

# Kansas City's Overflow Control Program

#### Chief

Environmental Enforcement Section Environment and Natural Resources Division U.S. Department of Justice Post Office Box 7611 Washington, D.C. 20044-7611 Reference Case No. 90-5-1-1-0643811

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## Kansas City's Overflow Control Program

### SEMI-ANNUAL REPORT

Reporting Period: January 1, 2011 through June 30, 2011

September 29, 2011

To the reader:

Please find enclosed the first semi-annual report related to Kansas City's Overflow Control Program. This report covers the first full semi-annual period from January 1, 2011 to June 30, 2011. Pursuant to the Consent Decree, this report has a required submittal date no later than September 30, 2011.

Additionally, and as required by the Consent Decree, any report, plan, or other submission that the City is required to submit, including reports, plans or other submissions that the City is required to submit by its Current NPDES Permits, shall be signed and certified by an official or authorized agent of the City.

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.

Thank you for your participation and cooperation in this important program. If you have any questions, please contact the undersigned at (816) 513-0203.

Sincerely,

empech

Terry Leeds Acting Director, Water Services Department, City of Kansas City, Missouri

cc: Honorable Sly James, Mayor, City of Kansas City, Missouri Members of City Council, City of Kansas City, Missouri Troy Schulte, City Manager, City of Kansas City, Missouri Matthew J. Gigliotti, Assistant City Attorney, City of Kansas City, Missouri







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## CITY OF FOUNTAINS HEART OF THE NATION



KANSAS CITY MISSOURI



### SEMI-ANNUAL STATUS REPORT PURPOSE AND SCOPE

On September 27, 2011, the Consent Decree and its associated Appendices related to reducing overflows in Kansas City's sewer system came into effect. In accordance with Section IX.A. of the Consent Decree, this document constitutes the first semi-annual report to be submitted to the regulatory agencies for the reporting period between January 1, 2011 and June 30, 2011.

Pursuant to the Consent Decree, the semi-annual and annual reports differ in content. The semi-annual status report is used to update the regulatory agencies as to Kansas City's progress on implementing control measures defined in Appendix A of the Consent Decree. While the annual status report is used to update the regulatory agencies on all other Consent Decree activity.

### KANSAS CITY'S SEWER SYSTEM

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

Kansas City's overall sanitary sewer system is comprised of both combined and separate sewer systems. A combined sewer system is a single sewer system that carries both wastewater and stormwater. Kansas City has 58 square miles of combined sewers. Typically these systems are in the oldest areas of the City and are not capable of carrying the large amounts of stormwater that now run off from our urban landscape. During moderate to heavy rainfall events, the system will reach capacity, overflow, and discharge a mixture of wastewater and stormwater directly to our streams and rivers. Although these overflows will be reduced over time, the discharge of combined sewer overflows is not uncommon in combined sewer systems and is allowed under a National Pollutant Discharge Elimination System (NPDES) permit issued to Kansas City's Water Services Department (WSD) by the Missouri Department of Natural Resources.

The remaining 260 square miles of Kansas City's sanitary sewer system are considered a separate system. A separate sanitary sewer system is designed to collect only wastewater. However, rainwater can enter the system through joints, broken pipes, manholes, and unpermitted direct connections causing the system to overload during rain events. When this system exceeds its capacity, it too overflows a mixture of wastewater and stormwater. Kansas City does have one constructed Sanitary Sewer Overflow (SSO) which will be eliminated as part of the Overflow Control Program.





KANSAS CITY MISSOURI 2



Porous concrete sidewalk, Middle Blue River Basin Green Infrastructure Project



### KANSAS CITY'S OVERFLOW CONTROL PROGRAM

Individual elements of the Overflow Control Program became part of an enforceable document on September 27, 2010, 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, the Environmental Protection Agency (EPA) and Missouri Department of Natural Resources (MDNR) related to reducing overflows. The Consent Decree includes requirements targeted at capital construction, management, operations and maintenance of the City's sewer systems.

Kansas City's Overflow Control Program was developed to meet regulatory requirements related to reducing overflows from the combined sewer system and preventing overflows from the separate sewer system. The City and its regulatory partners have agreed to meet those objectives over a 25-year time period by completing a planned list of improvements targeted at capturing for treatment 88 percent of combined sewer flows and eliminating sanitary sewer overflows during a five-year rainfall event.

### **Consent Decree components include:**

- Capital Projects targeted at reducing overflows through Combined Sewer Overflow (CSO) Control Measures and Separate Sewer Overflow (SSO) Control Measures;
- Nine Minimum Controls Plan targeted at operationally reducing and addressing combined sewer overflows through a series of minimum control efforts;
- Capacity Management Operation and Maintenance Plan targeted at reducing overflows by adequately operating and maintaining the sewer system;
- Post Construction Monitoring Plan targeted at long-term monitoring and assessment of overflow reduction;
- Supplemental Environmental Project targeted at reducing septic system use in the sewered area;
- Installation of Disinfection Technology at Wastewater Treatment Plants.

"The proposed sole reliance on utilizing distributed green infrastructure to achieve combined sewer overflow control performance goals in an area of this size is unprecedented in both scale and scope at the national level." -Middle Blue River Basin Green Infrastructure Project

### **REPORTING PERIOD ACTIVITY**

No specific milestones related to the compliance measures defined in Appendix A of the Consent Decree were required during this reporting period. However, the City did meet Consent Decree milestone requirements related to the development of a Water Quality Management Plan, water quality testing, and flow monitoring during the reporting period as defined in Appendix D of the Consent Decree, which will be discussed in the annual status report for the period ending December 31, 2011.

Although no milestone dates related to compliance measures defined in Appendix A were scheduled to occur during the reporting period, there were several significant events that took place related to Consent Decree implementation which will be reported in further detail in the first annual report. The following key activities occurred from the start of the Consent Decree through the first semi-annual reporting period:

- September 27, 2010 Consent Decree effective date.
- Fall 2010 and Spring 2011 Middle Blue River Basin Green Infrastructure Pilot Project sewer rehabilitation and repair continued through a contract issued to RePipe. Activity related to this contract is described in a later section of this report.
- December 2010 Through a contract issued to Limnotech, a Water Quality Management Plan (WQMP) was developed in accordance with requirements set forth in Appendix D.II. of the Consent Decree.
- March 2011 A contract was issued to Seagull Environmental Technologies for water quality sampling at large river locations identified in the WQMP. Water quality sampling in areas defined in the WQMP, but not covered under the contract with Seagull as performed by WSD laboratory staff. Water quality testing defined in the WQMP was also performed by WSD laboratory staff.
- March 2011 A contract was issued to George Butler and Associates to install flow monitors, record, and report data for flows at Outfalls 059 and 069. Raw data associated with the monitors is recorded and reported to WSD via remote website reporting. Data is reviewed and processed before submitting a quarterly report to WSD defining flow activity for these outfalls.
- March 2011 Construction Notice to Proceed was issued to Foley Company for construction of disinfection facilities at the Rocky Branch Wastewater Treatment Plant.
- April 2011 A program assistance contract was issued to Burns & McDonnell to support WSD in preparation of upcoming Consent Decree milestones and to put in place programmatic tools needed to manage the 25-year Consent Decree schedule.
- May 2011 A wastewater utility rate increase was approved by the City Council of Kansas City and went into
  effect May 1, 2011. Kansas City's Overflow Control Program is currently funded through wastewater utility
  rates. In order to achieve Consent Decree compliance, significant rate increases are necessary for each of the
  next 10 years. Annual approval of these rate increases is critical to compliance with the Consent Decree.
- May 2011 Construction notice to proceed was issued to Mega Construction for construction of green infrastructure in the Middle Blue River Basin Green Infrastructure Pilot Project Area. This 18-month contract will focus on construction of bioretention cells, cascades, and porous concrete sidewalks during 2011 with installation of vegetated material concentrated in Spring 2012. Activity related to this contract is described in a later section of this report.
- May 2011 A program Goals & Objectives Workshop was conducted by the Overflow Control Program Assistance Contractor with senior WSD Staff. This two-day workshop helped define programmatic goals for WSD as well as focused activities in early program years designed to help the Department successfully implement the Consent Decree.
- May 2011 Construction Notice to Proceed was issued to Foley Company for construction work at the Northland Mobile Home Park Wastewater Treatment Plant. Construction at this facility is part of WSD's approach to disinfection, which includes turning this small wastewater treatment plant into a pump station.

- June 2011 Construction Notice to Proceed was issued to Foley Company for construction of disinfection facilities at Birmingham Wastewater Treatment Plant.
- June 2011 Began early planning for the next phases of work in the Middle Blue River Basin Projects and South of Missouri River Projects. Deliverables associated with work in the Middle Blue River Basin Combined Sewer Area will include requests for qualifications/proposals related to cleaning, assessment, rehabilitation and flow monitoring activities for the remaining 644 acres not included in the Middle Blue River Basin Green Infrastructure Pilot Project. Deliverables associated with work south of the Missouri River in the Separate Sanitary Sewer System will include Construction Bid Documents for Inflow/Infiltration reduction in the Round Grove Basin, Construction Documents for replacement of the 24-inch Round Grove Force Main, and early site evaluation reports for the 87<sup>th</sup> Street Pump Station Phase 1 Storage Project.



Bioretention cell below-grade storage, Middle Blue River Basin Green Infrastructure Pilot Project

### **PUBLIC PARTICIPATION**

Several public involvement activities for the Overflow Control Program have been undertaken during the reporting period. Presentations about the Overflow Control Program made to various organizations include:

- Wet Weather Partnership Presentation: April 15, 2011
- Middle Blue River Basin Green Infrastructure Pilot Project Construction Kick-off Presentation and Neighborhood Meeting: May 21, 2011
- City Council Business Session Presentation: June 9, 2011

As part of the Overflow Control Program Assistance Contract with Burns & McDonnell, a review of the existing Overflow Control Program website (www.kcmo.org/wetweather) and related websites was conducted during the reporting period. The purpose of the review was to identify needed updates, while also determining how the website should be organized when moving forward into plan implementation.

During the next reporting period, work will continue to update and combine related Overflow Control Program websites. The revised website will act as the sole location of all information relating to the Overflow Control Program. The website will also be updated to make the site more project-focused. The site will be designed to include topical information and details about projects such as descriptions, schedules and general information such as project updates and statistics.



Public meeting, Middle Blue River Basin Green Infrastructure Pilot Program

## MIDDLE BLUE RIVER BASIN GREEN INFRASTRUCTURE PILOT PROJECT

The Overflow Control Program includes funding dedicated to developing green infrastructure pilot projects and partnerships in the combined sewer basins. While proven individually or as part of small systems, green infrastructure has yet to be utilized in a widespread effort to address combined sewer overflows. The first pilot project implemented, the Middle Blue River Basin Green Infrastructure Project, is currently under construction. This pilot focuses on the use of green infrastructure to provide distributed storage of stormwater throughout a 100-acre area of the Marlborough neighborhood. The area is primarily residential, but does include commercial businesses. In addition to gaining valuable information about the effectiveness of green infrastructure in controlling combined sewer overflows, this initial pilot will also evaluate alternatives for achieving additional program objectives, including:

- Effectiveness of green infrastructure as a systematic solution;
- Codes and ordinances in conflict with green infrastructure utilization;
- Socio-economic benefits/change;
- Construction techniques and costs on a wide-scale programmatic level;
- Potential changes in City services in green infrastructure areas;
- Maintenance approaches and costs;
- Public/Private partnership opportunities; and
- Community interaction and support of green infrastructure practices.

Construction activities in the Middle Blue River Basin Green Infrastructure Pilot Project conducted during the reporting period included repairing damaged and leaking combined sewers and the installation of Stormwater Best Management Practices (BMPs) to reduce flows in the collection system. The project is generally bounded on the north by 73rd Street, on the south by 77th Terrace, on the east by Holmes Road, and on the west by The Paseo. Extensive public involvement activities for the project also took place.

Sewer rehabilitation work in the Middle Blue River Basin Green Solutions Pilot Project was considered substantially complete during the reporting period. Approximately 17,000 feet of sewer line and more than 70 manholes have been repaired or replaced. Additional work to bring the project into full completion was conducted from January to June 2011. The work included rehabilitation of the existing combined sewer system using cured-in-place-pipe (CIPP) for the public sewer lines. Trenchless technology, such as CIPP, pipe bursting, or open excavation was used for sanitary service laterals.

The rehabilitation included lining of approximately : 130 linear feet CIPP of 8-inch sewer pipe; 5,700 linear feet of 10-inch sewer pipe; 4,275 linear feet of 12-inch sewer pipe; 1,875 linear feet of 15-inch sewer pipe; 1,650 linear feet of 18-inch sewer pipe; 2,025 linear feet of 21-inch sewer pipe; 675 linear feet of 24-inch sewer pipe; 475 linear feet of 27-inch sewer pipe; 475 linear feet of 30-inch sewer pipe; 550 linear feet of 36-inch sewer pipe; and 475 linear feet of 42-inch sewer pipe. The rehabilitation also included approximately 6,100 linear feet of 6-inch/4-inch sanitary sewer service lines; the installation of up to 317 cleanouts on sanitary sewer service laterals; the rehabilitation of 56 existing manholes, including new frames, covers, and grade rings; and 850 vertical linear feet of cementitious liner, together with all accessories and appurtenances.

Construction of the stormwater BMPs began in May 2011. The construction will include the installation of approximately 150 BMPs in the 100-acre pilot project area. Mega Industries was awarded the contract through a competitive bid process in March 2011. Bids were received from five (5) Kansas City construction companies. The \$4,246,000 contract was structured for a basic construction period of a year, plus a three (3) year maintenance requirement.

Construction includes numerous stormwater BMPs to capture and temporarily hold stormwater runoff from entering the combined sewer system serving the project area. The BMPs include: Rain gardens, Subsurface water storage systems, Bioretention areas, Porous pavement and pavers, and Bioswales.



Rain gardens, curb extension work and porous concrete sidewalks, Middle Blue River Basin Green Infrastructure Pilot Project

kansas city missouri 9 To better manage runoff, the project area also includes street improvements, including curbing and replacement of sidewalks that have fallen to disrepair. Missouri Gas Energy (MGE) will also replace aged natural gas service lines along three of the residential streets. MGE has worked in advance of the construction contractor to install new service mains along 75th Terrace, 76th Street and 76th Terrace. Following the installation of the service main, each residential service was disconnected from the old main and connected to the new service.

Construction is progressing with planned completion of major construction during the calendar year 2011 and completion of landscaping in Spring 2012. However, construction in a fully developed, combined residential and commercial project area is a significant challenge in working around extensive utilities in the project area and dealing with the uncertainties of where underground conflicts may be encountered. To date, residents have been patient with the progress of work as they are appreciative of the improvements being made to their neighborhood.

Public involvement in the pilot project area included door-to-door outreach and a public meeting. In late April and early May, door-to-door outreach for the pilot project area was conducted. The purpose of this outreach was to contact property owners and residents to inform them of the improvements that will be made in the right-of-way of their property starting in the next few months. In addition, properties that were found to have downspouts connected to the sanitary sewer system were notified that the City would like for them to disconnect their downspouts.

A total of 147 of the 161 properties affected by construction were contacted in the pilot project area during the doorto-door outreach. Ten (10) properties were not contacted due to the property being vacant and four (4) additional properties were not contacted due to an unleashed dog or there was nowhere to leave information. Of the 147 properties where contact was made, personal contact was made with 27 property owners and 14 renters. Materials were left at the properties of the remaining addresses.

Handouts included "Public meeting announcement & project update" and "Why Should you Disconnect Your Downspout?" In general, a majority of the property owners and residents were positive about the upcoming improvements.

On May 21, 2011, a public meeting was held at South-Broadland Presbyterian Church at 7850 Holmes Road. In preparation of this meeting, designed to inform the residents and businesses in the project area of the forthcoming construction, signage was posted in the project area advertising the event and project staff canvassed the area to distribute flyers and encourage the participation of residents. The event included a pancake breakfast and an opportunity to learn more of what is going to occur on their street and in front of their property. The construction contractor was introduced as well as the utility representatives that were also going to be working in the project area.

Sixty-three (63) members of the community attended with 51 of them living within the project boundaries. Other stakeholders attending included the Blue River Watershed Association and the Marlborough Community Coalition. City officials present included newly inaugurated Mayor Sly James and City Council representatives Cindy Circo, Michael Brooks, John Sharp and City Manager Troy Schulte. Other City departments represented include City Planning and Development, Neighbor & Community Services and Neighborhood Housing Services. The event included representatives from U.S. Environmental Protection Agency (Region VII) and Mid-America Regional Council (MARC).

Kansas City's Combined Sewer Basins



SEMI-ANNUAL REPORT Reporting Period: January 1, 2011 through June 30, 2011

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## CONSENT DECREE APPENDIX A: COMBINED SEWER OVERFLOW CONTROL MEASURES

About 58 square miles within Kansas City are served by combined sewers. This area is generally bound by the Missouri/ Kansas state line on the west, 85th Street on the south, the Blue River on the east, and the Missouri River on the north. The area served by the combined sewer system is subdivided into seven principal basins: Gooseneck Creek, Lower Blue River, Town Fork Creek, Brush Creek, Middle Blue River, Northeast Industrial District and Turkey Creek/ Central Industrial District. North of the river, the Charles B. Wheeler Municipal Airport is also served by combined sewers.

The Consent Decree defines improvements in the combined sewer system estimated at approximately \$1.4 billion in 2008 dollars. Repairs to the existing system are scheduled to occur early in the implementation of the Overflow Control Program. The early years will also include aggressive pilot projects focused on developing green infrastructure solutions. The middle years of the program will focus on maximizing the capacity within the existing system and analyzing the results of source volume reductions and pilot projects. The final years of the program will address necessary improvements to the City's wastewater treatment plants and construction of structural storage solutions, currently proposed as deep storage tunnels.

No specific milestones related to the compliance measures for the Combined Sewer System defined in Appendix A of the Consent Decree were required during the reporting period. Consent Decree starting deadlines for the basins are as follows:

- Brush Creek Basin Work in the Brush Creek Basin is scheduled to begin in 2017.
- Lower Blue River Basin Work in the Lower Blue River Basin is scheduled to begin in 2018.
- Middle Blue River Basin Work in the Middle Blue River Basin is scheduled to begin in 2012. However, the City has begun initial planning efforts related to small sewer rehabilitation and condition assessment for the remaining areas in the Middle Blue River Basin.
- Northeast Industrial District Basin Work in the Northeast Industrial District Basin is scheduled to begin in 2015.
- Town Fork Creek Basin Work in the Town Fork Creek Basin is scheduled to begin in 2015.
- Turkey Creek/Central Industrial District Basins Work in the Turkey Creek/Central Industrial District Basins is scheduled to begin in 2014.
- Blue River WWTP Work at the Blue River WWTP is scheduled to begin in 2025.
- Westside WWTP Work at the Westside WWTP is scheduled to begin in 2017.

Kansas City's Separate Sewer System Watersheds North of the Missouri River



Kansas City's Separate Sewer System Watersheds South of the Missouri River

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## CONSENT DECREE APPENDIX A: SEPARATE SEWER OVERFLOW CONTROL MEASURES

Kansas City's separate sanitary sewer system is comprised of nine principal basins covering 260 square miles of the City. The four separate sanitary sewer system basins north of the Missouri River are the Northern and Northwestern watersheds and the Line Creek/Rock Creek and Birmingham/Shoal Creek basins. The five separate sanitary sewer system basins south of the Missouri River are the Blue River North, Round Grove, Blue River Central, Blue River South and Little Blue basins.

The Consent Decree defines improvements in the Separate Sanitary Sewer System estimated at approximately \$1 billion in 2008 dollars. These projects involve early efforts to reduce inflow and infiltration of stormwater into the system by repairing the existing system where cost-effective. A combination of wet weather storage and treatment will be utilized to address inflow and infiltration determined to be too expensive to keep out of the system.

No specific milestones related to the compliance measures for the Separate Sewer System (SSS) defined in Appendix A of the Consent Decree were required during the reporting period. Consent Decree starting deadlines for the basins are as follows:

- North of the Missouri River Separate Sewer System Work in the SSS north of the Missouri River is scheduled to begin in 2014.
- South of the Missouri River Separate Sewer System Work in the SSS south of the Missouri River is scheduled to begin in 2012. However, the City has begun preliminary planning related to reconstructing one of the Round Grove Force Mains; I/I reduction in the Round Grove Basin; and site assessment and planning for the proposed storage project near the 87th Street Pump Station. Work on each of these projects during this reporting period focused on assembly and review of initial design documents developed during Overflow Control Plan development.

### SCHEDULED ACTIVITY FOR THE NEXT REPORTING PERIOD

There are no Appendix A Control Measures scheduled to begin during the next semi-annual report period between July 1, 2011 and December 31, 2011. However, program activity will continue to accelerate with work focusing on the following key areas:

- Middle Blue River Basin Green Infrastructure Pilot Project Construction will continue in the pilot project area. Major construction elements should reach significant levels of completion during the reporting period with most plantings scheduled for Spring 2012.
- Public Involvement Planned activities during the reporting period include updating of the program website as well as scheduled presentations to the Chamber of Commerce, American Consulting Engineers Council, and other local focus groups.
- Data Management Work on assembly and long-term data management required by the Consent Decree will continue in preparation for the first annual status report. The building of the data management system will define not just long-term storage requirements, but also how the City can utilize data to better manage wastewater utility operations, maintenance, and long-term capital projects.
- Project Planning Planning and preparation will continue for projects in the remainder of the drainage area related to Outfalls 059 and 069, reconstructing the Round Grove Force Main, inflow/infiltration work in the Round Grove Drainage Basin, and Phase 1 of the 87<sup>th</sup> Street Pump Station Modifications and Storage Project. All with Consent Decree start dates scheduled for 2012.
- Budget and Schedule Refinement Work will also continue on building and refining the project controls and financial models which will be used to manage the program.
- Force Main Maintenance Program A program will be developed which inventories force mains and air relief valves and puts in place a maintenance program targeted at providing condition assessment, corrosion investigation, preventative maintenance and documentation of force main maintenance activities.

The conclusion of the next semi-annual reporting period will coincide with the first annual status report covering activities occurring between January 1, 2011 and December 31, 2011.

## CITY OF FOUNTAINS HEART OF THE NATION



KANSAS CITY MISSOURI





Reporting Period: January 1, 2011 through June 30, 2011



CITY OF FOUNTAINS HEART OF THE NATION

KANSAS CITY MISSOURI

