



Illicit Discharge Detection and Elimination

Overview of Category 3

Description

The stormwater management objective of these programs is to regulate discharge of pollutants to the MS4 system, in accordance with the MS4 permit to discharge stormwater to surface waters including lakes, streams, wetlands, and the Mississippi River.

- Existing Minneapolis Code of Ordinances Chapters that relate to programs and enforcement administered in full or in part by the Regulatory Services Department include the following:

Chapter 46 (Solid and Hazardous Waste) addresses storing, handling and processing of motor oils, motor vehicle fluids and parts, and contaminated materials.

Chapter 47 (Air Pollution) addresses particulates, which when washed out of the air during rain events can flow to surface waters.

Chapter 48 (Watershed Management Authority) addresses storage of regulated substances, investigation of environmental contamination and remediation of contaminated sites.

Chapter 50 (Waste Control and Waste Discharges) addresses registration to discharge to the sewer system, industrial waste discharge registration, and direct storm drain discharge registration.

Chapter 52 addresses drainage, soil storage, and soil erosion and sedimentation.

Chapter 53 addresses disposal of oil.

Chapter 54 addresses requirements for and registration of stormwater treatment devices.

Chapter 55 General Regulations on Fertilizer Application and Sale of Fertilizers Containing Phosphorus.

Chapter 57 addresses keeping fluorescent bulbs or other products containing mercury out of the waste stream.

Chapters 215 and 216 Polluted Water Wells, and Water Well Construction.

Chapter 427 addresses leaves, grass clippings or other organic debris on street or alley.

- Existing MPRB Ordinances that relate to programs and enforcement administered in full or in part by the Regulatory Services Department include the following:

Chapter 6.5 (Enforcement) empowers MPRB park patrol agents to issue violations of state laws, City ordinances, in addition to MPRB ordinances.

Chapter 7 prohibits storage of building materials on MPRB Parkways without permit.

Chapter 11 contains the MPRB shoreland and floodplain ordinances.

Measurable Goals (MS4 Reference V.B4)

- Documentation of work practices
- Completion of the dry weather field screening program (see SMP Sheet 3.3)
- Completion of the initial inventory of stormwater hotspots (see SMP Sheet 3.6)
- Completion of the identification of target pollutants and target audiences for additional source control outreach programs (see SMP Sheet 3.7)
- NEW in June 2014 - Completion of staff training program for 2014-2016 with identified target audiences, educational goals for each audience, and activities to reach goals (see SMP sheet 3.9)**

Participating Departments

Public Works Department

Regulatory Services Department

Category 3 SMP Sheets

3.1 PHOSPHORUS-FREE FERTILIZER PROGRAM

3.2 PESTICIDES PROGRAM

3.3 ILLICIT DISCHARGES IN STORM DRAINS INVESTIGATION PROGRAM

3.4 SPILL RESPONSE PROGRAM

3.5 FACILITIES INSPECTION PROGRAM

3.6 STORMWATER MANAGEMENT FOR REGULATED ACTIVITIES PROGRAM

3.7 SOURCE CONTROL EDUCATION AND OUTREACH PROGRAM

3.8 EDUCATION AND OUTREACH PROGRAM – CATCH BASIN STENCILING

NEW IN 2014: 3.9 COORDINATED STAFF TRAINING PROGRAM

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Illicit Discharge Detection and Elimination

NEW IN June 2014 –

SMP No. 3.9: COORDINATED STAFF TRAINING PROGRAM

Description

The stormwater management objectives of this program is to deliver training related to the Stormwater Management Program into all relevant parts of the business of city government in a coordinated, cost effective way, and to fulfill federal and state requirements under the permit. The training is customized at multiple levels, for various departments and personnel groups. The SWMP obligations are embedded in different City departments, and coordinating training—compared to separate, disconnected efforts—will improve efficiency and effectiveness, result in more people trained, and increase staff awareness of how their activities relate to federal and state regulatory requirements.. A coordinated program will also target a higher level of awareness for staff and officials of how the municipal stormwater conveyance and treatment system is related to our lakes, creeks and the Mississippi River, the importance of minimizing the discharge of pollutants into the system, and recognizing and reporting illicit discharges and improper disposal of waste.

Workplan

- Administer program (2014 and ongoing)
- Permit identifies that training is to include personnel who perform activities such as park and open space maintenance, public street maintenance and deicing, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance. Compile training needs for these personnel groups identified in the detailed Stormwater Management Practice (SMP) Sheet workplans (2014)
- Working with participating departments and divisions, define the training objectives, who participates, how often, and identify additional resources needed (2014-2015)
- Identify and evaluate staff training already in place. Determine gaps or training that needs strengthening.
- To address, catalog existing training and training materials that are available from the US EPA, MPCA, University of Minnesota, state and regional agencies, or other organizations that fulfill SWMP commitments by creating a reference page for each, including core competencies, who offers it, frequency, length of time, intended audience, performance indicators, how to access them, recommended audience, costs, available accreditation or certification, opportunities for collaborations, etc. Where gaps remain, develop new trainings or adapt existing trainings to meet the needs of a highly developed urban city. (2014-2015)
- Develop a technical training plan that specifies outcomes, audiences, activities (training needs and potential forums), resources, audiences, evaluation components and costs. Where possible, use media/technology to interface for on-demand access by staff. Prioritize needs and implement the plan. (2015 and ongoing)
- Develop system to track, coordinate and report on relevant training (2015-2016)
- Coordinate with other public jurisdictions involved with water resource management (ongoing)

Targeted Pollutants and Targeted Sources

Pollutants

Phosphorus and other nutrients
Sediment and other solids
Chlorides and cyanide
Bacteria
Metals

Oil and grease
Arsenic
Sulfates
Volatile organic compounds
Polycyclic aromatic hydrocarbons (PAH)

Sources

Grass clippings, leaves or other organic materials on pavement	Atmospheric deposition
Fertilizers containing phosphorus	Gasoline and diesel fuel combustion
Soil erosion	Automotive fluids
Road salts, other de-icing materials	Deterioration of brake pads, tires
Pet waste, wildlife waste	Driveway and parking lot coal tar sealants
Sanitary waste	Manufacturing
Pesticides	

MS4 Permit Reference

V.C3c, V.C3e, V.C4f, V.C4h, V.C6a, V.C6b

Assessment Process for Annual Reporting

- Narrative of staff training activities

Participating Departments, Divisions, Contacts

Public Works Department Surface Water & Sewers Division	Lois Eberhart, Water Resources Administrator
All Other Participating Departments, Divisions and Contacts	See each SMP Sheet



Construction Related Erosion and Sediment Control

SMP No. 4.1: DEVELOPMENT and REDEVELOPMENT PROGRAM

Description

The objective of this program is to minimize the discharge of pollutants from construction sites by requiring erosion prevention and sediment control measures, including but not limited to inlet protection and minimizing tracking of sediment onto streets. The MCO Chapter 52 ordinance requires Erosion & Sediment Permits for activities that will disturb more than five cubic yards or 500 square feet and must be obtained before commencement of work. For activities that will disturb land greater than 5,000 square feet, Erosion & Sediment Control Plans must be submitted and approved before Minneapolis Erosion & Sediment Control Permits can be issued. Sites one or more acres in size are also required to get NPDES General Construction Permits from the Minnesota Pollution Control Agency. Under the ordinance, permits are also required for soil storage that is not associated with construction sites.

Workplan

Public Works Surface Water & Sewers

- Administer program, with Regulatory Services - EMS. (ongoing)
- Assess need to update MCO Chapter 52, with Regulatory Services – EMS. (2012)
- Review and approve Erosion & Sediment Control Plans. (ongoing)
- Require prompt removal of soil or debris that is tracked or otherwise deposited onto right-of-way and/or into storm drains resulting from the construction activity or during transit to and from the construction site. (ongoing)
- Require management of erosion and sediment control compliance for the life of the project, including inspection and repair of erosion and sediment control devices, proper disposal of wastes at the construction site (concrete truck washout, sawcutting slurry, discarded materials, construction site chemicals, litter and other), and establishment of vegetative cover. (ongoing)
- Require a temporary or permanent sedimentation basin or other sedimentation control measure if dewatering discharge water is sediment laden, so that receiving waters are not adversely affected. The discharge must not cause erosion and scour. (ongoing)
- Provide information about regulatory requirements to Departments/Divisions carrying out permitting and inspection responsibilities, with Regulatory Services - EMS. (ongoing)
- Provide information on training opportunities. (ongoing)
- Continue to develop checklists and other communication tools. (ongoing)
- Create written procedures for reviewing and approving Erosion & Sediment Control Plans. (ongoing)
- Provide training for reviewers/approvers. (ongoing)
- Review ordinance requirements to ensure control of construction wastes, stabilization of stockpiles, and proper treatment of dewatering discharges, with Regulatory Services - EMS. (2012 – 2013)

Regulatory Services - Minneapolis Development Review

- Issue Erosion & Sediment Control Permits for projects subject to Chapter 52, including demolition, construction and other land disturbances. Require before commencement of any grading, filling, excavating, storing, stockpiling or disposing of earth materials or performing other land disturbing or land filling activity. (ongoing)
- Create written procedures for issuing Erosion & Sediment Control Permits. (2012)

Regulatory Services - Environmental Management & Safety

- Administer program, with Public Works - SWS. (ongoing)
- Assess need to update MCO Chapter 52, with Public Works - SWS. (2012)
- Provide information about regulatory requirements to Departments/Divisions carrying out permitting and inspection responsibilities, with Public Works - SWS. (ongoing)

- Regulate demolition and construction projects to minimize discharge of pollutants. (ongoing)
CLARIFICATION IN 2014: Perform inspections and enforcement actions at demolition and construction projects to minimize discharge of pollutants. Use approved Erosion and Sediment Control Plans and checklists as primary compliance tools. (ongoing)
- NEW IN 2014: Continue to identify or develop outreach materials, as handouts or web site content, for site operators at private construction sites. (ongoing)**
- Track Erosion & Sediment Control Permits for demolition and construction projects subject to MCO 52, inspect sites, enforce ordinance. (ongoing)
- Distribute information to contractors and developers regarding training opportunities and regarding dangers to water resources from improper control of erosion and sediment (ongoing)
- Utilize 311 Call Center as hotline for reporting construction related activities that degrade stormwater runoff. (ongoing)
- Continue to implement written procedures for inspecting and enforcing Erosion & Sediment Control Permit sites. Identify criteria for prioritizing inspection of construction sites. (ongoing)
- Provide training for inspectors. (ongoing)
- Review ordinance requirements to ensure control of construction wastes, stabilization of stockpiles, and proper treatment of dewatering discharges, with Public Works - SWS. (2012-2013)

Regulatory Services – Problem Property Unit

- Track and enforce Erosion & Sediment Control Permits for demolition projects subject to MCO 52, and inspect sites. (ongoing)

Targeted Pollutants and Targeted Activities

Pollutants

Phosphorus and other nutrients	Oil and grease
Sediment and other solids	Bacteria
Metals	Volatile organic compounds

Activities

Soil erosion, tracking of sediment	Concrete truck washout, concrete slurry
Improper handling and disposal of construction materials and chemicals	Litter
Paints and stains	Sanitary waste

MS4 Permit Reference

V.B1-3, V.B5-6, V.C1b, V.C1c, V.C3c, V.C4a, V.C4b, V.C4c, V.C4d, V.C4e, V.C4f, V.C4g, V.C4h

Assessment Process for Annual Reporting

- Report on number of erosion control permits issued in year
- Report on number of non-compliance incidents that were addressed
- Report on number of site inspections
- Report on number of public complaints responded to
- Report on three most common types of violations
- Report on public education and outreach related to construction-related erosion and sediment control

Participating Departments, Divisions, Contacts

Public Works Department Surface Water & Sewers Division	Lois Eberhart, Water Resources Administrator
Community Planning and Economic Development – Minneapolis Development Review Division	Janine Ryan, Manager
Health – Environmental Management & Safety Division	Dan Huff, Manager
Regulatory Services – Problem Property Unit	Kellie Rose Jones, Problem Properties/Boarded Buildings



Pollution Prevention and Good Housekeeping for Municipal Operations

Overview of Category 6

Description

The stormwater management objective of this program is to minimize the discharge of pollutants through the proper operation and maintenance of public streets and alleys, municipal properties and parking lots, and the municipal equipment yards.

Measurable Goals (MS4 Permit Reference V.B4)

Document work practices. (See SMP Sheets 6.0, 6.2, 6.3, 6.4, 6.5, 6.6)

Inspect and evaluated targeted segments of the storm tunnel system on a 5-year schedule based on condition. (See SMP Sheet 6.1.1)

Inspect, evaluate and maintain outfalls on a 5-year schedule where 20% of the outfalls are inspected each year. (see SMP Sheet 6.1.3)

100% of grit chambers inspected and cleaned twice per year unless patterns of maintenance demonstrate otherwise (See SMP Sheet 6.1.6)

Develop system wide maintenance and manual/guidance for City-owned "Green Infrastructure". (See SMP Sheet 6.1.7).

Complete electronic inventory and map of stormwater management system. (See SMP Sheet 6.1.11)

Train staff in best management practices.

NEW IN 2014: Develop routes and schedules for conducting inspections of all catch basins (see SMP Sheet 6.1.1)

NEW IN 2014: Develop inventory of municipal operations facilities (see SMP Sheet 6.3)

NEW IN 2014: Develop Facility Stormwater Plans for facility categories (see SMP Sheet 6.3)

Participating Departments

Public Works Department

Community Planning & Economic Development Department

Office of the City Coordinator

Minneapolis Park and Recreation Board

Category 6 SMP Sheets:

6.1.0: OPERATE AND MAINTAIN MS4 SYSTEM IN ACCORDANCE WITH NPDES MS4 PERMIT TO MINIMIZE DISCHARGE OF POLLUTANTS

6.1.1: STORM DRAIN AND STORM TUNNEL OPERATION & MAINTENANCE

6.1.2: CATCH BASIN AND MANHOLE OPERATION & MAINTENANCE

6.1.3: OUTFALL OPERATION & MAINTENANCE

6.1.4: PUMP STATION OPERATION & MAINTENANCE

6.1.5: LEVEL CONTROL WEIR, BULKHEAD AND OPEN DITCH/VEGETATED CHANNEL OPERATION & MAINTENANCE

6.1.6: GRIT CHAMBER OPERATION AND MAINTENANCE

6.1.7: OPERATION & MAINTENANCE OF STORMWATER RETENTION PONDS AND DETENTION BASINS, STORMWATER WETLANDS, AND BIO-(IN)FILTRATION AREAS (RAIN GARDENS)

6.1.8: STORWATER RETENTION POND DREDGING PROCESS

- 6.1.9: HANDLING AND DISPOSAL OF STORED AND STOCKPILED DREDGED OR OTHER REMOVED MATERIALS
- 6.1.10: OPERATE AND MAINTAIN MPRB STORM DRAIN CONVEYANCE SYSTEM IN ACCORDANCE WITH NPDES MS4 PERMIT TO MINIMIZE DISCHARGE OF POLLUTANTS
- 6.1.11: ELECTRONIC INVENTORY AND MAPPING
- 6.2: STREET SWEEPING AND CLEANING
- 6.3: CITY AND MPRB PARKING LOT AND EQUIPMENT YARD MANAGEMENT
- 6.4: APPLICATION OF SNOW AND ICE CONTROL MATERIALS FOR STREETS
- 6.5: APPLICATION OF SNOW AND ICE CONTROL MATERIALS FOR CITY AND MPRB PROPERTIES
- 6.6: VEGETATION MANAGEMENT FOR RIGHT-OF-WAY AND CITY PROPERTIES



Pollution Prevention and Good Housekeeping for Municipal Operations

SMP No. 6.1.2: CATCH BASIN and MANHOLE OPERATION & MAINTENANCE

Description

The objective of this stormwater management program is to minimize the discharge of pollutants through the proper operational management and maintenance of the MS4 system’s catch basins and manholes. Catch basins are structural devices located along the city's street system that provide entrance of stormwater runoff into the storm drainage system.

Workplan

Catch Basins

- Track and follow up on 311 or other complaints/notices of plugged or damaged catch basins (ongoing).
- Prioritize observed or reported plugging or damages for repair and/or cleaning. Also prioritize repair on impact to the traveling public. (ongoing)
- When cleaning, capture and properly dispose of removed materials. (ongoing).
- Inspect as needed to ensure catch basins are operational so as not to restrict flow and cause localized flood damage. (ongoing)
- **NEW IN 2014: Develop routes and schedules for conducting inspections of all catch basins for necessary maintenance. (2015)**

Manholes

- Track and follow up on 311 or other complaints/notices of damaged manholes. (ongoing)
- Inspect as needed to ensure they are operational so as not to restrict flow and cause localized flood damage. (ongoing)
- Check pipe inverts, benches, safety condition of steps, and walls, address condition of castings and rings and address structural defects as needed (examples are cracked, deteriorated and spalled areas). (ongoing)

Targeted Pollutants and Targeted Sources

Pollutants

Phosphorus and other nutrients	Oil and grease
Sediment and other solids	Arsenic
Chlorides and cyanide	Sulfates
Bacteria	Volatile organic compounds
Metals	Polycyclic aromatic hydrocarbons (PAH)

Sources

Grass clippings, leaves or other organic material on pavement	Atmospheric deposition
Fertilizers containing phosphorus	Gasoline and diesel fuel combustion
Soil erosion	Automotive fluids
Road salts , other de-icing materials	Deterioration of brake pads, tires
Pet waste, wildlife waste	Driveway and parking lot coal tar sealants
Pesticides	

MS4 Permit Reference

V.B1-3, V.B5-6, V.C1b, V.C1c, V.C6b

Assessment Process for Annual Reporting

- Report on number of complaints of plugged or backed up catch basins, number of complaints of cave-ins around catch basins or manholes, number of completed minor and major repairs to catch basins and manholes.

Participating Department, Division, Contact

Public Works Surface Water & Sewers Division

Kevin Danen, Operations Engineer



Pollution Prevention and Good Housekeeping for Municipal Operations

SMP No. 6.3: CITY and MPRB PARKING LOT and EQUIPMENT YARD MANAGEMENT

Description

The stormwater management objective of these activities is to prevent or reduce the discharge of pollutants by utilizing proper fleet and building maintenance practices, and proper operation and maintenance of parking lots and equipment and storage yards.

Workplan

- Operate and maintain municipal and MPRB property to minimize discharge of pollutants. (ongoing)
- Develop a program to improve sweeping city and MPRB parking lots, prioritizing based on land use, trash and stormwater pollutant levels generated. (2014 and ongoing)
- Train staff on proper operation and maintenance activities to minimize discharge of pollutants and non-stormwater discharges from City and MPRB storage facilities. (ongoing)
- For exposed stockpile, storage material handling and equipment washing areas, incorporate controls such as inlet protection and perimeter controls, or runoff collection systems, to prevent material from entering the MS4 system. (ongoing)
- Preferred method of washing trucks or equipment is inside buildings where sediment is caught in traps and then disposed of properly. When this is not possible, use runoff collection systems or other methods to trap sediment. Dispose of properly. (ongoing)
- **NEW IN 2014: Develop an inventory of municipal operations facilities to include equipment/vehicle storage and maintenance, materials storage yards (including de-icing materials), public works yards, public parking lots, parks, golf courses, swimming pools, recycling, composting, and solid waste handling and transfer facilities. (2014-2015)**
- Develop and maintain written operating procedures **NEW IN 2014: and Facility Stormwater Plans according to facility category that identify practices with potential to discharge pollutants to the MS4, identify best management practices, and identify staff positions responsible for BMP operation and maintenance, inspections and reporting.** (2014 and ongoing)

Program categories:

- a) Minneapolis Park & Recreation Board - MPRB parks, office buildings, equipment and materials storage
- b) Public Works – Transportation Maintenance & Repair – equipment and materials storage, vehicle and equipment maintenance
- c) City Coordinator's Office - Property Services – city-owned properties such as office buildings, police stations, fire stations
- d) Community Planning & Economic Development – city-owned economic development properties
- e) Public Works - Surface Water & Sewers – equipment and materials storage, vehicle and equipment maintenance
- f) Public Works – Traffic & Parking Services – city-owned public parking ramps and public parking lots
- g) Public Works – Traffic & Parking Services – equipment and materials storage
- h) Public Works - Water Treatment & Distribution – equipment and materials storage, vehicle and equipment maintenance
- i) Public Works – Fleet Services – equipment and materials storage, vehicle and equipment maintenance
- j) Convention Center / Target Center – city owned parking lots

Targeted Pollutants and Targeted Sources

Pollutants

Phosphorus and other nutrients
Sediment and other solids
Chlorides and cyanide
Bacteria
Metals

Oil and grease
Arsenic
Sulfates
Volatile organic compounds
Polycyclic aromatic hydrocarbons (PAH)

Sources

Grass clippings, leaves or other organic material
on pavement
Fertilizers containing phosphorus
Soil erosion
Road salts , other de-icing materials
Pet waste, wildlife waste
Pesticides

Atmospheric deposition

Gasoline and diesel fuel combustion
Automotive fluids
Deterioration of brake pads, tires
Driveway and parking lot coal tar sealants

MS4 Permit Reference

V.B1-3, V.B5-6, V.C3c, V.C6c

Assessment Process for Annual Reporting

- Narrative of training activities

Participating Departments and Contacts

Minneapolis Park & Recreation Board
Public Works – Transportation Maintenance & Repair
City Coordinator's Office - Property Services
Community Planning & Economic Development
Public Works - Surface Water & Sewers
Public Works – Traffic & Parking Services
Public Works – Traffic & Parking Services

Public Works - Water Treatment & Distribution
Public Works – Fleet Services
Convention Center / Target Center

Debra Pilger, Director Environmental Operations
Steven Collin, Street Maintenance Engineer
Greg Goeke, Director of Property Services
to be updated
Kevin Danen, Operations Engineer
to be updated
Steve Mosing, Infrastructure and Street Lighting
Engineer
Marie Asgian, Superintendent of Water Distribution
John Scharffbillig, Fleet Services Director
Chris Larson, Director of Facility Services



Stormwater Discharge Monitoring and Analysis

SMP No. 7.1: MONITORING and ANALYSIS to ASSIST in ASSESSING STORMWATER MANAGEMENT PROGRAM EFFECTIVENESS

Description

The purposes of monitoring and analysis are to understand and improve stormwater management program effectiveness, as described on the Overview of Category 7. The four types of sites for sampling, with priority levels established in the MS4 permit, are:

Type 1. To determine and improve system/BMP effectiveness through adaptive management (highest priority).

Type 2. The largest outfall(s) to the Mississippi River (second priority). **UPDATE JUNE 2014: This type is no longer reported under the MS4 Permit. This activity is carried out by the Mississippi Watershed Management Organization (MWMO), not the City and MPRB.**

Type 3. Representative management sites selected by co-permittees (third priority).

Type 4. To determine contributions from upstream jurisdictions (lowest priority).

Workplan

- Carry out sampling, data collection, and analysis as detailed in table on page 2 of this SMP Sheet. (~~2012–2013 for technical transition period to determine MWMO and MPRB software compatibility data formats and transfer protocols, etc.~~)

Minneapolis Park & Recreation Board: Type 1, 3 and 4 monitoring activities and analysis

Mississippi Watershed Management Organization*: Type 2 monitoring activities and analysis

- Quality assurance project plan for lab and field methods and procedures:
 - EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/600/R98/018) (or approved variation)
 - EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5 (EPA/240/B-01/003) (or approved variation)
 - MDH-certified laboratory(s)
 - Gulliver, J.S., A. J. Erickson, and P.T. Weiss (editors). 2010. *Stormwater Treatment: Assessment and Maintenance*. U of M St. Anthony Falls Laboratory (or Permittee –selected variation)

** Type 2 activities will be carried out by the MWMO at its expense. The MWMO is not a co-permittee. **UPDATE JUNE 2014: An agreement with the MWMO detailing responsibilities will be sent to the MPCA with each Annual Report. Type 2 activities and data sampling events are subject rainfall, site conditions, backwatering or other complications, and successful equipment performance. MPCA no longer requires the City and MPRB to report activities at these four sites. Reporting to MPCA is carried out directly by MWMO.***

Targeted Pollutants and Targeted Sources

For targeted pollutants, see table on page 2 of this SMP Sheet. For targeted sources see Table 1-4 in Section 1.

MS4 Permit Reference

V.B1-3, V.B5-6, V.C7, V.C8a, V.C8b, VI.A2

Assessment Process for Annual Reporting

- For monitor sites, report location, land use, outfall ID, area, pipe size, total vol. of sampled events, % sampled by season, sample type, dates, list of monitored chemical parameters, analysis method, sampled event data, event mean concentration statistics, flow-weighted mean concentrations, and statistical summary of concentrations by season. Submit electronic copies of spreadsheets.
- For municipal outfalls, identify discharge location, its drainage area within the municipality, land area by use, estimated impervious cover, available information of any upstream contributing areas that extend beyond the municipal boundaries, estimate of annual and seasonal loads for parameters listed in Table 1,

annual estimate of runoff volume, flow-weighted mean concentration, description of calculation methods, identification of software used, description of model calibration, and analysis of uncertainty associated with loading estimates for unmonitored portions of the MS4. For those outfalls that discharge to the Mississippi River, organize information from upstream to downstream and east bank or west bank. Submit electronic copies of modeling and spreadsheets.

- Provide narrative of available water quality trend data for Minneapolis lakes and for Bassett, Shingle and Minnehaha Creeks that may provide information about stormwater system performance.

Participating Departments and Contacts

Public Works Surface Water & Sewers

Lois Eberhart, Water Resources Administrator (lead)

Minneapolis Park & Recreation Board

Debra Pilger, Director Environmental Operations

(Types 1, 3, and 4 activities)

Mississippi Watershed Management Organization (MWMO)* (Type 2 activities) **CLARIFICATION JUNE 2014: Carried out separately from MS4 City and MPRB Permit requirements.**

MONITORING AND ANALYSIS			Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
Analytical data for samples			Sites 1 thru 6 Monitored by MPRB Types 1,3,4						Sites 7 thru-10 Monitored by MWMO Types 2 or 4			
Parameter	Sample Type	Frequency	Each year, sites will be selected for the following year. Sites may be changed, or rotated, for cost-effective resource use, however reasonable effort will be made to monitor for at least two consecutive years at a site. In choice and location of stations and monitoring activities, consider safety, backwatering effects and access.									
Chloride, Total	Flow-paced composite samples over non-ice time period (approx. March thru Nov.) Grab samples at least two times during typical winter thaw (approx. December to March)	15 samples*/year, select from events 0.10 inch or greater over range of seasons and events <i>* taking into consideration weather and safety</i>	x	x	x	x	x	x	*	*	*	*
Copper			x	x	x	x	x	x	*	*	*	*
Lead, Total (as Pb)			x	x	x	x	x	x	*	*	*	*
Zinc, Total (as Zn)			x	x	x	x	x	x	*	*	*	*
Hardness, Carbonate (as CaCo3)			x	x	x	x	x	x	*	*	*	*
Nitrate+Nitrite, Total (as N)			x	x	x	x	x	x	*	*	*	*
Nitrogen, Kjeldahl, Total			x	x	x	x	x	x	*	*	*	*
Phosphorus, Total (as P)			x	x	x	x	x	x	*	*	*	*
Solids, Total Suspended (TSS)			x	x	x	x	x	x	*	*	*	*
Solids, Volatile Suspended (VSS)			x	x	x	x	x	x	*	*	*	*
Solids, Inorganic Suspended by difference (TSS-VSS=ISS)	x	x	x	x	x	x	*	*	*	*		
BOD, Carbonaceous 5-Day (20 Deg C)	Flow-paced composite samples	Quarterly	x	x	x	x	x	x	*	*	*	*
Nitrogen, Ammonia, Un-ionized (as N)			x	x	x	x	x	x	*	*	*	*
Phosphorus, Total Dissolved or Ortho			x	x	x	x	x	x	*	*	*	*
Solids, Total Dissolved (TDS)			x	x	x	x	x	x	*	*	*	*
Sulfate			x	x	x	x	x	x	*	*	*	*
pH	Grab, measured by multi-parameter probe	Quarterly	x	x	x	x	x	x	*	*	*	*
E. coli	Grab		x	x	x	x	x	x	*	*	*	*
Flow	Measurement		x	x	x	x	x	x	*	*	*	*
Precipitation	Measurement, at 3800 Bryant Av S location	Daily	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Include in Annual Report												
Receiving water location description			x	x	x	x	x	x	*	*	*	*
Brief narrative of results			x	x	x	x	x	x	*	*	*	*
Sample analytical data, identified as storm composite or grab, with corresponding flows and storm event periods			x	x	x	x	x	x	*	*	*	*
Spreadsheets with data tabulations, statistics, summary table(s), drainage area, est. annual total discharge vol., storm event discharge vol., runoff yield (in./yr.), dates and durations of sampled events			x	x	x	x	x	x	*	*	*	*
Analysis of flow weighted mean concentrations, analysis of annual mean concentrations			x	x	x	x	x	x	*	*	*	*
Graphics			x	x	x	x	x	x	*	*	*	*
Map of sampling sites			x	x	x	x	x	x	*	*	*	*
Estimate of sampled storm event rainfall, and approximate duration between sampled storm event and end of previous storm event >0.10 inch			x	x	x	x	x	x	*	*	*	*

** Types of sites for stormwater monitoring (sites 1-5 can be Type 1, 2, 3, or 4. Sites 6-10 can be Type 2 or 3)

Type 1. To determine and improve system/BMP effectiveness through adaptive management (highest priority)

Type 2. The largest outfall(s) to the Mississippi River (second priority).

Type 3. Representative management sites selected by co-permittees (third priority).

Type 4. To determine contributions from upstream jurisdictions (fourth priority)

CLARIFICATION JUNE 2014: Type 2 is carried out by MWMO, separately from MS4 City and MPRB Permit requirements.

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