

ANNUAL REPORT

KANSAS CITY'S OVERFLOW CONTROL PROGRAM

REPORTING PERIOD: JANUARY 1, 2020 TO DECEMBER 31, 2020





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March 31, 2021

To All,

Please find enclosed the tenth annual report related to Kansas City's overflow control program. This report covers the annual reporting period from January 1, 2020, to December 31, 2020. Pursuant to the Consent Decree, this report has a required submittal date of no later than March 31, 2021. Included with this report are electronic files containing inspection records of critical structures performed in accordance with the City's CMOM and NMC programs, and certificates of AFO for OCP projects completed in 2020 referenced in Attachments C and D, respectively.

Additionally, as required by the Consent Decree, enclosed are electronic files of Discharge Monitoring Reports and other reports submitted by the City under its current NPDES permits.

By signing below, I certify under penalty of law that the document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted, and that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please contact me if you have questions.

Best regards,

Terry Leeds

Director of Water Services

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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 for the first time by the parties and approved by the court on January 9, 2015 (Civil Action No. 4:10 -cv-0497-GAF). A second amendment was presented by the parties and approved by the courts on January 5, 2018 (Civil Action No. 4:10- cv-0497-GAF). A Non-Material Consent Decree Modification was agreed upon by the parties and filed with the court on February 12, 2020. The Third Amended Consent Decree, which was being negotiated during this reporting period, was entered into the United States District Court for the Western District of Missouri Western Division on March 3rd, 2021. 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, 2020, and December 31, 2020.

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 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.

The City and its regulatory partners have agreed to meet the objectives over a 30-year period from 2010 through 2040 as indicated in the Third Amended Consent Decree (hereafter referred to as Consent Decree). The Plan involves a list of improvements that are structured to capture for treatment approximately 88 percent of total wet weather flow in the combined sewer system and eliminate separate sanitary sewer overflows during a five-year, 24-hour rainfall event. This implementation is referred to as the Overflow Control Program (OCP). Kansas City's Overflow Control program team implements the OCP to ensure compliance with the City's federal consent decree.

The Consent Decree components include:

- Capital projects targeted at reducing the occurrence Combined Sewer Overflows (CSO)
- Separate Sewer Overflow (SSO) Control Measures
- Nine Minimum Controls (NMC) 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 sanitary 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 areas with public sewers
- Implementation of disinfection at all six of the City's wastewater treatment plants

III. KANSAS CITY'S SEWER SYSTEM OVERVIEW

More than 150 years ago, Kansas City began building the basic sewer infrastructure that would allow the city to grow and prosper. 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 320 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 overflows 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 260 square miles of Kansas City's sewer system is comprised of separate sewers. A separate sanitary sewer system is only intended to collect and convey wastewater. However, rainwater can enter the sanitary system through inflow and infiltration (I/I) sources including but not limited to 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 wet weather capacity due to excessive I/I, it too overflows a mixture of wastewater and rainwater into local streams and rivers. Kansas City has one constructed sanitary sewer overflow (SSO) in the Line Creek Basin, which is being eliminated as part of the Overflow Control Program. In addition, five SSOs are located in the separate sanitary systems in the Brush Creek and Blue River South Basins. The City is actively working to eliminate these five SSOs through inflow and infiltration reduction measures.

IV. REPORTING PERIOD ACTIVITY

Year 2020 presented the City with many unique challenges due to the COVID-19 pandemic that adversely affected the City's staffing and financial resources for which the full impacts are yet to be realized. The City submitted a General Force Majeure Notification due to the COVID-19 Pandemic to regulatory agencies on March 25, 2020 informing them of the possibility that compliance with ongoing requirements of the decree may be delayed or prevented due to COVID-19 related impacts. During these unprecedented times, the City's City Council did not approve proposed FY2021 utility rate increases, which will have a lasting affect and necessitated the deferral of construction starts for several inflow and infiltration reduction projects, the reduced investment in the City's annual sewer rehabilitation program, and suspension of the City's private inflow and infiltration reduction program. These impacts may cause a delay in the completion of one or more control measure projects in the combined and separate sewer systems including, but not limited to, Sewer Separation: 31st and Broadway, I/I Reduction: Area 4, and I/I Reduction: Area 5 Projects. The impacts of Covid-19 Pandemic were considered by the City and the regulatory agencies in its development of the Third Amended Consent Decree which was being negotiated during this reporting period. The Third Amended Consent Decree was entered into the United States District Court for the Western District of Missouri Western Division on March 3rd, 2021.

The following specific milestones, as laid forth in Consent Decree Appendices A and D, were met during the reporting period from January 1, 2020, through December 31, 2020. Work 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 milestones have been met in accordance

with the consent decree and its subsequent modifications, including the Third Amended Consent Decree. 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 in accordance with Section IX.B. Requirements for NMC and CMOM were met for the reporting period.

A. APPENDIX A – PERFORMANCE MEASURES

Brush Creek Basin

- Neighborhood Sewer Rehabilitation: Brush Creek 1 & 2
 - Consent Decree Required Achievement of Full Operation Date: December 31, 2020
 - Actual Achievement of Full Operation Date: June 2020

Northeast Industrial District Basin

- Neighborhood Sewer Rehabilitation: Northeast Area and Gooseneck Creek
 - Consent Decree Required Achievement of Full Operation Date: December 31, 2020
 - Actual Achievement of Full Operation Date: August 2020
- In-Line Storage: Gooseneck Arch Sewer Gate & Pump Station
 - Consent Decree Required Achievement of Full Operation Date: December 31, 2021
 - Actual Achievement of Full Operation Date: September 2020

Lower Blue River Basin

- Neighborhood Sewer Rehabilitation: Lower Blue River North
 - Consent Decree Required Achievement of Full Operation Date: December 31, 2021
 - Actual Achievement of Full Operation Date: December 2020
- Pump Station Upgrade: 15th Street
 - Consent Decree Required Start Date: 2020
 - Actual Start Date: November 2018
- Relief Sewer: Hardesty Ave and 31st Street
 - Consent Decree Required Start Date: 2020
 - Actual Start Date: January 2019
- Relief Sewer: Vineyard and Lawn Street
 - Consent Decree Required Start Date: 2020
 - Actual Start Date: January 2019
- Relief Sewer: 45th Street
 - Consent Decree Required Start Date: 2020
 - Actual Start Date: August 2019
- Dry Weather Sewer Line: Outfall 055
 - Consent Decree Required Start Date: 2020
 - Actual Start Date: August 2019

Northeast Industrial District Basin

- Green Infrastructure Pilot: Turkey Creek/Central Industrial District
 - Consent Decree Required Achievement of Full Operation Date: December 31, 2020
 - Actual Achievement of Full Operation Date: September 2020
- Sewer Separation: 31st Street and Broadway
 - Consent Decree Required Start Date: 2020
 - Actual Start Date: January 2018

B. APPENDIX D – POST-CONSTRUCTION MONITORING PROGRAM

Flow monitoring was performed in accordance with the revised CSS Metering Plan approved by USEPA in December 2016 and as supplemented by submitted Post Construction Flow Monitoring Plans. Post Construction Flow Monitoring Plans have been submitted for the Middle Blue River Basin and NEID Basin. Additionally, the City has submitted Post Construction Flow Monitoring Plans for the following major facilities: Turkey Creek Pump Station, In-Line Gates at Santa Fe Pump Station, Gooseneck Arch Sewer Gate and Pump Station, OK Creek Sewer In-Line Storage, Westside WWTP, and Diversion Structure 068 Storage Basin.

The City implemented its Long-Term Flow Monitoring Program for the outfalls listed below. Flow monitoring at the listed outfalls will continue for at least three recreation seasons or until basin compliance is verified. Data from the flow metering devices will be used to update the Program's system hydraulic model to simulate post-construction system response to rainfall events. Outfalls are listed as "continued" where post-construction related flow meters were installed in years prior to 2020. Outfalls listed as "commenced" had post-construction related flow meters installed in the 2020 calendar year.

- Outfall BR039 (continued)
- Outfall BR040 (continued)
- Outfall BR059 (continued)
- Outfall BR069 (continued)
- Outfall BR063 (continued)
- Outfall BR064 (continued)
- Outfall W003 (continued)
- Outfall BR056 (continued)
- Outfall BR067 (commenced)

In December of 2020 the City submitted two post construction flow-monitoring plans for the NEID Basin and the Middle Blue River – Diversion Structure 068 Storage Basin facility project. The NEID Basin Post Construction Flow Monitoring Plan was submitted following the completion of all projects in the NEID Basin, which include Sewer Separation: Diversion Structure 006, In-Line Storage: Gooseneck Arch Sewer Gate and Pump Station, Neighborhood Sewer Rehabilitation: NEID, and Green Infrastructure Pilot: Northeast Industrial District.

C. CITY MEETINGS WITH EPA AND MDNR

Historically the City conducts meetings with EPA or MDNR officials during the reporting period to provide updates on the status of Overflow Control Program implementation and to discuss the changes to the Consent Decree proposed by the City to be included in a Third Amended Consent Decree.

During the reporting period, two in-person meetings and multiple coordination calls were conducted between the City, the EPA, and the Department of Justice regarding optimization of and beneficial revisions to both the consent decree and its appendices. The in-person meetings were held on February 25, 2020 and March 16, 2020. These collaborative discussions culminated in the Third Amended Consent Decree being entered into the United States District Court for the Western District of Missouri Western Division on March 3rd, 2021. Based on the City's revised commitments as defined in the amended Consent Decree, the City projects to spend approximately \$1.4 billion in future dollars to implement the control measures defined in Appendix "A" and an additional approximately \$0.7 billion in future dollars to operate and maintain the City's existing sewer system from 2019 – 2035 for a total of \$2.1 billion, as presented by the City at its February 25, 2020 meeting with EPA and DOJ representatives. This total investment of approximately \$2.1 billion in future dollars from 2019 – 2035 was also previously

discussed with EPA and DOJ representatives during negotiation discussions held on October 3, 2018.

V. DATA MANAGEMENT AND PROJECT CONTROLS

Managing the large amount of data generated by the Overflow Control Program is a primary focus of the City of Kansas City, MO. During the reporting period, the City continued to support and maintain its Management Information System (MIS) to capture data pertaining to work activities, schedules and budgets for all Overflow Control projects. The MIS is currently being used to create and update project status reports, provide program financial summary information, forecast project costs and schedule information.

During the reporting period, the City continued to utilize Primavera scheduling tools for schedule management. This software enabled staff to more readily identify, update and track project progress, recognize potential challenges and enhance project team coordination. The result of these proactive, problem-solving efforts is more effective management of project scope, schedule, budget, and risk profile.

The accumulation of data related to sewer system network characterizations, manhole inspections, sewer cleaning, and CCTV work throughout the City continued during the reporting period. Water Services continued the process of storing this data in a virtual cloud network, as well as organizing, categorizing and distributing this information to design professionals involved with Overflow Control projects. Using this data, the City has developed a City-wide Annual Sewer Rehabilitation program based on Likelihood of Failure (LoF) and Consequence of Failure (CoF). The LoF and CoF scores are multiplied together, resulting in a business risk exposure measurement for the prioritization of rehabilitation efforts.

Updating the quality of the City's GIS data related to Overflow Control projects also continued during the reporting period. As CCTV information in the Overflow Control project areas was collected, it was subjected to a quality control check process before it was linked 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.

During the reporting period, the City fully utilized an application and website built for Keep Out the Rain, the City's Private Inflow and Infiltration (I/I) Reduction Program. This data tool enabled 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 located on private property that are cost-effective for the City to remove for the public's benefit. This application also provided real-time analytics data to track program performance.

The City's Overflow Control Program uses two web-based document control systems as it transitions from the use of Aconex to e-Builder software platforms. These platform tools are utilized to track all facets of project delivery associated with construction, including submittals, correspondence, daily reports and payment applications. This application is utilized by design professionals, construction contractors, the City's program management team, and City staff involved in the implementation of Overflow Control Program projects.

VI. PUBLIC OUTREACH

Below is a summary of public outreach activities for the City's Overflow Control Program completed during the reporting period. Additional information regarding these activities is in the discussion of NMC 7, which begins on page 28 in this report.

- Conducted 5 public meetings attended by 149 citizens about overflow control program related projects, City-wide.
- Published program-related information on Water Services' program-specific website at www.kcsmartsewer.us, through the City of Kansas City, Missouri newsletter and social media channels, and in neighborhood association newsletters.
- 16 media stories related to various aspects of the City's Overflow Control Program (television, radio and print) generating more than 5.1 million impressions.
- Ongoing engagement about Overflow Control Program projects and initiatives with residents via AlertKC (Nixle), Nextdoor, Twitter, Instagram, and Facebook media channels.

VII. IMPLEMENTATION OF OVERFLOW CONTROL MEASURES

A. POST-CONSTRUCTION MONITORING PROGRAM

Post-construction monitoring activities completed in 2020, as defined in Appendix D of the Consent Decree, are summarized in this report beginning on page 56.

B. GREEN INFRASTRUCTURE

i. ADDITIONAL GREEN INFRASTRUCTURE PROJECTS

Additional green infrastructure pilot-scale projects located in the Lower Blue River Basin completed construction during the reporting period. These projects are being constructed above and beyond the Consent Decree requirements and include following three sites:

- East High School
- Veterans Administration (VA) Hospital and Linwood Green Park
- Avenues of Life Mattress Business Training Center+

The first phase of green infrastructure was previously completed at East High School as a joint effort between Kansas City Public Schools and the City. The second phase of green infrastructure at East High School, which includes a series of bioretention facilities, was completed during this reporting period.

Construction of green infrastructure improvements at the VA Hospital and Linwood Green Park site began in late October 2019 and continued through this reporting period. Green infrastructure facilities at this site include a series of bioretention swales and bioretention basins which were completed at the end of 2020.

Construction of green infrastructure at the Avenues of Life site began in October 2019 and continued through this reporting period. Green infrastructure facilities at the site include three bioretention basins which were completed at the end of 2020.

The City continued interdepartmental coordination and worked with private landowners on the design and construction of the green infrastructure improvements listed below to manage stormwater locally on-site within the combined sewer system to reduce overflows. These green infrastructure projects are not required by the Consent Decree, however, are considered to optimize CSO control solutions while providing multiple community benefits.

- Green Infrastructure: West Bottoms Flats. This private development project completed construction during this reporting period, incorporating underground storage with real-time controls to manage stormwater runoff from approximately 3 green acres. A “green acre” is an acre of impervious area draining to green infrastructure. This is a public-private partnership project located in the Central Industrial District basin.
- Green Infrastructure: Mill Creek Park. This is a Water Services Department led project, collaborating with KC Parks and Recreation Department to build green infrastructure in the northern areas of Mill Creek Park in the Brush Creek basin. Stormwater runoff collected from approximately 35 green acres of drainage area within the combined sewer system will be managed by the proposed project to reduce the CSO impacts. A concept evaluation report was completed in November 2020 and design services are anticipated to begin during the 2021 reporting period.
- Green Infrastructure: The Paseo Gateway/ Kansas City University. This proposed project is located at the intersection of The Paseo and Independence Avenue. This is a KC Parks and Recreation Department led project that will separate stormwater from approximately 17 green acres of drainage area and be managed using green infrastructure. Project design is complete, with construction planning underway.
- Green Infrastructure: Wornall Road, 74th to 79th Street. This is a Public Works Department led project that is incorporating green infrastructure into intersection and parking lot improvements to manage stormwater runoff from approximately 9 green acres of drainage area. The types of green infrastructure proposed include tree planters, pervious pavers, and underground storage. This project is located in the Town Fork Creek basin and is anticipated to complete design in 2021.
- Green Infrastructure: 63rd and Paseo/Daniel Morgan Boone Park: This is a sewer separation project with potential green infrastructure within the Town Fork Creek corridor and Daniel Morgan Boone Park. A concept evaluation report was drafted during this reporting period with consideration of multiple green infrastructure alternatives and potential drainage areas.

ii. *CONSENT DECREE GREEN INFRASTRUCTURE PROJECTS*

During the reporting period, the city completed construction of green infrastructure pilot projects located in the Northeast Industrial District and the Turkey Creek/Central Industrial District basins as required by the Consent Decree.

The green infrastructure improvements in the Northeast Industrial District consist of a gravel wetland facility at Nicholson Park and bioretention facilities along Gardner Avenue. Weather conditions and high stage of the Missouri River caused elevated groundwater levels at each green infrastructure site, resulting in a temporary suspension of construction from June 25, 2019 through the end of 2019. This project resumed construction in early 2020. The Achievement of Full Operation date for this project was extended from December 31, 2020 to December 31, 2021 by Non-Material Consent Decree Modification agreed upon and filed in February 2020. Construction was completed in December 2020.

The Turkey Creek/Central Industrial District Green Infrastructure project includes infiltration trenches, cisterns, permeable paver parking, infiltration dry wells, bioretention, and a bioretention swale. Construction was completed in December 2020.

See Table 1B on page 11 for more information.

C. COMPLIANCE WITH PERMITS

The City strives to continuously maintain compliance with its current wastewater treatment plant NPDES permits, and to properly maintain the capacity, management, and operation and maintenance of the City's collection system.

i. DISCHARGE MONITORING REPORTS

A collection of the required discharge monitoring reports for the City's wastewater treatment plants, submitted to MDNR during the reporting period, is included in Attachment A of this report. The Wastewater Treatment Division of the Water Services Department submitted these reports, which are a part of the Missouri State Operating Permits MO-0024911, MO-0024929, MO-0024961, MO-0048305, MO-0049531, and MO-0048313.

ii. 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 report.

VIII. COMBINED SEWER OVERFLOW CONTROL MEASURES – APPENDIX A

The combined sewer system (CSS) makes up approximately 58 square miles of the city's sewer system running from the Missouri/Kansas state line on the west to the Blue River on the east, and from the Missouri River on the north to 85th Street on the south. 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.

Collection system field investigation activities for CSS projects were completed during the reporting period through the City's OCP Program Management contract and two city-wide sewer cleaning and closed-circuit television (CCTV) inspection contracts. The work consists of sewer system network characterization and manhole inspections, and sewer cleaning and CCTV inspection of sewers in the Lower Blue River, Middle Blue River, and Brush Creek basins.

The City's 30-year Overflow Control Program is being implemented in three stages, each with a primary control strategy. The early years of the program included repairing/rehabilitating existing sewer systems to restore conveyance capacity and developing and evaluating green infrastructure pilot projects and I/I reduction efforts with a focus on at source control of stormwater impacts. The middle years of the program focus on maximizing the capacity within the existing system with strategic use of in-line storage, sewer separation and construction of relief sewers, and analyzing the results of source volume reductions in combined and separate systems through implementation of green infrastructure and infiltration and inflow reduction projects, respectively. 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 Tables 1A and 1B. During the reporting period, the combined sewer system had twenty-six (26) active projects. Nine (9) projects are recorded in Table 1A as non-Consent Decree projects. Seventeen (17) projects are recorded in Table 1B as projects that were included in Appendix A of the Consent Decree.

Table 1A: Non-Consent Decree Projects in Combined Sewer System Basin
(through December 31, 2020)

Basin	Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date		
Combined Sewer System			Pre-Design	Design	Construction AFO
Lower Blue River Basin	Additional Green Infrastructure Pilot Projects	This green infrastructure project is designed to reduce combined sewer overflows and to provide aesthetic, social and economic enhancements within the Lower Blue River Basin.	<u>100%</u>	<u>100%</u>	East High School – <u>100%</u> September 2020 VA Hospital – <u>100%</u> November 2020 AoL – <u>100%</u> November 2020
Brush Creek Basin	Green Infrastructure: Mill Creek Park	This project is being implemented in conjunction with the City's Streetcar Phase 2 Project and will reduce combined sewer overflow volume at Outfall 017 into Brush Creek. The project will separate sewers in the vicinity of 43rd Street and Main Street and direct separated stormwater flow to a green infrastructure facility in Mill Creek Park prior to being conveyed back in the CSS.	<u>70%</u> June 2021	April 2022	August 2023
Middle Blue River Basin	I/I Reduction Area 13	This project is being implemented to reduce water in basement occurrences in a separate sewer system area located within the Middle Blue River basin. The project will also increase the level of service achieved by downstream interceptor sewers.	<u>100%</u>	<u>50%</u> June 2021	October 2023
Brush Creek Basin	Brookside I/I Reduction	This project is being implemented to reduce water in basement occurrences in a separate sewer system area located within the Brush Creek Basin.	<u>100%</u>	<u>5%</u> April 2023	April 2025
Town Fork Creek Basin	Town Fork Creek Baseline Improvements	This project is being implemented to eliminate combined sewer overflows at 5 small outfalls in the Town Fork Creek Basin. A combination of sewer separation and green infrastructure will be constructed to eliminate overflows for the typical year at 7 diversion structures at various locations throughout the basin.	<u>100%</u>	<u>75%</u> May 2021	December 2022*

Basin	Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date		
Combined Sewer System			Pre-Design	Design	Construction AFO
Northeast Industrial District Basin	Green Infrastructure: The Paseo Gateway/ Kansas City University	This green infrastructure project is designed to reduce combined sewer overflows and to provide aesthetic, social and economic enhancements within the Northeast Industrial District basin. This is a KC Parks and Recreation Department led project that will separate stormwater and convey this separated area to a new green infrastructure facility.	<u>100%</u>	<u>50%</u> September 2021	June 2023
Town Fork Creek Basin	Green Infrastructure: Wornall Road, 74th to 79th Street	This is a Public Works Department led project that is incorporating green infrastructure into intersection and parking lot improvements to manage stormwater runoff. The types of green infrastructure proposed include tree planters, pervious pavers, and underground storage.	<u>100%</u>	<u>40%</u> April 2021	October 2022
Turkey Creek/ Central Industrial District	Green Infrastructure: West Bottom Flats	This private development project is incorporating underground storage with real-time controls to manage stormwater runoff from approximately 3.3 acres.	<u>100%</u>	<u>100%</u>	<u>100%</u> March 2020
Town Fork Creek Basin	Sewer Separation/Green Infrastructure: 63 rd & Paseo/Daniel Morgan Boone Park	Sewer separation of between 120 to up to 850 acres of combined sewer area with potential downstream green infrastructure within the Town Fork Creek corridor and Daniel Morgan Boone Park.	<u>0%</u> October 2021	October 2023	December 2026

* Project included and completion date set in Third Amended Consent Decree

Table 1B: Consent Decree Projects in Combined Sewer System Basin
(through December 31, 2020)

Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date			CD AFO Date
Combined Sewer System		Pre-Design	Design	Construction AFO	
<i>Brush Creek Basin</i>					
Neighborhood Sewer Rehabilitation	Neighborhood sewer rehabilitation work in the Brush Creek Basin has been split into two (2) design projects and four (4) construction packages due to the size of the basin. These projects are being implemented to improve the reliability and performance of the combined sewer system and reduce basement backups. The 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. Work also includes the rehabilitation of sewer pipes and manholes in a separate sewer system area located within the Brush Creek basin to reduce I/I flows contributing to SSOs.	<u>100%</u>	<u>100%</u>	Area 1 East - <u>100%</u> Area 2 I&I - <u>100%</u> June 2020 Area 1 West - <u>100%</u> August 2020 Area 2 NSR - <u>100%</u> February 2020	12/31/2020
<i>Lower Blue River Basin</i>					
Neighborhood Sewer Rehabilitation	This project is being implemented to improve the reliability and performance of the combined sewer system and reduce basement backups. This project involves identification of sewer system defects, the preparation of construction contract documents, and the rehabilitation of manholes and sewer pipes 12-inches and smaller in diameter	<u>100%</u>	<u>100%</u>	North - <u>100%</u> December 2020 South - <u>90%</u> March 2021	North 12/31/2021 South 12/31/2021
15th Street Pump Station Upgrade and Sewer Separation	Design documents will be prepared for the separation of approximately 22 acres of combined sewer system and for improvements to the 15th Street Pump Station.	<u>100%</u>	<u>75%</u> April 2021	June 2022	12/31/2022
Relief Sewer Hardesty & 31st Street	Design documents will be prepared for the installation of approximately 3,500 linear feet of approximately 54-inch diameter relief sewer.	<u>100%</u>	<u>70%</u> June 2021	October 2022	12/31/2022
Relief Sewer Vineyard & Lawn Street	Design documents will be prepared for the installation of approximately 3,400 linear feet of approximately 48-inch diameter relief sewer.	<u>100%</u>	<u>75%</u> April 2021	July 2022	12/31/2022
Relief Sewer: 45th Street	Design documents will be prepared for the conveyance of the combined sewer flow through a relief sewer from sewers located upstream of Outfall 048.	<u>100%</u>	<u>60%</u> May 2021	July 2022	12/31/2022

Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date			CD AFO Date
Combined Sewer System		Pre-Design	Design	Construction AFO	
Sewer Separation 40th & Monroe	The project will separate approximately 220 acres and eliminate typical year overflows that are located in the tributary area contributing to Combined Sewer Outfalls 041, 043, 044, 045, 046, 047, 049, and 050 of the Lower Blue River Basin in Kansas City, Missouri.	<u>100%</u>	<u>60%</u> June 2021	November 2023	12/31/2023
Sewer Separation: Outfall 054	The project will separate approximately 35 acres of the combined sewer system and eliminate typical year overflows at Outfall 54.	<u>100%</u> August 2020	10% November 2021	January 2023	12/31/23
Dry Weather Sewer Line: Outfall 055	Design documents will be prepared for a 22-acre combined sewer neighborhood for the installation of relief sewers. This will reduce the frequency of overflows that occur at outfall 055.	<u>100%</u> July 2020	10% November 2021	November 2022	12/31/22
<i>Middle Blue River Basin</i>					
Diversion Structure 068 Storage Basin (formerly Relief Sewer Diversion Structure 068 to Blue River Sewer)	The Project is being designed to reduce combined sewer overflows at Outfall 068. A new open storage basin will be constructed in lieu of a relief sewer.	<u>100%</u>	<u>100%</u>	<u>85%</u> April 2021	12/31/2021**
<i>Northeast Industrial District Basin</i>					
NEID Green Infrastructure Pilot Project	This project is designed to reduce combined sewer overflows and provide aesthetic, social and economic enhancements within the Northeast Industrial District. The design includes a gravel wetland facility and bioretention basins.	<u>100%</u>	<u>100%</u>	<u>100%</u> December 2020	12/31/2021*
Gooseneck Arch Sewer Gates and Pump Station Improvements	The project includes the construction of an adjustable crest gate inside a new gate structure situated over the existing 18 ft. by 21 ft. arch sewer to provide in-line storage of 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.	<u>100%</u>	<u>100%</u>	<u>100%</u> October 2020	12/31/2021*
NEID Neighborhood Sewer Rehabilitation	Neighborhood sewer rehabilitation work in the Northeast Industrial District Basin consists of one (1) design project and two (2) construction packages due to the size of the basin. This project is being implemented to improve the reliability and performance of the combined sewer system and reduce basement backups. This project involves identification of sewer system defects, the preparation of construction contract documents, and the rehabilitation of manholes and sewer pipes 12-inches and smaller in diameter.	<u>100%</u>	<u>100%</u>	North – <u>100%</u> May 2020 South – <u>100%</u> August 2020	12/31/2020

Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date			CD AFO Date
Combined Sewer System		Pre-Design	Design	Construction AFO	
<i>Turkey Creek/Central Industrial District Basin</i>					
Green Infrastructure Pilot Project	This green infrastructure pilot project is designed to reduce combined sewer overflows and to provide aesthetic, social and economic enhancements within the Central Industrial District. This includes infiltration trenches, cisterns, permeable paver parking, infiltration dry wells, bioretention, and a bioretention swale.	<u>100%</u>	<u>100%</u>	<u>100%</u> September 2020	12/31/2020
Neighborhood Sewer Rehabilitation	This project is being implemented to improve the reliability and performance of the combined sewer system and reduce basement backups. Two construction contracts will be issued for rehabilitation of manholes and sewer pipes that are 12-inches and smaller in diameter.	<u>100%</u>	<u>100%</u>	Area 1 – <u>95%</u> January 2021 Area 2 – <u>80%</u> March 2021	12/31/2021
Turkey Creek Basin Sewer Separation: 31st and Broadway	The project will separate approximately 35 acres of the combined sewer system and eliminate typical year overflows at outfall W006 by removing Diversion Structure 306.	<u>100%</u>	<u>100%</u> July 2020	0% April 2022	12/31/2022***
<i>Westside WWTP</i>					
Westside Wastewater Treatment Plant Wet-Weather Improvements	This project involves the construction of wet weather treatment and disinfection facilities sized for 32 MGD. Facility upgrades for non-OCP work will also be completed.	<u>100%</u>	<u>100%</u>	<u>60%</u> August 2021	12/31/2022**

* Modified per Non-Material Modification signed 2/12/2020

** AFO date as indicated in the Third Amended Consent Decree

*** The completion of this project may be delayed due to adverse impacts of Covid-19 Pandemic on construction contractor.

IX. SEPARATE SEWER OVERFLOW CONTROL MEASURES – APPENDIX A

Kansas City's Separate Sanitary Sewer Systems (SSS) comprise nine basins covering 260 square miles of service area. The four SSS basins north of the Missouri River are the Northern and Northwestern watersheds and the Line Creek/Rock Creek, Buckeye Creek, and Birmingham/Shoal Creek basins.

The five SSS system basins south of the Missouri River are the Blue River Central, Blue River North, Blue River South, Little Blue River, and Round Grove basins.

Much of the early projects and program strategy in the separate sanitary sewer basins involve reducing the amount of I/I entering the SSS to reduce overflows from the sanitary sewer system. This reduction in I/I is achieved by reducing or eliminating points of direct inflow into the system and reducing 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.

Collection system field investigation activities for the I/I reduction projects were completed during this

reporting period through the City's OCP Program Management contract and two city-wide Sewer Cleaning and Closed-Circuit Television (CCTV) Inspection contracts. The work consists of sewer system network characterization and manhole inspections, and sewer cleaning and CCTV inspection of sanitary sewers in the Line Creek/Rock Creek, Blue River South, Birmingham, Northern, Northwestern, Round Grove, and Buckeye Creek basins.

The status of the projects in the SSS basins is summarized in Tables 2A and 2B. During the reporting period, the separate sewer system had fourteen (16) active projects. Two (2) projects are recorded in Table 2A as a non-Consent Decree project. Twelve (12) projects are recorded in Table 2B as projects that were included in Appendix A of the Consent Decree.

In addition to the project list in Appendix A to the Consent Decree, the City is also evaluating and rehabilitating sewer defects at stream crossings and immediately adjacent to streams in an effort to identify excessive I/I sources attributed to sewer defects. The work is occurring under a multi-year, multi-phase design/build contract. The City evaluated and repaired thirty-five (35) sites in 2017 - 2020 and is in the process of repairing an additional seven (7) sites in 2021.

**Table 2A: Non-Consent Decree Projects in Separate Sewer System Basin
(through December 31, 2020)**

Watershed	Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date		
Separate Sanitary Sewer System			Pre-Design	Design	Construction AFO
Round Grove Watershed	Round Grove Supplemental I/I Reduction	This project is being implemented to reduce or eliminate the need for relief sewers upstream of the Round Grove Pump Station.	<u>100%</u>	<u>30%</u> October 2021	February 2023
Citywide	I/I Reduction at/adjacent to Stream Crossings	In an effort to identify excessive I/I sources attributed to sewer defects, the City is evaluating and rehabilitating sewer defects at stream crossings and immediately adjacent to streams. The work is occurring under a multi-year, multi-phase design/build contract.	<u>N/A</u>	Original Contract – <u>100%</u> Renewal 1 – <u>50%</u> Renewal 2 – <u>0%</u> May 2022	Original Contract – <u>100%</u> Renewal 1 – <u>50%</u> April 2022 Renewal 2 – May 2023

**Table 2B: Consent Decree Projects in Separate Sewer System Basin
(through December 31, 2020)**

Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date			CD AFO Date
Separate Sanitary Sewer System		Pre-Design	Design	Construction AFO	
Blue River South Watersheds					
I/I Reduction Area 4	The project will focus on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 375,000 linear feet of sewer pipe and 1,900 manholes in the project area.	Phase 1- <u>100%</u> Phase 2- <u>100%</u> Phase 3- <u>100%</u>	Phase 1 – <u>100%</u> Phase 2 – <u>100%</u> Phase 3 – <u>30%</u> <u>June 2021</u>	Phase 1 100% Phase 2 – <u>40%***</u> June 2021 Phase 3 August 2022	12/31/2023**

Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date			CD AFO Date
Separate Sanitary Sewer System		Pre-Design	Design	Construction AFO	
I/I Reduction Area 5	The project will focus on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 120,000 linear feet of sewer pipe and 600 manholes in the project area.	Phase 1 - <u>100%</u> Phase 2 - <u>100%</u>	Phase 1 - <u>100%</u> Phase 2 - <u>100%</u>	Phase 1 - <u>100%</u> Phase 2 - <u>40%***</u> June 2021	12/31/2023**
Line Creek/Rock Creek Watersheds					
I/I Reduction Area 3	The project focused on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 213,000 linear feet of sewer pipe and 1,000 manholes in the project area.	<u>100%</u>	<u>100%</u> March 2020	<u>0%</u> August 2024	12/31/2029**
I/I Reduction Area 4	The project focused on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 246,000 linear feet of 6 -inch to 54-inch sewer pipe and 1,360 manholes in the project area.	<u>100%</u>	<u>100%</u> August 2020	<u>0%</u> August 2024	12/31/2029**
I/I Reduction: North of the River	The project is tracked as part of the Line Creek/Rock Creek basin since the original OCP plan included buckeye creek area within the LC/RC basin. This project consists of field investigations, data analysis, preparation of construction contract documents, and rehabilitation of sewers, manholes and service lateral connections to achieve targeted infiltration and inflow reduction. The location of Phase 2 for this project will be confirmed based on I/I reduction optimization.	<u>100%</u>	Phase 1 - Buckeye - <u>30%</u> August 2021 North of River Phase 2 - <u>0%</u> June 2023	Phase 1 - Buckeye March 2023 North of River Phase 2 January 2025	Phase 1 - Buckeye 12-31-2029** North of River Phase 2 12/31/2029**
Round Grove Watershed					
Round Grove Pump Station Rehabilitation	The project involves expansion of the Round Grove Pump Station to provide additional wet weather capacity up to a 60 MGD firm capacity. This will include new, larger pumps, new piping, and other facility capital improvements to accommodate the expansion and meet building code requirements.	<u>100%</u>	<u>100%</u>	<u>90%</u> October 2021	12/31/2022
Little Blue River Watershed					
I/I Reduction Area 1	The project focuses on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 340,000 linear feet of sewer pipe and 1,400 manholes in the project area.	<u>100%</u>	<u>100%</u>	<u>75%</u> May 2021	12/31/2021
I/I Reduction Area 2	The project focuses on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 310,000 linear feet of sewer pipe and 1,410 manholes in the project area.	<u>100%</u>	<u>100%</u>	<u>70%</u> May 2021	12/31/2021

Project Name	Description	Percent Complete through 12/31/2020 Planned Completion Date			CD AFO Date
Separate Sanitary Sewer System		Pre-Design	Design	Construction AFO	
Birmingham/Shoal Creek Watersheds					
I/I Reduction Area 2	The project focuses on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 238,000 linear feet of sewer pipe and 1,200 manholes in the project area.	<u>100%</u>	<u>100%</u> October 2020	January 2024	12/31/2029**
I/I Reduction Area 3	The project will focus on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 216,000 linear feet of sewer pipe and 975 manholes in the project area.	<u>100%</u>	<u>30%</u> August 2021	September 2023	12/31/2029**
Northern and Northwestern Watersheds					
I/I Reduction Northwestern Watersheds Area 1	The project will focus on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 150,509 linear feet of sewer pipe and 778 manholes in the project area.	<u>100%</u> July 2020	<u>20%</u> October 2021	November 2023	12/31/27**
I/I Reduction Northern Watersheds Area 2	The project will focus on I/I reduction through rehabilitation of public sanitary sewers and manholes within the project area. There is an estimated 239,769 linear feet of sewer pipe and 1069 manholes in the project area.	<u>100%</u>	East – <u>25%</u> August 2021 West – <u>20%</u> September 2021	February 2023	12/31/23

** AFO date as indicated in the Third Amended Consent Decree

*** The completion of this project may be delayed due to adverse impacts of Covid-19 Pandemic on construction contractor.

A. PRIVATE INFLOW/INFILTRATION REDUCTION PROGRAM

In 2020, the OCP continued to manage a Private I/I Reduction Program called “Keep Out the Rain” (KOTR) in conjunction with public sewer I/I reduction projects in select areas of each SSS basin. In March 17, 2020, the City temporarily suspended the KOTR program due to the COVID-19 pandemic and it remained suspended through the end of this reporting period. It is anticipated the program will restart in 2021, pending conclusion of the COVID-19 pandemic and the City’s recovery from its significant impacts.

The focus of the program is to disconnect illicit private I/I sources when it is cost-effective to remove excessive I/I flows into the sanitary sewer system. Approximately 70,000 properties are targeted for private I/I evaluation in the City’s SSS. Since the start of the City’s Private I/I Reduction Program in 2016, through mid-March of 2020, the City has performed a total of approximately 47,200 property evaluations.

While the KOTR program was active, significant public outreach efforts were utilized to educate residents about the voluntary program and encourage eligible property owners to participate in building plumbing evaluations. During Fiscal Year 2020, the project team members made 2 presentations about the KOTR program at neighborhood association meetings. In addition, door-to-door outreach was conducted along with personal phone calls. During this period more than 8,800 properties received door-to-door outreach or phone calls.

Since commencement of the private I/I reduction program in 2016, approximately 60 percent of contacted property owners have granted interior and exterior building evaluations, while 34 percent of properties have had only an exterior building evaluation completed. Approximately ten percent of all properties evaluated have been found to contain cost-effective I/I sources and approximately 91 percent of property owners have voluntarily entered into agreements with the City to have disconnection work completed.

Each of the design professional firms continued to perform building evaluations, identify illicit connections, and coordinate disconnections until the KOTR program was temporarily suspended due to COVID -19. During this reporting period, 16 plumbers were under “indefinite delivery/indefinite quantities (ID/IQ) facility maintenance” contracts. prior to temporary suspension of the program. During 2020, the following was accomplished under the City’s Private I/I reduction program through voluntary participation by property owners:

- Building plumbing evaluations were attempted for 7,559 private properties.
- Interior and exterior building plumbing evaluations were completed at 1,733 private properties.
- Exterior-only building plumbing evaluations were completed for 2,310 private properties.
- A total of 290 cost-effective private I/I sources were identified private properties.
- Executed 187 property owner agreements to disconnect illicit sources.
- Completed 210 disconnection repairs by plumbing contractors on private properties where I/I sources had been identified.

X. SCHEDULED ACTIVITY FOR THE NEXT REPORTING PERIOD

The activities listed below are expected to occur during the next reporting period between January 1, 2021 and June 30, 2021. This list, however, should not be interpreted as an explanation of all activities that will occur in the first half of 2021. Certain Consent Decree and OCP activities (e.g., program management, NMC, CMOM, public participation, project planning, and 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 are scheduled to be developed and advertised for selection of Design Professional services:
 - Annual Sewer Rehabilitation: Large Diameter Inspections
 - Smart Sewer Sensor Data Analytics
 - Green Infrastructure: 63rd and Paseo/Daniel Morgan Boone Park
- Requests for bids proposals will be advertised for selection of Construction Contractors for the following OCP Projects:
 - Baseline Improvements: Town Fork Creek
 - Sewer Separation: 40th and Monroe
 - Relief Sewer: Vineyard and Lawn Street
 - 15th Street Pump Station Upgrade and Sewer Separation
 - Relief Sewer: Hardesty Ave and 31st Street
 - Northern Basins Area 2 East and West
 - I/I Reduction: North of the River
 - Relief Sewer: 45th Street
 - Annual Sewer Rehabilitation: Large Diameter Sewers
 - Annual Sewer Rehabilitation: Small Diameter Sewers

- Water Services will issue a Notice to Proceed to Design Professionals or Construction Contractors for the following OCP project contracts:
 - Green Infrastructure: Mill Creek (Design)
 - Green Stewards Program (PST)
 - Baseline Improvements: Town Fork Creek
 - Sewer Separation: 40th and Monroe
 - Relief Sewer: Vineyard and Lawn Street
 - 15th Street Pump Station Upgrade and Sewer Separation
 - Relief Sewer: Hardesty Ave and 31st Street
 - Northern Basins Area 2 East and West
 - I/I Reduction: North of the River
 - Relief Sewer: 45th Street
 - Annual Sewer Rehabilitation: Large Diameter Sewers
 - Annual Sewer Rehabilitation: Small Diameter Sewers
- Restart of the City's Private Inflow/Infiltration Reduction Program in the SSS, pending conclusion of the COVID-19 pandemic and the City's recovery from its significant impacts.
- Work will continue on the active OCP projects shown in Tables 1A, 1B, 2A, and 2B that were not completed in 2020.
- Flow monitoring will continue in accordance with the CSS Metering Plan approved by USEPA in December 2016.
- Water Quality Monitoring will resume during the recreation season, pending conclusion of the COVID-19 pandemic and the City's recovery from its significant impacts.

XI. NINE MINIMUM CONTROLS – APPENDIX B

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

Table 3: NMC Accomplishments Summary (2020)

NMC	Description	Accomplishment
1	Proper Operation and Regular Maintenance Program	<ul style="list-style-type: none"> Conducted routine maintenance procedures Conducted routine inspection schedules Carried out emergency response protocol and reported 46 dry weather overflows City-wide, 19 in the CSS Inspected flow regulating structures Conducted 70 miles of CCTV inspections in the CSS Cleaned 232 miles of CSS interceptor and collection lines Received and responded to 3564 3-1-1 Action Center calls about the City's wastewater collection system
2	Maximization of Storage in the Collection System	<ul style="list-style-type: none"> Continued construction on Gooseneck Creek Arch Sewer Gate and Pump Station project Enhanced the real-time controls at the OK Creek Gate to increase operational reliability
3	Review and Modification of Pretreatment Requirements	<ul style="list-style-type: none"> Inspected 603 non-domestic FOG sources at Food Service Establishments Assessed non-domestic CSO discharge impacts Issued zero citations for standards violations and self-reporting violations
4	Maximization of Flow to the POTW for Treatment (Westside and/or Blue River)	<ul style="list-style-type: none"> Continued implementation of an In-Line Storage and Conveyance Operational Analysis using real-time control to optimize existing system storage and capacity Commenced design of diversion structure improvements in the Town Fork Creek Basin to improve flow control and performance Continued construction of improvements at Westside WWTP to increase treatment capacity to 60 MGD
5	Elimination of CSOs during Dry Weather	<ul style="list-style-type: none"> Conducted 7308 inspections of the CSS diversion structures Conducted 473 sewer main point repairs in the CSS Reported 19 dry weather overflows in the CSS Reported 2 dry weather overflows from CSOs Performed routine preventative cleaning of system
6	Control of Solids and Floatable Material in CSOs	<ul style="list-style-type: none"> Repaired or replaced 297 catch basins City-wide Inspected and cleaned 18,184 catch basins City-wide
7	Pollution Prevention Programs to Reduce Contaminants in CSOs	<ul style="list-style-type: none"> Conducted street sweeping of 10,050 lane miles in the CSS Carried out Oil and Grease Management Program Conducted Solid Waste and Recycling activities Conducted Household Hazardous Waste Program Conducted Leaf and Brush Collection and Recycling Programs Conducted Public Education and Outreach Programs Made 9 presentations to more than 237 citizens and stakeholders Conducted 5 public meetings City-wide with approximately 149 residents
8	Public Notification	<ul style="list-style-type: none"> Provided CSO notification Distributed 11 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 Water quality monitoring was not performed in 2020 due to COVID-19 pandemic impact on City resources Mapped the location of green infrastructure facilities constructed by OCP and WSD

A. NMC1 – PROPER OPERATION AND REGULAR MAINTENANCE PROGRAM

i. ORGANIZATION

Kansas City operates and maintains its wastewater systems through its Water Services Department. The Wastewater Inspections and Investigations, Utility Repair, and Wastewater Treatment Divisions are primarily responsible for the operation and maintenance (O&M) of the City's wastewater and stormwater collection systems.

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) and all other wastewater treatment and pump stations.

ii. RESOURCES

Water Services maintains personnel and capital resources for O&M activities throughout the wastewater system. Through the end of the reporting period, Water Services employed approximately 300 staff members in maintaining the stormwater and wastewater collection systems. Water Services also engages the services of contractors specializing in construction inspection and repair to supplement the inhouse workforce. In fiscal year 2020 (May 1, 2019 through April 30, 2020), the operating expenses for sewer operations were as follows:

- Wastewater Treatment and Pumping: \$35,817,636
- Sewer Maintenance: \$28,462,881
- Administration and General: \$50,666,074

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 3 to 30 days, depending on the history of required cleaning. If inspections reveal the interval is not adequate, it is adjusted accordingly.

Attachment C on page 59 lists the identification number, location, map number, and receiving stream of the CSOs and inspection intervals.

iv. CSO SEWER MAINTENANCE MANUAL

Water Services Divisions adhere to requirements outlined in the CSO Operations and Maintenance Manual. 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
- Training and Safety Practices

v. *LOG OF MAINTRENANCE ACTIVITIES*

Water Services uses a computerized maintenance management system (CMMS) to log maintenance activities. The system logs activities with work orders initiated from various sources, including 3-1-1 Action Center calls, Internal observations, scheduled maintenance and repairs, and investigation activities. Work orders are prioritized based on the critical nature of the defect utilizing a system that categorizes each order 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
- GIS Locations
- Labor level of Effort
- Total Costs
- Permitting

All activity is tracked and reviewed weekly and monthly by differing levels of management to ensure appropriate response and resources. Table 4 shows a summary of the maintenance activities performed in the combined sewer system during the reporting period.

Table 4: CSS Maintenance Activities (2020)

Activity in CSS	Quantity
Sewer-Main Stoppages Opened	19 work orders
Sewer-Main Point Repairs	473 work orders
Sewer-Manhole Repair/Resurfacing	668 work orders
Sewer-Water in the Basement	885 work orders
Sewer-Main CIPP/Total Replacement	45 miles
Sewer CCTV	70 miles
Sewer Cleaning	232 miles

vi. *CLOSED CIRCUIT TELEVISION INSPECTION*

Wastewater Inspections and Investigations Division maintains a CCTV inspection program. The division utilizes both internal resources and contractors to perform the work.

In 2020, approximately 70 miles of CSS were televised, which exceeded the Consent Decree requirement of 52 miles annually. Documentation for sewer mileage CCTV inspected is stored in the CMMS and verified using inspection software.

vii. *SEWER CLEANING*

Water Services conducts sewer cleaning activities in-house and also uses outside contractors. Water Services maintains a fleet of sewer cleaning equipment including, jet trucks, vacuum and flushing trucks, rodding machines, easement machines, bucket machines, and street sweepers.

Local contractors are utilized for specialized cleaning services on large diameter sewers through

contractual agreements. In 2020, approximately 232 miles of CSS were cleaned, which exceeded the Consent Decree requirements of 106 miles annually.

viii. OVERFLOW AND BYPASS RESPONSE

The Inspections and Investigations 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 electronically to MDNR in accordance with the City's plan and permits. In 2020, a total of 46 dry weather overflows were reported City-wide, 19 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 calling 3-1-1 in Kansas City, Missouri, or by calling (816) 513-1313. 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. During the reporting period, 3,564 3-1-1 calls related to wastewater collection system problems were received and responded to.

Emergency contact numbers are also posted on 87 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. NMC2 – 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 3 to 30 days as shown on page 59 in Attachment C. During the reporting period, 7,308 inspections of the CSS diversion structures were performed.

ii. DIVERSION STRUCTURE MODIFICATION

No modifications to diversion structures were made during this reporting period.

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

The City actively identifies projects with the opportunity to produce multiple benefits by integrating green infrastructure that reduces and/or eliminates inflows or provides 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 their responsibility. Dedicated Green Solutions maintenance staff provide routine green infrastructure maintenance services, including trimming, mulching, and weeding. Water Services' Senior and technical staff provide inspection and assist with coordinating maintenance activities.

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

1. Water Services Capital Projects

In addition to the Consent Decree and OCP additional green infrastructure projects, Water Services has one (1) other green infrastructure project currently in pre-design. This Project, listed in Table 5 below, is intended to reduce inflows or provide solutions for localized flooding. In addition, green infrastructure improvements are being evaluated for inclusion as part of other stormwater and wastewater projects currently in design.

**Table 5: Water Services Green Infrastructure Projects
Under Design and Construction (2020)**

Property/Project Name	Phase	Description/Type
55 th /56 th and Brookside	Pre-Design	Local Flooding Solution, Temporary Storage Solution

2. Other City-Wide Green Infrastructure Efforts

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

iv. UPGRADE/ADJUST PUMP OPERATIONS AT SANITARY PUMP STATIONS

Seven pump stations are located within the boundaries of Kansas City's CSS and operated and maintained by the Wastewater Treatment Division. Four pump stations (Turkey Creek, Santa Fe, Northeast Industrial District (NEID), and Blue River) function as primary pump stations to convey flow to the Blue River and Westside Wastewater Treatment Plants (WWTPs). Two of these stations, Blue River and NEID, are located at the Blue River Primary WWTP. These pump stations are generally in operation for usual and customary flow and also according to the Wet Weather Operating Plan during wet weather events defined in NMC 4 during wet weather events.

Flow control management includes provisions for additional system storage and selected sewer/storm water 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. As part the 15th Street Pump Station and Sewer Separation project listed in the CSO Control Measures table located in Appendix A of the Consent Decree, following sewer separation, dry weather flows currently handled by the 15th street Pump Station will be diverted to the 12th Street Pump Station. The 15th Street Pump Station will be taken offline for future demolition and Diversion Structures 206 and 136 will be eliminated.

In 2020, various design and construction was initiated, continued, or completed at pump stations,

force mains, and pipelines including the Gooseneck Pump Station, Round Grove Pump Station, and the new Diversion Structure 068 (Trolley Trail Basin).

Continuous improvements are made to existing systems at all plants and stations as part of routine maintenance and capital upgrades and repairs. This enables continued reliability of system components during events requiring flow maximization.

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 Utility Repair and Inspections and Investigations Division. The division utilizes its crews and external contract cleaning crews on a continuous basis to remove and prevent accumulation of debris and sediment that restrict the flow.

C. NMC3 – REVIEW AND MODIFICATION OF PRETREATMENT REQUIREMENTS

The Regulatory Compliance 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 Industrial Pretreatment Program
- Surcharge Program for High-Strength Wastewaters
- Oil and Grease Management Program

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: no pretreatment requirements were modified in 2020

i. *FEDERAL PRETREATMENT PROGRAM*

The Regulatory Compliance 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 2019 Industrial Pretreatment Program Annual Report was submitted to the MDNR in March of 2020 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
- Notices of Violations

The Regulatory Compliance Division identifies the regulated discharge flow volume, potential pollutants of concern, drainage basins, and the pump station(s) serving each SIU. During the reporting period, there were 84 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’ Regulatory Compliance 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 2020, there were 603 food service establishment inspections. There were no enforcement actions taken because of these inspections.

iv. REVIEW OF PRETREATMENT REQUIREMENTS

Every year, the Regulatory Compliance Division reviews the pretreatment program to determine whether changes are warranted. Economic and environmental impacts are considered when evaluating potential changes. These include an assessment of the non-domestic discharges to the CSS. In 2020, no changes to the pretreatment program were made.

D. NMC4 – 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. Plant stress tests were also performed on both plants. 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 that the various processes have different hydraulic capacities. Although it was believed that a theoretical maximum of 156-MGD was possible, further investigation has determined that 120-MGD is the actual maximum throughput capacity of the facility as a whole.

Current Blue River NPDES permitting identifies 120 MGD as the maximum treatment capability.

Missouri does not make distinction between maximum monthly average flow and maximum day flow in our permits; Currently, a maximum day flow of 120 to 130 MGD is feasible for one or two days. The facility has never been permitted for more than 120-MGD via the NPDES program.

Stress testing has confirmed that 40 MGD is the peak capacity the Westside WWTP can process for multiple days without affecting process performance. Future plans include converting Blue River WWTP's secondary treatment system consisting of fixed film media components to activated sludge when necessitated by future regulatory requirements. This will also likely include optimizing wet weather capacity and treatment. Future design will incorporate the ability to manage more periodic wet weather flows without adversely affecting future secondary activated sludge NPDES treatment limits due the differing daily peaking factors between activated sludge and fixed film media secondary treatment systems

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 maximum total capacity of 120 MGD. Operationally, plant staff prioritize flow from the NEID Sewer for treatment versus flow from the Blue River Interceptor during wet weather.

2. Westside WWTP

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

- Turkey Creek PS: 11.4-24 MGD
- Santa Fe PS: 4.5-15 MGD
- Line Creek PS: 12 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 and peaking factors from these three pump stations during wet weather to determine how much additional flow can be pumped and handled at the Westside WWTP. Ranges are provided because KC Water continues to develop operating strategies based on routine improvements to maximize flows to Westside WWTP and Blue River WWTP.

E. NMC5 – ELIMINATION OF CSOs DURING DRY WEATHER

The Wastewater Preventative Maintenance and Wastewater Treatment Divisions actively work to identify and eliminate opportunities for dry weather overflows (DWO). The measures taken include:

- Routine Preventative Cleaning of the Combined Sewer System
- Inspection to Identify Dry Weather Overflows
- Correction of Primary Causes of Dry Weather Overflows
- 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, on page 59 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 overflows. The corrective actions include activity such as interceptor cleaning and line repair, equipment repair and replacement, changes in operational procedures, and identification of issues that require further evaluation. Water Services had previously developed and continues to revise as appropriate procedures to respond, remediate and report all dry weather and wet weather overflows immediately with an update of the details on the State of Missouri's website. This website was implemented in late 2019 and replaced the existing reporting mechanisms.

Wastewater Inspection and Investigation 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.

iii. DRY WEATHER OVERFLOW NOTIFICATION

Water Services Divisions notify MDNR within 24 hours of discovery of a DWO. Follow-up written reports are completed within five days. In all occurrences, the area around the overflow is inspected and cleaned for any debris or contaminants in accordance with best management practices for such events. If vandalism causes a DWO, the standard manhole covers are replaced with bolt-down covers to deter future vandalism. In 2020, 19 dry weather overflows in the CSS were reported to MDNR, two (2) of which were from combined sewer outfalls. No dry weather overflows occurred at pump stations during this reporting period.

F. NMC6 – CONTROL OF SOLIDS AND FLOATABLE MATERIAL IN CSOs

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

i. STREET SWEEPING

Water Services sweeps streets on a routine schedule to reduce trash, silt and other debris. During 2020, Water Services swept a total of 11,079 lane miles, including 10,050 lanes miles in the combined sewer system area and 1,029 lane miles in the separate sewer system areas. The schedule for street sweeping runs from January 1 through December 31 each year. In that time, street sweeping is conducted twice annually on all streets with curbs within the CSS area and once annually withing the SSS area.

ii. 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 2020, 18,184 catch basins were inspected and cleaned City-wide and 297 were repaired or replaced City-wide.

iii. CONSTRUCTION SITE EROSION CONTROL

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 2020, the Regulatory Compliance Division conducted monthly inspections for 27 active City construction sites that disturbed one acre or larger in size for compliance with sediment erosion control regulations. Construction work is required to conform to City engineering and construction standards for all public or private work.

G. NMC7 – 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, rivers and streams:

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.

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 2020, the program served 54 communities, including Kansas City, from five 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 various types of residential hazardous waste, such as automotive fluids, batteries, household cleaners, pesticides, herbicides, fertilizers and paint. It is open to the public on Thursdays, Fridays, and Saturdays, year-round; except City-observed holidays and the last two weeks of December.

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, Wednesdays and Saturdays from 9:00 a.m. to 4:00 p.m.; and Thursdays and Fridays from 9:00 a.m. to 6:00 p.m. Drop-off of household hazardous waste from participating communities occurs on Thursdays and Fridays between 9:00 a.m. and 6:00 p.m., and

Saturdays from 9:00 a.m. to 4:00 p.m. The Swap Shop was discontinued in the Spring of 2020 due to COVID-19 pandemic concerns, and it is expected to resume in 2021.

Mobile events throughout the City and the region provide convenient opportunities for proper disposal of HHW. 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 of HHW in landfills, storm sewers, or sanitary sewer facilities.

In 2020, the program collected a total of 1,472,290 pounds (667 Tons) of HHW materials.

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 leaf and brush waste 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 materials down storm drains and into local creeks, streams and rivers. During the reporting period, 3,483 tons of leaf and brush materials 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 City's Overflow Control Program, are provided below.

1. Presentations, Conferences, and Tours

During the reporting period, nine presentations were made to more than 237 citizens and stakeholders about overflow control measures, wastewater and water quality. The presentations included groups such as professional associations, metropolitan planning and non-governmental organizations, schools and neighborhood groups. The following is a listing of the organizations and presentations given during the reporting period:

- Water Treatment Plant Tour- Parkhill High School: January 13, 2020
- How Plants Reduce Runoff Part 1- Innovation Center: January 27, 2020
- How Plants Reduce Runoff Part 2- Innovation Center: January 28, 2020
- How Plants Reduce Runoff Part 3- Innovation Center: January 29, 2020
- Water Treatment Presentation- Pembroke HS: March 10, 2020
- Green Infrastructure Presentation- KC Water Engineers: March 11, 2020
- Stormwater Presentation- Park Ambassadors: June 23, 2020
- Urban Waters Tour- Heartland Conservation Alliance: September 22, 2020
- Workshop Presentation- Missouri Environmental Education Association: November 5, 2020

2. Public Meetings

Table 6 displays information about the public meetings held in 2020 in support of OCP projects. A total of 5 public meetings were held for OCP projects with approximately 149 residents in attendance. Due to local COVID-19 social distancing policies, in-person public meetings were paused in March of 2020. The public meetings listed below were held throughout the community, not just in the combined sewer system area.

Table 6: OCP Project Public Meeting Information (2020)

Date	Project	Meeting Purpose	No. of Attendees
January 9, 2020	Little Blue River Area 1 Inflow and Infiltration (I/I) Reduction Project	Project Update	32
January 21, 2020	Lower Blue River Neighborhood Sewer Rehabilitation South Project	Project Update	8
January 27, 2020	Little Blue River Area 1 Inflow & Infiltration Reduction Project	Project Update	8
February 22, 2020	40th and Monroe Sewer Separation Project	Project Update	36
March 5, 2020	Little Blue River Area 2 Inflow and Infiltration (I/I) Reduction Project	Project Update	65
		TOTAL	149

In addition to the 5 public meetings pertaining to project information and program updates, an outreach and scheduling events was held in support of Kansas City's voluntary Private Inflow and Infiltration Program, Keep out the Rain. Table 7 displays information pertaining to that outreach effort. This public scheduling event is listed separately because it is part of a larger, coordinated outreach effort for the City's Keep Out the Rain Program.

Table 7: Public Meeting Information (2020)

Date	Project	Meeting Purpose	No. of Attendees
February 18, 2020	Keep out the Rain	Scheduling Event	10
		TOTAL	10

3. Other Outreach

During the reporting period, the City of Kansas City, Missouri continued to add OCP project information online. The City's website (www.kcmo.gov/smartsewer) provides general information about the Overflow Control Program, current projects and fact sheets. In addition to the City's website, Water Services launched an OCP-specific website in 2020 (www.kcsmartsewer.us), which includes general information about the program and project fact sheets. The fact sheets provide citizens information about each active OCP project including what they should expect, why the project is being completed, and who they should contact with questions.

v. 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 mission of each team, City staff members from various departments volunteer their time.

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. Due to the ongoing Covid-19 pandemic, the normal outreach events for the year were canceled. For Earth Day, April 22, 2020, the EOT created an Earth Day every day website located at www.kcmo.gov/earthday. The website houses the Mayor's 2020 Earth Week proclamation, as well as a list of 50 things to do for the 50th anniversary of Earth Day that was compiled through a regional effort. The website also has short videos on proper recycling, litter management, and tree planting, that periodically rotate through the City's social media.

2. Green Infrastructure Team

The Green Infrastructure Team did not meet during 2020, however, they continued to work on identifying, tracking, and supporting green infrastructure capital projects in Kansas City through their efforts in their respective departments and through participation in the Stormwater Coordinating Committee. The team maintains a list of city-built green infrastructure projects.

3. Regulation and Policy

The Regulation and Policy Team's work in 2020 focused on the completion of a new Tree Preservation Administrative Regulation that is currently under review by the City Manager. This AR sets out the departmental rules for removing and replacing trees during city operations to ensure Kansas City's tree canopy is protected. The group extended the work of the multi-year Tree Champions group by bringing the Urban Forest Master Plan to various committees and boards, and ultimately to City Council for adoption. They began work on a new Tree Preservation Ordinance that will outline the replacement and/or reimbursement requirements for contractors removing mature healthy trees.

4. Resource Management

During 2020, the Resource Management Team (RMT) applied for and received a grant from the MARC Solid Waste Management District to improve procurement processes within the City. Kansas City has a Green Procurement Ordinance and associated Administrative Regulation, however the program's impact is largely unknown. Through the grant, the RMT will hire a consultant to audit current practices, create training materials for city staff, identify Key Performance Indicators to measure success, and work with the Procurement Department and vendors to ensure that sustainable products are widely promoted. The goal of this grant is to reduce the amount of hard to recycle items procured and promotion of more sustainably sourced products.

- vi. *STORMWATER: FROM KC TO THE SEA*

Since 2010, Water Services has worked to educate local 4th through 6th grade students via 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 2020, 1,596 students from 18 schools throughout the Kansas City metro area participated in the program.

vii. WE KC (WATER EDUCATION FOR KANSAS CITY)

In 2016, 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 2020, Water Services assisted 21 groups and schools with water quality related events and educational programs, reaching 754 people.

viii. REGIONAL WATER QUALITY EDUCATION PROGRAM (RWQEP)

Water Services is one of 23 local governmental organizations that contribute funding and staff time to a Regional Water Quality Education Program (RWQEP) sponsored by Mid-America Regional Council (MARC). 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.

During the past 17 years, the program has addressed several top NPS pollution issues facing our region. The program's theme — "Clean Water. Healthy Life." — focuses on changing behaviors to improve water quality, community health and quality of life. Each year, the Regional Water Quality Education Committee (WQEC), with MARC staff support, develops an NPS pollution-focused message that supports the program's theme and determines the most effective means for disseminating the message. The committee's education and outreach activities vary each year but typically consist of a media campaign, a mini-grant program, training, and education and outreach materials.

1. "Don't Leave It Behind" Personal Protective Equipment (PPE) Campaign

From August to October 2020, the Water Quality Public Education Committee ran an online media campaign to inform metro area residents about the importance of properly disposing of PPE during the COVID-19 pandemic. The campaign was posted on Facebook, Instagram, Twitter, YouTube, and Pinterest as well as the home page of the public education website CleanWaterKCMetro.org where it was viewed 10,713 times by 7,159 visitors. Online media campaign results:

- Total Impressions: 2,163,304
- Total Views: 211,996
- Total Clicks: 3,796

Messaging:

PPE left on streets and in parking lots washes into storm sewers that lead to rivers and streams. Plastics and other materials in PPE generally take years to breakdown and sometimes leech toxic chemicals into the water supply. Picking up PPE and disposing of it properly is a simple way you can help keep our water clean. To learn more about water quality in Greater Kansas City, visit CleanWaterKCMetro.org.

Plan It Native Partnership Messaging:

The 2020 Plan It Native Conference, hosted by Deep Roots, promoted native landscapes for a healthy planet. A video presentation on the importance of picking up PPE was shown at the virtual 2020 event in addition to a \$1000 sponsorship.

2. Education and Outreach Campaign

Table 8 displays information on activities carried out for the Education and Outreach Campaign during this reporting period.

Table 8: Educations and Outreach Campaign Activities (2020)

Campaign Item	Activity
Native Plants and Rain Gardens	<ul style="list-style-type: none">• Distribute “Build Your Own Rain Garden” how-to brochure• Distribute “Know your Roots” brochure• Distribute rain gauges designed with native species landscapes as promotional giveaway items• Distribute outdoor rated “Do Not Mow/Native Planting” signage for BMPs
Pet Waste	<ul style="list-style-type: none">• Distribute “Pick Up After Your Pet” brochure• Distribute Portable, refillable pet waste bag dispensers with “Pick Up After Your Pet” message as promotional giveaway items.
Lawn Care	<ul style="list-style-type: none">• Distribute “Build Your Own Rain Barrel” brochure• Distribute “Redirect or Disconnect Your Downspout” brochure• Distribute “Know Your Soil” brochure• Distribute “Making and Using Compost” brochure• Distribute “Use Lawn Chemicals Wisely” brochure
Brochure Translations	<ul style="list-style-type: none">• Distribute existing supply of Spanish-language brochures• Distribute double-sided doorhangers (in English and Spanish) as a companion outreach tool for neighbors near stormdrain marker installations
General Stormwater Education	<ul style="list-style-type: none">• Distribute stormdrain inlet markers for local municipalities• Distribute “Keep Sediment Out of Our Water”, “Know Your Watershed”, “Protect Our Streams” and “Stormdrain Stewardship” brochures• Make the committee’s Water Quality Education Program banner available for community events and functions• Distribute automotive trash bags with the “Stop Littering” imprinted message
Water Quality Education Postcards	<ul style="list-style-type: none">• Work with Kansas City Art Institute to develop educational postcards for metro area residents. Postcards outlined actions individuals could take to improve stream water quality, including using less fertilizer, landscaping with native plants, and picking up pet waste

ix. PARTNERSHIPS IN PUBLIC OUTREACH TABLING EVENTS

Water Services partnered with various schools and municipalities to host or participate in tabling events that raised awareness of water quality issues and promoted Science, Technology, Engineering and Math (STEM) education in the Kansas City region. Water Services tables used a combination of stormwater “Plinko”, the stormwater frame, aquatic macroinvertebrates, watershed models, and BMP bean bag tosses to get students and families interested in the science and math of water quality. The following tabling events reached a total of 168 people during the reporting period.

- Center Middle School KC Water Table: March 4, 2020
- Aim 4 Peace Community Outreach Table: October 9, 2020

- Heartland Conservation Alliance Partnership Summit: October 18, 2020
- Central Industrial District West Bottoms: November 5, 2020

x. *WATER QUALITY SMALL GRANT PROGRAM*

In 2016, Water Services launched the Water Quality Small Grant Program to support local non-profits in projects and activities related to water quality protection, improvement, and education within the city limits of Kansas City, Missouri. This grant process will help streamline reporting procedures for those organizations WSD already supports and increase capacity for water quality education partnerships in groups with which it has not previously worked. In 2020, KC Water awarded 4 grants for programs and projects. The next grant round will begin in early 2021.

The following organizations received grant funding through the Water Quality Small Grant Program:

1. Friends of Kaw Point Park

Friends of Kaw Point Park was one of the grant recipients at the end of 2020. Their grant proposal was to provide 12 “From Runoff to Rivers” classes in local middle and high schools. This curriculum provides students and adults in KCMO with hands-on experiences to learn how stormwater pollution impacts water quality which may impact public health in their community. In addition, they also proposed to lead 10 trash tally lessons with trash pickup and propose to create 4 educational videos. Due to COVID-19 pandemic, FOKPP received their grant in 2020 and will implement their grant in 2021.

2. Healthy Rivers Partnership/Little Blue River Watershed Coalition – Project Blue River Rescue

Project Blue River Rescue is an outreach event put on by Healthy Rivers Partnership and hosted by the Friends of Lakeside Nature Center, which is operated by the City’s Parks and Recreation Department. The event is sponsored by MDC and MDNR through the Missouri Stream Team Program and supported by many local governmental entities and businesses. The City’s Parks and Recreation, Public Works, and Water Services Departments continue to provide facilities, volunteers, equipment, expertise, and assistance with program coordination.

In October, LBRWC promoted 30 days to celebrate 30 years of clean up. Blue River Rescue saw over 3500 impressions through social media, newsletters, and emails. Volunteers participated in this event every weekend in October and collected almost 1 ton of trash along the river.

3. StoneLion Puppet Theatre

StoneLion Puppet Theatre (SPT) is dedicated to expanding environmental education through the art of puppetry. This year, SPT was awarded a Water Quality Small Grant to provide Puppets Talking Trash, a multi-level, multimedia project to engage and teach about the need to stop pollution on our streets from reaching our water system. Along with the puppet shows, SPT will also host a series of Stormwater Sundays. These shows will educate and inspire homeowners about how they can reduce stormwater runoff and pollution. Also, provide education on the importance of protecting infrastructure, local waterways, and associate natural resources. These events will have social distancing in place, have a limited number of attendees, and will be live streamed to a larger audience. In 2020, one (1) Stormwater event reached about 25 people and had 114 Facebook views and one (1) Backyard Bugging puppet show that reached 47 people, and a workshop that reached 44 people. Due to COVID-19 pandemic, SPT received their grant in 2020 and will finish up their grant in 2021.

4. Bridging the Gap

Due to COVID-19 pandemic, Bridging the Gap (BTG) received their grant in 2020 and will implement their grant in 2021. BTG had the following priorities for their 2020 grant:

- Host four stream clean-up workdays in watershed areas identified by KC Water as “high priority”
- Work with KC Water to identify two retail property management companies
- Train neighborhoods and community partners to provide business outreach/education in close proximity to high priority streams – including customized recommendations
- Post 20 education messages on social media regarding pollution prevention
- Continue to manage the Tool Lending Shed, which is a community resource for neighborhood leaders to borrow cleanup tools at no charge

H. NMC8 – PUBLIC NOTIFICATION

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
- Enable citizens to take appropriate steps to protect themselves and their families from such hazards

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

1. Warning 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. 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 3-1-1 Action Center phone number, so they can report dry weather overflows. The signs are printed in English and Spanish and are readable from 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.

2. Media Advisories

When a sewer overflow occurs during the recreation season, Water Services Communications distributes a media advisory to local media outlets. In 2020, eleven (11) advisories were distributed.

3. KCMO News Website

In addition to providing notification directly to media outlets, the media advisories are also posted on the KC Water Services website at www.kcwater.org/news.

I. NMC9 – 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 1, which was originally included in the October 2008 report entitled “Capacity, Management, Operations and Maintenance Plan (CMOM) and Nine Minimum Controls”, includes all the current outfalls and diversion structures. No diversion structures or outfalls were added or removed during this reporting period.

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. Town Fork Creek is a tributary to 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, Kansas (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 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, which was originally included in the October 2008 report entitled “Capacity, Management, Operations and Maintenance Plan (CMOM) and Nine Minimum Controls”, 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. As of October 16, 2017, the Brush Creek and Town Fork Creek classifications were updated to Primary Contact recreational use, Whole Body Contact Class B. 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, such as 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 OCCURRENCES ESTIMATES

The current performance of the CSS is estimated using updated baseline computer models initially developed as part of the Overflow Control Plan. Water Services recalibrates the models using sewer flow meter and rainfall data collected annually. The total estimated city-wide wet weather flow and total overflow volume for the typical year is 11.64 Billion gallons and 6.38 billion gallons, respectively.

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 City's 2012 Overflow Control Plan.

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

The City is implementing a Water Quality Monitoring Program (WQMP) that was developed in December of 2010 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. Due to COVID-19 pandemic impacts on City resources, the WQMP was not implemented in 2020. The City plans to resume its WQMP in 2021, pending conclusion of the COVID-19 pandemic.

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

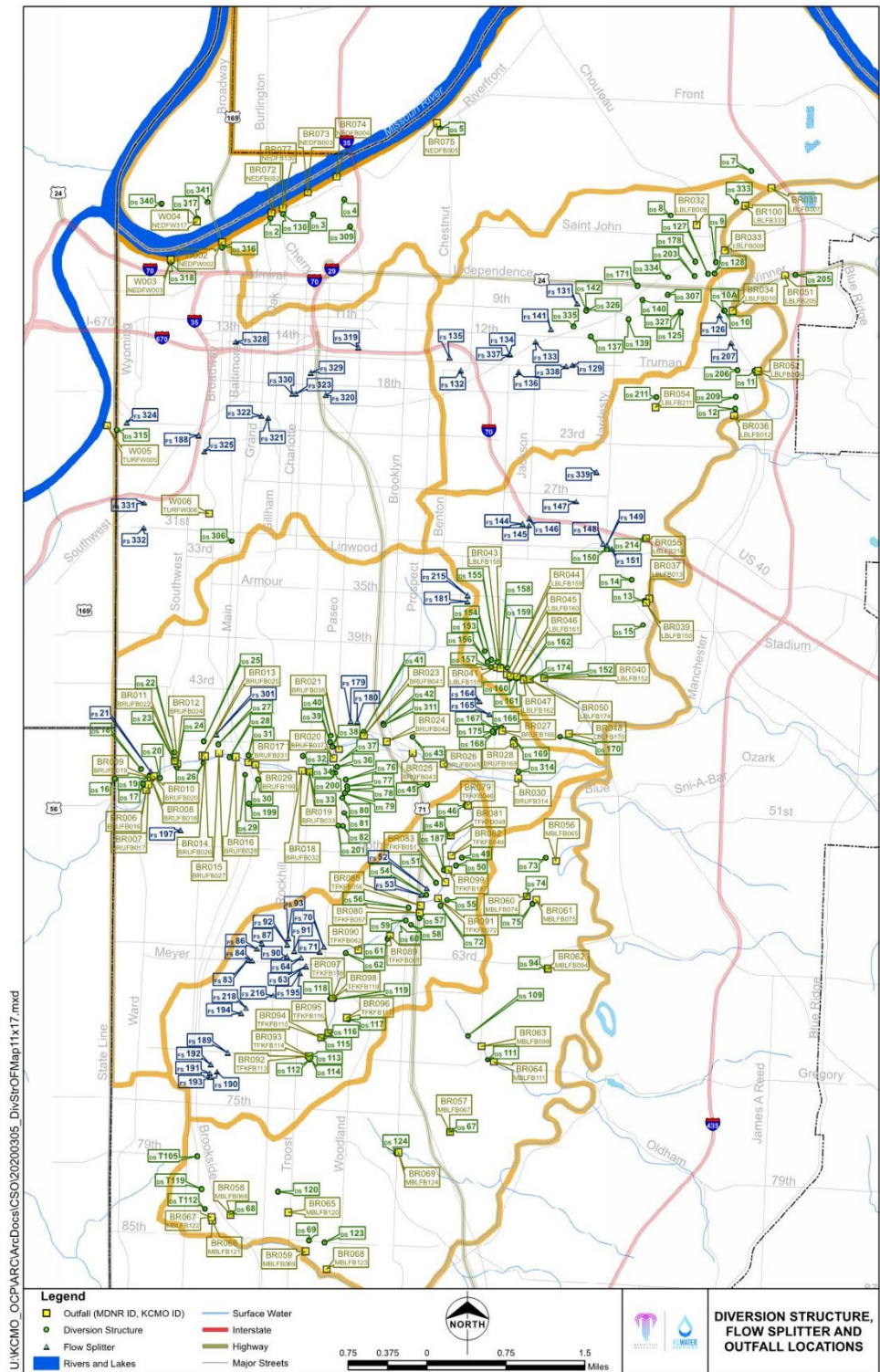
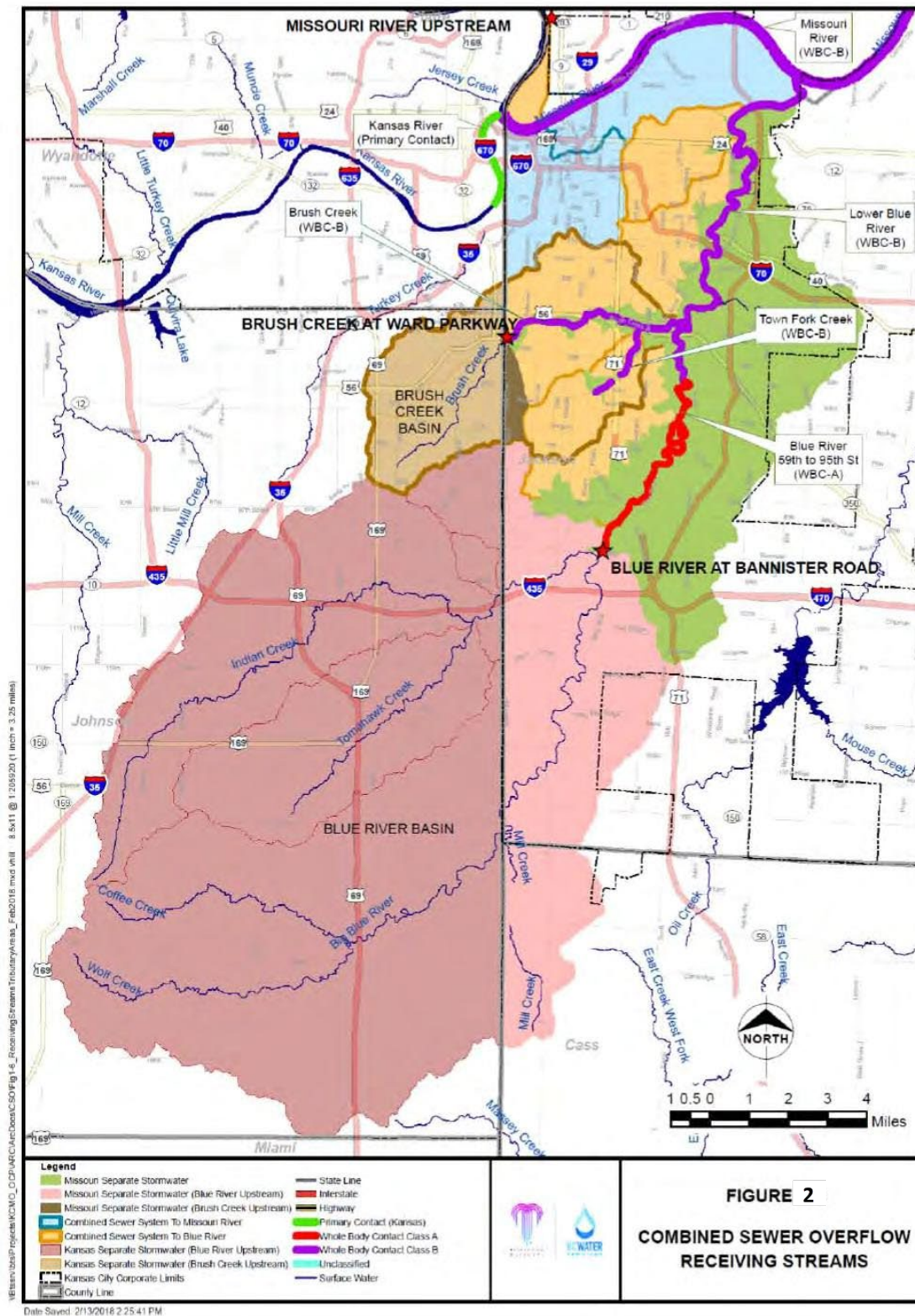


Figure 2: Combined Sewer Overflow Receiving Streams



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

The following information is a summary of activities conducted during the reporting period to demonstrate compliance with the Capacity, Management, Operation and Maintenance (CMOM) program. This 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 2020, there were 33 vacant positions in the divisions which have dedicated sections for stormwater and wastewater collection.

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

During the reporting period, KC Water communications staff continued to meet the unique needs of the many audiences the department serves. These audiences encompass:

- Approximately 900 Employees
- 170,000 Retail Customers
- 32 Wholesale Customers
- Local and National Media Outlets
- Neighborhood and Civic Groups
- Mayor, City Council, City Manager, City Departments
- State and Federal Elected Officials and Governmental Entities

During the reporting period, KC Water continued to improve internal business processes, enhanced employee training, and updated and/or made improvements to various software including WaterGIS.

Communications staff members produce a newsletter, “What’s on Tap,” that is distributed in water bills, and regularly update KC Water’s website (www.kcwater.us). Currently, the website and the City’s Smart Sewer website supplies information on the Overflow Control Program and informs customers 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 2020, the Action Center opened 3,564 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 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
- 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 required to interpret, adapt, and enforce Water Services Rules and Regulations as needed, which helps control causes of SSOs. Causes may include I/I, corrosion, blockage due to industrial waste and FOG. The Enforcement Program also provides the City with 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

The design and construction of infrastructure acquired as part of 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 pre-existing infrastructure and ensures the performance of proper record keeping 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 Division (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 work activities in the wastewater treatment and collection system, the primary data system is Infor-Hansen. 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 daily. The following is a list of the relevant systems maintained and used during the 2020 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 VX with PACP 7 coding.
- **Infor-Hansen System - CMMS:** Water Services is currently using Hansen 8.
- **KWIK:** Used for Water, Wastewater, and Stormwater utility billing. Used to manage and bill approximately 175,000 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.
- **Work Tracking Application:** In-house developed web-based application that standardizes and automatically uploads information into the City's Hansen work management system. The goal of the system is to better inform relevant stakeholders in a timelier manner about the assets that are repaired or rehabilitated.

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 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.

vii. 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. Monthly, 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.

viii. 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 who 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 office and field staff.

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.

ix. 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 encounter 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 1452 calls related to SSOs were routed to the Wastewater Line Maintenance Division during 2020. Of those, 56 complaints were the City's responsibility and 1396 were private problems. The breakdown of SSO call types City-wide includes:

- Water in basement dry weather – 1,071
- Water in basement wet weather – 381

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, because 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 as 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.

Generally, 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 categorized as a Code 2. If water comes up in the basement after using the facilities in the residence, it would most likely be categorized as 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. Wastewater Line Maintenance Crews respond to dry weather backup complaints based on the Code 2 or Code 3 priority. 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 to control the release of wastewater and perform appropriate cleanup tasks; crews are dispatched 24 hours a day to investigate complaints. Water Services continually evaluates the SSO Reporting and Notification Program.

x. *PERMIT AUTHORITY NOTIFICATION*

The Wastewater Treatment and Inspections and Investigations Divisions notifies MDNR when a DWO occurs within 24 hours of discovery. Water Services completes and submits a follow-up written report to MDNR within five days. 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.

There were 46 dry weather overflows reported to MDNR in 2020 compared to 49 in 2019.

B. COLLECTION SYSTEM 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).

i. *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, do not contribute to future I/I problems, and provide inspection and oversight of rehabilitative work to ensure proper execution. Stormwater and wastewater engineering is managed collaboratively by several units including Asset Management, Stormwater, and Smart Sewer Divisions in conjunction with overall direction from the engineering executive management.

The various engineering business units have unique areas of collection system responsibility, including:

- **Asset Management Division** is responsible for GIS mapping and IT software and systems used to manage the City's Overflow Control Program
- **Smart Sewer and Facilities Engineering Divisions** are responsible for the planning, design, and construction of stormwater and wastewater collection and pumping.

- **Facilities Engineering Division** is responsible for the design of all above-ground structures including pump stations and wastewater treatment plants.
- **Smart Sewer Division** is responsible for development and implementation of the City's Overflow Control Program
- **Stormwater Division** is responsible for stormwater management projects that are funded internally and jointly by other government agencies such as the Corps of Engineers

All engineering activities are performed under the supervision and direction of registered professional engineers. Staff members receive continuing education and training through industry seminars and workshops, as well as classes required to maintain PE licensure.

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

ii. 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. Due to impacts of the COVID -19 pandemic on City resources, Water quality sampling and analysis efforts were not performed during the 2020 recreation season (April 1 – October 31).

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.

iii. PRETREATMENT PROGRAM

The City continues to implement its approved pretreatment program through Water Services Regulatory Compliance Division pursuant to the Federal Register (40 C.F.R. Part 403) and 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.

iv. PUMP STATION OPERATIONS

Pump station operation is managed and staffed by the Wastewater Treatment Division to ensure reliable operations and continues as originally envisioned and developed.

The department ensures reliable operations by:

- Conducting routine scheduled inspections
- Troubleshooting and routine upgrades
- Performing preventative and corrective maintenance
- Retaining appropriate records of pump station performance
- Remotely monitoring pump station operations using remote dialers and a SCADA system

This program is executed in conjunction with the pump station maintenance program discussed later in this document. Operations staff are responsible for performing light and/or preventative maintenance work as needed, and routine inspections are performed which generate corrective work orders identifying work to be performed by maintenance staff.

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.

The 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 one to several times per week for smaller stations. Visit frequency is based on several factors including staffing, facility size, complexity, criticality, reliability and past maintenance history. Maintenance staff also performs emergency maintenance and other tasks needed to maintain the overall wastewater treatment system.

In 2020 various design and construction was initiated, continued or completed at pump stations, force mains, and pipelines including Birmingham Pump Station, Buckeye Force Main and Pump Station, Round Grove Pump Station, Satna Fe Pump Station, and Mace Road Pump Station.

The pump stations include remote monitoring using telephone dialers and SCADA. In 2020, projects continued to implement a multi-year, system-wide SCADA system development and implementation including a new Operations Center at the Blue River WWTP. Pump station inspections are recorded in a logbook, and inspection forms and data are archived and recorded electronically. At some of the larger stations, more extensive data is collected. Additional staff are assigned as needed to accomplish all activities.

Training for wastewater operators occurs through on-the-job experience and through an inhouse program in which staff are eligible to obtain continuing education credits required for certification.

v. PUMP STATION MAINTENANCE

The purpose of the Pump Station maintenance program is to perform the necessary preventative, corrective and predictive maintenance required to sustain the reliability of wastewater and flood pump stations and ensure all pump stations throughout the service area are operating efficiently. This program is executed in conjunction with operations and maintenance to complete work orders generated from routine inspections, trouble calls, and preventative maintenance schedules. In 2020, approximately 5,000 work orders were completed associated with maintenance of the City's 43 sewer pump stations and 15 flood pump station.

Maintaining the reliability of pump stations helps to decrease the chance of pump station failure, which could potentially cause an overflow. Performing predictive and preventative maintenance

helps to correct problems before they become an emergency and increases pump station reliability.

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 operational status, servicing equipment for proper operation, and other corrective and preventative maintenance.

Maintenance supervisors produce a weekly maintenance schedule and select specific projects based on crew availability, parts availability and the urgency of a repair. Staff members update plans during daily weekday meetings between the pump station mechanical, electrical and instrumentation mechanics and operators, supervisors and superintendents to facilitate coordination. As a result, 90 percent of all work performed consists of scheduled and planned maintenance.

The senior management team utilizes computerized maintenance management administration, procurement, project specifications reviews, project drawings, project design meetings and coordination. Additional daily meetings and communications with maintenance supervisors and chief plant operators are conducted to communicate and coordinate the activities that need to be performed.

The management and execution of work tasks are evaluated constantly through daily team meetings and regular tracking of work orders. Tracking work orders in computerized maintenance management system enables staff to identify performance patterns that may require further evaluation. All flood pump stations are inspected almost daily during routine events and more frequently during severe weather events. The U.S. Army Corps of Engineers conducts annual audits and identifies further actions needed for repair work.

vi. *PUMP STATION EMERGENCIES*

Emergency response procedures have been developed 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 Chief Plant Operator (CPO) at the Blue River WWTP, who reports to a Section Superintendent, who in turn reports to Wastewater Treatment Division Manager. 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 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 specific expertise, a contractor 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

computerized maintenance management system. 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)

vii. 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 using infrared video/thermal imagery conducted as part of the annual aerial flyover contract. If an anomaly is found, field inspectors in the Wastewater Preventative Maintenance Division are sent out to determine if the anomaly was an active leak on the force main. 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 Wastewater Treatment Division is responsible for the ARVs on force main sewers. The ARVs are checked annually at a minimum.

viii. 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 2020, smoke testing was performed on approximately 811,900 linear feet, or 154 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.

ix. FLOW AND RAINFALL MONITORING

Flow and rainfall monitoring are 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 and to monitor post-construction conditions after improvements are completed.

Water Services has implemented a Smart Sewer Sensor Network consisting of over 300 flow and depth sensors throughout the sanitary and combined sewer networks. The data collected from the sensor network will be displayed on data dashboards in real-time and configured for five Water

Services use cases: Consent Decree compliance, SSP hydraulic model maintenance and project delivery, Green Infrastructure performance evaluation, Operations and Maintenance support, and Wastewater Treatment Division support.

Water Services has developed a standard protocol for flow and rainfall monitoring and data analysis. Once the flow and rainfall data are received, it is stored on a server at Water Services and is reviewed by various Division managers and 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.

x. *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 2020, the City televised approximately 260 miles of sewer lines, exceeding the Consent Decree requirements. 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.

xi. *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.

Targeted sections of the 2800 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 exfiltration 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 March 2020 with 29 anomalies discovered and zero anomalies associated with an overflow. Using the supplied GPS coordinates, the Wastewater Inspections and Investigations Division visually inspects the anomalies. The remaining anomalies were the result of small ponds, dried up creeks with small pools of water, natural groundwater seepage, storm drainage pipes, and other non-sewage related items.

C. COLLECTION SYSTEM MAINTENANCE

i. MANHOLE REPAIRS

The purpose of the Manhole Repair Program is to ensure the structural integrity of manholes in the system, reduce infiltration into manholes, control odor problems at manholes, increase accessibility to buried manholes, and 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 2020, the City's OCP Program Management team inspected 2025(MHs). A total of 1,059 MHs were repaired, replaced, or raised City-wide as follows: 46 MHs by City-wide MH Raising Contractor, 893 MHs by OCP Project Contractors, and 120 MHs by City Wastewater repair crews.

ii. MAINLINE SEWER REPAIRS

Actual physical repairs are made to the gravity sewer lines by the Utility Repair Division and outside contractors. 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 the CMMS. Repair work performed by in-house construction crews is entered into the CMMS by Collection Systems personnel, and repair work performed by outside contractors is entered into the CMMS by Engineering personnel.

Water Services employs repair crews; however, a significant amount of mainline sewer repair work is 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 2020, approximately 404,459 linear feet (76.6 miles) of sewer main line repairs, including open cut replace/pipe bursting, point repairs, and CIPP was performed City-wide. Additionally, 19,236 linear feet (3.64 miles) of service lateral pipe replacement and rehabilitation were performed City-wide.

iii. SEWER CLEANING

The two purposes of the Sewer Cleaning Program are to perform preventative maintenance cleaning on the gravity sewer system and to 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 CMMS-generated work order.

The City performs both hydraulic and mechanical cleaning. Mechanical cleaning is performed using either a rod machine or a bucket machine, while hydraulic cleaning is performed using vacuum trucks. Water Services stores all data related to the sewer cleaning program in the CMMS. 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 2020, the City cleaned approximately 520 miles of sewer lines, exceeding the Consent Decree requirement 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 and 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 and 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

Short-term pre-construction flow monitoring was conducted by the City's Overflow Control program management team for ten I/I reduction projects listed below beginning in April 2020 for approximately 90 days to seven months. Monitoring occurred to provide data for the identification and quantification of I/I sources and to measure the effectiveness of I/I rehabilitation work.

- Middle Blue River Area 13
- Round Grove Basin
- Birmingham Area 1
- Birmingham Area 3
- Buckeye Creek Area
- Northern Basins Area 1
- Northern Basins Area 2

Post-construction flow monitoring was conducted to obtain data to measure the reduction in I/I obtained by three projects listed below. Flow data will be analyzed to determine I/I reduction effectiveness.

- Blue River Central Area 2
- Brush Creek/Mission Hills
- Line Creek/Rock Creek Area 2

Ten temporary rain gauges were also installed in the project areas to supplement coverage provided by the City's existing ALERT gauging system.

In addition, flow and rainfall monitoring was performed for 90 to 210 days at one project location in the Brush Creek basin to provide pre-design data, and at three project locations in the Middle Blue River basin to provide post-construction data. For **Long-Term Flow Monitoring**, refer to Sections IV, REPORTING PERIOD ACTIVITY, Part B. APPENDIX D: POST-CONSTRUCTION MONITORING PROGRAM.

B. WATER QUALITY TESTING

Water quality testing was not performed in 2020 due to COVID-19 pandemic impacts on City resources. The City plans to resume water quality testing in 2021. The 2020 reporting period is the tenth year that monitoring was to be 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 sampling and field measurements at three locations on each of the Kansas River and Missouri River. The Water Services laboratory conducted analysis of the samples. Sampling and analyses were conducted according to the methods prescribed in the Integrated Water Quality Monitoring Program¹ and the associated Quality Assurance Project Plan².

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 not conducted during the 2020 recreation season, which extends from April 1 through October 31, due to COVID-19 pandemic impacts on City resources.

¹ LimnoTech, December 28, 2010

² LimnoTech, 2005, Revised 2010

END

Attachment A: Discharge Monitoring Reports

The following is an example of a Discharge Monitoring Report as submitted by Water Services to MDNR. To conserve resources, electronic copies of all discharge and bypass reports submitted to MDNR in 2020 are enclosed.

PERMITTEE NAME/ADDRESS (include Facility Name/Location if Different)
 NAME: Birmingham Wastewater Treatment Facility
 ADDRESS: 4800 E 63rd St., Kansas City, MO 64130
 FACILITY: 1801 NE 28th Street
 LOCATION: Kansas City, MO 64141

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

Form Approved
 OMB No. 2040-0004

MO-049531
 PERMIT NUMBER

001
 DISCHARGE NUMBER

MONITORING PERIOD
 FROM 2020 12 01 TO 2020 12 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 ^{1,3}	SAMPLE MEASUREMENT	13.20	9.35	MGD	-	-	-	-	-	Daily	Flow meter
	PERMIT REQUIREMENT	Daily Max	Monthly Avg.		-	-	-		-	Once/Weekday	24-Hr estimate
Biochemical Oxygen Demands	SAMPLE MEASUREMENT	-	-		-	13	10	mg/L	0	Once/Weekday	Composite
	PERMIT REQUIREMENT	-	-		-	45 Weekly Avg	30 Monthly Avg		-	Once/Weekday ²	Composite
Total Suspended Solids	SAMPLE MEASUREMENT	-	-		-	11	10	mg/L	0	Once/Weekday	Composite
	PERMIT REQUIREMENT	-	-		-	45 Weekly Avg	30 Monthly Avg		-	Once/Weekday ²	Composite
pH	SAMPLE MEASUREMENT	-	-		6.8	-	7.0	SU	0	Once/Weekday	Composite
	PERMIT REQUIREMENT	-	-		Daily Min 6.5	-	Daily Max 9.0		-	Once/Weekday ²	Composite
Ammonia as N *	SAMPLE MEASUREMENT	-	-		26.1	-	25.1	mg/L	-	Once/week	Composite
	PERMIT REQUIREMENT	-	-		Daily Max	-	Monthly Avg		-	Once/week	Composite
Oil & Grease	SAMPLE MEASUREMENT	-	-		<3.1 ND	-	<3.1 ND	mg/L	0	Once/month	Grab
	PERMIT REQUIREMENT	-	-		15 Daily Max	-	10 Monthly Avg		-	Once/Month	Composite
BOD ₅ Removal	SAMPLE MEASUREMENT	-	97	%	-	-	-	-	0	Once/Month	Composite
	PERMIT REQUIREMENT	-	> 85%		-	-	-		-	Once/Month	Grab (Inf)

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Hans Newsom
 Utility Superintendent, North Operations

TYPED OR PRINTED

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE: 816 513-7225
 DATE: 2021 01 28

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here). * Monitoring requirement only. ² Weekday, except for 9 Federal Holidays ³ Additional samples were analyzed for this parameter, and that data is included in calculations. ND=Non-Detect

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PERMITTEE NAME/ADDRESS (include Facility Name/Location if Different)
 NAME: Birmingham Wastewater Treatment Facility
 ADDRESS: 4800 E 63rd St., Kansas City, MO 64130
 FACILITY: 1801 NE 28th Street
 LOCATION: Kansas City, MO 64141

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

Form Approved
 OMB No. 2040-0004

MO-049531
 PERMIT NUMBER

001
 DISCHARGE NUMBER

MONITORING PERIOD
 FROM 2020 12 01 TO 2020 12 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			
TSS Removal	SAMPLE MEASUREMENT	-	95	%	-	-	-	-	0	Once/Month	Composite
	PERMIT REQUIREMENT	-	> 85%		-	-	-		-	Once/Month	Grab (Inf)
E. coli (Apr. 1 – Oct. 31)	SAMPLE MEASUREMENT	-	-		NA	-	NA	MPN/100 ml	-	Once/Week	Grab
	PERMIT REQUIREMENT	-	-		1030 Weekly Avg	-	206 Monthly Avg		-	Once/Week	Grab
Total Residual Chlorine (Apr. 1 – Oct. 31)	SAMPLE MEASUREMENT	-	-		0	-	0	µg/L	0	Once/Month	Grab
	PERMIT REQUIREMENT	-	-		180 Daily Max	-	89.6 Monthly Avg		-	Once/Month	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Hans Newsom
 Utility Superintendent, North Operations

TYPED OR PRINTED

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE: 816 513-7225
 DATE: 2021 01 28

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here). NA = not applicable, sampling not required during non-recreational months.

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Attachment D: Certificate of Achievement of Full Operation for OCP Projects

To conserve resources, electronic copies of the following Certificates of Achievement of Full Operation for OCP projects achieving this milestone in 2020 are enclosed:

- Neighborhood Sewer Rehabilitation: Brush Creek 1 & 2 – June 2020
- Neighborhood Sewer Rehabilitation: Northeast Area and Gooseneck Creek – August 2020
- Green Infrastructure Pilot: Turkey Creek/Central Industrial District – September 2020
- Neighborhood Sewer Rehabilitation: Lower Blue River North – December 2020
- In-Line Storage: Gooseneck Arch Sewer Gate & Pump Station – September 2020



[KCMO.GOV/SMARTSEWER](https://kcmo.gov/smartsewer)