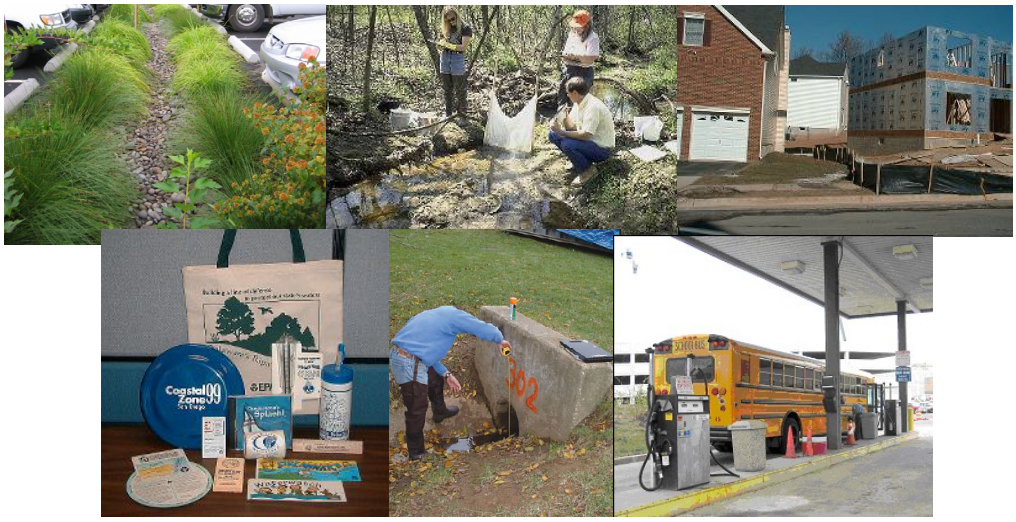
MS4 Permit Improvement Guide



U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF WATER

OFFICE OF WASTEWATER MANAGEMENT

WATER PERMITS DIVISION

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 14 2010

OFFICE OF WATER

Dear NPDES Stormwater Managers,

I am pleased to announce that the Environmental Protection Agency (EPA) has completed the "Municipal Separate Storm Sewer System Permit Improvement Guide." The primary purpose of this guidance document is to assist National Pollutant Discharge Elimination System (NPDES) permit writers in strengthening municipal separate storm sewer system (MS4) permits.

This Guide contains examples of permit conditions and supporting rationale that could be used in fact sheets that accompany NPDES permits. The Guide also includes recommendations for permit writers on how to tailor the language depending on the type of permit. For example, permits covering traditional municipalities may contain different permit provisions than those covering non-traditional entities like departments of transportation, universities, and prisons.

I ask that permit writers review the permit language and corresponding discussion presented in this Guide and consider how to incorporate this, or similar, language into their MS4 permits. Some modification of the language may be necessary to make it suitable for use with specific MS4 permits, and to better tailor it to meet the needs and goals of the various permitting authorities.

The permit language suggested in this Guide is not intended to override already existing, more stringent or differently-worded provisions that are equally as protective in meeting the applicable regulations. EPA expects the permitting authority to continue to make significant progress and ensure that the intent of the regulations or more stringent requirements is captured in the permit.

In addition, EPA would like to particularly stress the following key principles:

- Permit provisions should be clear, specific, measurable, and enforceable. Permits should include specific deadlines for compliance, incorporate clear performance standards, and include measurable goals or quantifiable targets for implementation.
- Permits should contain a performance standard for post-construction that is based on the objective of maintaining or restoring stable hydrology to protect water quality of receiving waters or another mechanism as effective.

EPA has begun a rulemaking to strengthen the stormwater program. Using this Guide to improve permits represents the direction that EPA is taking to strengthen the program. This Guide is a living document that will be updated as new information for improving the stormwater program is obtained.

I appreciate your continued efforts in strengthening the NPDES municipal stormwater program. If you have any questions about this Guide or suggestions for further improvements, please contact Rachel Herbert of my staff at herbert.rachel@epa.gov or call her at 202-564-2649.

Sincerely,

Linda Y. Boornazian

Linda Y. Boornazian, Director
Water Permits Division

CC: State Stormwater Coordinators
Association of State and Interstate Water Pollution Control Administrators

Contents

INTRODUCTION & GETTING STARTED

Purpose

The primary purpose of the MS4 Permit Improvement Guide (Guide) is to assist National Pollutant Discharge Elimination System (NPDES) permit writers in strengthening municipal separate storm sewer system (MS4) stormwater permits. The objective of the Guide is to facilitate the creation of MS4 permits which are clear, consistent with applicable regulations, and enforceable. This Guide contains examples of permit conditions and supporting rationale that could be used in fact sheets that accompany NPDES permits. Permit language should include controls that identify specific actions permittees must perform to comply with the Permit Requirements.

This Guide focuses in large part on permits for small (Phase II) MS4s. However, while the contents of the Guide are generally organized consistent with the six minimum control measures (40 CFR 123.34(b)) applicable to Phase II MS4 permits, however, permit writers may find this Guide useful for Phase I MS4 permits. In addition, the Guide specifically addresses Phase I MS4 Permit Requirements with regard to the industrial program elements set forth in the Phase I regulations at 40 CFR 122.26(d)(2)(ii) and (iv)(C). These are addressed in Chapter 7. The Guide may also be useful for "non-traditional" MS4 permittees, such as departments of transportation (DOTs), universities and prisons.

EPA has developed a Stormwater Phase II Final Rule Fact Sheet Series (www.epa.gov/npdes/stormwater/swfinal) to assist permitting authorities and permittees in understanding the Phase II regulations. Further, EPA has developed the National Menu of Stormwater Best Management Practices (www.epa.gov/npdes/stormwater/menuofbmps) which provides descriptive information in fact sheets about various best management practices associated with the Phase II six minimum control measures.

The Guide was created by reviewing numerous MS4 permits and fact sheets from around the country. Some of the example permit and fact sheet language presented in this Guide has been adapted from these permits; in those instances where existing language that meets the purpose of this document was not available, EPA has crafted new language.

Contents of this Guide

This document is divided into parts, as noted above, based largely on the six minimum control measures required in the Phase II stormwater regulations (see 40 CFR 122.34(b)). Chapters 1 -6 address development and implementation of a stormwater management program (SWMP) and the six minimum control measures that must be included in the SWMP. Chapter 7 addresses industrial facilities programs relevant for Phase I MS4 permits. Chapter 8, Overall Evaluation and Adaptive Management, discusses reporting, evaluation, and tracking requirements. This Guide does not focus on the water quality provisions of the Clean Water Act, which may require more stringent requirements than those programmatic elements specified here.

Each chapter opens with an introduction providing a brief overview of relevant regulatory requirements pertaining to the subject of the chapter. Each chapter is then divided into sections in which the following topics are addressed:

- *Example Permit Provision* – This section includes example MS4 permit language. The language has been formatted and numbered in such a way that each section corresponds directly to a permit structured in accordance with the chapter sequence of this Guide. EPA developed these examples by first surveying existing EPA and State MS4 permit language and drawing upon agency experience in implementing permits. EPA has identified the source of the language (in footnotes) if adapted from specific permits.
- *Example Permit Requirement Rationale for the Fact Sheet* – This section describes the rationale for the example permit provision. This language can assist the permit writer in developing the fact sheet, which accompanies all NPDES permits; however, it is up to the permit writer to ensure that a complete and customized version of the fact sheet accompanies the permit. Example Permit Requirement Rationale for the Fact Sheet sections often describe "requirements" or steps that "must" be taken. To the extent this language is used in these sections, it is intended to describe requirements included in the example permit provisions. It does not mean that all permits "must" include the specific "requirement" described.
- *Recommendations for the Permit Writer* (included where appropriate) – This section discusses issues the permit writer should consider in determining how to use the example permit provisions.

How to Use this Guide

This guidance includes "example" MS4 permit language for specific program elements, but is not intended to be definitive or comprehensive for all MS4 Permit Requirements.[1] EPA recommends that permit writers review the example permit language presented in this guide and consider how to incorporate this, or similar, language into MS4 permits as appropriate. Each state may have different NPDES requirements along with varied experience overseeing MS4 programs, and MS4 permittees vary widely in storm water management experience and sophistication, size, topography, precipitation patterns, land use, receiving water conditions and other factors. In most instances, EPA anticipates that permit writers will modify the language to make it suitable for specific MS4 permits, and to tailor example provisions to meet the various needs and goals that apply.

When possible, this Guide has tried to provide examples that can be used for both Phase I and Phase II permits. However, in some instances EPA has provided suggestions for how the language can be tailored to better fit within the context of a Phase I or Phase II permit. In addition, EPA acknowledges that some language presented in this Guide may be more suitable for an individual permit rather than a general permit. While EPA has presented a discussion for ways the language could be altered to fit these scenarios in Recommendations for the Permit Writer sections, it is up to the permit writer to determine the best use of the material for the permit being crafted.

[1] For example, the guide does not explicitly address provisions for compliance with CWA section 402(p)(3)(B)(ii), water quality standards, applicable wasteload allocations in TMDLs or such other conditions as the permitting authority deems necessary. For information on integrating TMDLs into stormwater permits see USEPA's DRAFT TMDLs to Stormwater Handbook (www.epa.gov/owow/tmdl/stormwater)

The example permit language in this Guide has been written as if the permit is a reissued permit and not an initial permit, since most MS4 permittees have been subject to NPDES permits for at least one permit term. Requirements to develop the initial SWMP are not included in this Guide since they would have been included in the first permit term. It is important that permit writers consider the different stages in the development and implementation of SWMPs when establishing permit conditions as well as the experience learned from other more advance programs. So, for example, this Guide includes brackets to indicate the place for an appropriate schedule or deadline rather than indicating specific timeframes in all instances. These examples are available to the permit writer, along with other resources such as the permittee's draft or existing SMWP document, annual reports, prior permit experience, receiving water quality information and the permit writer's best professional judgment, to issue permits suitable for their specific MS4s.

The permit language suggested in this Guide is not intended to override already existing, more stringent or differently-worded provisions that are equally as compliant in meeting the applicable regulations and protective of water quality standards. EPA expects the permitting authority to ensure that the intent of all applicable regulations is captured in the permit. States with more stringent permit provisions should continue to strengthen these provisions as the permits are reissued. This Guide includes suggestions on how to develop permit language for MS4 permittees. This Guide does not impose any new legally binding requirements on EPA, States, or the regulated community, and does not confer legal rights or impose legal obligations upon any member of the public. In the event of a conflict between the discussion in this Guide and any statute, regulation, or permit the statute, regulation or permit controls.

Terminology: SWMP and SWMP Document
This guide uses the term SWMP to refer to the stormwater management program that is required by the Phase I and Phase II regulations to be developed by MS4 permittees. The SWMP document is the written plan that is used to describe the various control measures and activities the permittee will undertake to implement the stormwater management program.

Preparing to Write an MS4 Permit

Most Phase II MS4 permittees are regulated under a general permit (with some exceptions where individual permits have been used for Phase II and non-traditional MS4 permittees). Phase I MS4 permittees are regulated under individual permits, and can include multiple co-permittees. EPA regulations require that initial MS4 permits (i.e. first permit term) set the foundation of the permittee's SWMP. For Phase II MS4 the focus is on the six minimum control measures in 40 C.F.R. 122.34(b), while the Phase I MS4 permittees are informed by the regulations at 40 C.F.R. 122.26(d). See Chapter 1 of this Guide.

As the permit writer prepares to reissue an MS4 permit, regardless of whether the permit is an individual or general permit, EPA recommends that the permit writer review, at a minimum, the following sources of information:

Past annual reports
For currently regulated MS4s, annual reports submitted by the permittee can include information that will help permit writers develop more specific and measurable Permit Requirements. The most recent annual report is usually the most helpful to review, but additional annual reports can be reviewed if time allows. If the permit writer is developing a general permit, a broad selection of

annual reports from various permittees should be reviewed. In particular, EPA recommends that the permit writer review, at a minimum, the following specific information:

Areas of obvious strengths or weaknesses in the SWMP

- For example, is the permittee vague about specific activities (often an indicator of a weak program area), or is the permittee clearly meeting the requirements of the permit and/or going above and beyond the minimum requirements?

Trends or common compliance problems

- For example, does the permittee analyze the data to assess the most common compliance problems, and then modify their controls/programs to address these problems? For example, do they use the common compliance issues identified to target their training and outreach/education efforts for construction operators?

Level of implementation of SWMP activities (e.g., frequency and numbers of inspections, frequency of catch basin cleaning, street sweeping)

- Does the permittee report the total universe when reporting the quantity of an activity achieved? For example, if the MS4 is required to conduct industrial inspections, does it report it did 100 inspections (which may be good or bad, depending on how many it was required to inspect), or that it did 100 out of 5,000 (only 2% of the total)?

Water quality priorities for the permittee (e.g. impaired waters, TMDLs, high quality waters)

- Does the permittee's annual report describe priority pollutants for impaired waters and other water quality programs and what was done to reduce and/or eliminate their contact with stormwater? Does the SWMP target both impaired and high quality waters?

Specific sources or pollutants of concern permittee is currently focusing on

- Does the SWMP target pollutants of concern in its activities?

Level and type of enforcement currently being used by permittee

- Does the annual report provide data and summary information on the different types of enforcement actions taken (how many verbal warnings, written notes, fines, etc)?

Any trends (i.e. water quality, compliance, control measure implementation levels) being reported by Permittees which indicate success or failure of particular SWMP components

- Does the permittee analyze the data, or just report the data in the MS4 annual report?

Types of measurable goals being applied and achieved by permittees

- Has the permittee met the measurable goals stated in the permit and SWMP?

Stormwater management program (SWMP)
Review the most current SWMP documents for potential gaps that may need to be specifically addressed in the reissued MS4 permit. EPA's *MS4 Program Evaluation Guidance* (available at www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf) can be used to assess the key elements in a SWMP.

NPDES MS4 audit reports, construction/industrial/commercial site inspection reports
Review the findings from any MS4 audits conducted during the past permit term to help identify key issues that should be addressed in the next permit. For example, if the audits identified weak or missing program elements and other controls, these should be addressed in the reissuance of the permit. Construction, industrial, and/or commercial site inspection reports for facilities within the MS4's boundary should be reviewed to determine if there are common compliance issues that should be addressed in the MS4 permit (for example, more training, more frequent inspections, more complete inventory or prioritization, etc.).

Monitoring/Information on Quality of Receiving Waters
Review any monitoring data collected by the permittee or any other entity that has collected useful monitoring data to identify potential pollutants of concern. In addition, the most recent information on impaired waters and total maximum daily loads (TMDLs) for the permit area should be reviewed. If there are waste load allocations (WLAs) applicable to the permittee, these should be addressed in the permit. If no WLA has been assigned to the MS4, the permit writer should still consider pollutants of concern identified in 303(d) lists and TMDLs when developing Permit Requirements. Such information will help identify whether more targeted permit conditions are needed to reduce the discharge of these pollutants. This Guide does not specifically address the inclusion of TMDL requirements in MS4 permits.

Permit renewal application data or past notice of intent (NOI) information
Review any permit renewal applications or NOIs submitted to establish coverage for the previous permit term. Permit writers should consider the recommendations made in the EPA "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems" (www.epa.gov/npdes/pubs/owm0125.pdf) published in 1996 (40 CFR Part 122; Federal Register, Volume 61, Number 155). This document provides information which clarifies the MS4 reapplication requirements and explains that MS4 permit applicants and NPDES permit writers have discretion to customize appropriate and streamlined reapplication requirements on a case-by-case basis.

Previous MS4 permit
Finally, review any past MS4 permits to identify where permit language should be revised or completely rewritten, for example, because language was vague. This MS4 permit improvement Guide should be used help strengthen key areas in the permit.

Note that if the MS4 permit is being issued for the first time, some of the above information will not exist yet, such as past annual reports or old SWMP documents.

MS4 Permit Writing Tips

There are a few general tips to keep in mind when writing MS4 permits. First, and most importantly, permit provisions should be clear, specific, measurable, and enforceable. Permits should include specific

deadlines for compliance, incorporate clear performance standards, and include measurable goals or quantifiable targets for implementation. Doing so will allow permitting authorities to more easily assess compliance, and take enforcement actions as necessary.

For example, the following permit provision could be strengthened: "The permittee shall demonstrate compliance with this Permit through the timely implementation of control measures and other actions to reduce pollutants in discharges to the maximum extent practicable in accordance with their SWMP…" This permit provision does not define what "timely implementation" is, allowing the permittee to determine what is timely. Timely implementation could be, although it probably was not intended to be, interpreted as meaning up to five years, or it could mean that implementation must occur within six months. In addition, "other actions" are mentioned in this provision, but they are never described. If a permit requires "other actions," these actions should be specifically described in the permit. Finally, it is important to strike a balance of providing specific Permit Requirements while still allowing the permittee come up with innovative controls.

In addition, vague phrases such as "as feasible" and "as possible" should be avoided because they result in inconsistent implementation by permittees and difficulties in permit authority oversight and enforcement. The permit writer's role is to determine what is necessary to achieve in a permit term, and to develop clear, enforceable language that conforms to these determinations. Accordingly, the permit should set forth objective standards, criteria or processes, which will aid the permittee in complying with the permit, as well as the permitting authority in determining compliance in the MS4 permit.

In order for permit language to be clear, specific, measurable and enforceable, each Permit Requirement will ideally specify:

- *What* needs to happen
- *Who* needs to do it
- *How much* they need to do
- *When* they need to get it done
- *Where* it is to be done

For each Permit Requirement: "What" is usually the stormwater control measure or activity required. "Who" in most cases is implied as the permittee (although in some cases the permitting authority may need to specify who exactly will carry out the requirement if there are co-permittees). "How much" is the performance standard the permittee must meet (e.g., how many inspections). "When" is a specific time (or a set frequency) when the stormwater control measure or activity must be completed. "Where" indicates the specific location or area (if necessary). These questions will help determine compliance with the permit requirement.

The Use of Partnerships in MS4 Permits

Since the Phase II Rule applies to all small MS4s within an urbanized area regardless of political boundaries it is very likely that multiple governments and agencies within a single geographic area are subject to MS4 permitting requirements. For example, a city government that operates a small MS4 within an urbanized area may obtain permit coverage under a general Phase II permit while other MS4s in the same vicinity (such as a county, other cities, or a state DOT) may have individual Phase I MS4 permits. All permittees are responsible for permit compliance in their permitted area. Given the

potential for overlapping activities in close proximity, EPA encourages permittees in a geographic area to establish cooperative agreements in implementing their stormwater programs. Partnerships and agreements between permittees and/or other agencies can minimize unnecessarily repeating activities and result in using available resources as efficiently as possible. Using existing tools and programs instead of creating new ones can allow permittees to focus resources on high priority program components instead. In addition by forming partnerships, water quality can be examined and improved on a larger, consolidated scale rather than on a piece-meal, site-by-site basis.

In addition to requiring MS4 permittees to maintain records of program implementation such as inspection forms, monitoring data, dry weather screening reports, and notices of violation, EPA recommends that MS4 permits include requirements for permittees to summarize and analyze data and submit the analysis to the permitting authority. For example, as permittees are required to evaluate program compliance and appropriateness of best management practices, the permit could require permittees to address in annual reports questions such as:

- For illicit discharge data, what are the most prevalent sources and pollutants in the illicit discharge data, and where are these illicit discharges occurring? How many illicit discharges have been identified, and how many of those have been resolved? How many outfalls or screening points were visually screened, how many had dry weather discharges or flows, at how many were field analyses completed and for what parameters, and at how many were samples collected and analyzed? Does the permittee need to conduct more inspections in these areas, or develop more specific outreach targeting these sources and pollutants?
- For the construction data, what are the most common construction violations, and are there any trends in the data (e.g., construction operators who receive more violations than others, areas of the MS4 with more violations, need to refine guidance or standards to more clearly address common violations) How has the permittee responded to these trends? Over the last year, how many construction site SWPPP reviews were completed and approved? How many inspections were conducted, how many noncompliant sites were identified, and how many enforcement actions (and of what type) were taken?

Also, although the stormwater Phase II rule requires reports, after the first permit term, reports are required to be submitted only in years two and four of the permit term. EPA strongly encourages annual reports for all permittees. (See 40 CFR 122.34(g)(3))

CHAPTER 1: ESTABLISHMENT OF THE STORMWATER MANAGEMENT PROGRAM

Introduction

Included Concepts

- Requirement to develop a stormwater management program
- Necessary legal authority
- Enforcement Measures and Tracking
- Adequate resources

An over-arching legal authority framework must be established in order for the SWMP to be effective. Ensuring that the permittee has established the legal authority to meet the requirements of the permit, created a well described enforcement response plan (ERP), and allocated adequate resources will set a necessary foundation for the SWMP.

Legal Authority

Permittees must have the authority to carry out all aspects of their stormwater management programs, including requiring the control of pollutants flowing into the MS4 system, having access to inspect sources of pollutant discharges, and being able to compel compliance and issue citations in the event of violations. Legal authority is especially critical for construction site runoff control, post-construction/permanent runoff control, industrial and commercial inspections, and illicit discharge detection and elimination programs. (See 40 CFR 122.26(d)(2)(i) and 40 CFR 122.34(b)(3)(ii)(B), (b)(4)(ii)(A), and (b)(5)(ii)(B))

A permittee seeking permit coverage under individual permits is required to describe the legal authority it has to implement and enforce the SWMP. EPA recommends that general permits also require regulated MS4s to describe their applicable legal authority in their Notices of Intent (NOIs) (40 CFR 122.26(d)(2)(i), 122.33(b)). This legal authority is typically established through the adoption of one or more ordinances, or by modifying existing ordinances to provide the necessary authority. In some cases, a permittee might already have codified water quality provisions to address previous MS4 Permit Requirements; in this case, the permittee should be required to review existing codes and ordinances and prepare a statement detailing any necessary changes required to address the new MS4 permit requirements. Some permittees, such as, DOTs, universities, and prisons, may not have the authority to create and enforce ordinances. For these entities other mechanisms and authorities that they do possess should be utilized (e.g. DOT right-of-way permits).

Enforcement Measures and Tracking

Permittees are required by the Phase I and Phase II regulations to include in their ordinance, or other regulatory mechanism, penalty provisions to ensure compliance with construction and industrial requirements, to require the removal of illicit discharges, and to address noncompliance with post-construction requirements. In complying with these requirements, EPA recommends the use of enforcement responses that vary with the type of permit violation, and escalate if violations are repeated or not corrected. EPA recommends that the permittee be required to develop and implement an enforcement response plan (ERP), which clearly describes the action to be taken for common violations associated with the construction program, industrial and commercial program, or other SWMP programs. A well-written ERP provides guidance to inspectors on the different enforcement

responses available, actions to address general permit non-filers, when and how to refer violators to the State, and how to track enforcement actions.

Adequate Resources

Each permittee will fund its SWMP differently; therefore, in order to assess whether adequate resources have been allocated to carry out the requirements of the MS4 permit, the permitting authorities should require their permittees to submit an accounting of stormwater-related budgets, costs, and staffing resources updated annually. The fiscal analysis should document and explain changes to budgets from year to year and describe how each type of funding can and cannot be used for stormwater program activities. (See 40 CFR 122.26(d)(2)(vi)).

1.1 Requirement to Develop a Stormwater Management Program

Example Permit Provision

1.1.1 Requirement to Develop Program – The permittee must revise and update its written stormwater management program (SWMP) document and submit the SWMP to the [*insert name of Permitting Authority*] for review by [*insert deadline, e.g., within one year of permit issuance*]. The permittee must continue to implement the current SWMP until the revised SWMP is submitted. The SWMP does not contain effluent limitations; the limitations are contained in Parts [*insert relevant part of the permit*] of the permit.

1.1.2 Contents of the SWMP document – At a minimum, the permittee must include the following information in its SWMP document:

a. Ordinances, or other regulatory mechanisms, providing the legal authority necessary to implement and enforce the requirements of this permit (see Part 1.1);

b. Statement by the permittee's legal counsel certifying to adequacy of legal authority (see Part 1.2);

c. Written procedures describing how the permittee will implement provisions described in Parts 2-8.

1.1.3 Modifications to the SWMP document – The [*insert applicable name of permitting authority*]may notify the permittee of the need to modify the SWMP document to be consistent with the permit, in which case the permittee will have [*insert deadline, e.g. 90 days*] to finalize such changes to the program. The permittee is required to keep the SWMP document up to date during the term of the permit. Where the permittee determines that modifications are needed to address any procedural, protocol, or programmatic change, such changes must be made as soon as practicable, but not later than [*insert deadline, e.g. 90 days*].

Example Permit Requirement Rationale for the Fact Sheet

The permittee is required to develop a SWMP document that describes how the permittee will meet the control requirements in the permit. (See 40 CFR 122.26(d)(2)(iv), 122.34(a)). The SWMP document is a consolidation of all of the permittee's relevant ordinances or other regulatory requirements, the description of all programs and procedures (including standard forms to be used for reports and inspections) that will be implemented and enforced to comply with this permit and to document the selection, design, and installation of all stormwater control measures. The permittee is required to submit its SWMP document to the permitting authority. If modifications to the SWMP are necessary then the permitting authority will notify the permittee.

Recommendation for the Permit Writer

The permit writer should include in this section the relevant parts of the permit that require specific descriptions or justifications to be included in the SWMP document. Also, permit writers may need to include an additional requirement regarding the submittal of the SWMP document since some information contained in the SWMP document is required to be submitted prior to the permittee obtaining permit coverage. In addition, permit writers should refer to the memo entitled *Interim Guidance on Implementation of NPDES Regulations for Storm Water Phase II for Small Municipal Separate Storm Sewer Systems in Response to Recent Ninth Circuit Decision in Environmental Defense Center, et al. v. EPA, No. 00-70014 & consolidated cases (9th Cir.)* for additional guidance on the implementation of regulations for Phase II MS4s (www.epa.gov/npdes/pubs/interim_guidelines_memo_final.pdf).

1.2 Requirement to Develop Adequate Legal Authority to Implement and Enforce Stormwater Management Program

Example Permit Provision

1.2.1 Within [*insert deadline, e.g., one year from permit issuance*] the permittee must review and revise its relevant ordinances or other regulatory mechanisms, or adopt any new ordinances or other regulatory mechanisms that provide it with adequate legal authority to control pollutant discharges into and from its MS4, and to meet the requirements of this permit.

1.2.2 To be considered adequate, this legal authority must, at a minimum, address the following:

a. Authority to Prohibit Illicit Discharges – Prohibit and eliminate illicit connections and discharges to the MS4. Illicit connections include pipes, drains, open channels, or other conveyances that have the potential to allow an illicit discharge to enter the MS4. Illicit discharges include all non-stormwater discharges except fire fighting discharges, discharges from NPDES permitted industrial sources and discharges not otherwise authorized under Part 1.2.2.b. of this permit.

b. Allowable Non-Stormwater Discharges –Exceptions to the prohibition in Part 1.2.2.a. may include the following, only if they are considered non-significant contributors of pollutants: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water.

c. Authority to Prohibit Spills or Other Releases – Control the discharge of spills, and prohibit dumping or disposal of materials other than stormwater into the MS4.

d. Authority to Require Compliance – Require compliance with conditions in the permittee's ordinances, permits, contracts, or orders (i.e., hold dischargers accountable for their contributions of pollutants and flows).

e. Authority to Require Installation, Implementation, and Maintenance of Control Measures – Require owners/operators of construction sites, new or redeveloped land, and industrial and commercial facilities to minimize the discharge of pollutants to the MS4 through the installation, implementation, and maintenance of stormwater control measures consistent with [*insert references to applicable stormwater control measure manuals, guidance documents, etc.*].

f. Authority to Receive and Collect Information – The permittee must have the authority to request from operators of construction sites, new or redeveloped land, and industrial and commercial facilities information such as stormwater plans, inspection reports, and monitoring results, and other information deemed necessary to assess compliance with this permit. The permittee must also have the authority to review designs and proposals for new development and redevelopment to determine whether adequate stormwater control measures will be installed, implemented, and maintained.

g. Authority to Inspect – The permittee must have the authority to enter private property for the purpose of inspecting at reasonable times any facilities, equipment, practices, or operations related to stormwater discharges to determine whether there is compliance with local stormwater control ordinances/standards or requirements in this Permit.

h. Response to Violations – The permittee must have the ability to promptly require that violators cease and desist illicit discharges or discharges of stormwater in violation of any ordinance or standard and/or cleanup and abate such discharges, including the ability to:

    1. Effectively require the discharger to abate and clean up their discharge, spill, or pollutant release within [*insert deadline, e.g. 48 hours*] of notification; or

    2. For uncontrolled sources of pollutants that could pose an environmental threat, require abatement within [*insert timeframe, e.g. 30 days of notification*]; or,

3. Perform the clean up and abatement work and bill the responsible party, if necessary.
4. If a situation persists where pollutant-causing sources or activities are not abated, provide the option to order the cessation of activities until such problems are adequately addressed.
5. When all parties agree that clean-up activities cannot be completed within the timeframe provided, determine a new timeframe and notify the [*insert name of permitting authority*].

i. Monetary Penalties – The permittee must have the ability to:

1. Levy citations or administrative fines against responsible parties either immediately at the site, or within a few days.
2. Require recovery and remediation costs from responsible parties.

j. Civil/Criminal Penalties – The permittee must have the ability to impose more substantial civil or criminal sanctions (including referral to a city or district attorney) and escalate corrective response, consistent with its enforcement response plan developed pursuant to Part 1.3, for persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm.

k. Interagency Agreements – Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements or other similar agreements with other owners of the MS4, such as [*insert other applicable permittees*].

1.2.3 The permittee must include as part of its written SWMP document a statement certified by its chief legal counsel that the permittee has taken the necessary steps to obtain and maintain full legal authority to implement and enforce each of the requirements contained in this permit. This statement must include:

a. Identification of all departments within the permittee's jurisdiction that conduct stormwater-related activities and their roles and responsibilities under this permit. Include an up-to-date organizational chart specifying these departments, key personnel, and contact information.

b. Identification of the local administrative and legal procedures and ordinances available to mandate compliance with stormwater-related ordinances and therefore with the conditions of this permit.

c. A description of how stormwater related-ordinances are implemented and appealed.

d. A description of whether the municipality can issue administrative orders and injunctions, or whether it must go through the court system for enforcement actions.

Example Permit Requirement Rationale for the Fact Sheet

Adequate legal authority is required to implement and enforce most parts of the SWMP. (See 40 CFR 122.26(d)(2)(i) and 40 CFR 122.34(b)(3)(ii)(B), (b)(4)(ii)(A), and (b)(5)(ii)(B)). Without

adequate legal authority the MS4 would be unable to perform many vital SWMP functions such as performing inspections and requiring installation of control measures. In addition, the permittee would not be able to penalize and/or attain remediation costs from violators.

Recommendations for the Permit Writer

A major difference between a traditional MS4 and a non-traditional MS4 (such as a DOT, military base, or university) is often the scope of legal authority available to the MS4. Non-traditional MS4 permittees often cannot pass "ordinances" nor do they have enforcement authority like a typical municipality, so legal authority may consist of policies, standards, or specific contract language. Non-traditional MS4 permittees also do not generally have the authority to impose a monetary penalty. Although these differences exist, just like traditional MS4s, non-traditional MS4s must have the legal authority to develop, implement, and enforce the program. Moreover, the scope of legal authority that may be exercised by MS4 operators that are municipalities may vary from state to state. Therefore, permit writers should tailor the legal authority section depending on the types of permittees covered and the scope of authority that may be exercised by the permittee. For example, non-traditional MS4 permittees often have authority over what their contracts require. Therefore, the permit could require that contracts for construction and maintenance activities include specific stormwater requirements that ensure the permittee's requirements are met. In addition, cooperative agreements could be maintained with those permittees that do possess the legal authorities to enforce stormwater measures within the permittee's MS4 boundary.

The discharge prohibitions listed in Part 1.2.2 are taken from the Phase II regulations and are the minimum requirements. Note that, unlike Phase II MS4s, Phase I MS4 permittees are required to address the sources of non-stormwater discharges in Part 1.2.2.b. when they are identified as sources of pollutants in stormwater discharges. (See 40 CFR 122.26(d)(2)(iv)(B)). The permit writer may choose to apply additional or more stringent prohibitions. For example, some states have chosen to prohibit discharges from street washing activities as they can be significant sources of pollutants such as oil and grease and heavy metals.

1.3 Enforcement Measures and Tracking

Example Permit Provision

1.3.1 The permittee must continue to implement, and revise within [*specify deadline for completion, e.g. 12 months of permit issuance*] if necessary, an enforcement response plan (ERP), which sets out the permittee's potential responses to violations and addresses repeat and continuing violations through progressively stricter responses as needed to achieve compliance. The ERP must describe how the permittee will use each of the following types of enforcement responses based on the type of violation:

a. Verbal Warnings – Verbal warnings are primarily consultative in nature. At a minimum, verbal warnings must specify the nature of the violation and required corrective action.

b. Written Notices – Written notices of violation (NOVs) must stipulate the nature of the violation and the required corrective action, with deadlines for taking such action.

c. Escalated Enforcement Measures – The Permittee must have the legal ability to employ any combination of the enforcement actions below (or their functional equivalent), and to escalate enforcement responses where necessary to address persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm:

   1. Citations (with Fines) – The ERP must indicate when the permittee will assess monetary fines, which may include civil and administrative penalties.
   2. Stop Work Orders – The permittee must have the authority to issue stop work orders that require construction activities to be halted, except for those activities directed at cleaning up, abating discharge, and installing appropriate control measures.
   3. Withholding of Plan Approvals or Other Authorizations – Where a facility is in non-compliance, the ERP must address how the permittee's own approval process affecting the facility's ability to discharge to the MS4 can be used to abate the violation.
   4. Additional Measures – The permittee may also use other escalated measures provided under local legal authorities. The permittee may perform work necessary to improve erosion control measures and collect the funds from the responsible party in an appropriate manner, such as collecting against the project's bond or directly billing the responsible party to pay for work and materials.

1.3.2 Enforcement Tracking – The Permittee must track instances of non-compliance either in hard-copy files or electronically. The enforcement case documentation must include, at a minimum, the following:

a. Name of owner/operator of facility or site of violation
b. Location of stormwater source (i.e., construction project, industrial facility)
c. Description of violation
d. Required schedule for returning to compliance
e. Description of enforcement response used, including escalated responses if repeat violations occur or violations are not resolved in a timely manner
f. Accompanying documentation of enforcement response (e.g., notices of noncompliance, notices of violations)
g. Any referrals to different departments or agencies
h. Date violation was resolved.

1.3.3 Recidivism Reduction – The permittee is required to identify chronic violators of any SWMP component and reduce the rate of noncompliance recidivism. The permittee

must summarize inspection results by these chronic violators and include incentives, disincentives, or an increased inspection frequency at the operator's sites. [2]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires permittees to have an established, escalating enforcement policy that clearly describes the action to be taken for common violations. The policy must describe the procedures to ensure compliance with local ordinances and standards, including the sanctions and enforcement mechanisms that will be used to ensure compliance. (See 40 CFR 122.26(d)(2)(i)). It is critical that the MS4 have the authority to initiate a range of enforcement actions to address the variability and severity of noncompliance. Enforcement responses to individual violations must consider criteria such as magnitude and duration of the violation, effect of the violation on the receiving water, compliance history of the operator, and good faith of the operator in compliance efforts. Particularly for construction sites, enforcement actions must be timely in order to be effective.

Recommendations for the Permit Writer

Typical enforcement mechanisms include verbal warnings, written NOVs, administrative fines and orders, stop work orders, and civil or criminal penalties. Some non-traditional MS4 permittees, such as DOTs and universities, may not have the authority to use the mechanisms described above. Therefore the enforcement requirements in the permit should take the permittee's enforcement limitations and abilities into consideration, allow for alternative mechanisms such as related contract obligations or right-of-way permits, and/or require entities that cannot enforce to coordinate with those entities that can. For example, if a DOT discovers an illicit discharge to the right-of-way, a mechanism should be in place for the DOT to communicate with the adjacent municipality to eliminate the discharge in a timely manner.

Some permit writers include specific language as to when permittees can refer violations of NPDES permits to the permitting authority. Because of the often similar control measures required in MS4 construction programs and NPDES CGP SWPPP requirements, permit writers want the permittee to make an honest effort at achieving compliance with their local requirements before referring a violator to the NPDES permitting authority. An example of permit language on NPDES referrals, which require the MS4 permittee to make a good faith effort at ensuring compliance by conducting at least two inspections and notices of violation, follows:

> NPDES Permit Referrals–For those construction projects or industrial facilities subject to the [*insert name of applicable NPDES general construction/industrial permit*], the permittee must:

[2] Adapted from 2009 San Francisco Bay Municipal Regional Stormwater Permit (Order No. R2-2009-0074; www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0074.pdf) and the Los Angeles MS4 Permit (Part 3; www.swrcb.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/ms4_permits/los_angeles/2001-2007/LA_MS4_Permit2001-2007.pdf)

a. Refer non-filers (i.e., those facilities that cannot demonstrate that they obtained permit coverage) to the [*insert name of permitting authority*] within [*insert number of days, e.g. 30 days*] of making that determination. In making such referrals, the permittee must include, at a minimum, the following documentation:

    1. Construction project or industrial facility location.
    2. Name of owner or operator.
    3. Estimated construction project size or type of industrial activity (including SIC code if known).
    4. Records of communication with the owner or operator regarding filing requirements.

b. Refer violations to the [*insert name of permitting authority*] provided that the permittee has made a good faith effort of progressive enforcement to achieve compliance with its own ordinances. At a minimum, the permittee's good faith effort must include documentation of two follow-up inspections and two warning letters or notices of violation. In making such referrals, the permittee must include, at a minimum, the following documentation:

    1. Construction project or industrial facility location
    2. Name of owner or operator
    3. Estimated construction project size or type of industrial activity (including SIC code if known)
    4. Records of communication with the owner or operator regarding the violation, including at least two follow-up inspections, two warning letters or notices of violation, and any response from the owner or operator

It is important to note that a referral to the permitting authority does not relieve the MS4 from its enforcement obligations. The MS4 must continue to work with the permitting authority, using all available enforcement authority in order to gain compliance.

1.4 Requirement to Ensure Adequate Resources to Comply with MS4 Permit

Example Permit Provision

1.4.1 Secure Resources – The permittee must secure the resources necessary to meet all requirements of this permit.

1.4.2 Annual Fiscal Analysis – The permittee must conduct an annual analysis of the capital and operation and maintenance expenditures needed, allocated, and spent as well as the necessary staff resources needed and allocated to meet the requirements of this permit, including any development, implementation, and

enforcement activities required. The analysis must include estimated expenditures for the reporting period, the preceding period, and the next reporting period and be submitted with the annual report.

a. Each analysis must include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.

b. Each analysis must include a narrative description of circumstances resulting in a [*insert percentage, e.g. 25 percent or greater*] annual change for any budget line items.

c. Each analysis must include a description of the staff resources necessary to meet the requirements of this permit.

Example Permit Requirement Rationale for the Fact Sheet

The annual fiscal analysis will show the allocated resources, expenditures, and staff resources necessary to comply with the permit, and implement and enforce the permittee's SWMP. (See 40 CFR 122.26(d)(2)(vi). The annual analysis is necessary to show that the permittee has adequate resources to meet all Permit Requirements. The analysis can also show year-to-year changes in funding for the stormwater program. A summary of the annual analysis must be reported in the annual report (see Section 8.4 and Appendix A). This report will help the Permitting Authority understand the resources that are dedicated to compliance with this permit, and to implementation and enforcement of the SWMP, and track how this changes over time.

Recommendations for the Permit Writer

Permit writers should be specific when requesting financial analysis information from the permittee. The Annual Report Template provided in this Guide includes basic questions that should be adequate for Phase II MS4s. However, more detailed information may be warranted from more established programs and larger Phase I MS4s.

Because stormwater is a component in many different program areas, it can often be difficult to get an accurate accounting of costs. For example, inspection staff may have multiple responsibilities in addition to stormwater inspections. Is it appropriate to count an entire inspector's time (i.e. full-time equivalent (FTE)) as a stormwater cost if the inspector is also doing building inspections? Also, some permittees count street sweeping as a stormwater compliance cost, while others consider their street sweeping costs as an aesthetic or air quality cost. Permittees should provide a detailed breakdown of costs, along with background or additional discussion so the permit writer knows what the costs include.

CHAPTER 2: PUBLIC EDUCATION AND OUTREACH/PUBLIC INVOLVEMENT

Introduction

Included Concepts

- Developing a comprehensive stormwater education/ outreach program
- Involving the public in planning and implementing the SWMP

The Phase II Regulations require MS4 permittees to develop programs to educate the public about the impact of stormwater discharges on local waterways and the steps that citizens, businesses, and other organizations can take to reduce the contamination of stormwater (40 CFR 122.34(b)(1),(2)). Phase I MS4 permittees were also required to describe their proposed public education programs as part of their initial permit application, but the regulations are not as specific as Phase II. (See 40 CFR 122.26(d)(2)(iv) (B), (D)(4) and (A)(6)).

As the public gains a greater understanding of the benefits of stormwater management, an MS4 is likely to gain more support for the SWMP (including financial support) and increased compliance with the applicable regulatory requirements as the public understands how their actions impact water quality. Education and awareness programs help change human behavior with respect to reducing the amount of pollution generated from stormwater sources within the MS4 system. In addition to education, encouraging public participation in local stormwater programs can lead to program improvement as well as enabling people to identify and report a pollution-causing activity, such as spotting an illicit discharge.

2.1 Developing a Comprehensive Stormwater Education/Outreach Program

Example Permit Provision

2.1.1 The permittee must:

a. Continue to implement, and revise if necessary within [s*pecify the time when the development of the program must be completed, e.g., within the first year after permit issuance*], a comprehensive stormwater education/outreach program. The program must, at a minimum:

1. Define the goals and objectives of the program based on at least three high priority, community-wide issues (e.g. reduction of nitrogen in discharges from the MS4, promoting pervious techniques used in the MS4);
2. Identify and analyze the target audience(s);
3. Create an appropriate message(s) based on at least three targeted residential issues and three targeted industrial/commercial issues from the suggested list below (or three issues deemed more appropriate to the MS4):

Residential Community

- Residential car washing and auto maintenance control measures
- Off-pavement automobile parking
- Home and garden care activities (pesticides, herbicides, and fertilizers)
- Disposal of household hazardous waste (e.g. paints, cleaning products)
- Snow removal activities
- Using techniques that keep water onsite and/or reduce imperviousness (rain barrels, rain gardens, porous pavers, permeable concrete, porous asphalt, etc.)
- Litter prevention
- Importance of native vegetation for preventing soil erosion
- Public reporting of water quality issues
- Community activities (monitoring programs, environmental protection organization activities, etc.)
- Pet and other animal wastes

Industrial/Commercial Community

- Automobile repair and maintenance Control measures
- Control measure installation and maintenance
- Lawful disposal of vacuum truck and sweeping equipment waste
- Pollution prevention and safe alternatives
- Snow removal activities
- Using techniques that keep water onsite and/or reduce imperviousness (rain barrels, rain gardens, porous pavers, permeable concrete, porous asphalt, etc.)
- Equipment and vehicle maintenance and repair
- Importance of good housekeeping (e.g. sweeping impervious surfaces instead of hosing)
- Illicit discharge detection and elimination observations and follow-up during daily work activities
- Water quality impacts associated with land development (including new construction and redevelopment)
- Water quality impacts associated with road resurfacing and repaving

4. Develop appropriate educational materials (e.g. the materials can utilize various media such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, websites);
5. Determine methods and process of distribution;
6. Evaluate the effectiveness of the program; and
7. Utilize public input (e.g., the opportunity for public comment, or public meetings) in the development of the program.

b. During the term of the permit, the permittee must distribute the educational materials, using whichever methods and procedures determined appropriate by the permittee, in such a way that is designed to convey the program's message to [*insert percentage or other appropriate numeric threshold, e.g., 20%*] of the target audience each year.

c. Within [*insert deadline, e.g., within the permit term*], the permittee must assess changes in public awareness and behavior resulting from the implementation of the program such as using a statistically valid survey and modify the education/outreach program accordingly.

d. The permittee must assess its stormwater education/outreach program annually as specified in Part 8.3 of this permit. The permittee must adjust its educational materials and the delivery of such materials to address any shortcomings found as a result of this assessment.

e. Written procedures for implementing this program must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

Without a focused and comprehensive program, outreach and education efforts will likely be poorly coordinated and possibly ineffective. The permit the permittee to develop an education/outreach program that addresses the six steps listed and also found in EPA's *Getting In Step: A Guide to Effective Outreach in Your Watershed (www.epa.gov/watertrain/gettinginstep/)*. This guide explains the steps in developing an outreach plan, presents information on creating outreach materials, and provides tips in working with the media. The permittee is encouraged to follow this guide in developing its outreach strategy.

The public education and outreach program must be tailored and targeted to specific water quality issues of concern in the relevant community. These community-wide and targeted issues must then guide the development of the comprehensive outreach program, including the creation of appropriate messages and educational materials. The permit includes a list of potential residential and commercial issues, but the permittee may also choose other issues that contribute significant pollutant loads to stormwater.

The permittee is encouraged to use existing public educational materials in its program. Examples of public educational materials for stormwater are available at EPA's *Nonpoint Source Outreach Toolbox (www.epa.gov/nps/toolbox)*. The permittee is also encouraged to leverage resources with other agencies and municipalities with similar public education goals.

Finally, the underlying principle of any public education and outreach effort is to change behaviors. The permittee must develop a process to assess how well its public education and outreach programs is changing public awareness and behaviors and to determine what changes are necessary to make its public education program more effective. This assessment of public education programs is typically conducted via phone surveys, but other assessment methods that quantify results can be used. The permittee is encouraged to use a variety of assessment methods to evaluate the effectiveness of different public education activities. The permit requires that the first evaluation assessment be conducted before the final year of the permittee's coverage under this permit, before the next permit is issued. The allows the permittee to make changes as appropriate before the next permit application is due, EPA's *Getting In Step: A Guide to Effective Outreach in Your Watershed (www.epa.gov/watertrain/gettinginstep/)* can provide useful information on setting up and conducting the evaluations.

Recommendations for the Permit Writer

EPA recommends that the requirement to identify high priority community-wide issues and targeted issues be set at least 3 to 6 months before the stormwater education/outreach program is to be implemented, so the permitting authority can review the issues and provide any feedback before the plan is completed.

The permit can be a means for increasing public awareness and understanding of stormwater impacts on local watersheds, including high quality watersheds that need protecting. EPA recommends that the permit writer consider requiring permittees to identify and describe issues, such as specific pollutants, the sources of those pollutants, impacts on biology, and the physical attributes of stormwater runoff, in their education/outreach program, which affect local watershed(s). Where applicable, the education/outreach program should identify and describe high quality watersheds in need of protection and the issues that may threaten the quality of these waters.

The list in Part 2.1.1.a(3) is not all-inclusive. Therefore, EPA recommends that the permit be written to allow the permittee to indentify priority issue(s) not listed that may contribute a significant pollutant load to stormwater. For Phase I, individual permits, it may be appropriate for the permit writer to specify the priority issues based on known issues, monitoring data, historical trends, etc. Phase II general permits will likely need to allow for more flexibility in selecting priority issues.

In addition, the permit writer will need to consider that DOTs and other "non-traditional" MS4s will likely have different priority concerns than the ones identified in the categories above. In fact, the categories (residential and commercial/industrial) may also need to be changed. In these instances, the permit writer may want to consider having the non-traditional permittees work together with any local government MS4s in their area to maximize the program and cost effectiveness of the outreach.

The permit writer may consider specifying the mechanism the permittee is required to use to measure the awareness of and behavior related to issues concerning stormwater runoff by the general public, or targeted audiences within the general public. Examples of evaluations could include:

- Direct Evaluations
- Surveys
- Tracking the number of attendees
- Interviews
- Review of media clippings
- Tracking the number of stormwater-related calls/emails/letters received

Permit writers should consider whether it is appropriate to require a baseline assessment of the public's awareness of stormwater issues, for example in the second year of the permit term, so that comparisons may be drawn in reference to the baseline. This would likely require the permittee to conduct two assessments in the first permit term that the assessment is required.

2.2 Involving the Public in Planning and Implementing the SWMP

Example Permit Provision

2.2.1 The permittee is required to involve the public in the planning and implementation of activities related to the development and implementation of the SWMP. At a minimum, the permittee must:

a. Establish a citizen advisory group or utilize existing citizen organizations. The permittee may establish a stand-alone group or utilize an existing group or process. The advisory group must consist of a balanced representation of all affected parties, including residents, business owners, and environmental organizations in the MS4 area and/or affected watershed. The permittee must invite the citizen advisory group to participate in the development and implementation of all parts of the community's SWMP.

b. Create opportunities for citizens to participate in the implementation of stormwater controls (e.g., stream clean-ups, storm drain stenciling, volunteer monitoring, and educational activities).

c. Ensure the public can easily find information about the permittee's SWMP.

2.2.2 Written procedures for implementing this program must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

Stormwater management programs can be greatly improved by involving the community throughout the entire process of developing and implementing the program. Involving the public benefits both the permittee itself as well as the community. B y listening to the public's concerns and coming up with solutions together, the permittee will gain the public's support and the community will become invested in the program. The permittees will likewise gain even more insight into the most effective ways to communicate their messages.

This permit requires the involvement of the public, which includes a citizen advisory group or process to solicit feedback on the stormwater program, and opportunities for citizens to participate in implementation of the stormwater program. The citizen advisory group should meet with the local land use planners and provide input on land use code or ordinance updates so that land use requirements incorporate provisions for better management of stormwater runoff and watershed protection. Public participation in implementation of the stormwater program can include many different activities such as stream clean-ups, storm drain markings, and volunteer monitoring.

Permittees are encouraged to work together with other entities that have an impact on stormwater (for example, schools, homeowner associations, DOTs, other MS4 permittees). Permittees are also encouraged to use existing advisory groups or processes in order to implement these public involvement requirements.

Recommendations for the Permit Writer

Especially for Phase I permittees, permit writers may consider requiring more specific information such as requiring at least one contact that the public can reach (including phone number and/or e-mail address) be clearly posted on the website. The contact may be a general contact or a specific person. The permitting authority may want the MS4 to have a mechanism for the public to comment year round, not just at public meetings. This could be facilitated by a webpage and email or a stormwater hotline.

Some Phase II permittees may find it more difficult to establish and maintain a formal citizen advisory group simply because they tend to have smaller populations. The permit writer may want to provide flexibility for the Phase II permittees to utilize the public involvement mechanism which best suits their individual community. For example, groups which are already involved with other aspects of municipal governance or established events where input could be solicited (i.e. farmers markets, festivals) may serve to meet the objective of this section.

CHAPTER 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION

Introduction

Phase I (see 40 CFR 122.26 (d)(1)(v)(B) and (d)(1)(iv)(B)) and Phase II stormwater management programs (see 40 CFR 122.26(d)(2)(iv)(B)) are required to address illicit discharges into the MS4 system. An illicit discharge is defined as any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater, except allowable discharges pursuant to an NPDES permit (40 CFR 122.26(b)(2)). In addition to requiring permittee to have the legal authority to prohibit non-stormwater discharges from entering storm sewers (CWA Section 402(p)(3)(B)) (see Chapter I), MS4 permits must also require the development of a comprehensive, proactive Illicit Discharge Detection Elimination (IDDE) program.

Included Concepts

- IDDE program development
- MS4 mapping
- Identification of priority areas
- Field screening
- IDDE source investigations and elimination
- Public reporting of non-stormwater discharges and spills
- Illicit discharge education and training

An effective IDDE program is more than just a program to respond to complaints about illicit discharges or spills. Permittees must proactively seek out illicit discharges, or activities that could result in discharges, such as illegal connections to the storm sewer system, improper disposal of wastes, or dumping of used motor oil or other chemicals.

In order to trace the origin of a suspected illicit discharge or connection, the permittee must have an updated map of the storm drain system and a formal plan of how to locate illicit discharges and how to respond to them once they are located or reported. The permittee must provide a mechanism for public reporting of illicit discharges and spills, as well as an effective way for staff to be alerted to such reports. Regular field screening of outfalls for non-stormwater discharges needs to occur in areas determined to have a higher likelihood for illicit discharges and illegal connections. Proper investigation and enforcement procedures must be in place to eliminate the sources of the discharges, as well. Finally, in order for the permittee to adequately detect and eliminate sources of illicit discharges, both field and office staff must be properly trained to recognize and report the discharges to the appropriate parties.

EPA recommends that permittees refer to the Center for Watershed Protection's guide on *Illicit Discharge Detection and Elimination (IDDE): A Guidance Manual for Program Development and Technical Assistance* (IDDE Manual, available at www.cwp.org) when developing an IDDE program.

3.1 IDDE Program Development

Example Permit Provision

3.1.1 The permittee must continue to implement a program to detect, investigate, and eliminate non-stormwater discharges (see Part 1.2.2), including illegal dumping, into its system. The IDDE program must include the following:

a. An up-to-date storm sewer system map (see Part 3.2).
b. Procedures for identifying priority areas within the MS4 likely to have illicit discharges, and a list of all such areas identified in the system (see Part 3.3)
c. Field screening to detect illicit discharges (see Part 3.4)
d. Procedures for tracing the source of an illicit discharge (see Part 3.5)
e. Procedures for removing the source of the discharge (see Part 3.5)
f. Procedures for program evaluation and assessment (see Part 8.3)
g. Procedures to prevent and correct any on-site sewage disposal systems that discharge into the MS4. [3]

3.1.2 In implementing the IDDE program, the permittee may conduct such investigations, contract for investigation, coordinate with storm drain investigation activities of others, or use any combination of these approaches.

3.1.3 For non-traditional MS4 permittees, if illicit connections or illicit discharges are observed related to another operator's municipal storm sewer system then the permittee must notify the other operator within [*insert applicable deadline, e.g., within 48 hours*] of discovery.

3.1.4 If another operator notifies the permittee of an illegal connection or illicit discharge to the municipal separate storm sewer system then the permittee must follow the requirements specified in Part 3.5.4.

3.1.5 Written procedures for implementing this program, including those components described in Parts 3.1 – 3.7 must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

EPA stormwater regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of stormwater" except discharges resulting from fire fighting activities and discharges from NPDES permitted sources (see 122.26(b)(2)). The applicable regulations state that the following non-stormwater discharges may be allowed if they are not determined to be a significant source of pollutants to the MS4 : water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water. If, however, these discharges are determined to be a significant source of pollution then they are prohibited.

Examples of common sources of illicit discharges in urban areas include apartments and homes, car washes, restaurants, airports, landfills, and gas stations. These so called "generating sites" discharge sanitary wastewater, septic system effluent, vehicle wash water, washdown from

[3] Vermont Phase II General Permit (www.vtwaterquality.org/stormwater/htm/sw_ms4.htm)

grease traps, motor oil, antifreeze, gasoline and fuel spills, among other substances. Although these illicit discharges can enter the storm drain system in various ways, they generally result from either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the storm drain system, spills, or "midnight dumping"). Illicit discharges can be further divided into those discharging continuously and those discharging intermittently.

One way of locating these dry weather discharges is to perform field screening of outfalls. If no rain has occurred prior to the screening then it is likely that any flow observed at an outfall is either groundwater or an illicit discharge. It is important to utilize resources effectively and to target field screening activities in priority areas that are the most common sources of illicit discharges. For example, municipalities with older neighborhoods should prioritize those areas for targeted investigation due to the likelihood of cross connections with the sanitary sewer. Older parts of the storm drain system may also be deteriorating and require repair or replacement.

In addition, it is important that permittees establish clear policies and procedures for tracing and eliminating illicit discharges to ensure that individual incidents are addressed consistently. These policies should include procedures to notify neighboring localities if a discharge is discovered either originating on or discharging to the neighboring storm sewer system.

Additional information is available in the Center for Watershed Protection's *IDDE Manual.*

Recommendations for the Permit Writer

In some instances the permit writer may choose to include more specific requirements. For example, if the priority areas are already known, then Part 3.1.1.a may be more specifically worded. In addition, regulations governing Phase I MS4 permits have somewhat different requirements including specific field screening procedures (40 CFR 122.26(d)(1)(iii)(D) and 122.26(d)(2)(iii)) and a program to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B).

3.2 MS4 Mapping

Example Permit Provision

3.2.1 The permittee must maintain an up-to-date and accurate storm sewer system map.

a. The storm sewer system map must show the following, at a minimum:

1. The location of all MS4 outfalls and drainage areas contributing to those outfalls that are operated by the permittee, and that discharge within the permittee's jurisdiction to a receiving water
2. The location (and name, where known to the permittee) of all waters receiving discharges from those outfall pipes. Each mapped outfall must be given an individual alphanumeric identifier, which must be noted on the map. When possible, the outfalls must be located using a geographic

position system (GPS) and photographs should be taken to provide baseline information and track operation & maintenance needs over time.[4]

3. Priority areas identified under Part 3.3
4. Field screening stations identified under Part 3.4.2.a

b. A copy of the storm sewer system map must be available onsite for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

In order to trace the origin of a suspected illicit discharge or connection, the permittee must have an up-to-date map of its storm drain system. This is critical in order to isolate the potential source of the non-stormwater discharges and the areas of potential impact. Ideally, the information would be available as a geographic information system (GIS) layer in a geo-locational database, however, paper maps are sufficient providing they have the necessary reference information.

The permit primarily requires the mapping of outfalls, drainage areas contributing to those outfalls, and receiving waters. The municipal facility inventory created to comply with the pollution prevention/good housekeeping requirements (see Part 6.1) must also be included either on this sewer system map or on a separate MS4 map.

Recommendations for the Permit Writer

Both Phase I and Phase II regulations require permittees to develop a map indicating outfalls and the waters that receive the MS4 discharges. This map is to be used to identify priority areas that have a reasonable potential for illicit discharges. The mapping requirements should be adjusted based on any existing mapping of the MS4 that has already been completed. For example, Phase I mapping should have been initiated during the initial permit application process. This map should not be static, however, since it would need to be updated as development patterns change and new collection and discharge components of the MS4 are added. The mapping requirement could be supplemented by adding a requirement to "modify existing maps to clearly identify all receiving waters."

3.3 Identification of Priority Areas

Example Permit Provision

3.3.1 The permittee must continue to identify the following as priority areas [*insert areas that may be more applicable to the jurisdiction*]:

a. Areas with older infrastructure that are more likely to have illicit connections;

[4] New Jersey Phase II General Permit (www.state.nj.us/dep/dwq/pdf/Tier_A_final.pdf), with modifications

b. Industrial, commercial, or mixed use areas;

c. Areas with a history of past illicit discharges;

d. Areas with a history of illegal dumping;

e. Areas with onsite sewage disposal systems;

f. Areas with older sewer lines or with a history of sewer overflows or cross-connections; and

g. Areas upstream of sensitive waterbodies.

3.3.2 The permittee must document the basis for its selection of each priority area and create a list of all priority areas identified in the system. This priority area list must be updated [*insert frequency, e.g., annually*] to reflect changing priorities and be available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

The permit requires an evaluation of the permittee's neighborhoods and land uses to identify areas that are more likely to have illicit discharges. These areas must be prioritized for more frequent screening and investigations. Each permittee will have a different set of priority areas: newer communities with modern infrastructure are less likely to have sewer cross-connections and illegal connections to the storm drain system, whereas towns with rural areas may place an emphasis on illegal dumping and onsite sewage disposal systems. Prioritization must be based not only on land use but also on prior history and frequency of problems.

The identification of priority areas must include "hotspots" or areas where dumping, spills, or other illicit discharges are a common occurrence. These hotspots will help identify potential field screening locations and may help target educational activities. For example, if evidence of motor oil dumping is found quite frequently and traced to the same apartment complex, information about motor oil disposal could be distributed to residents in response.

Recommendations for the Permit Writer

Phase I permittees should have been documenting information regarding high priority areas for several permit terms. In these instances the permit writer should require the permittee to continually evaluate and update the priority areas as development patterns change or new "hotspot" areas are found. If the permit writer has information regarding priority areas which are specific to the Phase I permittee (e.g. certain high priority watersheds or land use types which typically discharge a pollutant of concern) then those specific areas should be specified as high priority.

3.4 Field Screening

Example Permit Provision

3.4.1 The permittee must continue to implement and revise if necessary within [*specify deadline for completion*] a written dry weather field screening and analytical monitoring procedures to detect and eliminate illicit discharges to the MS4. These procedures must be included as part of the IDDE program, and incorporated into the permittee's SWMP document. Dry weather field screening and analytical monitoring consists of (1) field observations; (2) field screening monitoring; and (3) analytical monitoring at selected stations.

3.4.2 Conduct dry weather field screening and analytical monitoring. At a minimum, the permittee must:

a. Identify a minimum of [*specify number*] stations within the priority areas it identified in Part 3.3.1 at which field screening and analytical monitoring will take place. In addition, if the permittee is made aware of non-stormwater discharges that occur during the permit term outside of the priority areas, the permittee must include field screening stations in those areas;

b. Conduct dry weather field screening and analytical monitoring at each station identified above at least once [*insert timeframe for dry part of year, or specify annually*].

c. Sample runoff according to requirements outlined in (1) and (2) below if flow or ponded runoff is observed at a field screening station and there has been at least seventy-two (72) hours of dry weather. The permittee must also record general information such as time since last rain, quantity of last rain, site descriptions (e.g., conveyance type, dominant watershed land uses), flow estimation (e.g., width of water surface, approximate depth of water, approximate flow velocity, flow rate), and visual observations (e.g., odor, color, clarity, floatables, deposits/stains, vegetation condition, structural condition, and biology).

1. Field screening requirements: The permittee is required to conduct a field screening analysis for the following constituents. Samples must be collected and analyzed consistent with the procedures required by 40 CFR Part 136.

   [*insert specific indicator pollutants that the permittee is required to monitor for.]*

2. Analytical monitoring requirements: In addition to field screening, the permittee is required to collect samples for analytical laboratory analysis of the following constituents for a minimum of [*insert percentage*] of the samples taken. Samples must be collected and analyzed consistent with the procedures required by 40 CFR Part 136.

   [*insert specific pollutants of concern that the permittee is required to monitor for*]

3. Develop benchmark concentration levels for dry weather field screening and analytical monitoring results whereby exceedance of the benchmark will

require follow-up investigations to be conducted to identify and eliminate the source causing the exceedance of the benchmark.

d. Conduct a follow-up investigation under Part 4.5 if the benchmarks associated with the constituents listed above in Part 3.4.2.c(1) and (2) are exceeded; and

e. Make and record all applicable observations and select another station from the list of alternate stations for monitoring if, after two subsequent field screening tests have been completed, the field screening station is dry (i.e., no flowing or ponded runoff).

3.4.3 The permittee must assess its IDDE program every [*specify deadline for completion, e.g., once per permit term*] to determine if updates are needed. Where updates are found to be necessary, the permittee must make such changes [*insert deadline for finalizing changes*].

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the development of a dry weather field screening and analytical monitoring program. The program must identify stations (e.g., outfalls) within the identified "priority areas" where the field screening will be conducted. At a frequency set by the permitting authority, the permittee must screen outfalls during dry weather and, if flow or ponded water is observed, collect a sample for field screening and analytical monitoring.

Visually screening outfalls during dry weather and conducting field tests, where flow is occurring, of selected chemical parameters as indicators of the discharge source will assist permittees in determining the source of illicit discharges. For example, the presence of surfactants is an indicator that sewage could be present in the discharge (e.g., soaps being discharged into sewer system as an indicator that wastewater is being discharged). Specific conductivity, fluoride and/or hardness concentration, ammonia and/or potassium concentration, surfactant and/or fluorescence concentration, chlorine concentration, pH, and other chemicals may similarly be indicative of industrial sources.

The permit requires the permittee to develop benchmarks for dry weather screening and analytical monitoring results. An exceedance of the benchmark concentration level indicates the need to conduct a follow-up investigation. The results will help the permittee narrow down the possible sources causing the benchmark to be exceeded so that they can then be eliminated. This is a common protocol to trigger additional monitoring and/or implementation of BMPs at stormwater discharges (e.g. MSGP has sector-specific benchmark monitoring requirements).

Recommendations for the Permit Writer

There are many options for field screening programs available to the permit writer that will meet the requirements of the regulations. Phase I regulations require that permittees conduct initial field screening of the entire MS4 during the permit application process as well as on-going field screening activities during the life of the permit. Based on this historical information and data, permit writers may want to specify in Phase I individual permits which priority areas must be screened. They may

also want to specify how many outfalls or what percentage of the outfalls should be inspected during the permit term.

In addition, for new Phase II permittees, permit writers may want to require screening of all priority areas during the first permit term and then require on-going screening in the areas where illicit discharges were identified.

This permit language includes analytical monitoring at dry weather field screening locations. The monitoring required during field screening (Part 3.4.2.c.1.) should include appropriate indicator pollutants, i.e. pollutants that will indicate the presence of some sort of illicit discharge. For example, Phase II NPDES regulations suggest sampling for specific conductivity, ammonia, surfactant and/or fluorescence concentration, pH and other chemicals indicative of industrial sources.

Permit writers should select the additional pollutants to be monitored based upon specific pollutants of concern for the receiving water(s) and/or specific indicator pollutants which can assist the MS4 in the location of particular discharges of concern and the potential water quality impact of the discharge. For example, the Phase I San Diego MS4 Permit requires that permittees monitor the following parameters during field screening: total hardness, oil and grease, diazinon and chlorpyrifos, cadmium (dissolved), lead (dissolved), zinc (dissolved), copper (dissolved), Enterococcus bacteria, total coliform bacteria, and fecal coliform bacteria.

Permit writers should encourage or even require permittees to use the CWP *IDDE Manual* and/ or EPA's 2008 Multi-Sector General Permit (www.epa.gov/npdes/stormwater/msgp) to develop benchmarks for each parameter.

In the *IDDE Manual* it is strongly recommended that benchmarks be developed specifically for each area. As an example, the *IDDE Manual* lists the following benchmark concentrations (Table 3-1) to identify industrial discharges:

Table 3-1. Benchmark concentrations to identify Industrial Discharges (from CWP IDDE Manual, Table 45)

Indicator Parameter	Benchmark Concentration
Ammonia	>= 50 mg/L
Color	>= 500 units
Conductivity	>= 2,000 µS/cm
Hardness	<= 10 mg/L as CaCO3 or >= 2,000 mg/L as CaCO3
pH	<= 5
Potassium	>= 20 mg/L
Turbidity	>= 1,000 NTU

For comparison purposes, the chemical fingerprint for different flow types in Alabama is presented in Table 3-2. The chemical fingerprint for each flow type can differ regionally, so permittees should develop their own "fingerprint" library by sampling each flow type.

Table 3-2. Comparative "Fingerprint" (Mean Values) of Flow Types (from CWP IDDE Manual, Table 1)

Flow Type	Hardness (mg/L as CaCO3)	NH3 (mg/L)	Potassium (mg/L)	Conductivity (µS/cm)	Fluoride (mg/L)	Detergents (mg/L)
Sewage	50 (0.26)	25 (0.53)	12 (0.21)	1215 (0.45)	0.7 (0.1)	9.7 (0.17)
Septage	57 (0.36)	87 (0.4)	19 (0.42)	502 (0.42)	0.93 (0.39)	3.3 (1.33)

Table 3-2. Comparative "Fingerprint" (Mean Values) of Flow Types (from CWP IDDE Manual, Table 1)						
Laundry Washwater	45 (0.33)	3.2 (0.89)	6.5 (0.78)	463.5 (0.88)	0.85 (0.4)	758 (0.27)
Car Washwater	71 (0.27)	0.9 (1.4)	3.6 (0.67)	274 (0.45)	1.2 (1.56)	140 (0.2)
Plating Bath (Liquid Industrial Waste)	14330 (0.32)	66 (0.66)	1009 (1.24)	10352 (0.45)	5.1 (0.47)	6.8 (0.68)
Radiator Flushing (Liquid Industrial Waste)	5.6 (1.88)	26 (0.89)	2801 (0.13)	3280 (0.21)	149 (0.16)	15 (0.11)
Tap Water	52 (0.27)	<0.06 (0.55)	1.3 (0.37)	140 (0.07)	0.94 (0.07)	0 (NA)
Groundwater	38 (0.19)	0.06 (1.35)	3.1 (0.55)	149 (0.24)	0.13 (0.93)	0 (NA)
Landscape Irrigation	53 (0.13)	1.3 (1.12)	5.6 (0.5)	180 (0.1)	0.61 (0.35)	0 (NA)
The number in parentheses after each concentration is the Coefficient of Variation. Source: Robert Pitt data from CWP IDDE Manual						

The permit writer may also want to require the permittee to analyze a certain number of discharge samples to characterize the concentration of certain pollutants in the different drainage areas. This characterization sampling would be in addition to any characterization sampling completed for the Phase I permit application. This type of sampling would not necessarily aid in the elimination of the source of the discharge, however, the data would be useful in characterizing the discharge from the MS4.

For those areas that have ponding or flow during dry weather, permit writers may consider allowing permittees the flexibility to look for indicators of an illicit discharge before conducting water quality tests due to baseline flow (e.g. baseflow, groundwater flow, irrigation return flows) in certain areas. In these cases, permit writers could require that sensory indicators (i.e. odor, color, turbidity, and floatables) be evaluated.

For additional guidance on field screening, the *IDDE Manual* describes an outfall reconnaissance inventory (ORI) to assess outfalls and conduct indicator monitoring to help identify illicit discharges.

Regardless of the field screening scheme, it is also very important to emphasize in the permit conditions that monitoring must be done in compliance with 40 CFR 136.

3.5 IDDE Source Investigation and Elimination

Example Permit Provision

3.5.1 The permittee is required to develop written procedures for conducting investigations into the source of all identified illicit discharges, including approaches to requiring such discharges to be eliminated.

3.5.2 Minimum Investigation Requirements – At a minimum, the permittee is required to conduct an investigation(s) to identify and locate the source of any continuous or

intermittent non-stormwater discharge within [*specify time period*] of becoming aware of the illicit discharge.

a. Illicit discharges suspected of being sanitary sewage and/or significantly contaminated must be investigated first.

b. Investigations of illicit discharges suspected of being cooling water, wash water, or natural flows may be delayed until after all suspected sanitary sewage and/or significantly contaminated discharges have been investigated, eliminated and/or resolved.

c. The permittee must report immediately the occurrence of any dry weather flows believed to be an immediate threat to human health or the environment to [*insert state water quality emergency contact phone number*].

d. The permittee must track all investigations to document at a minimum the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

3.5.3 Determining the Source of the Illicit Discharge –The permittee is required to determine and document through its investigations, carried out in Part 3.5.1, the source of all illicit discharges. If the source of the illicit discharge is found to be a discharge authorized under [*insert NPDES discharge permit reference*] of an NPDES permit, no further action is required.

a. If an illicit discharge is found, but within six (6) months of the beginning of the investigation neither the source nor the same non-stormwater discharge has been identified/observed, then the permittee must maintain written documentation for review by the permitting authority.

b. If the observed discharge is intermittent, the permittee must document that a minimum of three (3) separate investigations were made to observe the discharge when it was flowing. If these attempts are unsuccessful, the Permittee must maintain written documentation for review by the permitting authority. However, since this is an ongoing program, the Permittee should periodically recheck these suspected intermittent discharges.[5]

3.5.4 Corrective Action to Eliminate Illicit Discharge – Once the source of the illicit discharge has been determined, the permittee must immediately notify the responsible party of the problem, and require the responsible party to conduct all necessary corrective actions to eliminate the non-stormwater discharge within [*specify deadline*]. Upon being notified that the discharge has been eliminated, the permittee must conduct a follow-up investigation and field screening, consistent with Part 3.4, to verify that the discharge has been eliminated. The permittee is required to document its follow-up investigation. The permittee may seek recovery and remediation costs from responsible parties consistent with Part 1.2, or require compensation for the cost of field screening and investigations. Resulting enforcement actions must follow the SWMP ERP.

[5] New Jersey Phase II Permit (www.state.nj.us/dep/dwq/pdf/Tier_A_final.pdf)

Example Permit Requirement Rationale for the Fact Sheet

The Clean Water Act, section 402(p)(3)(B)(ii) requires MS4 permits to "effectively prohibit non-stormwater discharges into the storm sewers." The permit implements this requirement, in part by requiring the development of procedures to investigate and eliminate illicit discharges. The permittee must develop a clear, step-by-step procedure for conducting the investigation of illicit discharges. The procedure must include an investigation protocol that clearly defines what constitutes an illicit discharge "case" and when a case is considered "closed." In many circumstances, sources of intermittent, illicit discharges are very difficult to locate, and these cases may remain unresolved. The permit requires that each case be conducted in accordance with the SOPs developed to locate the source and conclude the investigation, after which the case may be considered closed. A standard operating procedure (SOP) document is required in order to provide investigators with guidance and any necessary forms to ensure that consistent investigations occur for every illicit discharge incident.

Physical observations and field testing can help narrow the identification of potential sources of a non-stormwater discharge; however it is unlikely that either will pinpoint the exact source. Therefore, the permittee will need to perform investigations "upstream" to identify illicit connections to systems with identified problem outfalls.

Once the source of the non-stormwater discharge is determined through investigation, corrective action is required to eliminate the problem source. Resulting enforcement actions must follow the SWMP ERP. The permittee may conduct remediation activities on its own, in which case the permittee must require compensation for any and all costs related to eliminating the non-stormwater discharge. Non-traditional MS4 permittees may be limited in their ability to seek recovery.

Recommendations for the Permit Writer

Both Phase I and Phase II regulations require permittees to develop a process to trace the source of illicit discharges and eliminate them. The regulations also state that appropriate enforcement procedures and actions must be included in this process.

3.6 Public Reporting of Non-Stormwater Discharges and Spills

Example Permit Provision

3.6.1 The permittee must promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s through a central contact point, including phone numbers for complaints and spill reporting, and publicize to both internal permittee staff and the public. If 911 is selected, the permittee must also create, maintain, and publicize a staffed, non-emergency phone number with voicemail, which is checked daily.

3.6.2 The permittee must develop a written spill/dumping response procedure, and a flow chart or phone tree, or similar list for internal use, that shows the procedures for responding to public notices of illicit discharges, the various responsible agencies

and their contacts, and who would be involved in illicit discharge incidence response, even if it is a different entity other than the permittee.

3.6.3 The permittee must conduct reactive inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented by the responsible party to achieve and maintain compliance.[6]

Example Permit Requirement Rationale for the Fact Sheet

This provision serves to implement, in part, the statutory requirement that MS4 permits effectively prohibit non-stormwater discharges. Spills, leaks, sanitary sewer overflows, and illicit dumping or discharges can introduce a range of stormwater pollutants into the storm system. Prompt response to these occurrences is the best way to prevent or reduce negative impacts to waterbodies. The permittee must develop a spill response SOP that includes an investigation procedure similar to or in conjunction with the investigation SOP developed for illicit discharges in general (see Section 3.5). Often, a different entity might be responsible for spill response in a community (i.e. fire department), therefore, it is imperative that adequate communication exists between stormwater and spill response staff to ensure that spills are documented and investigated in a timely manner.

A stormwater hotline can be used to help permittees become aware of and mitigate spills or dumping incidents. Spills can include everything from an overturned gasoline tanker to sediment leaving a construction site to a sanitary sewer overflow entering into a storm drain. Permittees must set up a hotline consisting of any of the following (or combination thereof): a dedicated or non-dedicated phone line, E-mail address, or website.

Recommendations for the Permit Writer

Spills which occur due to municipal staff activities are considered illicit discharges, but, spill prevention could also be addressed in the municipal operations/good-housekeeping portion of the permit as in this Guide (Chapter 6).

Facilitating public reporting of illicit discharges is specifically required in the Phase I regulations and as a part of the plan to detect and address illicit discharge, EPA recommends that Phase II permittees also develop a venue to promote, publicize, and facilitate public reporting of these discharges.

It is also noteworthy that smaller Phase II MS4s may utilize outside agency resources for spill response and/or they may use a neighboring locality. In this case, permittees will need to coordinate with these agencies to ensure appropriate spill response occurs and the necessary documentation is completed.

[6] San Francisco Municipal Regional Stormwater permit (www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0074.pdf), with modifications

3.7 Illicit Discharge Education & Training

Example Permit Requirement

*3.*7.1 The permittee must continue to implement a training program for all municipal field staff, who, as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system. Contact information, including the procedure for reporting an illicit discharge, must be included in the permittee's fleet vehicles that are used by field staff. Training program documents must be available for review by the permitting authority.

3.7.2 By no later than [*insert applicable deadline, e.g., 6 months after permit authorization*], the permittee must train all staff identified in Section 3.7.1 above on the identification of an illicit discharge or connection, and on the proper procedures for reporting and responding to the illicit discharge or connection. Follow-up training must be provided as needed to address changes in procedures, techniques, or staffing. The permittee must document and maintain records of the training provided and the staff trained. [7]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the permittee to train field staff, who may come into contact or observe illicit discharges, on the identification and proper procedures for reporting illicit discharges. Field staff to be trained may include, but are not limited to, municipal maintenance staff, inspectors, and other staff whose job responsibilities regularly take them out of the office and into areas within the MS4 area. Permittee field staff are out in the community every day and are in the best position to locate and report spills, illicit discharges, and potentially polluting activities. With proper training and information on reporting illicit discharges easily accessible, these field staff can greatly expand the reach of the IDDE program.

Recommendations for the Permit Writer

Permit writers may wish to require training of office staff (or all permittee staff), as well as field staff, as they can act as additional "eyes and ears" since they typically live in the community. The training should consist of how to identify illicit discharges and dumping, as well as the appropriate people to contact based on the type of discharge that is occurring.

Existing permittees (Phase I and Phase II) may have been training staff for several permit terms. For this reason, the permit writer may want the permittee to focus on annual "refresher" trainings for existing staff and new employees within a certain time of their hire date.

[7] Washington State Phase I Permit (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/MODIFIEDpermitDOCS/PhaseIpermitSIGNED.pdf)

CHAPTER 4: CONSTRUCTION

Introduction

MS4 permits must address construction-related requirements (and often more specific state requirements) found in the following Federal regulations – Phase I MS4 Regulations 40 CFR 122.26(d)(2)(iv)(D) and Phase II MS4 Regulations 40 CFR 122.34(b)(4). Specific Permit Requirements should vary based on state requirements, rainfall amounts or other site-specific factors, but, in general, the requirements imposed on MS4 permittees for stormwater management of discharges associated with construction activities consist of several common requirements.

Included Concepts

- Construction requirements and control measures
- Construction site inventory
- Construction plan review procedures
- Construction site inspections and enforcement
- MS4 staff training
- Construction site operator education and public involvement

Permits must require that the permittee enact, to the extent allowed by State, Tribal or local law, an ordinance or other regulatory mechanism as part of the construction program that controls runoff from construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. As part of the ordinance or other regulatory mechanism, the permittee should provide commonly understood and legally binding definitions. These terms should be defined consistently across other related guidance and regulatory documents. Note that EPA's recommended definitions addressing this requirement are included in Appendix B.

Permits must require that MS4 permittees ensure that construction site operators select and implement appropriate erosion and sediment control measures to reduce or eliminate the impacts to receiving waters. The permit can require that permittees develop their own standards and specifications, but often it is preferable to require the permittees to utilize existing guidance that is approved by the permitting authority.

The permit must require that the permittee establish review procedures for construction site plans to determine potential water quality impacts and ensure the proposed controls are adequate. These procedures must include the review of individual pre-construction site plans to ensure consistency with local sediment and erosion control requirements. In addition, the permit must include requirements for inspection and enforcement of erosion and sediment control measures once construction begins.

Finally, Phase I MS4 permits must require the development of educational materials and training for construction site operators, and EPA recommends that training on stormwater controls for construction site operators be mandated in Phase II MS4 permits as well. Training should address site requirements for control measures, local stormwater requirements, enforcement activities, and penalties for non-compliance.

4.1 Construction Requirements and Control Measures

Example Permit Provision

4.1.1 The permittee must continue to implement a program which requires operators of public or private "construction activities" to select, install, implement, and maintain stormwater control measures that comply with [*Insert reference to documents including any and all applicable erosion and sediment control, pollution prevention, and other stormwater requirements, including applicable CGP, State, and local requirements*.] "Construction activity" for this permit includes, at a minimum, all public and private construction sites that result in a total land disturbance of [*insert disturbance threshold – either one or more acres or that result in a total land disturbance of less than one acre if part of a larger common plan or development or sale, or an alternative threshold that includes disturbances of less than one acre*]. Written procedures for implementing this program, including the components described in Parts 4.2 – 4.6, must be incorporated into the SWMP document. The permittee's construction program must ensure the following minimum requirements are effectively implemented for all construction activity discharging to its MS4:

[*Insert specific minimum requirements, such as:*

a. **Erosion and Sediment Controls**. Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

(1) Control stormwater volume and velocity within the site to minimize soil erosion;

(2) Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;

(3) Minimize the amount of soil exposed during construction activity;

(4) Minimize the disturbance of steep slopes;

(5) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

(6) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible; and

(7) Minimize soil compaction and, unless infeasible, preserve topsoil.

b. **Soil Stabilization**. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed within a period of

time determined by the permittee. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed as specified by the permittee.

c. **Dewatering**. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

(1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

(2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

(3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited Discharges**. The following discharges are prohibited:

(1) Wastewater from washout of concrete, unless managed by an appropriate control;

(2) Wastewater from washout and cleanout of stucco, paint, from release oils, curing compounds and other construction materials;

(3) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and,

(4) Soaps or solvents used in vehicle and equipment washing.

f. **Surface Outlets**. When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Example Permit Requirement Rationale for the Fact Sheet

Stormwater discharges from construction sites generally includes sediment and other pollutants such as phosphorus and nitrogen, turbidity, pesticides, petroleum derivatives, construction chemicals, and solid wastes that may become mobilized when land surfaces are disturbed. The permit requires MS4 permittees to require construction site operators at defined sites to meet certain minimum stormwater requirements relating to erosion and sediment control and pollution prevention, and to meet other restrictions imposed on them by the State, or local regulations. These minimum requirements clearly specify the expectations for addressing

erosion control, sediment control, and pollution prevention control measures at construction sites.

EPA's Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category (74 FR 62996, December 1, 2009) require construction site owners and operators to implement a range of erosion and sediment control measures and pollution prevention practices to control pollutants in discharges from construction sites. These standards will be required in state construction general permits as they are reissued. These standards are broadly applicable to all construction activity disturbing one or more acres. They provide an objective means of describing appropriate erosion and sediment control best management practices, pollution prevention controls on construction site waste and storage of building materials and other reasonable components of the permittee's program to reduce pollutants to the maximum extent practicable in stormwater from construction sites that discharge through the MS4.

Recommendations for the Permit Writer

The Phase II stormwater regulations require permittees to develop a construction site program addressing "land disturbance of greater than or equal to one acre." However, some states may have more stringent requirements that apply to some permittees, or the permit writer may have discretion to lower the one acre threshold if this threshold is too high for particular permittees. For example, smaller, built-out cities may have many small redevelopment projects that fall below the one acre threshold. In such cases, controlling construction site stormwater entering the MS4 to the maximum extent practicable may require stormwater controls at smaller sites. Permit writers should review available construction and planning data from the MS4 to determine an appropriate project size threshold.

The example permit provision's list of minimum requirements for erosion controls, sediment controls, and pollution prevention measures is intended to establish specific requirements to implement the broader requirements in the Phase II rule (40 CFR 122.24(b)(4)). The list of minimum requirements in the example permit provision are from EPA's Construction and Development Effluent Guidelines (published December 1, 2009) which will eventually be required in all NPDES stormwater permits issued to construction site operators. At a minimum, the permit should reference the applicable state standards and, where appropriate, any local standards as well. Permit writers may wish to modify these specific requirements based on current standards or guidance on construction site stormwater controls in the State.

4.2 Construction Site Inventory

Example Permit Provision

4.2.1 The permittee must continue to maintain an inventory of all active public and private construction sites that result in a total land disturbance of [*insert disturbance threshold from Part 4.1.1.*]. The inventory must be continuously updated as new projects are permitted and projects are completed. The inventory must contain

relevant contact information for each project (e.g., name, address, phone, etc.), the size of the project and area of disturbance, whether the project has submitted for permit coverage under [*insert name of applicable NPDES general construction permit*], the date the permittee approved the [*insert name of local erosion and sediment control/stormwater plan]* in accordance with Part 4.3, and the permit tracking number issued by [*insert name of permitting authority*]. The permittee must make it available to the permitting authority upon request.

Example Permit Requirement Rationale for the Fact Sheet

To effectively conduct inspections, the permittee must know where construction activity is occurring. A construction site inventory tracks information such as project size, disturbed area, distance to any waterbody or flow channel, when the erosion and sediment control/stormwater plan was approved by the Permittee, and whether the project is covered by the permitting authority's construction general permit. This inventory will allow the permittee to track and target its inspections.

Recommendations for the Permit Writer

Because of state or local construction permitting requirements, many permittees have some system in place to track construction activity in their jurisdiction. If this is the first MS4 permit issued to the permittee, the permit writer should include a deadline for the development of the initial inventory.

Permit writers may want to request electronic copies of the inventory quarterly or yearly, if that information will be used by the State permitting or inspection staff.

4.3 Construction Plan Review Procedures

Example Permit Provision

4.3.1 The permittee must continue to require each operator of a construction activity to prepare and submit a [*insert name of local erosion and sediment control/stormwater plan*] prior to the disturbance of land for the permittee's review and written approval prior to issuance of a [*insert appropriate permit, i.e. grading or construction*]. The permittee must make it clear to operators of construction activity that they are prohibited from commencing construction activity until they receive receipt of written approval of the the plans. If the [*insert name of local erosion and sediment control/stormwater plan*] is revised, the permittee must review and approve those revisions.

4.3.2 The permittee must continue to implement site plan review procedures that meet the following minimum requirements:

a. The permittee must not approve any [*insert name of local erosion and sediment*

control/stormwater plan] unless it contains appropriate site-specific construction site control measures that meet the minimum requirements in Part 4.1.1 of this permit.

b. The stormwater pollution prevention plan (SWPPP) developed pursuant to [*insert name of applicable NPDES general construction permit*] may substitute for the [*insert name of local erosion and sediment control/stormwater plan*] for projects where a SWPPP is developed. The permittee is responsible for reviewing those portions of the SWPPP that comply with the [*insert name of local erosion and sediment control/stormwater plan*].

c. The [*insert name of local erosion and sediment control/stormwater plan*] must include the rationale used for selecting control measures, including how the control measure protects a waterway or stormwater conveyance.

d. The permittee must use qualified individuals, knowledgeable in the technical review of [*insert name of local erosion and sediment control/stormwater plan*] to conduct such reviews.

e. The permittee must document its review of each [*insert name of local erosion and sediment control/stormwater plan*] using a checklist or similar process. [8]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the review and prior approval of all local erosion and sediment control plans/stormwater plans to ensure that construction activities adhere to the permittee's minimum stormwater control requirements. Adequate review of erosion and sediment control/stormwater plans is necessary to verify compliance with all applicable requirements in the permittee's ordinance or other regulatory mechanism, as well as compliance with control measure standards and specifications. A formalized review procedure ensures consistent review of plans by specifying the requirements for plans being submitted, the schedule for review, and general conditions for approval. The site plan review process also provides a way to track construction activities and enforce standards.

A good site plan review process provides the permittee with the opportunity to comment – early and often – on a project's proposed number, type, location, and sizing of stormwater control measures that will be in place prior to, during, and at the conclusion of active construction. It is important to keep in mind that a site plan is a "living document" that may change during the life of the project; however, it is critical that the site plan be adequately reviewed and initially based on established policy, guidelines, and standards. The plan is the framework for stormwater control implementation, as well as the basis of any enforcement action on a project site.

The permit requires the permittee to review plans before construction activity begins to ensure that the plans are consistent with the standards specified in Part 4.1.1. The permit language also includes some key requirements during the plan review process:

[8] 2009 Ventura County, CA Phase I MS4 Permit (www.swrcb.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/ventura_ms4/09-0057/Transmittal%20Letter%20and%20MS4%20Permit%20Order%20No%2009%200057.pdf)

- If a SWPPP is developed for the State construction general permit, that plan may substitute for the local plan if it also includes/addresses the local requirements.
- The plan must include the rationale used for selecting or rejecting control measures (for example, why a silt fence was selected or why a sediment trap was not included).
- Finally, plan reviewers must be trained and must document their review. For example, this can be done by using a checklist or similar process.

Recommendations for the Permit Writer

Some MS4 permits include a requirement that, prior to approval of local permits, the permittee must verify that the construction site operator has existing coverage under the State's Construction General Permit, if necessary. This requirement helps to reduce the number of non-filers for the State general permit by providing a check for NPDES CGP permit coverage at the local level.

4.4 Construction Site Inspections and Enforcement

Example Permit Provision

4.4.1 The permittee must continue to implement procedures for inspecting public and private construction projects in accordance with the frequency specified in Table 4-1 below:

Table 4-1: Inspection Frequencies

Site	Inspection Frequency
a. All sites [*insert a size threshold that is considered large for the MS4 if large projects are common, e.g. 5 acres*] or larger in size	Inspection must occur within [*insert number of days/hours, e.g. 48 hours] of a [insert significant rain event size, e.g. ½ inch rain event] and no less than biweekly (every 2 weeks)*]
b. All sites one (1) acre or larger that discharge to a tributary listed by the state/tribe as an impaired water for sediment or turbidity under the CWA section 303(d)	
c. Other sites one (1) acre or more determined by the permittee or permitting authority to be a significant threat to water quality*	
d. All other construction sites with one (1) acre or more of soil disturbance not meeting the criteria specified in (A),(B), or (C) above	Inspection must occur at least monthly
e. Construction sites less than one (1) acre in size	Inspection must occur as needed based on the evaluation of the factors that are a threat to water quality*
*In evaluating the threat to water quality, the following factors must be considered: soil erosion potential; site slope; project size and type; sensitivity of receiving waterbodies; proximity to receiving waterbodies; non-stormwater discharges; past record of non-compliance by the operators of the construction site; and [*insert other factors relevant to particular MS4*].	

4.4.2 The permittee must adequately inspect all phases of construction.

a. Prior to Land Disturbance: Prior to allowing an operator to commence land disturbance, the permittee must perform an inspection to ensure all necessary erosion and sediment controls are in place.

b. During Active Construction: During active construction, the permittee is required to conduct inspections in accordance with the frequencies specified in Table 4-1 in Part 4.4.1.

c. Following Active Construction: At the conclusion of the project, the Permittee must inspect all projects to ensure that all graded areas have reached final stabilization and that all temporary control measures are removed (e.g., silt fence).

4.4.3 The permittee must have trained and qualified inspectors (See Part 4.5). The permittee must also continue to follow, and revise as necessary, written procedures outlining the inspection and enforcement procedures. Inspections of construction sites must, at a minimum:

a. Check for coverage under the [*insert name of applicable NPDES general construction permit*] by requesting a copy of any application or Notice of Intent (NOI) or other relevant application form during initial inspections.

b. Review the applicable [*insert name of local erosion and sediment control/stormwater plan*] and conduct a thorough site inspection to determine if control measures have been selected, installed, implemented, and maintained according to the plan.

c. Assess compliance with the permittee's ordinances and permits related to stormwater runoff, including the implementation and maintenance of designated minimum control measures.

d. Assess the appropriateness of planned control measures and their effectiveness.

e. Visually observe and record non-stormwater discharges, potential illicit connections, and potential discharge of pollutants in stormwater runoff.

f. Provide education and outreach on stormwater pollution prevention, as needed.

g. Provide a written or electronic inspection report generated from findings in the field

4.4.4 The permittee must track the number of inspections for the inventoried construction sites throughout the reporting period to verify that the sites are inspected at the minimum frequencies required. Inspection findings must be documented and maintained for review by the permitting authority.

4.4.5 Based on site inspection findings, the permittee must take all necessary follow-up actions (i.e., re-inspection, enforcement) to ensure compliance in accordance with the permittee's enforcement response plan required in Part 1.3. These follow-up and enforcement actions must be tracked and maintained for review by the permitting authority. [9]

[9] 2007 San Diego Phase I MS4 Permit (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf)

Example Permit Requirement Rationale for the Fact Sheet

The permit requires inspections of construction sites based on a prioritized ranking of sites (see 40 CFR 122.26(d)(2)(iv)(D)(3) and 122.34(b)(4)(ii)(F)). Larger construction sites and sites that discharge to a sediment impaired waterbody are inspected more frequently than small sites. In addition to inspections at a regular interval, inspections are required within a certain timeframe after a rain event.

Inspections are required before land disturbance to ensure erosion and sediment controls are in place and a plan has been developed, during active construction, and after the site has been stabilized. The permit language also contains specific requirements on what the inspection must include (such as a comparison of control measures in the approved plan to measures installed in the field).

Without adequate implementation and maintenance, stormwater controls will not function as designed. In order to ensure proper implementation and maintenance by site operators, a rigorous inspection protocol is necessary. This protocol must include a written SOP for site inspections and enforcement to ensure inspections and enforcement actions are conducted in a consistent manner. The SOP must include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, slope of the site, proximity to receiving waters, the characteristics of soils, and the water quality status of the receiving water. This will allow inspection resources and staff time to be used most effectively. Documentation of inspections is critical to track noncompliance and enforcement. Regularly scheduled inspections, as well as post-storm event inspections, are necessary to be sure that regular maintenance occurs as well as repairs after storm events.

Recommendations for the Permit Writer

Selecting an appropriate inspection frequency is, by necessity, a case-by-case exercise. Inspection frequencies for one permittee will not necessarily be appropriate for other permittees. For example, appropriate inspection frequencies may vary among different permittees depending on such factors as topography and rainfall patterns, including whether the MS4 is located in a wet or arid region and/or has distinct wet and dry seasons. Appropriate inspection frequencies may also vary seasonally or geographically within a single MS4 based on seasonal variations in rainfall or snowfall, or differing topographical or geographic conditions in different parts of the MS4 area.

For individual MS4 permits, permit writers should consider seasonal rainfall patterns, the presence and location of impaired streams or sensitive habitats, soils, topography, and other MS4-specific factors. In addition, permit writers should review current inspection frequencies, as well as inspection and enforcement records.

The permit writer should also note that the permit language will need to be modified if the permittee was not previously required to develop written procedures for the inspection and enforcement conducted at construction sites.

4.5 MS4 Staff Training

Example Permit Provision

4.5.1 The permittee must ensure that all staff whose primary job duties are related to implementing the construction stormwater program, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. The training can be conducted by the permittee or outside training can be attended, however, this training must include, at a minimum:

a. Erosion and Sediment Control/Stormwater Inspectors:

1. Initial training, held within the first permit year, regarding proper control measure selection, installation, implementation, and maintenance, as well as administrative requirements such as inspection reporting/tracking and use of the permittee's enforcement responses; and
2. Annual refresher training for existing inspection staff to update them on preferred controls, regulation changes, permit updates, and policy or standards updates. Throughout the year, e-mails and/or memos must be sent out to update the inspectors as changes happen.

b. Other Construction Inspectors: Initial training must be held within the first permit year, on general stormwater issues, basic control measure implementation information, and procedures for notifying the appropriate personnel of noncompliance. Refresher training held at least once every two years.

c. Plan Reviewers:

1. Initial training, held within the first permit year, regarding control measure selection, design standards, and review procedures; and
2. Annual training regarding new control measures, innovative approaches, permit updates, regulation changes, and policy or standard updates.

d. Third-Party Inspectors and Plan Reviewers: If the permittee utilizes outside parties to conduct inspections and/or review plans, these outside staff must be trained per the requirements listed in Part 4.5.1.a (above).

Example Permit Requirement Rationale for the Fact Sheet

By setting up training for the permittee staff, the permittee can ensure that the erosion and sediment control requirements are understood and consistently applied since all staff will have been trained on the same information. The permit requires staff whose primary job duties are related to implementing the construction stormwater program to be trained. The training requirements vary by the type of staff. F or example, erosion and sediment control inspectors must be trained annually on a range of topics, while other construction inspectors (such as building inspectors) will receive more general training.

The permittee can conduct the training or the training can be provided by another entity (such as a State erosion and sediment control class). Ideally, the training should include classroom presentations, in-field training, and follow-up evaluations to determine whether the training was effective.

Also, the permittee should consider providing training to other in-field municipal staff so that problems associated with flooding and sedimentation from construction sites can be properly reported and addressed.

4.6 Construction Site Operator Education & Public Involvement

Example Permit Provision

4.6.1 Construction Operator Education. The permittee must develop and distribute educational materials to construction site operators as follows:

a. Each year, the permittee must either provide information on existing training opportunities or develop new training for construction operators on control measure selection, installation, implementation, and maintenance as well as overall program compliance.

b. The permittee must develop or utilize existing outreach tools (i.e. brochures, posters, website, plan notes, manuals etc.) aimed at educating construction operators on appropriate selection, installation, implementation, and maintenance of stormwater controls, as well as overall program compliance.

c. The permittee must make available appropriate outreach materials to all construction operators who will be disturbing land within the MS4 boundary. The permittees' contact information and website must be included in these materials.

d. The permittee must include information on appropriate selection, installation, implementation, and maintenance of controls, as well as overall program compliance, on the permittee's existing website.

4.6.2 Public Involvement.

a. The permittee must adopt and implement procedures for receipt and consideration of information submitted by the public regarding construction projects. This includes, but is not limited to, the public reporting mechanisms described in Part 3.6.

b. The permittee must hold public meetings for all public projects that have planned disturbance greater than or equal to an acre. [10]

[10] Eastern Washington MS4 Phase II Permit (Part 2 only) (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseiiEwa/MODIFIEDpermitDOCS/EWpermitMODsigned.pdf)

Example Permit Requirement Rationale for the Fact Sheet

Education of construction site operators regarding stormwater management and regulatory requirements is an essential part of controlling stormwater discharges from construction sites. Making brochures, guidance documents and trainings available will increase the knowledge of operators and compliance in the field and can help them choose the correct structural control and processes, correctly install the controls, and successfully implement control measures. The permit requires the permittee to provide appropriate outreach materials to construction site operators. These materials can be made available during the normal course of business (i.e. in BMP manuals, in plan notes, during meetings) or via brochures or websites. In addition, the permittee must either provide training or notify the operators of available training opportunities.

Public involvement requirements include the development of a hotline or other telephone number for the public to call regarding stormwater concerns at construction sites.

CHAPTER 5: POST-CONSTRUCTION OR PERMANENT/LONG-TERM STORMWATER CONTROL MEASURES

Introduction

Phase I MS4s are required to address new development and significant redevelopment in their SWMPs through controls to reduce pollutants in stormwater discharges after construction is completed. See 40 CFR 122.26(d)(2)(iv)(A)(2).

Included Concepts

- Post-construction stormwater management program
- Site performance standards
- Site plan review
- Long-term maintenance of post-construction stormwater control measures
- Watershed protection
- Tracking of post-construction stormwater control measures
- Inspections and enforcement
- Retrofit plan

The Phase II regulations require regulated small MS4 operators to develop, implement, and enforce a program to address stormwater discharges from new development and redevelopment sites that disturb greater than or equal to one acre to the MS4 (including projects that disturb less than one acre that are part of a larger common plan of development or sale). The regulations also require that the MS4 ensure that control measures are installed and implemented that prevent or minimize water quality impacts. See 40 CFR 122.34(b)(5)(i)

As part of these Phase II requirements, the MS4 must:

- Develop and implement approaches to addressing post-construction stormwater discharges that include a combination of structural and/or non-structural controls;
- Adopt adequate legal authority to enable the MS4 to address post-construction stormwater discharges from new development and redeveloped sites; and
- Ensure adequate long-term operation and maintenance of applicable post-construction control measures. See 40 CFR 122.34(b)(5)(ii).

As of April 2010, most MS4 permits only require permittees to adopt a post-construction program with enforceable requirements designed to reduce stormwater impacts from new development and redevelopment, without specifying a performance standard. To meet this requirement many MS4s have adopted criteria in ordinances or other legally enforceable mechanisms based on already promulgated flood-control based standards (i.e., focused only on discharge rates). However, performance standards can be a very useful and meaningful mechanism in the post-construction toolbox to ensure that water quality objectives are met.

The example permit provisions that follow present the current thinking on how to strengthen the effectiveness of the permittee's stormwater program by preventing the harmful effects of increased stormwater flows and pollutant loads from new development and redeveloped sites on receiving waterbodies. EPA recognizes that there are a wide variety of approaches that some states have already

taken to control discharges from new development and redeveloped sites, some of which are more stringent than the permit language recommended below. The language below includes components that EPA believes would provide focus and enforceability, and would bring about significant improvements in stormwater controls on site. However, the "maximum extent practicable" may be greater than is reflected in the example permit language below for some MS4s, and EPA encourages states, where possible, to go beyond these example provisions and to achieve even better watershed planning and water quality outcomes. For these reasons, this chapter presents the minimum permit provisions EPA currently recommends to be included in permits in order for permittees to reduce their discharges to the maximum extent practicable as well as the optional, more stringent, requirements.

5.1 Post-Construction Stormwater Management Program

Example Permit Provision

5.1.1 The permittee must continue to implement a program to control stormwater discharges from new development and redeveloped sites that disturb at least one acre (including projects that disturb less than one acre that are part of a larger common plan of development or sale) that discharge into an MS4 [*or insert smaller alternative size*]. The program must apply to private and public development sites, including roads.

5.1.2 The program must require that controls are in place that will infiltrate, evapotranspire, or harvest and use stormwater from the site to meet the performance standards in Part 5.2 to protect water quality.

5.1.3 Written procedures for implementing this program, including the components described in Parts 5.2 – 5.8, must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

The stormwater regulations require that an MS4 develop and implement a program to address post-construction discharges from new development and redeveloped sites, and ensure the long-term operation and maintenance of these controls (see Part 5.4 for the maintenance requirements). (See 40 CFR 122.34(b)(5)). The permit requires the use of specific stormwater controls, i.e., those that infiltrate, evapotranspire, or harvest and use stormwater, with the aim of maintaining or restoring the pre-development stormwater runoff conditions at the site.

Many traditional stormwater management practices, and the permit language that drives them, fail to address the hydrologic modifications that increase the quantity of stormwater discharges, and cause excessive erosion and stream channel degradation. Frequently the volume, duration, and velocity of stormwater discharges cause degradation to aquatic systems. Protecting and restoring the physical, chemical and biological integrity of receiving waters must be a central issue in stormwater permits. The recent report of the National Research Council (*Urban Stormwater Management in the United States*, National Academies Press, 2008, www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf) recommends that the NPDES stormwater

program examine the impacts of stormwater flow, treat flow as a surrogate for other pollutants, and includes the necessary control requirements in stormwater permits. Specifically the report recommends that the volume retention practices of infiltration, evapotranspiration and rainwater harvesting be used as primary stormwater management mechanisms. For this reason, EPA recommends use of a permit condition that is based on maintaining or restoring predevelopment hydrology although other forms of this permit condition maybe appropriate as well.

Additional information on the development of a post-construction program for Phase II permittees can be found in the Center for Watershed Protection's *Managing Stormwater In Your Community: A Guide for Building an Effective Post-Construction Program* (available at www.cwp.org/postconstruction). Also, EPA's green infrastructure website includes information on post-construction controls and programs (see www.epa.gov/greeninfrastructure).

5.2 Site Performance Standards

Example Permit Provision

5.2.1 The permittee must establish, implement and enforce a requirement that owners or operators of new development and redeveloped sites discharging to the MS4, which disturb greater than or equal to one acre (including projects that disturb less than one acre that are part of a larger common plan of development or sale), design, install, implement, and maintain stormwater control measures that infiltrate, evapotranspire, harvest, and use stormwater discharges.

5.2.2 Within [*insert deadline, e.g., 12 months, 24 months, etc.*] the permittee must require that stormwater discharges from such new development and redevelopment sites be managed such that post-development hydrology does not exceed the pre-development hydrology at the site, in accordance with the performance standard set forth in this paragraph. The SWMP must describe the site design strategies, control measures, and other practices deemed necessary by the permittee to maintain or improve pre-development hydrology.[11] [*Insert a new development performance standard, such as one or a combination of the following:*

Basis for Performance Standard	***Description***	***Performance Standard***
Rainfall	*Minimum storm volume to be retained on site.*	*Design, construct, and maintain stormwater management practices that manage rainfall on-site, and prevent the off-site discharge of the precipitation from [insert standards, such as "the first one inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation"]. Discharge volume reduction can be achieved by canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration and/or evapotranspiration and any combination of the aforementioned practices. This first one inch of rainfall*

[11] *Big Darby Creek Watershed CGP, Part III.G.2.d. (web.epa.ohio.gov/dsw/permits/DarbyStormWater_Final_GP_sep06.pdf)*

		must be 100% managed with no discharge to surface waters, except when the permittee chooses to implement the conditions in Part 5.2.5.d below.[12]
Rainfall	*Minimum storm size to be retained on site.*	*Design, construct, and maintain stormwater management practices that manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to [insert standards, such as "the 95th percentile rainfall event"]. This objective must be accomplished by the use of practices that infiltrate, evapotranspire and/or harvest and reuse rainwater. The 95th percentile rainfall event is the event whose precipitation total is greater than or equal to 95 percent of all storm events over a given period of record.*[13]
Recharge/Runoff	*Hydrologic analysis.*	*Design, construct, and maintain stormwater management practices that preserve the pre-development runoff conditions following construction. The post-construction rate, volume, duration and temperature of discharges must not exceed the pre-development rates and the pre-development hydrograph for 1, 2, 10, 25, 50 and 100 year storms must be replicated through site design and other appropriate practices. These goals must be accomplished through the use of infiltration, evapotranspiration, and/or rainwater harvesting and reuse practices. Defensible and consistent hydrological assessments and modeling methods must be used and documented.* [14]
Recharge	*Groundwater recharge requirement.*	*Any "major development" project, which is one that disturbs [insert standards, such as at least one (1) acre of land or creates at least 0.25 acres of new or additional impervious surface], must comply with one of the following two groundwater recharge requirements:* • *Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or* • *Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater discharges volume from pre-construction to post-construction for the two-year storm is infiltrated.*[15]
Impervious Cover	*Limiting total impermeable surface (or effective impermeable surface)*	*Minimize total impervious cover resulting from new development and redevelopment to [insert standards, such as <10% of disturbed land cover and/or limit total amount of effective impervious surface to no more than 5% of the landscape].*

[12] *West Virginia Small MS4 Permit (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*
[13] *Section 438, Energy Independence & Security Act (EISA) Guidance (www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf)*
[14] *Section 438, Energy Independence & Security Act (EISA) Guidance (www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf)*
[15] *New Jersey Stormwater Management Rules, N.J.A.C. 7:8* (www.nj.gov/dep/rules/adoptions/2004_0202_njpdes.pdf)

5.2.3 Incentives for Redeveloped Sites. When considered at the watershed scale, certain types of developed sites can either reduce existing impervious surfaces, or at least create less 'accessory' impervious surfaces. The Permittee may develop a program to allow adjustments to the performance standard for new development or redevelopment sites that qualify. A reduction of [*insert the amount of stormwater the Permittee can reduce for utilizing redevelopment principles, e.g. 0.2 inches from the one inch runoff reduction standard*] may be applied to any of the following types of development. Reductions are additive up to a maximum reduction of [*insert amount, such as 0.75 inches*] for a project that meets four or more criteria. The permittee may choose to be more restrictive and allow a reduction of less than [*insert amount, such as 0.75 inches*] if they choose. In no case will the reduction be greater than [*insert amount, such as 0.75 inches*].

1. Redeveloped sites
2. Brownfield redeveloped site
3. High density (>7 units per acre)
4. Vertical Density, (Floor to Area Ratio (FAR) of 2 or >18 units per acre)
5. Mixed use and Transit Oriented Development (within ½ mile of transit)[16]

5.2.4 Additional Requirements and Exceptions: The permittee must implement the following additional requirements where applicable:

a. A site that is a potential hot spot with the reasonable potential for contaminating underground sources of drinking water must provide treatment for associated pollutants (e.g., petroleum hydrocarbons at a vehicle fueling facility).

b. A site that discharges or proposes to discharge to any surface water or ground water that is used as a source of drinking water must comply with all applicable requirements relating to source water protection and must not cause an exceedance of drinking water standards.[17]

c. Sites may not infiltrate stormwater in areas of soil contamination.

d. For projects that cannot meet 100% of the performance standard in Part 5.2.2 on site, two alternatives are available: off-site mitigation and payment in lieu. If these alternatives are chosen, then the permittee must develop and fairly apply criteria for determining the circumstances under which these alternatives will be available and establish reasonable schedules for mitigation and require payment in lieu of prior to project inception. A determination that standards cannot be met on site must include multiple criteria that would rule out fully meeting the performance standard in Part 5.2.2, such as: too small a lot outside of the building footprint to create the necessary infiltrative capacity even with amended soils; soil instability as documented by a thorough geotechnical

[16] *West Virginia Small MS4 Permit (Section C.b.5.a.ii.A.3) (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*
[17] *West Virginia Small MS4 Permit (Section C.b.5.a.ii.A.2) (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*

analysis; a site use that is inconsistent with capture and reuse of stormwater; or too much shade or other physical conditions that preclude adequate use of plants. Sites must still maximize stormwater retention on-site, before applying the remaining stormwater to one of the alternatives. In instances where alternatives are chosen, technical justification as to the infeasibility of on site management is required to be documented.[18]

Example Permit Requirement Rationale for the Fact Sheet

Developed land changes the hydrology of sites, leading to higher stormwater discharge volumes and higher pollutant loads. The purpose of this standard is to maintain or restore stable hydrology in receiving waters thereby protecting water quality by having post-construction hydrology mimic the natural hydrology of the area.

A simpler, but reasonably approximate 'mimicking the natural hydrograph' approach can typically be accomplished by retaining (as opposed to detaining stormwater for later discharge) on a developed site the volume of water that was retained prior to development, through the mechanisms of infiltration, evapotranspiration, and capture and use. By significantly reducing the volume of stormwater discharges, these mechanisms significantly reduce the discharge of pollutants in stormwater, making discharge volumes the ideal all-around focus and metric for stormwater management. These provisions must be clear about the retention requirement, e.g., an underdrained rain garden likely functions more as a detention and filtration system than an infiltration system.

In Part 5.2.3, the five types of development which qualify for incentives are redevelopment, brownfield redevelopment, high density, vertical density, and mixed use with transit oriented development. Redeveloping already degraded sites can reduce regional land consumption and minimize new land disturbance. Minimizing land disturbance and impervious cover is critical to maintaining watershed health. In addition to water quality benefits, cleaning up and reinvesting in brownfield properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment. The effect of low-density urbanization on watersheds and the hydrologic cycle is substantial. High-density development, including vertical density, slows land consumption rates and accommodates more land uses on a smaller footprint. Finally, mixing land uses and promoting transit-oriented development can directly reduce runoff since mixed-use developments have the potential to use surface parking lots and transportation infrastructure more efficiently, requiring less pavement.[19]

In Part 5.2.4.d, the permittee must establish clear and stringent criteria for the conditions under which payment in lieu and off-site mitigation could be used. These criteria must be related to physical constraints such as a combination of soils which limit infiltration opportunities, space or light limited situations restricting the amount of vegetation that can be used, and a land use that is not conducive to capture and use of stormwater. Further, appropriate schedules for

[18] *West Virginia Small MS4 Permit (Section C.b.5.a.ii.A.4) (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*

[19] Adapted from the WV Phase II MS4 Fact Sheet (www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx)

payment and implementation of mitigation measures must be established to ensure stormwater impacts are addressed in a timely manner.

Recommendations for Permit Writer

Many communities have adopted criteria based on already promulgated flood-control based standards (i.e., focused only on discharge rates). This example permit language instead promotes the concept that effective standards should be based on the objective of maintaining or restoring stable hydrology to protect the quality of receiving waters by having post-construction hydrology mimic the natural hydrology of the area. The permit language provides a number of example standards that can be used to achieve this objective.

Performance standards should take into account the wide variability in hydrologic conditions in different areas. Ideally, standards should reflect the local naturally-occurring hydrology with respect to runoff, infiltration, evapotranspiration, and storage – that is, the water balance that would be present in the absence of development. Key parameters, such as rainfall patterns, soil characteristics, and topography, can be used to establish likely 'natural' hydrology. Where maintaining or reestablishing such hydrologic conditions is infeasible, off-site mitigation, payment-in-lieu, or fee programs may be used. Based on current (2010) information, EPA recommends that permits allow for a combination of techniques that utilize infiltration, capture and use, and evapotranspiration as appropriate, rather than relying only on infiltration or some other technique alone to meet performance standards.

The permit writer could include a performance standard that stipulates that predevelopment hydrographs match post-development hydrographs. In order for this type of performance standard to be effective, the permit writer should make sure that the permit clearly spells out all variables of the hydrograph (volume, rate, duration, frequency) to be matched, and not just the discharge rate. Many current pre-post hydrology standards focus only on discharge rate, which is primarily a flood control approach. In addition, a pre-development condition should also be defined, and that condition should be one that is reasonably 'natural', rather than simply the conditions (perhaps already fairly impervious) that existed immediately prior to the current developed site. A calculator tool based on key hydrologic parameters (soil, rainfall, slope, and vegetation) or an on-site rainfall retention standard that is appropriate for that area can help the permittee determine what constitutes pre-development hydrology and the means by which it may be matched.

As contemplated in the example permit provisions, permit writers may want to consider the difference between new development and redevelopment sites, as well as differences among some types of developed sites, in establishing performance standards. From the standpoint of imperviousness at a watershed scale, redeveloped sites are usually more desirable than new development sites, which replace relatively naturally functioning green spaces with impervious surfaces such as roads, and parking lots. Certain types of development generate less impervious surfaces than others. For example, typically, there is little or no increase in net stormwater discharges when redeveloping underused properties such as vacant properties, brownfield sites, or greyfield sites, since new impervious cover replaces existing impervious cover. The net discharge increase from already developed properties would likely be zero since the site was already predominately impervious cover. In many cases, redeveloped sites break up or remove some portion of the impervious cover, converting it to pervious cover and allowing for some stormwater infiltration. Redevelopment sites can produce a net improvement in regional water quality by decreasing total impervious area and its

associated stormwater discharges. Redeveloped sites can also reduce regional land consumption. By building on underused, already degraded land, the pressure to convert previously undeveloped land is reduced. Therefore differential standards for new development and redeveloped sites, as well as for different types of developed sites, may be reasonable. However, they should be crafted to minimize creation of imperviousness at the watershed scale, and still include some reasonable level of stormwater management at the site scale.

Redevelopment is the act of improving by renewing or restoring any developed property that results in the land disturbance of one acre or greater, and that has one of the following characteristics:

- Land that currently has an existing structure, such as buildings or houses, or
- Land that is currently covered with an impervious surface, such as a parking lot or roof, or
- Land that is currently degraded and is covered with sand, gravel, stones, or other non-vegetative covering.

Infiltration may not be appropriate in all cases. For example, a site that is a potential hot spot with the reasonable potential for significant pollutant loading(s) may not be appropriate for stormwater infiltration. Hot spots may include commercial, industrial, institutional, municipal, or transportation related operations that may produce higher levels of stormwater pollutants, and/or present a higher level or risk for spills, leaks, or illicit discharges such as: gas stations, petroleum wholesalers, vehicle maintenance and repair, auto recyclers, recycling centers and scrap yards, landfills, solid waste facilities, wastewater treatment plants, airports, railroad stations and associated maintenance facilities, and highway maintenance facilities.

In addition, the permit writer may want to consider what type of flexibility to afford sites where the owner/operator is not able to meet the performance standard on site. For instance, if a site is constrained by size or previous impervious surfaces, such that the use of control measures that infiltrate stormwater is severely limited, the permit could allow alternatives for meeting the performance standard in other ways such as payment in lieu and off-site mitigation within the same watershed.

Off-site mitigation and payment in lieu programs are options that can be used in these instances. Off-site mitigation generally means that control measures may be implemented at another location, in the same sewershed/watershed as the original project, and as approved by the regulatory agency. Payment in lieu programs generally mean that the developer pays a fee to the permittee which will then be applied to a stormwater control project, in lieu of installing the required control measures.

If the permit writer chooses to include an off-site mitigation or payment in lieu program in the permit, the permit writer could specify that the programs meet several criteria, for example, those described in the 2009 West Virginia Phase II General Permit Fact Sheet (www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx):

1. The permittee must establish clear and stringent criteria for the conditions under which these options are available that must be related to real physical constraints such as a combination of soils limiting infiltration opportunities, space or light limited situations restricting the amount of vegetation that can be used, and a land use that is not conducive to capture and use of

stormwater. While one or two of these characteristics should not be adequate to qualify for the alternative, the combination of multiple constraints could;

2. A minimal requirement for at least [*0.4 inch*] of stormwater managed on-site;

3. A [*1:1.5 ratio*] of the amount of requisite stormwater not managed on site to the amount of stormwater required to be mitigated at another site, or for which in-lieu payments must be made;

4. If demonstrated to the permittee that it is completely infeasible to manage the remainder [*0.4 inches*], then the ratio for this unmanaged portion is [*1:2*].

5. The necessary tracking systems for both types of programs, including the necessary inventory of public and retrofit projects for off-site mitigation; and,

6. The establishment of a credible valuation structure for payment in lieu, i.e., what is the actual cost for the permittee to provide retrofits for the necessary amount of stormwater, not just a token payment. The purpose of these provisions is to disincentivize the use of alternatives unless really needed, but also to provide a financial foundation for implementation of public stormwater management projects, including retrofits where those needs have been identified.

Additional justification for the development types which qualify for these incentives can be seen in the West Virginia Phase II MS4 Permit Fact Sheet (www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx).

5.3 Site Plan Review

Example Permit Provision

5.3.1 To ensure that all applicable new development and redeveloped sites conform to the performance standards required in Part 5.2, the permittee must continue to implement project review, approval, and enforcement procedures that include:

a. Procedures for the site plan review and approval process(es) that include inter-departmental consultations, as needed, and a required re-approval process when changes to an approved plan are desired; and

b. A requirement for submittal of 'as-built' certifications within 90 days of completion of a project.

5.3.2 The permittee must conduct site plan reviews, using the procedures described in Part 5.3.1, of all new development and redeveloped sites which will disturb greater than or equal to one acre [*or a smaller threshold as set by the permitting authority*] and discharge to the MS4 (including sites that disturb less than one acre that are part of a larger common plan of development or sale). The site plan review must specifically address how the project applicant meets the performance standards in Part 5.2 and how the project will ensure long-term maintenance as required in Part 5.4.

Example Permit Requirement Rationale for the Fact Sheet

Specific standards are a critical component of a stormwater management program. However, even the best requirements need to be supported by a review program to ensure that the standards are met. The example permit provision would require permittees to fully implement a comprehensive site plan review and approval program. To meet this requirement, the permittee must have the authority to withhold approvals when standards are not met.

Recommendations for the Permit Writer

The permit writer may want to consider adding a requirement for a pre-application concept plan meeting to occur (in addition to the requirement for the project applicant to submit a site plan for review). During this meeting the project land owner or developer, the project design engineer, and municipal planning staff could discuss the conceptual designs that would be used to ensure that they meet the performance standards. This meeting would ensure that stormwater and performance standards are addressed early in the development process. However, if this pre-application concept plan meeting is not consistent with local planning procedures, the permit writer could consider omitting this requirement.

5.4 Long-Term Maintenance of Post-Construction Stormwater Control Measures

Example Permit Provision

5.4.1 All structural stormwater control measures installed and implemented to meet the performance standards of Part 5.2 must be maintained in perpetuity. The permittee must ensure the long-term maintenance of structural stormwater control measures installed according to this Part through one, or both, of the following approaches:

a. Maintenance performed by the Permittee. See part 6.4.

b. Maintenance performed by the owner or operator of a new development or redeveloped site under a maintenance agreement. The permittee must require the owner or operator of any new development or redeveloped site subject to the performance standards in Part 5.2 to develop and implement a maintenance agreement addressing maintenance requirements for any structural control measures installed on site to meet the performance standards. The agreement must allow the permittee, or its designee, to conduct inspections of the structural stormwater control measures and also account for transfer of responsibility in leases and/or deeds. The agreement must also allow the permittee, or its designee, to perform necessary maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from the property owner/operator when the owner/operator has not performed the necessary maintenance within thirty (30) days of notification by the permittee or its designee.

5.4.2 Verification of maintenance responsibilities. The permittee must require that property owners or operators of any new development or redeveloped site subject to the performance standards in Part 5.2 provide verification of maintenance for the approved structural stormwater control measures used to comply with the performance standards. Verification must include one or more of the following as applicable:

a. The owner/operator's signed statement accepting responsibility for maintenance with a provision for transferring maintenance responsibility if the property is legally transferred to another party; and/or

b. Written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance; and/or

c. Written conditions in project conditions, covenants and restrictions for residential properties assigning maintenance responsibilities to a home owner's association, or other appropriate group, for maintenance of structural and treatment control stormwater management practices; and/or

d. Any other legally enforceable agreement that assigns permanent responsibility for maintenance of structural or treatment control stormwater management practices.

Example Permit Requirement Rationale for the Fact Sheet

Appropriate operation and maintenance are critical aspects to the function of any suite of controls. In many cases, controls may be located on private property, and it is necessary to establish some provision to assure responsibility and accountability for the operation and maintenance of these controls.

The permittee must ensure maintenance of all structural stormwater control measures. In this Guide, structural controls also include many green infrastructure practices such as rainwater harvesting, rain gardens, permeable pavement, and vegetated swales.

Recommendations for the Permit Writer

Most non-traditional MS4 permittees will probably not have the legal authority to recoup costs where the owner/operator has not completed necessary maintenance. Permit writers may want to be more specific in this requirement to include other options for non-traditional MS4 permittees.

5.5 Watershed Protection

Example Permit Provision

5.5.1 When the Permittee revises its General Plan (or equivalent) or other relevant plans (e.g. Transportation Master, or Community Plan) they must include effective water

quality and watershed protection elements that require implementation of consistent water quality protection measures for new development and redeveloped sites within [*insert deadline*]. Examples of water quality and watershed protection elements to be considered include the following: [*insert principles and/or policies which are appropriate for the watershed such as,*

- Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within each watershed, by minimizing the creation, extension and widening of parking lots, roads and associated development.
- Preserve, protect, create and restore ecologically sensitive areas that provide water quality benefits and serve critical watershed functions. These areas may include, but are not limited to; riparian corridors, headwaters, floodplains and wetlands.
- Implement management practices that prevent or reduce thermal impacts to streams, including requiring vegetated buffers along waterways, and disconnecting discharges to surface waters from impervious surfaces such as parking lots.
- Prevent disturbances of natural waterbodies and natural drainage systems caused by development, including roads, highways, and bridges.
- Avoid development in areas that are particularly susceptible to erosion and sediment loss.
- Implement standards to protect trees, and other vegetation with important evapotranspirative qualities.
- Implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils.
- Implement water conservation policies that will reduce both stormwater and non- stormwater discharges via storm sewer systems.[20]
- Implement policies that encourage stormwater practices close to the source of the runoff rather than downstream and lower in the watershed.]

Example Permit Requirement Rationale for the Fact Sheet

Imperviousness has been shown to correlate with water quality impacts. In order to minimize water quality impacts, the permittee must examine their planning principles to manage the creation of impervious surfaces at the watershed level, such as reducing the footprint of streets and parking lots. Also, ecologically sensitive areas can protect water quality by acting both as filters that reduce pollutants in stormwater discharges and as sponges to reduce the impact on the ecosystem's hydrology. Thermal pollution is also a concern that can impact biota in waterways. Stormwater discharges from impervious surfaces are often characterized by higher temperatures than natural, pervious surfaces. Reducing the chances of further increasing this temperature by preserving, protecting, and restoring natural features that provide shading for the waterway can further help reduce thermal pollution. Whenever possible natural waterways

[20] *West Virginia Small MS4 Permit (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*

must be protected and not disturbed by stormwater from developed sites. For example, areas that have a high potential for erosion must be avoided for development when possible. Protecting vegetation, native soils, and conserving water can also help ensure the hydrologic qualities of the site remain intact.

Consideration of stormwater impacts from development is critical during the planning phases of development. This not only includes planning on the site-level, but also with respect to discharges from the MS4 on the watershed level. To the extent possible, stormwater management must be an integral part of higher level planning documents that determine where and how development that will result in stormwater discharges to the MS4 should occur since these decisions affect water quality. Using land efficiently can result in better stormwater management by putting development where it is most appropriate. For example, by directing and concentrating new development in areas targeted for growth, communities can reduce or remove development pressure on undeveloped parcels and protect sensitive natural lands and recharge areas. Another strategy is redeveloping already degraded sites such as abandoned shopping centers or underutilized parking lots. In this case, the net increase in discharges from developed sites would likely be zero, and it would likely decrease, depending on the on-site infiltration practices used. Also, by allowing or encouraging denser development, less land is converted overall, and less total impervious area created.

Recommendations for the Permit Writer

Examining stormwater on a watershed basis and including watershed principles is an important part of protecting waterways in a holistic manner. Climate change may increase the size and frequency of storms in some area of the nation. Including watershed-type assessments and considerations as Permit Requirements will help the permittee better focus their efforts to ensure the best water protection outcomes for existing conditions and those anticipated future conditions. Therefore, permit writers should consider including watershed protection principles. Newer programs may not be ready for permit writers to include the exact example permit provision provided. If possible, permit writers should be as specific as possible for the needs of the watershed where the MS4 permittee is located. Permittees should be careful when installing new stormwater BMPs to ensure that there are not any negative, unintended consequences.

5.6 Tracking of Post-Construction Stormwater Control Measures

Example Permit Provision

5.6.1 Inventory of Post-Construction Stormwater Control Measures. The permittee must continue to maintain an inventory of all post-construction structural stormwater control measures installed and implemented at new development and redeveloped sites, including both public and private sector sites located within the permit area. The inventory must be searchable by property location (either on paper or electronic). New entries to the inventory must be made during the site plan review and approval process in Part 5.3.1.

5.6.2 Tracking Information. Each entry to the inventory must include basic information on each project, such as project name, owner's name and contact information, location, start/end date, etc. In addition, inventory entries must include the following for each project:

a. Short description of each stormwater control measure (type, number, design or performance specifications);

b. Latitude and longitude coordinates of each stormwater control measure;

c. Short description of maintenance requirements (frequency of required maintenance and inspections); and

d. Inspection information (date, findings, follow up activities, prioritization of follow-up activities, compliance status).

Based on inspections conducted under Part 5.7, the permittee must update the inventory as appropriate where changes occur in property ownership or the specific control measures implemented at the site. This inventory must be maintained and available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

Creating an inventory of post-construction structural stormwater control measures, including tracking of specific information, will first enable permittees to know what control measures they are responsible for. Without this information the permittee will not be protecting water quality to their full potential since inspections, maintenance, and follow-up changes cannot be performed. Tracking information such as the latitude/longitude, maintenance and inspection requirements and follow-up will allow the permittee to be able to better allocate their resources for those activities that are immediately necessary. Although not required, including photographs will help the permittee assess how the control measure has changed since it was first created and will likely aid in determining proper maintenance and/or retrofitting opportunities if the measure is no longer providing the water quality benefits it was originally designed.

Recommendations for the Permit Writer

Permit writers may wish to specifically define the types of structural controls that must be included in the inventory. For example, rain barrels may be considered a structural control, but the MS4 likely does not need latitude and longitude coordinates of the rain barrels.

5.7 Inspections and Enforcement

Example Permit Provision

5.7.1 Inspection Frequency. To ensure that all stormwater control measures are operating correctly and are being maintained as required consistent with its applicable maintenance agreement, the permittee must conduct inspections of each project site covered under Part 5.2 performance standards, [*insert inspection frequency, e.g., at least one time during the permit term, 20% of sites per year, etc.*]. The inspections must be in accordance with those specified in the [*insert State manual that describes the maintenance of control measures*]. A description of inspection procedures must be included in the SWMP document.

5.7.2 Post-Construction Inspection. Within [*insert deadline, e.g., 1 week, 2 weeks, etc.*] of completion of construction of any project required to meet the Section 5.2 performance standards, the permittee must conduct a post-construction inspection to verify that the permittee's performance standards have been met. The permittee must include in its SWMP a procedure for being notified by construction operators/owners of their completion of active construction so that the post-construction inspection may be conducted.

5.7.3 Inspection Reports. The permittee must document its inspection findings in an inspection report. Each inspection report must include:

a. Inspection date;

b. Name and signature of inspector;

c. Project location (street address, latitude/longitude, etc.) and inventory reference number (from inventory established in Section 5.6.1)

d. Current ownership information (for example, name, address, phone number, fax, and email)

e. A description of the condition of the structural stormwater control measure including the quality of: vegetation and soils; inlet and outlet channels and structures; embankments, slopes, and safety benches; catch basins; spillways, weirs, and other control structures; and sediment and debris accumulation in storage and forebay areas as well as in and around inlet and outlet structures;

f. Photographic documentation of all critical structural stormwater control measure components; and

g. Specific maintenance issues or violations found that need to be corrected by the property owner or operator along with deadlines and reinspection dates.

The permittee must document and maintain records of inspection findings and enforcement actions and make them available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

Inspection of post-construction control measures is key to ensuring the protection of water quality. If control measures are not inspected and maintained they could become sources of pollution rather than reducing pollution. By including detailed information in the inspection report, the permittee can better determine if maintenance is required and the permittee can have a snapshot of sorts to know the status of their control measures to prioritize funding.

Recommendations for the Permit Writer

Permit writers should clearly specify the requirements for inspections. Inspecting and properly maintaining structural stormwater controls to ensure they are working as designed is just as important as installing them in the first place. By having specific requirements, permittees will be reminded that they must allocate resources to ensure control measures are properly maintained and functioning. The permit writer may also want to add a prioritization scheme to the requirement to help the permittee determine what maintenance activities are priorities for protecting water quality and which ones are minor changes.

5.8 Retrofit Plan

Example Permit Provision

5.8.1 The permittee must develop a plan to retrofit existing developed sites that are impacting water quality. The retrofit plan must be developed within [*insert deadline, such as within two years of permit issuance*] and must emphasize controls that infiltrate, evapotranspire, or harvest and use stormwater discharges. The plan must include[21]:

a. An inventory of potential retrofit locations, which considers, at a minimum:

- Locations that contribute pollutants of concern to an impaired waterbody
- Locations that contribute to receiving waters that are significantly eroded
- Locations that are tributary to a sensitive ecosystem or protected area
- Locations that are tributary to areas prone to flooding

[21] Orange County Municipal Stormwater Permit (Section F.3.d) (www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml)

b. An evaluation and ranking of the inventoried locations to prioritize retrofitting which includes, at a minimum:
   - Feasibility
   - Cost effectiveness
   - Pollutant removal effectiveness
   - Impervious area potentially treated
   - Maintenance requirements
   - Landowner cooperation
   - Neighborhood acceptance
   - Aesthetic qualities, and
   - Efficacy at addressing concern.

Example Permit Requirement Rationale for the Fact Sheet

It is clear that we cannot protect the nation's waters without also addressing degradation caused by stormwater discharges from existing developed sites. For that reason stormwater programs must include substantive retrofit provisions.

It is possible and reasonable to significantly improve water quality in many urban receiving waters. This requires more than just a new development and redeveloped sites program, however, which at best can only hold the line. To actually improve the quality of receiving waters it is necessary to mitigate discharges from existing developed sites, which generally means implementation of measures to bring about the retrofit the stormwater control measures at existing sites to retain most stormwater on site.

In addition, research indicates that most streambank restoration projects that actively stabilize eroding channels should not be implemented until after hydrologic retrofits have been completed that restore the hydrologic regime not concurrently with the implementation of the retrofits.

Municipal projects, such as traffic calming sites could also include stormwater retrofit components, such as curb bump outs that include bioretention features, rain gardens, and curb cuts.

Information on retrofit options and the development of a retrofit plan can be found in the Center for Watershed Protection's guidance on Urban Stormwater Retrofit Practices (available at www.cwp.org as Manual No. 3 under the Urban Subwatershed Restoration Manual Series).

Recommendations for the Permit Writer

Permittees may need a permit term or two to adequately develop and implement a retrofit plan. Some permittees may not be ready to have retrofit plans as part of their requirements. It is up to the permit writer to make this determination based on the specific information they have available on current programs. A retrofit plan should assess the areas where retrofitting is appropriate and will result in increased water quality protection and restoration. The permit writer should determine

the appropriate timeframe and language for a retrofit plan. For example, if the permittee was already required to develop a retrofit plan in a previous permit term the permit may specify a schedule for implementation rather than development.

CHAPTER 6: POLLUTION PREVENTION/GOOD HOUSEKEEPING

Introduction

Federal stormwater regulations (see 40 CFR 122.34(b)(6) and 40 CFR 122.26(d)(2)(iv)(A)) require the operator of a regulated MS4 community to develop a program to:

- Prevent or reduce the amount of stormwater pollution generated by municipal operations and conveyed into receiving waters.
- Train employees on how to incorporate pollution prevention/good housekeeping techniques into municipal operations.
- Identify appropriate control measures and measurable goals for preventing or reducing the amount of stormwater pollution generated by municipal operations.

Included Concepts

- ► Municipal facility and control inventory
- ► Facility assessment
- ► Development of facility-specific stormwater management SOPs and Implementation of facility stormwater controls
- ► Storm sewer system maintenance activities
- ► Flood management
- ► Pesticide, herbicide, and fertilizer application and management
- ► Training and education
- ► Contractor requirements and oversight

The first step for the permittee is to evaluate and assess the areas and municipal facilities that it controls in order to determine which activities may currently have a negative impact on water quality and to find solutions for these activities. The simplest solution is to limit the number of activities that are conducted outside and exposed to stormwater.

Storm sewer systems need maintenance to ensure that structures within the storm sewer that are meant to reduce pollutants do not become sources of pollution. Regularly maintaining catch basins and cleaning storm sewer pipes prevent the accumulation of pollutants that are later released during rain events as well as blockages, backups, and flooding. Most permittees have an existing program to maintain the storm sewer infrastructure. EPA notes, however, that some of these programs have tended to focus on flood avoidance and complaint response rather than reducing water quality impacts from stormwater discharges.

The MS4 permit must require that the system be maintained to prevent the discharge of pollutants into receiving waters. System mapping and a schedule of regular maintenance are key to a successful pollution prevention program. EPA recommends establishing a tiered maintenance schedule for the entire storm sewer system area, with the highest priority areas being maintained at the greatest frequency. Priorities should be driven by water quality concerns and can be based on the land use within the MS4 area, the condition of the receiving water, the amount and type of material that typically accumulates in an area, or other location-specific factors. It is also advisable to use spill and illicit discharge data to track areas that may require immediate sewer infrastructure maintenance. It is also important for material that is collected to be disposed of in a responsible manner.

The procedures for storm sewer system operation and maintenance must be documented in the permittee's SOPs or similar type of documents, which are part of the permittee's SWMP. Employee training to carry out these pollution prevention measures is a required component of the program. The pollution prevention/good housekeeping/maintenance activities should be documented and, where possible, quantified (e.g., number and location of inspections and clean-outs, type and quantity of materials removed). Having permittees characterize the quantity, location, and composition of pollutants removed from catch basins can provide useful data that can later be used to assess the program's overall effectiveness, identify illicit discharges, and help the permittee better prioritize implementation activities in the future.

Specific pollution prevention requirements related to pollutant-generating activities such as landscaping techniques (including the application of pesticides, herbicides, and fertilizer) and operating and maintaining public streets, should also be included in the permit where applicable. For example, typical pollutants associated with street repair and maintenance include heavy metals, chlorides, hydrocarbons (e.g., benzene, toluene, ethylbenzene, xylene), concrete dust, sand, deicers, sediment, and trash. The permitting authority should consider requiring alternative landscaping practices such as integrated pest management (IPM), xeriscaping, or mechanical (non-chemical) removal of unwanted plants. Other landscaping controls, such as mulch management, chemical storage, reduction of soil compaction, and erosion control, should also be considered. Training and educating municipal and contracted staff is also important to ensure that everyone is knowledgeable and proficient in the newest and most effective approaches to minimizing pollutant discharges from municipal facilities and activities.

Additionally, permits should require that water quality be considered when designing flood management projects, and that existing structural flood control devices are evaluated to determine if retrofitting the device to remove/reduce pollutants from stormwater is necessary and practicable.

6.1 Municipal Facility and Control Inventory

Example Permit Provision

6.1.1 Development of a Municipal Facility and Stormwater Control Inventory – The permittee must continue to update and maintain an inventory of municipally-owned or operated facilities and stormwater controls, including but not limited to the following:

- Composting facilities
- Equipment storage and maintenance facilities
- Fuel farms
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Incinerators
- Landfills
- Landscape maintenance on municipal property
- Materials storage yards

- Pesticide storage facilities
- Public buildings, including schools, libraries, police stations, fire stations, municipal buildings, and similar buildings
- Public parking lots
- Public golf courses
- Public swimming pools
- Public works yards
- Recycling facilities
- Salt storage facilities
- Solid waste handling and transfer facilities
- Street repair and maintenance sites
- Vehicle storage and maintenance yards
- Municipally-owned and/or maintained structural stormwater controls

6.1.2 Documentation– The list of municipally-owned or operated facilities and stormwater controls must be maintained and available for review by the permitting authority.

6.1.3 Mapping – On a map of the area covered by the MS4 permit, the permittee must identify where the municipally-owned or operated facilities and stormwater controls are located. The map must identify the stormwater outfalls corresponding to each of the facilities as well as the receiving waters to which these facilities discharge. The permittee must also identify the manager of each facility and their contact information. The map must be maintained and updated regularly and be available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

Municipally-owned or operated facilities serve as hubs of activity for a variety of municipal staff from many different departments. Some municipalities will have one property at which all activities take place (e.g., the municipal maintenance yard), whereas others will have several specialized facilities such as those listed above. A comprehensive list and map of such facilities will help staff responsible for stormwater compliance build a better awareness of their locations within the MS4 service area and their potential to contribute stormwater pollutants. The facility inventory will also serve as a basis for setting up periodic facility assessments (see Part 6.2) and developing, where necessary, facility stormwater pollution prevention plans (see Part 6.3).

Recommendations for the Permit Writer

Permit writers should tailor the facilities listed in the assessment as best they can to include the facilities most likely to be owned or operated by the permittee. It is highly likely that some of the facilities listed in the Permit Requirement would not apply to most non-traditional and/or non-municipal MS4s.

6.2 Facility Assessment

Permit Requirement

6.2.1 Municipally-owned or operated facility assessment:

a. Comprehensive Assessment of Pollutant Discharge Potential –The permittee must review, reassess, and update the comprehensive assessment of all municipally-owned or operated facilities identified in Part 6.1 [*insert frequency, e.g., annually*] for their potential to discharge in stormwater the following typical urban pollutants: sediment, nutrients, metals, hydrocarbons (e.g., benzene, toluene, ethylbenzene and xylene), pesticides, chlorides, and trash. Other pollutants may be associated with, but not generated directly from, the municipally-owned or operated facilities, such as bacteria, chlorine, organic matter, etc. Therefore, the permittee must determine additional pollutants associated with its facilities that could be found in stormwater discharges. A description of the assessment process must be included in the SWMP document.

b. Identification of "High Priority" Facilities – Based on the Part 6.2.1.a comprehensive assessment, the permittee must identify as "high-priority" those facilities that have a high potential to generate stormwater pollutants. Among the factors that must be considered in giving a facility a high priority ranking is the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must not be performed outside (e.g., changing automotive fluids, vehicle washing), proximity to waterbodies, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s). High priority facilities must include the permittee's maintenance yards, hazardous waste facilities, fuel storage locations, and any other facilities at which chemicals or other materials have a high potential to be discharged in stormwater.

c. Documentation of Comprehensive Assessment Results – The permittee must document the results of the assessments and maintain copies of all site evaluation checklists used to conduct the comprehensive assessment. The documentation must include the results of the permittee's initial assessment, any identified deficiencies and corrective actions taken, and a list of the "high priority" facilities identified per Part 6.2.1.b.

Example Permit Requirement Rationale for the Fact Sheet

The initial ("first time") comprehensive assessment is necessary to identify which of the municipality's facilities are most likely to contribute stormwater pollutants and which are in need of stormwater controls. The assessments will involve a detailed site inspection that can identify improperly stored materials, activities that should not be performed outside (e.g., changing automotive fluids, vehicle washing), and poor housekeeping practices.

Recommendations for the Permit Writer

If the permitting authority has an established site inspection protocol to be used in the comprehensive assessment, it should be included and referenced here. The list of pollutants in this section should be modified or expanded based on pollutants of concern in the permitting authority's jurisdiction.

6.3 Development of Facility-Specific Stormwater Management SOPs and Implementation of Facility Stormwater Controls

Example Permit Provision

6.3.1 Facility-specific Stormwater Management SOPs for "High Priority" Facilities:

a. For each "high priority" facility or operation identified in Part 6.2, the permittee must develop a site-specific SOP that identifies stormwater controls (i.e., structural and non-structural controls, and operational improvements) to be installed, implemented, and maintained to minimize the discharge of pollutants in stormwater. At a minimum, the facility-specific SOP must include the stormwater control measures described below in Part 6.3.2, as well as inspection and visual monitoring procedures and schedules described in Part 6.3.3.

b. A copy of the facility-specific stormwater management SOP must be maintained and be available for review by the permitting authority. The SOP must be kept on-site at each of the municipally-owned or operated facilities' offices for which it was completed. The SOP must be updated as necessary.

c. The permittee must install, implement, and maintain all stormwater controls required per Part 6.3.2 of this permit and included in the facility's site-specific SOP.

6.3.2 Stormwater Controls for "High Priority" Facilities – The following stormwater controls must be implemented at all "high priority" municipally-owned or operated facilities identified in Part 6.2. A description of any controls included in this part and any standard operating procedures developed to comply with this part must be included as part of the of each facility's SOP:

a. General good housekeeping – The following good housekeeping practices must be implemented for all facilities identified as "high priority":

1. The permittee must keep all municipally-owned or operated facilities neat and orderly, minimizing pollutant sources through good housekeeping procedures and proper storage of materials.

2. Materials exposed to stormwater must be covered where feasible (without creating additional impervious surfaces, if possible).

b. De-icing material storage – The permittee must store salt and other de-icing materials in a permanent storage structure, unless stormwater runoff from the storage piles is not discharged, or if discharges from the piles are authorized under another stormwater permit. If a permanent storage structure is required but does not exist, one must be built within [*insert timeframe*], and seasonal

tarping must be used as an interim control measure until the permanent structure is completed. If a permanent storage facility is not feasible, the permittee must provide a rationale to the permitting authority as to why and what alternate BMPs will be utilized instead.

Where a permanent storage structure is present, the permittee must perform regular maintenance and inspections of the permanent storage structure.

c. Fueling operations – The permittee must continue to implement standard operating procedures for vehicle fueling and receiving of bulk fuel deliveries at municipally-owned or operated facilities with the goal of reducing the likelihood of spills, and providing spill controls in the event that accidental spills do occur.

d. Vehicle maintenance – The permittee must continue to implement a standard operating procedure for vehicle maintenance and repair activities that occur at municipally-owned or operated facilities with the goal of reducing the likelihood of spills or releases and providing controls in the event that accidental spills do occur. The standard operating procedures must include regular inspections of all maintenance areas and activities.

e. Equipment and vehicle washing – The discharge of equipment and vehicle wash wastewater to the MS4 or directly to receiving waters from municipal facilities is prohibited. The permittee may meet this requirement by either installing a vehicle wash reclaim system, capturing and hauling the wastewater for proper disposal, connecting to sanitary sewer (where applicable and approved by local authorities), ceasing the activity, and/or applying for and obtaining a separate stormwater permit.[22]

6.3.3 Inspections and Visual Monitoring:

a. Weekly visual inspections – The permittee must perform weekly visual inspections to ensure materials and equipment are clean and orderly, and to minimize the potential for pollutant discharge. The permittee must look for evidence of spills and immediately clean them up to prevent contact with precipitation or runoff. The weekly inspections must be tracked in a log for every facility, and records kept with the SWMP document. The inspection report must also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

b. Quarterly comprehensive inspections – At least once per quarter, a comprehensive inspection of "high priority" facilities, including all stormwater controls, must be performed, with specific attention paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar potential pollutant-generating areas. The quarterly inspection results must be documented and records kept with the SOP document. This inspection must be done in accordance with the developed SOPs. The inspection report must also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

[22] New Jersey Tier A Phase II MS4 Permit (NJ0141852) (www.state.nj.us/dep/dwq/pdf/Tier_A_final.pdf)

c. Quarterly visual observation of stormwater discharges – At least once per quarter, the permittee must visually observe the quality of the stormwater discharges from the "high priority" facilities (unless climate conditions preclude doing so, in which case the permittee must attempt to evaluate the discharges four times during the wet season). Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls must be remedied within three days or before the next storm event, whichever is sooner. Visual observations must be documented, and records kept with the SOP document. This inspection must be done in accordance with the developed SOPs. The inspection report must also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

Example Permit Requirement Rationale for the Fact Sheet

Each municipal facility will require a different set of control measures depending on the nature of activities that occur there and the types of materials that are stored and used. Developing and maintaining a site-specific SOP for each facility will help to ensure that employees responsible for facility operation are aware of the stormwater controls required for the site.

There are a number of storage areas and activities that are common at municipal facilities that have a high potential for polluting stormwater:

- Deicing materials, particularly road salt, are easily liberated and transported by rainfall, and constituents such as chloride are not removed by most stormwater controls.
- Fueling and vehicle maintenance and storage areas are prone to spills and drips of various automotive fluids.
- Equipment and vehicle washing areas are designed to mix water with dirt and hydrocarbons, requiring special treatment of the wastewater (including pretreatment and diversion to the sanitary sewer, if allowed) and protection of wash areas from rainfall and runoff.

The best way to avoid pollutant discharges from these sources is to keep precipitation and runoff from coming into contact with stored chemicals and activity areas that use chemicals and materials, which can become sources of stormwater pollutants. For example, the permittee must cover stockpiles, create dedicated structures for stored materials, build berms around areas of pavement to prevent clean runoff from contacting contaminated areas, and maintain a minimum distance between stockpiles and stormwater infrastructure and receiving waters. These are just a few of the ways in which these potential pollutant sources can be protected from precipitation and runoff.

The permit requires that comprehensive site inspections be conducted quarterly, which is an appropriate frequency to ensure that material stockpiles that might be moved or utilized on a seasonal basis are protected from precipitation and runoff. Also, quarterly inspections will allow inspectors to observe different types of operations that occur at different times of the year (e.g., landscape maintenance crews are less active in the winter). Quarterly visual observations are required so that inspectors can see in real time the qualitative nature of the

stormwater discharge and so that corrective action can be taken where necessary to improve on-site stormwater controls.

The permit also specifies that inspection procedures, results, and controls for each facility be documented to ensure that the site inspections are consistent and that maintenance of stormwater controls remains part of the municipality's standard operating procedures. The requirement for an inspection log will allow the permitting authority to verify that periodic site inspections have been performed.

Recommendations for the Permit Writer

Neither Phase I nor Phase II regulations specifically require that MS4 permittees develop facility-specific stormwater management SOPs. However, both Phase I and Phase II require that permittees prevent or reduce pollutant discharge in stormwater from municipal facilities and activities. Requiring permittees to assess high priority facilities and develop appropriate controls for each is an effective way of requiring permittees to address potential sources of pollutants at facilities.

When setting frequency for facility inspections (see Part 6.3.3), the permit writer should consider the number of facilities and the size/complexity of the sites to ensure that enough time is available to complete the assessments.

The list of specific stormwater controls for municipal facilities will vary from place to place based on local and watershed priorities and climate considerations. The permit writer should specify stormwater controls that are appropriate for the local conditions. For example, if a permittee uses satellite locations for temporary storage of deicing materials during snow events, the permit writer may want to consider options other than the permanent storage requirement if the permittee uses the piles within a certain time frame and the piles are covered by temporary tarping or a similar control.

6.4 Storm Sewer System Maintenance Activities

Example Permit Provision

6.4.1 MS4 catch basin maintenance

a. Assessment/prioritization of catch basins – The permittee must assign a priority to each of its catch basin inlets within its jurisdiction as one of the following:

- Priority A – Catch basins that are designated as consistently generating the highest volumes of trash and/or debris
- Priority B – Catch basins that are designated as consistently generating moderate volumes of trash and/or debris
- Priority C – Catch basins that are designated as generating low volumes of trash and/or debris

The permittee must use information compiled from citizen complaints/reports to help in the determination of the appropriate priority level. A description of

the prioritization scheme must be included in the SWMP.

b. Catch basin inspection and cleaning

1. Based on the priorities assigned in Part 6.4.1.a., the permittee must inspect and clean catch basins in accordance with the following schedule:

- Priority A – [*Insert cleanout frequency, e.g., 3 times per year*]
- Priority B – [*Insert cleanout frequency, e.g., 2 times per year*]
- Priority C – [*Insert cleanout frequency, e.g., 1 time per year*]

The permittee must develop a catch basin cleaning schedule based on the frequency specified in this permit, along with a list of each of its catch basins and the priority assigned to them per Part 6.4.1.a.

2. In addition to catch basin cleanings performed above, the permittee must ensure that any catch basin that is inspected and found to be between one third and one half full of trash and/or debris must be cleaned within [*Insert cleanout frequency e.g., 1 week of discovery*].[23] The permittee must maintain a log of all maintenance performed.

3. The permittee must document that it has performed all required catch basin cleanings in a log that is to be made available for review by the permitting authority upon request.

c. Catch basin labeling – The permittee must ensure that each catch basin includes a legible stormwater awareness message (e.g., a label, stencil, marker, or pre-cast message such as "drains to the creek" or "only rain in the drain"). Catch basins with illegible or missing labels must be recorded and re-labeled within [*insert number of days*] of inspection.

d. Maintenance of surface drainage structures – The permittee must visually monitor permittee-owned open channels and other drainage structures for debris at least [*specify frequency, e.g., once per year*] and identify and prioritize problem areas, such as those with recurrent illegal dumping, for inspection at least [*specify frequency, e.g., three times per year*]. Removal of trash and debris from open channels and other drainage structures must occur [*insert frequency of open channel/drainage structure cleaning, e.g., annually*]. The permittee must document its drainage structure maintenance in a log that is to be made available for review by the permitting authority upon request.

e. Disposal of waste materials – The permittee must develop a procedure to dewater and dispose of materials extracted from catch basins. This procedure must ensure that water removed during the catch basin cleaning process and waste material will not reenter the MS4.

6.4.2 Municipal activities and operations

a. Assessment of municipal activities and operations

[23] EPA's Office of Research and Development documented a threshold sump level of ½ as a break point where solids retainage was either erratic or negative (Catchbasin Technology Overview and Assessment #EPA-600/2-77-051 1977).

1. The permittee must maintain and revise as necessary the operation and maintenance (O&M) activity assessment. The following municipal O&M activities must be included in the assessment for their potential to discharge pollutants in stormwater:
    - Road and parking lot maintenance, including pothole repair, pavement marking, sealing, and re-paving
    - Bridge maintenance, including re-chipping, grinding, and saw cutting
    - Cold weather operations, including plowing, sanding, and application of deicing compounds and maintenance of snow disposal areas
    - Right-of-way maintenance, including mowing, herbicide and pesticide application, and planting vegetation
    - Municipally-sponsored events such as large outdoor festivals, parades, or street fairs
2. The permittee must identify all materials that could be discharged from each of these O&M activities. Typical pollutants associated with these activities include metals, chlorides, hydrocarbons (e.g. benzene, toluene, ethylbenzene, xylene), sediment, and trash.
3. The permittee must develop a set of pollution prevention measures that, when applied during municipal O&M activities, will reduce the discharge of pollutants in stormwater. These pollution prevention measures must include, at a minimum:
    - Replacing materials/chemicals with more environmentally benign materials or methods (e.g., use mechanical methods vs. herbicides, or use water-based paints or thermoplastics rather than solvent-based paints for stripping)
    - Changing operations to minimize the exposure or mobilization of pollutants (e.g., mulch, compost or landfill grass clippings) to prevent them from entering surface waters
    - Placing barriers around or conducting runoff away from deicing chemical storage areas to prevent discharge into surface waters), consistent with Part 6.3.2.b

    [*If available in your particular State or the municipality, insert relevant section of SWMP, or other relevant document, that includes specific stormwater controls that must be used*.]
4. The permittee must develop and implement a schedule for instituting the pollution prevention measures. At a minimum, with respect to all roads, highways, and parking lots with more than 5,000 square feet of pollutant-generating impervious surface area that are owned, operated, or maintained, the permittee must implement all pollution prevention measures by [*insert deadline*].
5. The results of the assessments and pollution prevention measures, including schedules for implementation, must be documented and made available for review by the permitting authority upon request.

b. Inspection of pollution prevention measures – All pollution prevention measures implemented at municipal facilities must be visually inspected [*insert frequency, e.g., monthly or quarterly*] to ensure they are working properly; a log of inspections must be maintained and made available for review by the permitting authority upon request.

6.4.3 Street Sweeping and Cleaning

a. The permittee must continue to evaluate and rate all municipally-owned streets, roads, and public parking lots within their jurisdiction. The permittee must include in the evaluation the sweeping frequency, timing, and efficiency of existing street sweeping programs. The street sweeping frequency must be based on land use, trash and stormwater pollutant levels generated. At a minimum, the following areas must be regarded as "high priority," for sweeping activities while the "medium priority" and "low priority" areas are recommended:

- High priority – Streets, road segments, and public parking lots designated as high priority include, but are not limited to, high traffic zones, commercial and industrial districts, shopping malls, large schools, high-density residential dwellings, sport and event venues, and plazas. This designation must include areas that consistently accumulate high volumes of trash, debris, and other stormwater pollutants.
- Medium priority – Streets, road segments and public parking lots designated as medium priority include, but are not limited to, medium traffic zones; warehouse districts; and light, small-scale commercial and industrial areas.
- Low priority – Streets and road segments designated as low priority include, but are not limited to, light traffic zones and residential zones.

b. The permittee must show on a map of its service area how the streets, roads, and public parking lots have been rated in accordance with Part 6.4.3.a.

c. Implementing sweeping schedules – The permittee must sweep streets/roads/public parking lots in accordance with the following frequency:

- High priority – average of at least [*insert frequency, e.g., twice per month*]
- Medium priority – average of at least [*insert frequency, e.g., once per month*]
- Low priority – [*insert frequency, e.g., twice per year*]

If a permittee's existing overall street sweeping effort provides equivalent or greater street sweeping frequency relative to the requirements above, the permittee may continue to implement its existing street sweeping program.

d. For areas where street sweeping is technically infeasible (e.g., streets without curbs), the permittee must increase implementation of other trash/litter control procedures to minimize pollutant discharges to storm drains and creeks. The permittee must show on its Part 6.4.3.b map the location of these areas.

e. Sweeping equipment selection and operation

1. When replacing existing sweeping equipment, the permittee must select and operate high-performing sweepers that are efficient in removing pollutants,

including fine particulates, from impervious surfaces.

2. The permittee must follow equipment design performance specifications to ensure that street sweeping equipment is operated at the proper equipment design speed with appropriate verification, and that it is properly maintained.
3. The permittee must operate sweepers to optimize pollutant removal by permitting sweepers access to the curb through the use of parking restrictions that clear the curb or through effective public outreach to inform citizens of sweeping days and times so that voluntary curb clearing can occur.

f. Sweeper Waste Material Disposal – The permittee must develop a procedure to dewater and dispose of street sweeper waste material. This procedure must ensure that water and material will not reenter the MS4.

g. Operator training – Street sweeper operators must be trained to enhance operations for water quality benefit.

h. The permittee must include the following in the SWMP and update as changes are made:

1. A description of the street sweeping frequency and any significant changes in the sweeping frequency map, along with the basis for those changes
2. The types of sweepers used
3. A summary of the proper sweeping operation verification results and street sweeping methods, including the way in which the permittee specifies and confirms the rate or speed at which street miles are covered by sweeper operators
4. The use of additional resources in sweeping seasonal leaves or pick-up of other material
5. A description of the methods for addressing areas identified in Part 6.4.3, considered infeasible for street sweeping

6.4.4 Maintenance of municipally-owned and/or maintained structural stormwater controls

a. The permittee must inspect at least [*insert frequency, e.g., yearly*], and maintain if necessary, all municipally-owned or maintained structural stormwater controls. The permittee must also maintain all green infrastructure practices through regularly scheduled maintenance activities.

Example Permit Requirement Rationale for the Fact Sheet

MS4 Maintenance

Traditional municipal storm drain systems were designed to quickly collect and convey runoff to receiving waters. The purpose of catch basin, inlet, and storm drain cleanouts is to prevent blockages, flooding, and reduce pollution.

Fine particles and pollutants from run-on, atmospheric deposition, vehicle emissions, breakup of street surface materials, littering, and sanding can accumulate along the curbs of roads in between rainfall events. This results in the accumulation of pollutants such as sediment, nutrients, metals, hydrocarbons, bacteria, pesticides, trash and other toxic chemicals. Storm drain maintenance is often the last opportunity to remove pollutants before they enter the storm drain system. Because they effectively trap solids, they need to be cleaned out periodically to prevent those materials from being transported by high stormwater flows. By doing so the MS4 will prevent trash and litter from ultimately becoming sources of marine debris, which is any man-made, solid material that enters waterways either directly or indirectly.

The permit includes a priority ranking approach for catch basins so that municipal resources are directed to the areas and structures that generate the most pollutants. A priority ranking system is required because some catch basins will accumulate pollutants faster than others based on the nature of the drainage area and whether controls are present upstream of the catch basin. Catch basins with the highest accumulations will need to be cleaned more often than those with low accumulations. The permit language also includes a requirement that triggers catch basin cleaning when a catch basin is one-third full.

Proper storm drain system cleanout includes vacuuming or manually removing debris from catch basins; vacuuming or flushing pipes to increase capacity and remove clogs; removing sediment, debris, and overgrown vegetation from open channels; and repairing structures to ensure the integrity of the drainage system. It is important to conduct regular inspections of all storm sewer infrastructure and perform maintenance as necessary. Though these activities are intended to ensure that the sewer system is properly maintained and that any accumulated pollutants are removed prior to discharge, if not properly executed, cleanout activities can result in pollutant discharges. In selecting maintenance practices, the permittee must carefully evaluate each with an eye towards stormwater pollution potential to minimize unintended pollutant discharges, such as the use of flushing storm drain pipes to remove debris without recapturing the debris further down the pipe.

The materials removed from catch basins may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials removed from storm drains and open channels may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

Street Sweeping and Cleaning

Street and parking lot sweeping is a practice that most municipalities initially conducted for aesthetic purposes. However, the water quality benefits are now widely recognized. Street sweeping also prevents particulate matter associated with road dust from accumulating on public streets and washing into storm drains.

The permit language addresses a number of important factors that impact the effectiveness of a street sweeping program. The first factor is the type of equipment used; the permit language stipulates that when equipment needs to be replaced, high-performance sweepers are purchased preferentially. Street sweeping has traditionally been more effective at removing large-sized particles, but new equipment has been developed to remove smaller, fine-grained particles. Mechanical sweepers (broom-type) are usually the least expensive and are better suited to pick up

large-grained sediment. Vacuum and regenerative air sweepers are better at removing fine-grained sediment particles, but they are more expensive. Removal efficiency can be improved through tandem sweeping (i.e., two sweepers sweeping the same route, with one following the other to pick up missed material), or if the street sweeper makes multiple passes on a street.

The second factor influencing street sweeping effectiveness is the way in which the equipment is operated; the permit specifies that equipment be operated according to the manufacturers' operating instructions by operators who have been trained to sweep in accordance with the Permit Requirements in order to protect water quality.

The third determining factor is the degree to which parked cars block sweeper access to the curb; one of the best ways to ensure access to the curb is to establish parking restrictions based on sweeping schedules and to inform residents of the schedule so they can voluntarily move their cars. The permit requires that the permittee institute parking restrictions and/or a public outreach campaign requesting that cars be parked elsewhere to accommodate sweeping schedules.

Because not all streets are suitable for sweeping (e.g., those that don't have a curb and gutter), source controls can be used in place of sweeping in those areas.

The permittee is required to maintain documentation of sweeping events and characterize the quantity and composition of pollutants removed from roadways. Street sweeping data are relatively easy to track and maintain, so the permit includes requirements for reporting and assessment of the effectiveness of the sweeping activities based on equipment used, miles swept, and the amount of materials collected.

The street sweeping material may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials may require special handling and disposal, and my not be authorized to be disposed of in a landfill.

Recommendations for the Permit Writer

MS4 Maintenance

MS4s should have a specific schedule to clean out their storm drains since it will ensure that the debris that is trapped in the system will not move into waterbodies and ultimately become marine debris in the ocean. For additional information to include on marine debris go to the EPA's Marine Debris website (www.epa.gov/owow/oceans/debris).

The frequency and timing of visual assessments and cleaning of storm drains and open channels can be tailored to local climate conditions. For example, one approach would be to require that visual observations and cleanings be conducted before the start of the wet season or before spring snowmelt.

The permitting authority should review and approve dewatering and disposal methods for materials removed from catch basins.

Catch basin labeling is believed to be an effective mechanism for educating residents since it involves a direct reminder that that water or other materials which flow into storm drains is not

treated in any way, but instead drains directly to nearby waterways. There are many methods for labeling catch basins and the permit writer should work with the permittee to determine the most feasible and cost effective method of delivering the "drains to stream" message.

Street Sweeping and Cleaning

Street sweeping frequency and timing can be based on climate conditions and seasonal variation in pollution loading. For example, in cold climates where sand is used for winter road maintenance, the permit language could specify increased sweeping during the winter and prior to the spring snowmelt. In areas with a rainy season, sweeping might be timed to occur before the rainy season starts.

In the fall, sweepers can be used to pick up leaves, as they can contribute 25 percent of nutrient loadings in catch basins. If more substantial piles of leaves are found in the community during the fall, street sweeping activities should be coordinated with leaf pick-up. Equally important is an early spring sweeping before rains begin to pick up sand, de-icing material, and winter debris. More frequent sweeping may reduce the need for catch basin cleaning.

The prioritization of sweeping activities (high, medium, low) should be based on standard categories that are based on traffic frequencies and used to determine service levels for the roadways. The example provided in the permit language is based on specific information for the location.

The permitting authority should review and approve dewatering and disposal methods for street sweeping material.

6.5 Flood Management

Example Permit Provision

6.5.1 Flood Management Projects – Within [*insert deadline, such as two years*] of permit issuance, the permittee must develop and implement a process to assess the water quality impacts in the design of all new flood management projects that are associated with the permittee or that discharge to the MS4. This process must include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting the project objectives. Beginning [*insert deadline, such as three years*] from date of permit issuance, the permittee must assess at least [*insert number of projects to be evaluated, such as two*] existing flood management projects per year to determine whether changes or additions should be made to improve water quality. [24] A description of this process must be included in the SWMP document.

[24] Eastern Washington Phase II MS4 Permit (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseiiEwa/MODIFIEDpermitDOCS/EWpermitMODsigned.pdf)

Example Permit Requirement Rationale for the Fact Sheet

This permit requires that existing flood management projects be prioritized and a set number be evaluated to identify opportunities for water quality retrofits. This is because the focus of stormwater management in the past had been to control flooding and mitigate property damage, with less emphasis on water quality protection. These structures may handle a significant amount of stormwater and therefore offer an opportunity to modify their design to include water quality features for less than the cost of building new controls. This requirement applies not only to new flood control projects, but also to existing structures.

6.6 Pesticide, Herbicide, and Fertilizer Application and Management

Example Permit Provision

6.6.1 Landscape maintenance

a. The permittee must evaluate the materials used and activities performed on public spaces such as parks, schools, golf courses, easements, public rights of way, and other open spaces for pollution prevention opportunities. Maintenance activities for the turf landscaped portions of these can include mowing, fertilization, pesticide application, irrigation, etc. Typical pollutants include sediment, nutrients, hydrocarbons, pesticides, herbicides and organic debris.

b. The permittee must implement the following practices to minimize landscaping-related pollutant generation:

   1. Educational activities, permits, certifications, and other measures for municipal applicators and distributors.
   2. Integrated pest management measures that rely on non-chemical solutions, including
      - Use of native plants, xeriscaping in arid/semi-arid regions (reduces water usage and fertilization)
      - Keeping clippings and leaves away from waterways and out of the street using mulching, composting, or landfilling
      - Limiting application of pesticides and fertilizers if precipitation is forecasted within 24 hours or as specified in label instructions
      - Limiting or replacing pesticide use (e.g., manual weed and insect removal)
      - Limiting or eliminating the use of fertilizers, or, if necessary, prohibiting application within 5 feet of pavement, 25 feet of a storm drain inlet, or 50 feet of a waterbody
      - Reducing mowing of grass to allow for greater pollutant removal, but not jeopardizing motorist safety
   3. Schedules for chemical application that minimize the discharge of such constituents due to irrigation and expected precipitation.

4. The collection and proper disposal of unused pesticides, herbicides, and fertilizers.[25]

Example Permit Requirement Rationale for the Fact Sheet

The permit focuses on requiring source controls to reduce the amount of chemicals used. The permit specifies the use of integrated pest management, selection of native vegetation that is naturally adapted to local conditions and therefore requires fewer chemical and water inputs, reducing exposure of the chemicals to water by scheduling application according to weather forecasts and plant needs, and ensuring that municipal employees who are responsible for storing and handling these materials are educated about their use, disposal, and possible impacts.

Recommendations for the Permit Writer

EPA is currently developing a general permit to control discharges from the application of pesticides to or over, including near, waters of the U.S. EPA is working closely with state NPDES and pesticide control authorities, the regulated community, and environmental organizations to develop its permit that will be required for such discharges beginning in April 2011. It is important to note that some of the permit language in this section may need to be altered to be consistent with the pesticide permit once it is finalized. For up-to-date information, go to EPA's website (www.epa.gov/npdes/agriculture).

6.7 Training and Education

Example Permit Provision

6.7.1 Employee Training Requirements – Permittees must develop an annual employee training program for appropriate employees involved in implementing pollution prevention and good housekeeping practices in the preceding Parts. All new hires must receive training within the first year of their hire date. This annual training must include a general stormwater education component, any new technologies, operations, or responsibilities that arise during the year, and the Permit Requirements that apply to the staff being trained. A description of the program must be maintained for review by the permitting authority. The permittee must also identify and track all personnel requiring training and records must be maintained. Training must begin [*insert deadline*] from the effective date of permit authorization.

[25] San Diego Phase I MS4 Permit (CAS0108758) (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/oc_permit/updates_8_13_09/R9-2009-0002_12Aug09.pdf)

Example Permit Requirement Rationale for the Fact Sheet

The regulations found at 40 CFR 122.34(b)(6) specifically requires that the permittee develop a "training component" that trains employees "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 storm water system maintenance." This permit requires employee training for existing and new employees who are involved in performing pollution prevention and good housekeeping practices. All training must include a general stormwater educational component, including an overview of the requirements with which the municipality needs to comply. The permittee is responsible for identifying which staff must attend trainings based on the applicability of the topics listed, and they are required to conduct refresher training on an annual basis.

Recommendations for the Permit Writer

The topics included in the trainings should take into consideration the types of activities in which the municipality engages and the extent to which such activities are performed in-house or contracted.

6.8 Contractor Requirements and Oversight

Example Permit Provision

6.8.1 Requirements for Contractors:

a. Any contractors hired by the permittee to perform municipal maintenance activities must be contractually required to comply with all of the stormwater control measures, good housekeeping practices, and facility-specific stormwater management SOPs described above.

b. The permittee must provide oversight of contractor activities to ensure that contractors are using appropriate control measures and SOPs. Oversight procedures must be described in the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

Many municipalities use third-party contractors to conduct municipal maintenance activities in lieu of using municipal employees. Contractors performing activities that can affect stormwater quality must be held to the same standards as the permittee. Not only must these expectations be defined in contracts between the permittee and its contractors, but the permittee is responsible for ensuring, through contractually-required documentation or periodic site visits, that contractors are using stormwater controls and following standard operating procedures.

CHAPTER 7: INDUSTRIAL STORMWATER SOURCES

Introduction

Phase I MS4 permittees are required to develop and implement an inspection and oversight program to monitor and control pollutants in stormwater discharges to the MS4 from industrial facilities. Regulations addressing industrial stormwater management in Phase I MS4 permits is found at 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv). Requirements to regulate the stormwater discharges from commercial facilities are found at 40 CFR 122.26(d)(2)(iv)(A).

Included Concepts

- Facility inventory
- Industrial facility stormwater control measures
- Industrial and commercial facility inspections
- Staff training

This program component typically applies only to Phase I MS4 permittees as Phase II federal regulations (40 CFR 122.34(b)) do not specifically address stormwater discharges from industrial facilities and commercial businesses (other than as part of the education and outreach program). However, EPA recommends that permit writers consider including requirements pertaining to stormwater discharges to the MS4 from industrial sources in Phase II permits to further reduce stormwater pollutants from the MS4.

Phase I MS4 regulations specify that several key elements be included in Phase I MS4 stormwater management programs. These elements include: adequate legal authority to require compliance and inspect sites, inspection of priority industrial and commercial facilities, establishing control measure requirements for facilities that may pose a threat to water quality, and enforcing stormwater requirements. In order to implement these requirements, MS4 permits require the development of an inventory of facilities and prioritization protocol and adequate staff training to ensure proper inspection and enforcement of requirements.

7.1 Facility Inventory

Example Permit Provision

7.1.1 Source Identification

a. The permittee must continue to maintain an inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could discharge pollutants in stormwater to the MS4. The inventory must be updated [*insert frequency, e.g. annually*] and available for review by the permitting authority upon request.

b. The inventory must include the following minimum information for each industrial and commercial site/source:

   1. Name

2. Address
3. Physical location of storm drain receiving discharge
4. Name of receiving water
5. Pollutants potentially generated by the site/source
6. Identification of whether the site/source is (1) tributary to an impaired water body segment (i.e., whether it is listed under Section 303(d) of the Clean Water Act) and (2) whether it generates pollutants for which the water body segment is impaired
7. A narrative description including standard industrial classification (SIC) codes, which best reflects the principal products or services provided by each facility.

The use of a geolocational database system is highly recommended.

c. At a minimum, the following sites/sources must be included in the inventory:

1. Commercial Sites/Sources:

[*insert commercial sources that are a priority such as*

- Airplane repair, maintenance, fueling, or cleaning
- Animal facilities
- Automobile and other vehicle body repair or painting
- Automobile (or other vehicle) parking lots and storage facilities
- Automobile repair, maintenance, fueling, or cleaning
- Boat repair, maintenance, fueling, or cleaning
- Building material retailers and storage
- Cement mixing or cutting
- Eating or drinking establishments (e.g., restaurants), including food markets
- Equipment repair, maintenance, fueling, or cleaning
- Golf courses, parks and other recreational areas/facilities
- Landscaping
- Marinas
- Masonry
- Mobile automobile or other vehicle washing
- Mobile carpet, drape or furniture cleaning
- Nurseries and greenhouses
- Painting and coating
- Pest control services
- Pool and fountain cleaning
- Portable sanitary services

- Power washing services
- Retail or wholesale fueling]

2. Industrial Sites/Sources:
   - Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the Multi Sector General Permit or individual NPDES permit
   - Facilities subject to Title III of the Superfund Amendments and Reauthorization Act (SARA)
   - Hazardous waste treatment, disposal, storage and recovery facilities
3. All other commercial or industrial sites/sources tributary to an impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired
4. All other commercial or industrial sites/sources that the permittee determines may contribute a significant pollutant load to the MS4[26]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the permittee to develop an inventory of all potential commercial and industrial sites/sources that could contribute pollutants to the MS4. A list of specific commercial and industrial sites/sources is included in the permit, and additional sites/sources can be added if they are likely to discharge a pollutant of concern to an impaired waterbody or they are contributing a significant pollutant load to the MS4.

The inventory information will provide the permittee with information on potential pollutant sources that contribute to its MS4 system, and at what locations in the system into which they discharge. This information will also allow the permittee to prioritize inspections and tailor education and outreach efforts, which will best assist the facility in implementing appropriate pollution prevention practices or other on-site stormwater controls. In addition, the inventory data will allow the permittee to determine whether the facilities may discharge pollutants of concern into impaired waters. Finally, the information contained in the inventory will enable permittees to characterize these facilities and prioritize them based on their potential impact on stormwater quality. By prioritizing facilities in such a manner, the permittee may then establish a targeted approach towards conducting inspections (see Part 7.3 for a discussion of inspection frequency).

In addition, data from NPDES pretreatment programs within the MS4 boundary on significant industrial users (SIUs) could also be used to identify and prioritize the industrial sites in the stormwater program.

[26] San Diego MS4 Permit (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf), with modifications.

Recommendations for the Permit Writer

The example permit provision lists specific commercial and industrial sources to be included in the inventory, but permit writers should customize this list to meet specific issues in their area. For example, some permittees may have large industrial areas with few commercial businesses, while others may have a large number of restaurants and retail businesses but no industrial facilities at all. Other permittees may have had past water quality problems at certain types of commercial or industrial sites, in which case such facilities should be included in their inventories.

7.2 Industrial Facility Stormwater Control Measures

Example Permit Provision

7.2.1 The permittee must require industrial and commercial facilities included in the Part 7.1 inventory to select, install, implement, and maintain stormwater control measures. At a minimum, these control measures must:

a. Minimize Exposure – Industrial/commercial facilities must minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff by either locating these industrial materials and activities inside or protecting them with storm resistant coverings (although significant enlargement of impervious surface area is not recommended). The facilities must consider, where appropriate:

1. Using grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas
2. Locating materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas)
3. Cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants
4. Using drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible
5. Using spill/overflow protection equipment
6. Draining fluids from equipment and vehicles prior to on-site storage or disposal
7. Performing all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray
8. Ensuring that all wash water drains to a proper collection system (i.e., not the stormwater drainage system)

b. Follow Good Housekeeping Practices – Industrial/commercial facilities must keep clean all exposed areas that are potential sources of pollutants, using such

measures as sweeping at regular intervals, keeping materials orderly and labeled, and storing materials in appropriate containers.

c. Conduct Maintenance – Industrial/commercial facilities must regularly inspect, test, maintain, and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharged to receiving waters.

d. Implement Spill Prevention and Response Procedures – Industrial/commercial facilities must minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, the facilities must implement:

    1. Procedures for plainly labeling containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides,") that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur

    2. Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling

    3. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available.

    4. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies [*Insert appropriate contacts for reporting*]

e. Implement Erosion and Sediment Controls – Industrial/commercial facilities must stabilize exposed areas and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants.

f. Manage Runoff – Industrial/commercial facilities must divert, infiltrate, reuse, contain, or otherwise reduce stormwater runoff, to minimize pollutants in discharges.

g. Address Salt Storage Piles or Piles Containing Salt – Industrial/commercial facilities must enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. If a permanent storage structure is required but does not exist, one must be built within [*insert timeframe*], and seasonal tarping must be used as an interim control until the permanent structure is completed. Facilities must implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if stormwater runoff from the piles is not discharged or if discharges from the piles are authorized under another NPDES permit.

h. Conduct Employee Training – All facility employees who work in areas where industrial materials or activities are exposed to stormwater, or who are

responsible for implementing activities necessary to manage stormwater must be trained. Training must be conducted [*insert frequency, e.g. at least annually*].

i. Address Non-Stormwater Discharges – Industrial/commercial facilities must eliminate non-stormwater discharges not authorized by an applicable NPDES permit.

j. Control Waste, Garbage and Floatable Debris – Facilities must ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

k. Control Dust Generation and Vehicle Tracking of Industrial Materials – Industrial/commercial facilities must minimize generation of dust and off-site tracking of raw, final, or waste materials.[27]

7.2.2 Within the [*insert deadline, e.g. first two years of permit term*], the permittee must notify the owner/operator of each industrial and commercial site/source of the stormwater requirements for control measures in Part 7.2.1.

7.2.3 As necessary to minimize any pollutants causing the applicable receiving waterbody to be listed as impaired, the permittee must require implementation of additional controls for industrial and commercial sites/sources that are tributary to the impaired water body segments and that are likely to generate such impairment pollutants.[28]

Example Permit Requirement Rationale for the Fact Sheet

The permittee is required to ensure that the minimum control measures are implemented, as applicable, at every industrial/commercial facility included in its inventory. The minimum measures outlined, when properly selected, designed and implemented, promote prevention and source control, before treatment.

The control measures in this permit are consistent with the control measure requirements found in EPA's 2008 Multi-Sector General Permit (MSGP) for stormwater discharges from industrial activities. The permit writer should ensure that these requirements are consistent with the State's industrial stormwater permit. The control measures in this permit describe specific activities that the permittee must require industrial facilities and commercial sites to implement to minimize stormwater pollution. Another control measure is simply preventing pollutants from coming into contact with precipitation in the first place since this will ensure they are not carried into nearby waterways. General good housekeeping and maintenance procedures are also required. Additional control measures address spill prevention and response, erosion and sediment controls, managing runoff, and controlling discharges from salt storage piles.

[27] 2008 MSGP (Section 2) (www.epa.gov/npdes/pubs/msgp2008_finalpermit.pdf), with modifications
[28] San Diego MS4 Permit (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf), with modifications

The control measures must also include employee training, controlling non-stormwater discharges, addressing waste, garbage and floatable debris, and addressing dust generation and vehicle tracking.[29]

The permittee is required to notify industrial and commercial sites of the control measure requirements and their responsibility to implement and comply with the requirements.

Facilities that discharge into impaired waterbodies may be required to implement additional controls as necessary to prevent the discharge of the associated pollutants of concern.

7.3 Industrial and Commercial Facility Inspections

Example Permit Provision

7.3.1 Industrial and Commercial Site Inspection Program

a. The permittee must continue to implement a program to inspect all commercial and industrial facilities included in its Part 7.1(a) inventory. The permittee must describe how this will occur in the SWMP.

b. The inspection program must:

1. Prioritize all facilities into high, medium, and low categories on the basis of the potential for water quality impact using criteria such as pollutant sources on site, pollutants of concern, proximity to a water body, and violation history of the facility. The different priority categories will be assigned different inspection frequencies, with the highest priority facilities receiving more frequent inspections. Describe the process for prioritizing inspections and frequency of inspections. If any geographical areas are to be targeted for inspections due to high potential for stormwater pollution, these areas must be listed in the Inspection Plan.

3. Explain how the priority assigned to any one facility may be modified based on the site inspection findings and the facility's potential to discharge pollutants.

7.3.2 Minimum Inspection Requirements

a. Inspection Frequency – The permittee is required to conduct inspections at the following frequencies, at a minimum:

1. Facilities with high potential for water quality impact must be inspected [*insert frequency, e.g. annually*].

2. Facilities with medium potential for water quality impact must be inspected at least [*insert frequency, e.g. once every three years*].

3. Facilities with low potential for water quality impact must be inspected at least [*insert frequency, e.g. once every 5 years*].

[29] 2008 MSGP Fact Sheet (www.epa.gov/npdes/pubs/msgp2008_finalfs.pdf), with modifications

4. Facilities with either a [*insert violation type*] written violation occurring in the previous year must be inspected at least [*insert frequency, e.g. annually*] until compliance is achieved.
5. For facilities with no exposure of commercial or industrial activities to stormwater, no inspections are required. However, the permittee must continue to track these facilities for significant change in the exposure of their operations to stormwater.

b. Scope of Inspection – Inspections must at a minimum:
   1. Evaluate the facility's compliance with the Part 7.2 requirement to select, design, install, and implement stormwater control measures.
   2. Conduct a visual observation for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to stormwater.
   3. Verify whether the facility is required to be authorized under the [*insert applicable NPDES general industrial stormwater permit*], and whether the facility has in fact obtained such permit coverage.[30]
   4. Evaluate the facility's compliance with any other relevant local stormwater requirements.

c. Documentation Requirements – At a minimum, the permittee must document the following for each inspection:

   The inspection date and time;

   The name(s) and signature(s) of the inspector(s);

   1. Weather information and a description of any discharges occurring at the time of the inspection;
   2. Any previously unidentified discharges of pollutants from the site;
   3. Any control measures needing maintenance or repairs;
   4. Any failed control measures that need replacement;
   5. Any incidents of noncompliance observed; and
   6. Any additional control measures needed to comply with the Permit Requirements.

d. Track Inspections – Inspection findings must be tracked to ensure inspections are conducted at the frequency specified in Part 7.3.2.b., highlight and document the recidivism of noncompliant facilities, and aid follow up and enforcement activities.

7.3.3 Enforcement – The permittee must ensure that all necessary follow up and enforcement activities are conducted as necessary to require necessary implementation and maintenance of the control measures described in Part 7.2. The permittee is required to utilize the approved ERP for all enforcement actions.

[30] San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0074.pdf), with modifications

Example Permit Requirement Rationale for the Fact Sheet

The permittee must design an inspection program that facilitates more frequent inspections of the highest priority facilities. (See 40 CFR 122.26(d)(iv)(C)(1)). This will help maximize use of the permittee's existing inspection resources and ensure that the permittee inspectors are the most visible and the most familiar with the facilities with the highest potential for water quality impact.

The permittee must develop a process for prioritizing inspections and designating all facilities in the industrial and commercial inventory as either a high, medium or low priority. The designation could occur by individual facility or by facility type. The prioritization for individual facilities may be adjusted after the first, or any subsequent, inspection (for example, if a facility is a high priority facility and the inspection reveals it has little potential for stormwater pollution, then the facility could be reprioritized as a low priority facility).

It is important that inspections be conducted in a thorough and consistent manner in accordance with a formal protocol for conducting an inspection. This protocol should be the basis for inspector training as well. Inspections should include a thorough walk-through of the facility.

The documentation of inspections is very important, not only when tracking noncompliance, but also to facilitate effective enforcement action when needed. A timeline of noncompliance and subsequent enforcement action is critical when escalating measures to gain compliance. Typically, the use of inspection forms facilitates complete and consistent documentation among inspectors and over time.

Recommendations for the Permit Writer

The permit writer may choose to define what criteria the permittee will use to determine the priority of each facility on its inventory. For example, the Phase I Los Angeles County MS4 permit specifies which facilities are Tier 1 and Tier 2 and provides the required inspection frequency for each. The permit writer could also automatically designate certain sets of industries to a certain priority category (e.g., all facilities subject to the State's Industrial General Permit could be designated as high priority facilities in the permit). If the permit does not define what criteria are to be used when prioritizing facilities, the permittee should be required to develop this protocol and submit it to the permitting authority for review.

The permit writer should review available industrial and commercial inventories to determine if more specific inspection frequencies should be set. For example, an MS4 with only 10 facilities in the inventory could probably inspect those facilities annually. However, an MS4 with over 2,000 facilities in the inventory may need to set the inspection frequency at a less frequent interval.

7.4 Staff Training

Example Permit Provision

7.4.1 The permittee must ensure that all staff whose primary job duties are implementing the industrial stormwater program is trained to conduct facility inspections. The training must cover what is required under this permit in terms of stormwater control measures, the requirements of other applicable Industrial Stormwater general permits or other related local requirements, the permittee's site inspection and documentation protocols, and enforcement procedures. Follow-up training must be provided every other year to address changes in procedures, techniques, or staffing. Permittees must document and maintain records of the training provided and the staff trained.[31]

Example Permit Requirement Rationale for the Fact Sheet

Inspectors responsible for conducting inspections at industrial/commercial facilities must be trained on the applicable stormwater requirements for the different types of facilities (i.e., industrial, commercial, other). Training must include a summary of federal, state, and local stormwater regulations that may apply to industrial/commercial facilities. Inspectors must be familiar with various types of stormwater control measures commonly used at the types of facilities typically found in the MS4 area and must be able to educate facility operators about such stormwater control measures. In addition, inspectors must understand and use the permittee's established enforcement response plan (see Chapter 1 of this Guide) to gain compliance as necessary. The inspection staff must be proficient in the enforcement escalation procedure and must properly document all enforcement actions accordingly per the ERP.

[31] Western Washington Phase I MS4 Permit (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/MODIFIEDpermitDOCS/PhaseIpermitSIGNED.pdf), with modifications

CHAPTER 8: MONITORING, EVALUATION, AND REPORTING

Introduction

Phase I MS4s are required to conduct discharge characterization, field screening and develop a monitoring program. Phase I MS4s are also required to conduct an assessment of controls. See 40 CFR 122.26(d)(1)(iii), (d)(2)(iii), and (d)(2)(v).

Phase II MS4 regulations allow, but do not specifically require, monitoring. Phase II MS4s are required to evaluate program compliance, the appropriateness of identified control measures, and progress toward achieving identified measurable goals. See 40 CFR 122.34(g).

Included Concepts

- Consolidated information tracking system
- Development of a comprehensive monitoring and assessment program
- Evaluation of overall program effectiveness
- Requirements for annual reporting of MS4 activities

There are many components involved in monitoring and evaluating the effectiveness of a municipal stormwater program. Any comprehensive monitoring program should have clear monitoring objectives to help determine compliance and water quality impacts. Each monitoring program is unique and should be customized to the specific waterbodies, impairments, and pollutant sources of the MS4.

Evaluating the overall effectiveness of the municipal stormwater program should be done using information from the monitoring program, progress toward meeting measurable goals, and other indicators. Without assessing the effectiveness of the stormwater management program the permittee will not know which parts of the program need to be modified to protect and/or improve water quality and instead will essentially be operating blindly. Establishing a comprehensive monitoring and assessment program will enable the permittee to track progress in complying with permit provisions and implementing a program to protect water quality.

8.1 Consolidated Information Tracking System

Example Permit Provision

8.1.1 Within the first [*insert time frame which corresponds to the development of the monitoring program e.g. first two years of permit*], the permittee must develop a tracking system to track the information required in the permit as well as the information required to be reported in the annual report (see Part 8.4).

Example Permit Requirement Rationale for the Fact Sheet

An important part of any municipal stormwater program is to document and track information on activities the permittee undertakes to comply with the Permit Requirements. Tracking should be integrated into each of the minimum measures. For example, tracking the location of illicit discharges may indicate that a specific area has a high incidence of motor oil being dumped into storm drains. Investigations may reveal that homeowners are changing the motor oil in their cars, but not properly disposing it. Therefore, the permittee will need to educate the homeowners in that area regarding proper disposal.

The permittee must develop a tracking system to monitor implementation of its various programs in order to document the permittee's compliance with its Permit Requirements, such as the number of construction sites and industrial facilities inspected. In addition, the tracking system will allow the permitee to monitor the compliance status of those entities within its jurisdiction, such as construction sites and industrial facilities, and to ensure compliance of municipally-owned and operated facilities.

Any tracking system should be coordinated with the monitoring and evaluation programs developed by the permittee. Ideally, a monitoring and evaluation program will link the "actions" (e.g., the inspections, maintenance, education and other activities the permittee implements) with the "results" (e.g., water quality monitoring data, improvements in environmental indicators) of the monitoring program.

In addition, adequate tracking is necessary to generate and provide reports of program progress not only to the permitting authority, but to a permittee's internal management for planning and funding purposes. Ideally, a MS4 permittee will have at least one person in charge of overall coordination, including tracking. While many departments or agencies might implement various stormwater program components, it is helpful for a single person or department to gather and analyze applicable data. This can be accomplished in a number of ways and will vary based on existing data tracking mechanisms used by a permittee, the data being captured and the reporting requirements the permittee must comply with. Ideally, the program would have a database accessible by all parties which specifies the required data. Lacking this, the permittee will need to coordinate all responsible parties. The permittee will need to ensure that responsible parties "mine" all data necessary to adequately represent the program and permit compliance, and specify adequate internal reporting deadlines to guarantee that the data is available in a timely manner for program planning, effectiveness assessments and permit reporting. Some permittees create reporting forms for program component managers to complete and submit by internal deadlines. Regardless of how the permittee coordinates the effort internally, without adequate tracking of data the permittees will not be able to submit annual reports to the permitting authority that provide the necessary information to determine permit compliance.

Recommendations for the Permit Writer

To assist the permittee in ensuring appropriate data is gathered and analyzed, the permitting authority should be very clear regarding annual reporting requirements. In addition, the text for this section should be tailored depending on the permittee. For example, some permittees may be able to develop a GIS-based system complete with the option to upload pictures and inspection reports versus a spreadsheet. In the text provided either system would meet the requirements, but more detailed information can be obtained with the GIS-based system.

8.2 Development of a Comprehensive Monitoring & Assessment Program

Example Permit Provision

8.2.1 The permittee must continue to implement, and revise as necessary, a comprehensive monitoring and assessment program. A description of this program must be included in the SWMP document. The monitoring and assessment program must be designed to meet the following objectives:

a. Assess compliance with this permit;

b. Measure the effectiveness of the permittee's stormwater management program;

c. Assess the chemical, physical, and biological impacts to receiving waters resulting from stormwater discharges;

d. Characterize stormwater discharges;

e. Identify sources of specific pollutants;

f. Detect and eliminate illicit discharges and illegal connections to the MS4; and

g. Assess the overall health and evaluate long-term trends in receiving water quality.

NOTE: Because monitoring programs and requirements are very specific to the MS4 and local water quality impairments, permit writers are directed to the "Recommendations to the Permit Writer" section below for examples of comprehensive monitoring program Permit Requirements.

Example Permit Requirement Rationale for the Fact Sheet

Without clear monitoring objectives and a detailed monitoring plan, it will be difficult for permittees and permitting authorities to evaluate the effectiveness of the municipal stormwater program.

There are numerous factors that should be examined while setting up the water quality monitoring portion of the comprehensive program. Understanding and considering climatic conditions such as precipitation patterns, temperature, and seasonal variations will ensure the study design will collect data that are representative of typical storms in the area and that sampling occurs during times of the year when it is most logical to do so. Acknowledging the different types of land uses within the area will also help the permittee to prioritize monitoring efforts based on the areas most likely to be impacted by stormwater. The type of waterbody monitored must also be considered when selecting sampling locations since pollutants behave differently depending on the environment thereby impacting sampling protocols. For example, sampling in a freshwater lake involves different protocols than monitoring in a tidally influenced river or a first order stream. Waterbody type can also influence the data results and conclusions (e.g. freshwater wetlands typically have high denitrification rates that will likely impact the results of nitrate sampling).

Selection of specific sampling locations is also very important. If particular sites are of concern, then monitoring both above and below the sites to figure out their contributions to the overall water quality issues may make sense. Also, the actual location in the waterbody is important to specify for consistency. For example, should samples be taken close to the stream bank or in the center of the waterbody, in riffles or pools? The answers to these questions, of course, depend on the goals of the monitoring and the constituents (biological, chemical, hydrological) being examined.

In addition, the number and frequency of samples collected and stream assessments performed will determine how robust the data will be (see page 287 in *National Research Council's Report Urban Stormwater Management in the United States (2009*) available at www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf). Monitoring may or may not be tied to specific wet weather events (i.e. within 72 hours after a rainfall event). A combination of specific wet weather samples and dry weather samples may be appropriate.

Establishing objectives with associated indicators (environmental or administrative) for each minimum measure can help put each component into perspective when considering the overall program. Indicators are one way to evaluate the success of the program from the overall program level. Developing standard environmental indicators is a critical step to evaluate the SWMP. Permittees need practical tools, such as these indicators, in order to determine if their stormwater programs are working, and that help elucidate where additional efforts may be most critical. Environmental indicators should be selected based on the type (estuarine/freshwater/brackish) and condition (impaired/non-impaired) of the waterbody to which stormwater is discharged as well as the intended use of the area where the stormwater is discharged (source water protection area, etc.).

In addition, permittees should document certain administrative efforts associated with developing and implementing their SWMPs. In this context 'administrative' is considered quite broad, including such things as control measures, inspection programs, policies and rules, MS4 system scope and condition, educational efforts and any other variable or outcome that could reflect on the quality of a stormwater program other than the actual environmental quality outcomes, which are covered under 'Environmental Indicators'.

Good administrative indicators are numerous, and good suites of indicators will vary from one community to another. More information can be obtained on each of the environmental and administrative indicators listed by going to the Stormwater Manager's Resource Center (www.stormwatercenter.net) and selecting "Monitor/Assess" on the left navigation bar.

Several protocols have been developed to assess the effectiveness of stormwater control measures:

- Guidance for Evaluating Emerging Stormwater Treatment Technologies, Technology Assessment Protocol - Ecology (TAPE) www.ecy.wa.gov/biblio/0210037.html . This guidance document's primary purpose is to establish a testing protocol and process for evaluating and reporting on the performance and appropriate uses of emerging stormwater treatment technologies.
- Technology Acceptance Reciprocity Partnership (TARP) Protocol for Stormwater Best Management Practice Demonstrations www.dep.state.pa.us/dep/deputate/pollprev/techservices/tarp/pdffiles/Tier2protocol.pdf . The purpose of the TARP

Protocol is to provide a uniform method for demonstrating stormwater technologies and developing test quality assurance (QA) plans for certification or verification of performance claims.

- BMP Performance Verification Checklist. This is a tool that helps permittees provide a consistent set of questions for applicants proposing to use manufactured and proprietary BMP. It is available as Tool # 8 of the Center for Watershed Protection's *Managing Stormwater in Your Community*. The checklist is accompanied by an explanation and instructions for using the checklist, technical appendices, and a matrix that compares existing verification protocols, such as TARP and TAPE.

Additional monitoring resources include:

- CWP, 2008, *Monitoring to Demonstrate Environmental Results: Guidance to Develop Local Stormwater Monitoring Studies Using Six Example Study Designs* (www.cwp.org)
- Geosyntec Consultants and Wright Water Engineers, 2009, *Urban Stormwater BMP Performance Monitoring*, (bmpdatabase.org/MonitoringEval.htm)
- CASQA, 2007, *Municipal Stormwater Program Effectiveness Assessment Guidance* (www.casqa.org)

Recommendations for the Permit Writer

Because of the site-specific nature and variability of these monitoring programs between permittees, the detailed requirements should be provided by each permit writer. For example, the Phase I regulations included specific monitoring requirements while the Phase II regulations allow, but do not specifically require monitoring. To assist permit writers, several examples of monitoring requirements from existing MS4 permits are listed below:

- Baltimore County, MD Phase I MS4 permit (issued 2005); see the watershed assessment and planning requirements (Part II.F) and assessment of controls (Part II.H) www.mde.state.md.us/assets/document/sedimentStormwater/MSSPermit/BA%20final%20permit.pdf
- Southern California Regional Bioassessment Monitoring Program (this is a regional monitoring program involving coastal counties in Southern California) www.socalsmc.org/Docs/SMC-DesignofBioassessmentRegionalMonitoringProgram.pdf
- San Diego, CA Phase I MS4 Permit (issued 2007); see Receiving Waters and Urban Runoff Monitoring and Reporting Program. www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf

The permit writer could consider the role of partnerships among the MS4s in establishing and implementing the monitoring programs so that any data collected is robust, useful, and meaningful. In addition, communities may benefit more by working with local organizations and/or neighboring communities who are already collecting similar data. By doing so resources may be used more efficiently and results of testing may be more robust.

The permit writer should also require the permittee to assess the effectiveness of the SWMP in meeting applicable Permit Requirements. The sampling protocols developed must support the goals of the monitoring program. The monitoring and assessment program must include water quality monitoring as well as an assessment of environmental and administrative indicators. Along these lines, the permit writer could also add requirements such as the ones provided below:

Water Quality Monitoring

a. *The Permittee must develop a water quality monitoring program that includes [insert specific monitoring programs and requirements, such as:*

   - Ambient receiving water monitoring,
   - Biological monitoring,
   - Control measure performance monitoring, or
   - Discharge (wet weather) monitoring

   Because the detailed monitoring program requirements are very unique to each MS4, the permitting authority should insert here the specific details of the relevant monitoring program, such as monitoring type, frequency, location, etc.]

b. When determining water quality monitoring components, the permittee must examine and consider a variety of factors, including, but not limited to:

   - Climatic conditions, including precipitation patterns, temperature, and seasonal variations
   - Land uses in the MS4
   - Waterbody type

c. The permittee must consider and address specific sampling quality assurance/quality control protocols, including, but not limited to:

   - Specific chemical constituents (pollutants), biological stream indicators, and physical stream indicators that will be monitored to best achieve the purpose of the monitoring
   - Sampling locations
   - Number and frequency of sample collection and assessments
   - Timing of sample collection

d. The permittee must determine if any similar monitoring is occurring within the MS4 and if it is logical to link efforts.

Environmental Indicators

As part of the comprehensive monitoring and assessment program, the permittee must identify and track at least [*insert number of indicators to be tracked*] environmental

indicators from each category listed below (physical and hydrologic indicators; biological indicators; water quality indicators). The indicators must be appropriate to assess if the SWMP is meeting goals and objectives:

Physical and hydrological indicators

- Stream widening/ downcutting
- Physical habitat quality
- Impacted dry weather flows
- Increased flooding frequency
- Stream temperature monitoring

Biological indicators

- Fish assemblage analysis
- Macro-invertebrate assemblage
- Single species indicator
- Composite indicators
- Other biological indicators

Water quality indicators

- Water quality pollutant constituent monitoring
- Toxicity testing
- Non-point source loadings
- Exceedance frequencies of water quality standards
- Sediment contamination
- Human health criteria

Administrative indicators

As part of the comprehensive monitoring and assessment program, the permittee must identify and track at least [*insert number of indicators to be tracked*] administrative indicator from each category listed below (social indicators; programmatic indicators; site indicators). The indicators must be appropriate to assess if the SWMP is meeting goals and objectives:

Social indicators

- Public attitude surveys
- Industrial/commercial pollution prevention
- Public involvement and monitoring
- User perception

Programmatic indicators

- Number of illicit connections identified and corrected
- Number of control measures installed, inspected, and maintained
- Permitting and compliance
- Growth and development

Site indicators

- Control measure performance monitoring
- Industrial site compliance monitoring

Performance Monitoring of Stormwater Controls

When monitoring the performance of stormwater controls, EPA recommends that percent removal efficiencies are not calculated and compared since results can be misleading because the percentages may be based on differing levels of the influent concentration (see cfpub.epa.gov/npdes/stormwater/urbanbmp/bmptopic.cfm#percentremoval for further discussion; also see *National Research Council's Report Urban Stormwater Management in the United States (2009*) available at www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf).

Modeling can also be a useful tool to quantify the impacts of municipal stormwater management. The following resources provide summaries and reviews of different types of models available to

determine existing loading from an MS4 as well as the effects expected from various stormwater controls.

1. USEPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters
   www.epa.gov/nps/watershed_handbook/

   Chapter 8 of this document focuses on methods for estimating pollutant loads, including the use of watershed models. This chapter provides assistance in selecting and applying watershed models to estimate pollutant loads from existing conditions.

2. USEPA TMDL Model Evaluation and Research Needs
   www.epa.gov/nrmrl/pubs/600r05149/600r05149.htm

   This report documents the review of more than 60 available watershed and receiving water models. It discusses model selection on the basis of model capabilities and provides a series of tables rating the capabilities or applicability the models using the categories of TMDL endpoints, general land and water features, special land processes, special water processes, and application considerations including the selection of appropriate best management practices and their water quality impacts. The document also provides individual fact sheets for each reviewed model.

8.3 Evaluation of Overall Program Effectiveness

Example Permit Provision

8.3.1 *Annual Effectiveness Assessment* – The annual effectiveness assessment must:

a. Use the monitoring and assessment data described in Part 8.2 to specifically assess the effectiveness of each of the following:

   1. Each significant activity/control measures or type of activity/control measure implemented;
   2. Implementation of each major component of the Stormwater Management Program (Public Education/Involvement, Illicit Discharges, Construction, Post-Construction, Good Housekeeping); and
   3. Implementation of the Stormwater Management Program as a whole.

b. Identify and use measurable goals, assessment indicators, and assessment methods for each of the items listed in Part 8.3.1.a above.

c. Document the permittee's compliance with permit conditions.

8.3.2 Based on the results of the effectiveness assessment, the permittee must annually review its activities or control measures to identify modifications and improvements needed to maximize SWMP effectiveness, as necessary to achieve compliance with this permit. The permittee must develop and implement a plan and schedule to address the identified modifications and improvements. Municipal activities/control

measures that are ineffective or less effective than other comparable municipal activities/control measures must be replaced or improved upon by implementation of more effective municipal activities/control measures.

8.3.3 As part of its Annual Reports, the permittee must report on its SWMP effectiveness assessment as implemented under Part 8.3.1 above.

Example Permit Requirement Rationale for the Fact Sheet

A key requirement in the stormwater Phase II rule is a report (40 CFR 122.34(g)(3)) that includes "the status of compliance with permit conditions, an assessment of the appropriateness of identified [control measures] and progress towards achieving identified measurable goals for each of the minimum control measures." This assessment is critical to the stormwater program framework which uses the iterative approach of implementing controls, conducting assessments, and designating refocused controls leading toward attainment of water quality standards.

Building on the monitoring and assessment program developed in Part 8.2, the permittee must conduct an annual effectiveness assessment to assess the effectiveness of significant control measures, SWMP components, and the SWMP as a whole. The California Stormwater Quality Association's (CASQA) *Municipal Stormwater Program Effectiveness Guidance* describes strategies and methods for assessing effectiveness, including examples of effectiveness assessment for each SWMP program component. The CASQA Effectiveness Guidance is available at www.casqa.org for purchase. A two-hour EPA webcast focusing on the CASQA Guide is also available (available at www.epa.gov/npdes/training under "Assessing the Effectiveness of Your Municipal Stormwater Program"). A resources document from the webcast includes a 10 page summary of the Guide and example pages from the municipal chapter (www.epa.gov/npdes/outreach_files/webcast/jun0408/110961/municipal_resources.pdf).

The *Municipal Stormwater Program Effectiveness Assessment Guidance* synthesizes information on designing and conducting program effectiveness assessments. The document also explains how to select certain methods based on programmatic outcomes and goals. The reader is led through a series of questions and case studies to demonstrate how proper assessments are selected. Techniques are related to different level of outcomes: level one – documenting activities, level two – raising awareness, level 3 – changing behavior, level 4 – reducing loads from sources, level 5 – improving runoff quality, and level 6 – protecting receiving water quality. The Guide includes fact sheets for all six NPDES program elements, outlining methods and techniques for assessing effectiveness of each program.

Recommendations for the Permit Writer

Adaptive management is the appropriate process for assessing new opportunities for improving program effectiveness in controlling stormwater pollution. The permit writer should require the permittee to use adaptive management throughout the permit term to assess options for improving controls on stormwater discharges as compared with measurable goals and demonstrated by monitoring and assessment protocols. The permit writer should have the permittee monitor and

assess the data and analyses required under the permit as well as applicable information from other sources in the adaptive management process.

In addition, the permit writer should have the permittee assess and modify, as necessary, any or all existing SWMP components and adopt new or revised SWMP components to optimize reductions in stormwater pollutants through an iterative process. This iterative process should include routine assessment of the need to further improve water quality and protect beneficial uses, review of available technologies and practices to accomplish the needed improvement, and evaluate resources available to implement the technologies and practices.

8.4 Requirements for Annual Reporting of MS4 Activities

Example Permit Provision

8.4.1 Summary Annual Report - The Permittee must submit annual reports on or before [*specify deadline, e.g., the anniversary date of this permit*] for the reporting period [*specify the reporting period, e.g., July 1-June 30*]. The Permittee must use the Summary MS4 Annual Report template in Appendix A to document a summary of the past year activities. All of the information required on this form must be completed.

8.4.2 Detailed Annual Report - The Permittee must also submit a detailed annual report that addresses, for the activities described in the SWMP document required in Part 1.1, the following:

- A summary of past year activities, including where available, specific quantities achieved and summaries of enforcement actions. See Part 8.4.3 for required information specific to certain SWMP areas.
- A description of the effectiveness of each SWMP program component or activity (see Part 8.3); and
- Planned activities and changes for the next reporting period, for each SWMP program component or activity.
- Detailed fiscal analysis described in Part1.4.2.

8.4.3 [*Specify any additional information and/or data pertaining to implementation of priority activities the Permitting Authority would like to see in Annual Reports, e.g. a list of green roofs (with square footage) installed in the MS4, a summary of water quality monitoring data collected for a specific waterbody, etc*.]

The Annual Report must clearly refer to the Permit Requirements, and describe in quantifiable terms, the status of activities undertaken to comply with each requirement.

Example Permit Requirement Rationale for the Fact Sheet

In general, an annual report must document and summarize implementation of the SWMP during the previous year and evaluate program results and describe planned changes towards continuous improvement. The annual report also can serve as a "state of the SWMP" report for the general public or other stakeholders in the community. While records are to be kept and made available to the public, the annual report is an excellent summary document to provide as well.

Recommendations for the Permit Writer

EPA recommends using its Summary Annual Report Template (see Appendix A) in this guidance in order to obtain summary information about the status of MS4 programs. In addition to the summary annual report template, permittees must also submit a more detailed annual report.

The permit writer may determine that additional, more detailed, information is needed to determine compliance with the Permit Requirements. Even if these reporting details are not required within the permit, the permitting authority and enforcement officials can still request them at any time or during a program audit.

MS4 permits should require permittees to summarize and analyze data concerning the effectiveness of the SWMP and submit the analysis to the permitting authority. For example, the permittees should address such questions as:

- For illicit discharge data, what are the most prevalent sources and pollutants in the illicit discharge data, and where are these illicit discharges occurring? How many illicit discharges have been identified, and how many of those have been resolved? How many outfalls or screening points were visually screened, how many had dry weather discharges or flows, at how many were field analyses completed and for what parameters, and at how many were samples collected and analyzed? Does the MS4 need to conduct more inspections in these areas, or develop more specific outreach targeting these sources and pollutants?

- For the construction data, what are the most common construction violations, and are there any trends in the data (e.g., construction operators who receive more violations than others, areas of the MS4 with more violations, need to refine guidance or standards to more clearly address common violations). How has the permittee responded to these trends? Over the last year, how many construction site plan reviews were completed and approved? How many inspections were conducted, how many noncompliant sites were identified, and how many enforcement actions (and of what type) were taken?

At a minimum, the permit should require that the annual report clearly illustrate three key items for each SWMP area:

- **Summary of the Year's Activities**. The summary should describe and quantify program activities for each SWMP component. Responsible persons, agencies, departments or co-permittees should be included. Each activity should be described in relation to achievement of established goals or performance standards.

- **Description of SWMP Effectiveness**. An annual report should not only describe the previous year's activities, but should also highlight the SMWP's effectiveness (see Part 8.3) using the indicators required in Part 8.2.

- **Planned Activities and Changes**. The annual report should describe activities planned for the next year highlighting any changes made to improve control measures or program effectiveness.

Also, although the stormwater Phase II rule requires reports, after the first permit term, to be submitted in only years two and four of the permit term, EPA strongly encourages annual reports for all permittees.

APPENDIX A: SUMMARY ANNUAL REPORT TEMPLATE

National Pollutant Discharge Elimination System Stormwater Program
Small MS4 Report Form

The purpose of this report is to contribute information to an evaluation of the NPDES small municipal separate storm sewer system (MS4) permit program. Consistent with 40 CFR §122.37 the U.S. Environmental Protection Agency is assessing the status of the program nation-wide. A "no" answer to a question does not necessarily mean noncompliance with your permit or with the federal regulations. In order to establish the range of variability in the program it is necessary to ask questions along a fairly broad performance continuum. Your permitting authority may use some of this information as one component of a compliance evaluation.

1. MS4 Information

_____

Name of MS4

_____ _____ _____

Name of Contact Person (First) (Last) (Title)

_____ _____

Telephone (including area code) Email

_____

Mailing Address

_____ ____ _____

City State ZIP code

What size population does your MS4 serve? _____ NPDES number _____

What is the reporting period for this report? (mm/dd/yyyy) From _____ to _____

2. Water Quality Priorities

A. Does your MS4 discharge to waters listed as impaired on a state 303(d) list? ☐ Yes ☐ No

B. If yes, identify each impaired water, the impairment, whether a TMDL has been approved by EPA for each, and whether the TMDL assigns a wasteload allocation to your MS4. Use a new line for each impairment, and attach additional pages as necessary.

Impaired Water	Impairment	Approved TMDL		TMDL assigns WLA to MS4	
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No

C. What specific sources contributing to the impairment(s) are you targeting in your stormwater program?

_____

D. Do you discharge to any high-quality waters (e.g., Tier 2, Tier 3, outstanding natural resource waters, or other state or federal designation)? ☐ Yes ☐ No

E. Are you implementing additional specific provisions to ensure their continued integrity? ☐ Yes ☐ No

3. Public Education and Public Participation

A. Is your public education program targeting specific pollutants and sources of those pollutants? ☐ Yes ☐ No

B. If yes, what are the specific sources and/or pollutants addressed by your public education program?

_____

C. Note specific successful outcome(s) (e.g., quantified reduction in fertilizer use; NOT tasks, events, publications) fully or partially attributable to your public education program during this reporting period.

_____

D. Do you have an advisory committee or other body comprised of the public and other stakeholders that provides regular input on your stormwater program? ☐ Yes ☐ No

4. Construction

A. Do you have an ordinance or other regulatory mechanism stipulating:

Erosion and sediment control requirements? ☐ Yes ☐ No

Other construction waste control requirements? ☐ Yes ☐ No

Requirement to submit construction plans for review? ☐ Yes ☐ No

MS4 enforcement authority? ☐ Yes ☐ No

B. Do you have written procedures for:

Reviewing construction plans? ☐ Yes ☐ No

Performing inspections? ☐ Yes ☐ No

Responding to violations? ☐ Yes ☐ No

C. Identify the number of active construction sites ≥ 1 acre in operation in your jurisdiction at any time during the reporting period. _____

D. How many of the sites identified in 4.C did you inspect during this reporting period? _____

E. Describe, on average, the frequency with which your program conducts construction site inspections.

_____

F. Do you prioritize certain construction sites for more frequent inspections? ☐ Yes ☐ No

If Yes, based on what criteria? _____

G. Identify which of the following types of enforcement actions you used during the reporting period for construction activities, indicate the number of actions, or note those for which you do not have authority:

☐ Yes Notice of violation #____ No Authority ☐

☐ Yes Administrative fines #____ No Authority ☐

☐ Yes Stop Work Orders #____ No Authority ☐

☐ Yes Civil penalties #____ No Authority ☐

☐ Yes Criminal actions #____ No Authority ☐

☐ Yes Administrative orders #____ No Authority ☐

☐ Yes Other _____ #____

H. Do you use an electronic tool (e.g., GIS, data base, spreadsheet) to track the locations, inspection results, and enforcement actions of active construction sites in your jurisdiction? ☐ Yes ☐ No

I. What are the 3 most common types of violations documented during this reporting period?

_____

J. How often do municipal employees receive training on the construction program? _____

5. Illicit Discharge Elimination

A. Have you completed a map of all outfalls and receiving waters of your storm sewer system? ☐ Yes ☐ No

B. Have you completed a map of all storm drain pipes and other conveyances in the storm sewer system? ☐ Yes ☐ No

C. Identify the number of outfalls in your storm sewer system. _____

D. Do you have documented procedures, including frequency, for screening outfalls? ☐ Yes ☐ No

E. Of the outfalls identified in 5.C, how many were screened for dry weather discharges during this reporting period?

_____

F. Of the outfalls identified in 5.C, how many have been screened for dry weather discharges at any time since you obtained MS4 permit coverage? _____

G. What is your frequency for screening outfalls for illicit discharges? Describe any variation based on size/type.

_____

H. Do you have an ordinance or other regulatory mechanism that effectively prohibits illicit discharges? ☐ Yes ☐ No

I. Do you have an ordinance or other regulatory mechanism that provides authority for you to take enforcement action and/or recover costs for addressing illicit discharges? ☐ Yes ☐ No

J. During this reporting period, how many illicit discharges/illegal connections have you discovered? _____

K. Of those illicit discharges/illegal connections that have been discovered or reported, how many have been eliminated?

_____

L. How often do municipal employees receive training on the illicit discharge program? _____

6. Stormwater Management for Municipal Operations

A. Have stormwater pollution prevention plans (or an equivalent plan) been developed for:

All public parks, ball fields, other recreational facilities and other open spaces ☐ Yes ☐ No

All municipal construction activities, including those disturbing less than 1 acre ☐ Yes ☐ No

All municipal turf grass/landscape management activities ☐ Yes ☐ No

All municipal vehicle fueling, operation and maintenance activities ☐ Yes ☐ No

All municipal maintenance yards ☐ Yes ☐ No

All municipal waste handling and disposal areas ☐ Yes ☐ No

Other _____

B. Are stormwater inspections conducted at these facilities? ☐ Yes ☐ No

C. If Yes, at what frequency are inspections conducted? _____

D. List activities for which operating procedures or management practices specific to stormwater management have been developed (e.g., road repairs, catch basin cleaning).

_____

E. Do you prioritize certain municipal activities and/or facilities for more frequent inspection? ☐ Yes ☐ No

F. If Yes, which activities and/or facilities receive most frequent inspections? _____

G. Do all municipal employees and contractors overseeing planning and implementation of stormwater-related activities receive comprehensive training on stormwater management? ☐ Yes ☐ No

H. If yes, do you also provide regular updates and refreshers? ☐ Yes ☐ No

I. If so, how frequently and/or under what circumstances? _____

7. Long-term (Post-Construction) Stormwater Measures

A. Do you have an ordinance or other regulatory mechanism to require:

Site plan reviews for stormwater/water quality of all new and re-development projects?	☐ Yes	☐ No
Long-term operation and maintenance of stormwater management controls?	☐ Yes	☐ No
Retrofitting to incorporate long-term stormwater management controls?	☐ Yes	☐ No

B. If you have retrofit requirements, what are the circumstances/criteria?

_____

C. What are your criteria for determining which new/re-development stormwater plans you will review (e.g., all projects, projects disturbing greater than one acre, etc.) _____

D. Do you require water quality or quantity design standards or performance standards, either directly or by reference to a state or other standard, be met for new development and re-development? ☐ Yes ☐ No

E. Do these performance or design standards require that pre-development hydrology be met for:

Flow volumes	☐ Yes	☐ No
Peak discharge rates	☐ Yes	☐ No
Discharge frequency	☐ Yes	☐ No
Flow duration	☐ Yes	☐ No

F. Please provide the URL/reference where all post-construction stormwater management standards can be found.

_____

G. How many development and redevelopment project plans were reviewed during the reporting period to assess impacts to water quality and receiving stream protection? _____

H. How many of the plans identified in 7.G were approved? _____

I. How many privately owned permanent stormwater management practices/facilities were inspected during the reporting period? _____

J. How many of the practices/facilities identified in I were found to have inadequate maintenance? _____

K. How long do you give operators to remedy any operation and maintenance deficiencies identified during inspections?

_____

L. Do you have authority to take enforcement action for failure to properly operate and maintain stormwater practices/facilities? ☐ Yes ☐ No

M. How many formal enforcement actions (i.e., more than a verbal or written warning) were taken for failure to adequately operate and/or maintain stormwater management practices? _____

N. Do you use an electronic tool (e.g., GIS, database, spreadsheet) to track post-construction BMPs, inspections and maintenance? ☐ Yes ☐ No

O. Do all municipal departments and/or staff (as relevant) have access to this tracking system? ☐ Yes ☐ No

P. How often do municipal employees receive training on the post-construction program? _____

8. Program Resources

A. What was the annual expenditure to implement MS4 permit requirements this reporting period? _____

B. What is next year's budget for implementing the requirements of your MS4 NPDES permit? _____

C. This year what is/are your source(s) of funding for the stormwater program, and annual revenue (amount or percentage) derived from each?

Source: _____ Amount $_____ OR %_____

Source: _____ Amount $_____ OR %_____

Source: _____ Amount $_____ OR %_____

D. How many FTEs does your municipality devote to the stormwater program (specifically for implementing the stormwater program; not municipal employees with other primary responsibilities)? _____

E. Do you share program implementation responsibilities with any other entities? ☐ Yes ☐ No

Entity	Activity/Task/Responsibility	Your Oversight/Accountability Mechanism

9. Evaluating/Measuring Progress

A. What indicators do you use to evaluate the overall effectiveness of your stormwater management program, how long have you been tracking them, and at what frequency? These are not measurable goals for individual management practices or tasks, but large-scale or long-term metrics for the overall program, such as macroinvertebrate community indices, measures of effective impervious cover in the watershed, indicators of in-stream hydrologic stability, etc.

Indicator	**Began Tracking (year)**	**Frequency**	**Number of Locations**

B. What environmental quality trends have you documented over the duration of your stormwater program? Reports or summaries can be attached electronically, or provide the URL to where they may be found on the Web.

10. Additional Information

In the space below, please include any additional information on the performance of your MS4 program. If providing clarification to any of the questions on this form, please provide the question number (e.g., 2C) in your response.

Certification Statement and Signature

I certify that all information provided in this report is, to the best of my knowledge and belief, true, accurate and complete. ☐ Yes

Federal regulations require this application to be signed as follows: **For a municipal, State, Federal, or other public facility**: by either a principal executive or ranking elected official.

Name of Certifying Official, Title

Date (mm/dd/yyyy)

Submit

APPENDIX B: DEFINITIONS

Commencement of Construction – the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material). (Source: 2008 CGP)

Control Measure – any best management practice (BMP) or other method used to prevent or reduce the discharge of pollutants to waters of the United States. (Source: 2008 CGP)

Discharge – when used without qualification means the "discharge of a pollutant." (Source: 2008 CGP)

Discharge of Stormwater Associated with Construction Activity – as used in this permit, refers to a discharge of pollutants in stormwater from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (Source: 2008 CGP)

Illicit Discharge - any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities. (Source: 40 CFR 122.26)

Large Construction Activity – is defined at 40 CFR §122.26(b)(14)(x) and incorporated here by reference. A large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site. (Source: 2008 CGP)

Non-Structural Controls – preventative actions that involve management and source controls. Refer also to 40 CFR 122.34(b)(5)(c)(iii). (Source: 40 CFR 122.26)

Qualified Personnel – A person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity. (Source: EPA's 2008 Construction General Permit)

Receiving Water – the "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges. (Source: 2008 CGP)

Small Construction Activity –includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb

less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site. (Source: 2008 CGP)

Stormwater control measure – see control measure.

Structural Control - physically designed, installed, and maintained practices used to prevent or reduce the discharge of pollutants in stormwater, to minimize erosion, and/or to minimize the impacts of stormwater on waterbodies.

Wasteload Allocation – the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. Wasteload allocations constitute a type of water quality-based effluent limitation. (40 CFR 130.2)