Kansas City, Missouri

Storm Water Management Program Plan

August 2019

National Pollution Discharge Elimination System (NPDES)

Municipal Separate Storm Sewer System (MS4)

Permit No. MO-130516

Table of Contents

Kansas City, Missouri

Storm Water Management Program Plan

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Introduction

The City of Kansas City has prepared this Storm Water Management Program Plan (SWMPP) in conjunction with requirements of the City's Municipal Separate Storm Sewer System (MS4) Discharge Permit as issued by the Missouri Department of Natural Resources. The SWMP describes strategies and practices the City will implement to manage the discharge of pollutants from the MS4 to the "maximum extent practicable" (MEP) based on local conditions, resources, and priorities. The SWMP is a "living document" that will continue to evolve as appropriate to address the need to protect water quality and to meet various requirements of the federal, state and local laws. This version remains in effect until it is replaced.

This plan is prepared to guide the City's storm water management programs and consists of programs addressing EPA guidance including: Public Education; Public Involvement and Participation; Illicit Discharge Detection and Elimination; Construction Site Runoff Control; Post Construction Discharge from new Development and Redevelopment; Pollution Prevention and Municipal "Good Housekeeping" in municipal operations; and Monitoring and Control of pollutants from Industrial and High Risk Areas; along with sections relating to Flood Control Projects and Water Quality Monitoring.

Public Education and Outreach

Overview

KC Water has been an active participant in the Mid America Regional Council's (MARC) Water Quality Public Education Program since it was initiated in 2003. The Program convenes a Committee of representatives from local government and environmental organizations to develop regional water quality public education initiatives. The Committee was formed in response to requests from local governments to develop a cooperative regional approach to water quality education and to meet regulatory requirements.

The Program's over-arching theme is "Clean Water. Healthy Life." The Program focuses on changing behavior throughout the region in order to improve water quality, community health, and quality of life. Each year the MARC Committee develops a non-point source pollution focused message that is disseminated in a variety of ways. The specific education and outreach activities vary each year, but typically they consist of a media campaign, a mini-grant program, training, and education and outreach materials. An Annual Report summarizes the activities from the previous year and is used by the participating communities as documentation of their collective efforts.

Also of note is a renewed emphasis on internal communication capabilities. KC Water has established an expanded Communications Office staffed with four full-time employees, a full-time Water Quality Education Coordinator to focus specifically on water quality efforts, and a Curriculum Coordinator who works primarily with schools.

A major emphasis of the Curriculum Coordinator position is the implementation of the "KC to the Sea" school curriculum aimed at students in fourth and fifth grades in the City's various school districts. Since 2010, KC Water has worked to educate local 4th through 6th-grade students through a curriculum titled *Storm water: From KC to the Sea*. The five-day interactive curriculum teaches students how precipitation moves through a watershed, how storm water becomes polluted, and how BMPs implemented on public and private property could improve water quality and reduce the quantity of storm water entering the sewer system.

During 2018, over 5,000 students from 18 schools throughout Kansas City participated in the program. The curriculum has received an "Excellence in Communications" award from the North Association of Flood and Storm Water Management Agencies. This brings KC to the Sea to a cumulative number of over 12,000 students reached since the creation of the curriculum.

KC Water is also working on the development of a water management demonstration and education site at its headquarters campus. This multi-phase project will eventually house multiple learning labs that will complement the various elements of the KC to the Sea curriculum.

Site Plans and Design Requirements

The City has embraced the cooperative efforts of the regional chapter of the American Public Works Association (APWA) through participation in the processes and adoption of standards. APWA has worked closely with Mid America Regional Council (MARC) to address storm water standards and development of the Best Management Practices (BMP) Manual to provide guidance for land development practices. Various trainings have been held to explain the new standards and how to achieve compliance with design requirements.

In addition, the City's Planning Department, which has responsibility for development plan requirements review and approval, works to educate developers on how to meet the requirements and achieve successful approvals. One particularly effective tool is the City's Development Assistance Team (DAT) which meets with developers early in the application process to assist them with understanding the requirements. Storm Water staff actively participates in these meetings to provide information and guidance on the requirements.

Household Hazardous Waste (HHW)

Education related to HHW is primarily focused on the public and more specifically the proper use and disposal of these materials. HHW has been a point of emphasis by the MARC Water Quality Education Committee and various messages and media have been used to educate the public about issues related to HHW as a threat to water quality.

Similarly, improper disposal of HHW can be a real problem, especially if that disposal results in concentrated quantities of material being introduced into water ways or water bodies. KC Water operates a Household Hazardous Waste Facility (HHW) for the City and actively engages other communities from the Missouri side of the metropolitan area in a regional HHW program designed to keep toxics out of the environment. Through regional partnership agreements, residents may also use Lee's Summit's permanent facility. The MARC Solid Waste District also coordinates several mobile outreach events with KC Water HHW staff throughout the region each year to enhance access to proper management and disposal. The HHW Program, along with the broader regional program, has received national recognition for the effectiveness of the operations.

Public Reporting of Spills, Dumping, and Illegal Connections

Since 2005 the City has operated a 311 City Services phone line to simplify citizen access to City services through a single point of contact. Residents are encouraged to contact the City if they are aware of situations such as spills, illegal dumping, or other threats to human health and the environment. All calls received through the 311 hotline are logged by type and directed to the appropriate city department for follow-up and resolution.

Construction Site Operators and Pollution Prevention Plans

Construction contractors working on private development projects are responsible for the proper training of their employees on the requirements for erosion and sediment control. They are also responsible for the development and implementation of Storm Water Pollution Prevention Plans (SWPPPs) for those sites. The City will continue to support the availability of various training opportunities for these sectors, however, it is most common that consultants and design professionals hired by developers are already trained in these matters and are given the role of ensuring compliance.

KC Water does provide training for project managers from various City departments who are responsible for compliance with the City's Land Disturbance Permit. This training is conducted periodically and is provided by Storm Water Compliance staff responsible or contractors. There is also online training available on an ongoing basis through a contract managed by the Office of Environmental Quality (OEQ).

Public Outreach

KC Water is responsible for billing customers for water, sewer and storm water on a monthly basis. The Communications Office produces a newsletter called "What's On Tap?" which is included with the monthly water bill and distributed to over 185,000 customers. The newsletter is a primary means of communication with customers and provides an opportunity for direct water-quality based educational content. Based on customer surveys, 69% of customers use the newsletter as a source of information. Examples of the topics covered include: "Summer Watershed Tips – Use lawn chemicals wisely"; "Pick-up After Your Pet – Pet waste affects water quality"; and tips on "How you can prevent pollution in local streams, and waterways". Recent editions of "*What's On Tap?" can* be found on the KC Water website at the following link: https://www.kcwaterservices.org/customer-service/news-faqs/.

Public Education and Outreach

PROGRAM ACTIVITIES

Task 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.

Lead: Communications Office
Water Quality Education Coordinator
Storm Water Compliance staff

Measurement: Ongoing use of the resource to provide relevant information.

Task 2: Development and use of the Department's dedicated website.

Lead: Communications Office
Water Quality Education Coordinator
Storm Water Compliance staff

Measurement: Ongoing utilization of the resource.

Task 3: Active participation and financial support for the Mid America Regional Council's (MARC) Water Quality Education Committee.

Lead: Environmental Manager (KC Water/Storm Water Compliance)
Water Quality Education Coordinator

Measurement: Active participation in monthly meetings and committee work.

Task 4: Use of the "KC to the Sea" curriculum in City schools.

Lead: Water Quality Education Coordinator & Curriculum Coordinator

Measurement: Annual implementation during the school year.

Task 5: Continue KC Water's participation and support for APWA efforts to improve and update various development standards that benefit water quality.

Lead: Storm Water Engineering Division staff

Measurement: Active participation in scheduled committee meetings and efforts.

Public Involvement and Participation Program

Overview

The purpose of the Public Involvement Program is to inform, educate, and engage the public about the causes of storm water pollution, its effects on local streams, lakes and rivers within the City and beyond, and the need for storm water management. Public involvement is an integral part of KC Water's storm water program. The public must be informed, educated and involved with storm water issues and solutions if the program is to be effective. This program will implement public information, education, involvement and stewardship activities that will raise awareness, foster community stewardship, and promote pollution prevention and proper storm water management.

Strategies

Inform: Messages and materials distributed to the public and media. Public awareness is crucial to effectively fostering public stewardship.

Educate: Activities designed to increase understanding about storm water/water quality and motivate the public to make behavioral changes.

Involve: Involving the public in identifying issues and developing solutions; encouraging and empowering Kansas City's citizens to take an active role in the decision-making process.

Stewardship: Enabling citizens to have an active, hands-on role in protecting water quality.

Tools

One tool that is getting renewed attention is KC Water's web site. With the installation of Automated Meter Infrastructure (AMI) throughout the City, customers are now able to monitor their water usage and make payments online. With this new "driver", significantly more traffic is expected over-time, making the web site that much more valuable as a public education and participation tool.

As mentioned in the Education section, the KC to the Sea school curriculum for fourth through sixth graders is designed to take advantage of the Learning Labs to be constructed at the KC Water headquarters complex. This will provide an active learning environment to compliment the class work focused on water and water quality issues. This sort of participatory approach builds on the previous efforts of the Blue River Watershed Association and their water quality monitoring work that has been supported by KC Water as well as other communities in the metro area.

Some of the relatively small marketing "give-away" items used at tabling events and the like actually do provide for action on the part of the recipient. The use of rain gauges is an engagement tool that requires the person to "install" the gauge and to monitor the results - - simple but meaningful steps toward a

greater appreciation of the importance of rainfall, storm water management, and water quality. Similarly, providing native plant seeds allows an explanation of the role these plants can play in increasing infiltration and transpiration and the importance that has in valuing the water and keeping it where it falls.

Storm Drain Labeling is another effort of KC Water that actively involves participants. Often done as a group effort, such as Scout Troops or community service organizations, the actions required to label a storm drain promotes an understanding of the functionality of that drain and the need to not allow it to become a source of contamination to the environment. Currently the program is shifting to the use of medallions in place of the stencil approach and is being coordinated regionally through the MARC Water Quality Committee for consistent messaging.

Projects

Project Blue River Rescue - The City supports and participates in the Blue River Rescue Cleanup held in April each year. Project Blue River Rescue is an outreach event put on by Healthy Rivers Partnership and hosted by the Friends of Lakeside Nature Center, operated by the City's Parks and Recreation Department. The event is sponsored by the Missouri Department of Conservation (MDC) and Department of Natural Resources (MDNR) through the Missouri Stream Team Program and supported by many local governmental entities and businesses. Parks and Recreation, Neighborhood Services, and KC Water continue to provide facilities, volunteers, equipment, expertise, and assistance with program coordination.

Missouri River Watershed Event - The City is a sponsor of this annual two state, seven county regional event. The event fosters awareness and elicits behavioral changes in youth regarding non-point source pollution throughout the metropolitan area. KC Water is one of the major sponsors and helps to provide overall facilitation.

Water Services Grant Program – In 2016 KC Water initiated a small grant program to support local groups interested in providing water quality education support and activities. Five to ten grants have been awarded in each year of the program, greatly enhancing the extension of our water quality messaging to a number of new audiences.

Public Involvement and Participation
PROGRAM ACTIVITIES

Task 1: Utilize the "What's On Tap?" newsletter as a water bill insert with monthly water bills, providing information on various topics relating to preserving and protecting water quality.

Lead: Communications Office
Water Quality Education Coordinator

Measurement: At least two storm water focused articles per year.

Task 2: Utilize KC Water's website to provide information on storm water management and water quality matters.

Lead: Water Quality Education Coordinator
Storm Water Compliance staff

Measurement: Ongoing use of the resource.

Task 3: Work cooperatively with Non-Governmental Organizations (NGOs) on educating and training students on storm water management, water quality and water quality testing, and KC to the Sea curriculum taught in schools.

Lead: Water Quality Education Coordinator
Storm Water Compliance staff

Measurement: Active participation and support of efforts.

Task 4: Continue to participate in the Mid America Regional Council's Water Quality Education Committee.

Lead: Environmental Manager (KC Water)
Water Quality Education Coordinator

Measurement: Attend monthly meetings and active participation on committees, etc.

Task 5: Administer the annual Water Quality Education grant program.

Lead: Water Quality Education Coordinator

Measurement: Completion of annual solicitation, review, administration and award of grants.

Program for Control of Illicit Discharge and Improper Disposal

Authorization

In response to the first MS4 permit, the City developed and adopted Ordinance 070395 (passed in April 2007) entitled "Storm Water Discharge Control Regulations". This ordinance established the legal authority to regulate storm water and non-storm water discharges to the storm drainage system. It prohibits illicit connections and discharges to the storm water drainage system and empowers KC Water to carry out inspections, monitoring, investigations and enforcement actions as necessary to ensure compliance.

Illicit Discharge Detection and Elimination Program (IDDE)

The City's Illicit Discharge Detection and Elimination Program (IDDE) includes the following elements:

- Conduct field screenings in accordance with federal requirements.
- Identify and eliminate illicit cross-connections to the system.
- Monitor the storm drainage system during dry weather to identify and subsequently eliminate illicit or non-storm water discharges of concern.
- Tracking storm water outfalls added or removed from the system.

Tracking of Complaints, Response, and Enforcement Actions

The City has a well-established "311" phone system for one-stop citizen interaction with the City. Primarily used for requesting services or information, it also can be used for expressing concerns or lodging complaints such as illicit discharges. All calls are directed to the appropriate entity for resolution, and in the case of illicit discharges, that would include investigation and determination as to actions needed to eliminate an inappropriate activity, including enforcement actions if necessary. The 311 system provides for tracking of complaints, responses and enforcement. Illicit Discharge notifications and complaints are directed to KC Water for investigation and resolution.

Illicit Discharge Response and Enforcement

In 2007 the City adopted an ordinance (located in Municipal Code Chapter 61) which prohibited illicit discharges and provided enforcement tools that can be used in cases of violations. The ordinance is titled Storm Water Discharge Control Regulations. The ordinance gives the City authority to investigate illicit discharge complaints on private property and to take enforcement actions as appropriate.

Dry Weather Field Screening Program

A minimum of 500 major outfalls were required to be field screened during the initial five year term of the permit. The City has continued the screening efforts at least at the same pace during the additional years of the administratively extended permit. Additional outfalls may be screened if warranted based on information found during the field screening investigations.

Per EPA guidance, if any unexplained flow is observed discharging from the outfall during the field screening, two grab samples will be collected during a 24 hour period with a minimum period of four hours between samples. For all such samples, a narrative description of the color, odor, and turbidity, the presence of an oily sheen or surface scum as well as any other relevant observations regarding the potential presence of non-storm water discharges or illegal dumping shall be provided. In addition, field tests will be performed for pH and ammonia for any flow from outfalls. Field analysis using a Storm water Test Kit will be used to field analyze for pH, total chlorine, total copper, total phenol, and detergents (or surfactants). An estimation of the flow rate will also be documented.

Spill Response

The Fire Department's Hazardous Materials Division (HazMat 71) has programs for educating the public on spill prevention along with responding to actual spills. The spills responded to by the Fire Department are tracked by their Information Technology Division. One of the goals of the spill prevention and response efforts is to minimize the impact of the spill on water quality through timely and effective response.

Household Hazardous Waste Program

The City's Household Hazardous Waste (HHW) Program is managed by KC Water and serves approximately 60 communities from the five counties on the Missouri side of the metropolitan area through coordination by the Mid America Regional Council's (MARC) Solid Waste Management District. The program includes a HHW drop-off facility, a "swap shop" which allows residents to take advantage of reusable materials like paint, and a HHW mobile collection program which allows residents to drop-off waste materials at convenient collection sites such as malls, schools, and other community locations. This activity promotes proper management and disposal of hazardous materials helping to keep them out of the environment. Well over one million pounds of HHW have been properly managed through the facility.

Illegal Dumping

The Neighborhood Preservation Division of the Neighborhoods and Housing Services Department is responsible for investigating illegal dumping activities, enforcing penalties for violators, and conducting clean-up operations. The City also partners with other organizations such as environmental groups and homes associations to promote proper management of solid waste and to discourage illegal dumping that often occurs because of a lack of awareness about available options.

System Inventory

KC Water has an ongoing effort to document the storm water system and continues to track the installation of new storm sewers and outfalls installed by both public projects and private projects. Specific information on new system components are obtained from "as-built drawings" provided by the appropriate City Department or the private developer and used to update the Geographic Information System (GIS). As new information is received, KC Water's GIS Division updates the system to reflect the additions. Additionally, staff is working to identify missing elements of the system and to locate the information necessary to resolve system gaps.

Program for Control of Illicit Discharge and Improper Disposal
PROGRAM ACTIVITIES

Task 1: Maintain an inventory of system outfall points, including the addition of new outfalls to the system and efforts to identify any missing outfalls historically not identified.

Lead: KC Water – Storm Water and GIS Divisions

Measurement: Add all new outfalls as established and systematically review historical system for gaps.

Task 2: Conduct field screening in accordance with established procedures (EPA).

Lead: Environmental Officer (KC Water Storm Water Compliance)

Measurement: Complete a minimum of 100 screenings annually.

Task 3: Conduct investigations as appropriate based on complaints or observations during field screenings.

Lead: Environmental Officer (KC Water Storm Water Compliance)

Measurement: Resolution of potential illegal connections and related issues.

Task 4: Support various efforts and programs that offer information and/or services designed to encourage proper management of materials or wastes so that they are not illegally disposed in ways that could impact water quality.

Lead: KC Water

Measurement: Program specifics and quantities managed are reported in the Annual Report.

Construction Site Run-off Program

Overview

The City has established regulations (Chapter63) intended to reduce the discharge of erosion and sediment from land disturbance occurring at construction sites. Project developers are required to follow standards and utilize appropriate controls to minimize the amount of erosion and sediment that might leave the site.

Land Disturbance Regulatory Authority

Several City Departments construct public infrastructure and are responsible for managing erosion, sediment, and pollutant controls on their active construction sites. The Aviation, Parks & Recreation, Public Works and KC Water Departments manage erosion and sediment controls for the City projects for which they are responsible. The individual department responsible for the project is responsible for complying with the Land Disturbance Permit Requirements.

Storm Water Compliance provides oversight for the City's General Land Disturbance Permit (MOR100006) issued by MDNR. This oversight includes the verification and review of Storm Water Pollution Prevention Plans (SWPPP), monthly inspections of the public projects during construction, interaction with Project Managers as necessary to maintain compliance, and quarterly reporting to MDNR.

The City Planning and Development Department, Land Development Division, administers and enforces City requirements pertaining to erosion, sediment, and pollutant control for private development activity.

Land Disturbance Requirements

City Code of Ordinances, Chapter 63 along with the City's "Erosion and Sediment Control Specifications" (APWA Standard 5100), approved by the Missouri Department of Natural Resources, serve as the basis for the City's comprehensive, city-wide erosion and construction site pollutant control program. Chapter 63 regulations cover site planning and use of best management practices (BMP's) for any land disturbance activity, as well as inspection and enforcement measures. A City site disturbance permit is required for projects disturbing more than one acre.

Chapter 63 specifies the following exemptions from obtaining a permit:

No land disturbance permit required if activity disturbs less than 1.0 acre but greater than 300-square feet, but erosion controls shall be utilized.

Land disturbance of less than 300-square feet is not required to comply with the adopted standard.

City Departments are not required to obtain a permit but are required to comply with the requirements of the City's general Land Disturbance Permit (No. MOR100006) issued by MDNR, and if applicable, the City's adopted standards and the City's building code.

Work to correct or remedy emergencies including situations that pose an immediate danger to life or property, or substantial flood or fire hazard is exempt.

Routine agricultural crop management practices are exempt.

Database for Tracking Complaints and Inspections

Citizen complaints that come into the City through the "311" system are tracked for progress and resolution. Inspection reports for City projects subject to the General Operating Permit are tracked by the Storm Water Compliance Section and reported quarterly to MDNR.

Training and Assistance

Storm Water Compliance provides training and assistance on erosion and sediment control requirements to City staff including project managers, inspectors and management staff with land disturbance related responsibilities. The City Manager's Office of Environmental Quality has also assisted with training, both in person and through online subscription services.

Construction Site Run-off Control
PROGRAM ACTIVITIES

Task 1: Implement the requirements of City Code Chapter 63 and the Erosion and Sediment Control Specifications.

Lead: Land Development Division (City Planning and Development Department)

Measurement: Ongoing as development occurs.

Task 2: Complete regular inspections of private developments with land disturbance activities.

Lead: Land Development Inspectors (City Planning and Development)

Measurement: Minimum two inspections plus additional as needed depending on the scope and scale of the project.

Task 3: Complete regular inspections of public projects with land disturbance activities.

Lead: Environmental Officer (KC Water)

Measurement: Monthly inspections for active sites.

Task 4: Provide erosion and sediment control training to City staff with land disturbance activity responsibilities.

Lead: Land Development Division (City Planning)
Regulatory Compliance (KC Water)
Office of Environmental Quality

Measurement: Periodic training provided.

Task 5: Reporting to MDNR.

Lead: Storm Water Compliance Staff (KC Water)

Measurement: Quarterly reports submitted (eDMR).

Post Construction for New Development and Redevelopment Program

Overview

The purpose of this program is to implement storm water management requirements for new development and redevelopment projects to minimize pollutant discharges and erosive storm water flows.

Responsibility

KC Water has responsibility (Code of Ordinances, Chapter 61 Storm Water) for all storm sewers which are constructed privately as part of the City's sewer system, by persons, firms, and corporations, under a permit issued by KC Water, and storm sewers constructed from funds otherwise made available to the Department by appropriate action of the City Council. KC Water also has responsibility for the maintenance and operations of the City's storm water system.

The City Planning and Development Department's Land Development Division has responsibility for plan review and approval and inspection of private developers storm water projects. The City requires new development and redevelopment projects to mitigate storm water impacts by managing storm water onsite. The planning and permitting processes for development approval provides the opportunity to incorporate design features that will provide post-construction storm water management and treatment.

Planning and Design Criteria

Pre-development meetings – (Development Assistance Team meetings)

The Development Assistance Team (DAT) is a group of representatives from City departments involved in the land development process. DAT meetings are optional, free of charge, and provide preliminary and informal information and schedules for development and explanations of related applications and procedures.

BMP design criteria – (Standards – maintain predevelopment discharge)

The City has adopted a modified version of the APWA Section 5600 Storm Drainage Systems and Facilities design criteria manual. The criteria provide uniform procedures for designing and checking the design of storm drainage systems under the rainfall and land characteristics typical in the Kansas City Metropolitan Area. This standard generally focuses on water quantity concerns including: conveyance, flow rates, and construction design parameters of storm water systems with a goal of maintaining predevelopment discharge rates for new land development projects.

Manual of Best Management Practices for Storm Water Quality – (Mid-America Regional Council and American Public Works Association)

The City has also adopted the "Manual of Best Management Practices for Storm Water Quality" (BMP Manual) as a complement to the 5600 standards with a focus on water quality. The manual was developed by Mid-America Regional Council (MARC) and the Kansas City Metro Chapter of the American Public Works Association (APWA) as a guide for applying storm water Best Management Practices (BMP) to land development within the Kansas City Metropolitan Area and the MARC planning region. The manual addresses the need to control the volume and quality of storm water discharges from developed sites, both of which are crucial requirements for protecting human life and property, maintaining overall water quality, and for creating more environmentally sensitive site designs.

This manual furnishes guidance for planning and sizing BMP's. It describes how to determine potential water quality impacts and how to select BMP's most appropriate for mitigating those impacts. The manual is based on water quality protection, BMP design, and BMP application guidance from sources throughout the U.S. It adapts this information for use in the Kansas City region. The information includes:

- Definitions for BMP's and water quality treatment concepts
- Storm water management goals and concepts
- A regionally based procedure for selecting and applying BMPs for a development
- A recommended program of minimum BMPs for all municipalities
- Methods of performing hydrologic calculations for design of water quality treatment
- BMP descriptions and design guidance

The manual provides guidance on storm water management which proceeds from thorough site analysis to planning and site design, and is unique for each site and development project. The first step in water quality management is to maintain or reduce the amount of runoff generated within a watershed by maintaining watershed hydrology and cover. Treatment is then applied to the remaining runoff to remove some of the pollutant load. BMPs are the key to both approaches and may be nonstructural (preserved soils; preserved or established open space and native vegetation; stream buffers) or structural (infiltration, filtration, and extended detention practices designed specifically for water quality treatment).

The BMP Manual utilizes the Level of Service Method which is a seven step systematic process for selecting and applying BMP's to development sites utilizing numeric calculations to account for changes in pre to post developed conditions as reflected by the difference in curve numbers of the two conditions. This difference determines the

resultant Level of Service (LS) requirement. LS is indicative of development impacts, which must be mitigated by the site design and incorporation of BMP's.

The manual adopts the following hierarchy of Storm Water Best Management Practices:

- Preservation and Promotion of Natural Hydrology
    - Preserve existing vegetation
    - Establish vegetated open space
    - Disconnect areas of impervious surfaces

- Engineered Storm Water Treatment and Infiltration
    - Provide storm water treatment through engineered BMP
    - Create infiltration systems to support fragile groundwater regimes

- On-Site Detention and Treatment
    - Provide on-site detention and treatment
    - Provide subsurface detention and treatment

The Best Management Practices for Storm Water Quality manual is available online at KCmetro.APWA.net.

Green Storm Water Infrastructure Manual (Kansas City, Missouri)

To supplement the BMP Manual, the Green Storm Water Infrastructure Manual was developed as a suite of tools for design and construction of BMP's. These tools include how to approach BMP design, construction specifications, component design guidelines and detail templates, recommended plant list and characteristics, and establishment and maintenance of the BMP.

Of particular note with regards to the planning and design requirements of the City as it relates to water quality was the adoption of a Stream Buffer Ordinance and the Conservation and Open Space Development Regulations. The Stream Buffer Ordinance prohibits the encroachment of development activities within varying distances of a stream, preserving most of the functionality of the stream corridor. The Open Space regulations encourage the preservation of conservation areas within a development in exchange for relaxation of certain other requirements.

Checklists

City Planning has developed the "Public Infrastructure Plan Submittal Checklist: Part A, B, C" (Informational Bulletin No. IB159) as a means of highlighting changes in the development codes to enhance the awareness and understanding of the requirements early in the planning and design process.

Plan Review Process

All new development and most redevelopment must comply with Kansas City's zoning and development code (Chapter 88 of the Code of Ordinances), which replaced the City's previous zoning and subdivision ordinances (Chapters 80 and 66, respectively). Besides consolidating all land development regulations into a single document, the zoning and development code contains several new and modified regulations.

People who approach the City about starting a new business or making other changes to property are encouraged to review the zoning and development code to identify regulations and approval procedures that apply to their situation. The zoning and development code guide contains a summary of the code and the zoning and subdivision procedures most likely to be encountered when building or developing in the City. It is intended to help developers understand the city's zoning and subdivision approval process and to help ensure that the process goes smoothly and efficiently. The City also has an interdepartmental "Development Assistance Team" (DAT) to assist prospective development.

Field Inspection and Enforcement

City Planning Department is responsible for review, approval and inspections of development and redevelopment projects. After installation (post-construction), it becomes the responsibility of KC Water. To this point, most emphasis has been on getting developers to use BMP's per the new regulations and standards. As part of the implementation of these standards, covenants for maintenance were developed that require developers and property owners to take responsibility for maintenance, repair, and restoration of detention or BMP structures.

Long-Term Operation and Maintenance

Public

Operation and Maintenance Programs (O&M) have been developed within both the Parks and Recreation and KC Water for the purpose of establishing crews knowledgeable and experienced in BMP operation and maintenance. Both Departments have also added Landscape Architects to support the O&M activities. As part of a green work force development effort, the City has established the Green Stewards program to assist with BMP maintenance.

Private

The City has developed three different "Covenants for Maintenance" to address the long-term operation and maintenance of storm water BMPs on private property. Depending on the

particular situation, a developer is required to make a determination which applies to their situation. The responsible party must sign a covenant agreement before receiving approval for their project.

Education and Training

The City provides training as needed for employees responsible for inspection functions. In addition, we work cooperatively with other cities, the regional planning agency (MARC), consultants, and the American Public Works Association (APWA), among others, to hold specialized trainings that support the work of City inspections and provides for qualified private sector service providers as well.

The City is a founding partner of the National Green Infrastructure Certification Program (NGICP) to support the construction, inspection, and workforce development programs centered around BMP's and green storm water infrastructure. As part of this partnership, the City hosts annually NGICP training available to staff and to contractors working on City projects.

Post Construction for New Development and Redevelopment PROGRAM ACTIVITIES

Task 1: Implement requirements of the BMP Manual and the APWA Section 5600 Storm Drainage Systems and Facilities Design Criteria as adopted by the City.

Lead: Land Development Division, City Planning and Development Department

Measurement: Ongoing implementation of the requirements during development reviews.

Task 2: Provide training and technical assistance to City Planning and Development staff.

Lead: Land Development Division, City Planning

Measurement: Periodic staff training.

Task 3: Provide training and technical assistance to the development community.

Assignment: Land Development Division, City Planning

Measurement: As needed based on evolving standards.

Task 4: Inspect newly constructed facilities to verify construction per the approved plans.

Assignment: Land Development Division, City Planning and Development

Measurement: All facilities inspected prior to occupancy.

Task 5: Perform the BMP Maintenance Inspection Program to verify that constructed facilities are properly functioning and maintained.

Assignment: Environmental Officer (KC Water - Storm Water Compliance)

Measurement: Inspect one-fifth of private storm water facilities annually.

Pollution Prevention and Good Housekeeping in Municipal Operations

Overview

The City has an extensive ongoing set of activities designed to eliminate or mitigate threats to water quality that might result from City operations. The MS4 permit generally addresses these efforts under one comprehensive "Good Housekeeping" program. The program elements specifically required under the permit are described below.

Employee Training

KC Water Storm Water Compliance staff work with the Environmental Coordinating Managers to access the various Departments to provide pollution prevention and good housekeeping training specifically targeting storm water runoff. The "Storm Watch" DVDs from Excal Visual are utilized as the primary training tools. In addition to those, we also have collaborative access to training materials obtained by the Mid America Regional Council (MARC) Water Quality Committee used throughout the region.

Floatables Capture

The City's primary ongoing effort related to capture and control of floatables is through the catch basin cleaning program. Some percent of floatables that enter the conveyance system are captured within the catch basin structure and will be removed and disposed of at the time of the periodic cleaning of the structures. The current goal is to get 15,000 catch basins cleaned annually. Additionally, floatables that end up in City owned and maintained detention basins are removed on an as needed basis such as when mowing occurs.

Roadways System Operation and Maintenance

<u>De-Icing</u>

The City's roadway de-icing activities are primarily the responsibility of the Public Works Department. They use a combination of both rock salt and brine in their treatment efforts. Salt is stored under cover at five different locations throughout the City. The brine solutions are stored in tanks. Public Works has been an active partner in the MS4 permit activities and they utilize a "Sensible Salting" approach in an effort to optimize the effectiveness of de-icing agents while minimizing waste or over application.

<u>Street Sweeping</u>

Due to budgetary limitations the City has suspended its street sweeping program.

Street Maintenance

During the first permit cycle, the City completed a review and evaluation of the operations and maintenance activities in public rights-of-ways. The City continues to conduct research to identify potential improvements and to incorporate effective approaches into O&M procedures.

City operations and maintenance within the public rights-of-way includes:

Paving (coldmill and overlay, saw-cutting, patching, crack filling)
Concrete work (curbs, sidewalks, bridges, retaining walls)
Pavement markings and street signage (which involves chemicals, paints, adhesives, etc.)
Snow and ice control operations
Clean-up of illegal dumping /other wastes
Vegetation management (e.g. horticultural chemical application, mowing)
Road shoulder maintenance (e.g. re-gravelling, shallow excavation)
Roadside drainage ditch maintenance

As part of these activities, work procedures have been implemented and are being evaluated with the goal to limit pollutant discharges to the MS4, including:

Use of deicing chemicals for snow and ice removal
Spill control and prevention
Control of other pollutants (i.e. -waste generated by grinding or saw cutting)
Outreach to other county and state agencies regarding their practices

Street Design

KC Water is routinely in communication with the Public Works and Parks and Recreation Departments about roadway design and the need to provide alternative or new designs that address both the quantity and quality of storm water runoff from streets and roadways. Primarily attributable to the Overflow Control Program (OCP), also known as "Smart Sewers", Kansas City is recognized as a leader in the adoption of green infrastructure as a means of keeping storm water runoff out of the combined sewers. But those approaches are also being utilized in the separate areas (MS4) of the City. A newly developed Green Infrastructure Manual has been created to provide guidance on the implementation of green infrastructure projects, especially on streets and roadway projects.

Other Municipal Facilities

The City has an extensive and mature Environmental Management System (EMS) approach to environmental compliance which is managed by the Office of Environmental Quality (OEQ). Each operating department within the City government has a designated Environmental Coordinating Manager (ECM). The ECMs meet monthly to learn of new developments and to coordinate activities related to

environmental compliance. Additionally, there are annual inspections of all facilities completed by OEQ in conjunction with the Department's ECM and other relevant staff. A complete manual outlining the City's EMS is available to all employees on the City's internal website.

Pesticides, Herbicides and Fertilizers Management

Pesticides, herbicides and fertilizers (PHFs) are a challenge for water quality due to their wide-spread use and the toxicity by the very nature of their purpose. In terms of municipal use, PHFs are sometimes used to manage vegetation in the right-of-way along roads, around the many municipal facilities, and sometimes in aquatic situations such as ponds/lakes and along the extensive levee system.

The management and use of PHFs is addressed in the Environmental Management System (EMS) under the title of "chemical use". The EMS references the need for employee training for those using PHFs and the requirement for a certification to be an applicator of restricted-use pesticides. There are also guidelines for the use of appropriate personal protective equipment when handling and using PHFs.

The use of less toxic alternatives is receiving increased attention over time. The interdepartmental Resource Management Team has developed a new procurement policy that has been adopted by the City Manager (AR 5-06) that addresses environmental preferability and is certainly applicable to PHFs use and provides guidance for policy decisions that value the use of less toxic, environmentally sound products.

Also the increased use of green infrastructure that utilize native plants provide an alternative to a more manicured landscape that may require the greater use of PHFs.

Pollution Prevention and Good Housekeeping in Municipal Operations
PROGRAM ACTIVITIES

Task 1: *Perform cleaning of catch basin inlets.*

Lead: Storm Water Maintenance (KC Water)

Measurement: Complete 15,000 cleanings per year.

Task 2: Continue implementation of the established Sensible Salting Manual to ensure proper levels of deicer usage.

Lead: Public Works Department – Streets and Traffic Division

Measurement: Amount of deicing materials used annually.

Task 3: Implement seasonal Leaf and Brush curbside collection program.

Lead: Storm Water Compliance Division, Operations and Maintenance Division (contracted services)

Measurement: Two seasonal collections per year (one in the fall, one in the spring)

Task 4: Reporting

Lead: Senior Environmental Officer (KC Water – Storm Water Compliance)

Measurement: Annually (Due October 28)

Program to Monitor and Control Pollution from Industrial and High Risk Areas

Overview

Certain industrial activities have a greater potential to contribute pollutants to the storm sewer system. The Industrial Controls Program focuses on reducing the discharge of pollutants in storm water runoff from industrial sites through site inspections and enforcement, as well as through outreach and technical assistance. This program focuses on site inspection and utilization of a self-assessment program. In addition to the City's efforts, the State administers industrial storm water NPDES permits for specific industrial and commercial facilities.

The previously mentioned Chapter 61 of the Code of Ordinances entitled "Storm Water Discharge Control Regulation" was primarily adopted pursuant to the requirements of the Illicit Discharge Program. However, elements of the ordinance are also applicable to this program as well. The purpose of the ordinance is to provide for the regulation of storm water and non-storm water discharges to the storm drainage system to the maximum extent practicable. The ordinance specifically regulates the contribution of pollutants to the storm drainage system by any user, prohibits illicit connections and discharges to the storm drainage system, and establishes legal authority to carry out all inspections, surveillance, monitoring and enforcement procedures necessary to ensure compliance.

Inventory

An inventory of "potentially significant or high-risk dischargers" was developed early in the first permit period and continues to be reviewed and updated by Storm Water Compliance on a regular basis. The inventory includes the following categories:

Municipal Landfills

There are no active municipal waste landfills operating in the City. There are six locations that were known to function as a municipal waste landfill (dump) in the past. These locations are regularly inspected by trained City environmental staff. If any issues are identified, they are addressed as appropriate relative to the extent of the issue and funding to address the problem however, only one of the six discharges storm water to the MS4.

Hazardous Waste Treatment, Storage, and Disposal facilities (TSDs)

This is information obtained from the Missouri Department of Natural Resources.

Industrial Facilities (SARA Title III Section 313 reporters)

This information is obtained from the Environmental Protection Agency.

Facilities with NPDES storm water permits

This information is obtained from the Missouri Department of Natural Resources.

Other facilities based on the field screening program or other City activities

These facilities are identified and investigated as a result of the field screening program or observed activities of concern.

Inspection Program

The industrial storm water management program identifies "high-risk" industrial facilities using referrals from City staff and field observations. If storm water exposure exists, the facility must either remove the exposure in order to obtain a no exposure certification from the City, or develop and implement a storm water self-assessment program which includes the development of a Storm Water Pollution Prevention Plan (SWPPP), self-inspections, and annual reporting.

City inspection and monitoring activities include:

Periodic inspections of facilities included in the inventory;

Review and technical assistance for development of the facility's SWPPP;

Review of each identified facilities SWPPP, monitoring results and annual report;

Periodic inspections of other commercial/industrial facilities (e.g. facilities with no-exposure certifications);

Responding to complaints and referrals.

Program to Monitor and Control Pollution from Industrial and High Risk Areas PROGRAM ACTIVITIES

Task 1: Maintain inventory through updated lists of NPDES industrial storm water permits issued by MDNR within Kansas City, Missouri.

Lead: Senior Environmental Officer (KC Water)

Measurement: Review list and add or remove facilities as warranted.

Task 2: Implement storm water self-assessment program for qualifying facilities.

Lead: Senior Environmental Officer (KC Water)

Measurement: Annual review of all self-assessment reporting.

Task 3: Conduct inspections of facilities on the high risk inventory.

Lead: Senior Environmental Officer (KC Water)

Measurement: Complete a minimum of 30 inspections per year.

Task 4: Monitor storm water runoff at selected outfalls.

Lead: Senior Environmental Officer (KC Water)

Measurement: Monitor one or more outfalls from industrial areas up to four times per year as qualifying precipitation events allow.

Task 5: Report

Lead: Senior Environmental Officer (KC Water)

Measurement: Annual reporting.

Flood Control Projects

Retrofitting Opportunities for Water Quality

Identify – Most of the City's flood control activities are managed by KC Water's Storm Water Engineering Division. All levee and major river work is done in close conjunction with the Army Corps of Engineers (Corps). The Corps and their authorized mission have been more receptive of multiple purposes and benefits in recent years. For example, a recently completed phase of the multi-phase Blue River Flood Control Project was modified to eliminate a very large concrete grade control structure and in its place use a series of in-stream rock baffles and similar measures resulting in a much more natural looking reach of the river. KC Water will continue to work to identify retrofitting opportunities for water quality benefits associated with flood control projects.

Evaluate – If opportunities are identified, an evaluation process will be used to determine if cost effective water quality improvements can be made in conjunction with existing or future flood control projects.

Schedule – If the evaluation identifies opportunities, the project(s) will be moved into the capital improvements planning process whereby prioritization and scheduling occur.

Funding – The capital improvements planning process identifies funding for projects and schedules when that funding might be available. It should be noted that the current primary funding mechanism for the Storm Water Division only allows for ongoing operations and maintenance of the system and not improvements. Improvements must rely on other funding sources, such as the Public Improvements Advisory Council (PIAC) where storm water projects are competing with other types of capital projects, so funding certainty is much harder to achieve.

In 2017, Kansas City voters approved "GO Bond" funding for several purposes, including flood control. These dedicated dollars are expected to be used to provide match funds to leverage federal flood control projects, so it is expected that there will be more projects in the future.

Monitoring Program

This section reflects the monitoring requirements as contained in the permit.

Action: Storm water runoff monitoring

Lead: Senior Environmental Officer (KC Water)

Support: Laboratory staff performs field measurements, collect samples, and conduct analysis

Schedule: Three samples per year (precipitation dependent) are to be taken from runoff resulting from storm events of at least 0.1 inch of rain which occur at least one month apart.

Description: Take runoff samples at six designated locations; complete sample testing; finalize the data; and conduct data analysis and interpretation.

Locations:

Site ID	Location
#801	SE 50th Terr. & Sterling
#802	SE Wyandotte & 135th St.
#803	NW 107 Terr. & Pomona
#804	49th St & N. Highland
#805	133rd St. & Inverness
#806	Barry Rd. & I-29

Action: Biological Assessment Program

Lead: Senior Environmental Officer (KC Water)

Support: Supported by field staff and contracted services as needed

Schedule: Once in the spring and once in the fall during the five year permit cycle.

Description: Conduct habitat assessment once per year; take biological samples once per year; complete sample identification; finalize data; and conduct data analysis utilizing contracted services.

Action: Monitoring Programs Evaluation

Lead: Senior Environmental Officer (KC Water)

Support: Contracted assistance as needed

Schedule: Data collected from the various sampling programs as described above. Results of the overall program evaluation provided in the annual MS4 report at the conclusion of the permit year.

Description: Use the data obtained from the various monitoring program elements to collectively evaluate the impacts of MS4 discharges on receiving waters.

Administration

Annual Reporting: An annual report that includes the various reporting categories as set forth in the permit will be submitted to MDNR by October 28 of each year.

SWMPP Review and Update: The Storm Water Management Program Plan will be reviewed on an annual basis in conjunction with the preparation of the annual report. Other changes in the SWMPP that may occur will be made in accordance with the procedures set forth in the permit.

Retention of SWMPP Records: In accordance with the permit requirements, records of program development and implementation will be maintained for at least three years after permit coverage terminates.