supports the Land Development Division on larger proposed developments or unique drainage or sanitary sewer service areas when requested.

For single taps City Planning, Land Development Division grants or authorizes the connection. Water Services then issues the connection inspection permits for all connections and performs the inspection of the physical connection. Public Works (and/or Parks and Recreation Department for roads under its jurisdiction) issues excavation permits for excavation within the public right-of-way or easement. Public Works also issues any required traffic closure permits. Building officials issue a plumbing permit for the service line on private property.

XIII. POST CONSTRUCTION MONITORING PROGRAM PERFORMANCE CRITERIA – APPENDIX D

a. Flow Monitoring Program

i. SHORT-TERM FLOW MONITORING

Short-term flow monitoring is conducted by the OCP Program Management team. Information about the flow monitoring activities for 2015 is listed below.

Middle Blue River Pilot Project: In spring 2015, flow monitoring was performed to facilitate additional performance evaluation of the completed green infrastructure improvements. This additional monitoring included one meter at the downstream end of the pilot project area.

Round Grove: In spring 2015, additional flow monitoring was conducted to further estimate post-construction flow rates and quantify the amount of I/I removal. Flow monitoring was performed using 14 meters from late March through early July.

Various I/I Projects: In spring 2015, pre-construction flow and rainfall monitoring was performed for 90 days. Monitoring occurred in three I/I project areas to provide information for the identification and quantification of I/I sources. Monitoring was performed for Line Creek/Rock Creek Basins Area 2 Project, Blue River South Area 4 Project, and Blue River South Area 5 Project. Multiple rain gauges were also installed in the project areas to supplement coverage provided by the City's existing ALERT gauging system.

In addition, pre-construction flow and rainfall monitoring were performed for 90 days at three locations in the Middle Blue River Neighborhood Sewer Rehabilitation Project area to provide quantification of system flows prior to rehabilitation. Monitoring was also performed at Outfall 057 and 068 in the Middle Blue River basin and at Diversion Structure 006 to quantify flows for model recalibration.

ii. LONG-TERM FLOW MONITORING

Flow monitoring was performed per the revised CSS Metering Plan approved by USEPA in December 2015. Long-term flow monitoring was initiated or suspended in 2015 at multiple locations within the combined sewer system as listed below.

- Outfall BR032 (started)
- Outfall BR033 – two meters (started)
- Outfall BR056 (started)
- Outfalls BR061-064, 066-067 (suspended)
- Outfall BR071-077 (suspended)
- Outfall W003 (suspended)
- Outfall W002 (suspended)

b. Water Quality Testing

The 2015 reporting period is the fifth year of monitoring conducted under the Integrated Water Quality Monitoring Program (IWQMP). Since April 2011, Water Services staff members have conducted sampling and field measurements at 20 smaller water locations. A Water Services contractor has conducted large river sampling and field measurements at three locations on both the Kansas River and Missouri River. The Water Services laboratory also conducted analysis according to the methods prescribed in the Integrated Water Quality Monitoring Program⁵ and the associated Quality Assurance Project Plan.⁶

The details of the monitoring program, including sampling locations, frequency of monitoring, and water quality parameters are presented in the IWQMP. The IWQMP specifies monitoring to be conducted every other week. Field measurements include temperature, pH, dissolved oxygen, and aesthetic observations. Samples are collected and delivered to the Water Services laboratory for analysis of E. coli, TSS, and conductivity. Monitoring was conducted during the 2015 recreation season, which extends from April 1 through October 31.

The implementation of the IWQMP in 2015 was successful in obtaining 95 percent of the planned samples for both the small stream sites and the large river sites. Also, the collection frequencies for field duplicate samples and field rinse blank (FRB) samples (both at 10 percent of samples) met or exceeded the planned numbers (10 percent for duplicates; 5 percent for FRBs), and exceeded the requirements specified in the sampling and quality assurance plans. Monitoring was also conducted outside the recreation season as weather conditions permitted.

A brief summary of the 2015 water quality monitoring results is presented for E. coli, dissolved oxygen, and TSS in *Table 9*. Bacteria concentrations represented in the 2015 data do not differ noticeably from previous years, nor do they indicate a trend over time. Highest concentrations of bacteria are observed in Town Fork Creek (TF-01), at Rockwell Lane in Brushy Creek (BC-03), and the lower end of the Blue River (BR-07 and BR-08). These locations are consistent with past years. Average dissolved oxygen concentrations were not noticeably different from previous years and are all above applicable water quality criteria. The data collected in 2015 indicate relatively higher TSS concentrations in the Missouri River and Kansas River as compared to previous years. 2015 was a high flow year for those systems leading to those higher concentrations. TSS concentrations in the smaller tributary streams were not noticeably different from previous years. Water quality conditions can vary significantly year-to-year depending on precipitation conditions. Precipitation in Kansas City during 2015 was higher than average (38.86 inches⁷) at 46.59 inches.

⁵ LimnoTech, December 28, 2010

⁶ LimnoTech, 2005, revised 2010

⁷ National Weather Service Forecast Office Online: <http://w2.weather.gov/climate/getclimate.php?wfo=eax>

Table 9: Summary of 2015 OCP Water Quality Monitoring

	Site	E. Coli (Count/100 ml)			Dissolved Oxygen (mg/L)		TSS (mg/L)		
		No. of samples	Geometric mean	No. of Samples recreational season	Geometric mean recreational season	No. of samples	Average	No. of Samples	Average
Small River Stream Sites	BC-01	31	281	17	457	27	9.4	31	16
	BC-02	28	473	17	884	24	7.5	28	10
	BC-03	30	1,398	17	2,752	28	10.2	30	10
	BC-04	28	276	17	466	26	8.2	28	12
	BC-05	27	801	17	443	25	7.0	27	13
	BC-06	30	676	16	646	27	8.5	30	9
	BC-07	27	440	17	500	25	7.7	27	17
	BR-01	29	233	18	298	25	8.2	29	39
	BR-02	29	312	17	492	25	8.0	29	31
	BR-03	28	378	17	794	24	8.1	28	54
	BR-04	29	601	17	658	25	8.4	29	41
	BR-05	29	513	17	570	25	8.0	29	39
	BR-06	29	790	17	1,012	26	8.1	29	49
	BR-07	30	1,009	17	1,345	26	8.7	30	63
	BR-08	31	2,020	18	2,654	27	8.3	30	45
	BR-09	28	561	16	1,285	26	9.3	28	19
	IC-01	29	376	16	539	25	8.4	29	33
	PV-01	27	163	17	197	24	10.2	27	16
TF-01	28	3,880	17	5,467	24	8.5	28	11	
MC-01	29	235	16	197	26	8.2	29	16	
Large River Sites	MR-01-R	16	364	15	402	16	7.8	16	513
	MR-01-C	16	409	15	458	16	8.1	16	564
	MR-01-L	16	351	15	394	16	8.3	16	517
	MR-02-R	32	288	30	281	15	7.8	32	419
	MR-02-C	16	442	15	437	15	7.9	16	415
	MR-02-L	16	528	15	501	15	7.9	16	435
	KR-01-R	16	96	15	111	16	8.5	15	232
	KR-01-C	16	127	15	137	16	8.6	16	239
	KR-01-L	16	142	15	143	16	8.8	16	195

Note: Three locations were monitored at each of the large river sites (MR, KR), one each in the right channel (R), the center channel (C), and left channel (L).

XIV. SUPPLEMENTAL ENVIRONMENTAL PROJECT PLAN – APPENDIX E

The original Supplemental Environmental Project plan (SEP) included the implementation of a Sewer Connection and Septic Tank Closure Program for areas where Kansas City Water Services provides sewer services. A reevaluation of the properties showed that only 277 properties were eligible; of those eligible properties, only 43 connected to the public sewer system. Because of the community's low interest in this septic tank closure program, an Alternative SEP project was proposed by Water Services to USEPA on July 28, 2014.

The Alternative SEP involved sustainable stormwater best management practices (BMPs) associated with Water Services' Swope Campus parking lot improvements. On February 23, 2015, Water Services received a letter from USEPA indicating partial approval of the Campus Parking Lot Alternative SEP in the amount of \$1,100,000. The Swope Campus SEP was substantially completed on September 11, 2015.

USEPA also offered Water Services the opportunity to propose an additional alternative SEP project(s) to offset the remaining balance of \$377,382. Water Services proposed an additional alternative SEP, which was submitted to USEPA on April 29, 2015, entitled "*Blue River Trailhead at Blue Parkway,*" to utilize the remaining SEP balance. The proposed project uses various BMPs to improve water quality and habitat features from stormwater runoff areas before ultimately discharging into the Blue River at the Blue Parkway Bridge.

On July 28, 2015, Water Services requested a time extension to complete both the Swope Campus Alternative SEP (SEP No. 2) and the Blue River Trailhead at Blue Parkway Alternative SEP (SEP No. 3). On October 16, 2015, Water Services received approval from USEPA in regards to the Blue River Trailhead Project serving as the third additional Alternative SEP. In this same letter, USEPA also approved time extension requests: September 27, 2016, for the Swope Campus project and September 27, 2018, for the Blue River Trailhead project.

XV. SCHEDULE FOR IMPLEMENTATION OF DISINFECTION TECHNOLOGY AT WASTEWATER TREATMENT PLANTS— APPENDIX F

Disinfection improvements have been completed. All six of the City's wastewater treatment plants are now equipped with effluent disinfection.

ATTACHMENT A: DISCHARGE MONITORING AND BYPASS REPORTS

The following is an example of a Discharge Monitoring Report as submitted by Water Services to MDNR. In order to conserve resources, electronic copies of all discharge and bypass reports submitted to MDNR in 2015 are included on the enclosed disc.

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)
 NAME: KC, Rocky Branch Sewage Treatment Plant
 ADDRESS: 4800 E 63rd St., Kansas City, MO 64130

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
 DISCHARGE MONITORING REPORT (DMR)

Form Approved
 OMB No. 2040-0004

PERMIT NUMBER: MO-0048305
 DISCHARGE NUMBER: 003

FACILITY: 500 NE 132nd Street
 LOCATION: Kansas City, MO 64165

MONITORING PERIOD
 FROM: 2015 01 01 TO: 2015 01 31

Check here if No Discharge
 NOTE: Read Instructions before completing this form

PARAMETER	SAMPLE MEASUREMENT	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Flow *	SAMPLE MEASUREMENT	1.2	0.87	MGD	-	-	-	-	-	Daily	24 Hr Total
	PERMIT REQUIREMENT	Daily Max	Monthly Avg		-	-	-	-	-	Once/Weekday *2	24 Hr Total
Biochemical Oxygen Demands	SAMPLE MEASUREMENT	-	-	-	-	9	6	mg/L	0	Once/Week	24 Hr Composite
	PERMIT REQUIREMENT	-	-	-	-	20 Weekly Avg	10 Monthly Avg		-	Once/Week	24 Hr Composite
Total Suspended Solids	SAMPLE MEASUREMENT	-	-	-	-	13	8	mg/L	0	Once/Week	24 Hr Composite
	PERMIT REQUIREMENT	-	-	-	-	25 Weekly Avg	15 Monthly Avg		-	Once/Week	24 Hr Composite
Ammonia as N (Oct 1 - Mar 31)	SAMPLE MEASUREMENT	-	-	-	0.22	-	0.22	mg/L	0/1	Once	Grab
	PERMIT REQUIREMENT	-	-	-	7.5 Daily Max	-	2.9 Monthly Avg		-	Once/Month	Grab
Oil & Grease	SAMPLE MEASUREMENT	-	-	-	ND	-	ND	mg/L	0	Once	Grab
	PERMIT REQUIREMENT	-	-	-	15 Daily Max	-	10 Monthly Avg		-	Once/Month	Grab
Dissolved Oxygen *	SAMPLE MEASUREMENT	-	-	-	10	-	9	mg/L	-	8 Times	Grab
	PERMIT REQUIREMENT	-	-	-	Daily Max	-	Monthly Avg		-	Once/Month	Grab
pH	SAMPLE MEASUREMENT	-	-	%	6.8	-	8.5	-	0	6 Times	Grab
	PERMIT REQUIREMENT	-	-	-	Daily Min 6.5	-	Daily Max 9.0		-	Once/Week	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Randy Williams, Utility Superintendent
 TELEPHONE: 816 513-7205
 DATE: 2015 02 27

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
 * Monitoring requirement only. *2 Weekday, except for nine Federal holidays. ND - Non-Detect.

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)
 NAME: KC, Rocky Branch Sewage Treatment Plant
 ADDRESS: 4800 E 63rd St., Kansas City, MO 64130

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
 DISCHARGE MONITORING REPORT (DMR)

Form Approved
 OMB No. 2040-0004

PERMIT NUMBER: MO-0048305
 DISCHARGE NUMBER: 003

FACILITY: 500 NE 132nd Street
 LOCATION: Kansas City, MO 64165

MONITORING PERIOD
 FROM: 2015 01 01 TO: 2015 01 31

Check here if No Discharge
 NOTE: Read Instructions before completing this form

PARAMETER	SAMPLE MEASUREMENT	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
BOD ₅ Removal	SAMPLE MEASUREMENT	-	98	%	-	-	-	mg/L	0	Once	24 Hr Composite
	PERMIT REQUIREMENT	-	> 85%		-	-	-		-	Once/Month	24 Hr Composite
TSS Removal	SAMPLE MEASUREMENT	-	98	%	-	-	-	mg/L	0	Once	24 Hr Composite
	PERMIT REQUIREMENT	-	> 85%		-	-	-		-	Once/Month	24 Hr Composite
	SAMPLE MEASUREMENT	-	-	-	-	-	-		-		
	PERMIT REQUIREMENT	-	-	-	-	-	-		-		
	SAMPLE MEASUREMENT	-	-	-	-	-	-		-		
	PERMIT REQUIREMENT	-	-	-	-	-	-		-		
	SAMPLE MEASUREMENT	-	-	-	-	-	-		-		
	PERMIT REQUIREMENT	-	-	-	-	-	-		-		
	SAMPLE MEASUREMENT	-	-	-	-	-	-		-		
	PERMIT REQUIREMENT	-	-	-	-	-	-		-		
	SAMPLE MEASUREMENT	-	-	-	-	-	-		-		
	PERMIT REQUIREMENT	-	-	-	-	-	-		-		

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Randy Williams, Utility Superintendent
 TELEPHONE: 816 513-7205
 DATE: 2015 02 27

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
 * Monitoring requirement only.

ATTACHMENT B: REPORTS SUBMITTED UNDER CURRENT NPDES PERMITS

In order to conserve resources, electronic copies of the following reports submitted to MDNR in 2015 are included in the enclosed disc.

- Monthly Operating Reports
- Industrial Pretreatment Program Annual Report – 2014
- Municipal Separate Storm Sewer System Permit Annual Report – May 1, 2014 – April 30, 2015
- Sewer Extension Authority Report – 2014
- Birmingham Inflow/Infiltration Report – 2014
- Birmingham Inflow/Infiltration Report - 2015

ATTACHMENT C: LIST OF CRITICAL FACILITIES AND INSPECTION FREQUENCY

Table 10 below is the start of the critical facilities list and associated inspection frequencies. In order to conserve resources, an electronic copy of the full list is included in the enclosed disc.

Table 10: Critical Structures Inventory – Kansas City, MO

STRUCTURE NUMBER	LOCATION	MAP NUMBER	MH NUMBER	RECEIVING STREAM	INSPECTION INTERVAL (days)
1	100 DELAWARE DIVERSION	S028	35	MISSOURI RIVER	7
2	100 MAIN STREET DIVERSION	S028	302	MISSOURI RIVER	30
3	100 GILLIS AVE DIVERSION 600FT W	S028	954	MISSOURI RIVER	7
4	100 LYDIA AVE DIVERSION	S027	860	MISSOURI RIVER	30
5	* 101 PROSPECT AVE PUMP STATION	S009	800	MISSOURI RIVER	30
6	1931 N CHOUTEAU TRFY* MILWAUKEE PUMP STATION	S006	801	MISSOURI RIVER	30
7	7300 HAWTHORNE DIVERSION	S012	47	BLUE RIVER	30
8	320 BELMONT AVE	S024	209	BLUE RIVER	14
9	WILSON & CAMBRIDGE	S024	87	BLUE RIVER	30
10	801 E 9TH ST, IN PARKING LOT	S035	435	BLUE RIVER	7
11	7601 TRUMAN RD	S036	18	BLUE RIVER	14
12	1800 CRYSTAL AVE	S048	210	BLUE RIVER	14
13	3557 STADIUM DRIVE	S059	9	BLUE RIVER	14
14	3333 STADIUM DRIVE	S059	1	BLUE RIVER	14
16	5015 STATE LINE RD	S078	629	BRUSH CREEK	7
17	1308 W 50TH TER	S078	22	BRUSH CREEK	3
18	4941 WESTWOOD RD	S078	174	BRUSH CREEK	7
19	1204 W 50TH ST	S078	186	BRUSH CREEK	7
20	4979 WARD PARKWAY	S078	323	BRUSH CREEK	7
21	4938 HOLLY ST	S078	190	BRUSH CREEK	7
22	807 W 48TH ST	S078	354	BRUSH CREEK	14
23	4821 ROANOKE PARKWAY	S078	344	BRUSH CREEK	30
24	717 WARD PARKWAY	S078	340	BRUSH CREEK	7
25	4700 BROADWAY	S078	488	BRUSH CREEK	3
26	4849 WORNALL RD	S079	134	BRUSH CREEK	7
27	111 NICHOLS RD	S079	232	BRUSH CREEK	7
28	1 WARD PARKWAY	S079	159	BRUSH CREEK	7
29	4908 BROOKSIDE BLVD	S079	93	BRUSH CREEK	14
30	4925 OAK ST	S079	82	BRUSH CREEK	14

