



PUBLIC EDUCATION



PUBLIC INVOLVEMENT



POST-CONSTRUCTION  
MANAGEMENT

# ST. LOUIS COUNTY PHASE II STORMWATER MANAGEMENT PLAN

Fall 2017

**DRAFT**

THIRD  
TERM  
PERMIT  
2017-2021



ILLICIT DISCHARGE  
DETECTION



CONSTRUCTION SITE  
CONTROLS



MUNICIPAL POLLUTION  
PREVENTION



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## **Stormwater Management Plan Development**

On December 14, 2016, the Metropolitan St. Louis Sewer, St. Louis County, and 59 St. Louis County Municipalities were issued a General State Operating Permit MO-R040005 for the MSD Municipal Separate Storm Sewer System. This permit is required by the Federal Clean Water Pollution Control Act and was issued by the Missouri Department of Natural Resources (MDNR). The permit's facility name is "MSD Small MS4 Co-Permit."

This permit requires municipal separate storm sewer systems (MS4s) to implement best management practices (BMPs) via an iterative process to reduce the discharge of pollutants into MS4 to the maximum extent practicable (MEP) for the goal of attainment with Missouri's Water Quality Standards. To meet this requirement, MS4s must develop a stormwater management plan (SWMP) that implements the permit's requirements for the following six minimum control measures:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention and Good Housekeeping

The 2016 Permit allows permittees one year of the effective date to revise their SWMP. To comply with the revised permit conditions, MSD and its co-permittees are submitting this SWMP to the MDNR. The 2012 St. Louis County SWMP that MSD submitted with its permit application is superseded by this document.

# Stormwater Management Plan Coordination

## A. Applicability

The 1999 Phase II Stormwater Regulations were promulgated to provide appropriate stormwater management for political subdivisions in urbanized areas which were exempted under the 1990 (Phase I) regulations. Appendix 6, Governmental Entities Located Fully or Partially Within an Urbanized Area, of the preamble to the USEPA’s December 8, 1999 rule listed most of the political subdivisions in St. Louis County as entities requiring a Phase II NPDES Permit. University City was added additionally as a co-permittee, based on the population served by separate storm sewers and other relevant factors.

## B. Permitting Strategy

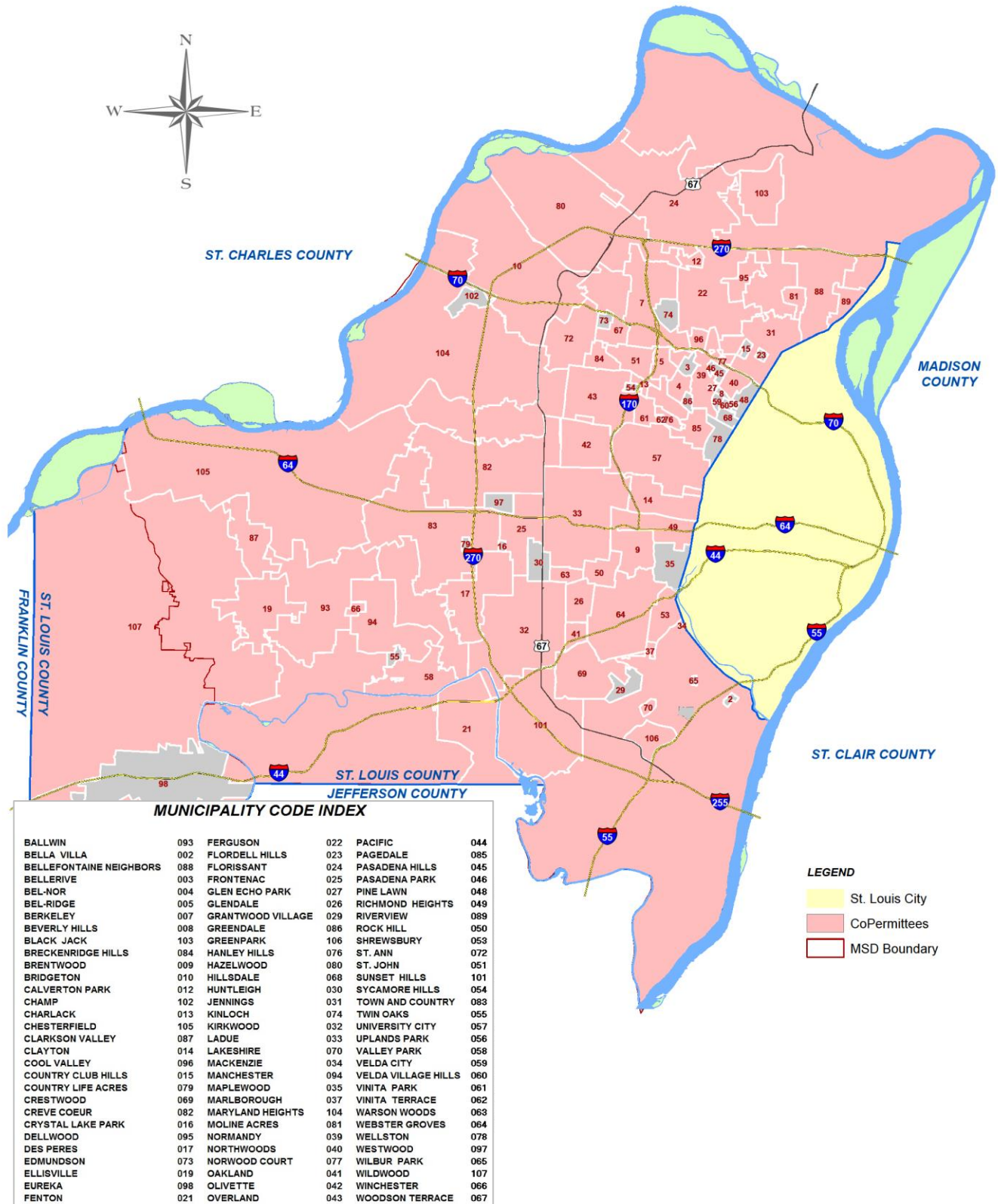
Missouri’s Phase II Stormwater Regulations for small MS4s are contained in 10 CSR 20-6.200. The statute allows regulated Small MS4s to seek coverage under a general permit or under a site-specific permit. MSD and the other regulated political subdivisions in St. Louis County have received the general permit. While MSD and each political subdivision that is regulated by the Phase II regulations and located within MSD’s boundaries has received its own operating permit, all have agreed to coordinate permit compliance activities as co-permittees. The co-permittee strategy encourages cooperation among municipal governments, a watershed approach to reducing pollution, and the sharing of legal, financial, and administrative responsibilities.

Figure 2 on page 3 shows the St. Louis County municipalities and MSD’s boundaries. MSD’s boundaries cover approximately 525 square miles, and will henceforth be referred to as the “Plan Area.” Although there are ninety municipalities located within MSD’s county service area, only fifty-nine and the St. Louis County received the MS4 permit. Two municipalities in St. Louis County, Pacific and Eureka, are located outside of MSD’s service area and are not part of the co-permittee group. Appendix A lists the 61 permitted entities in the group.

*Figure 1, Co-permittees Defined*

<b>Co-permittee</b>	<b>How Many</b>
Municipalities	59
St. Louis County	1
MSD	1
Total	61

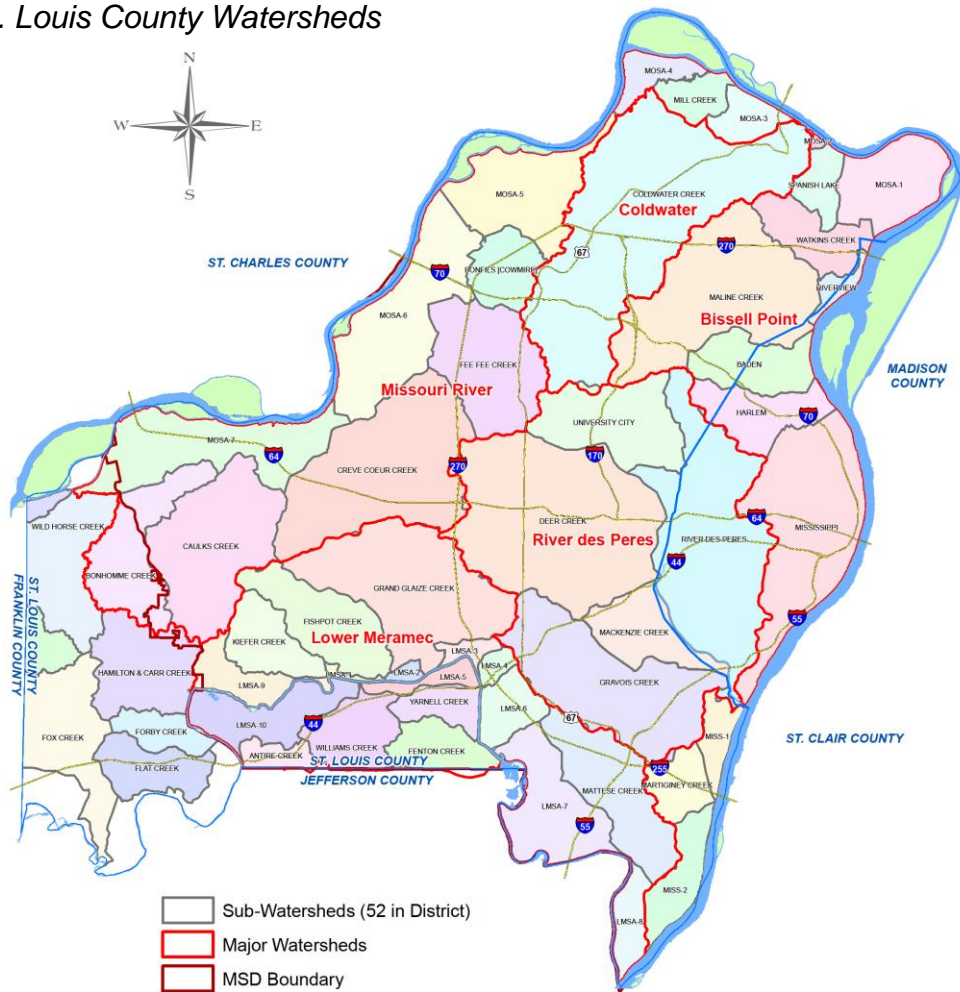
Figure 2, Incorporated Places in St. Louis County



### C. Plan Area Watersheds

St. Louis County stormwater drains into three major watersheds: the Mississippi River, the Meramec River, and the Missouri River. All stormwater runoff from the County ultimately enters the Mississippi River. The Mississippi River forms the eastern boundary of the southernmost and northernmost portions of the Plan Area with the remainder entering the western boundary of the City of St. Louis and its combined sewer system. The Meramec River generally forms the southern boundary of the Plan Area except for a portion in the west of the County where the border includes land south of the Meramec River that is drained by its tributaries. The Missouri River forms the northern boundary of the Plan Area. Many small tributaries feed into each of these three major rivers. Figure 3 shows the location of stream tributaries within the major watersheds of the Plan Area.

Figure 3, St. Louis County Watersheds



#### **D. Responsibility**

MSD is recognized as the coordinating authority of the SWMP under the St. Louis Metropolitan Small MS4 Stormwater Permit, MO-R040005. Each co-permittee has been assigned responsibility for specific BMPs to comply with the six MCMs related to their governmental purpose. For example,

- Public Education and Outreach (MCM 1) on stormwater impacts and Public Involvement and Participation (MCM 2) can best be coordinated by the MSD, with specific tasks performed with municipal support.
- Since MSD already has responsibility to operate and maintain the separate storm sewer systems in the county, it carries the bulk of the responsibility to comply with the requirements of MCM 3, Illicit Discharge Detection and Elimination.
- St. Louis County and municipalities, who operate land disturbance programs, are largely responsible for implementing BMPs to control pollution from land disturbance activities and compliance with MCM 4 requirements.
- For MCM 5, because MSD is the recognized continuing authority for public sewer extensions within its jurisdictional boundaries and has overall plan review responsibilities for stormwater management, it is responsible for post-construction structural BMPs. St. Louis County and municipalities, who maintain land use and zoning authority, are responsible for implementing post-construction nonstructural BMPs that need to be implemented in conjunction with MSD's efforts.
- All co-permittees are responsible for ensuring their own municipal operations comply with requirements under MCM 6, Pollution Prevention/Good Housekeeping for Municipal Operations.

#### **E. SWMP Responsibility**

The person primarily responsible for the SWMP is the MSD Program Manager for Environmental Compliance Programs. Contact information is as follows.

Metropolitan St. Louis Sewer MSD  
Engineering Department – Environmental Compliance  
Program Manager of Environmental Compliance Programs  
c/o Jay Hoskins, P.E.  
10 E. Grand Ave.  
St. Louis, MO 63147  
Phone: 314-436-8757  
[jshosk@stlmsd.com](mailto:jshosk@stlmsd.com)



Each municipality and St. Louis County also has a person primarily responsible for the SWMP. That contact information is provided in Appendix B.

## Watershed Water Quality

Section 303(d) of the Federal Clean Water Act requires states to identify water bodies that do not meet water quality standards (impaired waters) after applying the existing regulations. Table 1 shows Plan Area water bodies with segments on the 2016 303(d) listing.

*Table 1: 2016 303(d) listing*

Waterbody	Bacteria (E Coli)	Chloride	Other
Antire Creek	X		pH
Bee Tree Lake			Mercury
Black Creek	X	X	
Bonhomme Creek	X		pH
Coldwater Creek	X	X	
Creve Coeur Creek	X	X	Dissolved Oxygen
Deer Creek	X	X	
Fee Fee Creek	X	X	
Fenton Creek	X	X	
Fishpot Creek	X	X	
Grand Glaize Creek	X	X	Mercury
Gravois Creek	X	X	
Gravois Creek	X	X	
Keifer Creek	X	X	
Maline Creek	X	X	
Mattese Creek	X	X	
Meramec River	X		Lead
Mississippi River	X		
River des Peres	X	X	Dissolved Oxygen
Spring Branch	X		
Two mile Creek	X		
Watkins Creek	X	X	
Wildhorse Creek	X		
Williams Creek	X		

MDNR has developed and EPA has approved Total Maximum Daily Loads (TMDLs) to address bacteria (E.Coli) in four watersheds (Table 2). At the time this SWMP was written, MDNR has drafted and put on public notice three additional TMDLs (which have not been approved by EPA).

*Table 2: Bacteria (E.Coli) Total Maximum Daily Loads*

<b>Water Body</b>	<b>EPA Approval Date</b>	<b>Public Notice Date</b>
Coldwater Creek	7/13/2016	
Creve Coeur Creek	7/13/2016	
Deer & Black Creek		3/17/2017
Fishpot Creek	7/13/2016	
Grand Glaize Creek		3/17/2017
Mailne Creek		3/17/2017
Watkins Creek	7/13/2016	

# Minimum Control Measure Number 1, Public Education and Outreach of Stormwater Impacts (MCM1)

## A. Permit Requirements

Section 4.2.1.1 of the 2016 Permit requires the permittee to implement a public education program to distribute educational material to the community or conduct equivalent outreach activities about the impact of stormwater discharges on waterbodies and steps the public can take to reduce pollutants in stormwater runoff. As part of the SWMP, the Public Education and Outreach Program shall include the following information at a minimum:

- 4.2.1.1.1 A plan on how target audiences are identified for the public education program who are likely to have significant stormwater impacts (including commercial and industrial entities);
- 4.2.1.1.2 A plan to inform individuals and households about steps they can take to reduce stormwater pollution;
- 4.2.1.1.3 A plan to inform individuals and groups on how to become involved in the SWMP (with activities such as local stream and lake restoration activities);
- 4.2.1.1.4 The outreach strategy, including the mechanisms (e.g., printed brochures, newspapers, media, workshops, etc...) to reach target audiences; and
- 4.2.1.1.5 The pollutant(s) sources that the permittee's education program is designed to address.

Table 3 provides the specific BMPs that will be used to comply with 4.2.1.1.1-4.2.1.1.4. Pollutant sources (4.2.1.1.5) are addressed below.

## B. Pollutant Sources

### **1. Pet Waste**

Pet waste left on the ground pollutes stormwater when it rains or snows. Pollutants associated with pet waste include bacteria, ammonia, oxygen demand, and nutrients (nitrogen).

### **2. Yard Management**

Yard waste such as leaves, grass clippings, weeds, brush, and small twigs that are disposed of along a creek or in a storm drain can impact water quality. Yard waste

decaying in creeks decomposes and creates low dissolved oxygen, releases nutrients (nitrogen and phosphorus), and elevated suspended solids.

Stormwater containing fertilizers and pesticides from incorrect application and/or improper storage can also cause environmental problems (e.g., toxicity to aquatic life). Good management of fertilizers application is consistent with the goals of Missouri's Nutrient Reduction Strategy.

### **3. Individual Sewage Disposal Systems**

Commonly known as septic systems, these systems are designed to hold, treat, and dispose of household wastewater. Systems that are not properly installed and regularly serviced allow bacteria, viruses, nutrients, and ammonia to enter groundwater and streams.

### **4. Winter Deicing and Storage Activities**

Significant levels of salt (e.g., sodium chloride and calcium chloride) in waters can occur when salt is applied on roads, parking lots and driveways during deicing activities. Chloride is highly soluble and very mobile in water. High levels of chloride are toxic to aquatic life.

### **5. Household Hazardous Waste**

Many products around the home are hazardous because they contain chemicals that are toxic, corrosive, flammable, or reactive. Though usually safe if used according to the directions, when these products are no longer usable or wanted, they become household hazardous waste. If dumped onto the ground or poured into the storm sewer, household hazardous waste can contaminate groundwater and streams.

### **6. Land Disturbance**

Land disturbance is dredging, clearing, grading, excavating, transporting or filling from construction activities including but not limited to subdivisions, shopping centers, and road projects. Sediment is the primary pollutant from land disturbance activities.

### **7. Fats, Oils, and Grease**

Fats, oil, and grease (FOG) are found in common foods and food ingredients such as meat, fish, butter, cooking oil, gravy, sauces, mayonnaise, and food scraps. There are also "hidden oils," such as salad dressing, syrup, batter and cheese. When FOG is poured down the drain, it can form blockages that restrict wastewater

flow, eventually causing a blockage. Blockages can cause sewer overflows that pollute streams.

### **8. Swimming Pools**

Discharges (drains, overflows, and filter backwash water) of chlorinated pool water and saltwater to a storm sewer or stream contain pollutants such as elevated suspended solids, chlorides, and abnormal pH. These pollutants impact many species of aquatic life.

### **9. Industrial Activities**

Stormwater runoff from industrial facilities can easily become polluted by metals, chemicals, sediment, fertilizers, and trash. When exposed to the atmosphere, many industrial activities contribute to stormwater pollution (such as metal grinding and polishing, vehicle/equipment maintenance, improper disposal of hazardous waste, and more). Wastes, residues, and byproducts from these activities can enter storm drains and streams harming aquatic life and impacting water quality.

Table 3

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria	
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021		
4.2.1.1.1	1	Query MSD Environmental Compliance Pretreatment Information Management System for active industrial entities.	Maintain list of active industrial entities who could have a significant stormwater impact.	MSD	Provide co-permittees with a list of industrial stormwater sources.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	List updated, distributed, and filed.
	2	Query MSD Environmental Compliance Pretreatment Information Management System for approved commercial haul-waste vendors.	Maintain list of active commercial individual waste haulers who could have a significant stormwater impact.	MSD	Provide co-permittees with a list of waste haulers.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	List updated, distributed, and filed.
	3	Query MSD Asset Management System for list of active food service and restaurant establishment facilities.	Maintain list of active food service and restaurant establishments who could have a significant stormwater impact.	MSD	Provide co-permittees with a list of food service and restaurant establishments.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	List updated, distributed, and filed.
	4	Survey trade associations (such as Home Builders Association, Associated General Contractors, American Society of Civil Engineers, and Property Managers) involved with land disturbance, land development, and property management activities.	Maintain list of trade associations with members that could have a significant stormwater impact.	MSD	Provide co-permittees with list of trade associations.	Develop list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	List updated, distributed, and filed.
	5	Query municipal building permit databases for active major land disturbance contractors.	Maintain list of contractors that could have a significant stormwater impact.	All	Provide co-permittees with a list of contractors who are currently engaged in major land disturbance activities.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	Update list and distribute to co-permittees by end of plan year.	List updated, distributed, and filed.
	6	Collect stormwater education survey.	Develop a baseline of water quality and nonpoint source pollution awareness and behaviors, and identify target audiences for future SWMP revisions.	MSD	Develop a baseline of public water quality awareness in service area.	Develop survey questions, complete third party survey, record and analyze findings.	None	None	None	Complete third party survey, record and analyze findings.	Awareness baseline developed.
	7	Develop database of all K-12 public and private school districts in plan area.	Foster nonpoint source pollution and water quality awareness in community.	MSD	Maintain a comprehensive database of schools and contacts, which could be information outlets.	Develop database of schools and contacts by end of plan year	Maintain database of schools and designated contacts.	Maintain database of schools and designated contacts.	Maintain database of schools and designated contacts.	Maintain database of schools and designated contacts.	Database developed. Track schools providing stormwater education.
4.2.1.1.2	8	Develop and distribute stormwater messages for MSD bills and websites. Topics would include littering, pet waste, yard management (including nutrient application), individual sewage disposal systems, winter deicing, swimming pools, and household hazardous waste.	Reach plan area customers with concise messages on MSD bills and websites.	MSD	Greater awareness of best practices to protect water quality.	None	Develop message library by end of the plan year.	Distribute messages on MSD bills and websites. Record number of MSD bills mailed and website pages views/hits.	Distribute messages on MSD bills and websites. Record number of MSD bills mailed and website pages views/hits.	Distribute messages on MSD bills and websites. Record number of MSD bills mailed and website pages views/hits.	Message library developed and representative copies of bills filed. Track number of bills sent with messages. Track number of website page hits and views.

Table 3

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria	
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021		
4.2.1.1.2	9	Maintain and provide library of stormwater education materials.	MSD	Provide education to various audiences.	Maintain adequate supply of existing educational materials that address general awareness and pollutant sources in the SWMP for target audiences, individuals, and households.	Maintain adequate supply of existing educational materials that address general awareness and pollutant sources in the SWMP for target audiences, individuals, and households.	Maintain adequate supply of existing educational materials that address general awareness and pollutant sources in the SWMP for target audiences, individuals, and households.	Maintain adequate supply of existing educational materials that address general awareness and pollutant sources in the SWMP for target audiences, individuals, and households.	Maintain adequate supply of existing educational materials that address general awareness and pollutant sources in the SWMP for target audiences, individuals, and households.	Materials developed and available for distribution.	
	10	Provide presentations and educational materials to families and homeowners.	MSD	Foster nonpoint source pollution and water quality awareness in community.	Increase awareness and positive behavior change.	Provide pet waste brochures to St. Louis County Animal Control quarterly, starting 2017 fourth calendar quarter. St. Louis Animal Control distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis County Animal Control quarterly. St. Louis Animal Control distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis County Animal Control quarterly. St. Louis Animal Control distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis County Animal Control quarterly. St. Louis Animal Control distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis County Animal Control quarterly. St. Louis Animal Control distributes pet waste brochures during adoptions.	Track number of brochures provided to St. Louis County Animal Control.
					Increase awareness and positive behavior change.	Provide pet waste brochures to St. Louis humane society quarterly. Humane Society distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis humane society quarterly. Humane Society distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis humane society quarterly. Humane Society distributes pet waste brochures during adoptions.	Provide pet waste brochures to St. Louis humane society quarterly. Humane Society distributes pet waste brochures during adoptions.	Track number of brochures provided to St. Louis Humane Society.	
					Increase awareness and positive behavior change.	Partner with environmental organization (such as the Missouri Botanical Garden Earthways Center) to offer one education event on stormwater management. Record class attendance.	Partner with environmental organization (such as the Missouri Botanical Garden Earthways Center) to offer at least two education events on stormwater management. Record class attendance.	Partner with environmental organization (such as the Missouri Botanical Garden Earthways Center) to offer at least two education events on stormwater management. Record class attendance.	Partner with environmental organization (such as the Missouri Botanical Garden Earthways Center) to offer at least two education events on stormwater management. Record class attendance.	Classes completed and attendance tracked.	
	MSD	Increase awareness and positive behavior change.	Partner with environmental organization (such as St. Louis Audubon Society Bring Conservation Home) to: 1) support distribution of education material and 2) provide stormwater management education to landowners. Record education material distributed.	Partner with environmental organization (such as St. Louis Audubon Society Bring Conservation Home) to: 1) support distribution of education material and 2) provide stormwater management education to landowners. Record education material distributed.	Partner with environmental organization (such as St. Louis Audubon Society Bring Conservation Home) to: 1) support distribution of education material and 2) provide stormwater management education to landowners. Record education material distributed.	Partner with environmental organization (such as St. Louis Audubon Society Bring Conservation Home) to: 1) support distribution of education material and 2) provide stormwater management education to landowners. Record education material distributed.	Partner with environmental organization (such as St. Louis Audubon Society Bring Conservation Home) to: 1) support distribution of education material and 2) provide stormwater management education to landowners. Record education material distributed.	Education completed. Track type and number of material distributed.			

Table 3

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.1.1.2	11 Post pet waste signs in parks.	Foster nonpoint source pollution and water quality awareness in community.	St. Louis County and Municipalities	Increase awareness and positive behavior change.	Post pet waste signs in each city and St. Louis County owned park. Record and report on number of pet waste signs posted.	Post pet waste signs in each city and St. Louis County owned park. Record and report on number of pet waste signs posted.	Post pet waste signs in each city and St. Louis County owned park. Record and report on number of pet waste signs posted.	Post pet waste signs in each city and St. Louis County owned park. Record and report on number of pet waste signs posted.	Post pet waste signs in each city and St. Louis County owned park. Record and report on number of pet waste signs posted.	Track number of parks and posted pet waste signs.
4.2.1.1.3	12 Maintain database of community partners with water pollution education interests.	Know partners that can work with MSD to Foster nonpoint source pollution and water quality awareness in community. See MCM 2 for utilization.	MSD	Provide participation opportunities, in MCM2, to individuals and groups.	Develop database of individuals, partners, and activities. Distribute activities list to individuals and groups.	Update database of individuals, partners, and activities. Distribute activities list to individuals and groups.	Update database of individuals, partners, and activities. Distribute activities list to individuals and groups.	Update database of individuals, partners, and activities. Distribute activities list to individuals and groups.	Update database of individuals, partners, and activities. Distribute activities list to individuals and groups.	List updated, distributed, and filed. See also material distribution, presentation, and MCM2 BMPs.
4.2.1.1.4	13 Provide educational materials to industrial entities, waste haulers, and food service and restaurant establishments.	Foster nonpoint source pollution and water quality awareness in community	MSD	Increase awareness and positive behavior change.	Provide educational materials to industrial entities and waste haulers. Distribute fats, oils, and grease brochure at MSD food service and restaurant establishment inspections. Distribute IDD brochure at MSD, pretreatment inspections. Record number of material distributed.	Provide educational materials to industrial entities and waste haulers. Distribute fats, oils, and grease brochure at MSD food service and restaurant establishment inspections. Distribute IDD brochure at MSD, pretreatment inspections. Record number of material distributed.	Provide educational materials to industrial entities and waste haulers. Distribute fats, oils, and grease brochure at MSD food service and restaurant establishment inspections. Distribute IDD brochure at MSD, pretreatment inspections. Record number of material distributed.	Provide educational materials to industrial entities and waste haulers. Distribute fats, oils, and grease brochure at MSD food service and restaurant establishment inspections. Distribute IDD brochure at MSD, pretreatment inspections. Record number of material distributed.	Provide educational materials to industrial entities and waste haulers. Distribute fats, oils, and grease brochure at MSD food service and restaurant establishment inspections. Distribute IDD brochure at MSD, pretreatment inspections. Record number of material distributed.	Material distribution completed. Track number of material distributed.
	14 Provide presentations and educational materials to trade associations, schools, and watershed groups	Foster nonpoint source pollution and water quality awareness in community	MSD	Increase awareness and positive behavior change within trade associations that is topical to their industry.	Permittee group will offer one meeting with trade associations. Record materials distributed	Permittee group will offer one meeting with trade associations. Record materials distributed	Permittee group will offer one meeting with trade associations. Record materials distributed	Permittee group will offer one meeting with trade associations. Record materials distributed	Permittee group will offer one meeting with trade associations. Record materials distributed	Meetings completed. Track number of meetings and material distributed. Records saved in MSD files.
			Co-permittees	Increase awareness and positive behavior change	MSD will distribute education material at a minimum of 6 requested presentations or information booths. Record event material distributed and attendance.	MSD will distribute education material at a minimum 6 requested presentations or information booths. Record event material distributed and attendance. All permittees that distribute material at events will report material distributed and estimated attendance.	MSD will distribute education material at a minimum 6 requested presentations or information booths. Record event material distributed and attendance. All permittees that distribute material at events will report material distributed and estimated attendance.	MSD will distribute education material at a minimum 6 requested presentations or information booths. Record event material distributed and attendance. All permittees that distribute material at events will report material distributed and estimated attendance.	MSD will distribute education material at a minimum 6 requested presentations or information booths. Record event material distributed and attendance. All permittees that distribute material at events will report material distributed and estimated attendance.	Events completed. Track number of events and material distributed. Records saved in copermittees files.



Table 3

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.1.1.4	15 Partner with community organizations to provide stormwater information to a broad audience.	Foster nonpoint source pollution and water quality awareness in community.	MSD	Increase awareness and positive behavior change.	Develop and distribute stormwater information at a St. Louis area sports venue.	Develop and distribute stormwater information at a St. Louis area sports venue.	Develop and distribute stormwater information at a St. Louis area sports venue.	Develop and distribute stormwater information at a St. Louis area sports venue.	Develop and distribute stormwater information at a St. Louis area sports venue.	Track type and number of material distributed.
				Increase awareness and positive behavior change.	Host Information booth and record what and how many material distributed at St. Louis Earth Day in Forest Park.	Host Information booth and record what and how many material distributed at St. Louis Earth Day in Forest Park.	Host Information booth and record what and how many material distributed at St. Louis Earth Day in Forest Park.	Host Information booth and record what and how many material distributed at St. Louis Earth Day in Forest Park.	Host Information booth and record what and how many material distributed at St. Louis Earth Day in Forest Park.	Track type and number of material distributed.
				Increase awareness and positive behavior change.	None	Host Information booth and record what and how many material distributed at St. Louis Home and Garden Show.	Host Information booth and record what and how many material distributed at St. Louis Home and Garden Show.	Host Information booth and record what and how many material distributed at St. Louis Home and Garden Show.	Host Information booth and record what and how many material distributed at St. Louis Home and Garden Show.	Track type and number of material distributed.
				Increase awareness and positive behavior change.	Develop and distribute stormwater information at a St. Louis area amusement or recreation venue.	Develop and distribute stormwater information at a St. Louis area amusement or recreation venue.	Develop and distribute stormwater information at a St. Louis area amusement or recreation venue.	Develop and distribute stormwater information at a St. Louis area amusement or recreation venue.	Develop and distribute stormwater information at a St. Louis area amusement or recreation venue.	Track type and number of material distributed.
	16 Develop and advertise videos to be utilized in social media platforms.	Develop concise messages that can be used on MSD and partner social media platforms.	MSD	Provide education to broad audiences	Develop two videos that can be utilized in the desired format	Provide or purchase minimum 10,000 spots per year. Record number of plays.	Provide or purchase minimum 10,000 spots per year. Record number of plays.	Provide or purchase minimum 10,000 spots per year. Record number of plays.	Provide or purchase minimum 10,000 spots per year. Record number of plays.	Videos developed and track number of online plays.

## **Minimum Control Measure Number 2, Public Involvement and Participation (MCM2)**

### **A. Permit Requirements**

Section 4.2.2.1 of the 2016 Permit requires the permittee to implement a public involvement/participation program that provides opportunities for public involvement in the development and oversight of the permittee's SWMP, and provides opportunities for public involvement of the permittee's renewal application. The public involvement/participation program shall, at a minimum, include the following:

- 4.2.2.1.1 A public notice period to allow the public to review the SWMP and renewal application prior to the submission of the SWMP and renewal application to the Department. It is recommended that the public review period is at least 10 (ten) business days;
- 4.2.2.1.2 A notice of public meeting, if needed, regarding the SWMP and renewal application. It is recommended that the notice should be at least 72 hours prior to the meeting;
- 4.2.2.1.3 A plan to target all potentially affected stakeholder groups, including but not limited to, commercial and industrial businesses, trade associations, environmental groups, homeowner associations and educational organizations;
- 4.2.2.1.4 If the permittee utilizes a stormwater management panel/committee, then the permittee shall provide opportunities for citizen representatives on the panel/committee;
- 4.2.2.1.5 If appropriate, volunteer monitoring or stream/lake clean-up activities; and
- 4.2.2.1.6 Provide opportunities and work with citizen volunteers willing to educate others about the permittee's SWMP.

### **B. BMP Development**

Specific implementation of the public involvement and participation best management practices are presented in Table 4.

Table 4

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria	
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021		
4.2.2.1.1	17 Post SWMP on MSD's website for 30 days. Announce the SWMP is available to review, using e-mail and social media.	Provide opportunity for input on the SWMP.	MSD	Comply with permit requirement for public notice.	Revised SWMP posted on MSD stormwater section and social media platforms for 30 days. Revised SWMP e-mailed to stakeholders	None	None	None	None	4th term SWMP posted on MSD stormwater section and social media platforms for at least 10 days. Revised SWMP e-mailed to stakeholders	SWMP e-mailed and posted on MSD website/social media platforms. Record all comments to the SWMP.
4.2.2.1.2	18 Hold a meeting at MSD's office. Provide advance notice on MSD's website and by e-mail.	Provide opportunity for input on the SWMP.	MSD	Comply with permit requirement for public meeting.	Revised SWMP public meeting notice posted on MSD stormwater section at least 72 hours before meeting.	None	None	None	None	4th term SWMP public meeting notice posted on MSD stormwater section at least 72 hours before meeting.	SWMP meeting announcement posted on MSD website. File meeting minutes.
4.2.2.1.3	19 Maintain a list of outlets to provide information. Send letter or e-mail inviting comment in advance of finalizing SWMP.	Maintain contact with stakeholder organizations and their leadership.	MSD	Provide education and participation opportunities to target audiences.	Send a letter or e-mail to contacts on list, offering opportunity to comment on the revised SWMP.	Review and update list annually.	Review and update list annually.	Review and update list annually.	Review and update list annually.	Send a letter or e-mail to contacts on list, offering opportunity to comment on the 4th term SWMP.	List developed and communication sent.
4.2.2.1.4	20 Invite citizens to provide representation on the steering committee, with goal of including 2 citizens on steering committee	Provide opportunity for input on the SWMP	MSD	Provide participation opportunities to interested citizens	Send a letter or e-mail invitation to at least 10 citizen contacts. Based on interest, select 2 parties to participate on the committee.	None	None	Send a letter or e-mail invitation to at least 10 citizen contacts. Based on interest, select 2 parties to participate on the committee.	None	SWMP notification opportunities developed.	
4.2.2.1.5	21 Participate in at least one cleanup event annually.	Foster nonpoint source pollution and water quality awareness in community.	All	Prevent disposal of wastes in waterways. Increase awareness and positive behavior change.	MSD will organize with partner organizations one or more annual stream or neighborhood clean-up events to cover the Plan Area. Each co-permittee will participate with a planned event, or participate in their own stream or neighborhood clean-up activity in the community. Record participation activity.	Co-permittee group will provide equipment, in-kind sponsorship, staff support, and/or financial sponsorship, for Confluence Trash Bash, River des Peres Trash Bash, and Operation Clean Stream. Record participation activity.	Co-permittee group will provide equipment, in-kind sponsorship, staff support, and/or financial sponsorship, for Confluence Trash Bash, River des Peres Trash Bash, and Operation Clean Stream. Record participation activity.	Co-permittee group will provide equipment, in-kind sponsorship, staff support, and/or financial sponsorship, for Confluence Trash Bash, River des Peres Trash Bash, and Operation Clean Stream. Record participation activity.	Co-permittee group will provide equipment, in-kind sponsorship, staff support, and/or financial sponsorship, for Confluence Trash Bash, River des Peres Trash Bash, and Operation Clean Stream. Record participation activity.	Clean-ups completed. Track number of participants and waste amounts collected.	

Table 4

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.2.1.5	22 Continue to operate two household hazardous waste drop-off facilities.	Provide safe and economical outlet for household hazardous waste disposal	St. Louis County	Prevent disposal of wastes in waterways. Increase awareness and positive behavior change.	Operate the two household hazardous waste drop-off facilities and record participation and the amount of household hazardous waste collected.	Operate the two household hazardous waste drop-off facilities and record participation and the amount of household hazardous waste collected.	Operate the two household hazardous waste drop-off facilities and record participation and the amount of household hazardous waste collected.	Operate the two household hazardous waste drop-off facilities and record participation and the amount of household hazardous waste collected.	Operate the two household hazardous waste drop-off facilities and record participation and the amount of household hazardous waste collected.	Two locations remain open. Track number of participants and waste amounts collected.
4.2.2.1.6	23 Provide training to educators, watershed group members, and others on how to use the EnviroScape® watershed models.	Engage citizen volunteers on how to educate students on sources of pollution and best practices, providing additional resources.	MSD	Provide additional resources/labor who can help with education on sources of stormwater pollution and best practices	Provide or partner with environmental organization to provide an annual workshop on how to use the model.	Provide or partner with environmental organization to provide an annual workshop on how to use the model.	Provide or partner with environmental organization to provide an annual workshop on how to use the model.	Provide or partner with environmental organization to provide an annual workshop on how to use the model.	Provide or partner with environmental organization to provide an annual workshop on how to use the model.	Classes completed and track attendance.
	24 Provide EnviroScape® watershed models for community use.	Foster nonpoint source pollution and water quality awareness in community.	MSD	Provide opportunity to increase awareness and positive behavior change.	Target 50 presentations, maintain reservation tracking database, and record presentations.	Target 50 presentations, maintain reservation tracking database, and record presentations.	Target 50 presentations, maintain reservation tracking database, and record presentations.	Target 50 presentations, maintain reservation tracking database, and record presentations.	Target 50 presentations, maintain reservation tracking database, and record presentations.	Track number of presentations completed.
	25 Provide storm drain marker instructions and equipment to citizen volunteers.	Foster nonpoint source pollution and water quality awareness in community.	MSD	Provide opportunity to increase awareness and positive behavior change.	Target 500 markers applied and record how many projects completed (markers and door hangers).	Target 500 markers applied and record how many projects completed (markers and door hangers).	Target 500 markers applied and record how many projects completed (markers and door hangers).	Target 500 markers applied and record how many projects completed (markers and door hangers).	Target 500 markers applied and record how many projects completed (markers and door hangers).	Track number of markers and door hangers placed.
	26 Develop storm drain marking GIS map.	Maintain map of marked inlets.	MSD	Provide tool to facilitate participation opportunities.	Develop GIS map layer, develop mapping procedures, record labeled inlets (new and from available past records).	Maintain GIS map layer and record labeled inlets.	Maintain GIS map layer and record labeled inlets.	Maintain GIS map layer and record labeled inlets.	Maintain GIS map layer and record labeled inlets.	GIS map layer completed for use to direct public where they can label inlets.
	27 Provide resources, as available, to citizen volunteer organizations that promote green infrastructure and other healthy water programming.	Foster nonpoint source pollution and water quality awareness in community.	MSD	Provide tools to facilitate education, increase awareness, and positive behavior change.	Develop resource library of existing material (i.e., BMP O&M series brochures, websites). Distribute education material upon request via presentations/information booths and mailings. Record what, when, and who material distributed to.	Update resource library of existing material (i.e., BMP O&M series brochures, websites). Distribute education material upon request via presentations/information booths and mailings. Record what, when, and who material distributed to.	Update resource library of existing material (i.e., BMP O&M series brochures, websites). Distribute education material upon request via presentations/information booths and mailings. Record what, when, and who material distributed to.	Update resource library of existing material (i.e., BMP O&M series brochures, websites). Distribute education material upon request via presentations/information booths and mailings. Record what, when, and who material distributed to.	Update resource library of existing material (i.e., BMP O&M series brochures, websites). Distribute education material upon request via presentations/information booths and mailings. Record what, when, and who material distributed to.	Resource library completed and track number of material distributed.

## **Minimum Control Measure Number 3, Illicit Discharge Detection and Elimination (MCM3)**

### **A. Permit Requirements**

Section 4.2.3.1 of the 2016 Permit requires the permittee to develop, implement, and enforce a program to detect and eliminate illicit discharges, as defined in 10 CSR 20-6.200 and 40 CFR 122.34(b)(3), into the permittee's regulated Small MS4. As part of the SWMP document, the permittee's illicit discharge detection and elimination program shall include the development and implementation of, at a minimum:

- 4.2.3.1.1 A storm sewer map showing the location of all constructed outfalls and the names and locations of all receiving waters of the state that receive discharges from those outfalls. The permittee shall describe the sources of information used for the map(s), and how the permittee plans to verify the outfall locations with field surveys. If already completed, the permittee shall describe how the map was developed and how the map will be regularly updated. The permittee shall make the map information available to the Department upon request;
- 4.2.3.1.2 To the extent allowable under state or local law an effective prohibition, through ordinance or other regulatory mechanism, of non-stormwater discharges into the permittee's storm sewer system and implementation of appropriate enforcement procedures and actions. The permittee shall identify the mechanism (ordinance or other regulatory mechanism) the permittee will use to effectively prohibit illicit discharges into the Small MS4. If the permittee needs to develop this mechanism, describe the permittee's plan and implementation schedule. If the permittee's ordinance or regulatory mechanism is already developed, include a copy of the relevant sections with the permittee's SWMP;
- 4.2.3.1.3 A plan and implementation schedule to detect and address non-stormwater discharges, including discharges from illegal dumping and spills, to the permittee's system;
- 4.2.3.1.4 A dry weather field screening plan for non-stormwater flows and field tests of selected chemical parameters as indicators of discharge sources. The plan shall also address on-site sewage

- disposal systems that flow into the permittee's storm drainage system;
- 4.2.3.1.5 Procedures for locating priority areas which include areas with higher likelihood of illicit connections (e.g., areas with older sanitary sewer lines) or ambient sampling to locate impacted reaches;
- 4.2.3.1.6 Procedures for tracing the source of an illicit discharge, including the specific techniques the permittee will use to detect the location of the source;
- 4.2.3.1.7 Procedure for eliminating the illicit discharge;
- 4.2.3.1.8 A plan to ensure through appropriate enforcement procedures, including fines, and actions that the permittee's illicit discharge ordinance (or other regulatory mechanism) is implemented;
- 4.2.3.1.9 A plan to inform public employees, businesses and the general public of hazards associated with illegal discharges and improper disposal of waste. The permittee shall describe how this plan will coordinate with all other minimum control measures, monitoring, and TMDL implementation (if applicable);
- 4.2.3.1.10 A plan to address non-stormwater discharges or flows (i.e., illicit discharges) the permittee identifies as significant contributors of pollutants to the regulated Small MS4 including authorized non-stormwater discharges contained in Section 1.2.2.2 of the permit.<sup>1</sup>

## **B. Applicability**

An illicit discharge is any discharge to the stormwater system that is not composed entirely of stormwater, except for discharges pursuant to a state operating permit,

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<sup>1</sup> The permittee is authorized to discharge the non-stormwater sources provided the permitting authority has not determined these sources to be substantial contributors of pollutants to the permittee's MS4 that required a separate permit. These include landscape irrigation and lawn watering; rising groundwater; uncontaminated groundwater infiltration (infiltration is defined as water other than wastewater that enters a sewer system, including sewer service connections and foundation drains, from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow); uncontaminated pumped groundwater; discharges from potable water sources; foundation or footing drains; air conditioning condensate; springs; uncontaminated water from crawl space pumps; flows from riparian habitat and wetlands; street wash water; discharges or flows from emergency fire-fighting activities; individual residential car washing; and dechlorinated residential swimming pool discharges.

other than stormwater discharge permits and discharges from firefighting activities.<sup>2</sup>  
An illicit discharge or connection may result from:

- Illegal dumping practice (i.e., improper disposal of waste).
- A direct connection from the sanitary sewer to the storm sewer.
- Indirect connection from improper surface discharges to the storm sewer (i.e., hosing down outdoor areas on a parking lot or other impervious surface).

### **C. Stormwater System**

The stormwater system within the MSD service area consists of man-made facilities, structures, and natural watercourses used for collecting and conducting stormwater to, through and from drainage areas to the points of final outlet including, but not limited to, any and all of the following: sewers, pipes, inlets, conduits and appurtenant features, canals, creeks, channels, catch basins, ditches, streams, rivers, gulches, gullies, flumes, culverts, siphons, retention or detention basins, dams, floodwalls, levees, and pumping stations.<sup>3</sup> MSD maps the entire stormwater system using a geographic information system (GIS).

### **D. Enforcement**

MSD utilizes provisions in its sewer use ordinances to prohibit illicit discharges into the stormwater system. MSD Ordinance No. 12559 adopted December 13, 2007, is used as the legal enforcement tool to control such discharges.

### **E. BMP Development**

Specific illicit discharge detection and elimination best management practices are presented in Table 5.

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<sup>2</sup> 10 CSR 20-6.200(1)(A)(C)7

<sup>3</sup> As defined by MSD Ordinance 14393.

Table 5

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.3.1.1	28 Maintain GIS system showing constructed MS4 outfalls and receiving streams.	View outfalls in plan area watersheds.	MSD	Permit compliance.	Maintain map of constructed outfalls on GIS.	Maintain map of constructed outfalls on GIS.	Maintain map of constructed outfalls on GIS.	Maintain map of constructed outfalls on GIS.	Maintain map of constructed outfalls on GIS.	Constructed outfalls mapped.
	29 Use map update work orders to track any modifications to the sewer map.	Keep current information on storm sewer system in plan area watersheds	MSD	Permit compliance.	Maintain work order records of map updates.	Maintain work order records of map updates.	Maintain work order records of map updates.	Maintain work order records of map updates.	Maintain work order records of map updates.	Maps updates completed through work orders.
4.2.3.1.2	30 Enforce MSD ordinance 12559, and other ordinances as required.	Provides MSD legal authority to address illicit discharges.	MSD	Permit compliance.	Enforce MSD Ordinance. Record enforcement actions.	Enforce MSD Ordinance. Record enforcement actions.	Enforce MSD Ordinance. Record enforcement actions.	Enforce MSD Ordinance. Record enforcement actions.	Enforce MSD Ordinance. Record enforcement actions.	Ordinance developed and enforced. Track number of enforcement actions.
4.2.3.1.3	31 Survey all natural channels identified on stormwater GIS map once per 5 years.	Detect and eliminate illicit discharges.	MSD	Identify illicit discharges and take enforcement action as necessary.	Survey 280 miles of storm channels for illicit discharges. Record mileage, findings, and resolutions.	Survey 280 miles of storm channels for illicit discharges. Record mileage, findings, and resolutions.	Survey 280 miles of storm channels for illicit discharges. Record mileage, findings, and resolutions.	Survey 280 miles of storm channels for illicit discharges. Record mileage, findings, and resolutions.	Survey 280 miles of storm channels for illicit discharges. Record mileage, findings, and resolutions.	Track mileage, findings from surveys, and resolutions.
	32 Respond to reports of illegal dumping.	Detect and eliminate illicit discharges .	MSD	Identify illicit discharges and take enforcement action as necessary.	Respond to customer complaints in accordance with the effective version of MSD's SOP for Customer Sewer Maintenance Requests.	Respond to customer complaints in accordance with the effective version of MSD's SOP for Customer Sewer Maintenance Requests.	Respond to customer complaints in accordance with the effective version of MSD's SOP for Customer Sewer Maintenance Requests.	Respond to customer complaints in accordance with the effective version of MSD's SOP for Customer Sewer Maintenance Requests.	Respond to customer complaints in accordance with the effective version of MSD's SOP for Customer Sewer Maintenance Requests.	Track service requests, work orders, and resolutions. Initial response times comply with policy at least 90% of the occurrences.
4.2.3.1.4	33 Maintain operating procedures for field testing and surveying to help identify chemicals indicative of illicit discharge.	Field screening provides for timely and efficient illicit source identification and elimination.	MSD	Provide tools to identify illicit discharges and take enforcement action as necessary.	Maintain field screening plan.	Maintain field screening plan.	Maintain field screening plan.	Maintain field screening plan.	Maintain field screening plan. Review and revise plan as needed.	Standard operating procedures completed and update as needed.
4.2.3.1.5	34 Maintain and annually review findings from channel surveys. Previous findings inspected.	Identify priority areas for potential monitoring and followup.	MSD	Ensures there is followup on potential sources.	Review findings and inspect each as necessary to ensure 1-in-5 year frequency is achieved.	Review findings and inspect each as necessary to ensure 1-in-5 year frequency is achieved.	Review findings and inspect each as necessary to ensure 1-in-5 year frequency is achieved.	Review findings and inspect each as necessary to ensure 1-in-5 year frequency is achieved.	Review findings and inspect each as necessary to ensure 1-in-5 year frequency is achieved.	Annual review of all findings. All finding areas inspected 1-in-5 years, minimum.
	35 Review representative water quality data collected by MSD to prioritize investigation areas.	Use the water quality data that MSD collects to identify sources.	MSD	Identify reaches that are affected by sources. Allows development of a plan for sources.	None	Review water quality data and provide summary report comparing data to channel inspection findings, for 2017 WQ data.	Review water quality data and provide summary report comparing data to channel inspection findings, for 2018 WQ data.	Review water quality data and provide summary report comparing data to channel inspection findings, for 2019 WQ data.	Review water quality data and provide summary report comparing data to channel inspection findings, for 2020 WQ data.	Report submitted and filed.
	36 Develop a tabular database and GIS layer of areas that may utilize individual sewage disposal systems (i.e., septic tanks).	Have a database of areas with individual sewage disposal systems that could be used to assist illicit discharge investigations	All	Efficiently complete illicit discharge investigations	None	Identify possible files, databases, or other information that could contain such information.	Using GIS, identify possible areas for investigation.	Using GIS, identify possible areas for investigation.	None	Database developed.



Table 5

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.3.1.5	37 Develop a tabular database and GIS layer of properties that have participated in the sewer lateral repair program.	Have a database of properties that have participated in the sewer lateral repair program that could be used to assist illicit discharge investigations	All	Efficiently complete illicit discharge investigations	None	None	None	Using GIS, review and survey existing plan area data sources.	Using GIS, review and survey existing plan area data sources.	Database developed.
4.2.3.1.6	38 Maintain operating procedures for tracing illicit discharges from public sewer system.	Timely detect and eliminate illicit discharges within entire plan area	MSD	Have tools to identify illicit discharges and take enforcement action as necessary.	Maintain and implement standard operating procedures.	Maintain and implement standard operating procedures.	Maintain and implement standard operating procedures.	Maintain and implement standard operating procedures.	Maintain and implement standard operating procedures.	Standard operating procedures completed and updated as needed.
4.2.3.1.7	39 Maintain operating procedures for eliminating illicit discharges	Timely elimination of illicit discharges	MSD	Identify illicit discharges and take enforcement action as necessary.	Maintain and implement standard operating procedures. Report number of illicit discharges, resolved and outstanding.	Maintain and implement standard operating procedures. Report number of illicit discharges, resolved and outstanding.	Maintain and implement standard operating procedures. Report number of illicit discharges, resolved and outstanding.	Maintain and implement standard operating procedures. Report number of illicit discharges, resolved and outstanding.	Maintain and implement standard operating procedures. Report number of illicit discharges, resolved and outstanding. Revise procedures as needed.	Track number of illicit discharges, resolved and outstanding. Standard operating procedures completed and updated as needed.
4.2.3.1.8	40 Maintain enforcement plan for addressing illicit discharges.	Timely elimination of illicit discharges.	MSD	Identify illicit discharges and take enforcement action as necessary.	Maintain and implement ordinance.	Maintain and implement ordinance.	Maintain and implement ordinance.	Maintain and implement ordinance.	Maintain and implement ordinance.	SOP completed and updated as needed.
4.2.3.1.9	41 Maintain and distribute brochures, door hangers, and other communication tools that inform about hazards associated with illegal discharges and improper disposal of waste.	Foster stormwater nonpoint source pollution awareness and behavior change in community.	MSD	Provide education and increase awareness and positive behavior change.	Record location and number of brochures and door hangers provided as part of illicit discharge investigations.	Record location and number of brochures and door hangers provided as part of illicit discharge investigations.	Record location and number of brochures and door hangers provided as part of illicit discharge investigations.	Record location and number of brochures and door hangers provided as part of illicit discharge investigations.	Record location and number of brochures and door hangers provided as part of illicit discharge investigations.	Number of educational material tracked. Analyze MCM1 education survey.
					None	Review "location and numbers" to determine if modifications to MCM 1 activities is needed.	None	None	Review "where and numbers" to determine if modification to MCM 1 activities is needed.	Number of educational material tracked. Analyze MCM1 education survey.
4.2.3.1.10	42 Provide public outreach communications tools (brochures, etc.) to sources of non-stormwater discharge that could be substantial contributors of pollutants into the MS4, such as street cleaning, residential car washing, and residential swimming pools	Foster stormwater NPS pollution awareness and behavior change in community	MSD	Provide education and increase awareness and positive behavior change	Record location and number of brochures and door hangers provided as part of IDD investigations.	Record location and number of brochures and door hangers provided as part of IDD investigations.	Record location and number of brochures and door hangers provided as part of IDD investigations.	Record location and number of brochures and door hangers provided as part of IDD investigations.	Record location and number of brochures and door hangers provided as part of IDD investigations.	Number of educational material tracked. Analyze MCM1 education survey.

## **Minimum Control Measure Number 4, Construction Site Stormwater Runoff Control (MCM4)**

### **A. Permit Requirements**

Section 4.2.4.1 of the 2016 Permit requires the permittee to develop, implement and enforce a program to reduce pollutants in any stormwater runoff to their regulated Small MS4 from construction activities that result in land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activity disturbing less than one acre shall be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. As part of the SWMP, the permittee's construction site stormwater runoff control program shall include the development and implementation of, at a minimum:

- 4.2.4.1.1 An ordinance or other regulatory mechanism to require operators to implement erosion and sediment control BMPs at construction sites; to include sanctions designed to ensure compliance, to the extent allowable under state or local law; and
- 4.2.4.1.1.1 If the permittee needs to develop this mechanism, the permittee shall describe the plan and scheduled implementation. If the permittee's ordinance or regulatory mechanism is already developed, the permittee shall include a copy of the relevant sections with the permittee's SWMP.
- 4.2.4.1.2 Requirements for construction site operators to control construction-site waste that may cause adverse impacts to water quality, such as discarded building materials, concrete truck washout, chemicals, litter and sanitary waste;
- 4.2.4.1.3 Procedures for the permittee to consider and review all pre-construction site plans for potential water quality impacts;
- 4.2.4.1.4 Procedures for the permittee receive and consider information submitted by the public, including coordination with the permittee's public education and involvement programs;
- 4.2.4.1.5 Procedures for the permittee to inspect sites and enforce control measures, including prioritization of site inspection; and
- 4.2.4.1.5.1 The permittee shall inspect (or require inspection of) any structure that functions to prevent pollution of stormwater or to remove pollutants from stormwater and ensure that all BMPs

are implemented and effective; and a monitoring plan with implementation schedules shall be referenced in the SWMP document.

- 4.2.4.1.6 A plan designed to ensure compliance with the permittee's erosion and sediment control regulatory mechanism, including the sanctions and enforcement mechanisms the permittee will use to ensure compliance and procedures for when certain sanctions will be used. Possible sanctions include non-monetary penalties (such as stop work orders), fines, bonding requirements, and/or permit denials for non-compliance.

### **B. Applicability**

Within the Plan Area, construction and land disturbance activities are performed by private entities, as well as by MSD, St. Louis County, and many of the municipal co-permittees. Land disturbance activities conducted by the co-permittees are handled in-house or with the use of a contractor.

As a result of the first Phase II permit, each Plan Area co-permittee has amended its existing construction and land disturbance program or developed a new program (Appendix C), which includes adoption of appropriate Phase II compliant policies, procedures, and ordinances to reduce pollutants from construction activities that result in a land disturbance of equal to or greater than 1 acre in size. Activities conducted by private entities are subject to the land disturbance permitting requirements of the co-permittee, depending upon the governmental jurisdiction within which the site is located. In addition to any local approvals, every construction site operator must also obtain a separate MDNR permit for any land disturbance activities affecting an area of one acre or more. Regardless of the status of local approvals, land disturbance activities on such sites may not commence prior to the issuance of a state land disturbance permit.

### **C. Municipality Implementation Options**

Each incorporated municipality has the authority and responsibility to perform construction permitting and inspection services as a basic element of the police powers afforded municipal governments in Missouri. Each has implemented a Phase II compliance land disturbance program to regulate construction within their jurisdiction.

Some municipalities provide full permitting and inspection services with their own resources. These municipalities have implemented the project reviews, permitting,

inspection, complaint response, and other activities needed to implement the permit's land disturbance program.

A second option many municipalities have taken is to adopt St. Louis County's ordinance and contract with St. Louis County for Code Enforcement. The County contracts for permitting (including plan review and construction authorization documents) and code enforcement, including periodic and critical event inspections. The County contract requires the construction site operator to gain zoning approval from the municipality for a project before a county permit is issued. In addition, the municipality issues its final occupancy permits only after the Department of Public Works has completed all construction inspections. In all cases the ordinance authority and any penalties for non-compliance are the responsibility and authority of the individual municipal governments.

#### **D. BMP Development**

Specific construction site stormwater runoff control best management practices are presented in Table 6.

Table 6

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.4.1.1	43 Maintain list of regulatory mechanisms and active land disturbance programs.	Ensure co-permittee land disturbance programs are implemented.	MSD	Permit compliance.	Record each copermittees ordinance or other regulatory mechanism.	Record each copermittees ordinance or other regulatory mechanism.	Record each copermittees ordinance or other regulatory mechanism.	Record each copermittees ordinance or other regulatory mechanism.	Record each copermittees ordinance or other regulatory mechanism.	Track number of copermittees programs.
4.2.4.1.1.1	44 Verify regulatory authority.	Ensure existing co-permittee land disturbance programs have authority.	MSD	Permit compliance	Record each copermittees ordinance or other regulatory mechanism in the SWMP.	Record each copermittees ordinance or other regulatory mechanism in the SWMP.	Record each copermittees ordinance or other regulatory mechanism in the SWMP.	Record each copermittees ordinance or other regulatory mechanism in the SWMP.	Record each copermittees ordinance or other regulatory mechanism in the SWMP.	Track copermittees programs information. See Appendix C
4.2.4.1.2	45 Maintain written procedures and guidance materials for operators to follow.	Prevent land disturbance related waste from leaving the land disturbance area.	St. Louis County and Municipalities	Waste sources contained by BMPs	Record each copermittees written procedure	Record each copermittees written procedure	Record each copermittees written procedure	Record each copermittees written procedure	Record each copermittees written procedure	Track procedures completed.
4.2.4.1.3	46 Maintain written procedures and guidance materials for permittees to follow.	Require development pre-construction planning See also MCM5.	St. Louis County and Municipalities	Appropriate sediment and erosion BMPs installed	Record each copermittees written procedure	Record each copermittees written procedure	Record each copermittees written procedure	Record each copermittees written procedure	Record each copermittees written procedure	Track procedures completed.
4.2.4.1.4	47 Maintain written procedures to receive (i.e., public complaint hotline) respond to, and track public inquiries and complaints.	Provide timely customer response to complaints from land disturbance related waste leaving the land disturbance area.	St. Louis County and Municipalities	Permittees will follow procedures to ensure timely and appropriate responses.	Notification to start recording each copermittees complaints/follow-up written procedure name in year 2	Record each copermittees complaints/follow-up written procedure name	Record each copermittees complaints/follow-up written procedure name	Record each copermittees complaints/follow-up written procedure name	Record each copermittees complaints/follow-up written procedure name	Track procedures completed.
				Reduce pollution leaving site by demonstrating timely response occurred.	Notification to start recording each copermittees number of complaints and follow-up actions in year 2	Record each copermittees number of complaints and follow-up actions	Record each copermittees number of complaints and follow-up actions	Record each copermittees number of complaints and follow-up actions	Record each copermittees number of complaints and follow-up actions	Track number of copermittees complaint investigations (formal and informal).
	Maintain written procedures to receive (i.e., public complaint hotline) respond to, and track public inquiries and complaints.	Provide timely customer response to complaints from land disturbance related waste leaving the land disturbance area.	MSD	Reduce pollution leaving site by demonstrating timely response occurred.	Record number of findings, complaints, and response actions	Record number of findings, complaints, and response actions	Record number of findings, complaints, and response actions	Record number of findings, complaints, and response actions	Record number of findings, complaints, and response actions	Track number of MSD MCM3 land disturbance findings. See also MCM3

Table 6

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.4.1.5	48 Maintain written procedures and checklists for permittees to follow during SWPPP inspections.	To ensure BMPs properly installed and maintained.	St. Louis County and Municipalities	St. Louis County and municipalities will inspect that appropriate sediment and erosion BMPs are installed.	Record each copermitees written procedure and checklist.	Record each copermitees written procedure and checklist.	Record each copermitees written procedure and checklist.	Record each copermitees written procedure and checklist.	Record each copermitees written procedure and checklist.	Track procedures completed.
4.2.4.1.5.1	49 Inspect land disturbance sites and as specified in land disturbance program ordinance.	To ensure BMPs properly installed and maintained.	St. Louis County and Municipalities	St. Louis County and municipalities will inspect that appropriate sediment and erosion BMPs are installed.	Notification to start recording each copermitees number of inspections at each active land disturbance site in year 2.	Record each copermitees number of inspections at each active land disturbance site.	Record each copermitees number of inspections at each active land disturbance site.	Record each copermitees number of inspections at each active land disturbance site.	Record each copermitees number of inspections at each active land disturbance site.	Inspection records support program compliance.
4.2.4.1.6	50 Maintain written procedures for enforcement actions.	Provide authority to implement program.	St. Louis County and Municipalities	St. Louis County and municipalities will follow enforcement procedures when needed.	Record each copermitees number of formal enforcements. Notification to include informal actions in year 2.	Record each copermitees number of informal and formal enforcements.	Record each copermitees number of informal and formal enforcements.	Record each copermitees number of informal and formal enforcements.	Record each copermitees number of informal and formal enforcements.	Track number of informal and formal enforcements

# Minimum Control Measure Number 5, Post-Construction Stormwater Management in New Development and Redevelopment (MCM5)

## A. Permit Requirements

Section 4.2.5.1 of the 2016 Permit requires the permittee to develop, implement and enforce a program to address the quality of long-term stormwater runoff from new development and redevelopment projects that disturb equal to and greater than one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the permittee's regulated Small MS4. The permittee's program shall ensure that controls are in place that have been designed and implemented to prevent or minimize water quality impacts. As part of the SWMP document, the post-construction runoff control program shall include the following information, at a minimum:

- 4.2.5.1.1 An ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under state or local law. If the permittee needs to develop a mechanism, the permittee shall describe the plan and a schedule for implementation. If the permittee's ordinance or regulatory mechanism is already developed, the permittee shall include a copy of the relevant sections with the SWMP document;
- 4.2.5.1.2 A plan to ensure adequate long-term operation and maintenance of selected BMPs, including, as appropriate, types of agreements between the permittee and other parties such as post-development landowners or regional authorities;
- 4.2.5.1.3 Strategies to minimize water quality impacts, which include a combination of structural and/or non-structural BMPs appropriate for the permittee's community, including but not limited to the assessment of site characteristics at the beginning of the construction site design phase to ensure adequate planning for stormwater program compliance. The goal of this approach is to arrive at designs that protect sensitive areas, minimize the creation of stormwater pollution, and utilize BMPs that effectively remove stormwater pollution. This can be achieved by reasonably mimicking pre-construction runoff conditions on all affected new development

- projects, or the permittee may achieve this goal through a method more appropriate for its community;
- 4.2.5.1.4 An inspection plan with implementation schedules for post-construction BMPs;
- 4.2.5.1.5 The permittee shall inspect or require the inspection of post-construction stormwater BMPs to ensure that all BMPs are implemented and effective.

## **B. BMP Development**

Both structural and non-structural BMPs have a role in effectively addressing stream impairment and water quality. A milestone activity of the SWMP will be to continue implementing Plan Area wide requirements for stormwater facilities on development projects over 1 acre. MSD requires all stormwater facilities to be provided and designed in accordance with provisions contained in the “Rules and Regulations and Engineering Design Requirements for Sanitary Sewer and Stormwater Drainage Facilities,” as amended. These Rules and Regulations include requirements for BMPs for stormwater control and watershed protection to be incorporated into the project design. These rules and regulations are implemented under the authority of MSD Ordinance 9030, and the Rules and Regulations implementing the Phase II BMPs were adopted by the MSD Board of Trustees in Resolution 2630. The Rules and Regulations include stormwater design criteria for:

- Water quality treatment of the project disturbed area, or equivalent, using the 90<sup>th</sup> percentile daily rainfall depth or continuous simulation modeling indicating 90% of all annual rainfall is treated by the BMP.
- Reducing runoff volume to pre-construction levels on new development sites. New development sites include those with less than 20% impervious area and/or where prior land use activities have not impaired the site and utilization of natural processes like infiltration are still possible. A BMP’s ability to adequately reduce runoff is assessed based on average annual rainfall or continuous simulation modeling over a typical year. Runoff is defined as water discharged to the MS4 by overflow (bypass) and/or by underdrain piping (e.g., treated water that does not infiltrate).
- Extended detention storage and release of the 1-year 24-hour storm to reduce channel erosion, as appropriate for the site.



MSD applies these water quality design criteria on projects within the Plan Area that discharge to waters of the state or drainage areas tributary to a stormwater outlet.

MSD applies the water quality design criteria on projects within the flood control levee MSDs. Projects located within flood control levee MSDs may utilize regional water quality plans approved by MSD. These regional plans may adopt a modified 3-pronged approach: at the source, in master channels, and in flood storage basin structures, as reviewed and responded to by MDNR in a letter dated May 10, 2011.

To be considered an effective BMP for stand-alone treatment of the water quality volume, the BMP shall demonstrate a minimum removal efficiency of 80% total suspended solids and have an acceptable longevity rate in the field (i.e., be maintainable). MSD maintains an online BMP Toolbox on its website for developers and engineers who submit post-construction BMP plans to MSD and co-permittees. The Toolbox helps navigate a user through the technical and procedural paths to post-construction stormwater BMPs design, installation and maintenance.

MSD, St. Louis County, and the Plan Area municipalities will continue to approve development plans only after ensuring the development meets all applicable requirements. St. Louis County and municipalities enforce ordinances related to land use BMPs in their planning and zoning function. St. Louis County and each municipality has implemented procedures to ensure that all applicable private and public development projects involving stormwater management are reviewed and approved by MSD. MSD enforces sewer and drainage design requirements mandating structural and non-structural post-construction BMPs. MSD will continue to issue permits for and inspect the construction of all structural BMPs.

An executed maintenance agreement is required with all projects where BMPs are required to comply with the permit, and where MSD is not performing BMP maintenance. All structural BMPs located on private property (i.e., all parcels that are assigned a locator identification number by the St. Louis County assessor's office) will be maintained by the property owner(s), and MSD will enforce the maintenance through a Maintenance Agreement that is recorded with the property deed. MSD will also require a maintenance agreement be executed for BMPs located within right-of-way and for which MSD is not performing routine maintenance, although these agreements cannot be recorded with the right-of-way property.

MSD maintains responsibility under the Plan to ensure BMPs are maintained and MSD will continue to inspect BMPs to ensure adequate operation. MSD has enforcement authority to ensure owners maintain their post construction BMPs in MSD Ordinance 12559, Article IV, Part C. MSD BMP inspections will be conducted at a minimum of once every three years for each BMP, or an alternate frequency deemed appropriate for the BMP type, and MSD will continue enforcement compliance using MSD Ordinance 12559.

Specific best management practices for post-construction stormwater management in new development and redevelopment are presented Table 7.

Table 7

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.5.1.1	51 Follow MSD ordinances 9030 and 12559, MSD Rules and Regulations, and County and Municipal Ordinances.	Requires developers and plan reviewers to implement appropriate strategies and controls to address post-construction run-off.	MSD	New and redevelopment projects that disturb greater than or equal to one acre will implement BMPs.	Implement Ordinance and Design Rules.	Implement Ordinance and Design Rules.	Implement Ordinance and Design Rules.	Implement Ordinance and Design Rules.	Implement Ordinance and Design Rules.	Ordinance and Design Rules completed and implemented.
			St. Louis County and Municipalities	New and redevelopment projects that disturb greater than or equal to one acre will implement BMPs.	Implement ordinance to regulate and enforce post-construction strategies.	Implement ordinance to regulate and enforce post-construction strategies.	Implement ordinance to regulate and enforce post-construction strategies.	Implement ordinance to regulate and enforce post-construction strategies.	Implement ordinance to regulate and enforce post-construction strategies.	Ordinance completed and implemented.
4.2.5.1.2	52 Follow plan review process for executing maintenance agreements environmental compliance inspection process for long term maintenance.	To ensure long-term operation of BMPs.	MSD	BMPs will function correctly.	Develop and Implement maintenance agreement for each project, unless BMP maintained by MSD.	Develop and Implement maintenance agreement for each project, unless BMP maintained by MSD.	Develop and Implement maintenance agreement for each project, unless BMP maintained by MSD.	Develop and Implement maintenance agreement for each project, unless BMP maintained by MSD.	Develop and Implement maintenance agreement for each project, unless BMP maintained by MSD.	All MSD approved projects, with BMPs that are not maintained by MSD, have maintenance agreement. Annual internal review of 5 projects.
					Implement MSD BMP Enforcement and Response Plan.	Update & implement MSD BMP Enforcement and Response Plan.	Implement MSD BMP Enforcement and Response Plan.	Implement MSD BMP Enforcement and Response Plan.	Implement MSD BMP Enforcement and Response Plan.	Plan updated. See below for description of metrics used.
4.2.5.1.3	53 Utilize matrix of BMPs on BMP toolbox. Maintain existing strategies	Requires developments to implement appropriate strategies and controls to address post-construction run-off.	MSD	Implement BMPs to MEP.	Developments will utilize BMPs and design requirements as listed on the BMP toolbox. List water quality (WQ) and channel protection (CPv) requirements.	Update BMP toolkit, as needed. Developments will utilize BMPs and design requirements as listed on the BMP toolbox. List WQ and CPv requirements.	Developments will utilize BMPs and design requirements as listed on the BMP toolbox. List WQ and CPv requirements.	Developments will utilize BMPs and design requirements as listed on the BMP toolbox. List WQ and CPv requirements.	Developments will utilize BMPs and design requirements as listed on the BMP toolbox. List WQ and CPv requirements.	Development projects follow rules. Toolbox is complete and updated as needed. Annual internal review of 5 projects.
					54 Copermittees will review and update parking ordinances and/or policies, as needed	Reduce impervious parking areas and reduce barriers to incorporating green infrastructure into parking areas.	Ballwin, Bellefontaine Neighbors, Black Jack, Bridgeton, Chesterfield, Creve Coeur, Des Peres, Ellisville, Fenton, Frontenac, Kirkwood, Ladue, Manchester, Maryland Heights, Olivette, Overland, Sunset Hills, St. Louis County, Town and Country, Wildwood	Optimize use of impervious areas in parking	None	None

Table 7

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria	
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021		
4.2.5.1.3	55	Maintain optional conceptual review process.	Provides developers with plan review assessment of appropriate strategies and controls to address post-construction run-off.	MSD	Identify opportunities for water quality protection early in the development project planning phase.	Record number of developments that are charged for utilizing the conceptual review service.	Record number of developments that are charged for utilizing the conceptual review service.	Record number of developments that are charged for utilizing the conceptual review service.	Record number of developments that are charged for utilizing the conceptual review service.	Record number of developments that are charged for utilizing the conceptual review service.	Number of conceptual reviews.
	56	Site Design Guide Available	Provide developers and plan reviewers a way to implement BMP	MSD	Protect sensitive areas, minimize stormwater pollution, and utilize effective BMPs.	Site Design Guidance document available.	Site Design Guidance document available.	Site Design Guidance document available.	Site Design Guidance document available.	Site Design Guidance document available.	Site Design Guidance available for public use.
	57	Use pre-condition assessment with early stage project planning.	Requires developers and permittees to assess conditions early.	All	Protect sensitive areas, minimize stormwater pollution, and utilize effective BMPs.	Have process requiring pre-construction planning by MSD Site Design Guidance or equivalent procedure.	Have process requiring pre-construction planning by MSD Site Design Guidance or equivalent procedure.	Have process requiring pre-construction planning by MSD Site Design Guidance or equivalent procedure.	Have process requiring pre-construction planning by MSD Site Design Guidance or equivalent procedure.	Have process requiring pre-construction planning by MSD Site Design Guidance or equivalent procedure.	Process available, process used. Annual (starting in year 2) review audit of up to 5 projects.
4.2.5.1.4 & 4.2.5.1.5	58	Inspect all water quality BMPs and use key performance indicators to demonstrate compliance.	To ensure long-term operation of BMPs.	MSD	BMPs constructed and maintained to function properly.	Implement construction inspection requirements, as defined in rules and regulations.	Implement construction inspection requirements, as defined in rules and regulations.	Implement construction inspection requirements, as defined in rules and regulations.	Implement construction inspection requirements, as defined in rules and regulations.	Implement construction inspection requirements, as defined in rules and regulations.	Annual internal review of 4 projects.
						Schedule and track BMP three year inspections.	Schedule and track BMP three year inspections.	Schedule and track BMP three year inspections.	Schedule and track BMP three year inspections.	Schedule and track BMP three year inspections.	All BMPs are inspected once per 3 years, minimum.
						Implement Enforcement Response Plan and track number of BMP enforcement actions	Implement Enforcement Response Plan and track number of BMP enforcement actions	Implement Enforcement Response Plan and track number of BMP enforcement actions	Implement Enforcement Response Plan and track number of BMP enforcement actions	Implement Enforcement Response Plan and track number of BMP enforcement actions	Report number of enforcement actions taken. Enforcement action taken within 45 days of notice of problem, 90% of the time.
						Require and track BMP owner annual reports	Require and track BMP owner annual reports	Require and track BMP owner annual reports	Require and track BMP owner annual reports	Require and track BMP owner annual reports	Report number of annual reports received and outstanding.

# **Minimum Control Measure Number 6, Pollution Prevention Good Housekeeping for Municipal Operations (MCM6)**

## **A. Permit Requirements**

Section 4.2.6.1 of the small MS4 general permit requires the permittee to develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. As part of the SWMP, the pollution prevention/good housekeeping program shall include the following information, at a minimum:

- 4.2.6.1.1 A government employee training program to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance. The permittee shall describe any existing, available material the permittee plans to use such as those available from EPA, the state, or other organizations. The permittee shall describe how this plan will coordinate with all other minimum control measures, monitoring and TMDL implementations where applicable;
- 4.2.6.1.2 A list of all municipal operations that are impacted by this operation and maintenance program. The permittee shall also include a list of industrial facilities that the permittee owns or operates that are subject to NPDES permits for discharges of stormwater associated with industrial activity that ultimately discharge to the permittee's MS4. The permittee shall include the permit number or a copy of the No Exposure Exemption Certification (if applicable) for each facility. NPDES permitted facilities not owned or operated by the permittee are not required to be part of the list;
- 4.2.6.1.3 Maintenance BMPs, maintenance schedules, and long-term inspection procedures for controls to reduce floatable and other pollutants to the permittee's regulated Small MS4;
- 4.2.6.1.4 Controls for reducing or eliminating the discharge of pollutants from street, roads, highways, municipal parking lots, maintenance and storage yards, waste transfer station, fleet or maintenance shops with outdoor storage areas, and salt/sand

- storage locations and snow disposal areas the permittee operates;
- 4.2.6.1.5 Procedures for the proper disposal of waste removed from the permittee's Small MS4 and areas of jurisdiction, including dredged material, accumulated sediments, floatables and other debris;
- 4.2.6.1.6 Procedures to assess impacts of water quality for new flood management projects, if applicable. Flood management projects are those projects developed or designed to reduce flooding.
- 4.2.6.2 All paints, solvents, petroleum products and petroleum waste products (except fuels) under the control of the permittee shall be stored so that these materials are not exposed to stormwater. Sufficient practices of spill prevention, control, and/or management shall be provided to prevent any spill of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.

## **B. BMP Development**

The scope of municipal operations varies widely among the 60 entities involved in this SWMP. Municipal operations range from very small municipalities, having no municipal facilities other than a few blocks of local streets, to the county government, having responsibility for regional highways, parks, high rise municipal buildings, major construction activities, fleet maintenance operations, airport and all the other various operations of a major county government. Because of this broad variation in activities, selection of appropriate BMPs to satisfy the permit requirements will vary considerably among the co-permittees. Training programs will be similarly varied. Each co-permittee identified and listed their operations that are impacted by the MS4 permit requirements referenced in Section A above and have supplied the required information as part of their MS4 permit application. Implementation of an Operation and Maintenance Program using a program model is required by each co-permittee. The program model is based on the following common municipal operations:

- General Housekeeping and Operation and Maintenance
- Vehicle/Equipment Repair and Maintenance Operations

- Vehicle/Equipment Washing
- Facility Repair, Remodeling and Construction
- Cleaning and Maintenance of Roadways, Highways, Bridges, and Parking Facilities
- Maintenance of Parks, Green Spaces, Trails, and Landscaping
- Cleaning and Maintenance of Drainage Channels, Storm Sewers, and Inlet Structures.
- Operation and Maintenance of Recycling Facilities
- Water Quality Impact Assessment of Flood Management Projects

Specific BMPs for pollution prevention/good housekeeping for municipal operations best management practices are presented in Table 8.

Table 8

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.6.1.1	59 Provide annual training to all MSD, municipal, and St. Louis County employees who work in municipal operations impacted by stormwater.	To prevent and reduce stormwater pollution from municipal operations.	All	Training program exists, and updated to coordinate.	Maintain training program.	Maintain training program.	Maintain training program.	Maintain training program.	Review training program and update as needed.	Track number of training programs completed and implemented. Year 5 review documented.
				MSD	Co-permittee employees will be offered MSD annual training opportunities.	Hold 4 training events and record attendance.	Hold 4 training events and record attendance.	Hold 4 training events and record attendance.	Hold 4 training events and record attendance.	Hold 4 training events and record attendance.
4.2.6.1.2	60 List all operational facilities that are subject to MCM 6. List all operational facilities that are subject to No Exposure certification.	Identify copermitees industrial discharges not covered under a separate NPDES operating permit	All	Facilities listed in written operation and maintenance program.	Notification to complete list in operation and maintenance program plan in year 2.	Maintain current list in operation and maintenance program plan.	Maintain current list in operation and maintenance program plan.	Maintain current list in operation and maintenance program plan.	Maintain current list in operation and maintenance program plan.	List completed
				Maintain No Exposure certification status, as applicable.	Notification to review certification status of each facility and renew as necessary by end of year 2.	Review certification status of each facility, renew as necessary, and record application/expiration dates.	Review certification status of each facility, renew as necessary, and record application/expiration dates.	Review certification status of each facility, renew as necessary, and record application/expiration dates.	Review certification status of each facility, renew as necessary, and record application/expiration dates.	No Exposure Exemption Certification applications completed before expiration dates.
4.2.6.1.3	61 Maintain written Operation and Maintenance Program.	To ensure BMPs properly installed and maintained.	All	Confirm appropriate BMPs implemented and functioning correctly	Record inspection dates and locations.	Record inspection dates and locations.	Record inspection dates and locations.	Record inspection dates and locations.	Record inspection dates and locations.	Inspection completed and track number of inspections.
				Written operation and maintenance program in place. Program reflects practice.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program. MSD will take the lead to update the February 2005 dated Operation and Maintenance Program model template for co-permittees.	Implement Operation and Maintenance program. MSD will distribute the revised Operation and Maintenance Program model template and ask co-permittees to review and consider the need to update their operation and maintenance programs.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program.	Model Operation and Maintenance Program template complete and track number of co-permittee programs implemented.
	62 Maintain written inspection checklist template for performing inspections .	To ensure BMPs properly installed and maintained.	MSD	Confirm appropriate BMPs implemented and functioning correctly .	Checklist available for copermitees. Provide checklist at MSD annual training events.	Checklist available for copermitees. Provide checklist at MSD annual training events.	Checklist available for copermitees. Provide checklist at MSD annual training events.	Checklist available for copermitees. Provide checklist at MSD annual training events.	Checklist available for copermitees. Provide checklist at MSD annual training events.	Inspection checklist template completed and distributed at annual MSD training.



Table 8

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.6.1.4	63 Install BMPs (e.g., rain gardens and permeable pavement) with construction of municipal facilities and roadways, where feasible.	Provide pollutant controls with projects.	All	Reduce discharge of pollutants from project areas.	Project plans include BMPs. Permittees build BMPs. Permittees maintain and report on BMP condition.	Project plans include BMPs. Permittees build BMPs. Permittees maintain and report on BMP condition.	Project plans include BMPs. Permittees build BMPs. Permittees maintain and report on BMP condition.	Project plans include BMPs. Permittees build BMPs. Permittees maintain and report on BMP condition.	Project plans include BMPs. Permittees build BMPs. Permittees maintain and report on BMP condition.	Permittees build BMPs with projects, where feasible. Permittees report on BMP status in annual report, starting in year 2.
	64 Track salt application rates. Set baseline key performance indicator of salt application rates.	To prevent and reduce stormwater pollution from deicing operations.	St. Louis County and Municipalities	Salt application rates documented	Record BMPs and application rates.	Record BMPs and application rates.	Record BMPs and application rates.	Record BMPs and application rates.	Record BMPs and application rates.	Analyze salt application rate data annually for application trends. Consider also stream water quality data.
				Use alternative deicing approaches to reduce chloride load, where feasible.	Track copermittees use of alternative deicing approaches.	Track copermittees use of alternative deicing approaches.	Track copermittees use of alternative deicing approaches.	Track copermittees use of alternative deicing approaches.	Track copermittees use of alternative deicing approaches.	Report annually on the number of permittees utilizing alternative deicing approaches.
4.2.6.1.5	65 Maintain written Operation and Maintenance Program.	To prevent and reduce stormwater pollution from municipal operations.	All	Written operation and maintenance program in place. Program reflects practice.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program. MSD will take the lead to update the February 2005 dated Operation and Maintenance Program model template for co-permittees.	Implement Operation and Maintenance program. MSD will distribute the revised Operation and Maintenance Program model template and ask co-permittees to review and consider the need to update their operation and maintenance programs.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program.	Model Operation and Maintenance Program template complete and track number of co-permittee programs implemented.
4.2.6.1.6	66 Maintain written guidelines for MSD to follow when preparing preliminary engineering project studies.	To assess water quality impacts for new flood management projects.	MSD	Written guidelines in place.	Implement guidelines for preparing preliminary engineering project studies.	Implement guidelines for preparing preliminary engineering project studies.	Implement guidelines for preparing preliminary engineering project studies.	Implement guidelines for preparing preliminary engineering project studies.	Implement guidelines for preparing preliminary engineering project studies.	Guidelines for preparing preliminary engineering project studies complete and implemented.

Table 8

Permit Requirement	BMP Description	BMP Purpose	Responsible Person	Expected Result of BMP	Measurable Goals, Milestones, and Dates					BMP Evaluation Process/Criteria
					Permit Year 1, 2017	Permit Year 2, 2018	Permit Year 3, 2019	Permit Year 4, 2020	Permit Year 5, 2021	
4.2.6.1.6	67 Maintain written Operation and Maintenance Program.	To assess and mitigate water quality impacts for new flood management projects.	All	Written operation and maintenance program in place. Program reflects practice.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program. MSD will take the lead to update the February 2005 dated Operation and Maintenance Program model template for co-permittees.	Implement Operation and Maintenance program. MSD will distribute the revised Operation and Maintenance Program model template and ask co-permittees to review and consider the need to update their operation and maintenance programs.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program.	Model Operation and Maintenance Program template complete and track number of co-permittee programs implemented.
4.2.6.2	68 Maintain written Operation and Maintenance Program.	To prevent and reduce stormwater pollution from municipal operations.	All	Written operation and maintenance program in place. Program reflects practice.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program. MSD will take the lead to update the February 2005 dated Operation and Maintenance Program model template for co-permittees.	Implement Operation and Maintenance program. MSD will distribute the revised Operation and Maintenance Program model template and ask co-permittees to review and consider the need to update their operation and maintenance programs.	Implement Operation and Maintenance program.	Implement Operation and Maintenance program.	Model Operation and Maintenance Program template complete and track number of co-permittee programs implemented.

## Appendix A

### St. Louis County SWMP Co-permittees

1. City of Ballwin
2. City of Bellefontaine
3. City of Bel-Ridge
4. City of Berkeley
5. City of Black Jack
6. City of Breckenridge Hills
7. City of Brentwood
8. City of Bridgeton
9. City of Calverton Park
10. City of Charlack
11. City of Chesterfield
12. City of Clarkson Valley
13. City of Clayton
14. City of Cool Valley
15. City of Crestwood
16. City of Creve Coeur
17. City of Dellwood
18. City of Des Peres
19. City of Ellisville
20. City of Fenton
21. City of Ferguson
22. City of Florissant
23. City of Frontenac
24. City of Glendale
25. City of Green Park
26. City of Hazelwood
27. City of Jennings
28. City of Kirkwood
29. City of Ladue
30. City of Lakeshire
31. City of Manchester
32. City of Maryland Heights
33. City of Moline Acres
34. City of Normandy
35. City of Northwoods
36. City of Oakland
37. City of Olivette
38. City of Overland
39. City of Pagedale
40. City of Richmond Heights
41. City of Rock Hill
42. City of Shrewsbury
43. City of St. Ann
44. City of St. John
45. City of Sunset Hills
46. City of Town & Country
47. City of University City
48. City of Valley Park
49. City of Vinita Park
50. City of Warson Woods
51. City of Webster Groves
52. City of Wildwood
53. City of Winchester
54. City of Woodson Terrace
55. St. Louis County
56. Town of Norwood Court
57. Village of Bel-Nor
58. Village of Hanley Hills
59. Village of Marlborough
60. Village of Riverview
61. Metropolitan St. Louis Sewer District (coordinating authority for implementation of SWMP)

## Appendix B

### St. Louis County SWMP Co-permittees Contact Information

Co-permittee	First Name	Last Name	Title	Phone
City of Ballwin	Gary	Kramer	Director of Public Works	(636) 227-2185
City of Bellefontaine Neighbors	Deni	Donovan	City Clerk	(314) 867-0076
City of Bel-Ridge	Cary	Herndon	Public Works Supervisor	(314) 267-6846
City of Berkeley	Debra	Irvin	Municipal Services Manager	(314) 400-3705
City of Black Jack	Vijay	Bhasin	Director of Public Works	(314) 355-0400
City of Breckenridge Hills	George	Mudd	Building Inspector	(314) 427-6868
City of Brentwood	Dan	Gummersheimer	Building Official	(314) 963-8643
City of Bridgeton	Robert	Gunn	Director of Public Works	(314) 739-7665
City of Calverton Park	James	Paunovich	Chairman, Board of Trustees	(314) 524-1212
City of Charlack	Peter	Daub	Director of Public Works	(314) 427-4715
City of Chesterfield	James	Eckrich	PW Director/City Engineer	(636) 537-4764
City of Clarkson Valley	Michele	McMahon	City Clerk	(636) 227-8607
City of Clayton	Spencer	Litteken	Civil Engineer	(314) 290-8575
City of Cool Valley	Deborah	Jones	City Clerk	(314) 521-3500
City of Crestwood	James	Gillam	Director of Public Works	(314) 729-4722
City of Creve Coeur	Matt	Wohlberg	City Engineer	(314) 442-2084
City of Dellwood	Marvin	Crumer	Public Services Director	(314) 869-8686
City of Des Peres	Stephen	Meyer	Director of Public Works	(314) 835-6130
City of Ellisville	John	Collins	City Engineer	(636) 227-9660
City of Fenton	Dan	Howard	Project/Code Enforcement Mgr	(636) 349-8155
City of Ferguson	Matthew	Unrein	Director of Public Works	(314) 524-4721
City of Florissant	Tom	Goldkamp	Civil Engineer	(314) 839-7643
City of Frontenac	Jeff	Wappelhorst	Building Commissioner	(314) 994-0646
City of Glendale	Jaysen	Christensen	City Administrator	(314) 965-3600
City of Green Park	James	Mello	City Administrator	(314) 894-7336
City of Hazelwood	Nikki	Miller	Project Manager	(314)513-5031
City of Jennings	William	Kaeshamer	Director of Public Works	(314) 381-7184
City of Kirkwood	Chris	Pflasterer	Assistant Public Works Director	(314) 822-5819
City of Ladue	Anne	Lamitola	Director of Public Works	(314) 993-5665
City of Lakeshire	Tony	Seher	Mayor, City of Lakeshire	(314) 605-3578
City of Manchester	Bob	Ruck	Director of Public Works	(636) 227-1385
City of Maryland Heights	Cliff	Baber	Construction Manager	(314) 738-2258
City of Moline Acres	Dennis	DeShay	Public Works Director	(314) 868-2433
City of Normandy	Rodney	Jarrett	Director of Public Works	(314) 267-3695
City of Northwoods	Lillian	Eunice	City Administrator	(314) 385-8000

<b>Co-permittee</b>	<b>First Name</b>	<b>Last Name</b>	<b>Title</b>	<b>Phone</b>
City of Oakland	Deborah	LeMoine	City Administrator	(314) 416-0026
City of Olivette	Bruce	McGregor	Director of Public Works	(314) 993-0252
City of Overland	Jason	McConachie	City Administrator	(314) 952-1952
City of Pagedale	Craig	Lovings	Public Works Director	(314) 803-9204
City of Richmond Heights	Chris	Boyd	Director of Public Works	(314) 655-3670
City of Rock Hill	Al	Hayden	Director of Parks & Recreation	(314) 561-4304
City of Shrewsbury	Tony	Wagner	Public Works Superintendent	(314) 645-7441
City of St. Ann	Shawn	Seymour	Director of Public Services	(314) 447-1650
City of St. John	James	Phillips	Director of Public Works	(314) 427-8700
City of Sunset Hills	Bryson	Baker	Director of Public Works	(314) 849-3400
City of Town & Country	Craig	Wilde	Director of Public Works	(314) 587-2824
City of University City	Jennifer	Wendt	Project Manager	(314) 505-8562
City of Valley Park	Gerald	Martin	Director of Public Works	(636) 225-8930
City of Vinita Park	Gerald	French	Public Works Director	(314) 428-7373
City of Warson Woods	Michael	Dell'Orco	Acting City Engineer	(314) 965-3100
City of Webster Groves	Michael	Harney	Building Commissioner	(314) 963-5317
City of Wildwood	Rick	Brown	Director of Public Works	(636) 405-2024
City of Winchester	Barbara	Beckett	City Administrator	(636) 391-0600
City of Woodson Terrace	Doug	Zaiz	Director of Public Works	(314) 427-2600
St. Louis County	Ray	Gawlik	Storm Water Manager	(314) 615-8157
Town of Norwood Court	Dennis	Callahan	Town Clerk & Attorney	(314) 764-4500
Village of Bel-Nor	Christina	Buchek	Mayor	(314) 973-8866
Village of Hanley Hills	Dorothy	Matthews	Administrative Assistant	(314) 725-0909
Village of Marlborough	Joy	Drennan	Village Administrator	(314) 962-5055
Village of Riverview	Phil	Crimi	Street Department Supervisor	(314) 868-0700

## Appendix C

### MCM4 Co-permittee Ordinance and Regulatory Mechanism

Co-Permittee Name	Reported Phase II Land Disturbance Program	St. Louis County Code Enforcement Agreement
City of Ballwin	Ord. 04-07	No
City of Bellefontaine	Ordinance #2079	No
City of Bel-Ridge	Ord. 2006-4 Ord. 415.010	No
City of Berkeley	Ord. 3809	No
City of Black Jack	Ord 971	Yes
City of Breckenridge Hills	Ord 1100	No
City of Brentwood	Ordinance 4010	No
City of Bridgeton	Storm Water Management Program (Ordinance #05-43)	No
City of Calverton Park	Ordinance 662	Yes
City of Charlack	Ord. 08-611	Yes
City of Chesterfield	Ord. No. 2801; Chap 31 of Municipal Code	No
City of Clarkson Valley	Ord 08-003	No
City of Clayton	Ord. 5965 Chapter 430	No
City of Cool Valley	Ordinance 1128	Yes
City of Crestwood	Ordinance 3889, Grading and excavating ordinance.	No
City of Creve Coeur	Ordinance 5043	No
City of Dellwood	Ordinance 1170	Yes
City of Des Peres	Ord. 2260, enacted 11-10-2003	No
City of Ellisville	Ordinance 2769	No
City of Fenton	Ord 3389	Yes
City of Ferguson	Ord # 7-225	No
City of Florissant	Ord 7358	No
City of Frontenac	Ordinance 2010-1621	No
City of Glendale	Ord 09-10	Yes
City of Green Park	Ord 445-Land Disturbance Code	Yes
City of Hazelwood	Ord 3910-07	No
City of Jennings	Ord. 2149	No
City of Kirkwood	Ordinance 9174	No
City of Ladue	Ordinance 1950	No
City of Lakeshire	Ordinance 862	No
City of Manchester	Ordinance 09-1967	Yes
City of Maryland Heights	Ordinance 2008-3037	No
City of Moline Acres	Ord 993	Yes
City of Normandy	Ordinance 594	No
City of Northwoods	07-02 Art. D	No

<b>Co-Permittee Name</b>	<b>Reported Phase II Land Disturbance Program</b>	<b>St. Louis County Code Enforcement Agreement</b>
City of Oakland	Ordinance 735	Yes
City of Olivette	Ord 2277, Ord 2370, Ord 2395, Ord 2426, Ord 2470	No
City of Overland	2008-29	No
City of Pagedale	Ordinance 1321	Yes
City of Richmond Heights	Ord. 4965	No
City of Rock Hill	Ord 535	Yes
City of Shrewsbury	Ord 2444	No
City of St. Ann	Ord. 2533	No
City of St. John	Ordinance No. 907	No
City of Sunset Hills	Ordinance 1613	No
City of University City	Ordinance # 7060	Yes
City of Town & Country	Ord 4034	No
City of Valley Park	Ord 1473	No
City of Vinita Park	Ord 21578	No
City of Warson Woods	Ordinance 1305	No
City of Webster Groves	Ord 8591	No
City of Wildwood	Ord 1488	No
City of Winchester	City Ordinance 961	No
City of Woodson Terrace	Ord 1692	Yes
St. Louis County	Ordinance # 25,494	No
Town of Norwood Court	Ord 314	Yes
Village of Bel-Nor	Ord 859	Yes
Village of Hanley Hills	Ordinance 948	Yes
Village of Marlborough	Ordinance 05-422	Yes
Village of Riverview	Ord 07-18	No





