



National Pollutant Discharge Elimination System (NPDES)

Municipal Separate Storm Sewer System (MS4) Permit MO-0130516

May 1, 2019 - April 30, 2020



KC Water

4800 East 63rd Street

Kansas City, Missouri 64130

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ACRONYMS

APWA	American Public Works Association
ARAP	Assumptions & Attainment Plan
AE&RMS	Archibus Environmental & Risk Management System
BMPs	Best Management Practices
BOD	Biochemical oxygen demand
CERC	Columbia Environmental Research Center
City	City of Kansas City, Missouri
COD	Chemical oxygen demand
CPD	City Planning & Development
EMC	Event-mean concentration
GIS	Geographical Information System
HHW	Household Hazardous Waste
KCEEN	Kansas City Environmental Education Network
LDD	Land Development Division
MARC	Mid-America Regional Council
MCMs	Minimum Control Measures
MDNR	Missouri Department of Natural Resources
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollution Discharge Elimination System
OEQ	Office of Environmental Quality
P&R	Parks and Recreation Department
Permit	MO State Operating Permit MO-0130516
PHFs	Pesticides, herbicides, and fertilizers
PWD	Public Works Department
SPCC	Spill prevention control and countermeasures

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SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TSD	Treatment, storage and disposal
USACE	U.S. Army Corp of Engineers
UST	Underground storage tanks
WE KC	Water Education for Kansas City Program
WLA	Waste load Allocation

CERTIFICATION

As required in Part H, Section 1 of Missouri State Operating Permit No. MO-0130516, annual reports shall be signed in accordance with 40 CFR 122.22 and 10 CSR 20-6.010(2)(B) and include the following certification:


I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Terry Leeds, Director

KC Water

City of Kansas City, Missouri



Date

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INTRODUCTION

This report is submitted to the Missouri Department of Natural Resources (MDNR) by the City of Kansas City, Missouri (hereafter referred to as the City) pursuant to the conditions of the National Pollutant Discharge Elimination System (NPDES) Missouri State Operating Permit MO-0130516 (the Permit) for stormwater discharges from its municipal separate storm sewer system (MS4). The report provides an update on the permit activities conducted during the City's fiscal year May 1, 2019 through April 30, 2020 (the reporting period). The activities were conducted under the requirements of the second or renewed permit, which became effective in September 2018.

As required in the Permit, the City submitted to MDNR an updated plan for its Stormwater Management Program (SWMP) in August 2019. The plan was prepared to ensure its compliance with condition specified in the renewed permit.

The report is presented to be consistent with the layout of the requirements in the second permit and include activities identified in the SWMP. For each of the nine minimum control measures (MCMs) required in the Permit, a list of relevant BMPs is provided to include a description of individual BMPs, a summary of compliance status, assessment of BMPs, implementation status, plan for the next reporting cycle, any planned changes to the effective Stormwater Management Program (SWMP), as well as a summary of monitoring results, where applicable. The last part of the report are the appendices of supporting data or documents.

SECTION 1. TOTAL MAXIMUM DAILY LOAD

Permit Ref. C. Total Maximum Daily Load (TMDL)

Status: Not applicable

No Total Maximum Daily Load (TMDL) had been established that include MS4 wasteload allocations by the end of the reporting period. The Permit requires action from the permittee when the receiving stream has an approved or established TMDL.

Should any area of the MS4, including part of the Blue River watershed, be identified in an EPA-approved or established TMDL with an applicable wasteload allocation (WLA) in the future, the City would develop a TMDL Assumption and Requirements Attainment Plan (ARAP). The City will implement steps toward attainment of applicable WLA in accordance with 40 CFR 122.44(k)(2) and (3) as implemented through this permit. Pertinent activities will be captured in the annual report.

SECTION 2. MINIMUM CONTROL MEASURES (MCMs)

1. Public Education and Outreach of Stormwater Impacts

Permit Ref. E.1-a.i. Informing the public

Measurable Goal: Ongoing use of the available resources to provide relevant information

Status: Goal met

E.1-a.i. BMP 1. Utilize the Department's *What's on Tap?* newsletter sent to every water customer in their monthly water bill as a tool for wide-spread dissemination of relevant information/education

KC Water sends out a *What's on Tap?* newsletter to its water customers every other month. The newsletter is a tool to disseminate educational messages and information. During the reporting period, the following messages were delivered: *Storm Drains Get New Markings*; *Fall Leaf and Brush Curbside Collection*; *Storm Drains are Important to Clean Water*; *Get Rain Ready with Keep Out the Rain*, and *Celebrate Earth Day 50: Clean up the Blue River*; *Leaf-Brush Pickup Set for April*.

E.1-a.i. BMP 2. Utilize KC Water's website to provide information on stormwater management and water quality matters

During the reporting period, KC Water continued to improve its website, including its education page (<https://www.kcwater.us/education/>). The page currently lists various links and resources covering teacher resources, community outreach, water quality, tours, printed materials, videos, and water quality grants.

E.1-a.i. BMP 3. Use of the *KC to the Sea* curriculum in City schools

The curriculum was designed to help educate 4th through 6th grade students on the role of stormwater management in protecting the water quality in local rivers, lakes, and streams. During the reporting period, the curriculum was taught in 33 schools and 2 summer camps, reaching a total of 3,634 students in 8 different school districts, 3 charter schools, and 2 private schools.

Next Step: Continue to use the available resources to educate and reach out to the public

Permit Ref. E.1-a.ii.1. Pollutants related to pesticides, herbicides, and fertilizers

Status: Multiple efforts covered the pollutants.

E.1-a.ii.1. BMP 1. Freddy the Fish

Under the WE KC Program, KC Water staff taught *the Freddy the Fish* class to young children to educate them about various pollutants brought by human activities that Freddy will encounter during his

adventure. Pesticides, oil and gasoline are among the listed pollutants. The class was taught in 8 schools, and 5 summer and Girl Scout camps, reaching 530 students.

E.1-a.ii.1. BMP 2. Water Quality Small Grant (WQSG) Program

KC Water administers the WQSG Program to support local nonprofits in projects and activities related to water quality protection, improvement, and education within the city limits of Kansas City, Missouri. One of the grant recipients is StoneLion Puppet Theatre, an organization that is dedicated to expanding environmental education through the art of puppetry. During the reporting period, StoneLion Puppet Theatre performed a show, “The Little Red Hen’s Garden” that focuses on the effect of pesticides, herbicides, and fertilizers on waterways.

E.1-a.ii.1. BMP 3. KC’s Household Hazardous Waste (HHW) Facility

KC Water provides information to the public on materials accepted at the HHW facility and hours of operation. Lawn chemicals from residential sources are within the service scope. The facility also hosts mobile events to serve on a regional scale. See the links below. Also a brochure was provided on site with the information of facility location, open hours, and permissible collection contents.

<https://www.kcwater.us/programs/hhw/>

<https://www.marc.org/Environment/solid-waste/district-programs-and-projects/household-hazardous-waste>

Next Step: KC Water will continue to conduct the programs.

Permit Ref. E.1-a.ii. 2. Pollutants related to used oil and toxic materials

Status: Multiple efforts covered the pollutants.

E.1-A.ii.1. BMP 1. KC’s Household Hazardous Waste (HHW) Facility

See E.1.a.ii.1. BMP3. for details.

E.1-A.ii.2. BMP 2. KC Water hosts a Trash Tally

Trash Tally is a program provided for Grades 2 and 3. It incorporates graphs and storm drain locations, and it is usually a prelude to a litter pickup or other service project. It is designed to educate students about the downhill movement of stormwater towards storm drains, as well as the types of trash commonly found in the runoff (oil, chemicals, metals are on the list). During the reporting period, Trash Tally was taught in 9 schools and reached 643 students.

Next Step: Continue to conduct these programs

Permit Ref. E.1-a.iii. Activities and materials specific to targeted audiences and pollutants

Measureable Goal:

- Completion of annual solicitation, review, administration and award of grants
- Active implementation, participation and support of efforts

Status: Met goals

E.1-a.iii. BMP 1. See TABLE 1. A list of public education activities.

Table 1. A list of public education activities

Programs/ Partnerships	Achievement During this Report Period
KC Green	<ul style="list-style-type: none">• In September of 2019, the team hosted its biennial Green Fair in downtown, at which more than 20 area vendors were able to share information with City employees and residents about everyday ways to be green. This included information on water quality, native gardening, tree planting, waste reduction, recycling, alternative transportation, and alternative energy.• The Trees work group completed a draft of a new administrative regulation for municipal activities when removing and replacing trees, spearheaded adoption by City Council of the Urban Forest Management Plan and began work on development of a new ordinance supporting enhancement and expansion of the KC tree canopy.• In the spring of 2020, the Office of Environmental Quality updated the City's webpages to include Earth Day Everyday resources links and the social media Earth Week Campaign. 788 views have been recorded with 429 of those views occurring on Earth Day, April 22, 2020.• The KC Green Infrastructure Team provided continued support for the City's Green Stormwater Infrastructure (GSI) Manual and GSI Story Map. These resources are being used to inform green infrastructure project design and were made available on KC Water's web site at https://www.kcwater.us/programs/green-stormwater-infrastructure-gsi/.
Green Infrastructure Tours	<ul style="list-style-type: none">• KC Water offers educational tours of its public green infrastructure facilities and Green Storm Infrastructure demonstration parking lot at its Swope Campus headquarters.• KC Water hosted 3 tours of the Swope Campus, reaching 33 people.

Water Education for Kansas City (WE KC Program)	<ul style="list-style-type: none"> • The program empowers youth organizations and after school groups to make good water quality choices for their future through hands-on learning and facilitation of stewardship projects. • Facilitated 13 litter pickups reaching 1,257 students and cleaning up over 1,900 pounds of trash and 17 tires • Facilitated 3 storm drain marking events, reaching 74 students and marking 99 storm drains • Held 17 watershed education events reaching 710 students • 4 high school Career Day events reaching 213 students • 6 Professional Development and Workshop presentations reaching 171 teachers representing 7 local school districts
Water Quality Small Grant Program	See TABLE 2. Administer the annual Water Quality Education grant program
Stormwater: From KC to the Sea	Stormwater curriculum was taught to a total of 3,634 students (4 th to 6 th grades) from 33 schools and 2 summer camp in 8 different school districts, 3 charter schools, and 2 private schools.
Stormwater Plinko	Stormwater Plinko, an educational tool, was played at 2 outreach events, reaching about 200 people.
Additional Education Initiatives	<ul style="list-style-type: none"> • Clean Water Messages: Grades K-2: Using pictures showing the different types of pollution found in local creeks and streams, students learn that there are many things humans can do to help improve water quality. Clean Water Messages was taught in more than 6 schools reaching 150 students. • Macro Monitoring: The class was designed to educate students on how human activities can affect the bottom dwellers in streams. The class was taught to 894 students in 10 schools and 5 summer camps.
The Blue River Parkway Clean-up	<ul style="list-style-type: none"> • A collaborative effort from Heartland Conservation Alliance, KC Water, Urban Trail Co. and Rockhurst University students • The intention of the clean-up was to bring awareness to the community about the value of restoring the Blue River by picking up trash in its surrounding environment. • 67 volunteers showed up at 9800 Blue River Road, Kansas City, Missouri on Oct. 5, 2019. Volunteers included community members, five partners and 40 students. • Approximately 100 bags of litter, weighing about 1,700 pounds, were collected.
The Mid America Regional Council (MARC) Water Quality Public Education Program	<ul style="list-style-type: none"> • KC Water continues to be a leading stakeholder for this program. • <u>KC Metro Plog-a-thon:</u> On August 24, 2019, 81 “ploggers” participated in Kansas City’s first plogging event, which combined jogging and picking up litter. The inaugural Plog-a-thon, sponsored by MARC’s Water Quality Public Education Committee with support from partners Run 816 and the KC Marathon, netted 283 pounds of litter along a three-mile course that wound through Westport, Mill Creek Park, the Plaza, Brush Creek and Main Street in Kansas City, Missouri.

- KC Marathon Partnership Marketing: The Water Quality Public Education message logo was included on:
 - ✓ All participant and volunteer shirts (approximately 11,000 shirts)
 - ✓ All print marketing collateral
 - ✓ The race's start/finish truss
 - ✓ The Kansas City Marathon website
 - ✓ The virtual race bag participant packets (with an audience of approximately 9,500 event participants)
 - ✓ Signage in the Kansas City Marathon Finish Line Festival
 - ✓ All email marketing associated with the eventAdditionally, two emails were sent to the Sports Commission's e-marketing database (approximately 15,000 recipients).
There was a Water Quality Public Education Committee complimentary booth space on race day at the Finish Line Festival (9,300 people). Another complimentary booth space was set up at the Kansas City Marathon Health & Fitness Expo at Union Station (12,000 people; a \$1,000 value).
- Plan It Native Partnership Marketing: The Plant It Native Conference, hosted by Deep Roots, promoted native landscapes for a healthy planet. The printed program was distributed to 300 attendees.
 - ✓ Facebook post: 77 reached
 - ✓ Twitter post: 679 impressions
 - ✓ Newsletter: 1,200 people with an average 40% open rate.
- Website: launched a website to reach the general public with the water quality message and promote events and other water quality education related activities.
- Name the Droplet: launched a name the droplet contest to name the water droplet featured in its water quality education video series. The contest was a dual effort to promote water quality messages and name the droplet. The contest was promoted via social media yielding 128,211 impressions.
- Webinars: hosted a series of webinars broadcast by the Center for Watershed Protection.
 - ✓ Tree Crediting for Stormwater: June 19, 2019
 - ✓ Nutrient Trading: August 14, 2019
 - ✓ Stormwater Practice Design, Installation and Maintenance: September 18, 2019
 - ✓ Monitoring for Stream Restoration and Green Infrastructure Practices: October 16, 2019
 - ✓ Salt & Stormwater – The Salinization of Our Watersheds: November 20, 2019.

E.1-a.iii. BMP 2. Water quality education in the Era of Covid-19

Schools in Kansas City area were closed on March 13, 2020 due to Covid-19. The KC Water Education team utilized online resources to continue its mission for water quality education. More than 300 relevant internet sites and videos were vetted to make sure those resources were age appropriate, relevant, and met Missouri State Science Standards. As a result, KC Water posted a new link on the education page titled “At Home Learning” with more than 36 sites that can be readily accessed and used by parents, teachers, and students. More than 200 emails were sent to inform the teachers of the “At Home Learning” page. The purpose was to encourage the teachers to pass the link to the parents and students. Between March 15 and April 30, 2020, 374 hits to the page were recorded.

E.1-a.iii. BMP 3. Active participation and financial support for MARC’s Water Quality Education Committee (WQEC)

The City continues to be a leading stakeholder and sponsor for MARC’s water quality education effort. The City paid a \$45,000 membership fee this year. KC Water staff attended the full quarterly meetings and subcommittee meetings, as appropriate, during the reporting period. Also see Table 1. A List of public education activities for details.

E.1-a.iii. BMP 4. Continue KC Water’s participation and support for American Public Works Association’s (APWA) efforts to improve and update various development standards that benefit water quality

KC Water continued to participate in the efforts by the Kansas City Metropolitan Chapter of APWA to revise stormwater-related standards that include *APWA Division II. Sec. 2600 Storm Sewers* and *Sec. 5600 Storm Drainage Systems & Facilities*, as well as the *Manual of Best Management Practices for Stormwater Quality* in cooperation with MARC.

Next Step: The City will continue various programs and activities. The City will also go through the appropriate process to adopt the updated APWA standards and manual as needed.

Permit Ref. E.1.a.iv. Public reporting of illicit discharges or water quality impacts

Measureable Goal: Ongoing use of the resources to provide relevant information

Status: Met goal

E.1.a.iv. BMP 1. Promote, publicize, and facilitate public reporting of illicit discharges

The City uses a centralized system to provide multiple options for residents to access City services, including addressing illicit discharges. Residents used any of the ten following reporting methods as they appear on the City’s website:

1. Call the City Services hotline 311 or (816) 513-1313
2. Report a problem online by pointing on a map or typing an address
3. Download the 311 mobile app (iOS and Android) to report problems

4. Report a problem using our online form
5. If a citizen needs assistance, they could walk in at the City Hall 414 E. 12th St., Kansas City, MO 64106, weekdays from 8:00 AM - 5:00 PM, or use the Self-Service Station on the 1st floor with a phone to contact 311
6. Twitter: Follow@KCMO311
7. Fax or Mail Service Request Form
8. Mail: 311, City Hall, First Floor, 414 E. 12th St., Kansas City, MO 64106
9. Fax: (816) 513-1303

Requests received through these options receive a case number, are logged by category and routed to the appropriate City department for follow-up and resolution.

Next Step: Continue to use these resources to address this requirement

2. Public Involvement and Participation

Permit Ref. E.2.a.i. Public involvement in the development of the SWMP

Measureable Goal: Public participation in the development of the SWMP

Status: Completed

E.2.a.i. BMP 1. Opportunities for public involvement in the development of the SWMP

During the reporting period, KC Water updated its SWMP, which was originally crafted prior to the issuance of the second term permit. A public meeting was hosted by KC Water to invite public comments on the updated SWMP on July 25, 2019. The plan was finalized and submitted to the State in August, 2019, and it was also posted on KC Water website for review by intended parties.

Next Step: NA

Permit Ref. E.2.a.ii. Public participation in implementation activities

E.2.a.ii. BMP 1. Utilize the Department's *What's On Tap?* newsletters to disseminate educational information

Measureable Goals: At least two stormwater-focused articles per year

Status: Goal met

During the reporting period, What's On Tap newsletter carried the following stormwater-related topics: *Storm Drains Get New Markings; Fall Leaf and Brush Curbside Collection; Storm Drains are Important to Clean Water; Get Rain Ready with Keep Out the Rain, and Celebrate Earth Day 50: Clean up the Blue River; Leaf-Brush Pickup Set for April.*

For each issue of the newsletters, approximately 161,500 copies of newsletters were mailed out. In addition, the content was emailed to about 39,700 accounts.

Next Step: Continued use of this resource to educate and reach out to the public

E.2.a.ii. BMP 2. Utilize KC Water's website to provide information on stormwater management and water quality matters

Measureable Goal: Ongoing use of the resource

Status: Goal met

KC Water was continuously improving its website including its education page (<https://www.kcwater.us/education/>). This page lists various links and resources including teacher resources, community outreach programs, water quality reports and videos, tour information (all tours are currently on hold due to COVID-19), printed materials such as a guide to creating a rain barrel, links to various videos and recipients of the KC Water Water Quality Small Grant Program.

Next Step: Continue to use and improve the resource

E.2.a.ii. BMP 3. Work cooperatively with non-governmental organizations on educating and training students on stormwater management, water quality, and water quality testing and KC to the Sea curriculum

Measureable Goal: Active participation and support of efforts

Status: Goal met

Through KC Water's Water Quality Small Grant Program, KC Water continued to work with various non-governmental organizations, including Friends of Kaw Point Park, Bridging the Gap, Stonelion Puppet Theater, and Green Works KC. Barstow School was the new addition in 2019.

KC STEM Fest: KC Water participated in this event hosted by Science Pioneers on October 6, 2019. The event allows K-12 teachers to learn about hands on learning opportunities for their students. KC Water gave out information on the KC to the Sea curriculum and the WE KC water quality education program to over 150 area teachers.

KC to the Sea. During the reporting period, KC Water taught the *KC to the Sea* curriculum at 46 schools and 1 summer camp, reaching a total of 4,267 students in 11 different school districts.

Next Step: Continue the practices

E.2.a.ii. BMP 4. Continue to participate in the MARC WQEC

Measurable Goal: Attend monthly meetings and participate in committee work

Status: Goal met

KC Water staff attended the full quarterly meetings and subcommittee meetings during the FY 19/20. The Committee develops and implements a work plan annually with the goal of cooperatively presenting consistent water-quality messages throughout the KC metro region.

Next Step: Continue to participate in MARC's activities

E.2.a.ii. BMP 5. Administer KC Water's Annual Water Quality Education Grant (WQEG) program

Measurable Goal: Completion of another round of solicitation, review, and award of grants.

Status: Goal met

During the reporting period, KC Water continued to work with the organizations that received the grant in 2019. See Table 2 for the achievements made.

In January 2020, KC Water selected four proposals from six organizations to provide a total \$67,674 in grant money to support projects and activities related to water quality protection, improvement, and education. The organizations and their proposals were:

- Stone Lion Puppet Theater; *2020 KC Water Education Program*
- Bridging the Gap; *Business Outreach and Stream Clean-up Project*

- Friends of Kaw Point Park *Watershed Education* and Activities
- Little Blue River WS Coalition/Healthy Rivers Partnership; *Project Blue River Rescue*

Next Step: KC Water will continue to administer this program.

Table 2. WQEG program achievement summary

Organization	Achievements
Bridging the Gap (Be the Solution to Storm Drain Pollution)	<ul style="list-style-type: none"> • Reach out to businesses about how their operations may impact water quality • Identified 4 retail districts and 4 high priority stream areas to host litter pickups • Completed 4 clean-ups, recruited 45 volunteers, collected 1,800 lbs. of trash • Made presentation on general litter prevention tips to both the management and staff of 86 businesses • Contacted 36 neighborhood groups about the Tool Lending Shed
Friends of Kaw Point Park (Watershed Education and Activities)	<ul style="list-style-type: none"> • Updated and maintained the existing caches at 10 locations along local waterways and near constructed BMPs • Set up additional 10 caches • 819 geocaches have located the caches since 2017 • Taught 13 <i>From Runoff to Rivers</i> classes in 3 local schools, reaching 184 students
Barstow School (Watts Mill Water Quality Project)	<ul style="list-style-type: none"> • Implement a stream cleanup of Indian Creek near Watts Mill Plaza, an urban shopping area • 7th Grade students did water testing and a trash survey at the site • Students made a presentation to 46 people • Conducted a 4-hour litter cleanup along Indian Creek and invited business owners, managers, and employees to participate • 22 flyers were distributed and 66 volunteers joined in the litter pickup event • About 185 pounds of trash were removed from the creek
Green Works KC (Mighty Missouri SOS)	<ul style="list-style-type: none"> • Setting up a tent at public events during the summer and fall of 2019, to sell products that have a direct connection to protecting or conserving water • Due to excessive rains, most outdoor events were cancelled or rescheduled, only present at 3 events and reaching out to 35 people.
StoneLion Puppet Theatre (StoneLion 2019 KC Water Education Program)	<ul style="list-style-type: none"> • Expanded environmental education through the art of puppetry

	<ul style="list-style-type: none">• Performed one of two water quality based puppet shows in 20 Kansas City public, private, and charter schools: “The Little Red Hen’s Garden;” “The Frog Prints”, reached 5,222 students• Held the <i>Illuminated Waters</i> festival on July 21, 2019, reached an estimate of 6,000 attendees• Contracted a local artist to design and paint a sidewalk mural highlighting the need for clean water. Hundreds of motorists pass by the mural every day.
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3. Illicit Discharge Detection and Elimination

Permit Ref. E.3.a.i. Maintain and update a storm sewer map

Measureable Goal: Add all new outlets as established to the KC Water GIS and systematically review historical system for gaps

Status: The City maintains its GIS for storm sewer system.

E.3.a.i. BMP 1.

KC Water maintains a geographical information system (GIS) database that can map all known constructed outfalls and locations of all receiving waterbodies.

The City's resources for the outfalls information include:

- City-wide watershed studies conducted between 1997 and 2007
- Levee sewer outfall inspection reports conducted prior to 2002
- Investigations conducted under the City's Combined Sewer Overflow Program
- Data for the City's wastewater sewer systems

E.3.a.i. BMP 2.

As KC Water receives As-Builts from various sources, newly-constructed outfalls are added to the map. In addition, KC Water may also make a correction or addition on the outfall locations if a review of archived As-Builts or easement indicates any error. Such a review is usually conducted per a customer's request for information.

Next Step: KC Water will use a systematic approach to update and maintain the system.

Permit Ref. E.3.a.ii. A plan to prohibit illicit discharges and implement enforcement procedures and actions

Status: The City continues to implement the relevant ordinance.

E.3.a.ii. BMP 1.

The City adopted an ordinance for Stormwater Discharge Control Regulations (Chapter 61. Article III.) in 2007. The article specifically regulates the contribution of pollutants to the stormwater drainage system by any user, prohibits illicit connections, and establishes legal authority to carry out all inspections, surveillances, monitoring and enforcement procedures necessary.

Next Step: The City will continue to implement the ordinance, and develop a plan to prohibit illicit discharges and implement enforcement procedures and actions.

Permit Ref. E.3.a.iii. Inspection and investigation procedures for illicit discharges

Measurable Goal: Resolution of potential illegal connections and related issues

Status: Goal met

E.3.a.iii. BMP 1

KC Water is responsible for investigating reports of illicit discharges. The investigation procedure follows the manual, *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments*, developed by the Center for Watershed Protection and Robert Pitt. During the reporting period, KC Water investigated 14 incidents of suspicious illicit discharges. All were resolved.

Next Step: Continue to investigate, as needed

Permit Ref. E.3.a.iv. Conduct a field screening program

Measurable Goal: Complete a minimum of 100 screenings annually

Status: Goal partially met

E.3.a.iv. BMP 1.

KC Water had completed the field screening of the major outfalls in the watersheds north of the Missouri River in previous years and began to assess those located south of the River last reporting year. During the reporting period, KC Water continued to screen the outfalls in the watersheds south of the River and those functioning as a component of the City's separate storm sewer system. However, the inspector's schedule availability was affected by both an administrative task and COVID-19 pandemic, which limited progress in March and April. As a result, a total of 61 outfalls were screened.

The field inspector utilized the City's GIS to identify the sites for screening and followed the procedure established previously.

Next Step: Continue to implement the program

Permit Ref. E.3.a.v. Procedures to minimize, contain, and respond to spills

Measurable Goal: Continue the established procedures

Status: Goal met

E.3.a.v. BMP 1.

The Fire Department implements the following guidelines that address the potential impact on stormwater from a spill:

- HazMat Response General Operational Guideline for Fuel Spills. The Guideline encourages using dry absorption as the preferred method to clear a spill and taking measures to protect stormwater drains. It also provides direction on how to properly dispose of water and avoid discharge into storm drains if flushing is the option.

- HazMat response General Operational Guideline for First Responders. The Guideline requires the flush water must be confined after it has been used and then disposed of properly.

The Fire Department responded to a total of 358 incidents for fluid cleanup (342) or hazardous materials (16) during the reporting period. Hazardous material-related incidents referred to here may not necessarily be about liquid spills (e.g., chemical odors emitted from structures). Also note the total number does not include incidents that may have fluids spilled but were classified as a higher level of calls (i.e., emergency calls for injuries in vehicular accidents, etc.).

Next Step: The Fire Department will continue to implement the guidelines.

Permit Ref. E.3.a.vi. Limit exfiltration from municipal sanitary sewers

Status: The City continues to conduct programs to limit exfiltration from sanitary sewers.

E.3.a.vi. BMP 1.

KC Water maintains the City's sanitary sewer system through a joint effort by different divisions.

<u>Wastewater Maintenance Division</u>		<u>Engineering Division</u>	
164 miles	sewers televised	23 miles	sewers televised
492 miles	sewers cleaned	24 miles	sewers cleaned
1,777 feet	public sewers repaired	12 miles	sewer line rehabilitated
5,366 feet	private sewers repaired	236	sewer repair jobs
169	manholes repaired		
180	stoppages opened		

<u>Smart Sewer Program</u>	
92 miles	sewers televised
69 miles	sewers cleaned
19,997 feet	lateral repaired/replaced/rehabilitated
259,914 feet	sewer main repaired/replaced/rehabilitated
965	inlets repaired/replaced/rehabilitated

Next Step: The City will continue to implement the above programs to limit exfiltration and overflows from sanitary sewers.

Permit Ref. (not required) Programs for proper management of materials or wastes

Measurable Goal: Reported quantities from various efforts and programs

Status: Ongoing

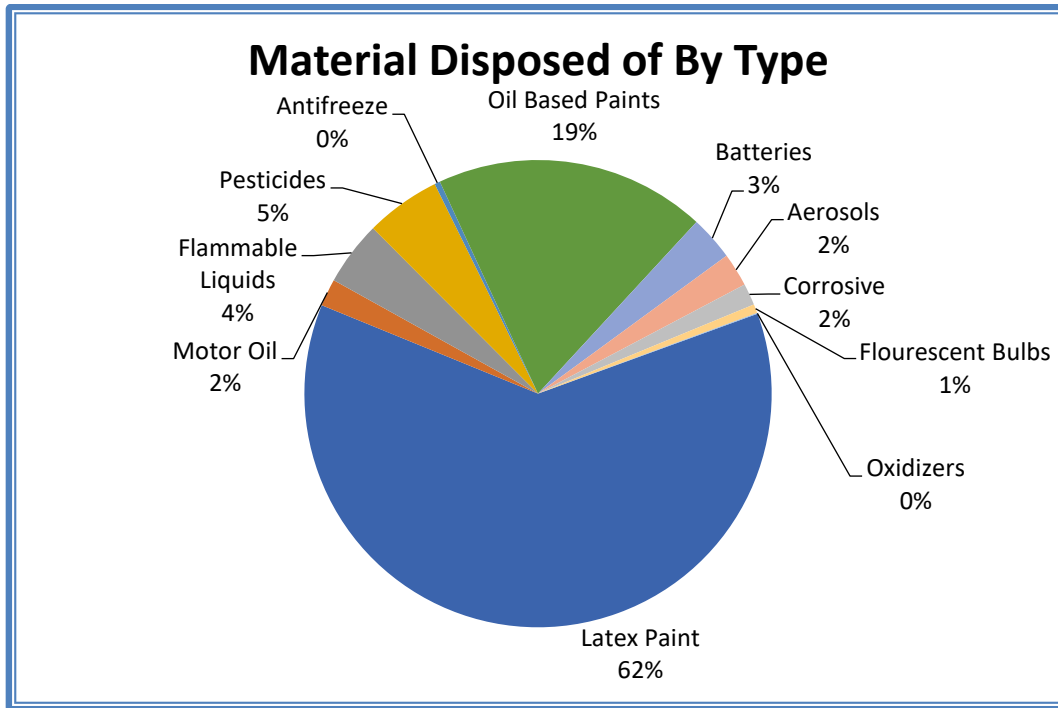
E.3. (NA) BMP 1.

The City operated several waste management programs that encourage proper disposal, as well as preventing and addressing illegal dumping. See Table 3, Fig. 1 and Fig. 2 for details.

Table 3. Comprehensive waste management program achievements

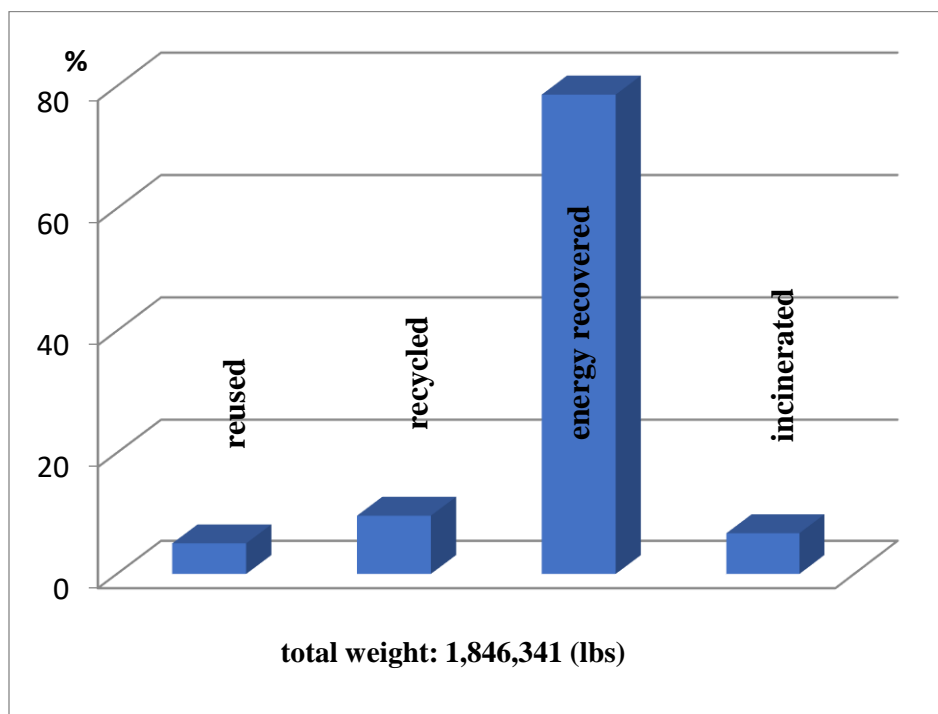
Quantity (in Tons)	<u>Program</u>
KC Recycles (FY 2019/20)	
636	Community recycling drop-off centers
15,231	Curbside recycling
Bulky Items Collection (FY 2019/20)	
7,124	Bulky items
Leaves and Brush Collection (FY 2019/20)	
3,383	Curbside
Illegal Dumping Cleanup (FY 2019/20)	
3,348	Material collected
	23 cameras placed at 17 locations
Neighborhood Cleanup Assistance (FY 2019/20)	
146	Tires collected in neighborhoods and during special events, or received at drop-off centers (# = 13,272)
Household Hazardous Waste (HHW) 2019 Calendar Year	
605	HHW Facility 12,599 vehicles participated
176	Mobile Outreach 3,475 vehicles participated
22	Total materials reused in Swap Shop
54	Total materials recycled
785	Total materials sent for energy recovery
62	Total materials incinerated

Figure 1. Material by type disposed of by Household Hazardous Waste (HHW) facility in 2019



- Total weight of the materials disposed of (not collected) was 1,799,003 pounds, or about 900 tons.
- Total weights are only for materials that were reused, recycled, used for energy recovery, or material incinerated.
- Percentages reflect the HHW numbers associated with Kansas City, Independence, Lee's Summit and the MARC participating communities.

Figure 2. Distribution of material managed by HHW facility in 2019



Next Step: Continue the existing programs

4. Construction Site Runoff Control

Permit Ref. 4.a.i. Ordinances to require erosion and sediment control BMPs

Measureable Goal: Ongoing implementation of City ordinance as any development occurs

Status: Goal met

4.a.i. BMP 1.

The City implements the City Code Chapter 63 Erosion and Sediment Control. Division 4 of this chapter is about enforcement which includes enforcement activities, suspension or revocation of permit, action against the security, as well as fines and penalties. See the link below.

https://library.municode.com/mo/kansas_city/codes/code_of_ordinances?nodeId=COORKAMIVOII_CH_63ERSECO

Next Step: The City will continue its current practice.

Permit Ref. 4.a.ii. Control construction site waste

Status: The City continues to require waste management at City-funded construction sites.

4.a.ii. BMP 1.

For City-funded construction projects, the City developed a template of Stormwater Pollution Prevention Plan (SWPPP) to address sediment and erosion controls. The Plan contains requirements to manage construction site-related wastes, including but limited to, solid waste, liquid waste, concrete waste (washout area), hazardous waste, etc.

4.a.ii. BMP 2.

For privately funded construction projects (≥ 1 acre), the Land Development Division (LDD) of City Planning and Development (CPD) Department requires that construction site operators comply with the City's erosion control requirements as well as the requirements of the Missouri Department of Natural Resources.

Next Step: The City will ensure that waste management is required in all ≥ 1 acre construction projects.

Permit Ref. 4.a.iii. Review all construction site stormwater pollution prevention plans (SWPPPs)

Status: Completed for City-funded projects

4.a.iii. BMP 1. City-funded construction projects

For City-funded construction projects, KC Water reviews each SWPPP. During the reporting period, KC Water reviewed 35 SWPPPs submitted by project managers from different City Departments.

4.a.iii. BMP 2. Privately-funded construction projects

For privately-funded construction projects (≥ 1 acre), the LDD of CPD Department currently does not request the submittal of SWPPPs, nor review SWPPPs. The LDD reviews the Site Disturbance Plans that are submitted for review as part of the construction plans for the proposed development.

Next Step: The City will continue the current practices.

Permit Ref. 4.a.iv. Procedures to address public reporting of the discharge of pollutants

Status: Continues to use the 311 system to address public reporting

4.a.iv. BMP 1. City's 311 System for Centralized Reporting

The City has a centralized 311 system to provide residents with multiple options to access City services, including addressing illicit discharges from construction sites. Once the report is logged into the system, the appropriate department or division will be assigned to investigate the issue. Once the issue is resolved, the department or division will close the issue in the system. The public can check online about the status of their report or they can request to receive an email notification. See E.1.a.IV. BMP 1. for more details.

For the complaints sent to the LDD directly, they are currently not tracked in the LDD's system.

Next Step: The City will continue the current practices to address all public reporting.

Permit Ref. 4.a.v. Procedures for inspection and enforcement

Measureable Goals

- For City-funded projects, KC Water provides monthly oversight inspections for active sites.
- For privately-funded projects, the LDD of CPD provides a minimum of two inspections; additional inspections are as needed, depending on the scope and scale of the project.

Status: Continues to conduct inspections

4.a.v. BMP 1. City-funded projects.

Inspection starts the month that KC Water receives the notice of the project and related Stormwater Pollution Prevention Plan sent by a project manager. The inspection ends the month after KC Water is notified the project is 100 percent completed. The inspector uses an Erosion & Sediment Control Report form to document the process.

If there is any issue identified during the inspection, the inspector sends notification to the relevant project manager, who subsequently will inform the contracted construction manager. If the issue does

not get resolved within a reasonable timeframe, the project manager can withhold the payment to the contractor until the issue is resolved.

During the reporting period, KC Water conducted 420 inspections. Issues identified during the inspection were all resolved in time.

4.a.v. BMP 2. For privately-funded projects (>1 acre)

No change related to site inspection or enforcement procedure was made. The LDD of CPD continued to conduct biweekly inspections on sites with active permits. More than 2,769 inspections were conducted during the reporting period. However, enforcement actions were not tracked in Compass KC.

4.a.v. BMP 3: For privately-funded projects (< 1 acre)

The Division of Inspections with CPD conducts investigations and enforces the ordinance. During the reporting period, the Division conducted 6,984 inspections. However, the number of investigations, violations, or other forms of enforcement actions were not tracked.

Next Step: The City will seek improvement to its current practices and utilize the new online service to track record.

Permit Ref. 4.a.vi. A plan for compliance with the erosion and sediment control ordinance

Status: Individual City Departments are accountable for City-funded projects and CPD oversees private projects.

4.a.vi. BMP 1. City-funded projects

The department that manages the construction work is responsible for the compliance with the erosion and sediment control ordinance. KC Water provides regular oversight inspections to ensure compliance.

4.a.vi. BMP 2. Privately-funded projects

CPD is responsible for compliance with the ordinance that outlines the enforcement options.

Next Step: The City will continue its current practice.

Permit Ref. 4.a.vii. Education and training for site operators

Measureable Goal: Provide periodic training

Status: Training was provided to the inspector for City-funded projects and new inspectors.

4.1.vii. BMP 1

One City employee, who was responsible for inspecting City project sites, took 15 webinars/seminars regarding stormwater-related topics.

4.1.vii. BMP 2

The LDD of CPD did not have regular scheduled educational or training activities for its staff other than regular training for job functions as required. The LDD also did not offer specific educational or training activities for the construction site operators.

The Division of Inspections with CPD had four new employees and supervisors provided training to the new employees.

Next Step: The City will implement on-line training for multiple departments.

5. Post-Construction Stormwater Management in New Development and Redevelopment

Permit Ref. 5.a.i. Ordinances to address post-construction runoff

Measureable Goal: Ongoing implementation of the requirements during development reviews

Status: Goal met

5.a.i. BMP 1

The City enacted a revised Zoning and Development code in 2009. The revised version promotes more open space and greater natural resource protection by incorporating the Stream Buffer Regulations and Conservation and Open Space Development Regulations. No significant stormwater-related changes have been made in the reporting period.

5.a.i. BMP 2

The LDD of CPD continued to require developments' adherence to the adopted APWA Standards and Supplements that include the Manual of Best Management Practices for Stormwater Quality and compliance with stream buffer regulations during the initial planning stages of new development/redevelopment, as well as during the construction of the projects. These standards require developments to mitigate their impacts for post-construction above predevelopment conditions by including permanent water quality BMPs, stream buffers, and maintenance instruments for all sites within the MS4. In addition, KC Water also provides BMPs guidance during the plan review and approval process.

5.a.i. BMP 3

Multiple City departments worked together to update the APWA 5600 Standard (*Storm Drainage Systems & Facilities*) and APWA 2600 Standard (*Storm Sewers*). A draft was prepared for further review and adoption.

Next Step: The City will continue to review the updated APWA 5600 and 2600 draft standards and work on adopting the updated version.

Permit Ref. 5.a.ii. A plan for long-term operation and maintenance of selected BMPs

Status: Multiple efforts are in place to operate and maintain the City's BMPs.

5.a.ii. BMP 1

For new development or redevelopment-related BMPs, CP&D continues to use three covenants applicable to stormwater BMP maintenance scenarios: *Stormwater Detention Covenant for Maintenance*; *Stormwater Detention & BMP Covenant for Maintenance*; and *Conveyance of Easement for BMPs*. These

documents require developers or property owners to take responsibility for maintenance, repair, and restoration of detention basins or BMP structures.

Currently CP& D does not track its reviews of BMP easements, covenants, or BMP maintenance agreements in Compass KC, the City's new permitting system.

5.a.ii. BMP 2

For projects built under the Smart Sewer Program (previously called Overflow Control Program), the BMPs are generally maintained for the first three years by the contractors that build the projects, and then they are subsequently maintained by the KC Water Green Solutions crew. There are a couple of notable exceptions, such as the currently under-construction BMPs on Veterans Administration property and Kansas City Public Schools property. Agreements are in place for the property owners to take over the maintenance responsibility after the initial three-year maintenance provided by the construction contractors who build them.

5.a.ii. BMP 3

For BMPs built through other stormwater projects (e.g., funded by Public Improvement Advisory Committee), the KC Water Green Solutions crew is responsible for maintenance.

Next Step: The City will continue to require or conduct maintenance as described above.

Permit Ref. 5.a.iii. Strategies to minimize water quality impacts

Status: Multiple efforts are in place to minimize water quality impacts.

5.a.iii. BMP 1

The CPD requires macro/micro stormwater drainage study for a development. A developer must submit a stormwater drainage study for a plat application as required by the City Code Chapter 66, Section 43 Preliminary plat and Section 45 Review of final plat by City Council. A general stormwater management plan must be submitted for the entire development when the preliminary plat is submitted. The plan must depict the concept for stormwater detention, BMPs, volume controls, or treatment areas as appropriate. A macro/micro drainage study must be submitted for the entire development when the first plat is submitted; a detailed micro drainage study must be submitted for approval before the issuance of any building permits; a macro storm drainage study for the entire development must be submitted with a micro stormwater drainage study for each phase during final platting. Refer to Permit Ref. 5.a.i for required adherence to Stream Buffer Ordinance and BMP manual.

5.a.iii. BMP 2

The City has adopted a stream setback ordinance and a companion conservation development ordinance. The ordinances are intended to protect life and property and promote healthy stream corridors while

providing flexibility and development options in stream corridors and City-wide. The stream setback and conservation development ordinances became effective in 2009 and apply to new development, redevelopment, and construction and infrastructure projects near streams.

Stream setbacks are based on the stream's actual characteristics, including the 100-year floodplain or flood conveyance; adjacent steep slopes (greater than 15 percent grades) and mature, native vegetation (such as woodlands). Three zones are specified, with more restrictions closer to the stream. For details, see the 2009 MS4 report.

Currently, the City does not have a requirement for preservation of undisturbed natural areas, trees, and steep slope, except for those specified in the Stream Buffer Ordinance.

5.a.iii. BMP 3

City Ordinance Chapter 28 addresses Floodplain Management. In Article IV. Provisions for Flood Hazard Reduction Sec. 28-51., general standards are set for:

- 1) Storage, material, and equipment. Specifically, the storage or processing of materials within the special flood hazard area that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited.
- 2) Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.
- 3) Hazardous materials. All hazardous material storage and handling sites shall be located out of the floodplain.

5.a.iii. BMP 4

KC Water completed the Green Stormwater Infrastructure (GSI) Manual, which is intended to guide the developments of future of stormwater management infrastructure. The manual provides the tools, design guidelines, construction specifications, as well as establishment and maintenance procedures for green infrastructures. Here is the link to the manual: <https://www.kcwater.us/wp-content/uploads/2020/01/KCMOGSIManualAugust2018-2.pdf>.

In November 2019, City Council passed Resolution #190760, which provided direction to implement the GSI Manual on capital projects with an emphasis on inter-departmental integration, coordination of design, and construction of public improvements. The GSI manual has been implemented throughout the City.

Next Step: The City will continue to implement the current ordinance and policies. KC Water will provide training for use of the GSI manual.

Permit Ref. E.5.a.iv. Inspect post-construction BMPs

Measureable Goal: All facilities inspected prior to occupancy; inspect one-fifth of private stormwater facilities annually

Status: Goals met

5.a.iv. BMP 1

During the reporting period, KC Water inspected 26 stormwater detention/retention basins, and addressed the issues with three of them. There are 99 basins on the inspection list.

Next Step: KC Water will continue to inspect the private stormwater detention/retention basins.

Permit Ref. 5 (Not required). Training and technical assistance to LDD staff

Measureable Goal: Provide periodic training

Status: Goal not met

5 (Not required) BMP 1

The LDD did not provide regular training to its staff on management of post-construction stormwater runoff, because the division is not in charge of managing the runoff after the construction.

Permit Ref. 5 (Not required). Training and technical assistance to the development community

Measureable Goal: Provide training as needed based on evolving standards

Status: Goal partially met

5 (Not required). BMP 1

City Planning staff works with property owners, contractors and designers directly by answering questions and finding resolutions to assure compliance within various City codes including the Zoning Ordinance and the Floodplain Ordinance. City Planning did not provide training to the development community on management of post-construction stormwater runoff.

6. Pollution Prevention and Good Housekeeping for Municipal Operations

Permit Ref. 6.a.i. An employee training program to prevent or reduce stormwater pollution

Status: Multiple efforts are existing that help with the training requirement.

6.a.i. BMP 1

For employee training related to land disturbance, refer to Section 4. Construction Site Stormwater Runoff Control

6.a.i. BMP 2

For the staff who service the City fleets, staff is required to have annual HazMat (Level-1) and Spill Prevention, Control, and Countermeasure (SPCC) training. During the reporting period, ten staff received the training. The Department of General Services hired certified contractors to maintain the City's fueling stations.

6.a.i. BMP 3

KC Water uses three DVDs for stormwater pollution prevention education for employees regarding municipal operations. The DVDs are produced by Excal Visual, and the titles are: *Stormwatch; A Drop in the Bucket*, and *Rain Check*. Each DVD is designed for stormwater pollution prevention for employees working outdoors with materials, wastes and operational activities that could potentially impact the quality of the stormwater runoff.

During the reporting period, 12 City employees and City contractors, who operated on City properties, received the training. Two employees from a local private company received the training as well.

6.a.i. BMP 4

The City Office of Environmental Quality provided City employees with trainings on Parts Washer, and Spill Prevention, Control and Countermeasure (SPCC). During the reporting period, 24 employees received training on Parts Washer, and 35 employees received SPCC training.

Next Step: The City will continue to provide training and education to its employees based on their job responsibilities.

Permit Ref. 6.a.ii. BMP maintenance to reduce floatables and other pollutants

Status: Efforts are in place that help to reduce floatables and other pollutants.

6.a.ii. BMP 1

KC Water continues to maintain City-owned Green Stormwater Infrastructure, allowing them to function at an optimal level. Currently, KC Water maintains a total footprint of 29 acres of Green Stormwater Infrastructure that includes but is not limited to rain gardens, bio-retention cells, detention basins, and permeable pavements.

6.a.ii. BMP 2

The Stormwater Maintenance group inspected and maintained the public detention basins at 6013 North Strathbury Road, 300 Chestnut Trafficway, 3913 North Kensington Road, Stillwell Avenue, Gardner Avenue (now a retention basin), and 81st and Troost. The City owns and the City's Board of Police Commissioners maintains multiple detention basins at several police department patrol stations that include Central, Metro, South, East Patrol, and Shoal Creek stations.

6.a.ii. BMP 3

KC Water continues to administer the Detention Basin Credit program to encourage the use of detention/retention basins. Routine inspections were conducted to the listed basins and owners of the properties can receive the credit in their monthly stormwater bills. During the reporting period, KC Water inspected 26 basins.

Next Step: The City will continue to conduct inspections and maintenance as described above.

Permit Ref. 6.a.iii.1. Management of deicing chemicals

Measureable Goals: Amount of deicing materials used annually

Status: Ongoing monitoring of usage

6.a.iii. BMP 1

The City's Public Works Department (PWD) has deicing chemical and material storage facilities at each of its three districts and two outlying salt storage facilities. The facilities vary in size, and their storage capacities range from 6,000-12,000 tons of materials. Rock salt is stored in dome structures at two locations. The domes were constructed on asphalt slabs and consist of wooden and concrete structural materials, capable of containing deicing chemicals during periods of extended storage. The three additional salt storage facilities are **Cover-All** buildings with ten-foot high concrete walls constructed on an asphalt slab. Salt brine and calcium chloride solutions are also used as deicing agents for the public streets, and both are stored in tanks. During the reporting period, the City used a total of 61,930 gallons of salt brine, 7,270 gallons of liquid calcium chloride, and 16,435 tons of salt to keep the City streets safe for cars and passengers.

Next Step: PWD will continue the current practices and will replace one dome with a Cover-All building in the future when funding is available.

6.a.iii. BMP 2

The City's General Services Department, which manages about 160 City sites, used deicing material mostly sourced from PWD (the amount was included in the above 6.a.iii. BMP 1.). In addition, it applied a total of two tons of ice-melt, sourced from a retail vendor, on the sidewalks of the buildings for pedestrians' safety.

Next Step: The department will continue the practice to ensure pedestrians' safety.

Permit Ref. 6.a.iii.2. Street sweepings

Measureable Goals:

- Sweep entire City according to schedule (approx. 20,000 curb miles annually)
- Two seasonal collections per year (one in the fall, one in the spring)

Status: Goal partially met

6.a.iii.2. BMP 1

The City uses Elgin Eagles for street sweeping. A total of 8,125 miles of streets were swept with a collection of 2,255 tons of debris. The Street Sweeping Program was suspended from May 1, 2019 till September 30, 2019 due to budgetary issues. The program was resumed on October 1, 2019.

6.a.iii.2. BMP 2

The City collected 3,383 tons of leaf and brush through two cycles of curbside collection during FY 19/20.

Next Step: The City is addressing the budget issue and working to meet the goal for the next reporting period.

Permit Ref. 6.a.iii.3. Street design/construction/maintenance practices

Status: Following the established procedures

6.a.iii.3. BMP 1

For street design, construction and maintenance, the City follows the Kansas City Metropolitan Chapter of the APWA standards with the supplements for all its relevant projects. See

<https://www.kcmo.gov/city-hall/departments/public-works/public-works-design-construction-standards>

Next Step: The City will continue its practices.

Permit Ref. 6.a.iii.4. Stormwater inlets cleaning

Measureable Goals: Complete 15,000 cleanings per year

Status: Goal met

6.a.iii.4. BMP 1

KC Water inspected and cleaned 18,833 stormwater inlets that included 1,691 inlets cleaned through 311 service requests. In addition, KC Water also repaired 369 stormwater inlets.

Next Step: KC Water will continue to maintain the stormwater inlets.

Permit Ref. 6.a.iv. Storage of paints and petroleum products; spill prevention and management

Status: Following the established procedure

6.a.iv. BMP 1

The City implements the Environmental Management System (EMS), updated in 2020, as good environmental stewardship for all of its organizational activities. Chapter 5. Chemical Management specifically addresses management of chemicals, including storage of paints, solvents, petroleum-related products.

6.a.iv. BMP 2

EMS Chapter 6 Waste Management addresses specific requirements for latex paint, used oil contaminated materials, as well as used oil.

6.a.iv. BMP 3

EMS Chapter 5 Section 04 addresses tank management. Regarding spill prevention, Section 5.04.02.a. specifically states for Portable Tanks' Condition, all portable tanks should be in "good" condition. Section 5.04.04.c.3. for petroleum Tank Requirements, Spills and Overfill Prevention states, both new and existing tanks must be equipped with catchment basins and one of the following: Automatic shutoff devices; Overfill alarms; Ball float valves.

Chapter 5 Section 04 also addresses spill and overfill prevention requirements. Chapter 5 Section 05 addresses spill prevention, control and countermeasures (SPCC).

Chapter 7 addresses spill prevention and response. It specifies job training and provides clear performance direction.

6.a.iv. BMP 4

Chapter 5 Section 04 addresses tank management. Regarding containment system material, Section 5.04.02.d. states: Portable Tanks should be made of, or lined with, a material that will not react with the substance being stored. Section 5.04.03.a. states (for aboveground and on-ground storage tanks) tanks shall be designed and built in accordance with recognized good engineering standards for the material of construction being used. The tank construction material shall be compatible with the liquid to be stored.

6.a.iv. BMP 5

Chapter 5 Section 04 addresses tank management. Regarding minimizing the contamination of groundwater, Section 5.04.04.e Release Detection states: All USTs must meet the federal release detection requirements.

6.a.iv. BMP 6

The City's Office of Environmental Quality (OEQ) conducted annual inspections at 347 sites that are either owned or operated by the City. The inspection was done in compliance with the EMS and tracked in the Archibus Environmental and Risk Management System (AE&RMS). An automated report is generated on monthly a basis to provide a summary of environmental compliance recommendations for each department.

Next step: The City continues using and following the EMS and AE&RMS, respectively

Permit Ref. 6.a.v. A plan to reduce pollutants related to pesticides, herbicides, and fertilizers (PHFs)

Status: Multiple efforts are in place that help to reduce the usage of PHFs.

6.a.v. BMP 1

There are multiple chapters in the City's EMS that address the application of pesticides, herbicides, or fertilizers (PHFs). Section 2.05.01 states that pesticides, used throughout City facilities and its landscapes, are regulated by the Missouri Department of Agriculture, which certifies commercial, noncommercial, and public pesticide applicators.

Section 5.07.06 specifies persons engaged to apply pesticides for commercial, noncommercial, private, and public entities are certified. It states that City departments that apply or utilize the services of those who apply PHFs should put into place BMPs to reduce their run-off before and after the products have been applied.

Section 9.03.03 lists chemicals that are not allowed in the storm water system. The list includes herbicides and pesticides.

6.1.v. BMP 2

The City's General Services Department, which manages about 160 City sites, does not use PHFs to maintain lawn or other landscape.

6.1.v. BMP 3

P&R crews maintain over 40 miles of park roads; hundreds of parking lots; 12,000 acres of parkland in 220 parks; 135 miles of boulevards, parkways, and streets, and over 100 miles of trails and bikeways.

Herbicides and fertilizers are used sparingly and only as needed on specific areas which require a higher level of maintenance.

6.1.v. BMP 4

P&R crews continue to maintain, improve, and protect thousands of acres of land that provide wildlife habitat and contribute to reducing stormwater runoff and water pollution throughout the City. These properties include:

- a) >6,500 acres protected as woodlands throughout the park system
- b) >150 acres in the reduced mowing program
- c) >290 acres of natural areas on 36 sites, consisting of restored and remnant prairies, glades, butterfly gardens, bio-swales, and rain gardens

6.1.v. BMP 5

P&R crews continue to use environmental BMPs and procedures for its five golf courses: Hodge Park, Shoal Creek, Swope Memorial, Minor Park, and Heart of America. The contracted management teams from Kemper Sports and Orion Management Solutions continue to reduce pesticide and fertilizer usage at the above courses by:

- a) Maintaining a native buffer near water bodies and sensitive areas wherever possible
- b) Allowing the outer rough areas that were once mowed and irrigated at each course to return to their native habitats (approximately 15 to 20 acres)

In addition, Shoal Creek Golf Course is designated as a *Certified Audubon Sanctuary* through the International Audubon Cooperative Sanctuary Program for golf courses. This ecologically-based program promotes both responsible land management and conservation of natural resources.

6.1.v. BMP 6

For the approximately 28 acres of BMP sites that KC Water maintains, staff or contractors are required to have a Missouri Pesticide Applicator License. For P&R's property maintenance, the Department requires its general supervisors, landscape technicians, and one of its Conservation Corps maintenance workers to have Pesticide/Herbicide Applicator licenses.

6.1.v. BMP 7

For maintenance of the levee systems, KC Water required that contractors be certified for commercial application of pesticides, herbicides, and fungicides.

Next Step: The City will continue to improve current practices regarding pesticide, herbicide, and fungicide management.

7. Industrial and High Risk Runoff

Permit Ref. 7.a.i. Identify facilities that discharge into the MS4

Measureable Goal: Review list and add or remove facilities, as warranted

Status: Goal met

7.a.i. BMP 1. Municipal landfills

The 87th Street solid waste dump site remains on the list. The City ceased operations of solid waste dump sites in 1974. These closed sites were operated by the City during various periods from 1950 to 1974. The 87th Street site is within the boundary of the MS4-served area and is thus subject to the MS4 permit. This site has been closed from dumping since 1972 and is currently the site of a City Wastewater Pumping Station. The OEQ, in consultation with several departments, continues to monitor this inactive dump site for compliance with the MS4 Permit and in general for issues that may pose a threat to public health or safety, threaten environmental protection, or that may create a nuisance condition.

The OEQ performed periodic walk-through inspections for 87th Street site. Visual observations during the inspection include evaluations for: (1) cap integrity and vegetative cover; (2) water ponding on the cap surface of the site; (3) fill material exposure; and (4) evaluate continued active seepage present at this site. The inspection results are documented and further investigations undertaken if warranted.

The OEQ established a maintenance program for the City's dump sites. All maintenance activities are geared toward maintaining the integrity of the landfill cap and minimizing the infiltration of water into the interred waste. The program may include surface waste removal and cap maintenance.

Next Step: The OEQ will continue periodic landfill inspections, consider remedial options and determine a course of action (if necessary), and implement the maintenance plans based on the results of the inspections.

7.a.i. BMP 2. Hazardous waste treatment, storage, and disposal (TSD) facilities; Title III Section 313 facilities; other facilities that contribute a substantial loading of pollutants to the MS4

During the reporting period, one TSD facility was deleted from the inventory due to the redevelopment of the property, and one commercial area was added due to its permitted activities and adjacency to Missouri River. There were 10 TSD facilities and 25 Title III Section 313 facilities with one also TSD facility.

Next Step: KC Water will continue to update the inventory as needed.

Permit Ref. 7.a.ii. Inspections and enforcement control measures

Measureable Goal: Complete a minimum of 30 inspections per year.

Status: Goal met

7.a.ii. BMP 1

KC Water inspected a total of 32 sites. The inspected sites included 21 municipally-operated sites, 10 private industrial sites, and one commercial site. Inspection priority was given to the facilities depending on:

- Time since last inspection
- A history of stormwater issues
- The nature of the industrial operation

7.a.ii. BMP 2

The Office of Environmental Quality with the City Manager's Office conducted annual environmental inspection at all municipal owned or operated sites. The Office worked closely with KC Water to address stormwater requirement for each individual site.

7.a.ii. BMP 3

Enforcement procedures were being developed to address any potential violations of stormwater regulations by industrial and business operations.

Next Step: KC Water will continue to evaluate the inventory for inspection priority and conduct the inspections based on the evaluation result.

Permit Ref. 7.a.iii. Monitoring high risk-runoff Facilities

Measureable Goal: Annual review of self-assessment reporting

Status: Goal met

7.a.iii BMP 1

KC Water continued to implement the Stormwater Self-assessment Program. The program was created in 2008 with the intent to help high-risk industrial operations to take preventive measures, improve housekeeping practices, and utilize BMPs to minimize stormwater pollution. KC Water continued to implement the Stormwater Self-assessment Program at 18 participating facilities.

7.a.iii BMP 2

During the reporting period, KC Water was able to collect one round of samples at three selected locations. The data results are in Table 4. All of the results, except that alkalinity for one sample (Commerce-8-7-2019) was slightly lower, were within the ranges of the levels shown for the stormwater runoff in local urban areas.

Table 4. Data summary of stormwater monitoring at the selected industrial areas

Parameter	Unit	Reporting Limit	Method Detection Limit	HWY210-8-7-2019	SKI-8-7-2019	Commerce-8-7-2019-	Average	Range of stormwater runoff*
Conductivity	us/cm	NA	2.97	106	149	148	134	NA
pH	SU	0	0	8.3	8.1	7.6	8.0	NA
Alkalinity	mg/L	0	0	37	43	28	36	32-177
Biochemical Oxygen Demand (BOD)	mg/L	2	2	6 ^A	4	3	4	3-21
Chemical Oxygen Demand (COD)	mg/L	7	6.25	48	23	18	30	7-803
Total Hardness	mg/L	2	2	36	52	40	43	27-580
Ammonia	mg/L	0.2	0.13	1.7	1.1	1.2	1.3	<0.13-4.72
Total Oil and Grease ^{AC}	mg/L	2	1.4	ND	ND	ND	NA	<1.4-24
Total Phenols ^{AC}	mg/L	0.01	0.002	ND	ND	ND	NA	<0.002-0.56
Total Dissolved Solids (TDS)	mg/L	1	1	80	120	150	117	22-4,940
Total Solids (TS)	mg/L	1	1	170	180	200	183	160-1,800
Total Suspended Solids (TSS)	mg/L	1	1	50	48	13	37	8-879
Volatile Suspended Solids (VSS)	%	1	1	14	12	54	27	NA
Silver, dissolved	mg/L	0.005	0.000744	ND	ND	ND	NA	<0.0007-0.0053
Aluminum, dissolved	mg/L	0.025	0.000816	0.044	0.023 ^J	0.026	0.031	NA
Cadmium, dissolved	mg/L	0.002	0.00011	ND	ND	ND	NA	<0.00011-0.078
Chromium, dissolved	mg/L	0.002	0.00026	0.002	0.003	0.001 ^J	0.002	<0.00026-0.02
Copper, dissolved	mg/L	0.002	0.00053	0.005	0.004	0.003	0.004	<0.00053-0.025
Nickel, dissolved	mg/L	0.002	0.0004	0.001 ^J	0.001 ^J	ND	0.001	<0.0004-0.019
Lead, dissolved	mg/L	0.002	0.00214	ND	0.002	ND	0.001	<0.00214-0.064
Zinc, dissolved	mg/L	0.002	0.00016	0.02	0.013	0.014	0.0157	<0.00016-0.272
Silver	mg/L	0.005	0.000744	ND	ND	ND	NA	NA
Aluminum	mg/L	0.015	0.00136	0.527	1.04	0.175	0.581	NA
Arsenic	mg/L	0.005	0.00166	0.007	0.003 ^J	0.003 ^J	0.004	NA
Cadmium	mg/L	0.002	0.00011	ND	ND	ND	NA	<0.00011-0.136

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Table 4 (Cont'd)

Parameter	Unit	Reporting Limit	Method Detection Limit		Commerce-3-28-2019	HWY210-3-28-2019	Average	Range of stormwater runoff*
Chromium	mg/L	0.002	0.00026	0.005	0.005	0.001 ^J	0.004	<0.00026-0.110
Copper	mg/L	0.002	0.00053	0.01	0.007	0.003	0.007	0.00053-0.035
Iron	mg/L	0.002	0.00029	0.744	0.72	0.166	0.543	NA
Magnesium	mg/L	0.15	0.0295	1.14	1.43	0.69	1.087	NA
Manganese	mg/L	0.002	0.00008	0.038	0.026	0.016	0.027	NA
Molybdenum	mg/L	0.002	0.00057	0.004	0.001 ^J	0.001 ^J	0.002	NA
Nickel	mg/L	0.002	0.0004	0.002	0.002	0.001 ^J	0.002	<0.0004-0.018
Lead	mg/L	0.002	0.00214	0.005	0.003	0.002	0.003	<0.00214-0.12
Zinc	mg/L	0.002	0.00016	0.072	0.035	0.021	0.043	0.01-0.473
Mercury	mg/L	0.0002	0.000025	0.00003 ^J	0.00003 ^J	ND	0.00002	<0.000025-0.0002
<p>*The ranges listed here were extracted from the ranges found for the stormwater runoff samples collected from representative residential, industrial, and commercial areas in the City from year 2005 to year 2015 per Part VI. Monitoring and Reporting Requirement</p> <p>** average is calculated based on detected values and half of the detection limits for those under their detection limits</p> <p>^{AC}Analyzed by a contracted laboratory</p> <p>^A Value is average of two or more analysis</p> <p>^J Estimated value, value may not be accurate</p>								

Next Step: KC Water will continue to implement the Stormwater Self-assessment Program and continue the monitoring.

Permit Ref. 7.b. Municipal operations

Measureable Goal: Maintain the existing inventory of facilities

Status: Completed

7.b. BMP 1

The inventory of the industrial and high-risk runoff facility includes a list of 74 municipal operations. Of those, ten carry State NPDES permits, 29 sites have the City's Stormwater No-exposure Certificates, and seven operations continue to implement the Stormwater Self-assessment Program.

Pollution prevention and good housekeeping measures will continue to be monitored at all municipal owned or operated sites. KC Water created a Stormwater Self-assessment Program in 2008. The program requires City facilities to establish good housekeeping measures and take steps to prevent pollution. KC Water continues to work with the Office of Environmental Quality to address pollution prevention and good housekeeping measures at all City facilities every year.

Next Step: KC Water will update the list as needed.

8. Flood Control Projects and Devices

Permit Ref. 8.a. Assess the water-quality impacts in the design of new flood control projects

Status: Efforts are in place to assess the impacts.

8.a. BMP 1

The flood control projects in which the City is involved are collaborative efforts with U.S. Army Corps of Engineers (USACE). Project design shall include an Environmental Assessment and/or an Environmental Impact Statement(s). The Stormwater Engineering Division of KC Water reviews the designs and provides input. The impact on water quality is one of the key elements considered in the review process.

Next Step: The City will continue the current practices.

8.a. BMP 2

During the reporting period, Dodson Flood Damage Reduction Project was in fifth and final Phase. This phase included constructing the tie-in levee to connect the Boone Creek Levee to the existing Bannister Levee. It also included continued construction on the earthen levee embankment from Prospect Avenue to the previously constructed flood wall (Phase I) near 85th Street and Bruce R. Watkins Drive.

The borrow area located on the riverside of the levee was designed and constructed to maintain the water quality of the Blue River. The borrow area was at least 30-feet from the riverward toe of the levee. Hard points were on the levee side of the borrow areas to prevent erosion toward the levee during high flows. After levee construction was complete, the borrow area will become part of a required wetland mitigation plan that requires connecting the borrow area to the River and selectively vegetating the site with appropriate wetland and upland plant species. Slopes greater than 20 percent will be hydroseeded to minimize erosion. Grasses in the mitigation areas will not be fertilized. The other borrow area located on the land side of the levee will also be planted with native grasses and managed in a similar environmentally responsible manner.

Another feature of the project is the levee stone slope protection. It is included on the riverside of the levee to prevent or minimize erosion of the levee slope during rain or high river events. Stone slope protection included for the gate structure, outfall channels and storm flow channels with the potential for high velocity flows which could cause erosion.

Next Step: The project is 80% complete and slated to be completed by the end of 2020.

8.a. BMP 3

During the reporting period, both the Central Industrial District (CID) and Northeast Industrial District (NEID) green infrastructure projects were in construction phase. Both projects are designed to capture up to the D-storm ("1.4" rain event) prior to entering into the combined sanitary system to help to reduce overflows.

CID project includes injection wells, bio-retention basins, and permeable paver system. NEID project includes bio-retention basins, gravel rock storage basins and collection cisterns.

Next Step: The CID project is scheduled to be completed at the end of 2020, and the NEID project is to be completed in 2021.

Permit Ref. 8.b. Retrofitting existing flood control devices to reduce stormwater pollutants

Status: Efforts are in place to assess the impacts and conduct retrofitting where applicable.

8.b. BMP 1

KC Water entered into an agreement with the USACE for the Lower Brush Creek Ecosystem Restoration Feasibility Study in February 2019.

Through Section 1135 of the **Water Resources Development Act**, USACE will review the need to modify any portions of Brush Creek between the Paseo Blvd. bridge and the confluence with the Blue River (inclusive of Lake of the Enshriners) in order to improve environmental quality and provide ecosystem restoration.

Potential modifications could:

- Address issues with sediment management within the Lake of the Enshriners
- Reduce goose habitat, while providing/improving habitat for native species of flora and fauna within and adjacent to the stream
- Improve water quality
- Provide ancillary improvements to flood control

The feasibility study will present potential solutions for ecosystem restoration, provide analysis of the costs, benefits, and environmental impacts of the alternatives, and recommend a selected plan. The City can subsequently elect to partner with the USACE to proceed with design and construction of the selected plan.

Next Step: KC Water will continue to partner with USACE to complete the feasibility study.

8.b. BMP 2

During the previous reporting period, KC Water was conducting an analysis for a pilot study in the Town Fork Creek watershed. This is part of the Town Fork Creek Phase II Watershed study, a federally cost-shared Section 22 Planning Assistance to state's study with the USACE Kansas City District. The analysis is to explore the feasibility of separating stormwater from a combined sewer system in the watershed, seeking alternative approaches using green infrastructure (e.g., bio-swales, bio-retentions) to manage and convey stormwater runoff. Conceptual BMPs were developed for a small pilot study area. Then, an initial hydrology and hydraulics modeling exercise was conducted using these BMPs to determine the feasibility of managing stormwater without the use of an extensive, subsurface storm sewer network. The final Stormwater Surface Drainage Analysis Report was completed July 2019.

Next Step: KC Water will evaluate the study result.

8.b. BMP 3

KC Water is in the process of purchasing flood-prone commercial properties (400-600 W 103rd St.) abutting Indian Creek. The conditions of these properties, which occupy about 3.1 acres, were compromised by previous flooding. KC Water plans to demolish the buildings, remove the asphalt surface and convert the area into a green space with native landscaping.

Next Step: KC Water will continue to seek the opportunities to protect water quality in association with flood control projects.

Permit Ref. 8.c. Include the procedures in the SWMP document

Status: Included in the SWMP

8.c. BMP 1

The 2019 SWMP includes the required procedures.

Next Step: The access to the required procedure will continue to be included in the future version of the SWMP.

9. Monitoring

Permit Ref. 9.a.i & ii. Collect stormwater samples from stormwater discharges

Measureable Goals: Stormwater samples are to be taken from runoff resulting from three qualified storm events at six designated locations

Status: Partially met goal

9.a.i. & ii. BMP 1

Due to the impact from COVID-19, staff with KC Water Laboratory, including both field crew and chemists, had their regular work schedule shortened during the last two months of the reporting period. Also there were several malfunction occurrences of the automatic samplers. Monitoring was conducted once at #801, and twice at #805, instead of three times for each site as required by the Permit. For all the remaining four designated sites, monitoring was done for a minimum of three storm events. All sampling occurred at least one month apart for each site.

By the end of the reporting period, KC Water completed the replacement of all six automatic samplers with latest model ISCO Avalanche Portable Refrigerated Samplers and associated 6712 CI modem modules. Recurrence of equipment malfunction was anticipated to decrease.

Next Step: The City will continue to implement the monitoring program.

Permit Ref. 9.a.iii. Sample testing and recordkeeping

Measureable Goals: Complete sample testing; finalize the data, and conduct data analysis and interpretation.

Status: Met goals

9.a.iii. BMP 1

Monitoring included field measurements and sample collection. Samples were analyzed by KC Water Laboratory for physicochemical and microbiological parameters. All field sampling, measurements, sample handling, laboratory analysis, and data validation, as well as a quality assurance and quality control plan, follow the Standard Operational Procedure for the MS4 stormwater discharge monitoring program developed by the Department's laboratory.

Samples were analyzed for the parameters required in the Permit. See Table 5 for data and Table 6 for a summary of the data results.

Next Step: The Standard Operational Procedure is being updated.

9.a.iii. BMP 2

Storm event data records are maintained and include all analytical results, the date and duration (in hours) of the storm event(s), rainfall measurements or estimates (in inches) of the storm event that generated the runoff that was sampled, and the duration (in hours) between the storm event sampled and the end of the previous measurable (>0.1 inch rainfall) storm event.

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2nd Year Report (May 1, 2019 – April 30, 2020)**Table 5.** Stormwater runoff monitoring data

Location (land use represented)	Parameter (unit)	pH (SU)	Cond (µs/cm)	BOD (mg/L)	COD (mg/L)	O&G (mg/L)	<i>E. coli.</i> (MPN/100mL)	TSS (mg/L)	NO2+NO3 (mg/L)	TKN (mg/L)	Diss-P (mg/L)	TP (mg/L)
	Detection limit	NA	3	2	6	3	1	2.5	0.035	0.28	0.016	0.016
	Sampling Date											
SE 59th Terr. & Sterling Ave. (residential)	8/16/2019	8.1	116	9 ^A	51	ND	17,329	80 ^A	0.895 ^J	1	0.23	0.75
W. 135th St & Wyandotte St. (industrial)	7/29/2019	8.2	156	9 ^A	78	ND	25,900	20 ^A	0.741 ^J	1.9	0.16	0.21
	12/29/2019	9.0	258	7	NA	ND	9,804	170	>0.193 ^J	1.1	0.14	0.36
	2/24/2020	8.4	2,120	6	86	ND	323	108	>0.395	2.4	0.16	0.35
NW 107th Terr. & Pomona Ave. (industrial)	8/7/2019	7.8	370	4	117	ND	4,106	9	0.629 ^J	1.3	0.13	1.01
	10/19/2019	7.9	337	8	46	ND	17,329	21 ^A	0.635 ^J	1.3	1.49	1.46
	12/28/2019	8.5	2,391	6	46	ND	9,208	110	0.894	1.7	0.163	0.356
	2/24/2020	7.9	7	7	156	ND	1,396	54	>0.903	2.4	0.122	0.214
NE 51st Terr. & N. Michigan Ave. (residential)	8/7/2019	8.0	176	12	7	ND	19,863	570 ^A	0.668 ^J	2.5	0.218	0.998
	9/21/2019	6.3	78	14 ^A	77	ND	160,700	200 ^A	0.429 ^J	1.3	0.220	0.470
	12/29/2019	7.7	801	32	138	ND	6,488	230	0.402 ^J	2.2	0.431	1.160
	3/9/2020	7.6	310	16	83	ND	1,187	81	>0.405	1.3	0.090	0.220
W. 133 rd St & Inverness Dr. (commercial)	10/19/2019	8.2	128	4	38	ND	2,282	10	0.733	0.9	0.080	0.090
	2/24/2020	8.6	793	5	75	ND	393	76	ND	1.7	0.122	0.251
NW Barry Rd. & NW Barrybroke Dr. (commercial)	8/7/2019	8.1	171	12	79	ND	1,396	37	0.538	1.8	0.144	0.212
	12/29/2019	8.7	1,305	20	123	7.8	160	190	0.940	2.0	0.202	0.385
	3/9/2020	8.3	821	10	48	ND	144	70	ND	1.4 ^M	0.240	0.410

Table 6. A summary of stormwater runoff monitoring data

Data summary	Parameter (unit)										
	pH (SU)	Cond (µs/cm)	BOD (mg/L)	COD (mg/L)	O&G (mg/L)	<i>E. coli.</i> (MPN/100mL)	TSS (mg/L)	NO2+NO3 (mg/L)	TKN (mg/L)	Diss-P (mg/L)	TP (mg/L)
	Detection limit										
	NA	3	2	6	3	1	2.5	0.035	0.28	0.016	0.016
	Result										
Sample count	17	17	17	16	17	17	17	17	17	17	17
Minimum	6.3	7	4	7	ND	144	9	0.402	0.9	0.08	0.09
Maximum	9.0	2,391	32	156	7.8	160,700	570	0.94	2.5	1.49	1.46
Average (Geometric mean for <i>e. coli</i>)	8.1	608	11	78	1.9	3,368	120	0.56	1.7	0.26	0.52
ABBREVIATIONS Cond-conductivity; BOD-biochemical oxygen demand; COD-chemical oxygen demand; O&G-oil & grease; TSS-total suspended solids; NO2+NO3 -nitrate and nitrite; TKN-total Kjeldahl nitrogen; Diss-P - phosphorus, dissolved; TP-phosphorus, total NA: not available; ND: below detection limit											
For NDs, average is computed with half value of the method detection limit.											
^A Value is average of two or more analysis											
^M Estimated value, matrix interference											
^J Estimated value, value may not be accurate											

Next Step: The City will continue the practices.

Permit Ref. 9.b. Biological assessments

Measureable Goals: Once in the spring and once in the fall during the five year permit cycle

Status: In preparation

9.b. BMP 1

Up until the end of 2019, KC Water had maintained an existing collaborative agreement with the Columbia Environmental Research Center (CERC) of U.S. Geological Survey to complete the bio-assessment program per the requirement in the previous permit. The streams covered in the assessment include: East Fork Shoal Creek, Line Creek, Round Grove Creek, Brush Creek, Hickman Mills Creek, Searcy Creek, Buckeye Creek, North Brush Creek, Fishing River, Little Blue River, and Prairie Creek.

During the reporting period, the CERC lab completed the following tasks: (1) conducted taxonomic identification for the samples collected in 2017; (2) enumerated macroinvertebrate specimens; (3) analyzed the data, and (4) completed a report.

Results for the spring 2017 macroinvertebrate data are consistent with trends in the MS4 results from previous years. Based on biotic condition scores, we observed a slight decline at two sites (Little Blue R. and Round Grove Cr.) and a slight increase at two sites (Buckeye Cr., Hart Grove Cr.), with most other sites comparable to previous spring samples. The 2017 results also indicate that the previously observed trend in MSCI scores of fall samples performing higher than expectations and spring samples performing lower than expectations, is continuing. This has resulted in several sites being classified as fully-supporting in fall seasons and partially supporting in the spring evaluations (Round Grove Cr., Prairie Cr., East Fork Shoal Cr.). This was also the case for the control site at Fishing R., which scored lower in the last three spring evaluations (2015, 2016, 2017) as compared to previous fall sampling periods in 2013 and 2015.

Next step: KC Water will start to develop a sampling plan to address the current permit requirements.

Permit Ref. 9.c. Methodology of sample collection analysis

Status: Using the required methods

9.c. BMP 1

The analytic methods utilized in sample testing are consistent with the methods specified in 40 CFR 136. Below is a list of the parameters and corresponding testing methods.

- Total suspended solids: SM 2540 D
- Specific conductivity: SM 2510 B
- Chemical oxygen demand: SM 5220 D
- Biochemical oxygen demand: SM5210 B

- Oil & grease: SM 5520 B
- *E. coli*. SM 9223A,B
- Total Kjeldahl nitrogen: SM 4500-Norg B
- Nitrate + nitrite: EPA 300.0
- Dissolved phosphorus, total phosphorus: SM 4500-P