Drainage Design Manual

for Maricopa County, Arizona

Erosion Control

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Acknowledgments

This manual, in its present form, is an update/upgrade to the original Volume III Erosion Control of the Drainage Design Manual (3 volume set) issued by the Flood Control District of Maricopa County (FCDMC) in 1993. The revisions were prompted by the significant recent changes in the stormwater discharge regulations and the State's recent delegation as the permitting authority of these regulations.

This manual update/upgrade was prepared by AMEC Earth & Environmental, Inc. under the direction of the FCDMC. The authors of this manual are indebted to many individuals and organizations for their support, recommendations, technical guidance, and review of the draft manual. Specific contributors include Matt Oller, and his predecessor Todd G. Williams, Water Quality Branch Manager, Engineering Division, FCDMC, who served as the District's Project Manager and overall vision for the project, and Tom Loomis, P.E., Special Projects Manager, Engineering Division, FCDMC, who provided the guidance in relation to the standardization of the Drainage Design Manual as desired by the District. We also truly appreciate the gracious assistance of many local stormwater program coordinators and staff from professional organizations for their input and useful comments. We also wish to recognize and thank the Arizona Department of Transportation (ADOT) for providing many of the Best Management Practices set forth in this manual.

We thank the Flood Control District and its Board of Directors for giving AMEC Earth & Environmental the opportunity to be of service. We appreciate being able to assist in the ways that the District provides assistance to the general public and to serve as good stewards of the public resources and trust. We hope that our efforts will be beneficial to all who use this manual.

Comments

Users of this manual are welcomed to submit comments, suggestions, or findings of errors. This information should be addressed to:

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Revisions

Because of ongoing technical and administrative changes in the field of stormwater management, revisions to this manual will be required from time to time. Such revisions will take place on an ongoing, as needed, basis and will be posted on the FCDMC's Web page (www.fcd.maricopa.gov). The dates of revision and an overview of changes made are listed below.

1st Edition January 1, 1993

2nd Edition Draft March 21, 2012

Overview of Changes Made in the Second Edition Draft

The entire manual was revised and updated to current EPA and ADEQ standards.

The Vendor List, included as Appendix F in the initial draft versions of the 2nd edition, was removed and replaced by the *Stormwater Pollution Prevention Vendor Registration Application* (SPPVRA) hosted by the Flood Control District of Maricopa County. The primary purpose of this application is to allow vendors to register stormwater-related products they consider to be best management practices (BMPs) and it allows the public to browse products that could assist them with their stormwater pollution prevention needs. This application can be accessed at:

http://www.fcd.maricopa.gov/Waterq/webVendors/default.asp

2nd Edition Final November 2012

A Public Review period was conducted from April 10, 2012 through April 27, 2012. The final 2nd Edition document includes revisions to address input received from this review period. Various typographical errors and a problem with graphics display in the web-based PDF file were attended to. The various revisions included:

Sections 2.4.2, 2.5.2 and 4.1.3. Language regarding NOI approval was revised to match the most current information from the ADEQ web site.

EC-10, pg. 5-79. Added note to the figure to clarify the intent of application for Sales A and B.

EC-11, pg. 5-85. Clarified difference between temporary and final design for parameter L_a.

SPC-1, Recommended Standards and Specifications, pg. 5-97. Added guidance regarding damaged sediment wattles. Added language throughout Chapter 5 to help clarify the addition of sediment wattles as an acceptable BMP. Created a materials section and added language foe sizing of sediment wattles.

SPC-1, pg. 5-118. Added language to allow sediment wattles for use as Check Dams in roadway ditches and channels.

SPC-7, pg. 5-139. Changed picture of sediment wattle application at a street stormwater inlet to one depicting gravel bags.

SPC-8, Recommended Standards and Specifications, pg. 5-145. Added language clarifying differences between temporary and permanent retention basins.

Second Edition Dates of Revision

The following indicates the dates in which the second edition has been updated and summarizes revisions made after the approval date in November 2012.

Revised the current publication date to match the other two volumes of the DDM, August 15, 2013.

July 2018

1. EC-5 Stabilized Construction Entrance under Chapter 5 Best Management Practices was revised.

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Approvals

APPROVAL BY CHIEF ENGINEER AND GENERAL MANAGER

The Drainage Design Manual for Maricopa County – Erosion Control is hereby approved and accepted for use within Maricopa County, AZ as best available technical information. This manual has been submitted to various Flood Control District of Maricopa County (FCDMC) staff, other agencies, consultants and the Public for technical review. Review comments have been addressed and the document is hereby incorporated into FCDMC and County Policy. The Erosion Control manual is only available in digital format and can be found on the FCDMC public web site at:

http://www.fcd.maricopa.gov/Pub/manuals/erosionControl.aspx

Refer to the Revisions section of the manual for a history of the changes made.

The objective of the Drainage Design Manual, Erosion Control, is to provide guidance to agencies, municipalities, developers, property owners, engineers, contractors and others involved with construction events as a means to comply with the Arizona Pollutant Discharge Elimination System (AZPDES) -- or the National Pollutant Discharge Elimination System (NPDES) when seeking permit coverage within Tribal Lands – storm water permitting process for construction activities. Specifically, this document provides guidance on how to comply with the AZPDES (and NPDES) General Permit for discharges from regulated construction activities.

This document is only advisory and, in conformance with A.R.S. 48-3641.6, is intended to inform the general public of the Flood Control District of Maricopa County's current approach or opinion to the requirements of the various federal, state and county floodplain and drainage related ordinances or regulations, including, where appropriate, the Flood Control District of Maricopa County's current recommended minimum practice, procedure or method of action based on that approach or opinion. This document is not intended to impose additional requirements or penalties on regulated parties or confidential information. Submissions made using other methodology shall be acceptable to the Flood Control District of Maricopa upon submission of scientific documentation and evidence showing that such methodology yields results that are consistent and in accordance with the requirements of the various ordinances and regulations and specifically of the AZPDES (and NPDES) General Permit for discharges from regulated construction activities. However, the burden of proof is on the applicant and may affect submittal review times.

Approved for use by:

9/9/13

Timothy S. Phillips, P.E. Date
Chief Engineer and General Manager
Flood Control District of Maricopa County

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1 INTRODUCTION

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1 INTRODUCTION
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Soil erosion and sedimentation are naturally occurring processes that become significantly increased by land disturbance and construction activities, particularly those associated with land development when large parcels of land become severely altered. Soil erosion and the resulting sedimentation typically caused by construction activities (i.e., clearing, grading, and excavation operations) impact the environment, damaging aquatic and recreational resources as well as aesthetic qualities of the receiving surface waters.

The type and extent of construction activities can vary significantly. These typically involve the erection of a horizontal structure such as a building or the extension of a linear structure such as a roadway. In any case, the construction phase of a project is usually considered a temporary condition, which will be supplanted by the permanent improvements and facilities for the completed project. However, construction work may take place over an extended period of time, sometimes over several seasons of multiple years, resulting in an increased potential for sediment and other pollutants to be carried away from the site in stormwater discharges. For this reason, all erosion and sediment control measures used in the course of construction should be designed and installed correctly, and properly maintained throughout the construction period for maximum effectiveness. Likewise, they should also consider post-construction issues once the project is complete.

1.1 PURPOSE OF THIS MANUAL

In November 1990, the United States Environmental Protection Agency (EPA) established a National Stormwater Program by adopting regulations requiring National Pollutant Discharge Elimination System (NPDES) permits for stormwater discharges from certain systems and activities, including construction sites. A two-phase stormwater program was established, incorporating a prioritized approach to stormwater discharge regulation.

On December 2002, the state of Arizona obtained authorization from EPA to operate the National Pollutant Discharge Elimination System (NPDES) Permit Program at the state level. The Arizona Department of Environmental Quality (ADEQ), on behalf of the state, developed its own program

to address NPDES. This Arizona-specific program, which was reviewed and approved by EPA, is known as the Arizona Pollutant Discharge Elimination System (AZPDES) Program. Under the AZPDES Program, systems and facilities that discharge stormwater are required to obtain or seek coverage under an AZPDES permit.

The main objective of this **Erosion Control Manual** is to provide guidance to agencies, municipalities, developers, property owners, engineers, contractors, and others involved with construction events to comply with the AZPDES (or the NPDES when seeking permit coverage within Indian country) stormwater permitting process for construction activities. Specifically, this document provides guidance on how to comply with the ***AZPDES*** (and NPDES) ***General Permit for discharges from regulated construction activities and the Maricopa County Stormwater Quality Management and Discharge Control Regulation***.

The **Construction General Permit** (CGP) seeks the minimization of stormwater flows, prevention of soil erosion, capture of waterborne sediment that has been unavoidably released from uncovered or disturbed soils, and at the same time, protection of water quality from onsite pollutant sources through the planning, implementation, and maintenance of Best Management Practices (BMPs). This manual establishes the framework and provides the tools to effectively plan, install and maintain stormwater BMPs for construction sites. The BMPs must be specifically identified and properly described in a Stormwater Pollution Prevention Plan (SWPPP) for a regulated construction site to obtain permit coverage under the CGP. An overview of the development of most elements of a SWPPP as required by the CGP is also presented in this manual. What this manual does not provide is specific design criteria for erosion and sediment control, as well as construction standards. These may be obtained by contacting the local stormwater control jurisdiction.

The goal of this manual is to provide guidance in the local implementation of the NPDES stormwater permit program for construction activities. The manual was developed using four major principles:

1. Review existing local design and construction processes to develop a guideline for development of SWPPPs compatible with typical construction project development, design, and scheduling practices.

2. Avoid duplication of requirements for permitting and inspection, wherever possible, in order to minimize costs in providing stormwater pollution controls as part of private and public improvements.

3. Review existing design and construction practices to identify and take advantage of those local planning, design, and construction standards which are currently required by local agencies and which can be directly applied as BMPs in preparing a SWPPP.

4. Provide information and guidelines for structural and non-structural BMPs that are applicable to an arid and semi-arid region and comply with the requirements of the CGP.

1.2 MANUAL ORGANIZATION

This manual is organized into five (5) main chapters, as follows:

Chapter 1. *Introduction*: This chapter provides an introduction to the importance of preserving the quality of surface waters through proper erosion and sediment control practices. It also provides the manual's purpose and organization.

Chapter 2. *Regulations*: This chapter provides an overview of the environmental laws and regulations by the U.S. EPA and the State of Arizona that specifically pertain to stormwater discharges from construction activities. The EPA National Stormwater Program objectives as it pertains to construction activities are also presented. This chapter also provides the permit requirements for construction stormwater discharges.

Chapter 3. *Principles and Practices*: This chapter provides a technical overview of soil erosion and sedimentation and how it impacts water quality. Guidance is given for construction control measures and management practices to reduce erosion, minimize sedimentation, and control non-stormwater discharges. Minimum erosion, sediment, and pollutant controls are defined to meet the NPDES design goals for construction activities. Site planning, design, and construction management strategies are provided for private and public construction projects. This chapter includes discussions and illustrations of temporary construction BMPs for erosion and sediment controls and for onsite general housekeeping to minimize pollutants. Permanent erosion controls to minimize erosive velocities and minimize sediment are also discussed.

Chapter 4. *Obtaining and Terminating Permit Coverage*: This chapter includes explanations of the requirements and processes for notifying the appropriate regulatory agency prior to commencement of the construction project, as well as upon completion of the project - specifically how to prepare and submit Notices of Intent (NOIs) and Stormwater Pollution Prevention Plans (SWPPPs) and Notices of Termination (NOTs). This chapter also includes process flowcharts and procedures for preparing and implementing elements of the SWPPP.

Chapter 5. *Best Management Practices*: This chapter provides basic information on select construction BMPs. It includes guidance on methods of selecting and implementing BMPs for a specific construction site on the basis of careful review of the areas of the site that affect its potential for erosion and stormwater runoff contamination. BMPs are organized into three main groups: 1) erosion control (EC), which are preventative; controlling erosion at its source, 2) sediment pollutant control (SPC), which treat runoff for the purpose of limiting or removing sediment and other associated stormwater pollutants, and 3) general housekeeping (GH),

which are less structured in nature and addresses operations and maintenance activities at the construction site. Each BMP is cross-referenced to the potential problem area for which the individual BMPs apply.

Chapter 6. *Appendices:* This chapter includes a number of appendices as follows:

Appendix A - *Construction General Permit*: Includes copies of the latest CGPs that are applicable in Arizona, specifically the AZPDES (ADEQ Permit No. AZG2008-001, February 2008) and the NPDES (EPA, January 2009) CGPs.

Appendix B - *Forms*: This appendix contains the required NOI and NOT forms, for both ADEQ and EPA CGPs. This chapter also includes other forms, such as the AZPDES Construction SWPPP Checklist and other useful guidance documents.

Appendix C - *Links and References*: This appendix includes links and references to other useful stormwater discharge permit sources of information and tools.

Appendix D - *Glossary*: This appendix includes definitions for those terms most commonly used for stormwater quality control, construction, and within state and federal regulations.

Appendix E - *Bibliography*: This appendix contains a list of the references used for development of this manual.

2 REGULATIONS

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Polluted runoff occurs when rain, snowmelt, irrigation water, and other water sources move across land and pick up pollutants and sediment, carrying them into lakes, rivers, and streams. Nowadays, diffuse or nonpoint sources of pollution remain the Nation's largest source of water quality problems. Efforts by the U.S. Government to address polluted urban runoff have been substantial since the late 1980's. By the early 1990's, significant regulatory developments requiring stormwater pollution control and discharge permits from certain industrial facilities, construction sites, and municipalities were in effect. Additional requirements were implemented about a decade later. This chapter provides the background and general information about these regulations, including what is specific to the State of Arizona. Most importantly, it highlights the permit requirements for construction stormwater discharges.

2.1 EVOLUTION OF WATER POLLUTION CONTROL LAWS

The first comprehensive federal regulation aimed specifically at water pollution control dates back to 1948 with the Water Pollution Control Act (WPCA). The WPCA set a precedent for many of the environmental laws that followed. The Federal Water Pollution Control Act (FWPCA) of 1956 built on the original water pollution control statute by authorizing federal planning and technical assistance. Since 1956, the statute has been amended extensively either to authorize additional water quality programs, standards and procedures to govern allowable discharges, funding for construction grants or general program funding. Major amendments were enacted in 1961, 1966, 1970, 1972, 1977, and 1987; with those of 1972, 1977 and 1987 considered the most

important to the development of the National Stormwater Program (NSWP). Also critical was the formation of the Environmental Protection Agency (EPA) – a federal agency established by a Presidential Executive Order in 1970 that brought together over a dozen governmental agencies that were involved with pollution control.

The FWPCA Amendments of 1972 (Public Law 92-500) stipulated broad national objectives to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. These included requirements that limitations be determined for point sources which are consistent with State water quality standards, procedures for State issuance of water quality standards, development of guidelines to identify and evaluate the extent of nonpoint source pollution, water quality inventory requirements, as well as development of toxic and pretreatment effluent standards. Specifically, Section 402 of the Amendments of 1972 established the National Pollutant Discharge Elimination System (NPDES) – a provision that prohibits the discharge of pollutants into surface waters of the United States unless the EPA or properly designated government (State or Indian tribal) issues a permit.

The 1977 amendments of the FWPCA, which is commonly known as the Clean Water Act (CWA) (Public Law 95-217), again extensively amended the Act. The CWA established the basic structure for regulating discharges of pollutants into Waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA, through a variety of regulatory and non-regulatory tools, made it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution.

Perhaps the most important set of amendments to the FWPCA was the Water Quality Act (WQA) of 1987 (Public Law 100-4) that established the NSWP through a two-phased, prioritized approach to regulating stormwater discharges from certain categories of industrial activities, construction sites, and municipalities. It specifically added provisions to Section 402 of the CWA, requiring EPA to issue NPDES permits for the various categories of stormwater discharges.

2.2 THE NATIONAL STORMWATER PROGRAM

By September of 1992, Phase I of the NSWP provided the regulation of the following three categories of stormwater discharges:

1. **Construction**: Large construction activity (i.e., clearing, grading, and excavating) resulting in land disturbance equal to or greater than 5 acres of land or disturbing less than 5 acres of total land area but part of a larger common plan of development or sale that will ultimately disturb equal to or greater than 5 acres. Large construction sites were permitted mostly under NPDES general permits.

2. **Municipal**: Stormwater discharges from large (populations greater than 250,000) and medium (populations of 100,000 to 250,000) *municipal separate storm sewer systems* (MS4s)[1]. Regulation of large and medium MS4s was achieved through NPDES individual permits.

3. **Industrial**: Stormwater discharges associated with eleven (11) select industrial activities, including nine (9) categories of industry[2] that already required permits for stormwater discharges prior to the Phase I rule. Regulation of the target industries was typically through NPDES general permits.

About a decade later, Phase II of the NSWP set forth a number of additional categories of stormwater discharges to be permitted, with a deadline for application by existing facilities and regulated entities of March 10, 2003. The additional discharges to be permitted are:

1. **Construction**: Small construction activity (i.e., clearing, grading, and excavating) resulting in land disturbance equal to or greater than 1 acre and less than 5 acres of land, or disturbing less than 1 acre of total land area but part of a larger common plan of development or sale that will ultimately disturb equal to or greater than 1 acre and less than five 5 acres. Phase II also provided two (2) potential permit waivers to small construction facilities. The vast majority of both large and small construction sites nationally that are discharging stormwater are permitted under general NPDES permits.

2. **Municipal**: Stormwater discharges from small MS4s in urbanized areas[3] based on the results of the 2000 Census of population and housing by the Bureau of the Census (Census Bureau). It did not include large and medium MS4s since these were already regulated under Phase I. Further, it included small MS4s located outside urbanized areas meeting EPA or State criteria for designation, which targeted entities having a total population of 10,000 or more and a population density of 1,000 per square mile and entities contributing substantially to stormwater pollution. MS4s with a population less than 1,000 people were generally waived from the permitting requirements.

3. **Industrial**: Industrial facilities owned or operated by small municipalities (i.e., where the municipality's population was less than 100,000 based on the 1990 Census), which were temporarily exempted from the Phase I industrial permitting requirements in accordance with the provisions of the Intermodal Surface Transpor-

1. The term MS4 refers to the systems that collect and convey stormwater runoff from within a municipal jurisdiction, and eventually discharge into the Waters of the United States. These systems include municipal streets, curbs, gutters, ditches, catch basins, and storm drains.
2. Between 1974 and 1982, EPA promulgated effluent limitations guidelines for stormwater discharges from nine categories of industrial discharges, including cement manufacturing, feedlots, fertilizer manufacturing, petroleum refining, phosphate manufacturing, steam electric power generation, coal mining, ore mining and dressing, and asphalt emulsion. (Dodson, 1999).
3. An urbanized area consists of densely settled territory that contains 50,000 or more people. The 2000 Census defined six urbanized areas within the state of Arizona. The urbanized areas were named for the central place in that region (67 FR 21962). Urbanized areas in Arizona, as determined by the US Census Bureau include Avondale, Flagstaff, Phoenix, Prescott, Tucson, and Yuma.

tation Efficiency Act (ISTEA) of 1991. The rule also provided relief from stormwater permitting requirements to regulated industrial facilities that could provide written certification of “no exposure” of industrial materials and activities to stormwater.

2.3 AZPDES REGULATIONS

On December 5, 2002, the U.S. Environmental Protection Agency (EPA) approved the State of Arizona’s application for primacy of the NPDES program. As a result of this, the Arizona Department of Environmental Quality (ADEQ) became authorized and responsible for administering the NPDES program in all areas within the State except for Indian Country. The NPDES is a federal regulatory program to control discharges of pollutants to surface waters of the United States. Prior to December 2002, EPA Region IX was responsible for administering this program throughout Arizona. The “application” that EPA approved was for implementation of the Arizona Pollutant Discharge Elimination System (AZPDES) program. AZPDES is the State program to carry out the NPDES program. When this happened, Arizona became the 45th state to obtain this authority. It is important to note that ADEQ does not have permit authority in Indian country (due to sovereignty). Thus, construction discharge permits for Indian country within the state of Arizona are normally acquired through EPA Region IX.

The ADEQ, on behalf of the State, is responsible for development and revisions of the rules for the AZPDES program. The AZPDES rules are published in the Arizona Administrative Code, specifically Title 18, Chapter 9, Article 9.

For regulatory purposes, pollutant sources are generally categorized as either "point" or "non-point" sources. Typical point sources include process discharges from publicly owned treatment works and discharges from industrial facilities. Although urban runoff is not traditionally considered a point source, municipalities are permitted as if they were point sources under the MS4 component of the NPDES program. Under the AZPDES Permit Program, all facilities or systems that discharge pollutants from any point source into Waters of the U.S. are required to obtain or seek coverage under an AZPDES permit. As a general matter, groundwater is not considered Waters of the U.S. and discharges to groundwater do not require AZPDES permits[4].

The water quality permitting process is the primary way that ADEQ can balance environmental protection and good resource stewardship with social and economic considerations. By issuing permits, approvals and certifications, ADEQ ensures facilities are legally constructed and operated and that discharges to surface waters are within the standards established by law. Beyond this, given that it is a public process, it enables citizens to stay informed and involved as decisions are made about proposed activities affecting the environmental quality of their community.

4. In Arizona, an Aquifer Protection Permit, or APP, is required for any facility that discharges a pollutant either directly to an aquifer or to the land surface or the vadose zone in such a manner that there is reasonable probability that the pollutant will reach an aquifer. The APP rule was undergoing a revision in 2004. Final rule revisions became effective in 2005.

In addition to AZPDES (or NPDES) regulations, operators for construction activity in urbanized unincorporated areas of Maricopa County must also obtain permit coverage under County stormwater regulations. Therefore, at a minimum, a project that disturbs one acre or more will have a t least one permit through AZPDES or NPDES (if on Indian Lands), and may need a second permit through Maricopa County. The County program is fee-based, requiring fees for a number of activities including plan review.

2.4 INDIVIDUAL PERMITS VERSUS GENERAL PERMITS

Stormwater permit requirements can be issued through either an individual permit or a general permit. The use of general permits, instead of individual permits, reduces the administrative burden on permitting authorities, while also limiting the paperwork burden on regulated parties seeking permit authorization. Permitting authorities, as in the case of ADEQ, may require individual permits in some cases to address specific concerns, including permit non-compliance.

2.4.1 Individual Permits

An individual permit is tailored for a specific facility or entity based on an individual application. The regulatory agency develops the permit based on this information and other conditions appropriate to the facility or entity seeking the permit. The permit is then issued for a specified period of time not to exceed five years.

Large and medium MS4s under Phase I of the NSWP were regulated through individual permits. In Arizona, the municipal group that became regulated under Phase I include the ADOT, Phoenix, Tempe, Mesa, Tucson, Glendale, Scottsdale and Pima County. Although EPA Region IX is who originally issued each of these individual permits, ADEQ is now responsible for reviewing the management programs and permit reapplications of these regulated municipalities, and to renew their permits when expired. Under Phase II, despite the stormwater management program requirements (i.e., the six minimum control measures) being best-suited for a general permit, the rule provided the flexibility for small MS4s to seek more individualized permit requirements.

2.4.2 General Permits

A general permit is developed and issued to cover multiple facilities or entities within a specific category, industry or area. General permits offer a cost-effective and efficient option for agencies to cover a large number of regulated facilities or entities with elements in common under one permit. In addition, the permittee is ensured consistency in permit conditions for similar facilities or entities.

General permits require that the applicant submit a Notice of Intent (NOI) to the regulatory agency responsible for the NPDES program. The permitting authority will confirm permit coverage with the permittee by a letter containing the discharge authorization number. If the NOI is submitted with missing, nonconforming or incorrect information, the permitting authority will

inform the applicant of the inadequacies and request additional information. This form must be complete and accurate and signed by the appropriate signatory agent before coverage can be obtained. The form also serves as a promise by the operator that there will be compliance with the permit conditions. The NOI must be complete and accurate and signed by the appropriate signatory in order for coverage to be obtained. The form also serves as a commitment by the operator that there will be compliance with the permit conditions. The 'operator' must develop and implement a SWPPP that satisfies the conditions of the permit. If the site is located within 1/4 mile of an impaired or outstanding Arizona water (OAW), the SWPPP must be submitted with the NOI. ADEQ will notify the applicant within 32 business days after receiving the SWPPP if the SWPPP needs revisions or if permit coverage is granted or denied. In all other cases, the applicant is not required to submit the SWPPP to the department for review unless specifically required by ADEQ. The SWPPP must be on-site whenever construction activities are actively underway and must be fully implemented and maintained as construction activities progress. If ADEQ does not issue the authorization certificate within seven days, or 32-business days for sites located within 1/4 mile of an impaired or outstanding Arizona Water, of receiving the NOI or otherwise notify the operator that the submitted NOI is deficient, the operator may commence construction activities without an authorization certificate; however, it is the operator's responsibility to verify the date the NOI was received by ADEQ before initiating construction activities. Whether or not ADEQ notifies the operator of a deficiency in the NOI, discharges are not authorized under this permit if the operator submits and incomplete or incorrect NOI.

The permittee submits a Notice of Termination (NOT) to end its regulation under the NPDES stormwater program. Like the approval of a NOI, the NOT must be complete and accurate before permit responsibilities end.

In Arizona, and almost everywhere else in the U.S., general permits are used to regulate most NPDES stormwater discharges permit requirements. This includes the following permits:

Small MS4 General Permit: This general permit is what Phase II communities normally adhere to in order to meet the permit requirements of the Phase II regulations. General requirements of the Small MS4 General Permit include the development and implementation of a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the Small MS4 to the maximum extent practicable (MEP). The SWMP must specifically address the following six minimum control measures:

1. Public Education and Outreach
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management in New Development and Redevelopment

6. Pollution Prevention/General Housekeeping for Municipal Operations.

As of mid 2009, regulated Small MS4s (i.e., meet the description as operators of small MS4s located in "urbanized areas," as defined by the Census Bureau) in Arizona consisted of 28 cities, 5 counties, and 8 non-traditional entities. Once ADEQ defined and applied the designation criteria statewide, a total of 8 additional cities and towns were designated to apply for coverage under the Small MS4 stormwater permit. A list of the entities required to comply with these regulations is presented in Table 2.1. The AZPDES Small MS4 General Permit (AZG2002-002) was issued on December 19, 2002, and expired five years later on December 19, 2007. A new AZPDES Small MS4 General Permit is expected to be available by early 2010. Indian Communities in Arizona, unless they have individual primacy of the NPDES program, are permitted under the EPA Small MS4 General Permit and administered by Region IX. One of the main differences in the above two general permits is that AZPDES neither includes provisions nor requires information regarding the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA) given that it is not a “federal” program.

TABLE 2.1
NPDES STORMWATER PHASE II COMMUNITIES IN ARIZONA

Regulated Communities			Designated Cities/Towns
Cities	**Counties**	**Non-Traditional**	
Apache Junction Avondale Chandler El Mirage Flagstaff Gilbert Goodyear Guadalupe Litchfield Park Marana Oro Valley Paradise Valley Peoria Prescott Prescott Valley South Tucson Surprise Tolleson Youngtown Yuma	Coconino Maricopa Pinal Yavapai Yuma	Arizona State University Northern Arizona University University of Arizona Yuma Marine Corps Air Station Davis Monthan Air Force Base Luke Air Force Base Phoenix VA Medical Center Tucson VA Medical Center	Camp Verde Cottonwood Douglas Fountain Hills Lake Havasu Nogales Sedona Sierra Vista

Construction General Permit: In Arizona, the vast majority of both large and small construction sites discharging stormwater are permitted under the AZPDES Construction General Permit (AZG2008-001), which was issued on February 28, 2008 and expires on February 28, 2013. If

the construction activity is to occur within Indian Country, then the applicable Construction General Permit is that issued by EPA on January 8, 2009 and valid through January 8, 2014. More details about the CGP are presented in Section 2.5 in this chapter.

Multi-Sector General Permit: The Multi-Sector General Permit (MSGP) is designed for discharges of stormwater from regulated industrial sites that are of a non-construction nature. The MSGP is one large permit divided into numerous separate sectors. Each sector represents a different type of activity and is dependent upon its standard industrial classification (SIC) code or narrative description (refer to Table 2.2). The MSGP details the requirements EPA considers necessary for each sector to produce an acceptable Stormwater Pollution Prevention Plan (SWPPP).

Presently, all regulated industrial facilities in Arizona are covered by the EPA MSGP issued on October 30, 2000. ADEQ is in the process of developing its own AZPDES MSGP, expected to be available in early 2010.

TABLE 2.2
INDUSTRIAL SECTORS COVERED BY THE MSGP

Sector A	Timber Products
Sector B	Paper and Allied Products Manufacturing
Sector C	Chemical and Allied Products Manufacturing
Sector D	Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers
Sector E	Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing
Sector F	Primary Metals
Sector G	Metal Mining (Ore Mining and Dressing)
Sector H	Coal Mines and Coal Mining-Related Facilities
Sector I	Oil and Gas Extraction and Refining
Sector J	Mineral Mining and Dressing
Sector K	Hazardous Waste Treatment Storage or Disposal Facilities
Sector L	Landfills and Land Application Sites
Sector M	Automobile Salvage Yards
Sector N	Scrap Recycling Facilities
Sector O	Steam Electric Generating Facilities
Sector P	Land Transportation
Sector Q	Water Transportation
Sector R	Ship and Boat Building or Repairing Yards

TABLE 2.2
INDUSTRIAL SECTORS COVERED BY THE MSGP

Sector S	Air Transportation Facilities
Sector T	Treatment Works
Sector U	Food and Kindred Products
Sector V	Textile Mills, Apparel, and Other Fabric Product Manufacturing
Sector W	Furniture and Fixtures
Sector X	Printing and Publishing
Sector Y	Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries
Sector Z	Leather Tanning and Finishing
Sector AA	Fabricated Metal Products
Sector AB	Transportation Equipment, Industrial or Commercial Machinery
Sector AC	Electronic, Electrical, Photographic and Optical Goods

De Minimus General Permit: This permit allows for the discharge of pollutants associated with potable and reclaimed water systems, subterranean dewatering, well development, aquifer testing, hydrostatic testing of specific pipelines, residential cooling water, charitable car washes, building and street washing, and dechlorinated swimming pool water. The permit also allows ADEQ to review and approve other case-by-case short-term and/or low volume discharges that are considered *"De Minimus"* in nature. ADEQ issued the AZPDES De Minimus General Permit No. AZG2004-001 on March 17, 2004. As of June 2009, this permit was expired and ADEQ was in the process of preparing a new permit.

Concentrated Animal Feeding Operations: To conform with the updated federal regulations for Concentrated Animal Feeding Operations (CAFOs), ADEQ revised the AZPDES program rules and made them effective on February 2, 2004. Under this rule all CAFOs (defined by number and type of confined animal), and whether or not they discharge to Waters of the U.S.) are required to apply for a permit, submit an annual report and develop and follow a plan for handling manure and wastewater. In addition, the rule moves efforts to protect the environment forward by placing controls on land application of manure and wastewater, covering all major animal agriculture sectors, and increasing public access to information through CAFO annual reports. ADEQ issued the AZPDES Concentrated Animal Feeding Operations General Permit (No. AZG2004-002) on April 16, 2004.

2.5 CONSTRUCTION GENERAL PERMIT

The *AZPDES General Permit for Discharge from Construction Activities to Waters of the United States* (Permit No. AZG2008-001), which became effective on February 28, 2008 (Construction General Permit, or CGP), establishes the procedures and activities required for proper permit

coverage of both large and small construction sites. This permit replaces the previous CGP that expired in early 2008. A copy of the AZPDES CGP, along with a copy of the EPA NPDES General Permit for Stormwater Discharges from Construction Activities issued in January 2008 (i.e., Federal CGP that is applicable only in relation to large and small construction activities on Indian land in Arizona) is included in Appendix A. Both CGPs are good for a 5-year period, at which time the corresponding permitting authority will revise and re-issue the permit for another 5 years.

A **large construction activity** refers to the clearing, grading, and excavating that results in land disturbance of 5 or more acres. It also refers to the disturbance of less than 5 acres of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb 5 acres or more.

A **small construction activity** refers to the clearing, grading, and excavating that results in land disturbance of 1 or more, but less than 5 acres of land. It also refers to the disturbance of less than 1 acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb 1 or more, but less than 5 acres.

In summary, coverage under the AZPDES CGP (or the NPDES CGP where applicable) is required for stormwater discharges from construction sites involving clearing, grading and excavating activities that disturb one or more acres of land.

There is one (1) permit waiver for small construction activities (Note: not available for large construction activities) provided in both the AZPDES and NPDES CGPs. This permit waiver is where the construction site operator has determined that the rainfall erosivity factor (***R***) in the *revised universal soil loss equation* (RUSLE)[5] is less than 5. The project ***R*** value is dependent on the duration of the project, the climate of the project area, and the time of year in which the project is scheduled. The rainfall erosivity factor can be determined using ADEQ's web-based SMART NOI program (https://az.gov/app/noi/(S(osmjob55sgseg155fanh5345))/Default.aspx) or, for manual calculation, as specified in the EPA Construction Rainfall Erosivity Waiver (Fact Sheet 3.1, EPA Document No. 833-F-00-014). Permit waivers must be explicitly approved prior to construction activities by the permitting authority, plus can be revoked anytime during the project if physical or operation conditions of the construction site change.

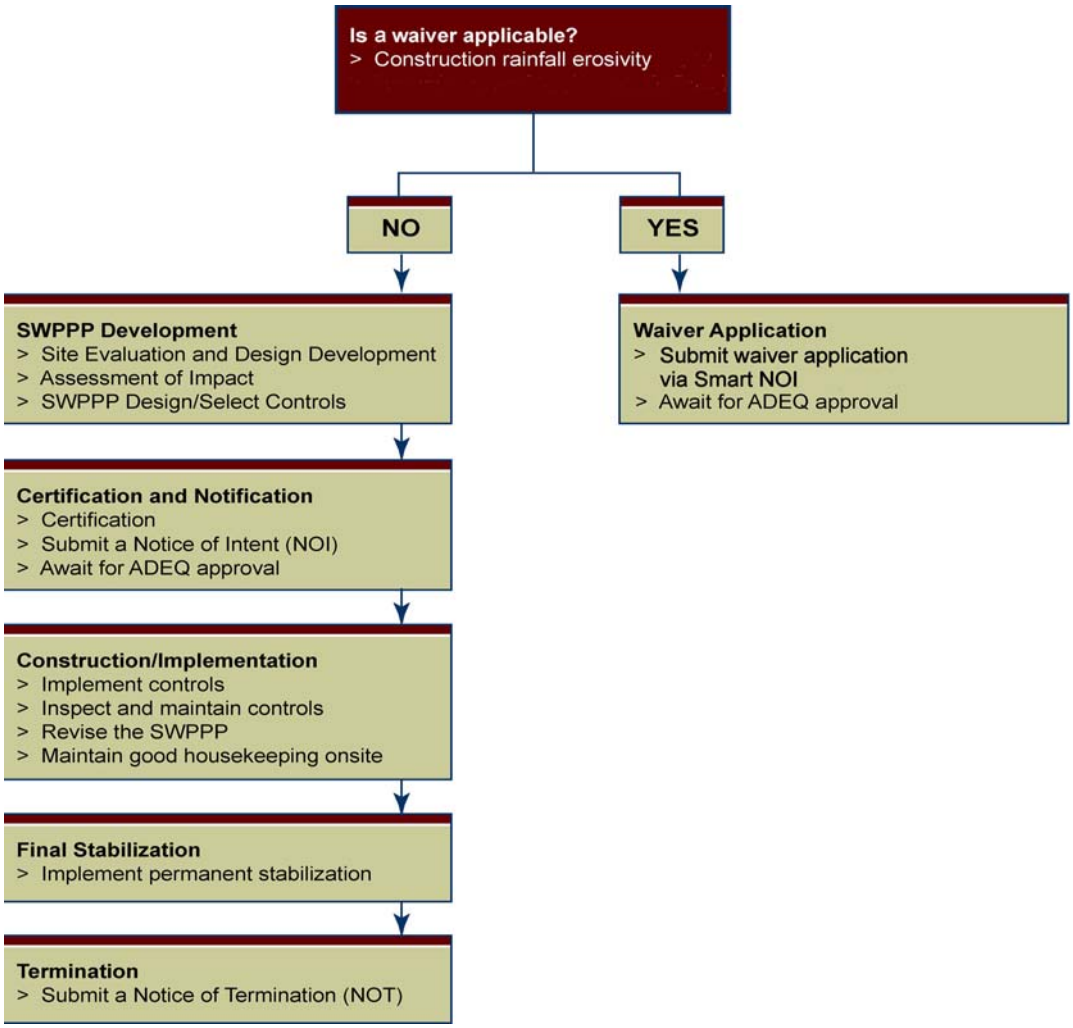
A construction stormwater discharge permit waiver under the AZPDES or NPDES CGP does not provide a waiver for compliance related to Maricopa County's Dust Control Program. The Air Quality Division of the County's Environmental Services Department issues Dust Control Permits to citizens who plan to conduct activities that will disturb a surface area equal to or greater than 0.1 acre or the demolition of buildings. All sites with disturbed surface areas, regardless of the size, must maintain compliance with Rule 310[6].

5. An equation developed by the USDA-Agricultural Research Service in 1997 that is commonly used to calculate soil loss potentials.
6. Rule 310 – *Fugitive Dust from Dust-Generating Operations*: Establishes limits for the emissions of particulate matter into the ambient air from any property, operation or activity that may serve as a fugitive dust source.

Compliance with the requirements of the AZPDES CGP and NPDES CGP consists of the following major components (illustrated in Figure 2.1):

- Preparation of a Stormwater Pollution Prevention Plan (SWPPP)
- Applying and obtaining authorization to discharge
- Installation, maintenance and inspection of best management practices
- Stabilization of the site terminating permit coverage

FIGURE 2.1
COMPLYING WITH THE CONSTRUCTION GENERAL PERMIT REQUIREMENTS



The information that is presented in the following sections is intended for general guidance only. Construction site operators should obtain and refer to the latest AZPDES CGP (or the latest NPDES CGP if the construction site is on Indian land) for specific permit requirements.

2.5.1 Preparation of the Stormwater Pollution Prevention Plan

A Stormwater Pollution Prevention Plan (SWPPP) is the document that defines the measures to be employed to prevent the release of pollution from a specific construction site. The SWPPP identifies the techniques that the operator will use to reduce site erosion and sediment loss, as well as manage construction-related wastes. It identifies the maintenance procedures that the operator will perform to preserve the efficiency of the techniques used. The SWPPP must clearly describe the control measures, the timing and sequence of implementation, and which operator is responsible for implementation of the control measures. In summary, the operator must develop and implement a SWPPP that satisfies the conditions of the permit. More information about the development of SWPPPs is presented in Chapter 4 of this document.

The SWPPP is normally not submitted to ADEQ (or EPA), instead it must be available onsite or nearby for inspection by the regulatory agency personnel, local jurisdiction staff, and the public upon request. The SWPPP is a “living document” that must be updated as conditions on the construction site change. Compliance checks by the permitting authority are normally based on completeness and accuracy of the record keeping in the SWPPP. SWPPP records must be kept a minimum of 3 years after the permit coverage ends.

2.5.2 Obtaining Authorization to Discharge

The operator of a construction site is responsible for obtaining coverage under the appropriate CGP. The operator could be the owner, the developer, the general contractor or individual contractor. When responsibility for operational control is shared, all operators must apply. Thus, it is possible that a single construction site may have a number of operators who may operate under a common or separate SWPPP.

The Notice of Intent (NOI) is the “application” that is used to obtain coverage from the permitting authority. The NOI must be complete and accurate and signed by the appropriate signatory agent in order for permit coverage to be obtained. Thus, submission of the NOI alone also serves as a commitment by the operator that there will be compliance with the permit conditions.

The 'operator' must develop and implement a SWPPP that satisfies the conditions of the permit. If the site is located within 1/4 mile of an impaired or outstanding Arizona water (OAW), the SWPPP must be submitted with the NOI. ADEQ will notify the applicant within 32 business days after receiving the SWPPP if the SWPPP needs revisions or if permit coverage is granted or denied. In all other cases, the applicant is not required to submit the SWPPP to the department for review unless specifically required by ADEQ. The SWPPP must be on-site whenever construction activities are actively underway and must be fully implemented and maintained as con-

struction activities progress. If ADEQ does not issue the authorization certificate within seven days, or 32-business days for sites located within 1/4 mile of an impaired or outstanding Arizona Water, of receiving the NOI or otherwise notify the operator that the submitted NOI is deficient, the operator may commence construction activities without an authorization certificate; however, it is the operator's responsibility to verify the date the NOI was received by ADEQ before initiating construction activities. Whether or not ADEQ notifies the operator of a deficiency in the NOI, discharges are not authorized under this permit if the operator submits and incomplete or incorrect NOI.

To grant permit approval, ADEQ may require that specific controls or monitoring for the site be implemented and/or specific BMP selection/criteria be followed. ADEQ must review the permit materials and notify the operator within 32 business days. If notification is not received in this time frame, the construction site operator may assume coverage under the CGP.

Because all MS4s are regulated under a separate permit to manage discharges from construction and post-construction activities, if the facility has the potential to discharge to a MS4, the applicant must also forward a copy of the completed NOI to the owner/operator of the MS4 system at the time it is submitted to the permitting authority. Also, the MS4 may have individual procedures or policies regarding SWPPP and/or NOI review or submittal requirements that the construction operator will need to be familiar with and follow. Contact information of the person or department for each MS4 within Maricopa County is presented in Appendix A.

2.5.3 Installation, Maintenance, and Inspection of BMPs

The practices and procedures identified in the SWPPP for the initial phase of construction must be implemented prior to commencing construction activities that result in soil disturbance. BMPs for subsequent phases of construction must be implemented in accordance with the SWPPP.

All erosion and sediment control measures and other protective measures identified in the SWPPP must be maintained in effective operating condition. Qualified personnel provided by the operator must inspect the construction site and BMPs to verify effectiveness. If the inspections reveal poorly performing or ineffective best management practices, the BMPs and possibly the SWPPP must be modified to correct identified problems. Inspection reports must be signed and certified by appropriate personnel as specified in the CGP and retained as part of the SWPPP.

The operator must perform routine inspections to ensure that BMPs are functional and that the SWPPP is being properly implemented. The operator must specify one of the following inspection schedules:

1. At least once every 7 calendar days, or
2. At least once every 14 calendar days, and also within 24 hours of the end of each storm event of 0.5 inches or greater.

Under the AZPDES CGP, the operator may reduce the inspection schedule if the entire site is temporarily stabilized or runoff is unlikely due to winter conditions.

2.5.4 Stabilization of the Site

During construction, some areas that are disturbed may be inactive for extended periods of time. Areas where construction activities have temporarily or permanently ceased for extended periods (longer than 14 days) must be stabilized through the use of temporary or permanent vegetation, mulching, sod, geotextiles or other similar measures to minimize erosion. When all construction activities for a site have permanently ceased, final stabilization of the site must be achieved.

There are no specific notification requirements for operators of small construction sites seeking to terminate coverage. Final stabilization of the site to at least 70 percent of natural background levels must be achieved in order to consider coverage under the CGP terminated. Coverage under the CGP is not considered terminated until a NOT is filled and approved by ADEQ or EPA.

2.5.5 Termination of Coverage

After final stabilization of the construction site is achieved, or another operator has assumed control over all areas of the site that have not been finally stabilized, the operator must submit a NOT to ADEQ or EPA. Upon submission of the NOT, the operator loses the authority to discharge stormwater under the CGP. Note that some local jurisdictions (MS4s) may require that a copy of the NOT be submitted to them as well.

After the construction project is complete and the project's disturbed area is stabilized, or if the responsibility for the project has been assumed by another operator, the permittee must submit a Notice of Termination (NOT) to the appropriate permitting authority to end participation in the stormwater permit program.

The operator shall retain a copy of the SWPPP at the construction site from the date that construction activities begin to the date of NOT submittal. Once the NOT is submitted and termination of permit coverage approved by the permitting authority, records can be elsewhere but need to be kept for a minimum of three years.

The NOTs for both the AZPDES and NPDES CGPs, as well as other forms, can be found in Appendix B of this document.

3 PRINCIPLES AND PRACTICES

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The objective of this chapter is to present overview information and a general approach towards selecting the appropriate best management practices (BMPs) that address the major erosion and sediment control issues specific to the construction site when developing a Stormwater Pollution Prevention Plan (SWPPP).

3.1 EROSION AND SEDIMENTATION PRINCIPLES

Erosion is a natural process by which soil and rock material is loosened and transported. Erosion may occur by wind, water, or ice. Natural erosion generally occurs over a period of years, decades, or centuries, but human activities can greatly accelerate this. Erosion from land disturbed by construction activities may be as much as 10,000 times that from undisturbed areas. Furthermore, although natural erosion may replenish sediment needed for habitat in streams, erosion from large bulldozed areas is more likely to smother streams. An understanding of erosion processes helps predict when such undesirable impacts will occur and how to prevent them.

3.1.1 Erosion Mechanisms

Erosion begins with the detachment of soil particles by some force, such as raindrop impact, running water, or wind. If the force that the water or wind exerts on the soil, called shear stress, overcomes the cohesiveness of the soil, the soil particle is detached and erosion occurs. A number of site factors determine the balance of these forces and how much erosion occurs. The grain size, cohesiveness, and other physical/chemical properties of soils affect erosion susceptibility. Soils cleared of vegetation are not protected from the impact of raindrops and are not held in place by plant roots. Steeper slopes increase the velocity of water and thus, are more prone to erosion. Torrential rainfall is more likely to loosen soils and carry it away than gentle rainfall.

Once soil particles are detached, the same wind and water forces that began the erosion can transport them. Soil scientists have identified several stages or types of water erosion: splash, sheet, rill or gully, and channel erosion, as shown in Figure 3.1.

Splash erosion occurs when bare soil is exposed to raindrop impact. The pounding action destroys the soil structure and often forms a hard crust when the surface dries. The crust prevents water infiltration and establishment of vegetation, which increases runoff and future erosion.

Sheet erosion occurs when there has been enough rain to cause shallow sheets of water to flow over the surface of the soil. Sheet flow picks up and transports the particles detached by splash erosion. The sheet flow will persist for only a few hundred feet before concentrating into rills or gullies.

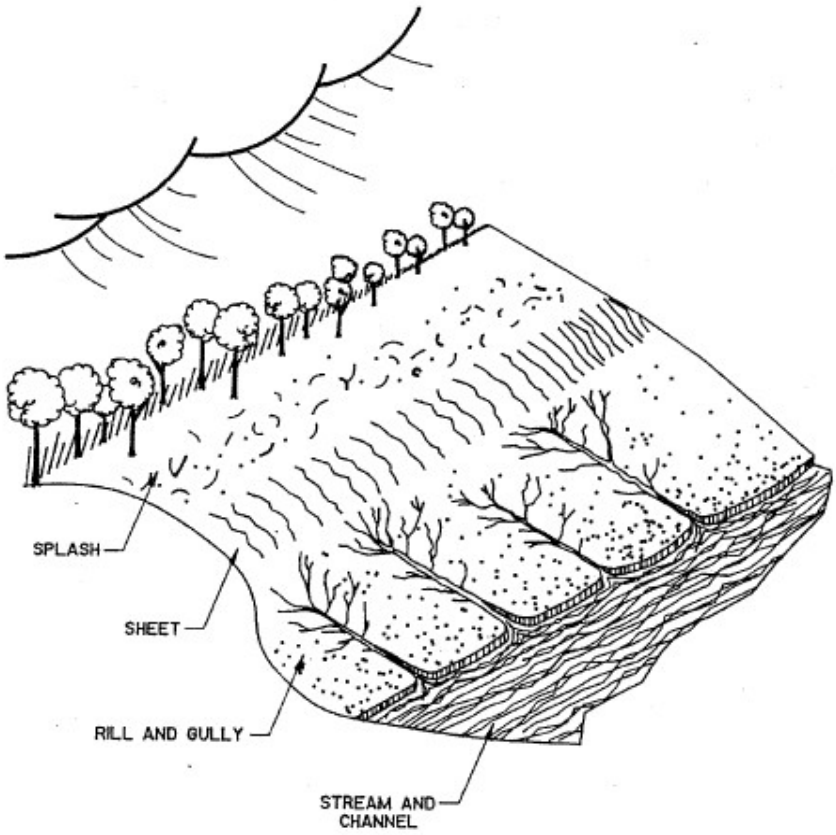
Rills and **gullies** are formed when runoff begins to concentrate into rivulets. The energy of the concentrated flows is able to both detach and transport soil particles. The small, shallow rills begin to cut deeper and come together to form gullies, further increasing the force of the flow and causing more erosion.

Channels receive the runoff from the rills and gullies. Natural stream channels are generally in equilibrium with erosion and deposition. However, the increased volume and velocity of runoff from development will cause the channel to adjust by widening and downcutting.

3.1.2 Surface Erosion

Rainfall impact and sheet flow both have low velocities and normally result in minimum surface erosion on undisturbed land. Even in the semi-arid climate of Arizona where vegetative cover is minimal, natural desert soil conditions (including desert pavement and compacted hardpan formed from evaporated salt solutions), provide protection against surface erosion. Construction activities remove the protective cover of vegetation and the natural soil resistance to erosion.

FIGURE 3.1
ILLUSTRATION OF THE VARIOUS STAGES OF WATER EROSION



Surface erosion can be predicted by the Revised Universal Soil Loss Equation (RUSLE), which estimates the annual soil loss in tons per acre from rainfall and sheet erosion. The RUSLE predicts the sediment loss according to physical parameters of the rainfall erosion index, soil erosion potential, length and steepness of slope, plant cover or crop management practices, and erosion control practices such as terracing and contouring. The USDA Natural Resources Conservation Service (NRCS; formerly Soil Conservation Service) has developed regional maps covering Arizona, which provide recommended values for these parameters based on the typical soils in Arizona, climatic factors, and geographic factors (USDA, 1997). This data can be accessed at http://www.nrcs.usda.gov/.

3.1.3 Gully and Channel Erosion

Natural stream channels are usually in overall equilibrium with erosion and deposition balancing out along the length of the stream. The channel from bank to bank is formed from the smaller flow events, events occurring once every year or two. Urbanization increases the intensity and duration of flows causing flooding, channel instability and increased erosion potential. Typical human responses to these symptoms include removal of stream bank vegetation, straightening the channel, or lining the channel with riprap. These measures may increase capacity but they also increase erosion in non-armored parts of the stream, particularly at bends or near culverts.

In Arizona, modifications to stream channels have long been reviewed for the short-term and long-term impacts to the stream course sediment transport balance and the channel slope. Maintaining the natural sediment transport characteristics of the native ephemeral streams or arroyos are an important part of the stormwater quality management planning for Maricopa County and many other locations in Arizona.

Planners can predict potential stream erosion by using geomorphic analyses, stable slope equations, sediment transport equations, and computer models. Where special conditions exist along major channels and floodplains, the engineer should consult with local stormwater authorities to determine what level of erosion and sediment transport analysis may be necessary to meet local standards.

Site design and construction practices, including temporary drainage structures, should be reviewed for potential erosion impacts, particularly at outlet structures. Methods for predicting erosive flow velocities at these structures have been developed based on soil types, particle size, flow velocities, and flow depth. The Flood Control District of Maricopa County's *Drainage Design Manual for Maricopa County, Arizona, Hydraulics Manual* (FCDMC, 2003), contains information on design parameters for culvert outlet protection and design of stream channel protection.

3.2 EROSION AND SEDIMENT CONTROL PRACTICES

Erosion and sediment control is a phrase commonly used to describe a variety of measures (BMPs) that deal with excessive losses of soil through stormwater runoff. However, erosion control and sediment control are actually two different processes and have distinct families of BMPs associated with each one of them. These processes are directed at different phases of the erosion process. This has repercussions affecting both site planning and costs.

Erosion control refers to measures that keep erosion from occurring in the first place. That is why it is sometimes called source control. These preventative measures include limiting soil disturbances, maintaining or increasing vegetative cover, or routing water away from exposed soils. Erosion control is often non-structural in nature and may be relatively inexpensive.

Sediment control measures are practices that address erosion once soil particles have detached and have the potential to be transported by water across the land. These treatment measures

may include silt fences, inlet protection, retention, or detention ponds. Sediment control measures tend to be more structural in nature and are usually more costly.

Dust control measures deal with wind-generated erosion. Some of the techniques are similar to those for water erosion, but there are some important differences, including higher wind erosion rates along exposed ridges and slopes and less in streambeds and gullies.

All three types of measures, erosion, sediment, and dust control should be incorporated into construction activities to prevent stormwater pollution and comply with construction stormwater discharge regulations and associated stormwater pollution management plan, the SWPPP.

3.2.1 Erosion Control Methodology

Erosion control is preventative in nature. Although simple in concept, erosion control is often difficult to implement due to the varied activities and schedules at a construction site. Table 3.1 lists the general factors to be addressed in the erosion control part of the SWPPP.

TABLE 3.1
GENERAL EROSION CONTROL MEASURES

- Minimize the area disturbed and the time period of disturbance.
- Preserve vegetation when possible and quickly replant disturbed areas.
- Minimize the runoff volume flowing onto the site from adjacent areas.
- Reduce the volume and velocity of storm runoff from the site.
- Install temporary or permanent soil stabilization, such as mulches, matting, or chemical soil binders.

A large number of BMPs help minimize site disturbances. The area to be graded should be clearly marked. Access to the site, as well as heavy equipment movement across the site, should be controlled. Limiting traffic leads to less erosion onsite and less sediment leaving the site. Consider phasing the project so the entire area is not cleared at once if building will not immediately take place on some lots. Although phasing may mean extra expense by bringing in grading equipment more than once, that expense may be offset by less structural BMPs for sediment control.

Where possible, vegetation should be preserved (especially large trees). The foliage helps protect the soil from the impact of rainfall (the first step in the erosion process). The roots increase the infiltration of water moving across the soil (decreasing sheet flow, the second step of erosion), and the roots also help anchor soil in rills and along channels (the third and fourth steps). Preserving vegetation can also help decrease the cost of new landscaping, both in terms of the costs of the new plants and of increased maintenance they require. Existing, mature vegetation may also increase the sale value of new homes.

Runoff from the development site poses one set of problems, runoff from adjacent sites another. Structures to divert flows around the downstream development are the most common means of dealing with this problem. However, in some cases, the upstream and downstream property owners may find cooperating on detention structures or other regional facilities during construction is a more cost effective method.

Reducing the internal volume and velocity of runoff from the site can take many forms. Preserving site vegetation is one method. Reducing heavy equipment traffic helps reduce soil compaction and preserves the infiltration capacity of the soil. Packed soils can be roughened with harrows or tracked equipment. Take advantage of the ups and downs of natural topography in the grading plans as it helps to break up long straight slopes that increase runoff velocity.

Mulches, matting, or chemical soil binders can provide temporary cover for soils. Used correctly, they prevent erosion from rain impact and along channels. They can be impregnated with seeds and fertilizer allowing vegetation to become established. These methods of covering soils are often the best types of BMPs to use on steep slopes or less accessible locations. They are not a first choice for surfaces that are heavily traveled, as they will break down rapidly under such conditions.

3.2.2 Sediment Control Methodology

In addition to the methods for erosion control, the SWPPP also requires sediment control measures. Sediment control BMPs treat runoff for particulates after they have already been eroded and are being washed off the site. It should be kept in mind that another goal of the Arizona Pollutant Discharge Elimination System (AZPDES; specific to Arizona) and the National Pollutant Discharge Elimination System (NPDES; in Arizona, only applicable in relation to Indian Country) construction discharge permit programs is the reduction, wherever practicable, of sediment resulting from post-construction conditions as well as during construction. This means some permanent measures may be required in addition to temporary ones. Table 3.2 provides information on sediment control.

Temporary structural barriers reduce the velocity of runoff from a site. Silt fences, straw bales, sand bags, and gravel filter berms pond the runoff, allowing it to slowly seep through the barrier. The ponding reduces the velocity, which causes particulates to settle out at the barrier. Only a limited amount of sediment is also removed by filtration through the barrier. Proper installation and maintenance is critical for all of these sediment control barriers. If water runs around the ends of the barrier, underneath the barrier, or through rips, tears, or other gaps in the barrier, sediment will not be removed effectively. All of these barriers will also fall apart with time and exposure to weather, with straw bales being particularly short-lived.

Check dams reduce the velocity of flows in areas of concentrated flows, such as in channels or along slopes. Reducing velocity helps the settling of sediments and prevents erosion or scour along the channel. Using rock-filled sandbags for temporary checkdams allows easy removal,

unlike gravel or earth berms. Gravel or earth berms may be left in place as a post-construction measure to slow down flows in the channel.

TABLE 3.2
GENERAL SEDIMENT CONTROL MEASURES

- Install temporary structural barriers such as silt fences or organic filter barriers.
- Use check dams and other structures to decrease channel velocities.
- Provide sediment filters or traps at storm drain inlets.
- Treat flows from dewatering activities to remove sediment.
- Route runoff through sediment traps, and/or sedimentation basins.
- Provide final stabilization of disturbed areas through revegetation.

Sediment filters or traps help protect storm drain inlets. A wide variety of materials may be used to construct these protective measures, but all operate in much the same way as the temporary sediment barriers, by allowing short-term ponding and settling of particulates.

Treating flows from dewatering activities may be done chemically or physically. Chemically, a flocculant such as alum can be added to the discharge to settle out solids. Physically removing the sediment is, in many ways, the reverse of the inlet protection measures. Instead of removing sediment by trapping it before it enters the conveyance system, a filtration bag receives sediment-laden water pumped from an excavation and filters sediment before it seeps through to the outside of the bag. The more sediment is trapped the more efficient the bag becomes at trapping it, causing it to burst if not carefully watched.

Routing flows through sediment traps and basins is perhaps the easiest type of sediment control BMPs to understand. These detention facilities hold the runoff for a period of time allowing suspended particulates to settle out. Generally, larger facilities allow longer residence times for the stormwater and result in greater sediment removal rates. Designing them with a permanent pool of water greatly increases the sediment removal rate, because the deposited sediments are secure from washing out during the next storm.

Stabilization of disturbed areas through revegetation differs slightly from the vegetation measure discussed under the Erosion Control Section. Whereas the erosion control measure stressed preservation of existing vegetation and replanting to protect underlying soils, the use of vegetation for sediment control emphasizes new plantings for treating sediment in runoff. Vegetation can treat runoff through several mechanisms. Vegetation along channels and in filter strips filters runoff, slowing velocities and promoting settling and pollutant adsorption to the leaves and stems of the vegetation and underlying soils. Vegetation can be used in infiltration facilities where the root systems help keep infiltration rates high and evapotranspiration from leaves helps reduce waterlogging in soils. Vegetation will also take up and sequester some metals, nutrients, and other compounds into the plant that would otherwise be passed downstream as pollutants. One

of the biggest advantages to using vegetation is that once properly established, it is self-maintaining, limiting the amount of human care required.

3.2.3 Dust Control Methodology

A third component of erosion and sediment control is dust control. In semi-arid regions, control of wind-borne sediment (dust) is an important part of pollutant source control. Once these fine sediments leave a site by wind, they are often re-dispersed into the atmosphere or into the public storm sewer systems by subsequent vehicular traffic, wind, and rainfall. Control measures that minimize the generation of fugitive dust from construction sites help limit the quantity of sediments in stormwater.

Dust is defined as solid particles or particulate matter small enough to remain suspended in the air for an extended period of time. Dust from a construction site originates as inorganic particulates from rock and soil surfaces, material storage piles, and construction materials. The majority of dust generated and emitted into the air at a construction site is related to earth moving, demolition, construction traffic on unpaved surfaces, and wind over disturbed soil surfaces. Measures for addressing the most common sources of fugitive dust generated by construction activities are listed in Table 3.3.

TABLE 3.3
GENERAL DUST CONTROL MEASURES

Pave or gravel travel surfaces such as:

- Temporary parking lots and staging areas
- Construction access driveways.

Treat exposed areas with soil binders or water:

- Construction sites, bare ground areas.
- Land clearing and grubbing activities.
- Earthwork, dozing, grading, scraping.
- Soil and debris piles.
- Tilling.

Limit exposure during materials handling:

- Batch drop, dumping.
- Conveyor transfer and stacking.
- Material transfer points.
- Crushing, milling, and screening operations.
- Spilled materials.
- Sawing/sanding concrete or wood.
- Demolition and debris disposal.

Paving or constructing gravel roads for vehicle traffic throughout the construction site helps prevent breakdown of soils and tracking of sediments offsite, both common sources of dust.

Dust control may be accomplished on exposed surfaces at the site by frequent watering of loose soils. In arid climates, such as Arizona this may prove infeasible. The use of soil binders, chemicals that form a crust over the soil surface, may be necessary for long-term control.

Many construction activities create fine particulates during construction. These include any crushing, milling, or sawing activities. Conducting these activities where wind exposure is limited will help limit dust releases. Another effective measure is covering material stockpiles

3.3 FACTORS AFFECTING BMP SELECTION

A successful erosion and sediment control plan will need to incorporate several different types of BMPs to address the various stages of erosion that are taking place on the construction site as noted above. However, most developments are planned around construction activities and permitting, not the mechanisms of erosion. The following is a brief overview of how erosion and sediment control BMPs may be considered in the context of development.

The choice of which BMPs to use will depend on a number of factors: the characteristics of the site, the type of construction project, and the applicable regulations.

3.3.1 Site Characteristics

The effect of site characteristics on erosion should be taken into account early in the planning process, before the development is laid out, not as an afterthought following the final grading plan. The natural terrain, soil types, vegetation, and drainages dramatically affect erosion as well as planning where to construct buildings and roads. Steep slopes and high points of the site are areas where erosion will tend to start. Long, uninterrupted slopes will generate high runoff velocities, increasing the risk of erosion. Areas with good existing vegetation are relatively stable, but depending on the underlying soils, may quickly erode when exposed. Eroded sediments will tend to accumulate in the low points of the drainage, which may cause flooding issues.

Larger questions may also need to be addressed. Does all of the runoff originate on the site or does some come from offsite? Where does the site drain? Does it drain to adjacent properties or public waterways? Is the site located next to sensitive areas? Does it drain through open channels or into pipes? These may limit the options available for erosion or sediment control.

The climate of the site should be considered in relation to the construction schedule. Ideally, construction should happen during dry weather, but not so dry that dust becomes a significant problem. But, as the weather is never completely cooperative, the likely quantity and intensity of rainfall should be accounted for when planning site activities.

3.3.2 Anticipated Construction Activities

The type of construction activity must be considered. Is it a commercial development with large buildings and acres of parking? Is it a residential development with houses separated by yards? Or, is it perhaps multi-family housing with little or no yard?

The construction schedule will affect which erosion and sediment control BMPs will work. A large commercial building built as a single project, will require a different approach, perhaps a large settling basin, that might not be appropriate when building single-family homes.

The overall size of the project, surrounding land uses, and proximity to public infrastructure are other factors that will influence an erosion and sediment control plan.

3.3.3 Regulatory Requirements

The characteristics of the site location and anticipated construction activities will determine many of the regulatory requirements for erosion and sediment control. Sensitive areas or habitat issues may restrict activities or require extra measures. Local zoning and ordinances may come into play with steep slopes or adjacent public lands. In addition, Maricopa County Regulations, including that for stormwater, must be followed. Different regulatory requirements may apply during different parts of the year. One of the key requirements is the preparation of a SWPPP as required by the AZPDES/NPDES general permits. The AZPDES/NPDES goals are to: (1) reduce erosion, (2) minimize sedimentation, and (3) eliminate the discharge of non-stormwater pollutants associated with construction activities.

3.3.4 Maintenance Requirements

The most common cause of erosion and sediment control failure is not usually poor planning or design, although those can certainly play a role. The most common failure is the lack of proper maintenance. Erosion and sediment control devices must be regularly inspected and maintained. If rills and gullies begin forming on site, the erosion control measures are not working and additional steps need to be taken. If downstream channels and pipes fill up with sediment, the sediment control measures must be cleaned or new BMPs installed. But the site foreman should not wait until a failure before doing maintenance. The site will be in violation of its permit and the developer may be fined or a stop work order may be issued.

A good erosion and sediment control plan recognizes the need for maintenance and ideally, a set of BMPs is selected to minimize the maintenance requirements and lessen the chance of failure.

3.4 USE OF BMPS IN THE SWPPP

The SWPPP is site-specific and should be developed based on a site evaluation and assessment of the soil characteristics and erosion potential. Emphasis should be placed on erosion control measures, because they are generally more effective and less costly to implement. How-

ever, erosion control is almost never sufficient by itself, so a typical SWPPP will include both erosion and sediment control BMPs.

The SWPPP should also consider which erosion and sediment control measures are to be permanent measures and which are to be temporary measures. Permanent measures will be an important part of the finished development and need to be integrated from the start. Temporary measures, although important to consider early on, are less dependent on the planned final development of the site and may change over the course of the project.

3.4.1 Permanent Erosion and Sediment Controls

In Arizona, as in other arid areas in the west, permanent erosion and sediment control measures are very important because of the difficulty in re-establishing vegetation through natural processes. Grading and construction may leave areas subject to erosion and sedimentation both onsite and offsite long after construction is complete because of the nature of desert soils and native vegetation and the high intensity of rainfall events when they do occur.

Permanent controls are designed before the contractor begins site construction. During construction, the contractor is responsible for installation of the permanent controls. These may include irrigation and landscape improvements to increase effectiveness. After the project is complete, it will be the responsibility of the owner, private or public, to provide for the long-term operation and maintenance of these permanent controls. EPA's *design goal* for post-construction conditions is for the reduction of sediments in runoff that exceed the pre-development conditions.

Permanent controls deal with the final improvements and configuration of the construction project and site. Permanent improvements are normally considered during the design phase of a project and are reflected on the plans or in the specifications. Table 3.4 lists some typical design elements of permanent erosion and sediment controls that are found in a SWPPP.

TABLE 3.4
PERMANENT EROSION AND SEDIMENT CONTROL MEASURES FOR A TYPICAL CONSTRUCTION PROJECT SWPPP

- Final land grading, contours and drainage patterns.
- Street alignment and building locations.
- Control of the quantity or quality of stormwater runoff by such means as detention/retention basins, porous pavement, dry-wells, debris basins, etc.
- Permanent landscaping, rock rip rap, or other permanent ground cover designed to stabilize the soil or slopes.
- Channel stabilization, energy dissipaters, or other drainage structures.

Final grading should be designed to work with the natural contours as much as possible. Making use of existing drainage patterns helps lessen the erosion that would occur during establishment of a new stream channel. Existing vegetation along the channel can also help to decrease sediment movement.

Many considerations other than stormwater determine **alignment of streets and locations of buildings**. However, a few things may help minimize erosion if they are not already included. Minimizing the length of streets that run at a steep grade down slopes will help keep velocities reasonable and lessen flooding and erosion problems. Buildings may be clustered, allowing open, rainwater-absorbing areas between clusters. Narrower streets, smaller parking areas, sidewalks on only one side of the street, or a street layout featuring many short branches off a few larger arterials all help to minimize the amount of impervious surface in the development and therefore, the amount of stormwater runoff and erosion likely to occur. These design elements are sometimes referred to as low impact development and they are preventative measures, focusing on limiting the first phases of erosion. However, they do have to be consistent with local zoning, building codes, floodplain use regulations, construction codes, and design criteria, which can be a challenge.

A number of structural measures can help reduce the amount of runoff from the site, decreasing the potential for future erosion (as well as decreasing the size of required conveyance facilities). Among these are: **porous pavement and dry-wells**, which infiltrate stormwater and can recharge groundwater. Detention by sediment basins is a measure that decreases the rate of stormwater discharge from the site. This is a measure that can be installed before construction to trap and control sediments. Detention facilities can also be cleaned out and landscaped to provide water quality benefits after development is complete.

Once established, **groundcovers** and other vegetation can help protect soils from beginning to erode. Properly selected native vegetation reduces the amount of required irrigation and maintenance. In steeper areas or where vegetation establishment is difficult, other permanent ground covers, such as decomposed granite may be used for similar purposes.

Channel stabilization, energy dissipaters, and other drainage structures are designed to reduce erosion in channels. They tend to be more expensive and difficult to maintain than the above measures that focus more on source control. Designed correctly, they do provide long-term benefits by preventing channel erosion and flooding problems from buildup of excess sediments.

3.4.2 Temporary Erosion and Sediment Controls

Permanent measures cannot address all of the erosion and sediment control needs on a construction site. Temporary controls target specific problem areas and only need be in place for the duration of that problem. For instance, once grading work on a particular slope is finished, a BMP, such as a silt fence may be replaced with another BMP, such as mulching, which can be left in place. Table 3.5 lists typical temporary controls. Notice that they address the different compo-

nents of the erosion process, similar to what was discussed above, first by controlling the source of erosion and finally by treating any erosion that does occur.

TABLE 3.5
TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES FOR A TYPICAL CONSTRUCTION PROJECT SWPPP

- Limit exposure of disturbed areas.
- Establish perimeter controls.
- Stabilize disturbed areas.
- Protect slopes.
- Trap sediments.

The staging and timing of construction can **limit the exposure of disturbed areas** and minimize the amount of erosion that occurs. The grading may be staged so that only small areas are exposed to erosion at any one time, with only the areas that are actively being developed exposed. As soon as construction is complete in one area, stabilize the remaining exposed graded areas.

A key aspect of this management strategy is to *retain* the existing vegetation and ground cover where feasible, especially along existing washes and along the downstream perimeter of the site (Goldman et. al., 1986).

When vegetative cover is removed from land, the soil becomes highly susceptible to erosion. Runoff may cause erosion if allowed to cross the exposed soils, particularly when the denuded areas are on slopes. Use of **perimeter controls**, such as dikes or ditches, to divert upland runoff away from a disturbed area to a stable outlet is recommended. The two most common applications of these diversion devices are to intercept runoff on cut or fill slopes and to prevent runoff from entering a disturbed area, such as a group of building pads. The flow can then be taken to the downstream area of the project site and released back into the natural drainage pattern. Depending on the size of the drainage area, slope, and other factors affecting erosion, the diverted water may require a spreading basin or other temporary form of energy dissipater before returning to the natural downstream drainage.

In constructing any perimeter channel or berm to divert flow, the contractor must insure that these controls do not adversely impact surrounding properties. The contractor is also reminded that these structures for sediment control are only for the average runoff. The structures are temporary and need not provide for large capacity flows (US EPA, 1999).

Stabilize disturbed areas with vegetation or mulch. Native vegetation provides the first and best line of defense against erosion and sedimentation and does so at the least cost to the contractor, while minimizing the need to revegetate or provide structural controls.

Temporary ground covers such as temporary seeding, mulch, chemical and fabric stabilizers provide quick, continuous ground cover to protect the soil from erosion until permanent vegetation can be established or permanent construction is installed (US EPA, 1999).

While temporary vegetative ground cover can be a very effective method of preventing erosion, the re-establishment of vegetation in the arid regions of Arizona is not always practical. Timing of re-vegetation efforts is critical to the success of any revegetation effort. A more practical approach, especially for areas where the stabilization is temporary, may be the use of magnesium chloride or lignum sulfate. These two chemical measures do not have an adverse impact on plant life and are a low-cost stabilization treatment. Unacceptable treatments include oil treatment or sodium chloride. Ground cover of gravel, decomposed granite, wood chips, or mulch may also be used separately or with vegetation (Goldman et. al., 1986).

Slope length and steepness are among the most critical factors in determining erosion potential. Increasing slope length and steepness increases the velocity of runoff, which greatly increases its erosion potential. Providing **slope protection** is critical in high risk areas such as these.

To prevent erosive velocities from occurring on long or steep slopes, the slopes may be terraced at regular intervals. Terraces will slow down the runoff and provide a place for small amounts of sediment to settle out. Slope benches are usually constructed with ditches along them or are back-sloped at a gentle angle toward the hill. These benches and ditches intercept runoff before it can reach an erosive velocity and divert it to a stable outlet. Slope stability for cuts and fills should conform to Uniform Building Code standards or to the soil report recommendations.

Overland flow velocities can be kept low by minimizing slope steepness and length and by providing a rough surface for runoff to cross. Driving a bulldozer across a slope (called trackwalking) creates tread marks parallel to slope contours. These miniature terraces both slow runoff velocity and provide flat places for vegetation to hold. Raking or disking the soil surface before seeding also keeps runoff velocities down and increases plant establishment rates. Vegetation, once established, will further reduce runoff rates (Goldman et. al., 1986).

Some erosion during construction is unavoidable. The function of a sediment barrier is to **trap sediment** and prevent it from leaving a site after it has been eroded. The most common sediment barriers are sediment basins and traps, straw bale dikes, and silt fences. Locate sediment basins and traps at low points below disturbed areas. Use earth dikes or swales to route drainage from disturbed areas on gentle to moderate slopes. Stormwater runoff temporarily ponds up behind these barriers allowing sediment to settle out. Gradually the water seeps out, leaving the silt behind (Goldman et. al., 1986).

3.5 SUMMARY OF EROSION AND SEDIMENTATION GUIDELINES

Planning for erosion and sediment control should begin well before the bulldozer shows up on site. Following some of the guidelines discussed in this chapter will increase the likelihood of a successful plan:

- The plan needs to comply with AZPDES/NPDES and local requirements.
- It should use existing site features such as topography and vegetation as much as feasible.
- The plan should consider measures that can be left in place permanently, after development is complete.
- A combination of BMPs that address different stages of erosion and sediment control should be selected.
- Emphasis should be placed on BMPs that focus early in the erosion process and prevent erosion from occurring.
- BMPs must be regularly maintained.
- BMPs that will require less maintenance should be encouraged.

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4 OBTAINING AND TERMINATING PERMIT COVERAGE

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This chapter presents information regarding compliance with the permit requirements for stormwater discharges from large and small construction sites (as defined in Chapter 2 of this manual), including completion and submittal of the Notice of Intent (NOI) to discharge, preparation and implementation of the Stormwater Pollution Prevention Plan (SWPPP) for construction activities, and completion and submittal of the Notice of Termination (NOT) for termination of permit coverage after achieving the site's final stabilization.

The information that is presented in the following chapter is intended as general guidance only. Construction site operators should obtain and refer to the latest AZPDES CGP (or the latest NPDES CGP if the construction site is on Indian land) for specific permit requirements.

In addition to the CGP, site operators working in unincorporated areas of Maricopa County must comply with the Maricopa County Stormwater Quality Management and Discharge Control Regulation, including the submittal of applicable documents and fees.

4.1 THE CONSTRUCTION GENERAL PERMIT

As described in Chapter 2, the Arizona Department of Environmental Quality (ADEQ) has the delegated authority to administer, revise, and enforce the Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (CGP, Permit No. AZG2008-001), issued on February 28, 2009. ADEQ does not have permit authority for Indian Country in the State. Con-

struction discharge permits for Indian country within Arizona must be acquired through EPA Region IX or the Indian Community itself if it has obtained National Pollutant Discharge Elimination System (NPDES) permit authority from EPA. Region IX relies on the national NPDES General Permit for Discharges from Large and Small Construction Activities that was issued by EPA on January 8, 2009. Copies of both of these CGPs are presented in Appendix A.

The size of the construction site is the main factor in determining who must apply for a permit. Formerly, only construction sites disturbing more than 5 acres were required to have permits. With the implementation of NPDES Phase II rule, smaller sites disturbing from 1 to 5 acres or part of a larger development with total disturbances of 1 to 5 acres, are now required to obtain stormwater discharge permits as well.

The CGP authorizes stormwater discharges from construction activities that include clearing, grading, or excavation provided a permit compliant, site-specific SWPPP is developed and implemented and a complete and accurate NOI is submitted. The CGP has certain limitations of coverage for allowing stormwater discharges and does not automatically authorize:

1. Post construction discharges. These may need to be covered by a separate AZPDES or NPDES permit.

2. Discharges that are mixed with sources of non-stormwater that are not explicitly allowed by the AZPDES or NPDES CGP.

3. Discharges that are covered under an individual permit or have been required to obtain coverage under an alternative general permit.

4. Discharges that may cause or contribute to the exceedance of a water quality standard.

5. Discharging into impaired or unique receiving waters. Refer to Appendix B for a list and map of impaired and unique waters within Arizona.

6. Discharges that have the potential to jeopardize the continued existence of endangered or threatened species or their habitat.

4.1.1 Permit Waivers

Permit waivers may be obtained for “small” construction sites under certain conditions (“large” sites are not eligible for any waivers). A permit waiver for the AZPDES CGP must be applied for via Smart NOI and explicitly approved by ADEQ prior to commencing construction activities. For the NPDES CGP, the permit waiver must be submitted and approved by the EPA prior to commencement of construction activities.

A project may be eligible for a construction stormwater discharge permit waiver when the construction operator can certify that the rainfall erosivity factor (R) for the project/site, as it is described and calculated in the revised universal soil loss equation (RUSLE), is less than 5

throughout the duration of the construction. The equation is described in detail in the Agriculture Handbook No. 703, published by USDA in 1997. The calculation of R is based on geographical location, the start date and duration of project.

The rainfall erosivity factor can be determined using ADEQ's web-based SMART NOI program or, for manual calculation, as specified in the Erosivity Fact Sheet (EPA Document No. 833-F-00-014). The waiver application must be submitted through the Smart NOI system.

The second condition, only applicable with the NPDES CGP, that could result in a construction stormwater discharge waiver is only available for non-impaired waters (refer to Appendix B for a list and map of impaired waters in Arizona). The operator can develop an *equivalent analysis* that determines allocations for his/her small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. Refer to the NPDES CGP (Appendix A) for more details of the equivalent analysis procedures.

4.1.2 Development of the SWPPP

The SWPPP serves as the stormwater management plan for all construction site activities that may cause water quality problems. The construction operator must keep a copy of the SWPPP at the construction site from the date that construction activities begin to the date of NOT submittal.

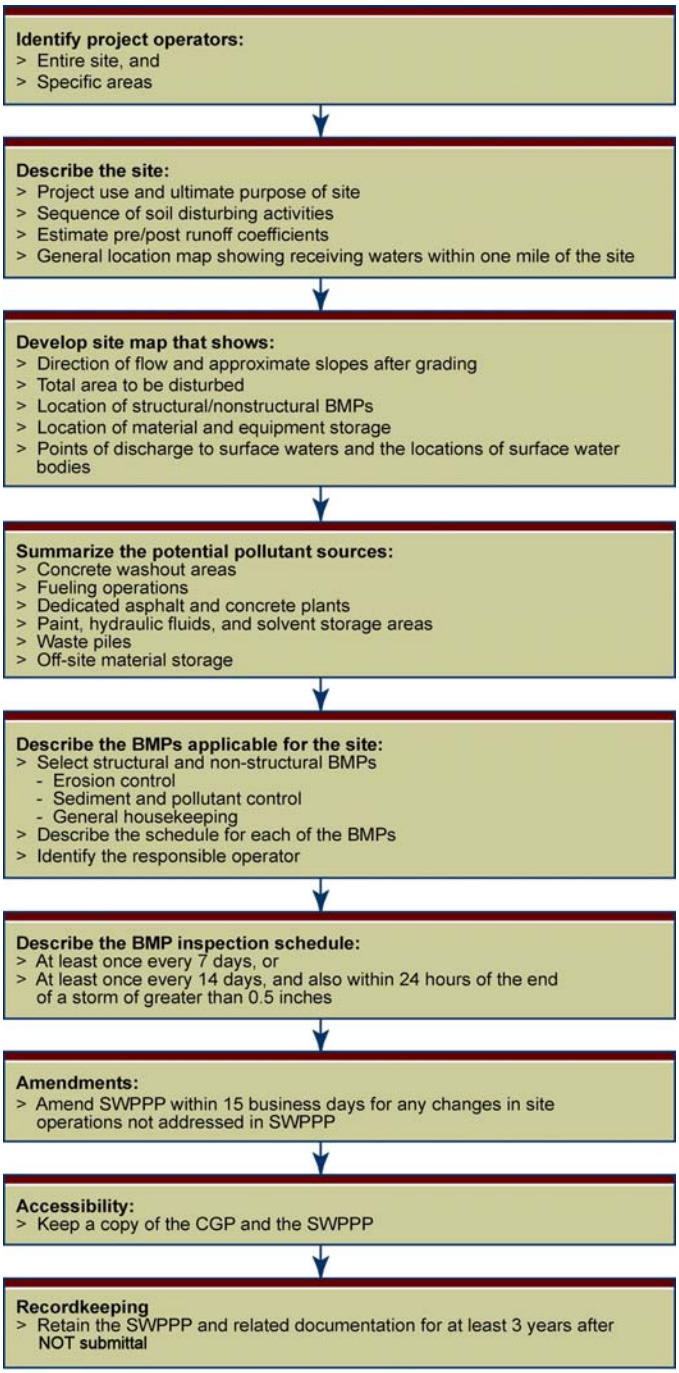
There are two main categories of information required in a construction SWPPP: (1) descriptions of the site and construction activities, and (2) information pertaining to the proposed controls, or best management practices (BMPs), to reduce stormwater pollution. The main contents of the SWPPP are illustrated in Figure 4.1 below.

The site and activity description requirements of a construction SWPPP include:

1. Identification of Operators. The SWPPP must identify all operators for the project site, and the areas over which each operator has control. The operator must meet one of the following two criteria:

    a. The person has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

FIGURE 4.1
MAIN CONTENTS OF A SWPPP



b. The person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

2. Site Description. The SWPPP must describe the nature of the construction activity, including:

a. A description of the project and its intended use after the NOT is filed (e.g. low density residential, shopping mall, highway, etc.).

b. A description of the intended sequence of activities that disturb soils at the site (e.g., grubbing, excavation, grading, utilities, and infrastructure installation).

c. The total area of the site, and an estimate of the total area of the site expected to be disturbed by excavation, grading, or other activities including offsite borrow and fill areas.

d. An estimate of the impervious area of the site for both the pre-construction and post-construction conditions and data describing the soil and any existent data on the quality of any discharge from the site. ***(This is not required by the NPDES CGP***).

e. A general location map (e.g., U.S.G.S. quadrangle map, a portion of a city or county map, or other map) with enough detail to identify the location of the construction site and the receiving waters within one mile of the site.

f. A description of the site's soils including the potential for erosion.

3. Site Map. The SWPPP must contain a legible site map completed to-scale, showing the entire construction area and clearly identifying:

a. Directions of stormwater flow (e.g., use arrows to show which ways stormwater will flow) and approximate slopes anticipated after major grading activities.

b. Areas of soil disturbance and areas that will not be disturbed.

c. Locations of temporary and permanent controls identified in the SWPPP.

d. Locations where stabilization practices are expected to occur.

e. Locations of onsite material, waste, borrow areas, or equipment storage areas.

f. Locations of all surface water bodies (including wetlands).

g. Locations where stormwater discharges to a surface water (including ephemeral waters or dry washes) and to MS4s.

h. Locations and registration numbers of onsite drywells and drywells on adjacent properties that have the potential to receive stormwater from the site. (***This is not required by the NPDES CGP***).

i. Areas where final stabilization has been accomplished and no further construction phase permit requirements apply.

j. Location of trees and environmentally sensitive areas and buffer zones to be preserved.

4. Receiving Waters. The SWPPP must identify the nearest receiving water(s), including ephemeral and intermittent streams, dry sloughs, arroyos. If applicable, the SWPPP must also identify the areal extent and describe any wetlands near the site that could be disturbed or that could potentially receive discharges from disturbed areas of the project. (***This is not required by the NPDES CGP***).

5. Summary of Potential Pollutant Sources. The SWPPP must identify the location and describe any stormwater or non-stormwater discharges at the site associated with activity other than construction and other pollutant sources such as fueling operations, materials stored onsite, waste piles, etc. This also includes discharges from dedicated asphalt plants and dedicated concrete plants that are covered by this permit.

6. Offsite Material Storage. The SWPPP must identify and address offsite material storage areas or borrow areas used solely by the operator's project. (***This is not required by the NPDES CGP***).

7. Endangered Species. The NPDES CGP requires that the SWPPP include documentation supporting a determination of permit eligibility with regard to the Endangered Species (refer to the NPDES CGP for details). (***This is not required by the AZPDES CGP***).

In addition to the site and activity descriptions that are required, the SWPPP must also describe the BMPs that will be implemented as part of the construction project to control erosion and pollutants in stormwater discharges. An extensive list of BMPs, including information to assist with the proper selection and implementation of these BMPS, is presented in Chapter 5 in this manual. For each major activity identified in the project description, the SWPPP must clearly describe:

1. Stormwater pollution and erosion control measures (refer to Section 4.2 for BMP selection guidance), a schedule for implementing the BMPs, and the responsible operator(s) for the implementation of the BMPs.

2. General housekeeping procedures to prevent litter and construction materials from becoming exposed to stormwater runoff.

3. Stabilization practices including:

   a. A schedule of when the practices will be implemented

   b. A deadline for stabilization measures, usually within 14 days in portions of the site where construction activities have temporarily or permanently ceased. Refer to the AZPDES CGP for more details of deadlines. (***This is not required by the NPDES CGP***).

   c. Records of stabilization including dates when major grading activities occur, dates when construction activities temporarily or permanently cease on a portion of the site, and dates when stabilization measures are initiated and completed.

4. Structural practices to divert flows from exposed soils, store flows, or limit runoff to exposed areas.

5. Post-construction management measures that will be installed during the construction process to control pollutants in stormwater discharges after construction operations have been completed.

6. Measures to eliminate or reduce *non-stormwater discharges*, as listed in the AZPDES and the NPDES CGPs, to the maximum extent possible.

7. Other controls. The SWPPP should also describe:

   a. Measures to prevent the discharge of solid materials to waters of the United States, except those authorized under section 404 of the Clean Water Act.

   b. Measures to minimize offsite sediment tracking and dust generation.

   c. Construction and waste materials expected to be stored onsite with updates as appropriate.

   d. Pollutant sources from areas other than construction such as dedicated asphalt and concrete plants and a description of the controls for those other non-construction sources.

   e. Measures to sufficiently stabilize soil around culverts to prevent rill and gully formation during construction (***This is not required by the NPDES CGP***).

4.1.3 NOI Submittal

A SWPPP must be prepared for the site before submitting an NOI. To obtain coverage under the CGPs, the construction operator must prepare and submit a complete and accurate NOI. Discharges are not authorized if the NOI is incomplete or inaccurate, or not eligible to obtain a permit to begin with. The submission of the NOI demonstrates the operator's intent to be covered by the general permit.

Regarding the AZPDES CGP, the NOI must be complete and accurate and signed by the appropriate signatory in order for coverage to be obtained. The form also serves as a commitment by the operator that there will be compliance with the permit conditions. The 'operator' must develop and implement a SWPPP that satisfies the conditions of the permit. If the site is located within 1/4 mile of an impaired or outstanding Arizona water (OAW), the SWPPP must be submitted with the NOI. ADEQ will notify the applicant within 32 business days after receiving the SWPPP if the SWPPP needs revisions or if permit coverage is granted or denied. In all other cases, the applicant is not required to submit the SWPPP to the department for review unless specifically required by ADEQ. The SWPPP must be on-site whenever construction activities are actively underway and must be fully implemented and maintained as construction activities progress. If ADEQ does not issue the authorization certificate within seven days, or 32-business days for sites located within 1/4 mile of an impaired or outstanding Arizona Water, of receiving the NOI or otherwise notify the operator that the submitted NOI is deficient, the operator may commence construction activities without an authorization certificate; however, it is the operator's responsibility to verify the date the NOI was received by ADEQ before initiating construction activities. Whether or not ADEQ notifies the operator of a deficiency in the NOI, discharges are not authorized under this permit if the operator submits an incomplete or incorrect NOI.

In relation to the AZPDES CGP, submit the NOI (and SWPPP, if necessary) to:

Arizona Department of Environmental Quality
Water Permits Section/Stormwater NOI (5415B-3)
1110 W. Washington Street
Phoenix, Arizona 85007

or fax the form to (602) 771-4674. ADEQ now offers the SMART NOI Program, which is a web-based service (go to http://az.gov/webapp/noi/main.do) to assist construction operators applying online for stormwater discharge permits. The site can also be used to apply for a permit waiver and coverage termination. Completion of the NOI online starts the coverage review by ADEQ. A hardcopy of the Smart NOI final submittal printout needs to signed by an authorized agent and mailed to ADEQ within 10 days. Note that, regardless of the method of submittal, submission of the NOI does not mean that the operator has met all the eligibility requirements for the general permit.

In relation to the NPDES CGP, submit a Notice of Intent (NOI) to:

For Regular U.S. Mail Delivery:	For Overnight/Express Mail Delivery:
EPA Stormwater Notice Processing Center	EPA Stormwater Notice Processing Center
Mail Code 4203M	Room 7420
U.S. EPA	U.S. EPA
1200 Pennsylvania Avenue, NW	1201 Constitution Avenue, NW
Washington, DC 20460	Washington, DC 20004

The construction operator is authorized to discharge stormwater from construction activities within seven (7) calendar days after receipt by EPA of a complete and accurate NOI. Acknowledgement of receipt of the complete and accurate NOI is typically posted on EPA's NPDES website http://www.epa.gov/npdes/stormwater/cgp. In lieu of hardcopy submittal of the NOI to EPA, a federal CGP NOI can be submitted using EPA's electronic NOI system (i.e., eNOI), which can also be found on the website listed above.

Both the AZPDES and NPDES CGP NOIs, as well as other forms, can be found in Appendix B of this document.

If the facility has the potential to discharge to a municipal separate storm sewer system (MS4), the applicant must also forward a copy of the completed NOI to the owner/operator of the MS4 system at the time it is submitted to the permitting authority. Whenever the operator changes or another is added during the construction project, the new operator must also submit an NOI to be authorized under this permit.

4.1.4 Implementation of the SWPPP

Maintenance of BMPs. All erosion and sediment control measures (BMPs) and other protective measures identified in the SWPPP must be maintained in effective operating condition. If site inspections identify BMPs that are not operating effectively, maintenance must be performed as soon as practicable and before the next anticipated storm event. If existing BMPs need to be modified or additional BMPS are necessary, implementation must be completed before the next anticipated storm event. If implementation before the next storm event is impracticable, alternative BMPs should be implemented as soon as practicable.

Inspections. The SWPPP must contain an inspection schedule for the site's BMPs. The operator can choose between two options:

- At least once every 7 calendar days
- At least once every 14 calendar days and also within 24 hours of the end of each storm event of 0.5 inches or greater.

Qualified personnel knowledgeable in the principles and practice of erosion and sediment controls must do the inspections. An inspection report documenting the condition of BMPs must be completed during each inspection and include the following:

1. Inspection date.
2. Names, titles, and qualifications of personnel making the inspection.
3. Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection).
4. For inspections occurring during or after a rain event, weather information and description of any discharges occurring at the time of the inspection.
5. Location(s) of discharges of sediment or other pollutants from the site
6. Location(s) of BMPs that need to be maintained, failed to operate as designed, or proved inadequate.
7. Location(s) where additional BMPs are needed that did not exist at the time of inspection.
8. Corrective action required including any changes to the SWPPP necessary and implementation dates.
9. Identification of all sources of non-stormwater and the associated pollution prevention control measures (***This is not required by the NPDES CGP***).
10. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas (***This is not required by the NPDES CGP***).
11. Identification of any non-compliance with permit conditions, or where the inspector does not identify incidents of non-compliance, include a certification that the project is being operated in compliance with the SWPPP and permit.
12. A certification statement and signature in accordance with the CGP.

The NPDES CGP requires that inspections of any long, narrow, linear construction activities (i.e. utility and pipeline construction) may be inspected at 0.25 miles up and below each access point, instead of driving along the entire length of the narrow construction area, which may result in further soil disturbances. These two ends of the construction area are deemed as representative points of inspection for the entire reach of the narrow, linear construction area.

The operator may reduce the inspection frequency under the following conditions:

- The site has been temporarily stabilized. (NPDES and AZPDES CGPs)
- Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists). (NPDES CGPs only)

- Construction is in an area of the state that receives < 20 inches of average annual rainfall and construction is occurring during the seasonal dry period. (NPDES and AZPDES CGPs)

The NPDES CGP further authorizes a waiver of the inspection requirements until one month before thawing conditions are anticipated. This assumes that the project is located in an area where frozen conditions are anticipated for extended periods of time, the land disturbance activities are suspended, and the beginning and ending dates of the waiver period are documented in the SWPPP.

Amendments. The SWPPP must be amended and properly logged in the SWPPP whenever there is a change in site operations that may affect pollutant discharges or inspections reveal problems with the existing SWPPP. The AZPDES CGP requires that the amendments to the SWPPP be made within 15 business days that the change is realized to be necessary (i.e., the date of inspection), whereas the NPDES CGP requires that revisions to the SWPPP resulting from an inspection must be made within seven calendar days following the inspection.

Accessibility. The operator must have a copy of the permit and a signed copy of the SWPPP at the construction site from the commencement of construction activities to the date of NOT submittal. The SWPPP must be accessible to all operators and those identified as having responsibilities under the SWPPP whenever they are on the construction site. Moreover, the operator must post permit authorization near the main entrance of the construction site (or some other nearby public building).

The NPDES CGP requires the following information to be displayed:

1. A copy of the completed NOI as submitted to the EPA Storm Water Notice Processing Center.

2. If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed (i.e. different than that submitted to EPA in the NOI), the current location of the SWPPP and name and telephone number of a contact person for scheduling viewing times.

Record-keeping. The operator must retain copies of the SWPPP and all documentation required by this permit, including a copy of the confirmation from ADEQ or EPA, depending on the applicable CGP, that the NOI was received and administratively complete. Also, inspection reports, and records of data used to complete the NOI, must be kept for at least three years from the date of final stabilization of the site.

4.1.5 Termination of Permit Coverage

A NOT needs to be submitted to ADEQ or EPA, depending on the applicable CGP, when the construction activities at the site have been completed and within 30 days when any of the following conditions have been met:

- Temporary controls are removed and the residence is transferred to the homeowner (this only applies to residential construction)
- Permanent controls and stabilization have been completed and are functional
- Disturbed area has been returned to 70% of the natural vegetative cover. For example, if the original, natural vegetation covers 50% of the total land area, then the final vegetated stabilization must cover 35% (i.e. 70% of 50%) of the total land area.
- Another operator (with permit authorization) has assumed control over the areas of the project that are not finally stabilized.
- The planned construction activity identified in the original NOI was never initiated.
- The operator has obtained coverage for the site area under another AZPDES permit.

The same procedures and addresses used for submittal of the NOI are also used for submittal of the NOT. Authorization to discharge terminates at midnight of the day the NOT is signed and submitted to the permitting authority.

Copies of the AZPDES and NPDES NOTs are included in Appendix B. If the site is located within the jurisdiction of an MS4, the operator must also forward a copy of the completed NOT to the responsible party at the MS4. Once the NOT is submitted and termination of permit coverage approved by the permitting authority, records can be removed from the construction site but need to be kept for a minimum of three years.

4.2 SELECTION OF BMPS FOR THE SWPPP

The SWPPP requires that stormwater BMPs be identified and implemented to address potential pollution problems. A combination of BMP types including erosion control, sediment and pollutant control, dust control, and general housekeeping measures will be necessary in most cases. Chapter 3 contains additional information about the difference between these types. General guidelines on choosing appropriate BMPs from these categories are presented below.

4.2.1 Identify Construction Activities

The first step in selecting appropriate BMPs is to identify the construction activities that will take place. Common activities that may be exposed to stormwater include:

- Grading
- Excavation
- Utility installation
- Road, curb, sidewalk construction

- Materials storage
- Materials processing, such as concrete or asphalt mixing
- Framing, shingling, exterior painting, etc.
- Refueling
- Vehicle and equipment maintenance

4.2.2 Identify Activity Location/Category

After identification of these activities, examine where they are likely to occur and how they will affect water quality of runoff from the construction site. Decide which of the following categories are applicable for each of the construction activities.

- Slope protection
- Material stockpiles
- Excavated areas (trenches, pits)
- Perimeter and access controls
- Inlet drain protection
- Channels and medians
- Equipment storage and maintenance
- Debris management and washout
- Landscaping and vegetation

For example, a concrete plant may be constructed at the edge of the construction site and raw material stockpiled at that location for later processing. Here the main concerns would be material storage and materials processing. Applicable categories would include the exposure of sand, gravel, and other material (material stockpiles), preventing materials from moving offsite (perimeter and access controls), cleaning up after activities at the concrete plant (debris management and washout). If there is a catch basin in the street close to the plant, inlet drain protection may apply.

4.2.3 Select Appropriate BMP Combination

After identification of appropriate categories turn to Table 5.1 in the next chapter. This is the BMP selection matrix. The above categories are listed in the columns at the top of the matrix. Potential BMPs are listed along the left side of the matrix. An X in the column indicates that the BMP

listed in that row may be applicable to that situation. Based on the concrete plant example, EC-7 Dust Control may be applicable to the site because of the material stockpiles. A large number of potential BMPs are indicated in the perimeter and access controls column. Many of these do not appear to be as relevant as dust control. Fact sheets on each BMP are included in Chapter 5 after the matrix. Details on those sheets will help determine the appropriate application of each of the BMPs listed in the matrix.

The BMPs listed along the left side of the matrix are organized into three groups. The first group is Erosion Control, the second is Sediment and Pollutant Control, and the third is General Housekeeping.

The **Erosion Control** measures are the first line of defense against pollution in stormwater runoff. They help prevent erosion from beginning and are generally less expensive and more effective than treating sediment in runoff. Unfortunately, it is usually impossible to completely stop erosion using just Erosion Control measures. Some BMPs from the second category, Sediment and Pollutant Control, will be needed to treat runoff before it is discharged.

Many of the **Sediment and Pollutant Control** BMPs can be used to treat runoff from multiple erosion sources. A silt fence installed around the perimeter of a site will help treat sediment whether it is from excavation, grading, or road construction activities.

The **General Housekeeping** category is less structurally-oriented than the first two categories. It affects the way many routine operations and maintenance activities are conducted.

4.2.4 Incorporate BMPs into SWPPP

The completed SWPPP should contain a combination of BMPs from all three categories, selected to fit conditions at the site, and designed to address the potential pollutant sources that have been identified. The BMP fact sheets contain information on operation and maintenance, which must be accounted for in the SWPPP and periodic inspections.

The BMP combination should not be rigidly fixed. As conditions change, some BMPs may no longer be needed, while others become critical. One example is when major grading activities are completed and the emphasis shifts towards framing in buildings. Thus, the successful SWPPP is flexible, emphasizing the most cost-effective BMP combination to address site concerns during each phase of construction.

5 BEST MANAGEMENT PRACTICES

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Chapter 5 is intended only as a technical *guidance* for the selection and implementation of Best Management Practices (BMPs). Any Flood Control District policies or standards are specifically outlined in the Flood Control District of Maricopa County's Policies and Standards manual. It is recommended that a registered Professional Engineer (P.E.), Certified Professional in Erosion and Sediment Control (CPESC), or a Certified Professional in Stormwater Quality (CPSWQ) design or review the specification and sizing criteria of any of the BMPs. Such a registered or certified professional should also review the site plans, and ultimately the SWPPP containing the BMPs. Also, it is recommended that the SWPPP designer conduct a site visit prior to beginning the BMP selection process.

BMPs are defined as nonstructural and structural practices which, when properly implemented, operated, and maintained, provide the most efficient and practical means of reducing or preventing stormwater pollution. The BMPs presented in this manual provide effective methods to control stormwater pollution but are by no means all-inclusive. New and creative methods of controlling pollution are continuously generated by owners and contractors. However, it is recommended that the contractor monitor and prove the effectiveness of a new BMP before including it in a SWPPP.

5.1 SELECTION MATRIX

Selection of the most appropriate combination of BMPs for a specific construction site should be based upon a careful review of the areas of the site that affect its potential for erosion and stormwater runoff contamination. These potential problem areas are:

1. Slope protection
2. Soil mounds and material stockpiles
3. Excavated Areas (trenches, pits, etc.)
4. Perimeter and access controls
5. Inlet drain protection
6. Channels or medians
7. Equipment storage and maintenance
8. Debris management, cleanup, and washout
9. Landscaping and vegetation

For each of the nine potential problem areas, there is often more than one BMP available to effectively reduce the volume and velocity of stormwater runoff, the amount of the site exposed to erosion, and the potential for stormwater runoff pollution. As shown in the Selection Matrix below (Figure 5.1), BMPs are organized into three main groups: Erosion Control (EC), Sediment and

FIGURE 5.1
BMP SELECTION MATRIX

Solutions																														
	Erosion Control (EC)													Sediment and Pollutant Control (SPC)										General Housekeeping (GH)						
BMP	EC-1 Erosion Control Mats	EC-2 Mulching	EC-3 Protection of Trees and Vegetation in Construction Areas	EC-4 Pipe Slope Drains	EC-5 Stabilized Construction Entrance	EC-6 Construction Road Stabilization	EC-7 Dust Control	EC-8 Temporary Access Waterway Crossing	EC-9 Diversion Dikes	EC-10 Drainage Swales	EC-11 Outlet Protection, Velocity Dissipation Devices	EC-12 Surface Roughening	SPC-1 Organic Filter Barrier	SPC-2 Sand Bag Barrier	SPC-3 Gravel Filter Berms	SPC-4 Check Dams	SPC-5 Silt Fence	SPC-6 Revegetation	SPC-7 Storm Drain Inlet Protection	SPC-8 Temporary Sediment Basins	SPC-9 Temporary Sediment Traps	SPC-10 Sediment Dewatering Operations	GH-1 Chemical Management	GH-2 Solid Waste Management	GH-3 Equipment Maintenance Procedures	GH-4 Designated Washdown Areas	GH-5 Spill Containment Plan	GH-6 Road Sweeping/ Trackout Cleaning
Potential Problem Areas																														
Landscaping and Vegetation			X							X									X		X	X							
Debris Management and Washout																							X	X	X	X	X	X
Equipment Storage and Maintenance																							X		X		X	
Channels or Medians			X													X		X	X									
Inlet Drain Protection													X	X	X		X		X				X		X	X	X	
Perimeter and Access Controls			X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X					X		X
Excavated Areas (trenches, pits, etc.)									X	X			X	X	X	X	X	X		X	X	X						
Soil Mounds and Material Stockpile	X				X		X						X				X											X
Slope Protection	X	X	X	X			X		X	X		X	X	X	X	X	X	X										

Pollutant Control (SPC), and General Housekeeping (GH). The first group (EC) is preventative; controlling erosion at its source. The second (SPC) treats runoff to remove eroded sediment and other associated stormwater pollutants. The third (GH) is less structured in nature and addresses operations and maintenance activities. Each BMP is cross-referenced to the potential problem area for which the individual BMPs applies. Many of the BMPs achieve control in more than one category, which should be taken into account when selecting BMPs for maximum effectiveness.

The contractor should select the control practices that are best suited to the site, then select from suggested BMPs based upon consideration of cost, material availability, topography, location, and duration of exposure. Each of the BMP fact sheets has a “Ratings” table, which rates the associated costs and the target pollutants removal efficiency as high (H), moderate (M), or low (L). In selecting BMPs suitable for a site and developing a SWPPP, a five-step selection process may be used. A discussion of this step-by-step approach follows.

5.2 STEP 1: CONSTRUCTION SCHEDULING

The first step in selecting BMPs is to compare the project schedule with onsite management measures that can limit the exposure of the project site to erosion. Consider the following strategies:

1. Sequence construction activities so that denuded areas are not exposed for long periods of time.

2. Schedule landscaping and other work that permanently stabilizes the area to be done immediately after the land has been graded to its final contour.

3. Alter the project schedule to minimize the amount of denuded areas during the monsoon summer months of July, August, and September and the wet, winter months of November, December, and January.

4. Construct permanent stormwater control facilities early in the project schedule and then utilize these structures for controlling erosion and sedimentation both during and after the project. Common examples include converting temporary sediment traps and basins to permanent, vegetated retention basins (sedimentation basins) and incorporating revegetation practices with the final landscaping plan.

5.3 STEP 2: EROSION CONTROL BMPS

The second step is to examine the site plan to determine appropriate methods for reducing the volume of stormwater which will run across the denuded areas of the project site. Limiting the exposure of graded areas to offsite runoff may involve vegetative and structural controls as well as onsite management options. To effectively determine appropriate volume control measures, the designer should visit the site and review a topographic map of the project site so that existing and proposed drainage patterns can be identified and temporary and permanent stormwater control structures can be located. Identify the following on the site map in the order listed:

1. Locations where stormwater enters and exits the site. Include both sheet and channel flow paths for the existing and final grading contours.

2. Approximate boundaries and estimated surface areas of each drainage area if your site has more than 1 drainage outlet.

3. Sensitive locations subject to high rates of erosion due to soil types, steep slopes, or unlined channels. Slopes over 100 feet in length are considered as areas of moderate to high erosion potential.

4. Categorize slopes as:

Slope (%)	Erosion Potential
0-5	Low
5-10	Moderate
Over 10	High

5. Construction entrances and exits, staging areas, and roads.

6. Areas where existing vegetation will not be disturbed by construction activity, and establish clearing limits.

7. Locations of permanent stormwater collection, drainage, and control structures.

With this information, consider the following methods for reducing the rate and volume of runoff affecting your construction site. Specific erosion control BMPs have been listed in the Selection Matrix above.

5.3.1 Structural Controls

Structural controls aid in reducing runoff volumes. Examples of structural controls include:

1. Constructing dikes and swales to divert upslope water from entering the unvegetated areas of the construction site.

2. Using temporary dikes, swales, pipe slope drains to divert or intercept stormwater before it reaches long and/or steep slopes.

3. Releasing captured stormwater at a slow and controlled rate to prevent damage to downstream drainage ways and structures.

5.3.2 Vegetative Controls

Vegetative controls also aid in reducing runoff volumes. Appropriate techniques include:

1. Preserving vegetative cover and the canopy to protect soil from direct impact of rainfall, where most erosion begins. Root systems hold soil particles and nutrients in place.

2. Increasing the soil's ability to absorb moisture through vegetative means, surface roughening, and mulching.

3. Staging the grading schedule so that the native vegetation provides a buffer to slow and disperse runoff.

5.3.3 Runoff Velocity Reduction

Erosion control is greatly enhanced when the velocity of runoff is reduced in denuded areas, steep slopes, and drainage channels. Structural and vegetative controls to be considered to aid runoff velocity reduction were listed above in Section 5.3.1 and Section 5.3.2, respectively. Examples of velocity reduction practices include:

Slope and overland controls

1. Limiting the length of slopes to 50 feet. Construct mid-slope diversion (swales) or straw wattles on longer slopes to intercept runoff.

2. Roughening slopes to increase the absorption of rainfall and slow runoff.

3. Limiting slopes to 3:1, where practical.

4. Preventing flows from becoming concentrated, wherever possible. Sheet flow is less erosive than concentrated channel flow.

5. Protecting slopes with mulches, matting, or other types of temporary or permanent soil stabilization.

Channel controls

6. Installing check dams in unlined drainage channels to slow runoff velocity and encourage settlement of sediments.

7. Providing velocity reducing structures such as riprap at stormwater outfalls.

8. Matching flow velocities to soil channel lining type (as described in the table below).

TABLE 5.1
RECOMMENDED VELOCITIES FOR VARIOUS SOIL TYPES (ADOT, 1995)

Soil type	**Allowable velocity (feet per second)**
Fine sand to sandy loam	2.5
Silt loam	3.0
Firm loam and noncolloidal alluvial silt	3.5
Fine gravel, stiff (very colloidal) clay, and colloidal alluvial silts	5.0

TABLE 5.1 (CONTINUED)
RECOMMENDED VELOCITIES FOR VARIOUS SOIL TYPES (ADOT, 1995)

Cobbles	5.5
Coarse gravel and shales	6.0

9. If flow velocities in a channel are anticipated to be higher than those included in the table above, a vegetated lining should be installed, if not already present. For velocities greater than six feet per second, riprap, gabions, or concrete lining may be required.

5.4 STEP 3: SEDIMENT AND POLLUTANT CONTROL BMPS

Once preventative measures have been implemented to control erosion through reduced soil exposure, runoff volume, and velocity (Section 5.3), the next priority is to treat stormwater to remove sediment and other suspended pollutants from the stormwater as much as possible before the water leaves the project site. Strategies for controlling sediment and pollutants include:

1. Temporary sediment barriers such as:

   - Silt fences
   - Organic filter barriers
   - Sand bag barriers
   - Gravel filter berms

   are appropriate for areas on construction sites with relatively flat slopes that produce sheet flow runoff.

2. Directing sediment-laden stormwater to temporary sediment traps and basins via berms or channels. Onsite controls are only designed and sized for site runoff alone.

3. Construct temporary sediment traps or basins at the drainage outlet for the site. When more than one basin is required due to the size of the site, construct these basins to operate in parallel.

4. Protect downstream municipal storm drainage structures from sediment clogging by providing inlet protection for area drains and curb inlets and implement regular street sweeping.

5.5 STEP 4: GENERAL HOUSEKEEPING BMPS

In conjunction with controlling erosion and sediment loading, practices must be implemented to prevent contamination of stormwater by materials other than sediment. As seen in the BMP Selection Matrix, there are several methods for preventing non-sediment stormwater pollution by construction materials, equipment, and wastes. Sometimes, the best housekeeping control is to manage potential pollutants offsite. For example, conducting equipment maintenance back at the maintenance shop rather than at the site will eliminate potential spills and contamination.

5.6 STEP 5: REVIEW AND DESIGN THE PROPOSED BMPS

After selecting the appropriate BMPs for a particular problem area on the site, the final step of the process is to review the site and site map for locations of all major structural and non-structural controls, and areas of permanent or temporary stabilization.

The BMP fact sheets in this section describe the appropriate applications, limitations, planning considerations, recommended standards and specifications, and recommended maintenance and inspection for each management practice. Additionally, keep the following points in mind:

- Flow diversions should not adversely impact offsite properties and the historic flow patterns should be maintained.
- BMPs should be designed and implemented for the Maricopa County climate, which has the following characteristics:
    - An average 24 thunderstorm events per year; between 0.2 – 0.7 inches per event and a cumulative annual rainfall of less than 11 inches. Maximum rainfall within a one-hour span is approximately 1.5 inches. (Western Regional Climate Center, www.wrcc.dri.edu).
    - Wind velocities range from 5.8 – 7.3 mph (important for dust control).
- In addition to the applicability and relative effectiveness of a BMP to a particular problem area, BMPs should also be selected based on the costs, including implementation, maintenance, and training.

Several erosion and pollutant control practices can be maintained on the developed site after the construction project has been completed as permanent measures. Refer to the Post Construction Methods section of each BMP fact sheet for detailed information. Note that permanent diversion and settling basin structures are subject to the Drainage Regulations, set forth by Maricopa County.

EC: Erosion Control

Erosion control refers to methods for reducing the volume or velocity of stormwater runoff, which will come into contact with exposed areas of the project site. Erosion control methods involve limiting the exposure of graded areas to offsite runoff through modifications of the construction design plan or scheduling, reducing runoff velocities, providing vegetative cover, installing structural controls, and implementing other onsite management options. If a pre-manufactured product is to be implemented on a site for erosion control, the contractor should always follow the manufacturer's installation and maintenance recommendations as the primary reference for implementation.

EC-1 Erosion Control Mats

EC-2 Mulching

EC-3 Protection of Trees and Vegetation in Construction Areas

EC-4 Pipe Slope Drains

EC-5 Stabilized Construction Entrance

EC-6 Construction Road Stabilization

EC-7 Dust Control

EC-8 Temporary Access Waterway Crossing

EC-9 Diversion Dikes

EC-10 Drainage Swales

EC-11 Outlet Protection, Velocity Dissipation Devices

EC-12 Surface Roughening

Disclaimer

Any hyperlinks in the vendor products table will direct you out of the Flood Control District of Maricopa County (FCDMC) domain. FCDMC is providing the following vendor information for possible assistance to any interested parties, but does not necessarily endorse any of the information or products provided by the vendors.

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EC-1 EC-1: Erosion Control Mats

DEFINITION

Geotextiles, mats, plastic covers, or erosion control blankets designed to stabilize disturbed soil areas and protect soils from erosion by wind or water.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - moderate
Material Stockpiles - moderate

Most effective when used with:

Seeding or other re-vegetation methods described in SPC-6 Revegetation

Alternative BMPs:

Consider using chemical stabilization for large areas or steeper slopes: EC-7 Dust Control

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation	X		
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material			X
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-1 Erosion Control Mats Photos

CAD Drawings

Installation of Netting and Matting

Orientation of Netting and Matting

PURPOSE

Erosion control matting is used to reduce rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface. The matting may be used alone or with a mulch during the establishment of protective vegetative cover on critical slopes.

APPROPRIATE APPLICATIONS

Erosion control matting can be applied to:

- Steep slopes, generally steeper than 1:3 (V:H).
- Slopes with newly vegetated slopes or where the erosion potential is high.
- Slopes and disturbed soils where mulch must be anchored.
- Disturbed areas where plants are slow to develop.
- Channels with flows exceeding 3 to 7 ft/sec.
- Stockpiles.
- Slopes adjacent to water bodies.

LIMITATIONS

Geotextiles, mats, plastic covers, and erosion control covers have maximum flow rate limitations; consult the manufacturer for proper selection.

Blankets and mats:

- More expensive than other erosion control measures, due to labor and material costs. This usually limits their application to areas inaccessible to hydraulic equipment, or where other measures are not applicable, such as channels.
- Generally not suitable for excessively rocky sites, or areas where the final vegetation will be mowed (since staples and netting can catch in mowers).

Plastic sheeting:

- Easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
- Plastic results in 100% runoff, which may cause serious erosion problems in the areas receiving the increased flow.
- Limit the use of plastic covers to covering stockpiles, or very small graded areas for short periods of time (such as through one imminent storm event), until alternative measures, such as seeding and mulching, may be installed.

PLANNING CONSIDERATIONS

Consider using Revegetation in conjunction with Erosion Control Mats for additional erosion control and stabilization.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Jute Mat - should be a uniform plain weave of undyed and unbleached single jute yarn and weigh about 1.2 pounds per linear yard of cloth. The yarn should be loosely twisted, with an average twist of not less than 1.6 turns per inch, and should not vary in thickness by more than half its normal diameter.

Straw Mat - should be a machine produced mat consisting of about 70 ± 3% agricultural straw and 30 ± 3% coconut fiber. The blanket should be of consistent thickness with the straw and coconut fiber evenly distributed. The blanket should be covered on the top side with polypropylene netting having an approximate 5/8" x 5/8" mesh containing ultraviolet additives to resist breakdown, and on the bottom, have a polypropylene netting with an approximate ½" x ½" mesh.

Excelsior Mat - should be wood excelsior, about 48 inches in width, and about 0.8 pounds per square yard. The excelsior material should be covered with a netting to facilitate handling and to increase strength.

Glass Fiber Matting - should be made of bonded textile glass fibers with an average fiber diameter of eight to twelve microns and two to four inch strands of fiber bonded with phenol formaldehyde resin. Mat should be roll type, water permeable, minimum thickness ¼ inch, maximum thickness ½ inch, and have a density greater than three pounds per cubic foot.

Other Mulch Nettings - such as paper, plastic, cotton or fiber glass matting should be installed according to the manufacturer's recommendations.

Staples - used as anchors should be Number 11 gauge wire or heavier, and the length should be six to ten inches, minimum.

Installation

Site Preparation:

After the site has been shaped and graded to the approved design, prepare a friable seed bed, relatively free from clods and rocks more than 1.5 inches in diameter and any foreign material that will prevent contact of the protective mat with the soil surface.

Planting:

Fertilize and seed in accordance with seeding or other type of planting plan. When using jute matting on a seeded area, apply approximately half the seed before laying the mat and the remainder after laying the mat. The protective matting can be laid over sprigged areas when grass has been planted. Where vines or other ground covers are to be planted, lay the protective matting first and then plant through matting.

Erosion Stops:

Erosion stops are made of glass fiber strips, excelsior matting strips or tight-folded jute and are useful on steep, highly erodible slopes. They prevent water from flowing below the erosion control matting at the matting joints. Erosion stops can be placed in narrow trenches six to twelve inches deep across the channel, left flush with the soil surface, and must extend the entire cross section of designed flow. Straw wattles (see Organic Filter Barrier) are commonly installed as erosion stops

Laying and Securing Matting:

Before laying the matting, all erosion stops should be installed and the friable seed bed made free of clods, rocks, and roots. Most matting comes with manufacturer's recommendations for installation, which should always be followed. The matting should be unrolled starting at the upper end of the channel, allowing a four-inch overlap of mattings along the center of channel. To secure, bury the top ends of matting in a narrow trench, minimum of six inch depth. Backfill trench and tamp firmly to conform to channel cross section. Secure with a row of staples about four inches down slope from trench with staples twelve inches apart.

Where matting crosses erosion stops, reinforce with a double row of staples, six-inch spacing, staggered pattern on either side of erosion stop. Likewise, overlaps joining the length of matting together and the discharge end of the matting liner should be similarly secured with a double row of staples.

Mechanical or manual laydown equipment should be capable of handling full rolls of fabric, and laying the fabric smoothly, without wrinkles or folds. The equipment should be in accordance with the fabric manufacturer's recommendations or as approved by the Engineer.

The surface upon which the separation fabric will be placed should be compacted and finished according to the manufacturer's recommendations.

Final Check:

- Make sure matting is uniformly in contact with the soil.
- All lap joints are secure.
- All staples are flush with the ground.
- All disturbed areas seeded.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect blankets and mats periodically after installation. Installation should be inspected after significant rainstorms to check for erosion and undermining. If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.
- Repairs may include re-anchoring loosened nettings and replace lost net and staples as required.

- Reapply or replace temporary soil stabilization when protected area becomes exposed or exhibits visible erosion.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

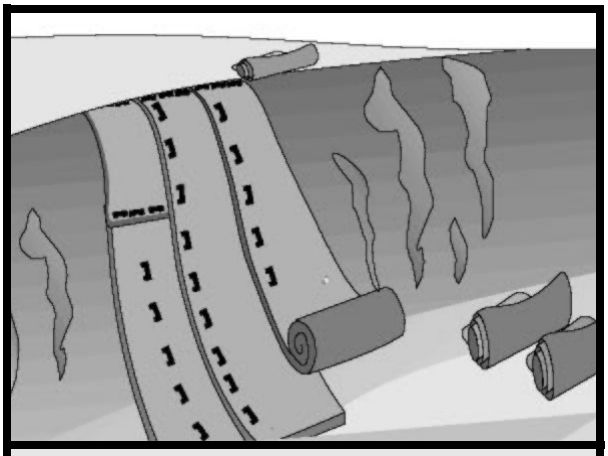
North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

City of Austin, Texas, March, 2004, Environmental Criteria Manual.

Arizona Department of Transportation (ADOT), June 1995, Erosion and Pollution Control Manual, Intermodal Transportation Division.

EC-1 Erosion Control Mats Photos



Schematic of applying erosion control matting to a slope.

Courtesy of CALTRANS

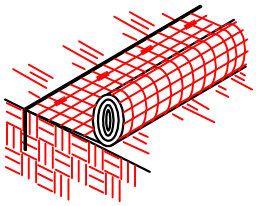
Biodegradable erosion control.

Courtesy of EPA

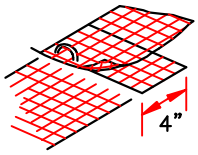
Applying sod to a slope

Courtesy of Douglas County

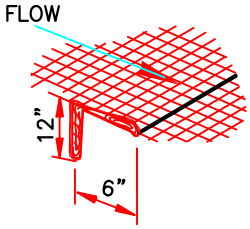
EC-1 Erosion Control Mats Drawing



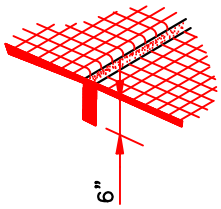
ANCHOR SLOT: BURY THE UP–CHANNEL END OF THE NET IN A 12" DEEP TRENCH. TAMP THE SOIL FIRMLY. STAPLE AT 12" INTERVALS ACROSS THE NET.



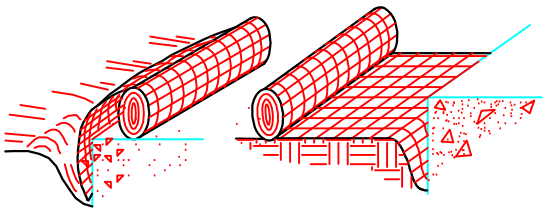
OVERLAP: OVERLAP EDGES OF THE STRIPS AT LEAST 4". STAPLE EVERY 12" DOWN THE CENTER OF THE STRIP.



JOINING STRIPS: INSERT THE NEW ROLL OR NET IN A TRENCH, AS WITH THE ANCHOR SLOT. OVERLAP THE UP–CHANNEL END OF THE PREVIOUS ROLL 18" AND TURN THE END OF THE PREVIOUS ROLL, JUST BELOW THE ANCHOR SLOT, LEAVING 6" OVERLAP.



CHECK SLOTS: ON ERODIBLE SOILS OR STEEP SLOPES, CHECK SLOTS SHOULD BE MADE EVERY 15 FEET. INSERT A FOLD OF THE NET INTO A 6" TRENCH AND TRAMP FIRMLY. STAPLE AT 12" INTERVALS ACROSS THE NET. LAY THE NET SMOOTHLY ON THE SURFACE OF THE SOIL – DO NOT STRETCH THE NET, AND DO NOT ALLOW WRINKLES.

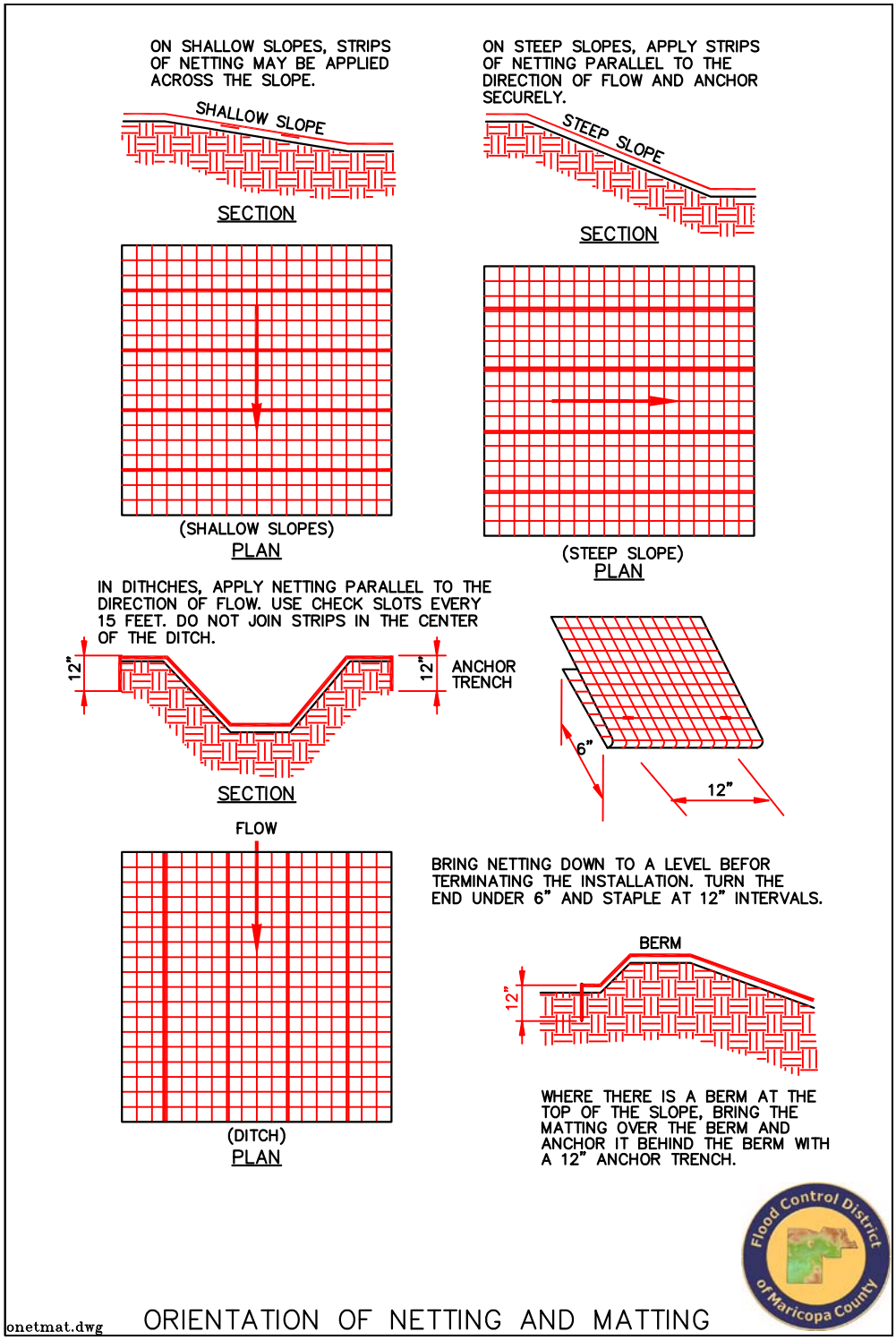


ANCHORING ENDS AT STRUCTURES: PLACE THE END OF THE NET IN A 12" SLOT ON THE UP–CHANNEL SIDE OF THE STRUCTURE. FILL THE TRENCH AND TAMP FIRMLY. ROLL THE NET UP THE CHANNEL. PLACE STAPLES AT 12" INTERVALS ALONG THE ANCHOR END OF THE NET.

netmat.dwg

INSTALLATION OF NETTING AND MATTING

EC-1 Erosion Control Mats Drawing



EC-2 EC-2: Mulching

DEFINITION

Providing a stabilized surface for seeding and/or prevention of erosion. Mulches include organic materials, straw, wood chips, bark or other wood fibers, decomposed granite, gravels, a variety of netting or mats of organic or non-organic materials, and chemical soil stabilization.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - moderate

Most effective when used with:

EC-1 Erosion Control Mats

Seeding or other re-vegetation methods described in SPC-6 Revegetation

Alternative BMPs:

Consider using chemical stabilization for large areas or steeper slopes: EC-7 Dust Control

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation	X		
Maintenance		X	
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease		X	
Nutrients			X
Sediment	X		
Floatable Material			X
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-2 Mulching Photos

CAD Drawings

None

PURPOSE

The purposes of using mulch are: (1) prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow and (2) to foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold.

Mulches can increase the infiltration rate of the soil, reduce soil moisture loss by evaporation, prevent crusting and sealing of the soil surface, modify soil temperatures, and provide a suitable microclimate for seed germination.

APPROPRIATE APPLICATIONS

- Mulching is appropriate for temporary or permanent methods of erosion control. Organic mulches, straw and wood fiber are appropriate in landscaped or revegetated areas as temporary controls. Permanent controls that are appropriate for arid regions include gravels and decomposed granite.
- Apply mulching to the following:
    - Areas that have been permanently seeded,
    - Areas that cannot be seeded right away due to the season or other environmental restrictions but still need to be reinforced,
    - Seeded or planted areas where slopes are steeper than 2:1
    - Areas where seedlings require protection from extreme temperatures or moisture loss.

LIMITATIONS

The following limitations of mulching should be considered:

- Mulching may delay seed germination because the cover changes soil surface temperatures.
- Mulches are susceptible to erosion and may be washed away in large storm events.
- Maintenance is necessary to ensure that mulches provide effective erosion control.
- Chemical soil stabilizers are less effective than mulches when used alone.

PLANNING CONSIDERATIONS

Mulches are applied to the soil surface to conserve a desirable soil property or to promote plant growth. Surface mulch is one of the most effective means of controlling runoff on disturbed land. There are several forms and methods of mulching. The choice of materials for mulching will be

based on the type of soil to be protected, site conditions, landscape requirements, and economics. Additionally, consider that:

- Organic mulch materials, such as straw, wood chips, bark, and wood fiber, have been found to be the most effective where re-vegetation will be provided by reseeding.
- Chemical soil stabilizers can enhance the mulching effectiveness by binding organic mulches together or to stabilize flat areas such as roadways.
- A variety of nets and mats developed for erosion control may also be used as mulches, particularly in critical areas such as waterways. They may be used to hold other mulches to the soil surface (see Erosion Control Mats).
- Seeding or other re-vegetation methods should be used in conjunction with mulching as described in Revegetation. Decomposed granite, gravels and bark are also effective as ground cover in landscaped areas.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Design Criteria

Mulching consists of furnishing all materials, preparing the soil surface, and applying the mulch to all soil surface areas designated on the project plans or established by the Engineer.

Materials

Compliance with the requirements of Subsection 106.05 of the ADOT Standard Specifications for Road and Bridge Construction is recommended.

Wood fiber mulch - Should consist of a specially prepared wood fiber processed to contain no growth or germination inhibiting factors. The mulch should be from virgin wood and be manufactured and processed so the fibers will remain in uniform suspension in water under agitation to form a homogenous slurry.

Straw mulch - Should conform to the requirements of Subsection 805 - 2.03 of ADOT's Standard Specifications and should be from the current season's crop. A letter of certification from the supplier should be required to show that the straw was baled less than 12 months from the delivery date.

Emulsified asphalt - Emulsified asphalt should be type SS-1 or CSS-1 and should conform to the requirements of Subsection 1005-3.04 of the ADOT Standard Specifications.

Binder - Binder should be free flowing, noncorrosive powder produced from natural plant gum marketed under M-Binder, M145 Binder, AZ-TAC or approved equal.

Preparation/Method and Equipment

The equipment and methods used to distribute mulching materials should provide an even and uniform application of mulch and/or other materials at the specified rate. The mulch can be spread by hand or by mulch-blowing equipment.

Applying mulch - Mulch should be immediately affixed by either crimping or tacking as described below; the Engineer should determine which areas are not conducive to anchoring by crimping and direct the contractor to instead anchor the mulch by tacking. Within 24 hours after each area is planted, straw mulch should be uniformly applied at about 2.5 tons per acre for crimped areas and 1.75 tons per acre for tacked areas. See photos of this process

Crimping - Mulch should be anchored into the soil using a tractor disc, spaced no more than nine inches apart. Mulch should be anchored to a depth of at least two inches and should not cover an excessive amount of soil. Crimp the mulch across the slopes, where practical, with one or two passes. Immediately following the crimping operation, tack the mulched area.

Tacking - Mulch can also be anchored by uniformly applying either emulsified asphalt approximately 500 gallons per acre or a slurry consisting of about 150 pounds of binder, 400 pounds of wood fiber mulch, and 700 gallons of water per acre. The specific content of pre-manufactured tacking product may vary, so be sure to follow manufacturer instructions before each application.

RECOMMENDED MAINTENANCE AND INSPECTION

Maintenance requirements will vary greatly based upon the type of mulch used and the type of vegetation to be established. Mulches are not usually intended to be permanent; but are extended only as a base for re-seeding or re-vegetation. Where a permanent anchor for vegetation is required, such as along steep slopes or areas of higher velocity flows, a geotextile mat or net is recommended instead.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff

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Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992, Virginia Erosion and Sedimentation Control Handbook, Third Edition.

Smolen, M.D., September 1988, North Carolina Erosion and Sediment Control Planning and Design Manual, North Carolina Sediment Control Commission, et al.

EC-2 Mulching Photos

Mulching protects exposed areas and seeding for revegetation.

Straw mulching along the shoulder of a highway.

Mechanical chipper application of mulching

Courtesy of NCDOT

EC-3 EC-3: Protection of Trees and Vegetation in Construction Areas

DEFINITION

Preservation of existing vegetation is the identification and protection of desirable vegetation in order to provide erosion and sediment control and protect desirable trees from mechanical damage while the land is being developed.

GENERAL INFORMATION

Applicability - Effectiveness

Perimeter and Access Controls - moderate
Landscaping and Vegetation - high
Channels and Medians - high

Most effective when used with:

SPC-6 Revegetation to enhance the existing vegetation.

Alternative BMPs:

None

RATINGS

Associated Costs	H	M	L
Implementation			X
Maintenance		X	
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease		X	
Nutrients			X
Sediment	X		
Floatable Material			X
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-3 Protection of Trees and Vegetation in Construction Areas Photos

CAD Drawings

Tree Well

PURPOSE

Preserving natural vegetation protects desirable trees, vines, bushes, and grasses from damage during project development. Vegetation provides erosion control, stormwater detention, biofiltration, and aesthetic values to a site during and after construction activities.

APPROPRIATE APPLICATIONS

Preservation of natural vegetation is applicable to all construction sites where vegetation exists in the predevelopment condition. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain. Only land needed for building activities and vehicle traffic needs to be cleared.

LIMITATIONS

Preservation of vegetation is limited by the extent of existing vegetation in preconstruction conditions. It requires planning to preserve and maintain the existing vegetation. It is also limited by the size of the site relative to the size of structures to be built. High land prices might prohibit preservation of natural areas. Additionally, equipment must have enough room to maneuver; in some cases preserved vegetation might block equipment traffic and may constrict the area available for construction activities. Finally, improper grading of a site might result in changes in environmental conditions that result in vegetation dieoff. Consideration should be given to the hydrology of natural or preserved areas when planning the site.

PLANNING CONSIDERATIONS

There are various methods for protecting existing trees on a site:

- Stake off root system limits (drip line of tree).
- Fence off tree along the drip line.
- Flag or mark trees to remain in place.
- Tree wells and retaining walls (permanent)

To enhance the existing vegetation in construction areas is most effective when installed with Revegetation.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Protect existing trees with tree wells as shown in the CAD drawing.

Rock Mulch

Rock mulch should be in accordance with the applicable requirements of Subsections 803-3.03 of the ADOT Standard Specifications and should meet the following gradation:

Sieve Size (inch)	Percent Passing (%)
3	75-100
2	25-75
1.5	0-25

Wall Construction Rocks

The rock should be clean, durable, free from segregations, seams, cracks and other structural defects or imperfections as approved by the Engineer, and should meet the following gradation:

Sieve Size (inch)	Percent Passing (%)
12	75-100
8	25-75
6	0-25

Mortar should consist of one part Portland cement and two parts fine aggregate by volume. Portland cement and water should conform to the applicable requirements of Section 1006 of ADOT specifications. Hydrated lime should conform to the requirements of ASTM C-207, Type N, to the extent of 10% by volume of cement, may be added to the mortar. Hydrated lime should be treated as an additive and not a replacement for cement.

Construction of tree wells should be in accordance with the applicable requirements of Sections 201, 202, 203, and 803 of the ADOT Standard Specifications and/or as directed by the Engineer.

RECOMMENDED MAINTENANCE AND INSPECTION

- During construction, the limits of disturbance should be clearly marked at all times. Irrigation or maintenance of existing vegetation should conform to the requirements in the landscaping plan.
- Damaged vegetation should be repaired or replaced immediately.
- Newly planted vegetation should be planned to enhance the existing vegetation.

POST CONSTRUCTION METHODS

Both newly planted and protected trees and vegetation can be incorporated as part of the final landscaping around the perimeter of a developed site, referred to as buffer zones. For environ-

mentally sensitive areas including streams, natural washes, the recommended minimum width for buffer zones is 100 feet and should include vegetated ground cover and depressions to sufficiently contain stormwater runoff from leaving the development. Studies have shown that buffer zones are often seen as amenities.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

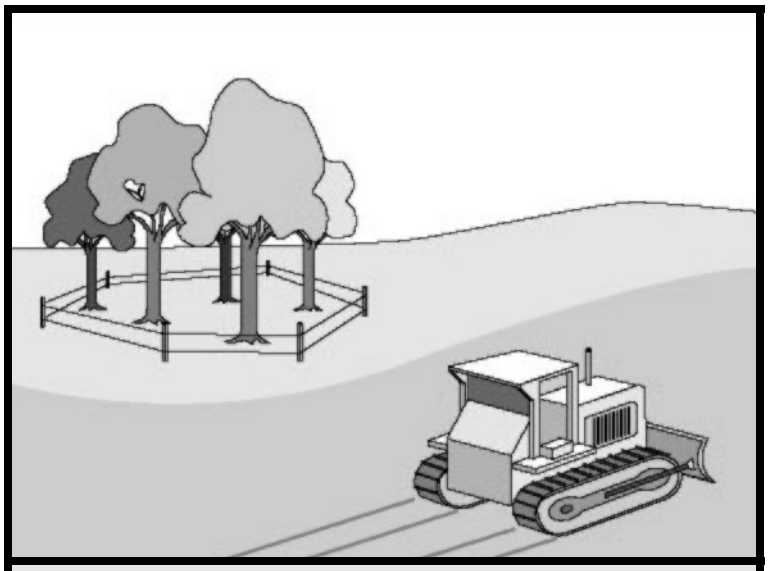
CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992, Virginia Erosion and Sedimentation Control Handbook, Third Edition.

Smolen, M.D., September 1988, North Carolina Erosion and Sediment Control Planning and Design Manual, North Carolina Sediment Control Commission, et al.

EC-3 Protection of Trees and Vegetation in Construction Areas Photos

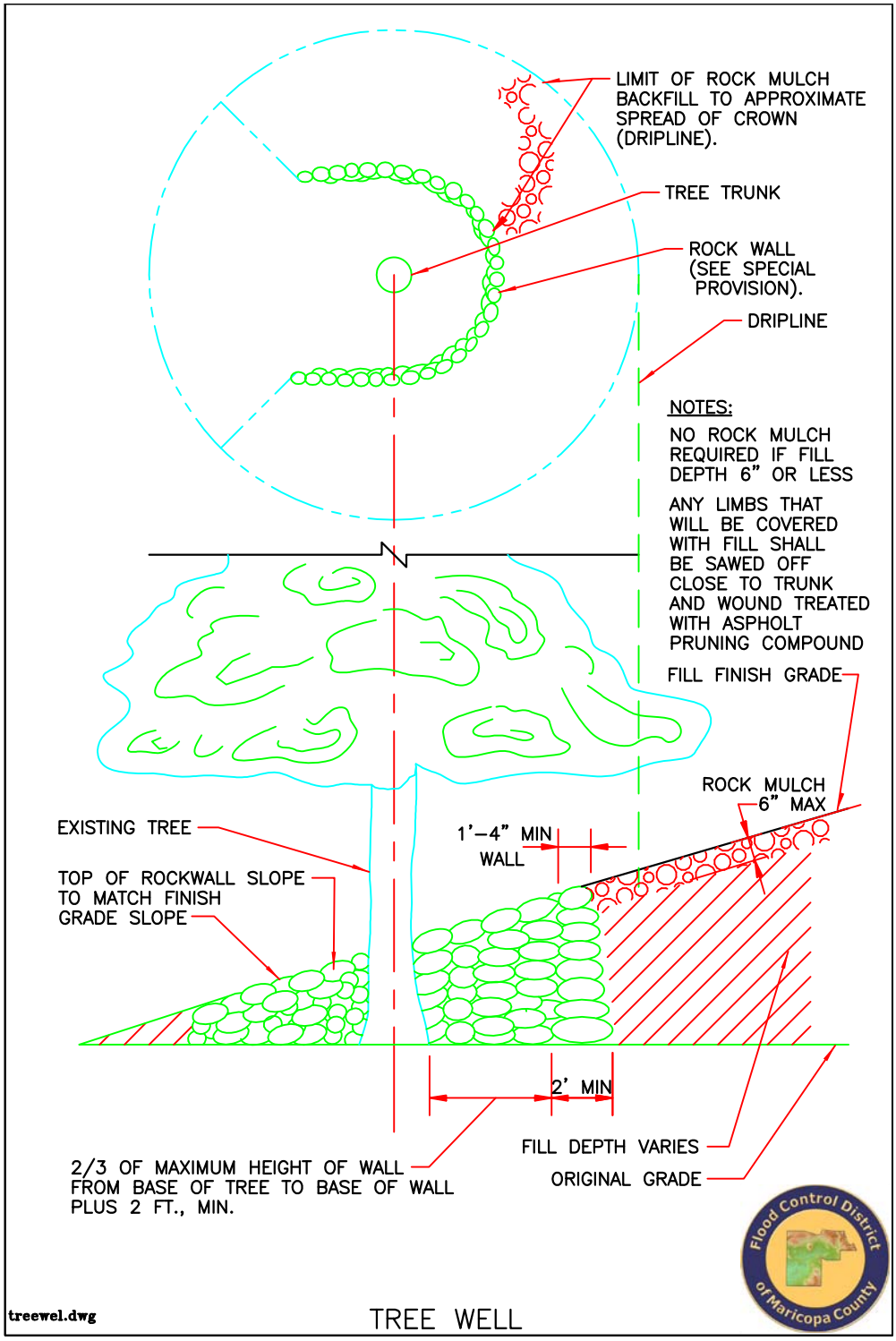


Schematic of vegetation protection.

Courtesy of CALTRANS

Flagging and wooden stakes help to protect existing trees and groundcover.

EC-3 Protection of Trees and Vegetation in Construction Areas Drawing



EC-4 EC-4: Pipe Slope Drains

DEFINITION

A temporary rigid or flexible pipe that conveys runoff down unstabilized slopes. The drain is anchored on the upstream end with some form of headwall to limit erosion, secure the pipe, and direct water into the pipe inlets.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - high

Most effective when used with:

EC-1 Erosion Control Mats

EC-2 Mulching

EC-9 Diversion Dikes

Alternative BMPs:

For smaller slopes that are not as steep, consider: EC-12 Surface Roughening

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation	X		
Maintenance	X		
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material		X	
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

Pipe Slope Drains Photos

CAD Drawings

Pipe Slope Drains Drawing (rigid)

Pipe Slope Drains Drawing (flexible)

PURPOSE

Pipe slope drains convey concentrated flows of surface runoff and protect preliminary and final graded slopes. Pipe slope drains are used during the establishment of temporary and permanent ground covers on sites with long, unstabilized, steep slope areas that are subject to erosion from overland flow. They minimize erosion down a slope because all flow is confined to an enclosed pipe.

APPROPRIATE APPLICATIONS

Pipe slope drains are applicable to sites with large berms or grade changes, such as road embankments. They are typically used in conjunction with top of slope diversion dikes or swales and may also be used as an emergency spillway for a sediment basin.

LIMITATIONS

- The area drained by a temporary slope drain should not exceed 5 acres.
- Physical obstructions substantially reduce the effectiveness of the drain.
- Pipe slope drains can also fail due to overtopping if the pipe inlet capacity is exceeded and/ or the diversion channel capacity and ridge height is reduced.
- Drains must be located away from construction areas since the drain can easily be damaged by construction traffic.
- Securing the pipe to the slope can be difficult and require significant maintenance during the life of the system.
- If a pipe slope drain conveys a sediment-laden runoff, pipes can become clogged during large rain events.
- Pipe slope drains reduce erosion, but it does not prevent or reduce the amount of sediment in runoff. Additional BMPs should be used in conjunction with pipe slope drains to treat the flow.
- Erosion and scouring may occur at the discharge point.

PLANNING CONSIDERATIONS

Pipe slope drains are easiest to install, maintain, and remove when flexible pipe is used and are most effective when installed with Erosion Control Mats, Mulching, and Diversion Dikes.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Pipe slope drains are effective in eliminating slope erosion because water is not allowed to flow directly on the slope.

- Pipe slope drains minimize erosion down a slope because all flow is confined to an enclosed pipe.
- When flexible pipe is used, slope drains are easy to install and require little maintenance.

Design and Sizing Criteria

The capacity for temporary drains should be sufficient to handle a 10-year, 24-hour peak flow. This may be computed using the Rational Method described in the Flood Control District of Maricopa County's "Hydrology Manual". Higher flows must be safely stored or routed to prevent any offsite concentration of flow.

- Temporary pipe slope drains should not be sized smaller than as shown in the following table:

Minimum Pipe Diameter (inches)	Maximum Upstream Drainage Area (acres)
12	0.5
18	1.5
21	2.5
24	3.5
30	5.0

- The entrance should consist of a standard flared end section for culverts 12-inches and larger with a minimum 6-inch metal toe plate to prevent runoff from undercutting the pipe inlet. The slope of the entrance should be at least 3 percent. The soil around and under the pipe and entrance section should be thoroughly compacted. The flared inlet section should be securely connected to the slope drain and have watertight connecting bands.
- Slope drain sections should be securely fastened together and have gasketted watertight fittings, and be securely anchored into the soil.
- Interceptor dikes should be used to direct runoff into a slope drain. The height of the dike should be at least 1 foot higher at all points than the top of the inlet pipe.
- The area below the outlet must be stabilized with a riprap apron per the attached construction drawings.
- If the pipe slope drain is conveying sediment-laden water, direct all flows into the sediment trapping facility.

RECOMMENDED MAINTENANCE AND INSPECTION

- Check inlet and outlet points regularly, especially after heavy storms.

- The inlet should be free of undercutting and no water should pass around the point of entry. Erosion around the pipe drain should be stabilized with erosion control mats, crushed stone, concrete, or other acceptable methods. The headwall should be reinforced with compacted earth or sand bags.
- The outlet point should be free of erosion and installed with appropriate outlet protection.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention, http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu

iSWM, integrated Storm Water Management Design Manual for Construction, December 2003, North Central Texas Council of Governments.

North Carolina State University, (NCSU) North Carolina Nonpoint Source Pollution Control Measures. http://www.water.ncsu.edu/watershedss/info/bmps.html

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

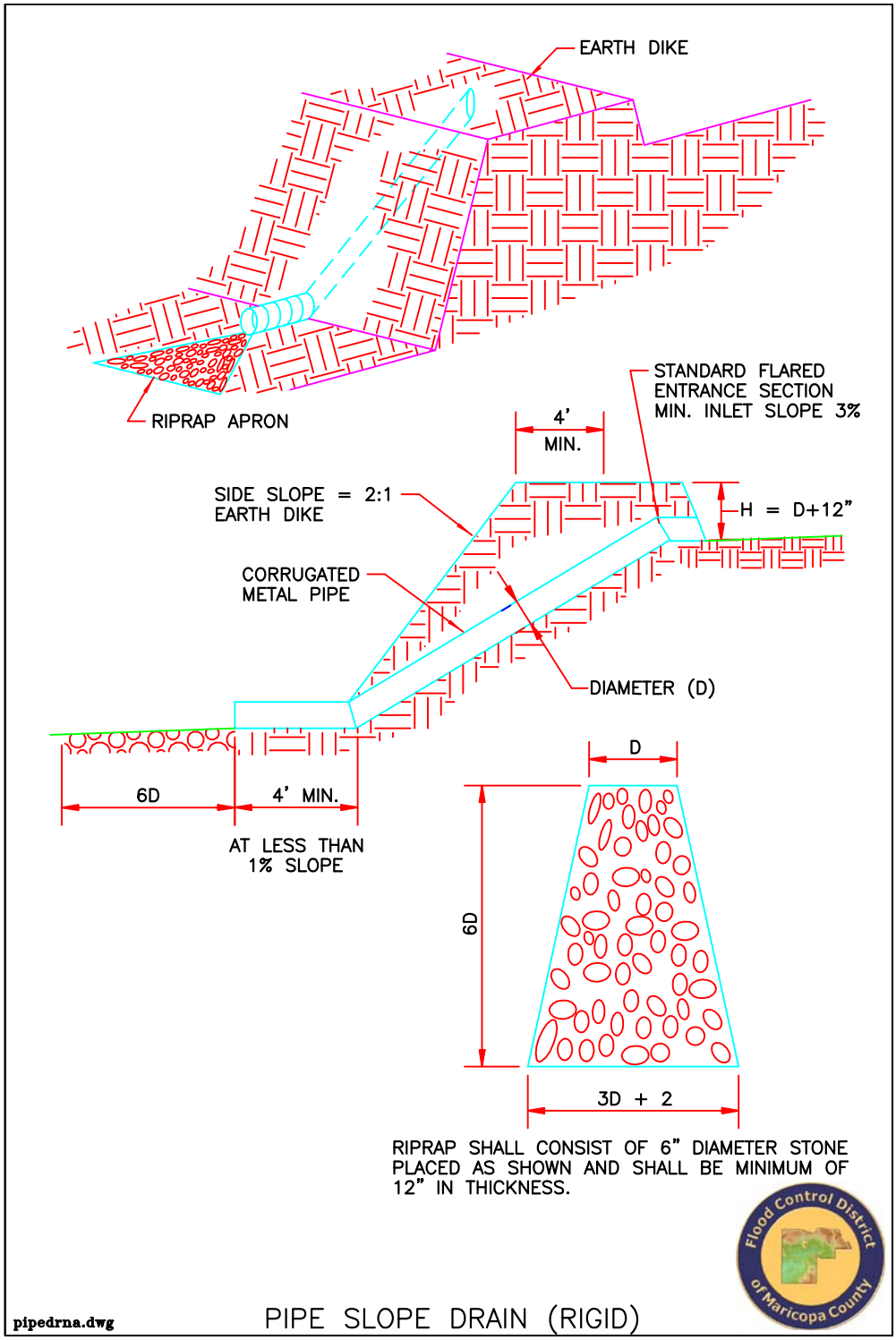
Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15

EC-4 Pipe Slope Drains Photos

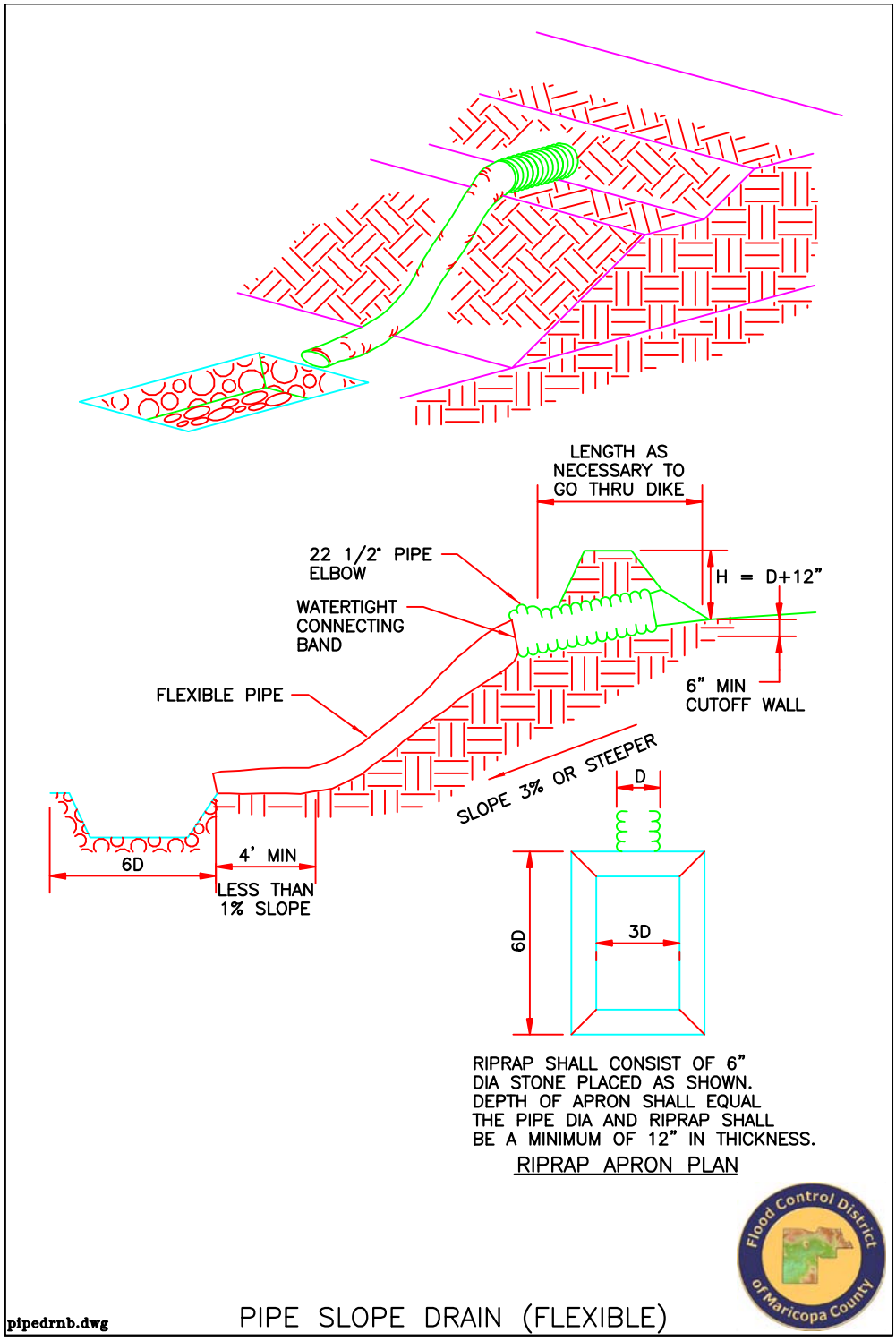
Pipe slope drain with a sediment basin at the bottom

Courtesy of :http://www.cacaponinstitute.org

EC-4 Pipe Slope Drains Drawing (rigid)



EC-4 Pipe Slope Drains Drawing (flexible)



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EC-5 EC-5: Stabilized Construction Entrance

DEFINITION

A hardened surface combined with a stabilized pad of aggregate underlain with filter cloth located where traffic will be entering or exiting a construction site to or from a public right-of-way, street, alley, sidewalk or parking area. For added effectiveness, a wheel wash or wash rack area can be incorporated into the design to further reduce sediment tracking.

GENERAL INFORMATION

Applicability - Effectiveness
Perimeter and Access Controls - high

Most effective when used with:

EC-6 Construction Road Stabilization

EC-7 Dust Control

GH-6 Road Sweeping/Trackout Cleaning

Alternative BMPs:

GH-4 Designated Washdown Areas – wheel wash is especially useful with clay soils.

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation		X	
Maintenance		X	
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material			X
Metals		X	
Other Construction Waste			X

FIGURES

Photos/Sketches

Stabilized Construction Entrance Photos

CAD Drawings

Stabilized Construction Entrance Drawing

PURPOSE

Stabilized construction entrances reduce or eliminate the tracking of sediment onto public rights-of-ways or streets. Reducing trackout of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drain and production of airborne dust. It also can direct traffic to a single location, reducing the number of disturbed areas on the site and providing traffic control.

APPROPRIATE APPLICATIONS

A stabilized construction entrance should be used at all points of construction ingress and egress. Use at construction sites:

- Where dirt of mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where clayey or silty soils are encountered.
- Where dust is a problem during dry weather conditions.

AZPDES/NDPES permits and Maricopa County dust control regulations require that appropriate measures are implemented to prevent trackout of sediments onto paved roadways.

LIMITATIONS

Stabilized construction entrances may not be completely effective against preventing the deposition of sediments onto paved surfaces. To further reduce the chance of these sediments polluting stormwater runoff, sweeping of the paved area adjacent to the stabilized site entrance is recommended.

PLANNING CONSIDERATIONS

Limit points of entrance/exit to only stabilized locations.

Stabilized construction entrances are most effect when used in conjunction with EC-6: Construction Road Stabilization, EC-7: Dust Control, and GH-6: Road Sweeping/Trackout Cleaning.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Stabilized construction entrances alone are not very effective in removing sediment from equipment leaving a construction site. Efficiency is greatly increased, though, when a washing rack is included at the point of egress.

Design and Sizing Considerations

The aggregate for stabilized construction entrance aprons should have a nominal diameter of 1 to 3 inches in size, washed, well-graded gravel or crushed rock. The apron dimensions shall follow the requirements of the regulating agency.

- The entrance must be properly graded to prevent runoff from leaving the construction site.
- Install a washrack at ground elevation.
- When wash areas are provided, washing should be done on an area stabilized with crushed stone which drains into a properly constructed sediment trap or basin (pond).
- The dimensions of the temporary hardened surface shall meet the requirements of the regulating agency.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspection interval per regulating agency.
- Replace gravel mat when surface voids are no longer visible. Periodic top dressing with additional stone will be required.
- All sediments deposited on paved roadways must be removed within 24 hours.
- Remove temporary hardened surface, gravel and filter fabric upon completion of construction.

Note: If working on a project that is subject to a Maricopa County Dust Control Permit under Rule 310, follow the permit requirements for Stabilized Construction Entrance design and sizing.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

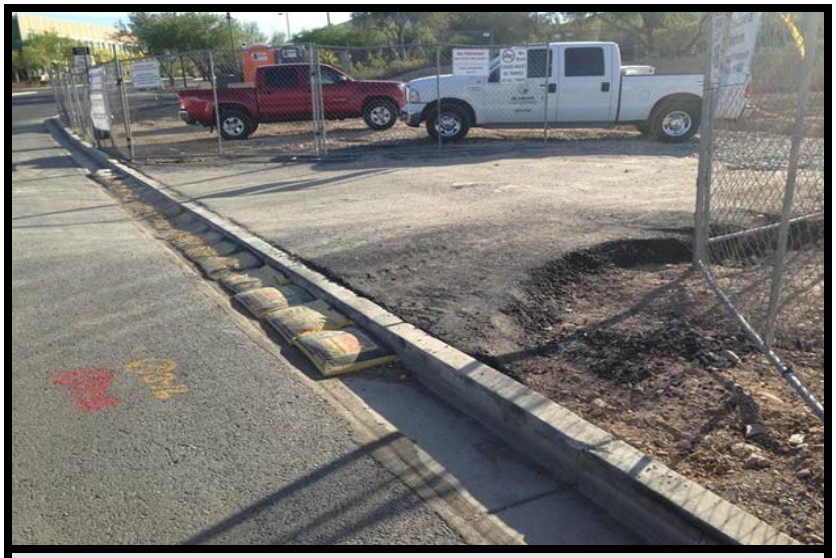
North Carolina State University, (NCSU) North Carolina Nonpoint Source Pollution Control Measures. http://www.water.ncsu.edu/watershedss/info/bmps.html

Center for Watershed Protection, Inc., Stormwater Manager's Resource Center (SMRC). http://www.stormwatercenter.net/

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA,

City of Austin, Texas, March, 2004, Environmental Criteria Manual.

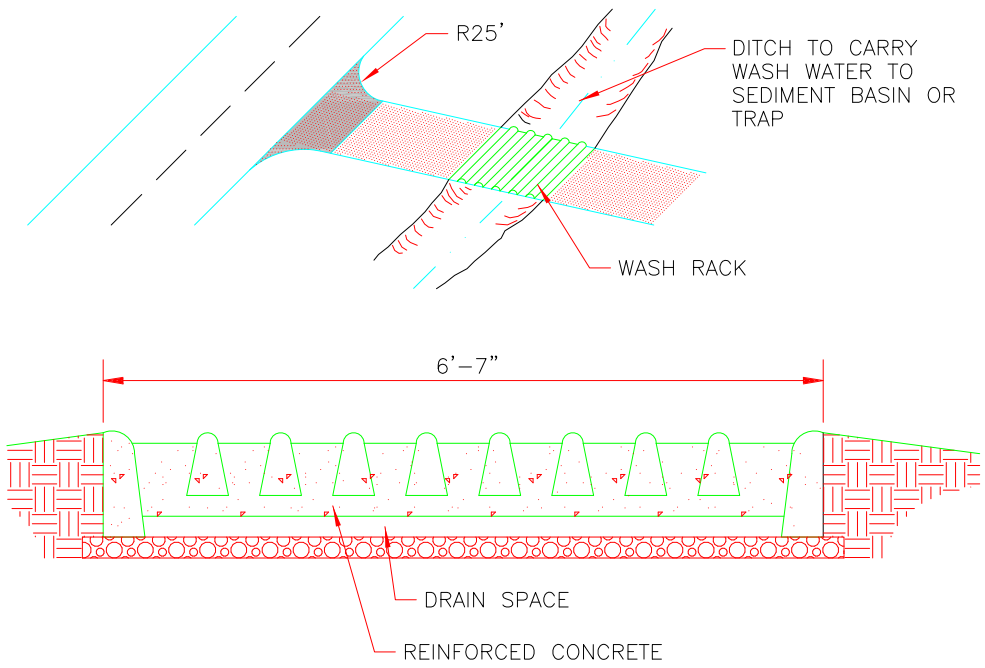
EC-5 Stabilized Construction Entrance Photos



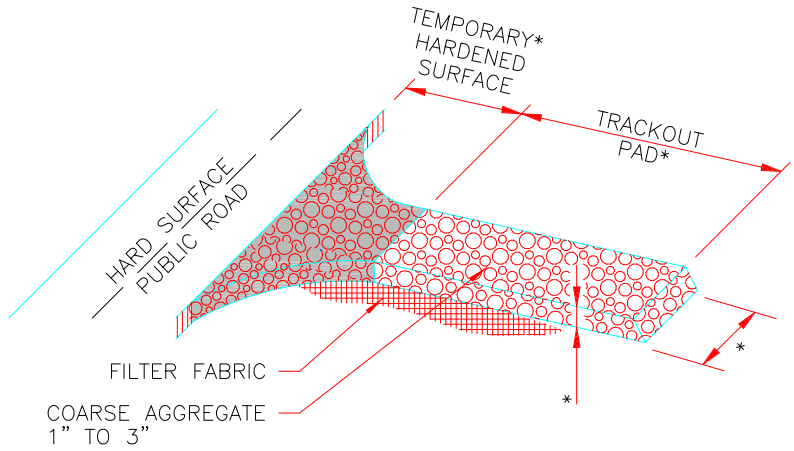
Stabilized entrances should consist of a hardened surface and a bed of course aggregate (not shown)

Another example of a stabilized construction entrance

EC-5 Stabilized Construction Entrance Drawing



WASH RACK



STABILIZED CONSTRUCTION ENTRANCE

*TEMPORARY HARDENED SURFACE AND TRACKOUT PAD DIMENSIONS PER REGULATING AGENCY

EC-6 EC-6: Construction Road Stabilization

DEFINITION

The temporary stabilization of the subgrade, sub-base, and base of access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes for dust and erosion control.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - moderate
Perimeter and Access Controls - high

Most effective when used with:

GH-4 Designated Washdown Areas

EC-5 Stabilized Construction Entrance

EC-7 Dust Control for additional erosion and fugitive dust control.

Alternative BMPs:

For light traffic, dust suppressants in EC-7 Dust Control can be used for topical stabilization

For roadways crossing waterways, use EC-8 Temporary Access Waterway Crossing

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance		X	
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material		X	
Metals		X	
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-6 Construction Road Stabilization Photos

CAD Drawings

None

PURPOSE

Roads graded for construction vehicles are especially susceptible to erosion. The exposed soil surface is continually disturbed resulting in erosion, dust problems, and loss of sediment-laden runoff. During wet weather, the roads may generate significant quantities of sediment that may be transported offsite in surface runoff or on the wheels of construction vehicles. Stabilization helps to increase the compressive strength and durability of access roads. Stabilization also helps limit dust and erosion created by vehicular tracking and creates easier and safer driving conditions for construction vehicles and equipment.

APPROPRIATE APPLICATIONS

- Parking areas (both permanent and temporary) for use by construction traffic
- For phased construction projects where roadways are graded for utility installations, but will not be paved immediately.
- Detour roadways.
- When roadway construction occurs in wet weather.

LIMITATIONS

- Measures on temporary roads must be cheap to install and remove
- Aggregate or chemical stabilization to construction roads may need to be applied more than once during a construction period.
- All unpaved construction roads will generate airborne dust. The contractor should control dust in compliance with the requirements of the Maricopa County Air Quality Division, refer to Dust Control for strategies to control dust including the suite of chemical stabilization methods.

PLANNING CONSIDERATIONS

Construction Road Stabilization can be enhanced when implemented with Designated Wash-down Areas, Stabilized Construction Entrance, and Dust Control.

RECOMMENDED STANDARDS AND SPECIFICATIONS

There are various levels of road stabilization methods in costs and effectiveness. They are described in increasing order:

1. Dust palliative on an untreated/unimproved road.

   Chemical dust suppressants, or palliatives, can also act as road stabilization for light traffic and loading conditions. Refer to Commonly Used Dust Suppressants Table for an overview of these chemical treatments.

2. Gravel surface road consisting of either aggregate or imported gravel.

   Gravel or aggregate will provide additional stabilization to the road surface. A 6-inch layer of crushed rock (2 - 4 inch nominal diameter), gravel base, or crushed surface base course should be applied immediately after grading or utility installation has been completed within the right-of-way. A 4-inch course of aggregate base course may be used in lieu of the crushed rock.

3. Treated base and sub-base.

   The compressive strength of road base and sub-base material can be increased through chemical treatment including cement and lime/fly-ash. Lignosulfonates have also been shown to increase the compressive strength of base and sub-base materials. Road surfaces can also be strengthened using one or more layers of bituminous material (chip seal). Refer to Chapter 3 of the ADOT Construction Manual for exact specifications and requirements.

4. Composite road section design.

   Composite road section design provides the highest level of road stabilization. It also requires the highest level of design and implementation cost, time, and labor). A typical composite road section consists of a compacted native sub-grade soil, followed by a stabilized base course, followed with an unbound base, and finally a wearing surface of asphalt concrete or a Portland cement concrete pavement. Refer to Chapter 4 of the ADOT Construction Manual and/or Chapter 10 of the 2004 MCDOT Roadway Design Manual for exact specifications and requirements.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible and the slope should not exceed 15 percent. Roadways should be carefully graded to drain transversely. Provide drainage swales on each side of the roadway for a normal crown section, or to the downstream side for a super-elevated section. Simple gravel berms without a trench can also be used. Installed drainage inlets should be protected to prevent sediment-laden water entering the drain sewer system (see Storm Drain Inlet Protection BMP).

RECOMMENDED MAINTENANCE AND INSPECTION

Inspect stabilized roads at regular intervals (a minimum of once a month) and on a more frequent basis during rainy seasons. Look for cracks, potholes, and other signs of road surface erosion. Add rock, gravel, or asphalt patches where necessary to prevent any exposed areas to erosion.

POST CONSTRUCTION METHODS

Stabilized roads can be converted to a more permanent form, usually when the base and sub-base has been treated or when a composite road section design has been constructed. Refer to Chapters 3 and 4 of the ADOT Construction Manual and Chapter 10 of the MCDOT Roadway Design Manual.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

NCSU, North Carolina State University, North Carolina Nonpoint Source Pollution Control North Carolina State University, (NCSU) North Carolina Nonpoint Source Pollution Control Measures. http://www.water.ncsu.edu/watershedss/info/bmps.html

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992, Virginia Erosion and Sedimentation Control Handbook, Third Edition.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

EC-6 Construction Road Stabilization Photos

Comparison of a haul road before and after it has been stabilized.

Courtesy of Dust Pro, Inc.

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EC-7 EC-7: Dust Control

DEFINITION

A comprehensive plan to limit offsite sediment depression by minimizing or controlling airborne fugitive dust.

GENERAL INFORMATION

Applicability - Effectiveness
Perimeter and Access Controls - high

Most effective when used with:

EC-5 Stabilized Construction Entrance

EC-6 Construction Road Stabilization

GH-6 Road Sweeping/Trackout Cleaning

Alternative BMPs:

For long term dust control, consider SPC-6 Revegetation

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation			X
Maintenance	X		
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment	X		
Floatable Material			X
Metals		X	
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-7 Dust Control Photos

Tables

Commonly Used Dust Suppressants

PURPOSE

Sediments which are transported from construction sites by stormwater runoff, wind, erosion and vehicle trackout are often re-dispersed to the air by subsequent vehicular traffic and high winds. Likewise, these sediments may be transported by the next rainfall into public storm sewer systems. Implementation of control measures to minimize the generation of fugitive dust from construction sites will reduce particulate matter in the air, which has significant health effects to workers and any nearby residents. There are three methods of dust control: (1) Geotextiles, mats, plastic covers, and other mechanical methods (2) dust palliatives (soil binders), and (3) revegetation.

APPROPRIATE APPLICATIONS

Dust control measures should be applied at the following locations and activities:

- Grading Operations (land clearing and earthmoving)
- Drilling and blasting
- Batch drop operations (loader operation)
- Exposed areas, cleared unstabilized area.
- Vehicle traffic on unpaved surfaces
- Sediment tracking on paved surfaces
- Blasting and wrecking ball operations
- Soil and debris storage piles

The contractor is responsible for complying with the Maricopa County Air Quality regulations. A summary of the basic requirements are as follows:

- Permits require the use of reasonably available dust control measures.
- Enforce visible opacity emission limits to determine compliance.
- Require dust control plans for construction or land clearing projects.
- Enforcement activities with priority given to citizen complaints.
- Require contractors to maintain records.

LIMITATIONS

Dust suppressants have a range of limitations and precautions. Refer to Commonly Used Dust Suppressants Table for limitations of each type of dust suppressant.

- All dust suppressants are temporary in nature and may need reapplication(s) throughout the life of a project.
- Dust suppressants require a minimum curing time until fully effective, as prescribed by the manufacturer, which may be 24 hours or longer. Reapplication may be necessary after a storm event.
- Dust suppressants will generally experience spot failures during heavy rainfall events. If runoff penetrates the soil at the top of a slope treated with a soil binder, the runoff may completely undercut the stabilized soil layer and discharge at a point further down the slope.
- Dust suppressants may not penetrate soil surfaces made up primarily of silt and clay, particularly when compacted.
- Some dust suppressants can be environmentally hazardous, especially if the dust suppressant dissolves in water. Dissolved chemicals can migrate with the runoff or percolate further below the ground surface. For additional information, refer to the EPA document, "Potential Environmental Impacts of Dust Suppressants: Avoiding Another Times Beach", referenced at the end of this BMP.
- Some dust suppressants do not perform well with low relative humidity, while others become slippery or leach out of the soil under heavy precipitation.

PLANNING CONSIDERATIONS

Many of the reasonably available control measures for controlling fugitive dust from construction sites can also be implemented as Best Management Practices for stormwater pollution prevention. Those best management practices include:

- Pave, vegetate, or chemically stabilize access points to paved roads.
- Provide covers for trucks transporting materials that contribute dust.
- Provide for wet suppression or chemical stabilization of exposed soils.
- Provide for rapid cleanup of sediments deposited on paved roads.
- Furnish stabilized construction road entrances and vehicle wash down areas.
- Stabilize unpaved haul roads, parking and staging areas.
- Implement dust control measures for material stockpiles.
- Prevent drainage of sediment-laden stormwater onto paved surfaces.
- Stabilize abandoned construction sites using vegetation or chemical stabilization methods.

- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

RECOMMENDED STANDARDS AND SPECIFICATIONS

There are many products available as dust suppressants for chemicals available and recommendations for their use are summarized in Commonly Used Dust Suppressants Table.

RECOMMENDED MAINTENANCE AND INSPECTION

Dust control is an ongoing process during site construction. Re-application of dust control measure may be necessary until construction is complete.

POST CONSTRUCTION METHODS

Consider Revegetation or emulsion chip seals for more permanent dust control after the construction project has been completed.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction

U.S. Environmental Protection Agency, Nevada May 30-31, 2002, Potential Environmental Impacts of Dust Suppressants: “Avoiding Another Times Beach” An Expert Panel Summary, Las Vegas.

EC-7 Dust Control Photos

Wind blown dust.

EC-7 Dust Control Table

TABLE 5.2
COMMONLY USED DUST SUPPRESSANTS

Types	Functional Mechanism	Advantages	Limitations
Freshwater	Moisture wets particles, thereby increasing their mass and binding them together.	Usually readily available, low material cost, and easy to apply	Frequent light applications may be necessary during hot dry weather and can be labor intensive. Over application may result in loss of traction, erosion, or points of road failure.
Calcium Chloride	At a relative humidity greater than approximately 30% (77 F), the salts within the soil will pull moisture from the air above and retain it in the soil.	Reduces evaporation rate of surface moisture, lowers the freezing point of water, which reduces frost heave and freeze-thaw cycles, thereby reducing required road maintenance. Calcium Chloride also increases the compacted density of existing road base material. Effectiveness is retained after reblading.	Effectiveness in arid and semi-arid regions may be limited due to low relative humidity. It is very corrosive to aluminum alloys and slightly corrosive to steel. Solubility of calcium chloride results in leaching during heavy precipitation. Releases heat when mixed with water.
Magnesium Chloride	At a relative humidity greater than approximately 30% (77° F), the salts within the soil will pull moisture from the air above and retain it in the soil.	Reduces evaporation rate of surface moisture, lowers the freezing point of water, which reduces frost heave and freeze-thaw cycles, thereby reducing required road maintenance. Magnesium Chloride increases the compacted density of existing road base material more than Calcium Chloride. Effectiveness is retained after reblading.	Effectiveness in arid and semi-arid regions may be limited due to low relative humidity. It is very corrosive to aluminum alloys and slightly corrosive to steel. Solubility of calcium chloride results in leaching during heavy precipitation.
Lignin Derivatives	Act as adhesives by binding soil particles together and curing.	Greatly increases dry strength of soil, not humidity-dependent, imparts some plasticity to road surfaces, and lowers freezing point of road surface and base. Effectiveness is retained after reblading.	High solubility results in leaching during heavy precipitation. It is corrosive to aluminum alloys due to acidity ($CaCO_3$ can neutralize the acidity). Proper aggregate mix is important to performance. Becomes slippery when wet and brittle when dry.
Tree Resin Emulsions (tall oil)	Act as adhesives by binding soil particles together and curing.	Low solubility after curing minimizes leaching and provides degree of surface waterproofing. Imparts some plasticity to road surfaces, has a high bonding strength, and is non-corrosive.	Requires proper weather and time to cure. No residual effectiveness after reblading. Equipment requires prompt cleanup to avoid curing of resin in hoses and pipes.
Synthetic Polymer	Bind soil particles together by forming a polymerizing matrix; a function similar to adhesives.	Applicable to a range of emission sources and function well in sandy soil conditions. Some types allow seeded vegetation to grow through the polymer matrix.	Requires proper weather and time to cure. Water repellent. May be subject to UV (sunlight) degradation. Application equipment requires timely cleaning. There is no residual effectiveness after reblading.
Bituments, Tars, and Resins	Asphalt and resinous products are adhesive binding soil particles together. Petroleum oil products coat soil particles, increasing their mass and binding them together.	Water insoluble when dry; provide a degree of surface waterproofing. Good residual effectiveness.	Surface crusting fracturing arid potholing may develop. Long-term application may cause road to become too hard for reblading. Bituments won't lower freezing point and petroleum oil products lack adhesive characteristics.
Cementitious Based Binders	High purity gypsum mixes with water and mulch to form a thin cement-like crust on the soil surface.	Flexible, durable, water permeable, arid resists soil chemicals. Reduces amount of aggregate required during initial construction and has lower maintenance costs than other dust suppressants.	Cementitious based binders are only effective for dust control in non-traffic areas. Instead, consider mixing cementitious based binders with sub-base soils for greater soil strength.

EC-7 Dust Control Table

TABLE 5.2
COMMONLY USED DUST SUPPRESSANTS (CONTINUED)

Types	Ideal Soil Characteristics	Relative Cost Comparison (average life expectancy)	Environmental Considerations
Freshwater	None	Low initial cost, high long-term maintenance cost (0 months)	Minimal environmental hazard. If applied excessively, may result in erosion and sediment runoff. Supply may be limited in some areas and, depending on the source, may require a water right permit.
Calcium Chloride	Plasticity index > 8 10-20 percent fines passing the No. 200 sieve (by weight)	Low initial cost, medium long-term maintenance cost (1-6 months)	Repeated applications and long term use may harm adjacent vegetation (See the manufacturer's product information).
Magnesium Chloride	Plasticity index > 8 10-20 percent fines passing the No. 200 sieve (by weight)	Low initial cost, medium long-term maintenance cost (1-6 months)	Repeated applications and long term use may harm adjacent and nearby vegetation (See the manufacturer's product information).
Lignin Derivatives	Plasticity index > 8 10-30 percent fines passing the No. 200 sieve (by weight)	Medium initial cost, low long-term maintenance cost (3-12 months)	Lignin products have high BOD (biological oxygen demand) in aquatic systems. Spills or runoff into surface or groundwaters may create low dissolved oxygen conditions resulting in fish kills or increases in ground water concentrations of iron, sulfur compounds arid other pollutants. (See the product MSDS for specific information).
Tree Resin Emulsions (tall oil)	Plasticity index < 3 10-20 percent fines passing the No. 200 sieve (by weight)	Medium initial cost, low long-term maintenance cost (1-6 months)	(See the manufacturer's product information)
Synthetic Polymer	Plasticity index < 3 5-20 percent fines passing the No. 200 sieve (by weight)	High initial cost, low long-term maintenance cost (1-3 months)	(See the manufacturer's product information)
Bituments, Tars, and Resins	Plasticity index < 3 <20 percent fines passing the No. 200 sieve (by weight)	High initial cost, high long-term maintenance cost (1-3 months)	Use of used oils prohibited. Some petroleum based products may contain carcinogenic polycyclic aromatic hydrocarbons (PAHs). (See the manufacturer's product information)
Cementitious Based Binders	Depending on the type of cementitious based binder, will work with both high and low plasticity index soils.	Low initial cost, medium long-term maintenance cost (3-6 months)	None

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EC-8 EC-8: Temporary Access Waterway Crossing

DEFINITION

A temporary access stream crossing is a structure placed across a waterway to provide access for construction purposes for a period of less than one year.

GENERAL INFORMATION

Applicability - Effectiveness
Inlet Drain Protection - high
Debris Management, Cleanup, and Washout - high

Most effective when used with:

None

Alternative BMPs:

None

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease		X	
Nutrients			X
Sediment			X
Floatable Material			X
Metals			X
Other Construction Waste		X	

FIGURES

Photos/Sketches

EC-8 Temporary Access Waterway Crossing Photos

CAD Drawings

Temporary Access Culvert

Temporary Access Ford

PURPOSE

The purpose of the temporary access waterway crossing is to provide a safe, pollution free access across a stream. Temporary access waterway crossings are necessary to prevent construction equipment from damaging the stream and tracking sediment and other pollutants into the waterway.

APPROPRIATE APPLICATIONS

Temporary stream crossings are installed at sites:

- Where appropriate permits have been secured (404 Permits and/or 401 Certification).
- Where construction equipment or vehicles need to frequently cross a waterway.
- When alternate access routes that do not cross streams impose significant constraints to the project
- Construction activities will not last longer than one year.

There are two main temporary access waterway crossings that are generally constructed:

- Temporary access culverts - are effective in controlling erosion, easily constructed, and allow for heavy equipment loading.
- Temporary access fords - offer very little sediment and erosion control and are only effective in ephemeral stream channels. Temporary fords are the least expensive waterway crossing, allow for maximum load limits, and require minimal maintenance.

LIMITATIONS

- Temporary access culverts - often require maintenance and can cause erosion if stream flow is restricted. Culverts usually disturb the waterway during installation and removal.
- Temporary access fords - offer little erosion control.
    - May require section 401 and 404 certification of the Clean Water Act prior to installing a temporary access ford.
    - Special care must be taken for all these practices when crossing an environmentally sensitive stream. Oils or other potentially hazardous materials should not be used for surface treatments.

PLANNING CONSIDERATIONS

- Most streams within Maricopa County will be flowing only after moderate to heavy rainfalls. For minor washes, no crossing may be necessary. For larger streams, the contrac-

tor should consider the time of year, construction schedule and construction requirements. For crossing intermittently flowing streams, a shallow access ford or culvert is recommended. Temporary culverts must be sized and installed per the requirements of the Flood Control District of Maricopa County or local municipal stormwater agency.

- Construction in dry streams should be at or near the natural invert of the streambed to prevent flooding upstream of the crossing. Construction in waterways may be subject to additional permit requirements. Contact the Flood Control District of Maricopa County or local municipal stormwater agency for information.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Temporary culverts should be sized and installed per the requirements of the Flood Control District of Maricopa County and the ADOT Construction Manual, Sections 501 and 502.

RECOMMENDED MAINTENANCE AND INSPECTION

- Periodically remove debris behind fords, in culverts, and under bridges.
- Replace protective aggregate from culvert inlets and outlets that were eroded and lost during a storm.
- Remove a temporary crossing promptly when it is no longer needed.
- Check for structural weakening of the temporary crossing, such as cracks, and undermining of foundations and abutments.
- Inspect, at a minimum, weekly and after each significant rainfall. The inspection should include:
    - Checking for blockage in the channel, debris buildup in culverts or fords, and under bridges or trapped debris.
    - Checking for erosion of abutments, channel scour, riprap displacement, or piping in the soil.

POST CONSTRUCTION METHODS

Fords are only temporary waterway crossings and the stream must be returned to the original natural state as it was prior to construction. Temporary access culverts may remain permanent, per the requirements of the Flood Control District of Maricopa County and the ADOT Construction Manual, Sections 501 and 502.

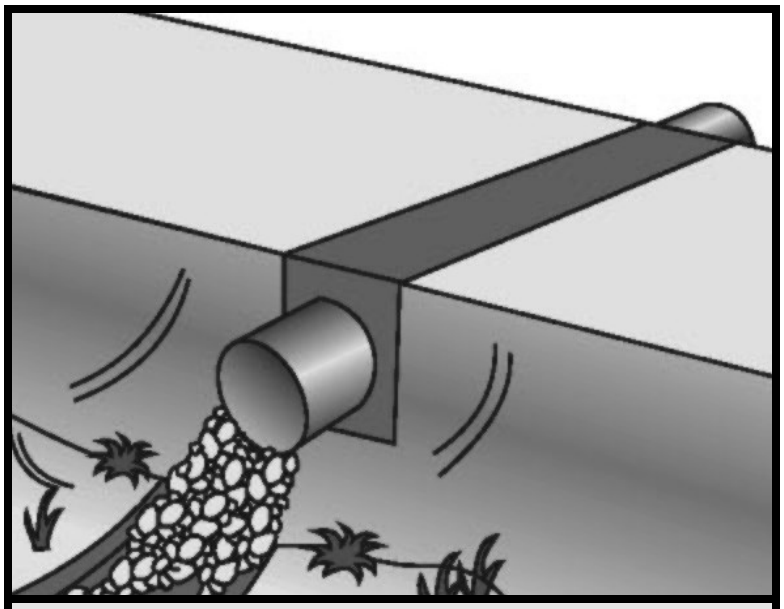
REFERENCES

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Carolina Department of Transportation, August 2003, Best Management Practices for Construction and Maintenance Activities, Chapter 5.0 “Operation Best Management Practices”, http://www.doh.dot.state.nc.us/operations/BMP_manual/

EC-8 Temporary Access Waterway Crossing Photos



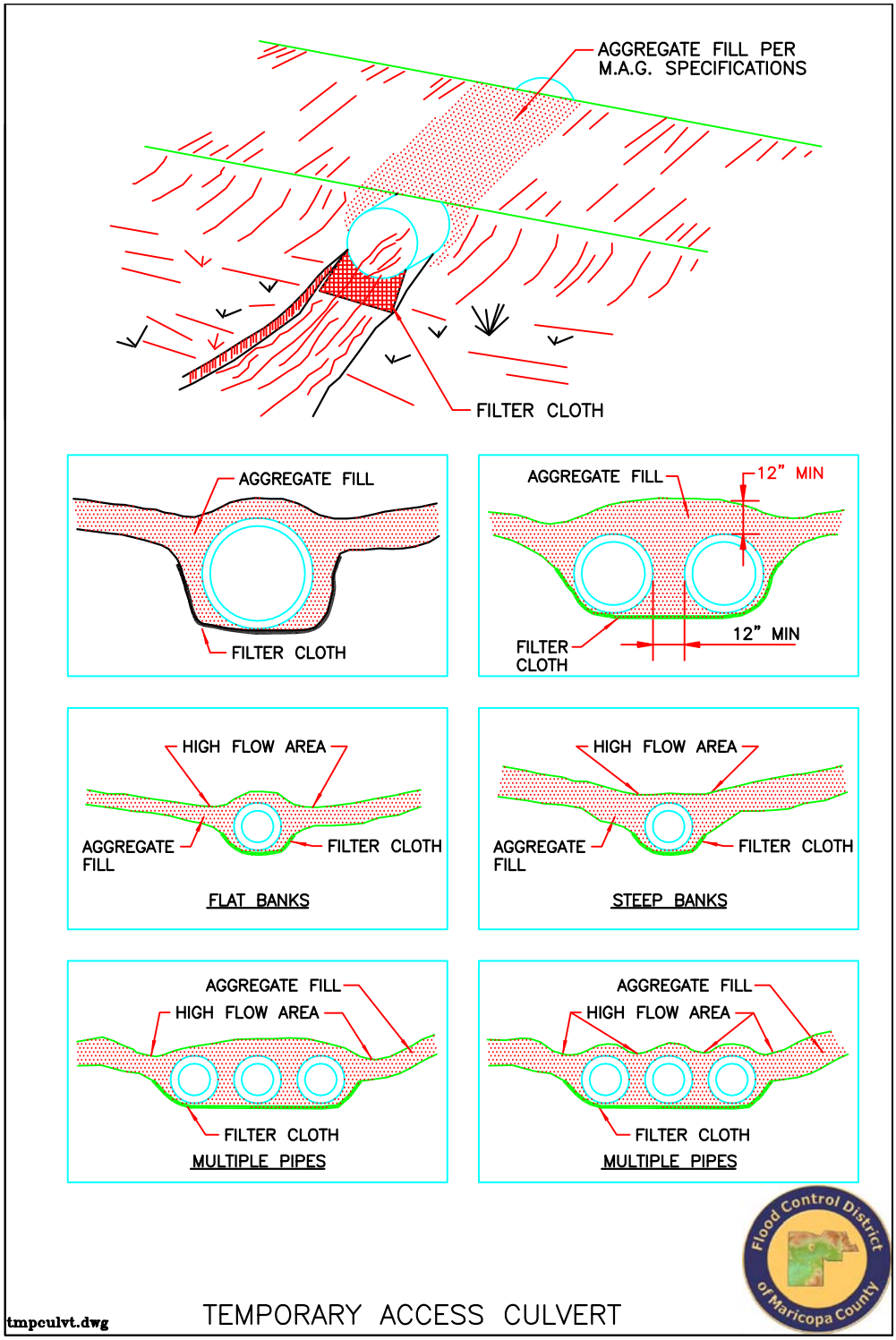
Schematic of a temporary access culvert.

Courtesy of CALTRANS

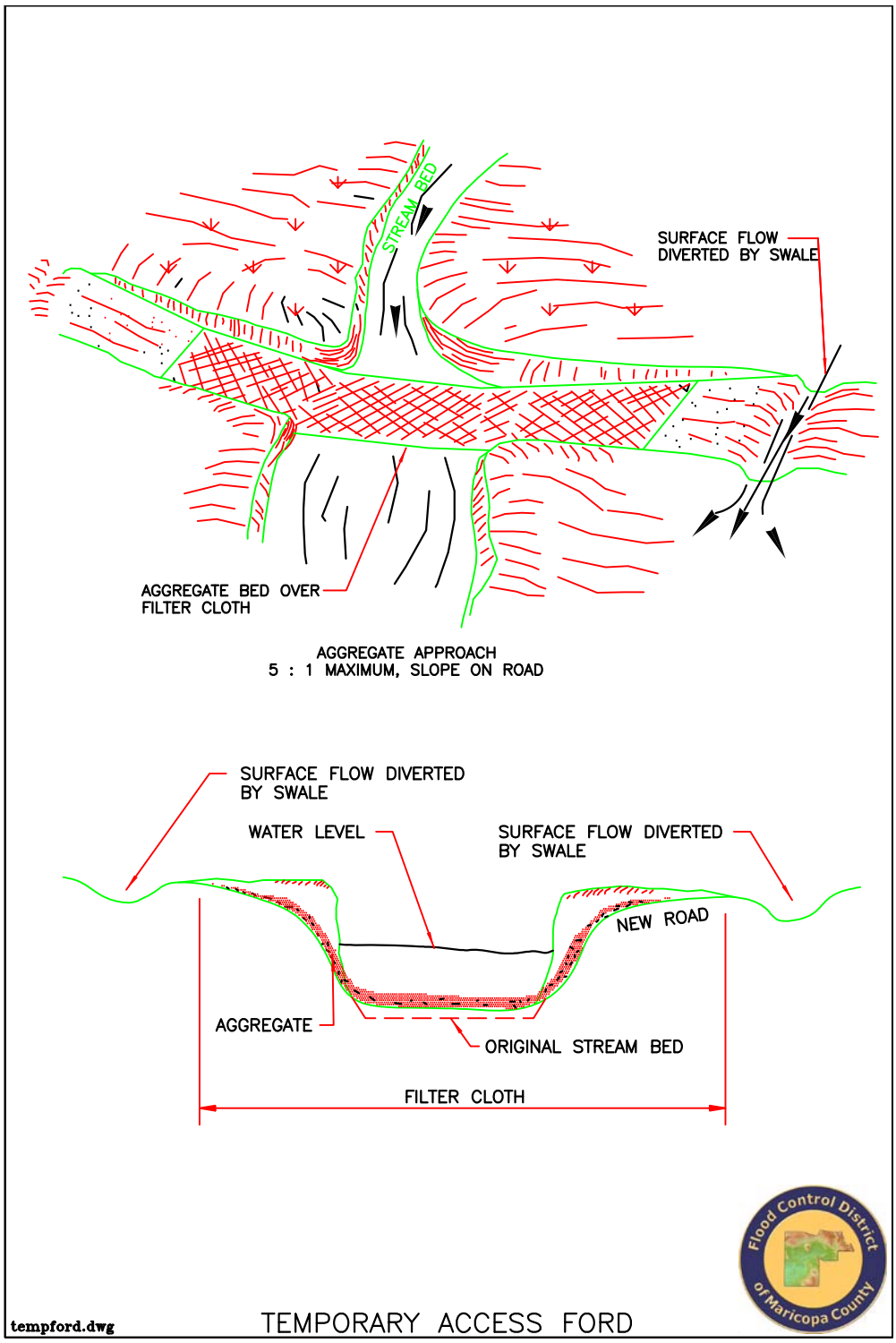
Temporary access culvert.

Courtesy of NCDOT

EC-8 Temporary Access Waterway Crossing Drawing



EC-8 Temporary Access Waterway Crossing Drawing



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EC-9 EC-9: Diversion Dikes

DEFINITION

A ridge of compacted soil (recommended with a vegetated lining) that is often located at the top or base of a sloping disturbed area, and redirects runoff to a less sensitive outfall or area.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - high
Excavated areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high

Most effective when used with:

EC-1 Erosion Control Mats to help reduce erosion along the dike.

EC-4 Pipe Slope Drains to provide additional control if flow cannot be completely routed around the disturbed area.

Alternative BMPs:

For a less expensive, temporary control, consider SPC-2 Sand Bag Barrier

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material		X	
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-9 Diversion Dikes Photos

CAD Drawings

Diversion Dikes

PURPOSE

Depending on the location and topography, diversion dikes can achieve two different goals:

- Located on the upslope of a site, they can prevent surface sheet flow runoff from entering a disturbed construction site.
- Located on the downslope of a site, they can divert sediment-laden runoff created onsite to sediment trapping devices, preventing soil loss from the disturbed area.

APPROPRIATE APPLICATIONS

Diversion dikes may be used to:

- Intercept and divert runoff to avoid sheet flow over sloped surfaces.
- Divert and direct runoff towards a stabilized watercourse, drainage pipe or channel.
- Intercept runoff from paved surfaces.

Diversion dikes may be installed:

- Below steep grades where runoff begins to concentrate.
- Along roadways and facility improvements subject to flood drainage.
- At the top of slopes to divert runon from adjacent or undisturbed slopes.
- At bottom and mid-slope locations to intercept sheet flow and convey concentrated flows.

LIMITATIONS

- Limit to upstream drainage areas of 10 acres or less and for slopes less than 5 percent. For larger areas more permanent structures should be built.
- All structures should be in compliance with hydraulic design standards set by the local municipality or Flood Control District of Maricopa County.
- Earth dikes may create more disturbed area on site and become barriers to construction equipment.
- Earth dikes must be stabilized immediately which increases maintenance and installation costs.
- Diverted stormwater flow may cause flood damage to adjacent areas.
- Diversion dikes are not suitable as sediment trapping devices.

- The concentrated runoff in a channel or ditch has increased erosion potential. To alleviate this erosion capability, diversion dikes must be used in conjunction with sediment trapping devices, soil stabilization, and sediment controls.

PLANNING CONSIDERATIONS

Several considerations must be made before installing diversion dikes. Diversion dikes can either be installed temporarily or as a permanent structure:

Temporary diversion dikes are generally made up of earth material. Earth dikes are advantageous because they can handle flows from large drainage areas, are relatively inexpensive and easy to install, use onsite materials, and once stabilized, earth dikes require little maintenance. However, earth dikes, alone, do not control erosion or remove sediment from runoff. Rather, they direct runoff to erosion control devices such as Temporary Sediment Basins or Temporary Sediment Traps, or away from an erodible surface. Temporary diversion dikes should not adversely impact adjacent properties and must conform to local floodplain management regulations.

For large flows, earth dikes can begin to erode and further contribute to the sediment loading in the runoff. Stone, recycled concrete, rip-rap, or filter cloth can be used to temporarily stabilize a diversion dike (see Recommended Standards and specifications below).

Consider using Erosion Control Mats and Pipe Slope Drains in conjunction with a Sand Bag Barrier for additional erosion control and stabilization.

RECOMMENDED STANDARDS AND SPECIFICATIONS

- All dikes should be compacted by earth-moving equipment.
- All dikes should have positive drainage to an outlet.
- Top width may be wider and side slopes may be flatter if desired to facilitate crossing by construction traffic.
- Runoff should be conveyed to a sediment trapping device such as a sediment trap or sediment basin when either the dike channel or the drainage area above the dike are not adequately stabilized.
- Temporary stabilization, when necessary, should be as scheduled below:
    - Stone or recycled concrete equivalent, should be applied in a layer at least 8 inches in thickness and be pressed into the soil with construction equipment.
    - Rip-rap should be applied in a layer at least two times the D50 and pressed into the soil.
    - Approved equivalents can be substituted for any of the above materials.

- Filter cloth and erosion control mats may be used for dikes in use for long periods.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect temporary measures prior to the rainy season, after rainfall events, and regularly during the rainy season.
- Inspect ditches and berms for washouts. Replace lost riprap, damaged linings or soil stabilizers as needed.

POST CONSTRUCTION METHODS

By providing a vegetated cover to the diversion dike, the dike can become a permanent structure.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

North Carolina Department of Transportation, August 2003, Best Management Practices for Construction and Maintenance Activities, Chapter 5.0 “Operation Best Management Practices”, http://www.doh.dot.state.nc.us/operations/BMP_manual/

Center for Watershed Protection, Inc., Stormwater Manager’s Resource Center (SMRC). http://www.stormwatercenter.net/

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

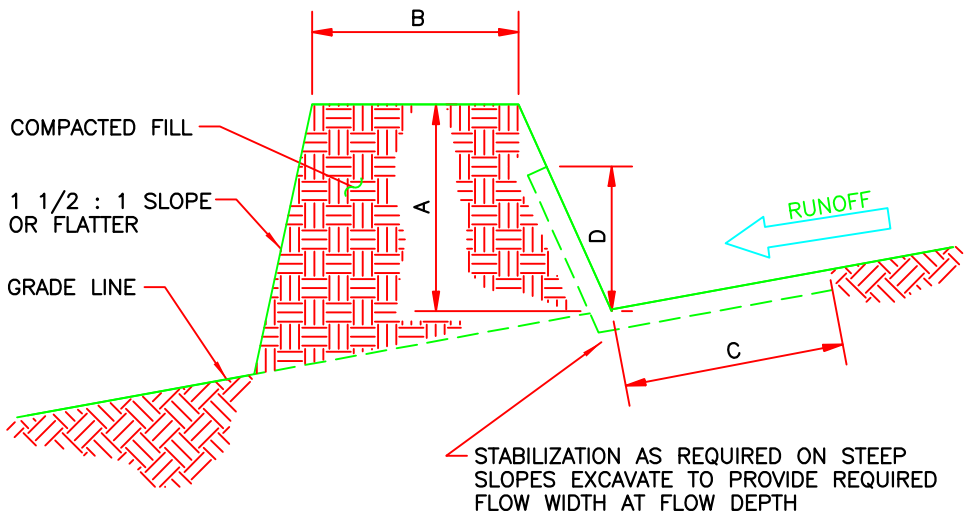
EC-9 Diversion Dikes Photos

A temporary diversion dike can be stabilized with straw mulching.

Courtesy of Douglas County

Permanent diversion dikes can be constructed of grouted riprap and vegetated.

EC-9 Diversion Dikes Drawing



REQUIREMENTS BASED ON UPSTREAM DRAINAGE AREA

	DIKE 1 (5 ACRES OR LESS)	DIKE 2 (5–10 ACRES)
A–DIKE HEIGHT	18"	36"
B–DIKE WIDTH	24"	36"
C–FLOW WIDTH	4'	6'
D–FLOW DEPTH	8"	15"

tmpdike.dwg

EC-10 EC-10: Drainage Swales

DEFINITION

A drainage way with a lining of grass, stone, asphalt, concrete, or other material. Permanent channels must be designed and constructed in accordance with appropriate local design standards.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - high
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high
Channels and Medians - high

Most effective when used with:

EC-11 Outlet Protection, Velocity Dissipation Devices

EC-1 Erosion Control Mats

SPC-4 Check Dams

All of the above provide erosion control for higher flows.

Alternative BMPs:

EC-9 Diversion Dikes

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation	X		
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment	X		
Floatable Material			X
Metals		X	
Other Construction Waste		X	

FIGURES

Photos/Sketches

Drainage Swales Photos

CAD Drawings

Drainage Swales Drawing

PURPOSE

Drainage swales are used as perimeter controls or slope protection to convey runoff without causing erosion by intercepting runoff from above unprotected slopes or at the perimeter and directing the runoff to a sediment trapping device or stabilized outlet. Depending on the design of the drainage swale, different objectives can be achieved. A meandering or winding swale with vegetation helps to reduce flow velocities and reduce suspended sediments. A straight, lined swale provides the maximum conveyance of drainage flows.

APPROPRIATE APPLICATIONS

Drainage swales and lined ditches may be used to:

- Convey surface runoff down sloping land.
- Intercept and divert runoff to avoid sheet flow over sloped surfaces.
- Divert and direct runoff towards a stabilized watercourse, drainage pipe or treatment facility.
- Intercept runoff from paved surfaces.

Drainage swales and lined ditches may be used:

- Below steep grades where runoff begins to concentrate.
- Along roadways and facility improvements subject to flood drainage.
- At the top of slopes to divert runon from adjacent or undisturbed slopes.
- At bottom and mid-slope locations to intercept sheet flow and convey concentrated flows.

LIMITATIONS

- Temporary drainage swales or any diversion of runoff should not adversely impact upstream or downstream properties and must conform to local floodplain management regulations.
- Constructing the proper swale to handle the desired runoff flows often requires engineering design work which can be costly.
- Swales can be expensive to construct if a liner is required.
- Interceptor swales must be stabilized quickly upon excavation in order not to contribute further to the sediment loading.

PLANNING CONSIDERATIONS

Consider using Outlet Protection, Velocity Dissipation Devices, Erosion Control Mats, and Check Dams in conjunction with Drainage Swales to provide erosion control for higher flow rates.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Once the proper geometry and lining is used in a drainage swale, large volumes of flows can be effectively conveyed and/or treated with little maintenance. Velocity dissipation devices should be installed at the beginning or end of the swale to prevent erosion or scour.

Design and Sizing Criteria

The Hydraulics Manual of the Flood Control District of Maricopa County will be used for all appropriate design criteria. In addition:

1. All temporary swales should have uninterrupted grade to an outlet.
2. Diverted runoff from a disturbed area should be conveyed to a sediment trapping device.
3. Diverted runoff from an undisturbed area should outlet directly into an undisturbed stabilized area at non-erosive velocity.
4. All trees, brush, stumps, and obstructions, may need to be removed and disposed of so as not to interfere with the proper functioning of the swale, but can remain for sediment filtration.
5. The swale should be excavated or shaped to line, grade, and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fills should be compacted by earth moving equipment.
7. All earth removed and not needed on construction should be placed so that it will not interfere with the functioning of the swale.
8. For flow velocities up to 4 feet per second, use vegetation. For flow velocities less than 4 feet per second, apply a vegetated cover to the channel. For velocities greater than 4 feet per second, consult the table below.

Flow Stabilization

Type of Treatment	Channel Grade%	Average Diameter of Rock: Drainage Area <5 acres	Average Diameter of Rock: 5-10 acres
1	0.5 - 1.0	4” Rock	4” Rock
2	1.1 - 2.0	6” Rock	6” Rock
3	2.1 - 3.0	8” Rock	Rip-Rap 6”-12”
4	3.1 - 5.0	8”-12” Rip-Rap	Engineered

Note: Refer to the drainage swale CAD drawing file for specified dimensions.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect temporary measures prior to the rainy season, after rainfall events, and regularly during the rainy season.
- Inspect ditches and berms for washouts. Replace lost riprap, damaged linings or soil stabilizers as needed.
- Inspect channel linings, embankments, and beds of ditches and berms for erosion and accumulation of debris and sediment. Remove debris and sediment, and repair linings and embankments as needed.
- Temporary conveyances should be completely removed as soon as the surrounding drainage area has been stabilized, or at the completion of construction.

POST CONSTRUCTION METHODS

By providing a vegetated cover to the diversion swale, the swale can become a permanent structure.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff

Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

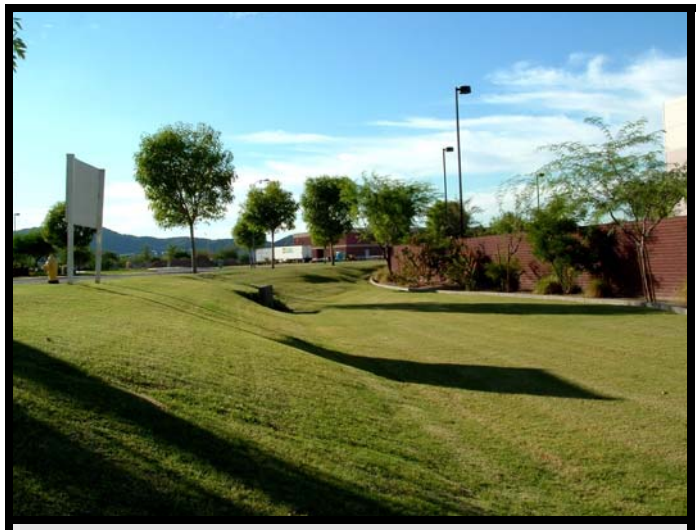
Center for Watershed Protection, Inc., Stormwater Manager's Resource Center (SMRC). http://www.stormwatercenter.net/

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

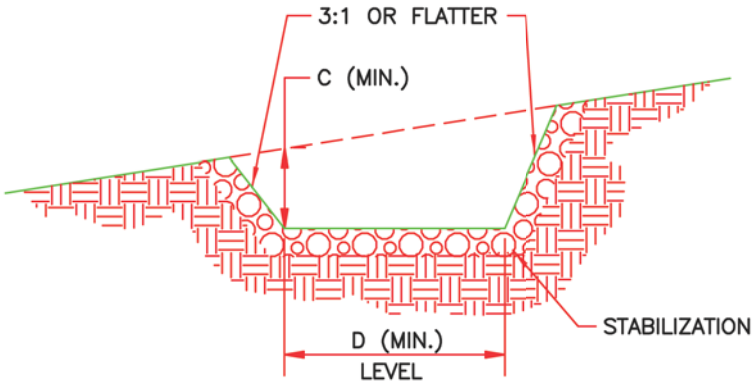
EC-10 Drainage Swales Photos

When possible, leave existing vegetation in the drainage swale for added velocity reduction.



Permanent drainage swales are often vegetated.

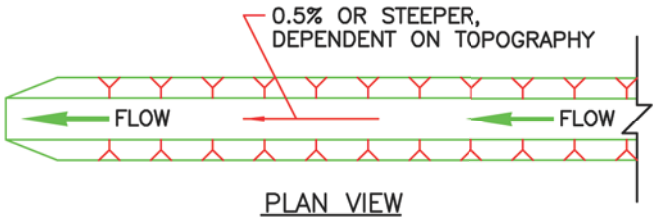
EC-10 Drainage Swales Drawing



	SWALE A	SWALE B
C	1'	1'
D	4'	6'

Watershed Application:
Swale A: 5 acres or less
Swale B: 5-10 acres

CROSS SECTION VIEW



PLAN VIEW

tmpswale.dwg

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EC-11 EC-11: Outlet Protection, Velocity Dissipation Devices

DEFINITION

Structures and devices placed at pipe outlets to prevent scour and reduce the velocity and/or energy of stormwater flows. These structures may include a section of rock, grouted riprap, and concrete rubble placed at the outlet end of culverts, conduits, or channels. Various products can also be installed for velocity reduction including hydrobrakes, vortex valves, and drop shafts.

GENERAL INFORMATION
Applicability - Effectiveness Perimeter and Access Controls - high
Most effective when used with: None
Alternative BMPs: None

RATINGS			
Associated Costs	**H**	**M**	**L**
Implementation	X		
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment	X		
Floatable Material			X
Metals			X
Other Construction Waste			X

FIGURES
Photos/Sketches EC-11 Outlet Protection, Velocity Dissipation Devices Photos **CAD Drawings** Pipe Outlet Conditions

PURPOSE

Outlet protection and velocity dissipation reduces the velocity and energy of the runoff water, thereby preventing the flow from eroding the receiving downstream reach.

APPROPRIATE APPLICATIONS

Outlet protection and velocity dissipation can be used at the following locations:

- Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits or channels.
- Outlets located at the bottom of mild to steep slopes.
- Discharge outlets that carry continuous flows of water.
- Outlets subject to short, intense flows of water, such as flash floods.
- Points where lined conveyances discharge to unlined conveyances.

Note: Rock outlet protection is usually less expensive and easier to install than concrete aprons or other energy dissipators.

LIMITATIONS

- Rock outlet protection may need continual maintenance because large storms often wash away the stone and leave the area susceptible to erosion.
- Loose rock may have stones washed away during high flows.
- Grouted riprap may break up in areas of freeze and thaw.
- If there is not adequate drainage, and water builds up behind grouted riprap, it may cause the grouted riprap to break up due to the resulting hydrostatic pressure.

PLANNING CONSIDERATIONS

Rock outlet protection is effective when the rock is sized and placed properly. When this is accomplished, rock outlets do much to limit erosion at pipe outlets. If runoff is sediment-laden, a sediment trap below the pipe outlet is recommended.

Permanent rock riprap protection should be designed and sized by the engineer as part of the culvert, conduit or channel design.

RECOMMENDED STANDARDS AND SPECIFICATIONS

General recommendations for rock size and length of outlet protection mat are shown in the CAD drawing figure.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect temporary measures prior to the rainy season, after rainfall events, and regularly during the rainy season.
- Inspect apron for displacement of the riprap and/or damage to the underlying fabric. Repair fabric and replace riprap that has washed away.
- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes or underlying filter fabric immediately.
- Temporary devices should be completely removed as soon as the surrounding drainage area has been stabilized, or at the completion of construction.

POST CONSTRUCTION METHODS

Rock outlet protection and other velocity dissipation devices can remain after the construction project for long term erosion protection. However, the design engineer should consult with the local municipality or the Flood Control District of Maricopa County for specific requirements of permanent outlet protection.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

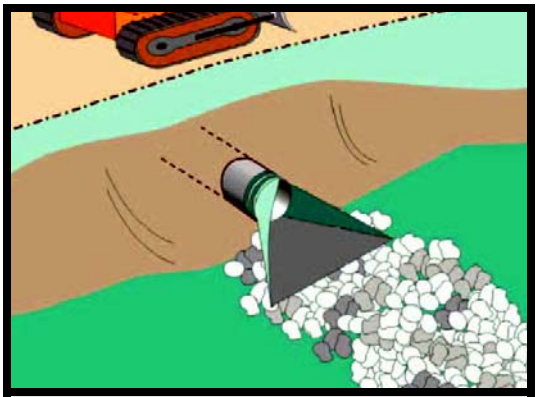
North Carolina State University, (NCSU) North Carolina Nonpoint Source Pollution Control Measures. http://www.water.ncsu.edu/watershedss/info/bmps.html

City of Austin, Texas, March, 2004, Environmental Criteria Manual.

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992, Virginia Erosion and Sedimentation Control Handbook, Third Edition.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

EC-11 Outlet Protection, Velocity Dissipation Devices Photos

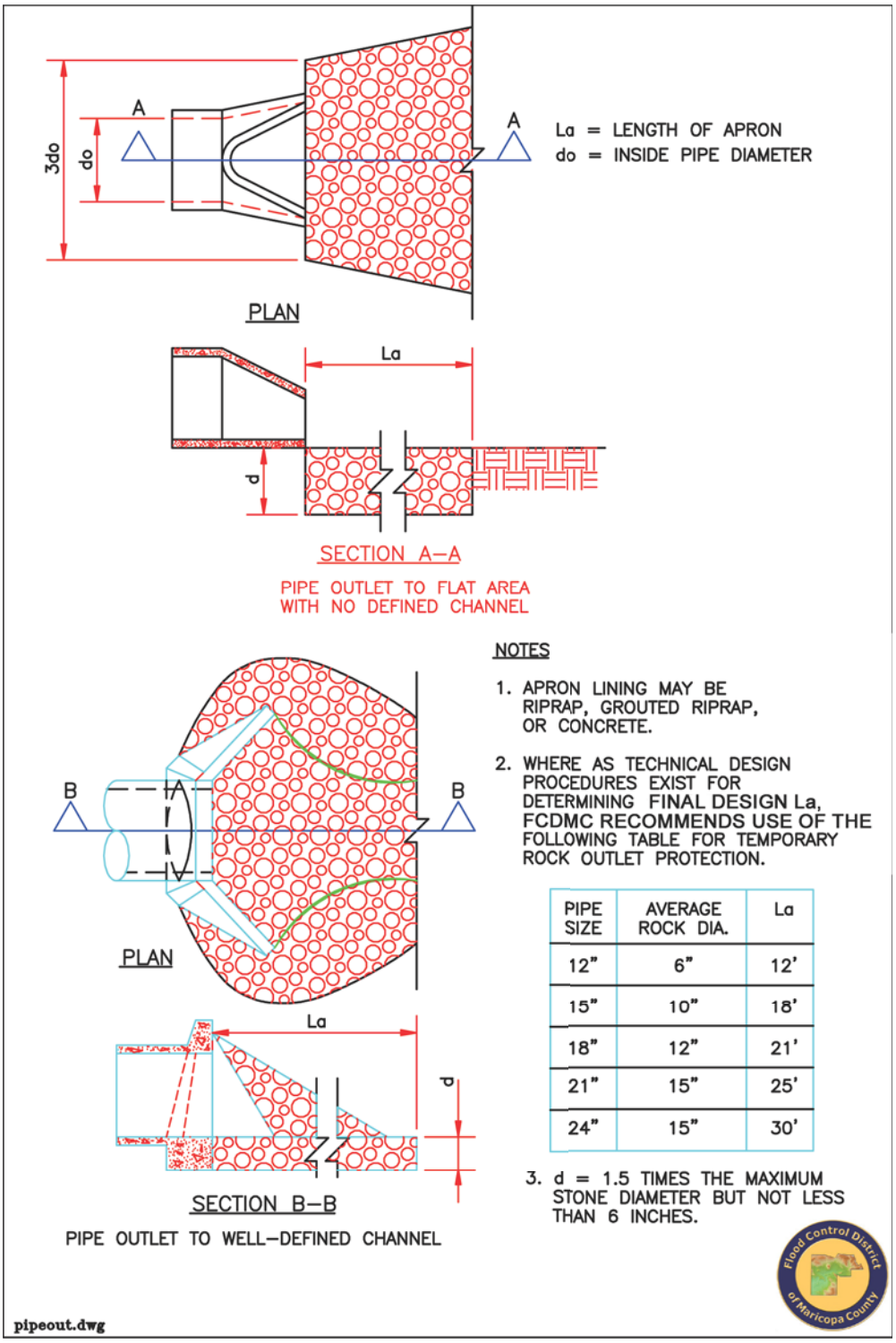


Schematic of culvert outlet protection.

Courtesy of CALTRANS

Drainage outlet protection to the shoulder of a highway.

EC-11 Outlet Protection, Velocity Dissipation Devices Drawing



PIPE SIZE	AVERAGE ROCK DIA.	La
12"	6"	12'
15"	10"	18'
18"	12"	21'
21"	15"	25'
24"	15"	30'

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EC-12 EC-12: Surface Roughening

DEFINITION

A temporary erosion control practice often used in conjunction with grading. Soil roughening involves increasing the relief of a bare soil surface with horizontal grooves, stair-stepping (running parallel to the contour of the land), or tracking using construction equipment. Slopes that are not fine graded and that are left in a roughened condition can also reduce erosion.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - moderate

Most effective when used with:

EC-2 Mulching to establish vegetation

EC-9 Diversion Dikes to divert flow away from the slope

Alternative BMPs:

For inaccessible slopes/areas, use EC-1 Erosion Control Mats

For slopes or loose soils, use EC-4 Pipe Slope Drains

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment	X		
Floatable Material			X
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

EC-12 Surface Roughening Photos

CAD Drawings

Stair-Stepping Cut Slopes and Grooving Slopes

PURPOSE

Soil roughening reduces runoff velocity, increases infiltration, reduces erosion, traps sediment, and prepares the soil for seeding and planting by giving seed an opportunity to take hold and grow.

APPROPRIATE APPLICATIONS

Soil roughening is appropriate for slopes up to 3:1 or higher than 5 vertical feet, on piles of excavated soil, and in areas with highly erodible soils. This technique is especially appropriate for soils that are frequently mowed or disturbed because roughening is relatively easy to accomplish. To slow erosion, roughening should be done as soon as possible after the vegetation has been removed from the slope. Roughening can be used with both seeding and planting and temporary mulching to stabilize an area. For steeper slopes and slopes that will be left roughened for longer periods of time, a combination of surface roughening and vegetation is appropriate. Alternatively consider terracing along steep slopes. Roughening should be performed immediately after grading activities have ceased (temporarily or permanently) in an area.

LIMITATIONS

- Soil roughening is not appropriate for rocky slopes.
- Soil compaction might occur when roughening with tracked machinery.
- Soil roughening is of limited effectiveness in anything more than a gentle or shallow depth rain.
- If roughening is washed away in a heavy storm, the surface will have to be re-roughened and re-seeded or revegetated.

PLANNING CONSIDERATIONS

Graded areas with smooth, hard surfaces give a false impression of "finished grading" and a job well done. It is difficult to establish vegetation on such surfaces due to reduced water infiltration and the potential for erosion. Rough slope surfaces with uneven soil and rocks left in place may appear unattractive or unfinished at first, but they encourage water infiltration, speed the establishment of vegetation, and decreased runoff velocity.

Rough, loose soil surfaces give lime, fertilizer, and seed some natural coverage. Niches in the surface provide microclimates which generally provide a cooler and more favorable moisture level than hard flat surfaces; this aids seed germination.

There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-

step grading, grooving, and tracking. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

1. Disturbed areas which will not require mowing may be stair-step graded, grooved, or left rough after filling.
2. Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material which sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment.
3. Areas which will be mowed should have slopes less than 3:1 and may have small furrows left by discing, harrowing, raking, or seed-planting machinery operated on the contour.
4. It is important to avoid excessive compacting of the soil surface when scarifying. Tracking with bulldozer treads is preferable to not roughening at all, but is not as effective as other forms of roughening, as the soil surface is severely compacted and runoff is increased.

For longer slopes or where heavy equipment cannot operate, consider using Erosion Control Mats, and Pipe Slope Drains. Surface roughening is most effective when used with Mulching to establish vegetation or Diversion Dikes to divert flow away from the slope.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Graded areas with slopes greater than 3:1 but less than 2:1 should be roughened before seeding. This can be accomplished in a variety of ways, including "track walking," or driving a crawler tractor up and down the slope, in leaving a pattern of cleat imprints parallel to slope contours.

Graded areas steeper than 2:1 should be stair-stepped with benches as shown in the CAD drawing. The stair-stepping will help vegetation become established and also trap soil eroded from the slopes above. As slopes become steeper, benches can be widened to terraces.

RECOMMENDED MAINTENANCE AND INSPECTION

Areas need to be inspected after storms, since roughening might need to be repeated. Regular inspection of roughened slopes will indicate where additional erosion and sediment control measures are needed. If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be filled, graded again, and reseeded immediately. Proper dust control methods should be used.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

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North Carolina State University, (NCSU) North Carolina Nonpoint Source Pollution Control Measures. Measures. http://www.water.ncsu.edu/watershedss/info/bmps.html

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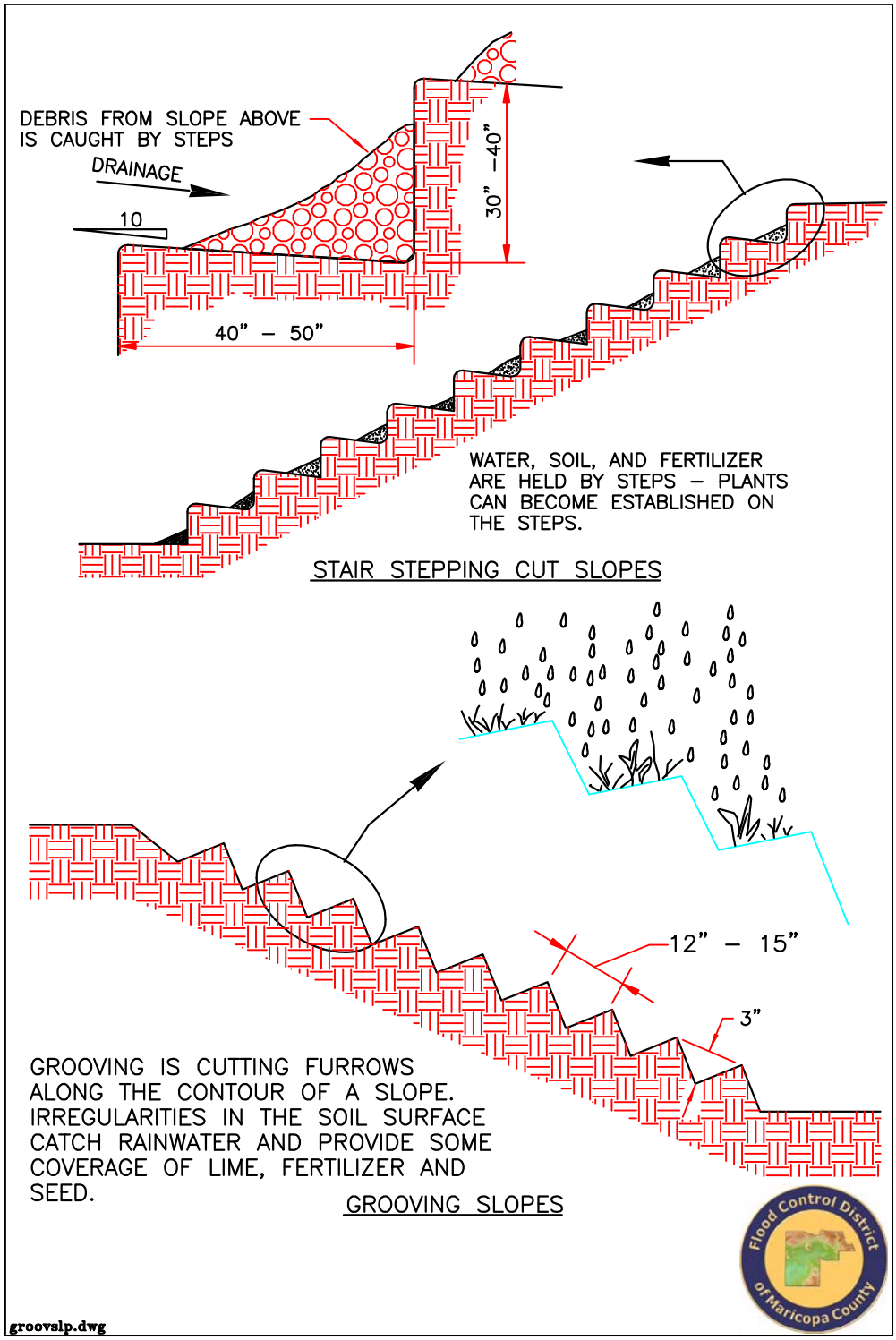
EC-12 Surface Roughening Photos

Creating a roughened soil surface can reduce runoff velocities and increase infiltration.

Courtesy of Douglas County

EC-12 Surface Roughening Drawing



SPC: Sediment and Pollutant Control

Sediment and pollutant control includes methods for separating and containing suspended sediment and other construction related pollutants from the stormwater before the water leaves the project site and enters a storm drain inlet or a receiving natural water body. These methods involve constructing organic, sand, and rock barriers to filter sediment-laden runoff, protecting storm drain inlets, and constructing settling ponds. If a pre-manufactured product is to be implemented on a site for sediment or pollutant control, the contractor should always follow the manufacturer's installation and maintenance recommendations as the primary reference for implementation.

SPC-1 Organic Filter Barrier

SPC-2 Sand Bag Barrier

SPC-3 Gravel Filter Berms

SPC-4 Check Dams

SPC-5 Silt Fence

SPC-6 Revegetation

SPC-7 Storm Drain Inlet Protection

SPC-8 Temporary Sediment Basins

SPC-9 Temporary Sediment Traps

SPC-10 Sediment Dewatering Operations

VENDOR PRODUCTS

The *Stormwater Pollution Prevention Vendor Registration Application* (SPPVRA) hosted by the Flood Control District of Maricopa County can be used access vendor products. The primary purpose of this application is to allow vendors to register stormwater-related products they consider to be best management practices (BMPs) and it allows the public to browse products that could assist them with their stormwater pollution prevention needs. This application can be accessed at: http://www.fcd.maricopa.gov/Waterq/webVendors/default.asp

Disclaimer

Any hyperlinks in the vendor products application or this chapter will direct you out of the Flood Control District of Maricopa County (FCDMC) domain. FCDMC is providing the following vendor information for possible assistance to any interested parties, but does not necessarily endorse any of the information or products provided by the vendors.

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SPC-1 SPC-1: Organic Filter Barrier

DEFINITION

A temporary linear sediment barrier consisting of straw bales, sediment wattles or similar material, designed to intercept and slow sediment-laden sheet flow runoff. Organic filter barriers allow sediment to settle from runoff before water leaves the construction site. Organic filter barriers include straw bales, sediment wattles, and other organic filter berms.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - moderate
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high

Most effective when used with:

SPC-8 Temporary Sediment Basins

SPC-9 Temporary Sediment Traps

Alternative BMPs:

For higher flows or paved surfaces, consider rock socks detailed under SPC-2: Sand Bag Barrier.

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance	X		
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment			X
Floatable Material	X		
Metals			X
Other Construction Waste		X	

FIGURES

Photos/Sketches

SPC-1 Organic Filter Barrier Photos

CAD Drawings

Organic Filter Barrier

PURPOSE

Organic filter barriers reduce runoff velocity and cause deposition of the transported sediment load. They are well suited to sites with small disturbed drainage areas that are not subjected to concentrated flows and that will ultimately be seeded, sodded, or landscaped.

APPROPRIATE APPLICATIONS

Organic filter barriers are useful where there are no concentrations of water in a channel or drainage way, and where erosion would occur from sheet flow. These barriers are typically constructed:

- Along the perimeter of a site, around stockpiles, and parallel to a roadway to keep sediment off paved areas.
- Along streams and channels and across minor swales or ditches with small catchments.
- Below the toe of exposed and erodible slopes and down slope of exposed soil areas.
- Around above grade type temporary concrete washouts.

LIMITATIONS

Of all the organic filter barriers, straw bale barriers may be the most limited in erosion control and sediment loading reduction. The following limitations are associated with straw bale barriers.

- Suitable only for sheet flow on slopes of 2 percent (%) or flatter and are not appropriate for drainage areas greater than one acre. Cannot be used in areas of concentrated flow, channel flow, and live streams.
- Installation and maintenance can be labor intensive.
- Degraded straw bales may fall apart when removed or left in place for extended periods due to rotting.
- Bale bindings of jute or cotton are not recommended.
- Straw bale barriers are not efficient on paved surfaces.
- Straw bale barriers are not to be used for drain inlet protection.
- Can be an attractive food source for some animals and may introduce some undesirable non-native plants to the area.

PLANNING CONSIDERATIONS

Optimal efficiency of organic filter barriers can be achieved through careful maintenance with special attention to replacing rotted or broken barriers. Barriers should be constructed on a level contour to prevent concentration of flow against a small portion of the barrier. Organic filter barriers are additionally more efficient when used in conjunction with Temporary Sediment Basins and Temporary Sediment Traps. Consider using rock socks under Sand Bag Barrier for higher flows or paved surfaces.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Installation

- Organic filter barriers must be installed in a trench and tightly abut adjacent barriers/segments along a line of constant elevation (along a contour line) if possible, with the last organic filter barrier turned up slope.
- Construct organic filter barriers with a set-back of at least 3 feet (ft) from the toe of a slope. Where it is determined not to be practical due to specific site conditions, the organic filter barrier may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practical
- Limit the drainage area upstream of the barrier to 0.25 acre/100ft of barrier and the maximum flow to any 20 foot section to less than 1 cubic feet per second (cfs).
- Limit the slope length draining to the organic filter barrier to 100 ft for average slopes of 2V:100H (2%) or flatter.
- If the slope exceeds 1V:10H (10%), the length of slope upstream of the barrier must be less than 50 ft.
- Organic filter barriers may be seeded with a seed loading of 1 pound (lb) per 10 linear feet for small berms or 2.25 lbs per 10 linear foot for larger berms.

Specifications

See Organic Filter Barrier Drawing for the required dimensions of organic filter barriers as described below.

- Size: Each straw bale type organic filter barrier should be a minimum of 14” wide, 18” high, 36” long and should have a minimum weight of about 50 lbs. Alternatively, organic filter barriers can be trapezoidal, triangular, or circular in cross-section. Each sediment wattle shall be 9” to 18” in diameter. Sediment wattles that are flattened during shipping or construction activities should be reshaped if practical or replaced. The bottom three wattles shall be 18” in diameter when the slope length exceeds 100 feet.

- Materials: Organic filter barriers can either be composed entirely of straw (i.e. straw bale), or constructed of a mixture of 50% compost and 50% wood mulch (untreated woodchips less than 5 inches in length, 95% passing a 2 inch screen, and less than 30% passing a 1 inch screen). Materials shall be certified to be weed-free. Organic filter barriers may be seeded with a County approved seed mix with a loading of 1 pound (lb) per 10 linear feet for small berms or 2.25 lbs per 10 linear foot for larger berms.

- Bindings: Straw bales only: Barrier should be bound by steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding should not be used. Steel wire should be a minimum diameter of 0.06 inches. Nylon or polypropylene string should be approximately 0.08 inches in diameter with a breaking strength of no less than 80 lbs. of force.

- Stakes: Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement should be equal to a number four designation or greater. End protection should be provided for any exposed bar reinforcement.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect organic filter barriers before and after each rainfall event, and weekly throughout the rainy season for sediment accumulations and remove sediment when depth reaches one-third the barrier height.

- Replace or repair damage barriers as needed. Remove barriers or dismantle as mulching when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area.

POST CONSTRUCTION METHODS

There are no post construction uses for organic filter barriers, but filter barriers can be dismantled and used as mulching for erosion control purposes when a filter barrier is no longer needed.

REFERENCES

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SPC-1 Organic Filter Barrier Photos

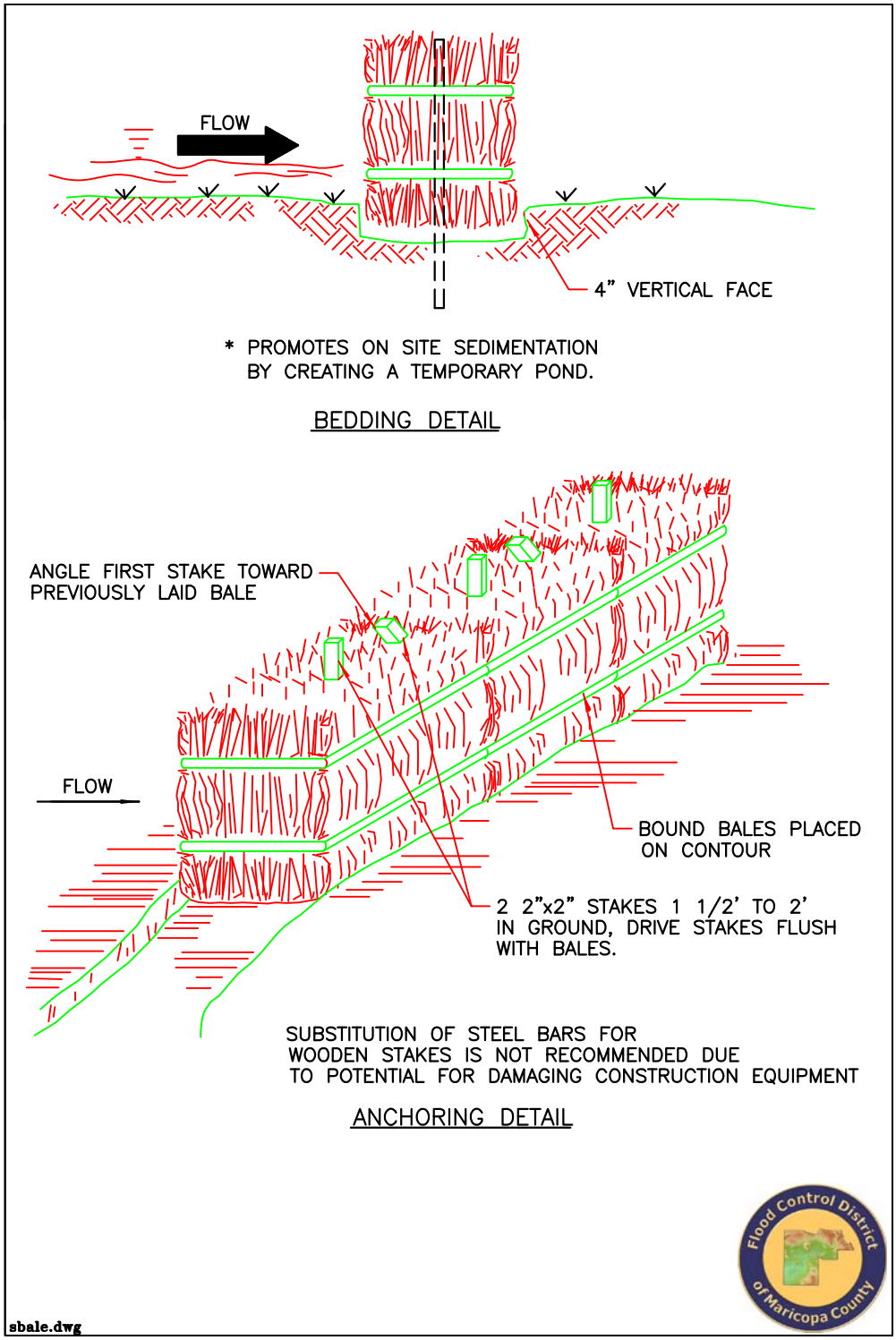
Properly staked organic filter barrier.

Storm wattle (wrapped).

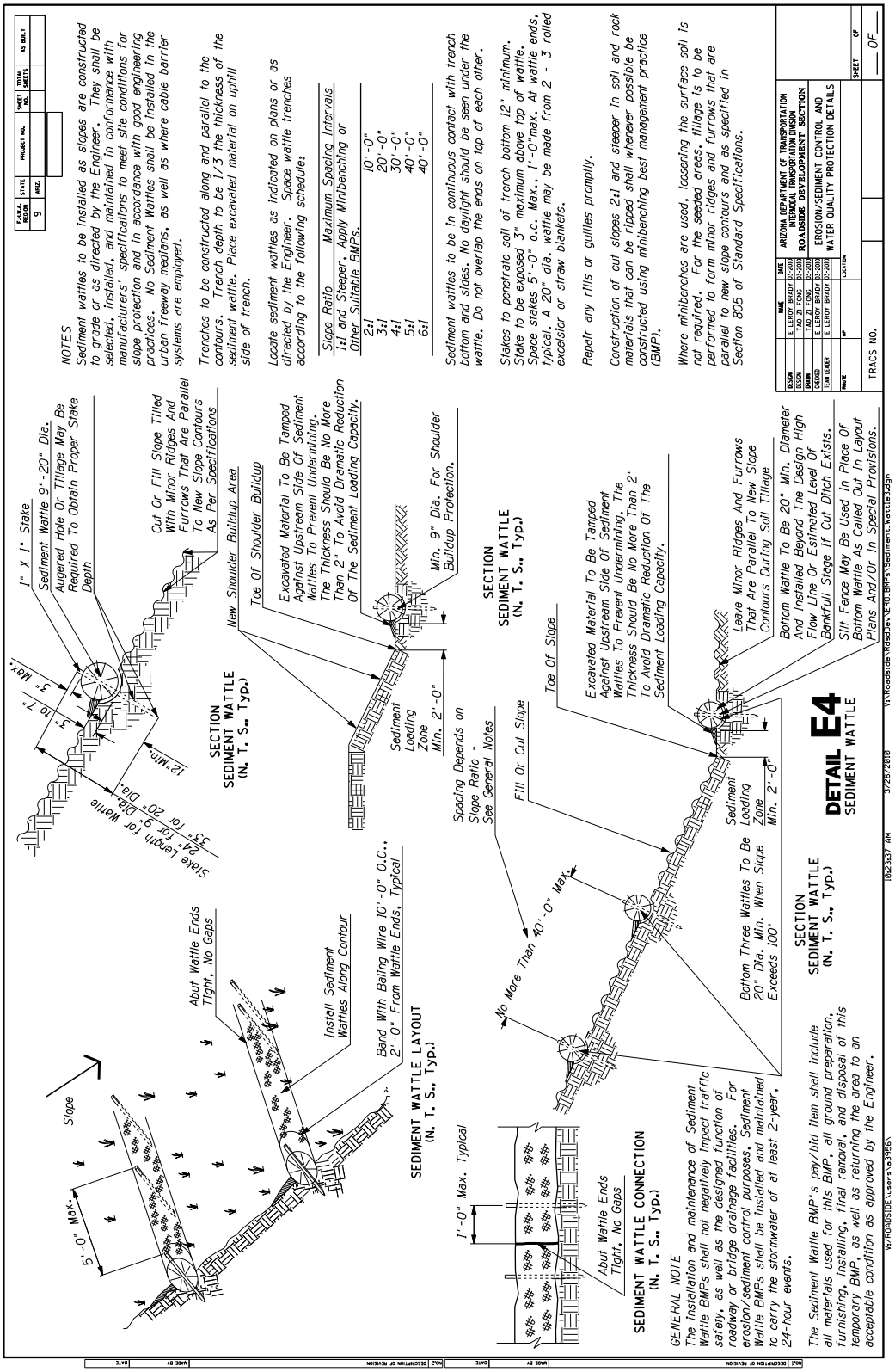
Courtesy of Kristar

Use of an organic filter barrier in the highway median.

SPC-1 Organic Filter Barrier Drawing



SPC-1 Sediment Wattle Drawing



SPC-2 SPC-2: Sand Bag Barrier

DEFINITION

A temporary berm constructed of stacked sandbags, along the perimeter of a site, installed across a channel, or along the right of way in a disturbed area. The sandbags may be filled with pea-sized gravel to enhance filtration.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - moderate
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

If the berm is to be permanent, consider using SPC-4 Check Dams

If used for storm drain inlet protection, consider other methods under SPC-7 Storm Drain Inlet Protection

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance	X		
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material	X		
Metals		X	
Other Construction Waste		X	

FIGURES

Photos/Sketches

SPC-2 Sand Bag Barrier Photos

CAD Drawings

Sand Bag Barrier

PURPOSE

A sandbag barrier is designed to intercept and slow the flow of sediment-laden runoff. Sandbag barriers allow sediment to settle from runoff before water leaves the construction site.

APPROPRIATE APPLICATIONS

Sandbag berms may be used during construction activities when the contributing areas is less than 5 acres. Sandbag berms may also be used to create temporary sediment traps, retention basins and in place of organic filter barriers or silt fences. They are also useful for storm drain protection because they do not need to be anchored down to the paved surfaces. Two main applicable areas include:

Perimeter control

- These areas include the entire construction site boundary, around stockpiles, along streams and channels, across channels to serve as a barrier for utility trenches, parallel to a roadway to keep sediment off paved areas, and along the perimeter of vehicle and equipment fueling and maintenance areas or chemical storage areas.

- Furthermore, sand bag barriers are useful when site conditions or construction sequencing require adjustments or relocation of the barrier to meet changing field conditions and needs during construction, and to temporarily close or continue broken, damaged or incomplete curbs.

Temporary diversion structure

- Sand bag barriers can be used as a temporary diversion structure below the toe of exposed and erodible slopes and down slope of exposed soil areas. They can also be used as a temporary sediment/desilting basin.

LIMITATIONS

- Limit the drainage area upstream of the barrier to 10 acres or less.

- Degraded sandbags may rupture when removed, spilling sand.

- Sandbag barrier installation can be labor intensive.

- Sandbag barriers have limited durability for long-term projects.

- When used to detain concentrated flows, maintenance requirements of sandbags increases.

PLANNING CONSIDERATIONS

Sandbag barriers are appropriate to use when construction of check dams in a channel is unnecessary. They can provide the same function as a check dam without disturbing the stream or vegetation. The sandbag barrier can also retain sediment prior to construction of final detention basins. For lower flows and paved surfaces, consider using rock socks (described below in Recommended Standards and Specifications). Small rock socks are easier to handle and cause less traffic problems than sand bags.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Materials

- Sandbags: The bag should be made of woven polypropylene, polyethylene or polyamide fabric, minimum unit weight 4 ounces per square yard, Mullen Burst strength exceeding 300 psi in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. **Use of burlap is not acceptable.** Bag dimensions are nominal, and may vary based on locally available materials. Sand-filled bags should generally are 24-30 inches long, 16-18 inches wide, 6-8 inches thick, and weigh approximately 90-125 pounds. The choice of fill material depends on the objectives that are desired from the sand bag barriers. If fine grained sand is used as fill material, the sand bag barrier will provide a barrier and act as a diversion dike. If coarser grained materials are used (i.e. pea-sized gravel), the barrier will allow flow to pass through and act more as a sediment filter.

- Rock socks: An alternative to sand bags, are rock socks, which are more elongated that sand bags and contain pea-size rock. A rock sock should be made of a loosely woven material, such as burlap, when used for filtration. A tighter weave, such as a geotextile, is better for diversion. Note that burlap rock socks are not as sturdy as geotextile ones, but can be recycled on site since they quickly biodegrade.

Installation

- When used as a linear sediment control:
    - Install along a level contour.
    - Turn ends of sandbag row up slope to prevent flow around the ends.
    - Generally, sandbag barriers should be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.
    - Sandbag barriers should be set back at least 3 feet from the toe of a slope where practical.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect sandbag barriers before and after each rainfall event, and weekly throughout the rainy season.
- Reshape or replace sandbags as needed.
- Inspect sandbag barriers for sediment accumulations and remove sediments when accumulation reaches one-third the barrier height.
- Remove sandbags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area.

POST CONSTRUCTION METHODS

None.

REFERENCES

City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention, January 1993, Tacoma Public Works Environmental Services. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, Construction Site Best Management Practices (BMPs) Manual, March 2003. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

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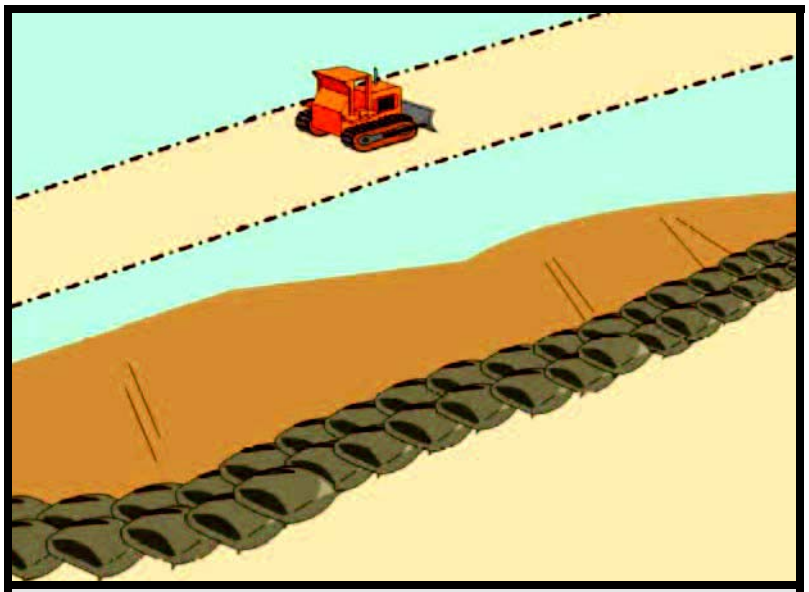
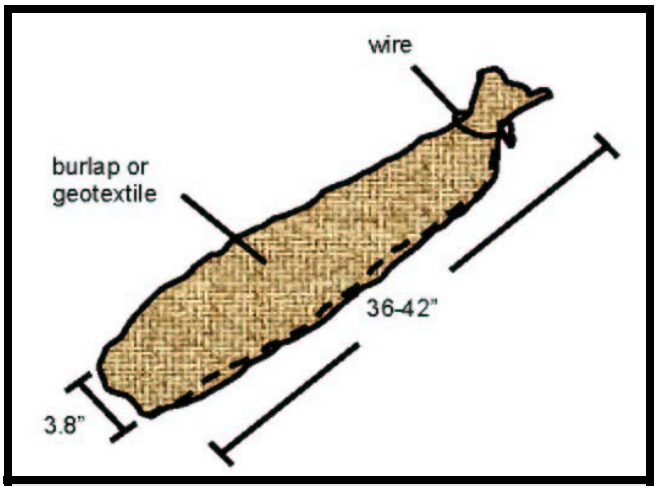
SPC-2 Sand Bag Barrier Photos



Schematic of sand bag barriers.

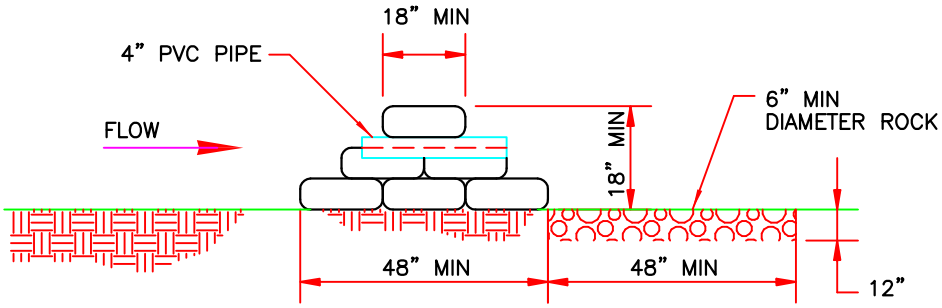
Courtesy of CALTRANS



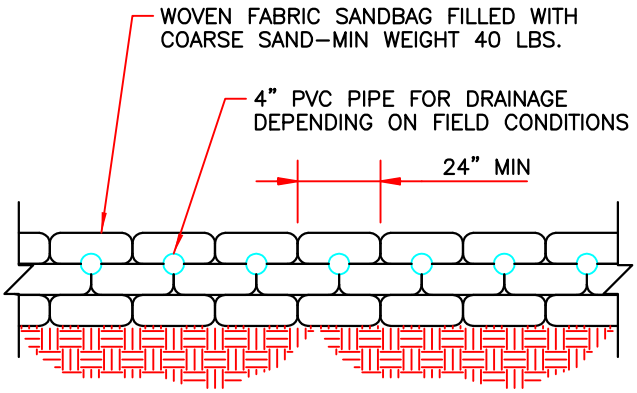
Schematic of rock socks, often more versatile than sand bags.

Courtesy of Island County

SPC-2 Sand Bag Barrier Drawing



CROSS–SECTION VIEW



FRONT VIEW

sandbag.dwg

SPC-3 SPC-3: Gravel Filter Berms

DEFINITION

A temporary berm constructed of open graded rock or bags of gravel installed at the toe of a slope, or the perimeter of a developing or disturbed area.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - moderate
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

If the berm is to be permanent, consider using SPC-4: Check Dams.

If used for storm drain inlet protection, consider other methods under SPC-7: Storm Drain Inlet Protection.

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance	X		
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material	X		
Metals		X	
Other Construction Waste		X	

FIGURES

Photos/Sketches

Gravel Filter Berms Photos

CAD Drawings

Gravel Filter Berms Drawing

PURPOSE

Gravel filter berms are designed to intercept and detain sediment-laden water from an unprotected area, detain the sediment, and release the water in sheet flow.

APPROPRIATE APPLICATIONS

Where a temporary measure is needed to retain sediments such as:

- Near the toe of slopes.
- At construction site perimeters.
- May be used as check dams across one or more lanes of construction traffic temporary roads, or unsurfaced rights of way subject to construction traffic.

LIMITATIONS

- Limit the drainage area upstream of the barrier to 5 acres and to gently sloping areas.
- Not recommended to be built on landscaped areas due to the difficulty of clean up
- Gravel filter berms are only temporary and must be routinely maintained due to clogging from mud and soil on vehicle tires.

PLANNING CONSIDERATIONS

- Construct along a level contour for intercepting sheet flow.
- Provide an undisturbed or stabilized outlet suitable for sheet flow.
- Allow ample room for sediment removal equipment between the berm and toe-of-slope.
- Installation in stream beds requires large rock, staking of woven wire sheathing (gabions), and daily inspection.
- For a more vegetated control, consider Organic Filter Barriers. In order to lessen the chance of displaced material, consider Sand Bag Barriers, or Silt Fences. Gravel filter berms are more effective when combined with an erosion control BMP.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Open Graded Rock

Open graded rock berms should be built on a level contour, designed for a maximum flow rate of 0.13 cubic feet per second (cfs) per square foot of berm. Use 3/4 to 3 inch diameter rock for sheet flow and 3 to 5 inch diameter rock for concentrated flow. For non-traffic areas, open

graded rock berms should be constructed a minimum of 18 inches high and 24 inches wide, with side slopes of 2:1 or flatter. Woven wire sheathing (poultry netting) is recommended in areas of concentrated flow to keep rocks in place. The wire should be galvanized 20 gauge with 1 inch diameter hexagonal mesh. Provide multiple berms in series:

- Every 300 feet on slopes less than 5 percent
- Every 200 feet on slopes of 5-10 percent.
- Every 100 feet on slopes greater than 10 percent.

If the open graded rock berm is constructed in a traffic area, the berm should be a maximum of 12 inches high.

Gravel Bag Berms

- Gravel bags should be made of woven polypropylene, polyethylene, or polyamide fabric. Bags should have a minimum unit weight of four ounces per square yard, mullen burst strength exceeding 300 pounds per square inch (psi) in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in accordance with ASTM D4355. Bag dimensions are nominal and may vary based on locally available bags and fill material. Generally, gravel bags are 24-30 inches long, 16-18 inches wide, 6-8 inches thick, and weigh approximately 90-125 pounds. Alternative bag sizes should be submitted to the site supervisor or engineer for approval prior to installing at the site. The choice of fill material depends on the objectives that are desired from the gravel bag berm. If finer grained material is used (i.e. pea-sized gravel), the berm acts more as a sediment filter and allows a lower flow than if coarser grained gravel is used (i.e. 3/4 to 3 inch diameter gravel).
- When used as a linear control for sediment removal:
    - Install along a level contour.
    - Turn the ends of the gravel bag berm up slope to prevent flow around the ends.
    - Generally, gravel bag barriers should be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.
- When used for concentrated flows:
    - Stack gravel bags to required height using a pyramid approach.
    - Upper rows of gravel bags should overlap joints in lower rows.
- Construct gravel bag barriers with a setback of at least 3 ft from the toe of a slope, or as far back as possible if the three foot setback is not physically possible.

RECOMMENDED MAINTENANCE AND INSPECTION

- Remove retained sediments when depth reaches 1/3 of berm height or 1 foot, whichever occurs first.
- Inspect monthly and after each rainfall. Reshape berm as needed, replace lost or dislodged rock.
- Remove gravel filter berm at the end of construction

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

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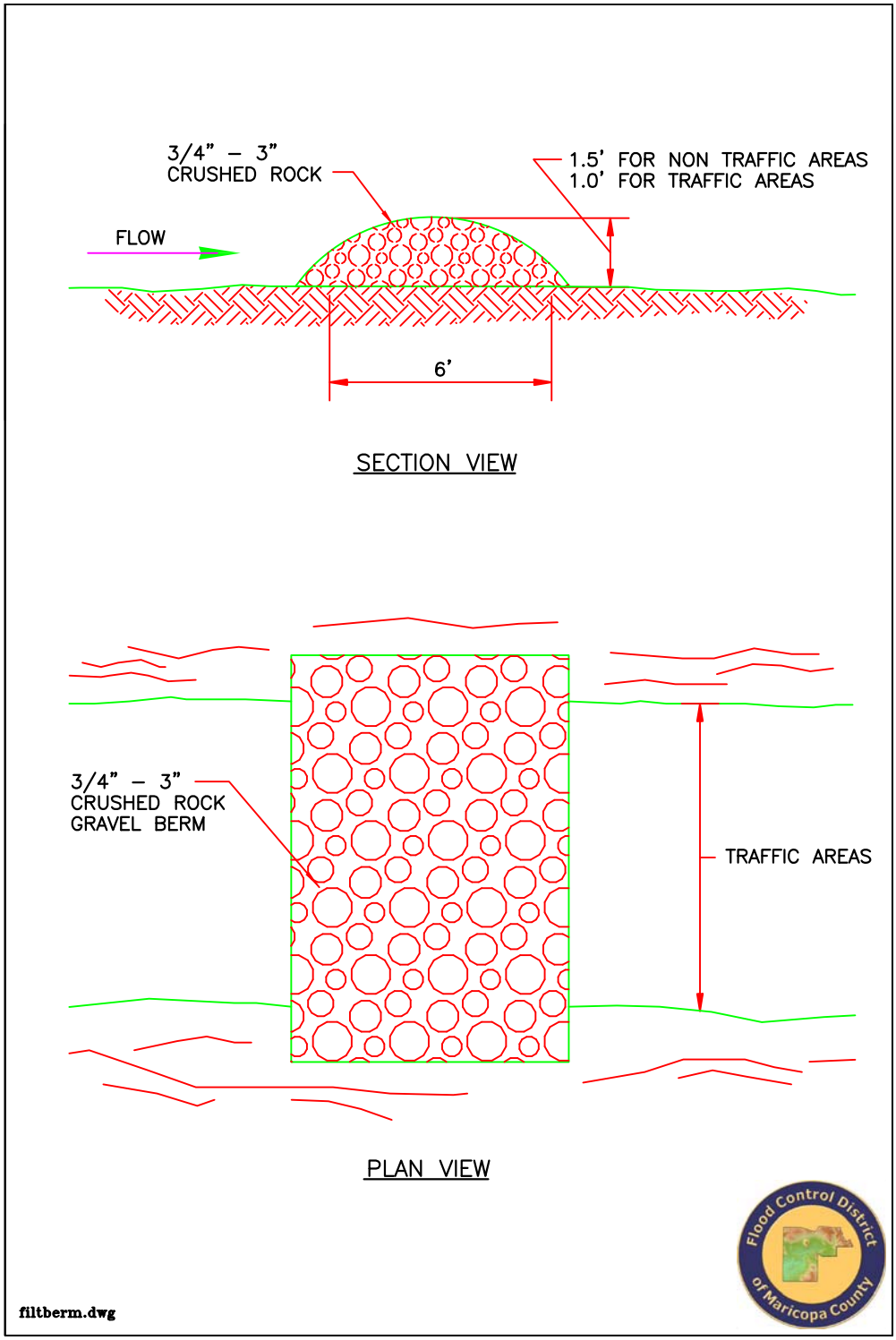
City of Austin, Texas, March, 2004, Environmental Criteria Manual.

SPC-3 Gravel Filter Berms Photos

Gravel filter berms filter sediment-laden water for relatively high flows.

Courtesy of Douglas County

SPC-3 Gravel Filter Berms Drawing



SPC-4 SPC-4: Check Dams

DEFINITION

Small barriers consisting of rock, sand bag, or earth berms placed across a drainage swale or ditch. Typically, they are used in conjunction with other channel protection techniques such as vegetation lining and turf reinforcement mats.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - moderate
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high
Channels and Medians - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

For a more temporary dam, consider SPC-2 Sand Bag Barrier

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance	X		
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material		X	
Metals			X
Other Construction Waste		X	

FIGURES

Photos/Sketches

SPC-4 Check Dams Photos

CAD Drawings

Check Dams Specifications

PURPOSE

Check dams reduce the velocity of small concentrated flows, provide a barrier for sediment, and help disperse concentrated flows, thereby reducing potential erosion.

APPROPRIATE APPLICATIONS

Check dams are appropriate where a temporary measure is needed to retain sediments such as:

- Near the toe of slopes.
- At construction site perimeters.
- May be used as check dams across one or more lanes of construction traffic temporary roads, or unsurfaced rights of way subject to construction traffic.

LIMITATIONS

- Check dams should not be used in live, flowing streams. They should not be used as a stand-alone substitute for other sediment trapping devices. Do not install check dams in channels, which have already been lined or vegetated. Leaves can clog check dams, thereby reducing their filtering and velocity dissipating functions.
- Check dams only perform their function of reducing velocities of concentrated flows and energy if they have been sized and constructed correctly and are maintained properly.

PLANNING CONSIDERATIONS

- Construct along a level contour for intercepting sheet flow
- Provide an undisturbed or stabilized outlet suitable for sheet flow.
- Allow ample room for sediment removal equipment between the berm and toe-of-slope.
- Installation in stream beds requires large rock, staking of woven wire sheathing, and daily inspection.

RECOMMENDED STANDARDS AND SPECIFICATIONS

- Check dams should be installed as soon as construction will allow and be used in conjunction with other sediment reduction techniques prior to releasing the flow offsite.
- Check dams should be placed at a distance and height to allow small pools to form between each one. Typically, dam height should be between 18 and 36 inches. Dams should be spaced such that the top of the downstream dam is the same elevation as the toe of the upstream dam. Place check dams along the same contour line, perpendicular to the flow of water.

- Major flows (greater than 2 year design storm) must pass the check dam without causing excessive upstream flooding.

- Use geotextile filter fabric under check dams exceeding 18 inches in height.

Three main types of check dams:

1. Rock Check Dam - usually the simplest and least expensive option.

    - Stone should be well graded with a size range from 1.5 to 3.5 inches in diameter, depending on expected flows

    - Rock check dams should be triangular in cross section with side slopes of 1:1 or flatter on the upstream side and 2:1 or flatter on the downstream side.

2. Sand Bag Check Dam - are lighter and more manageable than rock dams.

    - Sand bag check dams should have a maximum flow through rate of 0.1 cubic feet per second (cfs) per square foot of surface with a minimum top width of 16 inches and bottom width of 48 inches. Bags should be filled with clean coarse sand, pea gravel, or filter stone.

    - Bag should be 24-30 inches long, 16-18 inches wide, 6-8 inches thick, and approximately 40 pounds in weight.

    - Bag material should be polypropylene, polyethylene, polyamide, or cotton burlap woven fabric, minimum unit weight of four ounces per square yard, Mullen burst strength exceeding 300 pounds per square inch (psi) as determined by ASTM D3786.

    - PVC pipes may be installed through the sand bag dam near the top to allow for controlled flow through the dam. Pipe should be schedule 40 or heavier, having a nominal internal diameter of 4 inches.

3. Geotextile-Encased Check Dam (or Triangular Silt Dike) - may provide the most effective filtration of sediment laden water.

    - Consist of a triangular urethane foam sewn into a woven geosynthetic fabric. Dimensions include 10-14 inches high in the center, with a 20-28 inch base. A 2 foot apron extends beyond both sides of the triangle along its standard section of 7 feet. A sleeve at one end of one section can be overlapped and stapled with an adjacent section.

    - Install with ends curved up to prevent water from flowing around the ends.

    - The fabric flaps and check dam units are attached to the ground with wire staples. Wire staples should be No. 11 gauge wire and should be 8 to 12 inches long.

- The leading edge must be secured with rocks, sandbags, or a key slot and staples.

Sediment wattles may also be used as check dams in roadway ditches and channels downstream of disturbed soils. Refer to SPC-1 and ADOT (2009) Section 5.3.6 Sediment Logs.

RECOMMENDED MAINTENANCE AND INSPECTION

- Check dams should be inspected after each storm event to ensure continued effectiveness. During inspection, large debris, trash, and leaves should be removed. The center of a check dam should always be slightly lower than its edges. If erosion or heavy flows cause the edges of a dam to fall to a height equal to or below the height of the center, repairs should be made immediately.

- Accumulated sediment should be removed from the upstream side of a check dam when the sediment has reached a height of approximately one-half the original height of the dam (measured at the center). In addition, all accumulated sediment should also be removed prior to removing a check dam.

- Removal of a check dam should be completed only after the contributing drainage area has been completely stabilized. Permanent vegetation and mulching should replace areas from where the check dam has been removed.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

SPC-4 Check Dams Photos

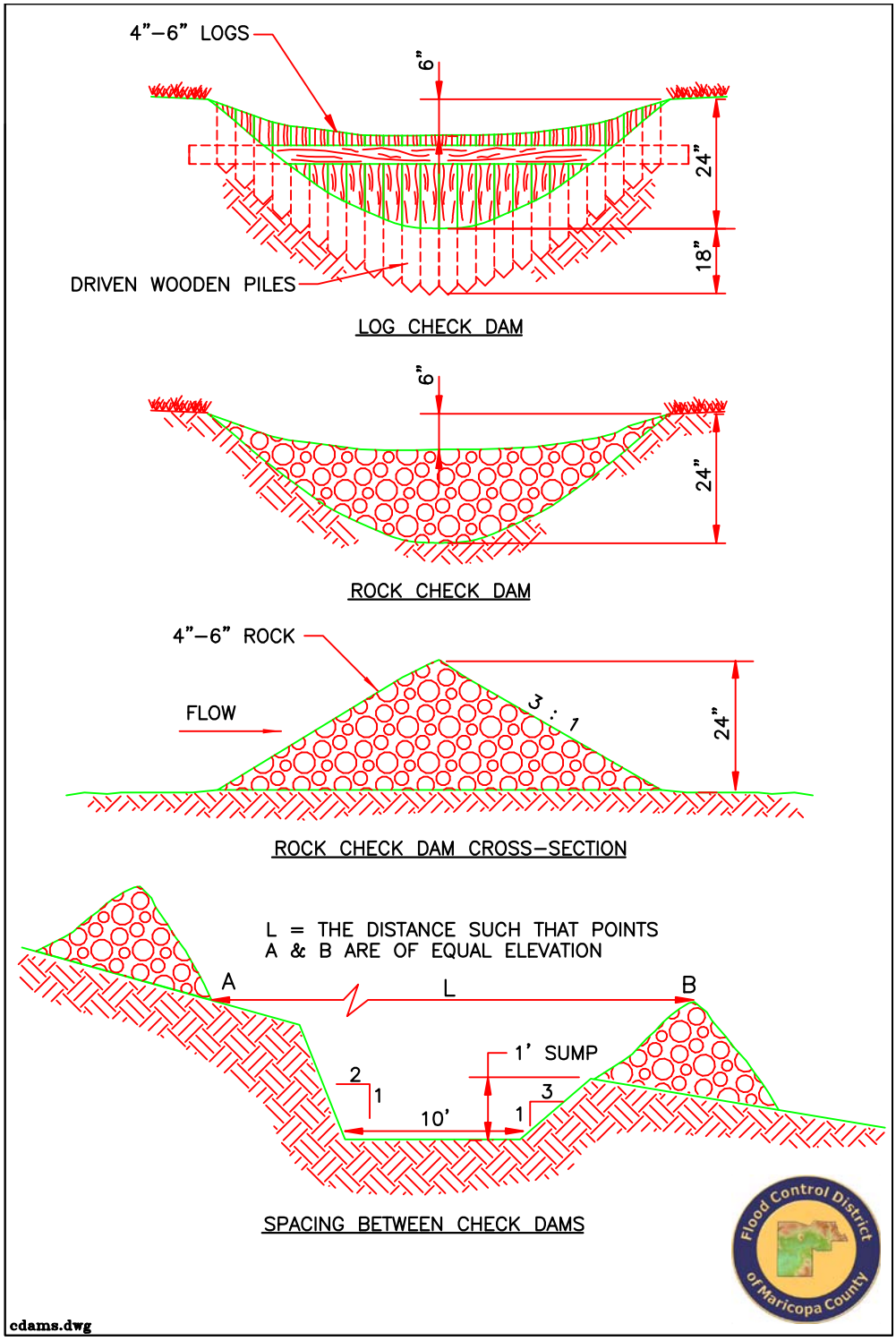
Check dams can be constructed of crushed rock material from the construction project.

Courtesy of Newfoundland

Check dams are most effective when placed in series.

Courtesy of NCDOT

SPC-4 Check Dams Drawing



SPC-5 SPC-5: Silt Fence

DEFINITION

A geotextile fabric stretched between either wooden or metal posts with the lower edge of the fabric securely embedded in the soil. The fence is typically located downstream of disturbed areas to intercept sheet flow runoff.

GENERAL INFORMATION

Applicability - Effectiveness
Slope Protection - moderate
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

EC-9: Diversion Dikes

SPC-1: Organic Filter Barrier

SPC-2: Sand Bag Barrier

SPC-3: Gravel Filter Berms

SPC-6: Revegetation

SPC-7: Storm Drain Inlet Protection

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance	X		
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material	X		
Metals			X
Other Construction Waste		X	

FIGURES

Photos/Sketches

Silt Fence Photos

CAD Drawings

Silt Fence Drawing

PURPOSE

There are two main purposes for silt fences:

- To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.
- To decrease the velocity of sheet flows and low-to-moderate level channel flows.

APPROPRIATE APPLICATIONS

Silt fences, as the name implies, are more effective with sandy or silty soil types. For very fine grained soils, such as clays, a soils engineer should confirm the suitability of a silt fence for that area.

Silt fences are generally applicable to construction sites with relatively small drainage areas. Silt fences are not intended for use in detaining concentrated flows. They are appropriate where runoff is a low-level shallow flow, not exceeding 0.5 cubic foot per second (cfs). The drainage area for silt fences generally should not exceed 0.25 acre per 100 feet (ft) of fence length. Slope length above the fence should not exceed 100 ft.

Silt fences may be used:

- Below disturbed areas where runoff may occur in the form of sheet and rill erosion; wherever runoff has the potential to impact downstream resources.
- Parallel to minor swales or ditch lines for up to one acre of contributing drainage areas.
- For both site development areas and linear roadway type projects.

LIMITATIONS

- Silt fences are less effective in areas with predominately clay soil types.
- Silt fences will create a temporary sedimentation pond on the upstream side of the fence, which may cause temporary flooding.
- Silt fences are not practical for large flows. Drainage areas should be restricted to less than one acre and a flow rate less than 0.5 cfs. Do not allow water depth to exceed 1.5 ft at any point in front of the silt fence.
- Silt fences may not filter runoff effectively if the pore size of the fabric is incorrectly selected. Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.

PLANNING CONSIDERATIONS

If the site contains a high content of clays, consult a soils engineer before installing a silt fence. The Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than straw bales can. Silt fences are preferable to straw barriers in many cases. However, while the failure rate of silt fences is lower than that of straw barriers, there are many instances locally in which silt fences have been improperly installed. The installation methods outlined here can improve performance.

- Anchor the site fence fabric below the ground surface sufficiently to prevent flow from undercutting the fence.
- Construct along a level contour.
- Silt fences should remain in place until the disturbed area is permanently stabilized.
- Provide sufficient room for sediment removal equipment between the silt fence and toes of slopes or other obstructions.
- The ends of the filter fence should be turned uphill to prevent stormwater from flowing around the fence.
- Provide an undisturbed or stabilized outlet suitable for sheet flow.
- Do not construct in live streams or intermittently flowing channels.

As alternatives to silt fences, consider using the following: Diversion Dikes, Organic Filter Barrier, Gravel Filter Berms, Sand Bag Barrier, Revegetation, or Storm Drain Inlet Protection.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Materials

Selection of a filter fabric is based on soil conditions at the construction site, which affect the equivalent opening size (EOS) fabric specification, and characteristics of the support fence, which affect the choice of tensile strength. The designer should specify a filter fabric that retains the soil found on the construction site yet will have openings large enough to permit drainage and prevent clogging. If 50 percent (%) or less of the soil, by weight, passes through US Standard Sieve No. 200, select the EOS that will retain 85% of the soil, by weight. In addition, consider the following recommendations in the table below during the selection of the equivalent opening size:

US Standard Sieve No.	Sieve hole size, inches	Comments / EOS Recommendations
70	0.0083	The EOS should not be larger than the openings of US Sieve No. 70
100	0.0059	If there is direct discharge to a stream, lake, or wetland, then the EOS should not be greater than the openings of US Sieve No. 100
200	0.0029	If greater than 85% of the soil passes this sieve hole size, by weight, do not use silt fences. Most of the particles in such a soil would not be retained if the EOS was too large or they would clog the fabric quickly if the EOS was too small. Consider Temporary Sediment Basins as an alternative BMP.

Fabric fences are supported with wire mesh, as recommended by the fabric manufacturer. Filter fabric material should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable life at a temperature range of 0° F. to 120° F.

Installation

The following drainage and topographical characteristics of the site should be considered before installing silt fences.

- Upstream drainage area limited to 1 acre or less when used alone or in combination with sediment basin in a larger site.
- Maximum slope steepness perpendicular to fence line is 1:1.
- Maximum sheet or overland flow path length to the fence is 100 feet.
- Silt fences are not intended for concentrated flows greater than 0.5 cfs.

Filter fences are to be constructed, as described below, on a level contour to maximize the available ponding area and prevent concentration of flow against the fence.

- Posts should be spaced a *maximum* of 6 feet apart and driven securely into the ground a *minimum* of 30 inches.
- A trench should be excavated approximately 8 inches wide and 12 inches deep along the line of posts and upslope from the barrier.
- When standard strength filter fabric is used, a wire mesh support fence should be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire should extend into the trench a minimum of 4 inches.

- The standard strength filter fabric should be stapled or wired to the fence, and 20 inches of the fabric should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated and the filter fabric stapled or wired directly to the posts.

- The use of joints should be avoided. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6-inch overlap and both ends securely fastened to the post.

- The trench should be backfilled with 3/4-inch minimum diameter washed gravel or compacted native material.

RECOMMENDED MAINTENANCE AND INSPECTION

Silt fences should be inspected regularly and frequently as well as after each rainfall event to ensure that they are intact and that there are no gaps at the fence-ground interface or tears along the length of the fence. If gaps or tears are found, they should be repaired or the fabric should be replaced immediately. Accumulated sediments should be removed from the fence base when the sediment reaches one-third to one-half the height of the fence. Sediment removal should occur more frequently if accumulated sediment is creating noticeable strain on the fabric and there is the possibility of the fence failing from a sudden storm event. Silt fences should not be removed until the upslope area has been permanently stabilized. When the silt fence is removed, the accumulated sediment also should be removed.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

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Practices". http://www.doh.dot.state.nc.us/operations/BMP_manual/

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Fifield, J.S., 2002, Field Manual on Sediment and Erosion Control, Forester Press, Santa Barbara CA.

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

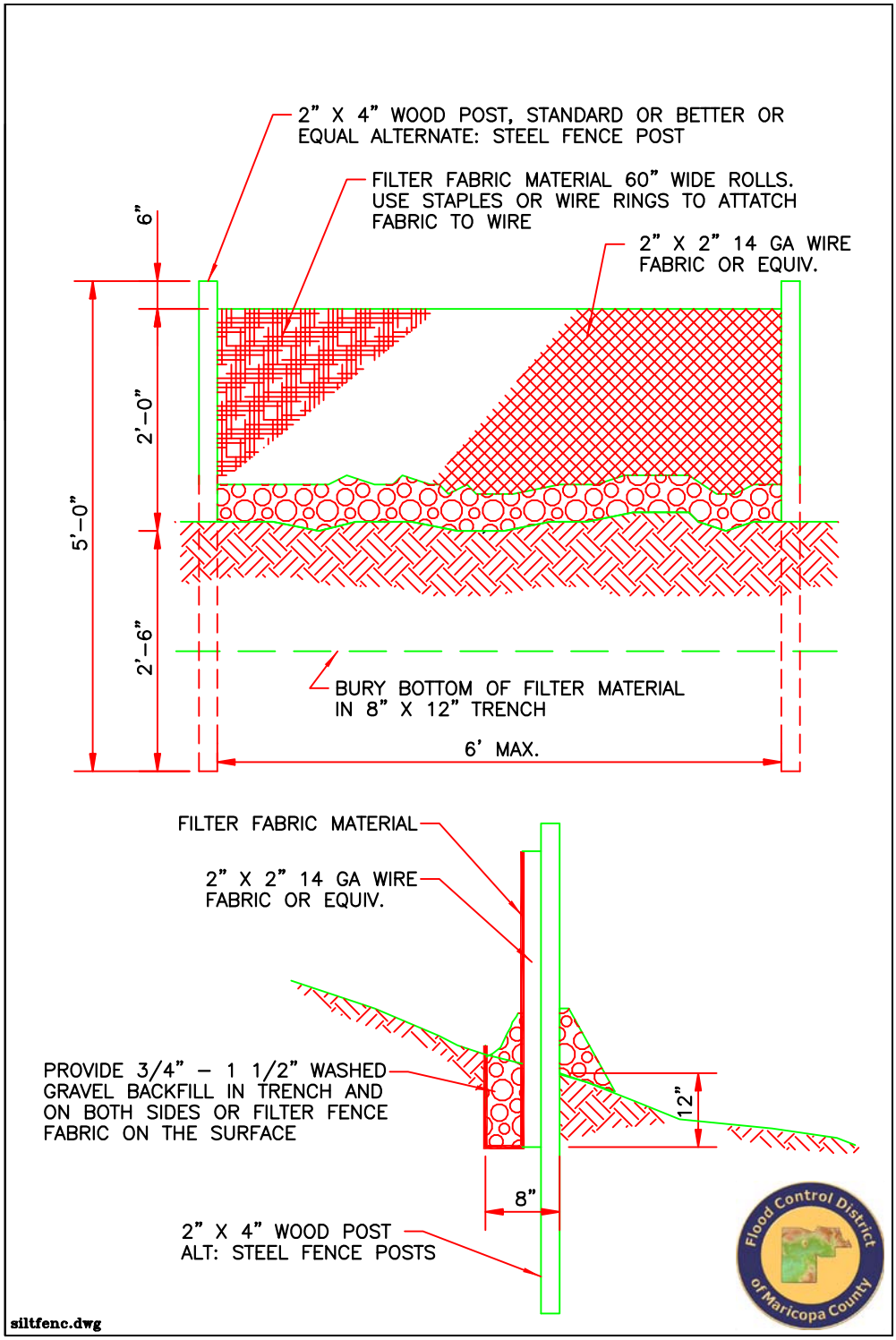
City of Austin, Texas, March, 2004, Environmental Criteria Manual.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

SPC-5 Silt Fence Photos

Silt fences can span the entire length of a construction site when installed properly.

SPC-5 Silt Fence Drawing



SPC-6 SPC-6: Revegetation

DEFINITION

Revegetation consists of an area of trees, shrubs, vines, and ground covers that create a buffer or a groundcover between a disturbed construction area and neighboring areas, particularly natural water bodies.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - high
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high
Channels and Medians - high
Landscaping and Vegetation - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

EC-8 Temporary Access Waterway Crossing

SPC-1 Organic Filter Barrier

SPC-2 Sand Bag Barrier

SPC-3 Gravel Filter Berms

SPC-4 Check Dams

SPC-5 Silt Fence

SPC-7 Storm Drain Inlet Protection

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance	X		
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients		X	
Sediment		X	
Floatable Material			X
Metals		X	
Other Construction Waste			X

FIGURES

Photos/Sketches

SPC-6 Revegetation Photos

CAD Drawings

None

PURPOSE

Revegetation buffers can provide superior, low maintenance, long-term erosion protection, and can often result in a more stable and aesthetically pleasing development. Vegetation stabilizes the soil and help prevent erosion, decrease stormwater runoff, moderate temperature, provide buffers and screens, filter pollutants from the air, supply oxygen, and provide habitat for wildlife.

APPROPRIATE APPLICATIONS

Revegetation can be applied in any area that is able to support vegetation, but it is most effective and beneficial on floodplains, near wetlands, along streambanks, and on steep, unstable slopes. Vegetation is also effective in separating land use areas that are not compatible and in protecting wetlands or waterbodies by displacing activities that might be potential sources of nonpoint source pollution. Trees, shrubs, vines, ground covers, and seeding should be applied:

- On steep or rocky slopes
- Along drainage swales and drainage dikes
- Around sediment basins to provide nutrient removal
- Where soil conservation is necessary (i.e. roughened slopes)
- Where attractive landscaping cover is desirable
- Where onsite dust control is necessary
- To establish a wildlife habitat

LIMITATIONS

Construction activities can easily injure or kill trees and shrubs unless adequate protective measures are taken. Direct contact by equipment is the most obvious problem, but damage can also occur by root stress due to filling, excavating, or compacting too close to trees. See Protection of Trees and Vegetation in Construction Areas for ways to protect vegetation on the construction site.

PLANNING CONSIDERATIONS

- Plants and ground cover can be used on cut-and-fill slopes adjacent to paved areas of shopping centers, schools, industrial parks, or other non-residential projects. They will also help to control foot traffic.
- Trees, shrubs, vines, or ground covers may be planted in residential areas, along rights-of-way, or easements to reduce maintenance and improve appearance.

- The Arizona Department of Water Resources has an approved plant list for Maricopa County of low water use plants, refer to the Drought Tolerant/Low Water Use Plant List on the ADWR website (www.water.az.gov/adwr/content/conservation/LowWaterPlantLists/). Native vegetation is compatible with surrounding desert habitat. Consult a local nursery for recommended plant species and growing tips.

The following steps will help insure good plant growth:

- Dig the holes 1/3 larger than the plant root ball.
- Use good topsoil or soil mixture with a lot of organics.
- Fill hole 1/3 to 1/2 full, shake plants to settle soil among roots, then water.
- Leave saucer-shaped depression around the plant to hold water.
- Water thoroughly and regularly.
- Space plants according to plant type and coverage desired.

Trees:

Some desirable characteristics to consider in selecting existing trees to be protected include: tree vigor, tree species, tree age, tree size and shape, and use as a wildlife food source and habitat. Trees to be saved should be clearly marked so that no construction activity will take place within the drip line of the tree.

At the same time as existing trees are being selected for salvage and protection on site, new plantings should be considered. The site where they will be planted should be evaluated. Consider the prior use of the land: adverse soil conditions such as poor drainage or acidity; exposure to wind; temperature extremes; location of utilities, paved areas, and security lighting and traffic problems.

Transplanting Trees:

- Time of Year - Late fall through winter (November to February) is the preferred time for planting trees.
- Tree preparation - Proper digging of a tree includes the conservation of as much of the root system as possible. Soil adhering to the roots should be damp when the tree is dug, and kept moist until planting. The soil ball should be 12 inches in diameter for each inch of diameter of the trunk.
- Site preparation - Refer to landscape plans and specifications for site and soil preparation.
- Supporting the tree - Newly planted trees need artificial support to prevent excessive swaying.

- Watering - Soil around the tree should be thoroughly watered after the tree is set in place. When the soil becomes dry, the tree should be watered deeply, but not often. Mulching around the base of the tree is helpful in preventing roots from drying out.

Shrubs:

- Follow the general procedure for tree planting when planting shrubs.

Vines and Ground Cover:

- Site preparation - Ground covers are plants that naturally grow very close together, causing severe competition for space nutrients and water. Soil for ground covers should be well prepared.
- The entire area should be spaded, disced, or roto-tilled to a depth of six to eight inches. Two to three inches of organic material, such as good topsoil or peat, should be spread over the entire area.

Seeding:

- Climate, soils, and topography are major factors that dictate the suitability of the types of vegetation to seed. The soil on a disturbed site might require nutrient or mineral amendments to provide sufficient nutrients for seed germination and growth. The surface soil should be loose enough for water infiltration and root penetration. Soil pH should be between 6.0 and 6.5 and can be increased with liming if soils are too acidic. Seeds can be protected with mulch to retain moisture, regulate soil temperatures, and prevent soil loss during seedling establishment. Consult a local nursery for growing conditions for particular species of plants.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Materials

There are many different species of plants from which to choose, but care must be taken in their selections. It is essential to select planting materials suited to both the intended use and specific site characteristics. Vegetative plans must include close-growing plants or an adequate mulch with all plantings of trees, shrubs, vines, and ground covers.

There are many species of plants that may be used for erosion purposes. The plants discussed in this practice are those which are known to be adapted to Maricopa County, and commonly available from commercial nurseries. Information can be obtained from local nurserymen, landscape architects, and extension agents. An approved low water use plant list from the Arizona Department of Water Resources is found on the ADWR website (www.water.az.gov/adwr/content/conservation/LowWaterPlantLists/).

RECOMMENDED MAINTENANCE AND INSPECTION

Specific maintenance requirements may be listed on landscape plans and specifications. General requirements include:

Trees:

Young trees should receive an inch of water each week for the first two years after planting. Transplanted trees should be fertilized on an annual basis.

Shrubs:

Proper pruning, watering, and application of fertilizer is necessary to maintain healthy and vigorous shrubs. A heavy layer of mulch reduces weeds and retains moisture.

Vines and Ground Cover:

Trim old growth as needed to improve the appearance of ground covers.

Seeding:

Seeded areas should be inspected for failure or limited growth. If vegetation fails to grow well and the soil has been sufficiently watered, test the soil for low pH or nutrient imbalances. On a typical disturbed site, full plant establishment usually requires refertilization in the second growing season. Soil tests will determine whether additional fertilizer should be added.

POST CONSTRUCTION METHODS

In many cases, revegetation can remain after the construction project has been completed to continue the same functions as described in this BMP. Include revegetated areas with the final site dress-up or landscaping plan. As with any final site landscaping, ongoing maintenance for vegetation including mowing, pruning, watering, fertilizing, and weed and pest control will be necessary after project completion.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

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SPC-6 Revegetation Photos

Groundcover reduces the surface area of a site that is exposed to rainfall erosion.

SPC-7 SPC-7: Storm Drain Inlet Protection

DEFINITION

A variety of methods of intercepting sediment at low point inlets through the use of stone, filter fabric, inlet inserts, and other materials. This is normally located at the inlet, providing either detention or filtration to reduce sediment and floatable materials in stormwater.

GENERAL INFORMATION

Applicability - Effectiveness
Inlet Drain Protection - high
Channels and Medians - high
Perimeter and Access Controls - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

SPC-1 Organic Filter Barrier

SPC-2 Sand Bag Barrier

SPC-3 Gravel Filter Berms

SPC-5 Silt Fence

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance	X		
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment		X	
Floatable Material		X	
Metals			X
Other Construction Waste			X

FIGURES

Photos/Sketches

SPC-7 Storm Drain Inlet Protection Photos

CAD Drawings

Filter Fabric Fence Drop Inlet Filter

Curb Inlet Protection

PURPOSE

Storm drain inlet protection measures prevent soil and debris from site erosion from entering storm drain drop inlets and clogging them. Typically, these measures are temporary controls that are implemented prior to large-scale disturbance of the surrounding site. The early use of storm drains during project development significantly reduces the occurrence of future erosion problems.

APPROPRIATE APPLICATIONS

Storm drain inlet protection is appropriate where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. There are a variety of types of structures that are applicable to different conditions:

- Filter Fabric Fence – applicable where the inlet drains a relatively small (less than 1 acre) flat area (less than 5 percent slope). Intended for relatively low flows.
- Excavated Drop Inlet Sediment Trap – intended for relatively high flows. An excavated drop inlet trap provides protections against sediment entering a storm drain inlet can be provided by excavating an area in the approach to the drain. The excavation volume should be approximately 1800 to 3600 cubic feet per acre of disturbed area drained.
- Block and Gravel Protection – used when the flows exceed 0.5 cubic feet per second (cfs) and it is necessary to allow for overtopping to prevent flooding around the inlet area.
- Foam or Fiber Roll Barriers - use for relatively low flows in areas where they can be anchored to the surface. Most appropriate for inlets on an unpaved surface.

LIMITATIONS

- Special caution should be exercised when installing inlet protection on publicly traveled streets or in developed areas.
- Inlet protection is only viable at low point inlets. Inlets that are on slope cannot be effectively protected because stormwater will bypass the inlet and continue downstream, causing an overload on downstream inlets.
- Ponding will occur at the inlet with possible short term flooding.
- Curb inlets on slopes cannot be effectively protected because the stormwater will bypass the inlet and continue downgrade.
- Filter fabric fences are limited to storm drain inlets for small drainage areas of five acres or less. Filter fabric fences are not appropriate in paved areas. For larger drainage areas, smaller sediment catchment areas are recommended.

PLANNING CONSIDERATIONS

Where storm sewers are made operational before their drainage area is stabilized, or where construction is adjacent to an existing storm sewer, large amounts of sediment may enter the storm sewer system. In cases of extreme sediment loading, the storm sewer itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

This practice contains several types of inlet filters and traps which have different applications dependent upon site conditions and type of inlet. Other innovative techniques for accomplishing the same purpose are encouraged, but only after specific plans and details are submitted to and approved by the local government.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Install inlet protection in accordance with the following:

- Filter fabric fence: Place 2 inch by 2 inch wooden stakes around the perimeter of the inlet a maximum of 3 feet apart and drive them at least 8 inches into the ground. Excavate a trench approximately 8 inches wide and 12 inches deep around the outside perimeter of the stakes. Staple the filter fabric (for material specifications, see SPC-5: Silt Fence to wooden stakes so that 32 inches of the fabric extends out and can be formed into the trench. Use heavy-duty wire staples at least 1/2 inch in length. Backfill the entire trench with 3/4 inch or less washed gravel.

- Excavated Drop Inlet Sediment Trap: Construct the inlet trap as shown in the Storm Drain Drop Inlet Protection Drawing. Ensure that the excavation volume can contain approximately 1800 to 3600 cubic feet per acre of disturbed area.

- Gravel Bag Filter: If there is a high content of clays and silts, use filter fabric in conjunction with gravel for additional filtering capacity. Construct the gravel bag filter as specified by Gravel Filter Berms.

- Foam or Fiber Roll Barrier: Foam or fiber roll is placed around the inlet and must be anchored to the curb surface, so that it is not carried away by runoff flows.

RECOMMENDED MAINTENANCE AND INSPECTION

For systems using filter fabric, inspections should be made on a regular basis, especially after large storm events. If the fabric becomes clogged, it should be replaced. Sediment should be removed when it reaches approximately half the height of the fence. If an excavated inlet sediment trap is used, sediment should be removed when it fills approximately half the depth of the hole.

POST CONSTRUCTION METHODS

Following the completion of construction projects in residential and municipal areas, more permanent drop-inlet protection devices can be installed in storm drain inlets. The link under the Vendor Products section lists several different drop-inlet protection devices.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

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SPC-7 Storm Drain Inlet Protection Photos

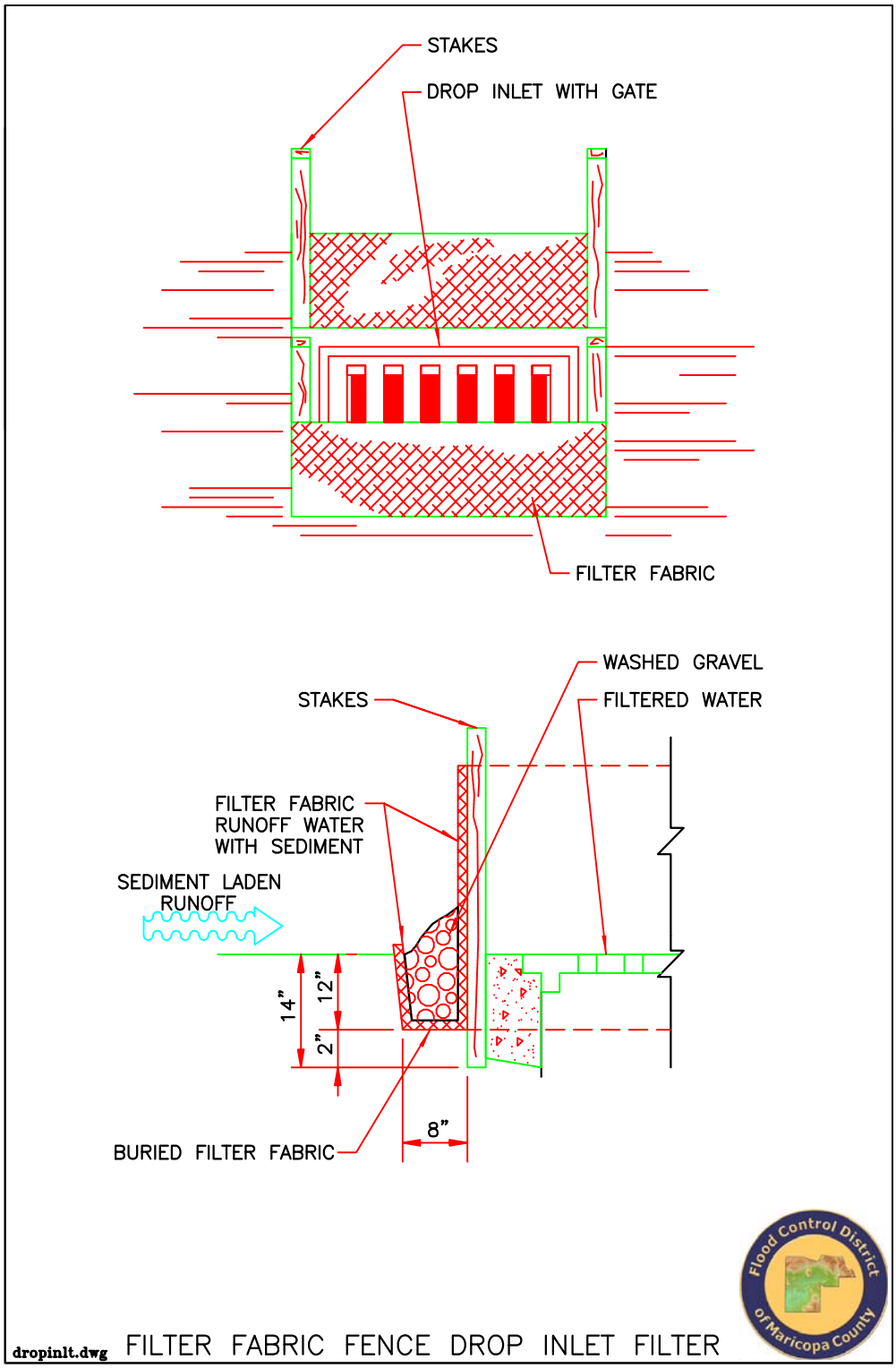
Coarse gravel and cinder blocks are often used to keep sediment and other pollutants out of storm drains.

Courtesy of EPA

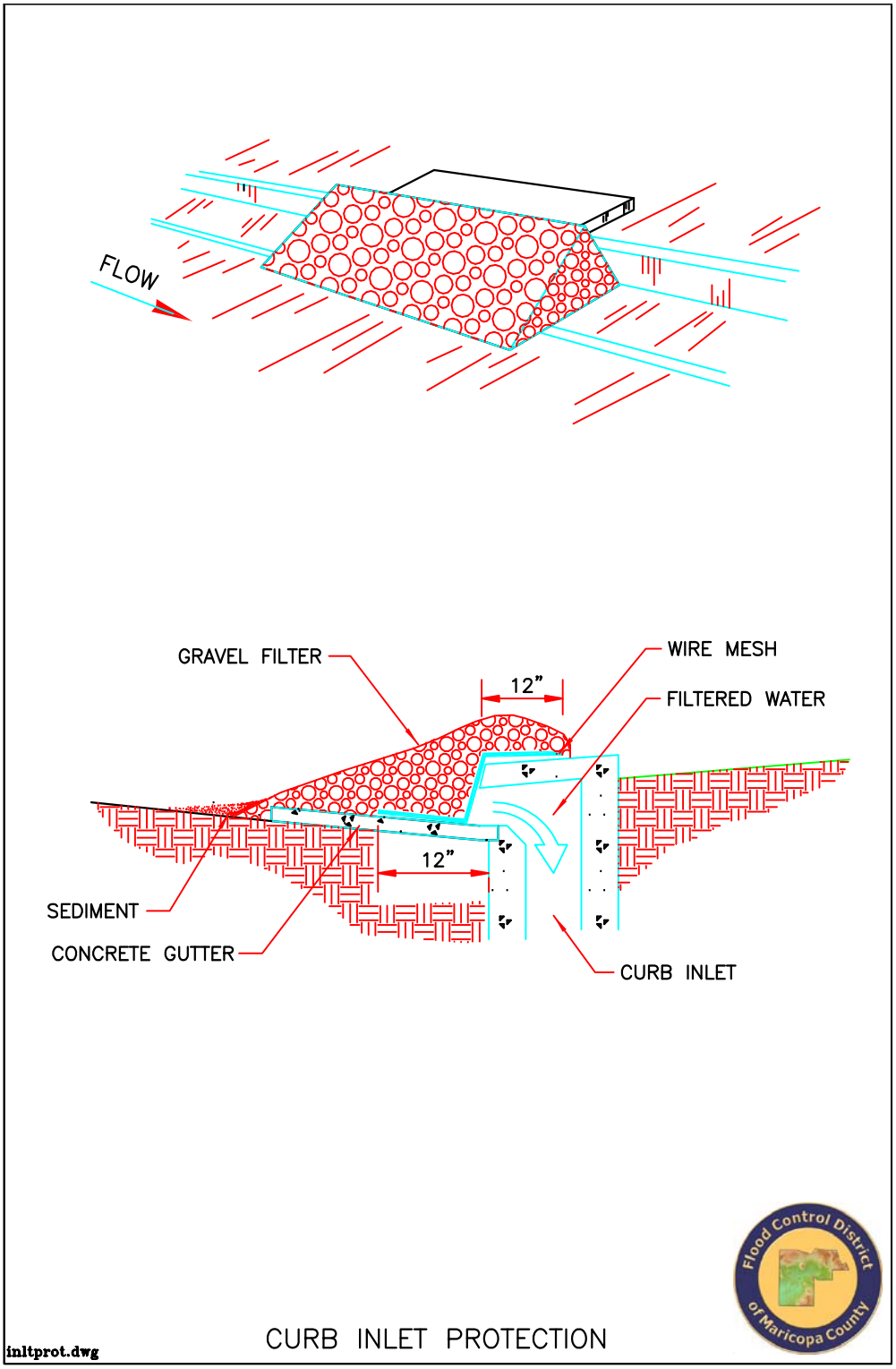
Gravel bag inlet drain protection.

Courtesy of California Regional Water Quality Board.

SPC-7 Storm Drain Drop Inlet Protection Drawing



SPC-7 Storm Drain Curb Inlet Protection Drawing



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SPC-8 SPC-8: Temporary Sediment Basins

DEFINITION

A pond area formed by constructing an embankment of compacted soil across a drainageway with a controlled outlet in which sedimentary laden runoff is directed to allow settling of suspended sediment from the runoff.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - high
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high
Landscaping and Vegetation - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

To treat lower flows and volumes than described in this BMP, consider SPC-9 Temporary Sediment Traps

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation	X		
Maintenance		X	
Training			X
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients		X	
Sediment	X		
Floatable Material		X	
Metals		X	
Other Construction Waste			X

FIGURES

Photos/Sketches

SPC-8 Temporary Sediment Basins Photos

CAD Drawings

Temporary Sediment Basins

PURPOSE

To collect and store sediment from sites cleared and/or graded during construction or for extended periods of time before reestablishment of permanent vegetation and/or construction of structures. It is intended to help treat and control silt-laden runoff. The basin is a temporary measure (with a design life less than 1 year) and is to be maintained until the site area is permanently protected against erosion or a permanent detention basin is constructed.

APPROPRIATE APPLICATIONS

Sediment basins serve as treatment devices which can be used on a variety of project types. They are normally used in construction projects where:

- Large areas of land drain to the basin
- A minor stream or off-line drainage way crosses the site
- A specific water feature is planned for the site
- Disturbed areas are greater than 5 acres during the rainy season
- Sediment-laden water may enter the drainage system

LIMITATIONS

Sediment basins and ponds must be installed only within the property limits where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities. Also, sediment basins and ponds are attractive to children and can be very dangerous. Local ordinances regarding health and safety must be adhered to. If fencing of the pond is required, the type of fence and its location should be shown on the Stormwater Pollution Prevention Plan (SWPPP).

- Generally temporary sedimentation basins are for disturbed upstream drainage areas of 5 acres or more.
- Because of additional detention time, sediment basins may be capable of trapping smaller sediment particles than traps. However, they are most effective when used in conjunction with other BMPs such as seeding or mulching.
- Sediment basins may become attractive to children and care must be taken to adhere to all safety practices. Also, standing water can attract mosquitoes.
- Sediment basins are only practically effective in removing sediment down to about the medium silt size fraction. Sediment-laden runoff with smaller size fractions (fine silt and

clay) will pass through untreated. This emphasizes the need to control erosion to the maximum extent first, rather than relying on sediment basins alone.

PLANNING CONSIDERATIONS

Effectiveness

- Sediment basins are at best only 70-80 percent effective in trapping sediment which flows into them. Therefore, they should be used in conjunction with erosion control practices such as temporary seeding, mulching, diversion dikes, etc. to reduce the amount of sediment flowing into the basin.

- Whenever possible, construct the sedimentation basins before clearing and grading work begins.

Location

- To improve the effectiveness of the basin, it should be located so as to intercept the largest possible amount of runoff from the disturbed area. The best locations are generally low areas below disturbed areas. Drainage into the basin can be improved by the use of diversion dikes and ditches. The basin must not be located in a stream but should be located to trap sediment-laden runoff before it enters the stream. The basin should not be located where its failure would result in the loss of life or interruption of the use or service of public utilities or roads. The sediment basin should be located more than 25 feet from septic system facilities.

RECOMMENDED STANDARDS AND SPECIFICATIONS

The sediment basin may be formed by partial excavation and/or by construction of a compacted embankment, or it may be a permanent retention basin designed in accordance with the Drainage Policies and Standards for Maricopa County. Each basin may have one or more inflow points carrying polluted runoff. For temporary basins, a securely anchored riser pipe is the principal discharge mechanism along with an emergency overflow spillway. The riser pipe should be solid with two 1-inch diameter dewatering holes located at the top of the sediment storage volume on opposite sides of the riser pipe as shown in the CAD file. Permanent basins are drained by percolation or dry wells. Outlet protection is provided to reduce erosion at the pipe outlet.

- As a general guideline, the sediment basin volume should be designed for 2,000 cubic feet, assuming limited infiltration.

- A hydraulics engineer should be consulted to properly design a sediment basin. Refer to the Drainage Design Manual for Maricopa County, Arizona for detailed design guidance. Total sediment pond volume and dimensions are determined as outlined below:

- Determine pond geometry for the storage volume calculated above using 3 feet in depth and 3:1 side slopes from the bottom of the basin. Note, the basin bottom is level.
- Adjust the geometry of the basin to effectively combine the settling zone volume and sediment storage volumes while preserving the depth and side slope criteria.
- Provide an emergency spillway with a crest elevation 1 foot above the top of the riser pipe.
- A minimum 3:1 length to width ratio is necessary. A larger length to width ratio (6:1) is even more effective to prevent short-circuiting. Baffles may also be implemented.

MAINTENANCE AND INSPECTION

- Inspect sediment basins before and after rainfall events or exceptionally large storms.
- Examine basin banks for seepage and structural soundness.
- Check inlet and outlet structures and spillway for any damage, obstructions, or erosion.
- Sediment basins should be drained within 36 hours after a rain event.
- Remove accumulated sediment when its volume reaches one-third the volume of the sediment storage. Properly dispose of sediment and debris removed from the basin, within the construction site.
- Check fencing for damage and repair.

POST CONSTRUCTION METHODS

Sediment basins can be converted to permanent structures after completion of the construction project. Remove all excess sediment from the basin. The containment volume of permanent sediment basins will need to be expanded to meet the design storm requirements in the Maricopa County Drainage Regulations. The inside of a permanent sediment basin should either be vegetated or rock lined. Alternatively, if the permeability of the soil is high and groundwater is close to the ground surface, a clay or synthetic liner may be installed. Ensure that the sedimentation basin has a stabilized outlet (see EC-11: Outlet Protection, Velocity Dissipation Devices).

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual.

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Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

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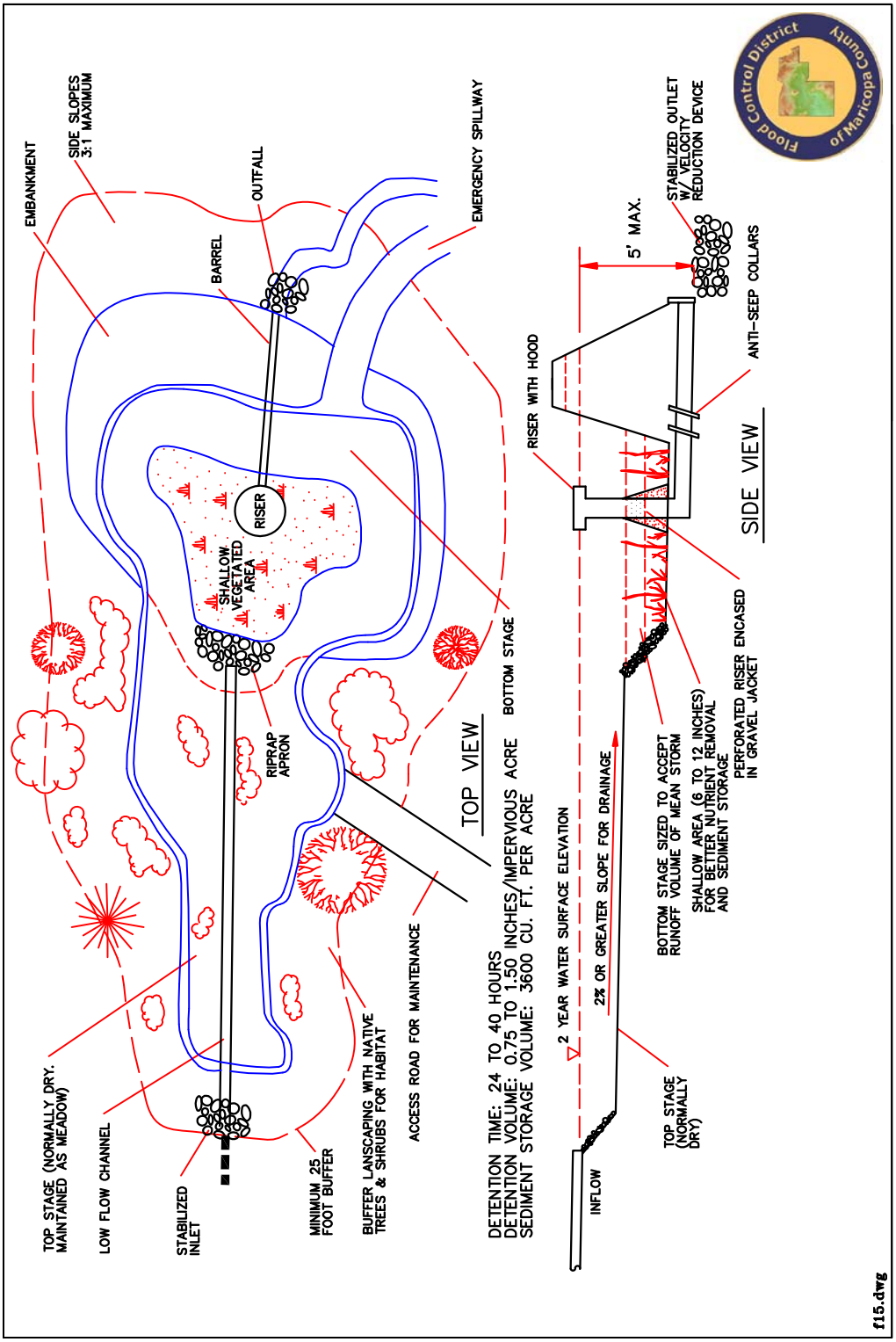
SPC-8 Temporary Sediment Basins Photos

Temporary sediment basin with outlet protection.

Temporary sediment basins provide stormwater storage during the construction process.

SPC-8 Temporary Sediment Basins Drawing



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SPC-9 SPC-9: Temporary Sediment Traps

DEFINITION

A sediment trap is a temporary containment area that allows sediment in collected stormwater to settle out during infiltration or before the runoff is discharged through a stabilized spillway. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area. Sediment traps are smaller and less expensive to install than sediment basins, but generally settle out coarser particles than sediment basins.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - high
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high
Landscaping and Vegetation - high

Most effective when used with:

An Erosion Control (EC) BMP

Alternative BMPs:

To treat higher flows and volumes than described in this BMP, consider SPC-8 Temporary Sediment Basins

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients		X	
Sediment		X	
Floatable Material		X	
Metals		X	
Other Construction Waste			X

FIGURES

Photos/Sketches

SPC-9 Temporary Sediment Traps Photos

CAD Drawings

Excavated Drop Inlet Sediment Trap

Temporary Sediment Trap

PURPOSE

Sediment traps generally remove larger particles (gravel and sand) than sediment basins, and some metals that settle out with the sediment. The trap is a temporary measure (with a design life of approximately 6 months) and is to be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

APPROPRIATE APPLICATIONS

Sediment traps are generally temporary control measures to slow concentrated runoff velocity and catch sediment, and they can be used with other temporary stormwater control measures. Traps should be placed where sediment laden stormwater enters a storm drain or watercourse. They are commonly used at the outlets of stormwater diversion structures, channels, slope drains, construction site entrance wash racks, or any other runoff conveyance that discharges waters containing erosion sediment and debris. Sediment traps can also be used as part of a stormwater drop intake protection system when the inlet is located below a disturbed area and will receive runoff with large amounts of sediment. Sediment traps may be used on construction projects where the drainage area is less than 5 acres.

LIMITATIONS

- Requires large surface areas to permit infiltration and settling of sediment.
- Not appropriate for drainage areas greater than 5 acres.
- Only removes large and medium sized particles and requires upstream erosion control.
- Attractive and dangerous to children, and requires protective fencing.
- Not to be located in live streams.
- Size may be limited by availability of right-of-way.

PLANNING CONSIDERATIONS

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 5 acres, refer to SPC-8 Temporary Sediment Basins, or subdivide the catchment area into smaller drainage basins.

Sediment must be removed from the trap after each significant rainfall event. Plans should detail how this sediment is to be disposed of, either using in-fill areas onsite or removal to an approved offsite dump. Sediment traps, along with other perimeter controls, should be installed before any land disturbance takes place in the drainage area.

Sediment traps and ponds must be installed only on sites where failure of the structure would not result in loss of life, damage to home or buildings, or interruption of use of service public roads or utilities. Also, sediment traps are attractive to children and can be dangerous. The following recommendations should be implemented to reduce risks:

- Install continuous fencing around the sediment trap. Consult local ordinances regarding requirements for maintaining health and safety.
- Restrict sediment trap side slopes to 3:1 or flatter.

RECOMMENDED STANDARDS AND SPECIFICATIONS

The sediment trap may be formed completely by excavation or by construction of a compacted embankment. The outlet should be a weir/spillway section, with the area below the weir acting as a filter for sediment and the upper area as the overflow spillway depth.

The effectiveness of sediment traps is directly related to the size of the trap. As a general guideline, based on soil and slope characteristics, the recommended sediment trap volume is approximately 2,000 cubic feet per acre of disturbed upstream drainage area for drainage areas of 5 acres or less. The required volume can be reduced if additional erosion and/or sediment control practices have been implemented upstream of the sediment trap.

After determining the necessary volume, size the trap by adding an additional 1.5 feet for sediment accumulation to the volume computed.

RECOMMENDED MAINTENANCE AND INSPECTION

Inspect sediment traps before and after rainfall events and weekly during the rest of the rainy season. During extended rainfall events, inspect sediment traps on a more frequent basis. The key to a functional sediment trap is continual monitoring and regular maintenance.

If captured runoff has not completely drained within 36 hours. Then the sediment trap must be dewatered.

- Inspect trap banks for embankment seepage and structural soundness.
- Inspect outlet structure and rock spillway for any damage or obstructions. Repair damage and remove obstructions as needed. Inspect outlet area for erosion and stabilize if required.
- Remove accumulated sediment when the volume has reached one-third the original trap volume.
- Inspect fencing for damage and repair as needed.

POST CONSTRUCTION METHODS

None.

REFERENCES

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual.
http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II.
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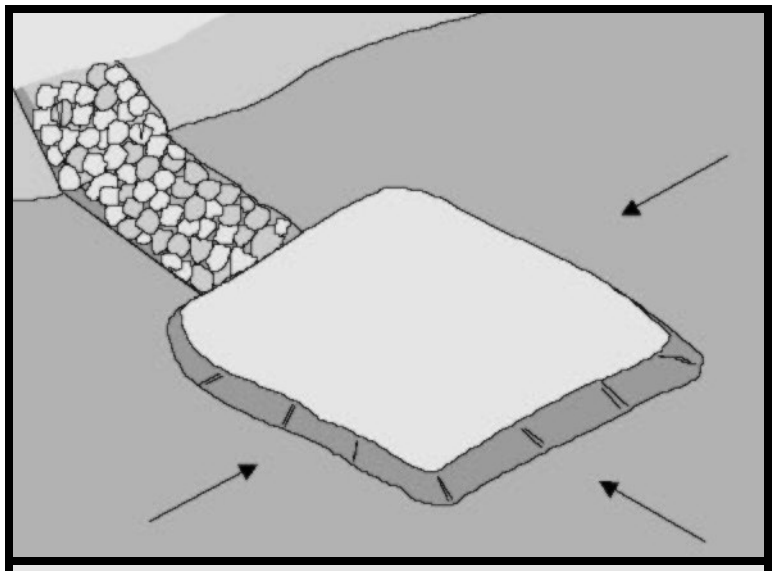
SPC-9 Temporary Sediment Traps Photos



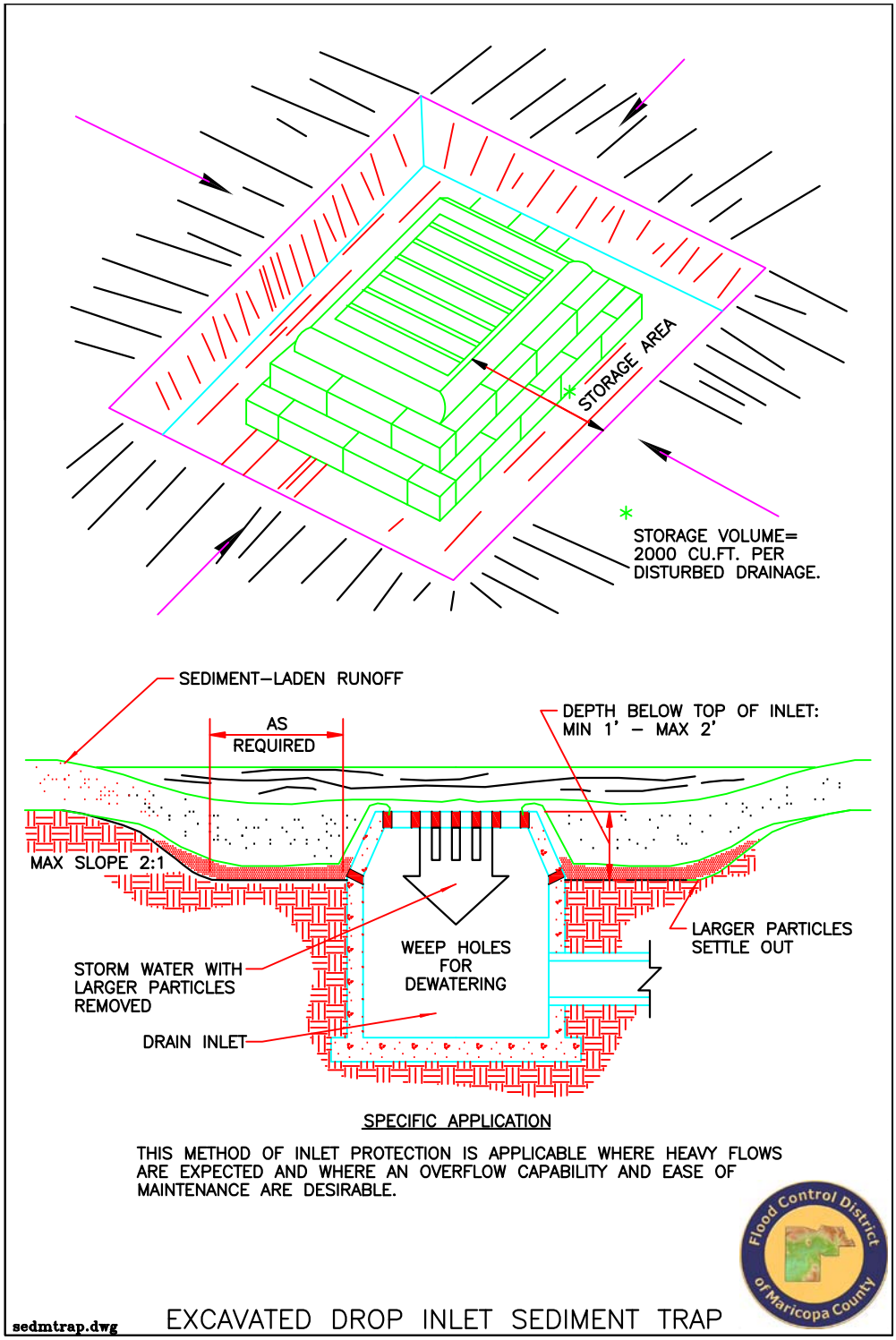
Schematic of sediment trap and outlet protection.

Courtesy of CALTRANS

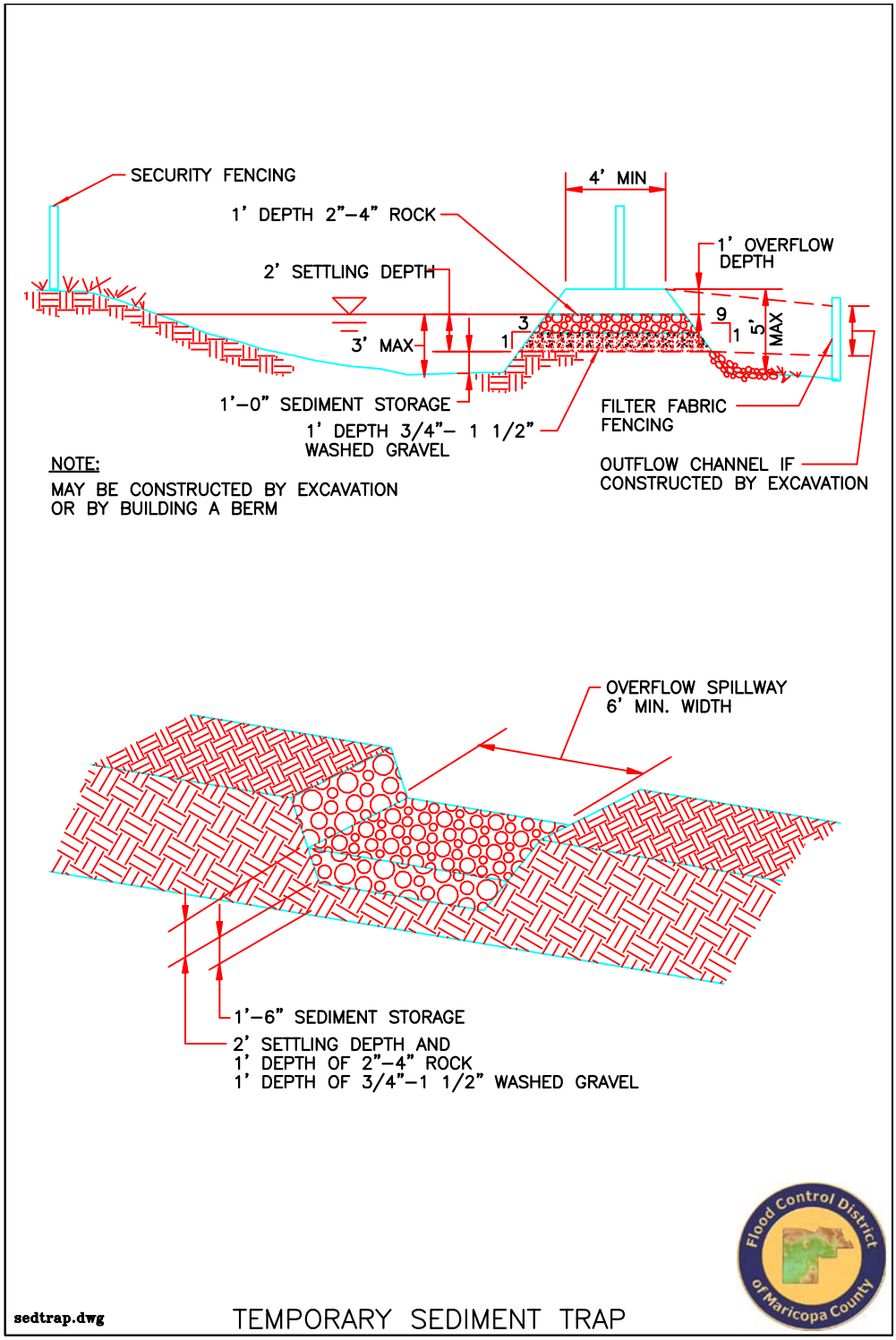
Sediment traps are used to collect sediment laden runoff from disturbed areas on construction sites.

Courtesy of Douglas County

SPC-9 Temporary Sediment Traps Drawing



SPC-9 Temporary Sediment Traps Drawing



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SPC-10 SPC-10: Sediment Dewatering Operations

DEFINITION

A filtration bag or sediment bag is a large bag made of geotextile that is used for filtering water pumped as part of dewatering a worksite. The bag is hooked up to a hose and water is pumped through the bag. The water seeps through the geotextile fabric and the sediment is trapped in the bag.

GENERAL INFORMATION

Applicability - Effectiveness

Slope Protection - moderate
Excavated Areas (trenches, pits, etc.) - high
Perimeter and Access Controls - high

Most effective when used with:

Protect excavated areas before runoff enters by using:

SPC-1 Organic Filter Barrier

SPC-2 Sand Bag Barrier

SPC-3 Gravel Filter Berms

For flows or sediment loads too large for a dewatering treatment device, consider:

SPC-9 Temporary Sediment Traps

Alternative BMPs:

For more efficient removal, use with:

SPC-8 Temporary Sediment Basins

SPC-9 Temporary Sediment Traps

RATINGS

Associated Costs	H	M	L
Implementation	X		
Maintenance	X		
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease		X	
Nutrients			X
Sediment	X		
Floatable Material		X	
Metals		X	
Other Construction Waste		X	

FIGURES

Photos/Sketches

SPC-10 Sediment Dewatering Operations Photos

CAD Drawings

None

PURPOSE

After storm events, dewatering of non-stormwater and accumulated rainfall from excavated work areas is often necessary before work can proceed. In the process of removing stormwater, certain measures must be taken to correctly discharge it.

APPROPRIATE APPLICATIONS

Dewatering is often implemented for discharges of non-stormwater from excavated work areas such as utility repairs and construction sites. Non-stormwater includes groundwater, water from cofferdams, water diversions, and water from drilling and other construction operations. Dewatering is also appropriate for removal of accumulated precipitation from depressed areas on a construction site.

LIMITATIONS

Dewatering controls described in this BMP are intended for control of sediment particles. Other control methods (i.e. sediment basins and sediment traps) may allow for longer settling time of sediment particles, and thus greater efficiency of removal, than dewatering controls. Dewatering operations that discharge water offsite will require an AZPDES De Minimus Discharge General Permit. Refer to ADEQ website (www.azdeq.gov/environ/water/permits/gen.html#demi) for more information. Dewatering discharges can be avoided by using the water for dust control or diverting it to an infiltration basin.

Specific limitations for sediment filter bags include:

- Filtration bags full of sediment are heavy and may need to be lifted with a front-end loader.
- As bags fill up with sediment, they become clogged and may “explode” from force of pump if not removed in time.
- Sediment filter bags may not work with very fine particulates.

PLANNING CONSIDERATIONS

Before starting a dewatering operation, one or more of the following mechanisms must be in place to treat water during dewatering operations:

- Sediment basin
- Sediment trap
- Weir tanks
- Dewatering tanks

- Gravity bag filter

Alternatively, excavated areas can be protected before runoff enters by using: Organic Filter Barrier, Sand Bag Barrier, or Gravel Filter Berms.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Sediment basin

Sediment basins are relatively large structures that are effective during dewatering operations for the removal of gravel, sand, silt, and some metals that settle out with the sediment as well as trash. Refer to Temporary Sediment Basins for a more detailed description.

Sediment trap

Sediment traps are smaller structures that mainly remove larger particles (gravel and sand) and are less effective at removing fines and associated metals than sediment basins. Refer to Temporary Sediment Traps for a more detailed description.

Weir tanks

Weir tanks separate waste from water through a series of weirs. The tank can remove trash, some settleable solids (gravel, sand, and silt), oil and grease, and some metals (removed with the sediment). For higher levels of flow, multiple tanks can be used in parallel, or if additional treatment is desired, the tanks can be placed in series or as pre-treatment in conjunction with other methods. For additional removal of fine sediment particles, consider adding a coagulant to the collected water in the weir tank. Note that periodic cleaning is required based on visual inspection or reduced flow. Any accumulated oil and grease must be disposed of by a licensed waste disposal company.

Dewatering tanks

A dewatering tank removes debris and sediment by passing the dewatered effluent through a fabric filter at the top and discharging it through the bottom of the tank. The filter separates trash, some settleable solids (gravel, sand, and silt), oil and grease, and some metals (removed with the sediment). Similar to weir tanks, for higher levels of flow, multiple tanks can be used in parallel, or if additional treatment is desired, the tanks can be placed in series or as pre-treatment in conjunction with other methods. For additional removal of the sediment particles, consider adding a coagulant to the dewatering tank. Note that periodic cleaning is required based on visual inspection or reduced flow. Any accumulated oil and grease must be disposed of by a licensed waste disposal company.

Gravity bag filter

A gravity bag filter, also referred to as a dewatering bag, is a rectangular bag made of non-woven geotextile fabric for effective removal of sediments (gravel, sand, and silt). Some metals are

removed with the sediment. Depending on size, the bag can handle up to 1500 gallons per minute. The bag should be installed on a slight slope so that water flows through the length of the bag. Place straps underneath the bag so that when full, the bag may be more easily lifted. Insert the hose (up to 4 inches in diameter) into the neck of the bag. Tie off the neck with baling wire and/or duct tape. Filtration bags come in sizes up to 15 feet by 15 feet. When filled with trapped sediment, it requires heavy equipment or a crew of men to lift it.

RECOMMENDED MAINTENANCE AND INSPECTION

Soil from full dewatering bags can either be reapplied to the site as it often contains nutrient rich top soil or should be properly disposed of offsite.

POST CONSTRUCTION METHODS

None.

REFERENCES

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual.
http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

SPC-10 Sediment Dewatering Operations Photos

Dewatering sediment bag.

Courtesy of www.stormwater-products.com

Dewatering tanks.

Courtesy of CALTRANS

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GH: General Housekeeping

General housekeeping refers to any management and/or work practices implemented on a construction site to prevent the contamination of stormwater by materials other than sediment. General housekeeping practices involve proper management of chemicals and other potentially hazardous construction materials, equipment, and wastes. Managing potential pollutants offsite (i.e. conducting equipment maintenance back at the maintenance shop rather than at the site) is an effective method of eliminating potential spills and contamination on the construction site. If a pre-manufactured product is to be implemented on a site for general housekeeping, the contractor should always follow the manufacturer's installation and maintenance recommendations as the primary reference for implementation.

GH-1 Chemical Management

GH-2 Solid Waste Management

GH-3 Equipment Maintenance Procedures

GH-4 Designated Washdown Areas

GH-5 Spill Containment Plan

GH-6 Road Sweeping and Road Trackout Cleaning

Disclaimer

Any hyperlinks in the vendor products table will direct you out of the Flood Control District of Maricopa County (FCDMC) domain. FCDMC is providing the following vendor information for possible assistance to any interested parties, but does not necessarily endorse any of the information, recommendations or products provided by the vendors.

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GH-1 GH-1: Chemical Management

DEFINITION

Chemical management includes the proper labeling, handling, storage and disposal of chemical products.

GENERAL INFORMATION

Applicability - Effectiveness

Inlet Drain Protection - high
Debris Management, Cleanup, and Washout - moderate
Equipment Storage/Maintenance - high

Most effective when used with:

Protect excavated areas before runoff enters by using:

GH-2 Solid Waste Management

GH-3 Equipment Maintenance Procedures

GH-5 Spill Containment Plan

Alternative BMPs:

None

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease	X		
Nutrients	X		
Sediment			X
Floatable Material			X
Metals	X		
Other Construction Waste	X		

FIGURES

Photos/Sketches

GH-1 Chemical Management Photos

CAD Drawings

None

PURPOSE

Proper chemical management prevents, or at least minimizes stormwater runoff from being polluted through spills or other forms of contact. It is not intended to supercede or replace normal site assessment and remediation procedures.

APPROPRIATE APPLICATIONS

Chemical management practices, along with the applicable OSHA, DOT, and EPA guidelines, should be incorporated at all construction sites that use or generate potentially hazardous wastes. Target chemicals include:

- Paints, solvents, and stains
- Wood preservatives
- Fuel, lube oils, grease, and cutting oils
- Roofing tar
- Pesticides, herbicides, and fertilizer
- Antifreeze

LIMITATIONS

- Chemical management practices are not intended to address site-assessments and pre-existing soil and water contamination. Major contamination and large spills require immediate response from spill-response personnel.
- Demolition activities and potential pre-existing materials, such as lead-based paint and asbestos in building materials, are not addressed by this practice.
- Chemical management practices cover general procedures and are not intended for products and uses that may require additional safeguards.

RECOMMENDED STANDARDS AND SPECIFICATIONS

The best method for controlling chemical pollution is to provide adequate controls at the point of storage and use. The following recommendations are intended to prevent, and/or minimize contamination of runoff:

Storage and Labeling Procedures

- Where possible, cover stockpiled materials indoors or with a temporary roof structure. Do not allow water to pond around stored drums.

- Do not pinch a drum with a forklift when unloading or moving.
- If moving multiple drums (i.e. on a pallet), make sure they are held together with shrink wrap or a steel band.
- Mark any damaged containers.
- Do not store chemicals, drums, and bagged materials directly on the ground. Use secondary containment platforms or wooden pallets.
- Provide spill containment dikes around chemical and fuel storage tanks. Line with plastic film to prevent soil contamination.
- When possible, keep chemical products in their original containers, bungs on lids closed (except during use), and labeled in accordance with DOT and EPA regulations. Use proper devices to transfer chemicals from one container to another.
- Containment areas that have collected precipitation should not be drained until the site supervisor has ensured that the drainage will not contaminate surrounding soil.

Waste Handling and Disposal Procedures

- Ensure that adequate hazardous waste storage space is available, hazardous waste collection containers are conveniently located, and that adequate cleanup and containment materials are available onsite.
- Store hazardous wastes in an appropriate type of container and properly labeled per EPA, OSHA, and DOT regulations.
- Consult with the local municipality jurisdiction as to whether wash up water from water-based paints may go into a sanitary sewer.
- Regularly dispose of oil-based paints, solvents, thinners, and mineral spirits through a licensed waste management firm.
- Follow the recommendations of the manufacturer to dispose of construction chemicals such as curing compounds, form releases, etc.
- Follow the manufacturer's instructions regarding the intended use, protective equipment, ventilation, flammability, and mixing of chemicals.

The effectiveness of chemical management is enhanced when the following BMPs are also implemented: Solid Waste Management**,** Equipment Maintenance Procedures, and Spill Containment Plan

RECOMMENDED MAINTENANCE AND INSPECTION

Various components of a Chemical Management program must be continually maintained and revised:

Educating workers

- Safety procedures for proper construction site chemical storage and management.
- Identification of potential sources of chemical pollutants.
- Spill prevention and response procedures.
- Potential dangers to humans and the environment from chemical pollutants.
- Establish a continuing education program to educate new employees.

Quality Assurance

- Foreman and/or construction supervisor should monitor onsite chemical storage and disposal procedures.
- Educate and if necessary, retain and/or discipline workers who violate procedures.
- Ensure the hazardous waste disposal contractor is reputable and licensed.

Emergency Response Plan

As specified by the local Fire Department, revisions may be necessary to the Protected Chemical and Materials Storage Area Plan during the course of construction based upon materials to be stored on site.

If a spill occurs which equals or exceeds the reportable quantity (RQ) for a 24-hour period as defined by the EPA in 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302, then:

- Report spill to the National Response Center, 1-800-424-8802, within 24 hours. Also notify the Arizona Emergency Response Commission and the Maricopa County Emergency Management Department.
- Revise the Stormwater Pollution Prevention Plan (SWPPP) to show corrective actions.
- Notify local EPA Region IX office within 14 days.

POST CONSTRUCTION METHODS

If hazardous materials are stored onsite after the development is completed, proper chemical management procedures and structures should be maintained.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

Smolen, M.D., September 1988, North Carolina Erosion and Sediment Control Planning and Design Manual, North Carolina Sediment Control Commission, et al.

GH-1 Chemical Management Photos

Secondary drum containment platform.

Courtesy of Interstate Products, Inc.

Secondary drum containment covered storage.

Courtesy of Interstate Products, Inc.

GH-2 GH-2: Solid Waste Management

DEFINITION

The routine collection, recycling, and disposal of accumulated solid waste generated at the construction site.

GENERAL INFORMATION

Applicability - Effectiveness

Debris Management, Cleanup, and Washout - moderate

Trash Collection/Management - high

Most effective when used with:

GH-1: Chemical Management

GH-3: Equipment Maintenance Procedures

GH-5: Spill Containment Plan

Alternative BMPs:

None

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients		X	
Sediment			X
Floatable Material	X		
Metals	X		
Other Construction Waste	X		

FIGURES

Photos/Sketches

Solid Waste Management Photos

CAD Drawings

None

PURPOSE

Solid waste is one of the major pollutants caused by construction activities. By limiting the trash and debris on site and through proper disposal methods, stormwater quality is improved and there is reduced clean up at the completion of a project.

APPROPRIATE APPLICATIONS

Proper solid waste management is applicable to all construction activities. Solid wastes include, but are not limited to:

- Construction wastes including plastic, glass, rubber, brick, mortar, timber, steel and metal scraps, sawdust, pipe and electrical cuttings, non-hazardous equipment parts, Styrofoam and other materials used to transport and package construction materials, materials from the demolition of structures. Highway planting wastes, including vegetative material, plant containers, and packaging materials.

- Domestic waste products, including sanitary wastes, food containers, beverage cans, coffee cups, paper bags, plastic wrappers, cigarettes, and litter generated by the public.

LIMITATIONS

- Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

- This practice only applies to non-hazardous solid waste.

RECOMMENDED STANDARDS AND SPECIFICATIONS

Education

- Site supervisor or other designated personnel should oversee and enforce proper solid waste procedures and practices.

- Instruct employees and subcontractors on identification of solid waste and hazardous waste, solid waste storage and disposal procedures. Require that employees and subcontractors follow solid waste handling and storage procedures.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).

- Prohibit littering by employees, subcontractors, and visitors.

- Wherever possible, minimize production of solid waste materials.

Collection, Storage, and Disposal

- Covered dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project operations.
- Prevent clogging of the storm drainage system by removing litter and debris from drainage grates, trash racks, and ditch lines.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Construction debris and litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Full dumpsters should be removed from the project site.
- Litter stored in collection areas and containers should be handled and disposed of by trash hauling contractors every two weeks or more frequently, if necessary. Notify trash hauling contractors that only watertight dumpsters are acceptable for use onsite. Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Stormwater runoff should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures.
- Solid waste storage areas should be located more than 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Dumpster washout on the project site is not allowed.
- Keep the site clean of litter debris.

Hazardous Waste Management

- Segregate potentially hazardous waste from non-hazardous construction site waste. Make sure that toxic liquid wastes (e.g., used oils, solvents, and paints) and chemicals (e.g., acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris. For disposal of hazardous waste, see Chemical Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.

Recycling

- Salvage or recycle useful vegetation debris, packaging and/or surplus building materials when practical. For example, trees and shrubs from land clearing can be converted into

wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Sanitary Waste Management

- Educate employees, subcontractors, and suppliers on sanitary/septic waste storage and disposal procedures and potential dangers to humans and the environment from sanitary/ septic wastes.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings) and to educate new employees.
- Locate portable toilets a minimum of 20 feet away from storm drain inlets, drainage facilities, watercourses, and from traffic circulation. If unable to meet the 20-foot distance requirement, provide secondary containment for portable toilets.
- Properly connect temporary sanitary facilities that discharge to the sanitary sewer system to avoid illicit discharges. Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- If using an onsite disposal system, such as a septic system, comply with local health agency requirements.
- Ensure that sanitary/septic facilities are maintained in good working order by a licensed service. Use only reputable, licensed sanitary/septic waste haulers.

The effectiveness of solid waste management is enhanced when the following BMPs are also implemented: Chemical Management, Equipment Maintenance Procedures, and Spill Containment Plan.

RECOMMENDED MAINTENANCE AND INSPECTION

- Onsite trash should be collected and disposed of on a regular basis. Sanitary systems should also be regularly serviced.
- Repair trash containers and dumpsters on an as needed basis. Where possible provide cover for waste containers to prevent the entry of rainwater and loss of contents by wind.
- Maintain a contingency plan in the case that hazardous or toxic materials are discovered onsite.

POST CONSTRUCTION METHODS

Long term solid waste practices should be implemented (i.e. dumpsters, and regular trash pick-ups, etc.)

REFERENCES

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

GH-2 Solid Waste Management Photos

Separate out different wastes from each other for recycling.

Place signage on the dumpster to prevent improper disposal of hazardous wastes.

GH-3 GH-3: Equipment Maintenance Procedures

DEFINITION

Establish a program of equipment maintenance procedures, which will reduce contamination of onsite soils.

GENERAL INFORMATION

Applicability - Effectiveness

Equipment Storage/Maintenance - high
Debris Management, Cleanup, and Wash-out- moderate
Trash Collection/Management - moderate

Most effective when used with:

GH-1: Chemical Management

GH-4: Designated Washdown Areas

GH-5: Spill Containment Plan

Alternative BMPs:

None

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease	X		
Nutrients			X
Sediment			X
Floatable Material			X
Metals	X		
Other Construction Waste		X	

FIGURES

Photos/Sketches

Equipment Maintenance Procedures Photos

CAD Drawings

None

PURPOSE

Non-sediment stormwater pollution can occur through improper disposal of equipment fluids and disposables such as filters, batteries, and tires. An established program of maintenance procedures can prevent job site pollution and contamination of stormwater.

APPROPRIATE APPLICATIONS

These procedures are applied on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles. Perform equipment maintenance, if possible, back at the maintenance shop.

LIMITATIONS

None identified.

RECOMMENDED STANDARDS AND SPECIFICATIONS

- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- All maintenance areas are required to have spill kits and/or use other spill protection devices.
- Dedicated maintenance areas should be protected from stormwater runon and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Absorbent spill clean-up materials should be available in maintenance areas and should be disposed of properly after use. Substances used to coat asphalt transport trucks and asphalt spreading equipment should be non-toxic.
- Use offsite maintenance facilities whenever practical.
- For long-term projects, consider constructing roofs or portable tents over maintenance areas.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials. Do not dump fuels and lubricants onto the ground, place used oil in a dumpster, or pour into a storm drain or watercourse. Repair fluid and oil leaks immediately. Provide spill containment dikes or secondary containment around stored oil and chemical drums.
- Properly dispose or recycle used batteries.

The effectiveness of equipment maintenance procedures is enhanced when the following BMPs are also implemented: GH-1: Chemical Management, GH-4: Designated Washdown Areas and GH-5: Spill Containment Plan.

RECOMMENDED MAINTENANCE AND INSPECTION

- Maintain waste fluid containers in leak proof condition.
- Vehicle and equipment maintenance areas should be inspected regularly.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

POST CONSTRUCTION METHODS

None.

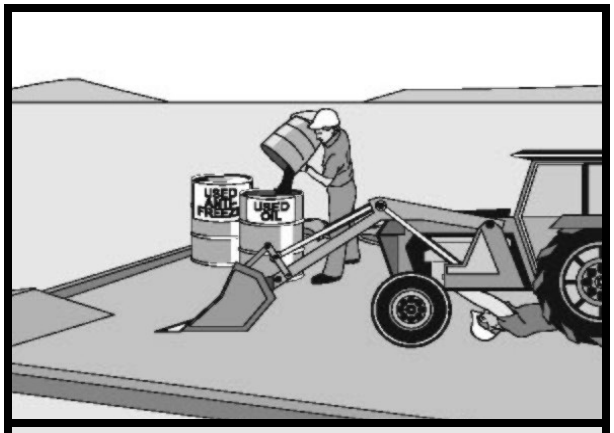
REFERENCES

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

GH-3 Equipment Maintenance Procedures Photos



Schematic of used oil containment.

Courtesy of CALTRANS

Enclosed area maintenance.

Courtesy of EPA

GH-4 GH-4: Designated Washdown Areas

DEFINITION

Procedures and practices that are designed to minimize or eliminate the discharge of concrete waste materials to the storm drain systems of watercourses.

GENERAL INFORMATION

Applicability - Effectiveness
Inlet Drain Protection - high
Debris Management, Cleanup, and Washout - high

Most effective when used with:

GH-1: Chemical Management

GH-3: Equipment Maintenance Procedures

GH-5: Spill Containment Plan

Alternative BMPs:

None

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation		X	
Maintenance		X	
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease		X	
Nutrients			X
Sediment			X
Floatable Material			X
Metals		X	
Other Construction Waste	X		

FIGURES

Photos/Sketches

GH-4 Designated Washdown Areas Photos

CAD Drawings

None

PURPOSE

Designated washout areas and associated procedures ensure the proper washout of concrete trucks, tools, and equipment and prevents fresh concrete or cement laden mortar from entering a storm drainage system.

APPROPRIATE APPLICATIONS

Concrete waste management procedures and practices are implemented on construction projects where concrete is used as a construction material or where concrete dust and debris result from demolition activities.

- Where slurries containing Portland cement concrete (PCC) or asphalt concrete (AC) are generated, such as from sawcutting, coring, grinding, grooving, and hydro-concrete demolition.
- Where mortar-mixing stations exist.
- Where concrete trucks and other concrete-coated equipment are washed on site. See also Equipment Maintenance Procedures.

LIMITATIONS

None.

PLANNING CONSIDERATIONS

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.
- The site supervisor or designated personnel should oversee and enforce concrete waste management procedures.

The effectiveness of washdown areas may be enhanced when the following BMPs are also implemented: Chemical Management, Equipment Maintenance Procedures, and Spill Containment Plan.

RECOMMENDED STANDARDS AND SPECIFICATIONS

PCC and AC Wastes

- PCC and AC waste should not be allowed to enter storm drains or watercourses. Instead, PCC and AC waste should be collected and properly disposed of outside the highway right-of-way or placed in a temporary concrete washout structure.
- Install a sign adjacent to each temporary concrete washout structure to inform concrete equipment operators to utilize the installed structures.

- A foreman and/or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.

- Saw cutting residue should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. Vacuum slurry residue and dispose in a temporary facility and allow slurry to dry. Dispose of dry slurry residue in accordance with GH-2: Solid Waste Management.

- Similarly, residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine.

Onsite Temporary Concrete Washout Facility Procedures

- Temporary concrete washout facilities should be located a minimum of 50 feet from storm drain inlets, open drainage facilities, and watercourses, unless determined infeasible by the site supervisor. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.

- Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor and have sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.

- Perform washout of concrete mixer trucks in designated areas only. A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.

- Wash concrete only from mixer truck chutes into approved concrete washout facility. Washout may be collected in an impermeable bag for disposal.

Above Grade Temporary Concrete Washout Structure

- Above grade temporary concrete washout structures should have a minimum length and width of 10 feet or larger to provide sufficient volume to contain all liquid and concrete waste generated by washout operations. If deemed necessary, the length and width of the washout structure may be expanded for more capacity.

- Straw bales, wood stakes, and sandbag materials should conform to the specifications in SPC-1: Organic Filter Barrier and SPC-2: Sand Bag Barrier.

- Plastic lining material should be a minimum of 10-mil polyethylene sheeting and should be free of holes, tears or other defects that compromise the impermeability of the material.

Below Grade Temporary Concrete Washout Structure

- Below grade temporary concrete washout should have a minimum length and width of 10 feet or larger to provide sufficient volume to contain all liquid and concrete

waste generated by washout operations. If deemed necessary, the length and width of the washout structure may be expanded for more capacity.

- Plastic lining material should be a minimum of 10-mil polyethylene sheeting and should be free of holes, tears or other defects that compromise the impermeability of the material.
- Ensure that the soil base is free of rocks or other debris that may cause tears or holes in the plastic lining material.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, as determined by the site supervisor, hardened concrete should be broken up, removed, and disposed of in accordance with GH-2: Solid Waste Management.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled.

RECOMMENDED MAINTENANCE AND INSPECTION

- Monitor on site concrete waste storage and disposal procedures at least weekly.
- Monitor concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are employed.

POST CONSTRUCTION METHODS

None.

REFERENCES

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual.
http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II.
http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

North Central Texas Council of Governments, December 2003, integrated Storm Water Management (iSWM) Design Manual for Construction.

Washington Department of Ecology, August 2001, Stormwater Management Manual for Western Washington, Publications #99-11 through 99-15.

GH-4 Designated Washdown Areas Photos

Concrete washout container.

Courtesy of Concrete Washout Systems, Inc.

Concrete washout area.

Courtesy of Douglas County

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GH-5 GH-5: Spill Containment Plan

DEFINITION

An emergency plan to contain spills of dangerous, hazardous, or toxic wastes which mitigates environmental damage and provides prompt notice to proper authorities.

GENERAL INFORMATION

Applicability - Effectiveness
Inlet Drain Protection - high
Debris Management, Cleanup, and Washout - high

Most effective when used with:

GH-1: Chemical Management

GH-3: Equipment Maintenance Procedures

GH-4: Designated Washdown Areas

Alternative BMPs:

None

RATINGS

Associated Costs	**H**	**M**	**L**
Implementation		X	
Maintenance			X
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease	X		
Nutrients			X
Sediment			X
Floatable Material			X
Metals		X	
Other Construction Waste		X	

FIGURES

Photos/Sketches

GH-5 Spill Containment Plan Photos

CAD Drawings

None

PURPOSE

These procedures and practices are implemented to prevent and control spills in a manner that minimizes or prevents the discharge of spilled material to the drainage system or watercourses.

APPROPRIATE APPLICATIONS

This best management practice (BMP) applies to all construction projects. Spill control procedures are implemented any time chemicals and/or hazardous substances are stored. Substances may include, but are not limited to:

- Soil stabilizers/binders.
- Dust Palliatives.
- Herbicides.
- Growth inhibitors.
- Fertilizers.
- Deicing chemicals.
- Fuels.
- Lubricants.
- Other petroleum distillates.
- Sanitary and septic wastes.

To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110, 117, and 302.

LIMITATIONS

- The procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite.
- This BMP only applies to *emergency* spill response. Refer to Chemical Management for proper storage, use, and disposal of dangerous, hazardous, and toxic wastes that should be observed at all times to minimize the potential for a spill.

PLANNING CONSIDERATIONS

Education

- Educate employees and subcontractors on what a significant spill is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings) and establish a program to instruct new employees.

Spill Response Procedures

- Significant/Hazardous Spills - for significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
    - Immediately notify the following:
        - Site supervisor and follow up with a written report.
        - Local emergency response (Fire department).
        - A spills contractor or a Haz-Mat team immediately. Construction personnel should not attempt to clean up the spill until the appropriate and qualified staff have arrived at the job site.
        - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center (see contact number in table below).
    - Any applicable divisions within ADEQ should also be contacted. Notification should first be made by telephone and followed up with a written report.

Agency	Situation	Phone
Arizona Department of Environmental Quality (ADEQ) -Emergency Response Unit	**Emergency**	**602-771-2330 800-234-5677**
Arizona Department of Environmental Quality (ADEQ) -Emergency Response Unit	**Routine Business**	**602-771-4106 602-771-4155**
National Response Center	**Emergency**	**800-424-8802**
Local Fire Department/District	**Emergency**	**911**

Other ADEQ Contact Numbers	
ADEQ front desk	602-771-2300
Air Quality Division	602-771-2308
Waste Programs Division	602-771-4209
Pollution Prevention/TRI	602-771-4235
Water Quality Division	602-771-2306
Stormwater	**602-771-4574**

Post Spill Response Procedures

- Spills should not be buried or washed with water.
- Used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose should be stored and disposed of in conformance with the special provisions.
- Water used for cleaning and decontamination should not be allowed to enter storm drains or watercourses and should be collected and disposed of in accordance with GH-1: Chemical Management. Water overflow or minor water spillage should be contained and should not be allowed to discharge into drainage facilities or watercourses.
- Proper storage, clean-up and spill reporting instruction for hazardous materials stored or used on the project site should be posted at all times in an open, conspicuous and accessible location.
- Waste storage areas should be kept clean, well organized and equipped with ample clean-up supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers and liners should be repaired or replaced as needed to maintain proper function.

The effectiveness of spill containment is enhanced when the following BMPs are also implemented: GH-1: Chemical Management**,** GH-3: Equipment Maintenance Procedures, and GH-4: Designated Washdown Areas.

RECOMMENDED MAINTENANCE AND INSPECTION

- Comply with suggestions and requirements set by local fire department.
- Verify weekly that spill control clean up materials are located near material storage, unloading, and use areas. Restock appropriate clean-up materials after a spill incident has occurred.

- Update spill prevention and control plans and stock appropriate clean-up materials whenever changes occur in the types of chemicals used or stored onsite, or after a spill incident has occurred.

POST CONSTRUCTION METHODS

None.

REFERENCES

Tacoma Public Works Environmental Services, January 1993, City of Tacoma Surface Water Management Manual Volume II, Construction Stormwater Pollution Prevention. http://www.cityoftacoma.org/Page.aspx?hid=951#manual

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual. http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

U.S. Environmental Protection Agency, December 1999, Construction Site Storm Water Runoff Control, National Menu of Best Management Practices for Storm Water Phase II. http://cfpub2.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm

GH-5 Spill Containment Plan Photos

Provide temporary inlet protection against any spills approaching drain inlets to a stormwater collection system.

Absorbent snakes can be used to protect storm drains from spills.

Courtesy of Stormwater 911

Containing leaks from equipment

Courtesy of Stormwater 911

GH-6: Road Sweeping/ Trackout Cleaning

DEFINITION

Road trackout cleaning procedures refer to methods to remove tracked sediment around construction site points of egress.

GENERAL INFORMATION

Applicability - Effectiveness

Perimeter and Access Controls - high
Debris Management, Cleanup, and Washout - high

Most effective when used with:

EC-5 Stabilized Construction Entrance

EC-6 Construction Road Stabilization

EC-7 Dust Control

Alternative BMPs:

None

RATINGS

Associated Costs	H	M	L
Implementation		X	
Maintenance	X		
Training		X	
Target Pollutants Removal	**H**	**M**	**L**
Oil and Grease			X
Nutrients			X
Sediment	X		
Floatable Material	X		
Metals		X	
Other Construction Waste	X		

FIGURES

Photos/Sketches

GH-6 Road Sweeping/Trackout Cleaning Photos

CAD Drawings

None

PURPOSE

Cleaning road trackout prevents the sediment from entering a storm drain or watercourse.

APPROPRIATE APPLICATIONS

These practices are implemented anywhere sediment is tracked from the project site onto public or private paved roads, typically at points of ingress/egress. Studies have shown that vacuum or regenerative air street sweepers can effectively remove fine dust particles and yield significant runoff quality benefits.

LIMITATIONS

- Sweeping and vacuuming may not be effective when soil is wet or muddy.
- Mechanical brush sweepers may only remove coarser particles.

RECOMMENDED STANDARDS AND SPECIFICATIONS

- Visible sediment tracking should be swept and/or vacuumed daily. For smaller areas of trackout, kick brooms can be used. For larger areas, consider mechanical brush or vacuum sweepers. Some mechanical sweepers can remove debris and dust particles down to 2.5 microns.
- Conduct sweepings at least once per week during the project operations. During rainy seasons, implement sweepings on a more frequent basis.
- Consider incorporating the removed sediment back into the project, rather than hauling offsite to disposal.

RECOMMENDED MAINTENANCE AND INSPECTION

- Inspect ingress/egress access points daily and sweep tracked sediment as needed.
- Properly dispose of any unknown substances or objects that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, sweeper water can be reused or disposed of at an approved dump-site.
- The operator is responsible for compliance with Maricopa County Dust Control Rules for Trackout Control.

POST CONSTRUCTION METHODS

In most cases, the municipality will continue with road sweeping operations after construction is complete.

REFERENCES

CALTRANS, State of California Department of Transportation, March 2003, Construction Site Best Management Practices (BMPs) Manual.
http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

Kamber Engineering Gaithersberg, Maryland, April, 1991, Sedimentation and Erosion Control, An Inventory of Current Practices, USEPA.

GH-6 Road Sweeping/Trackout Cleaning Photos

Road sweeping

Courtesy of Douglas County

Appendix A CONSTRUCTION GENERAL PERMIT

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APPENDIX A CONSTRUCTION GENERAL PERMIT

This appendix contains copies of the latest Construction General Permits (CGPs) that are applicable in Arizona, specifically the AZPDES (ADEQ Permit No. AZG2008-001, February 2008) and the NPDES (EPA, February 2012) CGPs.

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A.1 AZPDES Construction General Permit

This document is taken directly from the ADEQ website http://www.azdeq.gov/environ/water/permits/. Refer to that website for any updates that may be available for this information.

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Permit No. AZG2008-001

STATE OF ARIZONA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION
PHOENIX, ARIZONA 85007

ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT FOR DISCHARGE FROM CONSTRUCTION ACTIVITIES TO WATERS OF THE UNITED STATES

This permit provides authorization to discharge under the Arizona Pollutant Discharge Elimination System (AZPDES) program, in compliance with the provisions of the Arizona Revised Statutes, Title 49, Chapter 2, Article 3.1, the Arizona Administrative Code (A.C.C.), Title 18, Chapter 9, Articles 9 and 10, and the Clean Water Act as amended (33 U.S.C. 1251 et seq.).

This general permit specifically authorizes only discharges from construction activities in Arizona by those owners and operators who meet the eligibility requirements of this permit, who submit a complete Notice of Intent (NOI) in accordance with Part II of this general permit and who comply with the general permit requirements and conditions. All discharges authorized by this general permit shall be consistent with the terms and conditions of this general permit. Permit coverage is required from the "commencement of construction activities" until "final stabilization", as these terms are defined in this permit.

This general permit becomes effective on February 29, 2008.

This general permit and the authorization to discharge expire at midnight, February 28, 2013.

Issued this 28th day of February 2008.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Joan Card

Joan Card, Director
Water Quality Division

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APPENDIX A - Example Inspection Report Form

PART I. COVERAGE UNDER THIS GENERAL PERMIT

A. Permit Area. This general permit covers the state of Arizona, except for Indian Country.[1]

B. Eligibility. This general permit authorizes stormwater discharges from construction activity as defined in Part X and stormwater discharges associated with support activities from temporary plants or operations set up to produce concrete, asphalt, or other materials for the permitted construction project. These discharges are eligible for permit coverage provided the operator complies with all the requirements of this general permit and submits a Notice of Intent (NOI) in accordance with Part II of this general permit.

Any discharges that are not consistent with the eligibility conditions of this permit are not authorized by this permit. A person shall either apply for a separate Arizona Pollutant Discharge Elimination System (AZPDES) permit to cover such ineligible discharge(s), cease the discharge(s), or take necessary steps to make the discharge(s) eligible for coverage under this permit.

Individual Permit Requirements. If an operator desires, or is required by ADEQ, to obtain an individual stormwater permit, the operator cannot use an NOI for this purpose. Instead, the operator shall contact the ADEQ for the proper application procedure.

C. Authorized Discharges.

1. Allowable Stormwater Discharges. An operator may discharge pollutants in:
   a. Stormwater runoff associated with construction activities provided the discharge is conducted in compliance with this permit;
   b. Discharges designated by ADEQ as requiring a stormwater permit under 40 CFR 122.26(a)(1)(v); 40 CFR 122.26(b)(15)(ii); or under 40 CFR 122.26(a)(9);
   c. Stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:
      i. The support activity is directly related to a construction site that is required to have AZPDES permit coverage for discharges of stormwater associated with construction activity;
      ii. The support activity is not a commercial operation (serving multiple unrelated construction projects by different operators) and does not operate beyond the completion of the construction activity for which the support activity is directly associated.
      iii. The support activity is not otherwise covered by a separate AZPDES permit; and
      iv. Appropriate best management practices (BMPs) for the discharges from the support activity areas are identified in the Stormwater Pollution Prevention Plan (SWPPP) and implemented.

2. Allowable Non-Stormwater Discharges.
   a. The operator shall reduce or eliminate discharge of non-stormwaters from construction sites to the extent practicable. The following are the only non-stormwater discharges allowed under this permit, provided appropriate BMPs are in place to assure compliance with (d) below:

[1]The state of Arizona, Department of Environmental Quality, Water Quality Division, does not have permit authority for Indian Country. Construction discharge permits for Indian country within the state shall be acquired through the Environmental Protection Agency (EPA) Region IX or other appropriate permitting authority.

i. Discharges from emergency fire-fighting activities;
ii. Water used to control dust, provided reclaimed water or other wastewaters are not used;
iii. Routine external building wash down where detergents are not used;
iv. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
v. Uncontaminated air conditioning or compressor condensate;
vi. Uncontaminated groundwater or spring water;
vii. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
viii. Fire hydrant flushing, potable water line or well flushing where the receiving waters are ephemeral;
ix. Water used for compacting soil, provided reclaimed water or other wastewaters are not used;
x. Water used for drilling and coring such as for evaluation of foundation materials, where flows are not contaminated with additives; and
xi. Uncontaminated waters obtained from dewatering operations/foundations in preparation for and during excavation and construction.

Note: This permit does not prohibit the use of reuse/reclaimed or potable waters on-site for dust control or for landscape irrigation. However, such activities are to be managed in a way that they are not discharged off site or applied during rain events consistent with the reuse rules. Therefore, they are not permissible 'discharges.'

b. The operator shall identify on the NOI all non-stormwater discharges listed above that are expected to be associated with the project's construction activities.
c. The operator shall address in the SWPPP all non-stormwater discharges listed above that are expected to be associated with the project's construction activities as required in Part IV.E.
d. When an allowable non-stormwater discharge listed above is unavoidable, the operator shall specify BMPs in the SWPPP and implement practices to minimize the frequency and duration of flow, and the concentration of pollutants (including sediments) in such discharges.
e. All other non-stormwater discharges (not listed above) shall be eliminated or authorized under a separate AZPDES permit, as those discharges are not authorized under this permit.
f. The operator may not discharge any non-stormwaters, except for emergency fire-fighting activities required to preserve human health or property, to impaired or unique waters under this permit.

D. Limitations of Coverage.

1. Post-Construction Discharges. This general permit does not authorize stormwater discharges that originate from the site after construction activities have been completed and the site, including any temporary support activity site, has achieved final stabilization and a Notice of Termination (NOT) has been filed. Post-construction stormwater discharges from industrial sites may need to be covered by a separate AZPDES permit.

2. Discharges Mixed with Non-Stormwater. This general permit does not authorize discharges that are mixed with sources of non-stormwater except as allowed in Part I.C.2.

3. Discharges Covered by Another AZPDES Permit. This general permit does not authorize stormwater discharges associated with construction activity that are covered under an individual permit or are required to obtain coverage under an alternative general permit.

4. Discharges to Impaired Waters. An operator is not automatically eligible to discharge under this permit if any portion of the site is within ¼ mile of receiving waters listed as impaired under 303(d) of the Clean Water Act.
   a. To receive authorization, the operator shall submit the NOI and SWPPP to ADEQ. The SWPPP shall specifically identify BMPs that will minimize the discharge of pollutants from the site which would contribute to or aggravate the receiving water's impairment. The operator shall include in the SWPPP a monitoring plan that meets the requirements of Part V of this permit.
   b. If a discharge contains pollutants for which a Total Maximum Daily Load (TMDL) has been established, the SWPPP shall specifically identify BMPs necessary to ensure the discharges will be consistent with the provisions of the TMDL.
   c. If the operator receives a notification from ADEQ that the SWPPP is incomplete or otherwise found to be deficient, the operator shall revise it to address the Department's comments. Prior to authorization, ADEQ may require specific BMPs or monitoring be implemented or specific BMP design criteria be followed.
   d. Within 32 business days of receipt of the SWPPP and a complete and accurate NOI, ADEQ will notify the operator whether: 1) it is acceptable to proceed under this general permit; 2) the SWPPP requires revisions; or 3) there is cause for eligibility denial. If notification is not received in this time-frame, the operator may assume coverage under this permit.
   e. Where the existing water quality does not meet applicable water quality standards (i.e., Tier I Waters), further degradation is not allowed under this permit. If an operator's discharge causes or contributes to non-attainment of standards, more effective and/or additional BMPs shall be added. If after the implementation of additional and/or more effective BMPs the discharge continues to contribute to nonattainment, the operator shall cease all discharges under this permit and apply for coverage under an individual permit.

5. Discharges to Unique Waters. An operator is not automatically eligible to discharge under this permit if any portion of the site is within ¼ mile of receiving a water listed as unique (a.k.a. an Outstanding Arizona Water, or OWA) in A.A.C. R18-11-112.
   a. To receive authorization, the operator shall submit the NOI and SWPPP to ADEQ. The SWPPP shall specifically identify BMPs that ensure the discharges will minimize discharge of pollutants from the site and that no degradation of the receiving water will occur. The operator shall include a monitoring plan in the SWPPP that meets the requirements of Part V of this permit.
   b. Non-stormwater discharges (except for emergency firefighting activities required to preserve human health or property) are prohibited from discharging to unique waters.
   c. If the operator receives a notification from ADEQ that the SWPPP is incomplete or otherwise determined to be deficient, the operator shall revise it addressing the Department's comments. Prior to authorization, ADEQ may require that specific BMPs or monitoring be implemented or specific BMP

design criteria be followed.

d. Within 32 business days of receipt of the SWPPP and a complete and accurate NOI, ADEQ will notify the operator whether: 1) it is acceptable to proceed under the general permit; 2) the SWPPP requires revisions; or 3) there is cause for an eligibility denial. If notification is not received in this time-frame, the operator may assume coverage under this permit.

6. Exempt Discharges. Persons performing the following activities are not required to seek coverage under this permit, unless specifically required under subsection (e) below:

a. Construction projects that disturb less than one acre, unless part of a larger common plan of development or sale;

b. Routine maintenance that disturbs less than five acres that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility or structure.

c. Construction activities associated with the oil and gas exploration, production, processing, or treatment operations or transmission facilities (e.g., drilling site preparation, crude oil pipelines, etc). This exemption does not include construction associated with distribution lines that deliver natural gas to homes, businesses, or between substations, etc., and operate at relatively low pressures, or those pipelines that transport refined petroleum product and chemicals from refineries and chemical plants.[2]

d. Construction activities covered under an Erosivity Waiver (Part I.E).

e. Additional Condition for Exemption. Persons that are not required to file for permit coverage under this section shall operate exempt construction sites in a manner that minimizes pollutants in the discharges, including effectively stabilizing the site after completion of construction. In the event discharges from the site may cause or contribute to non-attainment of water quality standards, ADEQ may require the operator to obtain permit coverage.

E. Erosivity Waivers for Small Construction Activities. A person performing construction activity which disturbs between one and five acres may be exempt from obtaining coverage under this permit based on a low potential for soil erosion for the duration of the project. However, if any discharge point from the construction site is within ¼ mile of animpaired or unique water, the site is not eligible for this waiver. This exemption is predicated on certain criteria being met and proper application procedures being followed:

1. Calculating Erosivity. Low potential for erosion is defined as a rainfall erosivity (R) factor of less than five as calculated using ADEQ's Smart NOI Web site.

The small construction project's rainfall erosivity factor calculation shall be less than five during the **entire** period of construction activity. The period of construction activity begins at initial earth disturbance (commencement of construction activities) and ends with final site stabilization.

The applicant shall certify to ADEQ that construction activity will occur only when the rainfall erosivity factor is less than five.

Note: Construction activities that disturb five acres or greater, or less than five acres but

2 On June 12, 2006, USEPA published a rule that exempts construction activities at oil and gas sites from the requirement to obtain a National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges except in very limited instances. These amendments are consistent with the Energy Policy Act of 2005 signed by the President of the United States on August 8, 2005. This action also encourages voluntary application of best management practices (BMPs) for construction activities associated with oil and gas field activities and operations to minimize erosion and control sediment to protect surface water quality. The final rule became effective June 12, 2006.

are part of a common plan of development or sale, are not eligible for this waiver.

2. Permit Waiver Certification. The operator shall submit an AZPDES Permit Waiver Certification Form using the Smart NOI Web site to ADEQ before commencing construction activities.

   An operator of a construction activity that is eligible for a waiver based on low potential for erosion shall provide the following information on the Permit Waiver Certification Form:
   a. The name, address, and telephone number of the construction site operator(s);
   b. The name (or other identifier), address, county, and parcel or lot number as recorded by the county, of the construction project or site;
   c. An accurate (within 15 seconds) latitude and longitude (in degrees/minutes/seconds format) of the construction project or site at the point of discharge nearest to the receiving water;
   d. The project start and completion (final stabilization) dates;
   e. The total project acreage and the acreage to be disturbed by the operator submitting the NOI, to the nearest 1/2 acre;
   f. If there is potential for discharge to a municipal separate storm sewer system (including municipal streets and other improvements that can convey stormwater), the name of the municipal operator of the storm sewer;
   g. Verification that the rainfall erosivity factor calculation that applies to the active construction phase at the project site is less than five calculated using ADEQ's Smart NOI Web site; and
   h. The certification statement, signed by a qualified signatory as defined in Part VIII.J.

3. Deadline for Notification. Operator(s) of a project which qualifies for the Permit Waiver shall ensure that ADEQ receives a signed Permit Waiver Certification Form at least two business days prior to the commencement of construction activities. In the absence of a Permit Waiver Certification submittal, ADEQ will assume that the operator was required to apply for coverage under the construction general permit.

4. Projects Which Extend Past Certified Period. If the small construction project continues beyond the calculated "end date" as shown on the Permit Waiver Certification, the operator is in violation of this permit. If this occurs, the operator shall prepare a SWPPP and submit an NOI as required under Parts II and III before the end of the certified waiver period.

PART II. AUTHORIZATION UNDER THIS GENERAL PERMIT

Important: The operator shall read and understand all the conditions and requirements of this permit before submitting any of the forms described in Part II.

A. Prerequisites for Submitting a Notice of Intent (NOI). A person may be authorized to discharge under this permit only if the stormwater discharge is associated with construction activities from the project site. Prior to submission of a NOI, an applicant seeking authorization to discharge under this general permit shall:

1. Meet the eligibility requirements under Part I.B; and

2. Develop and implement a SWPPP that meets Part III of this permit and that covers either the entire site or all portions of the site for which the person is an operator.
   a. The SWPPP shall be prepared prior to submission of the NOI and shall be implemented prior to the start of construction.

b. The SWPPP is not required to be submitted to ADEQ (unless the project will discharge to an impaired or unique water as described in Part I.D.5 and I.D.6) but shall be retained and made available in accordance with Part III.G.

B. Submitting a NOI.

1. Application Required.

a. The operator shall submit separate, accurate and complete NOIs to ADEQ for each project that disturbs one or more acres of land. The operator of a common plan of development or sale that will ultimately disturb one or more acres must submit completed NOIs to the ADEQ.

b. Submission of the NOI demonstrates the operator's intent to be covered by this permit; it is not a determination by ADEQ that the operator has met the eligibility requirements for the permit. Discharges are not authorized if ADEQ notifies the operator that further evaluation is necessary, or the discharges are not eligible for coverage under this permit.

c. Whenever the operator changes or another is added during the construction project, the new operator shall also submit an NOI to be authorized under this permit before taking over operational control or commencing construction activities at the site.

2. NOI Requirements. Construction site owners or operators seeking authorization for stormwater discharges under this general permit shall submit (by photocopy/fax/email/electronically) a complete and accurate AZPDES NOI form to ADEQ. The NOI form contains, at a minimum, the following information:

a. The name, address, and telephone number of the construction site operator;
b. Whether the operator is a federal, state, tribal, private, or other public entity;
c. The type of project (including construction projects conducted by contractors on behalf of ADOT and projects requiring ADOT permits) shall be specifically identified on the NOI;
d. Whether the project is part of a greater plan of development;
e. Estimates of the total project acreage and the acreage to be disturbed by the operator submitting the NOI, to the nearest 1/2 acre;
f. The printed name (or other identifier), address, county, lot number or parcel or lot number as recorded by the county, of the construction project or site;
g. An accurate (within 15 seconds) latitude and longitude (in degrees/minutes/seconds format) of the construction project or site at the point nearest the closest receiving water. For sites which are part of a larger common plan of development, the operator shall provide the latitude and longitude of the discharge point for the portion of the site covered by that NOI;
h. Whether any part of the site is located on Indian Country;
i. Confirmation that a SWPPP meeting the requirements in Part III of this permit has been developed and will be implemented prior to commencement of construction activities. If the NOI is a late application, the operator shall certify that a SWPPP has been developed and implemented prior to submittal of the NOI;
j. The onsite location where the SWPPP may be viewed and the name and telephone number of a contact person;
k. Unless all discharges from the site go to a municipal separate storm sewer system (MS4), provide the name(s) of the closest receiving water(s) which may include unnamed washes;
l. The name of the MS4 into which there is a potential to discharge, if applicable;
m. The project's estimated start and completion dates;

n. Any non-stormwater discharges expected to be associated with construction activities at the site;

o. Whether the project has or will need any other environmental permits or approvals, including, but not limited to, subdivision approvals, air quality 404 permits (etc.), and the permit number(s), if applicable;

p. Whether any portion is within 1/4 mile of an impaired or unique water; and

q The following certification statement, signed and dated by a qualified signatory, as defined in Part VIII.J, and the name and title of the person who signs:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision, as applicable, in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, I believe the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition as an owner or operator, I certify that I have reviewed and intend to comply with all terms and conditions stipulated in 2008 Construction General Permit No. AZG2008-001 issued by the Director."

3. Where to Submit. The applicant shall submit the NOI electronically via the Smart NOI Web site or submit a paper copy to:

Arizona Department of Environmental Quality
Surface Water Section/Permits Unit/Stormwater NOIs (5415A-1)
1110 W. Washington Street
Phoenix, Arizona 85007
or fax to (602) 771-4528

Note: The operator shall receive an Authorization Certificate (by mail, faxed, or electronically via the Smart NOI system for electronic submittals with e-signatures) assigning a permit authorization number and stating the approval date. This Authorization Certificate is ***not*** *the permit - it merely acknowledges that the NOI has been received by the Department and the operator is authorized to discharge subject to the terms and conditions of this general permit.*

4. Notification to Municipal Separate Storm Sewer Systems/Local Authorities. If the construction site is located within municipal boundary or within Pima or Maricopa Counties for new or revised NOIs, the operator shall send a copy of the certificate authorizing permit coverage to the local authority(s).

5. Effective Date of Permit Coverage.

a. Incomplete NOI Submitted.

i. If ADEQ notifies the operator that an NOI is incomplete or incorrect, the operator shall resubmit an amended NOI if the operator still intends to obtain coverage under this permit; and

ii. Whether or not ADEQ notifies the operator of a deficiency in the NOI, discharges are not authorized under this permit if the operator submits an incomplete or incorrect NOI.

b. Discharges to Impaired or Unique Waters. Applicants proposing a site that has the potential for discharge to reach impaired or unique waters are not

authorized under this permit for a minimum of 32 business days following receipt of the signed NOI and SWPPP. ADEQ may notify operators within this time-frame that there is cause for SWPPP amendment or denial of coverage as specified in Parts I.D.5 and I.D.6 of this permit. If notification is not received in the 32 business day time period, the operator must verify with the Department that the Surface Water Section received the NOI and SWPPP prior to commencement of construction activities.

c. NOIs Requiring Additional Evaluation. ADEQ may notify an operator that authorization to discharge shall not occur for up to 32 business days in the event that review of the NOI identifies information requiring further evaluation. This notification may be made either in writing, email, by fax or phone contact. Operators receiving notice of a delay in coverage may discharge 32 business days after the date the signed NOI is received unless further notice is received from ADEQ during this time period. Such further notice may confirm authorization to discharge or deny permit coverage and require an application for an individual permit.

d. Routine Coverage. Except as provided in 5.a. through.5.c. above, an eligible operator is authorized to discharge stormwater from a construction project 7 calendar days after a signed NOI is received by ADEQ's Surface Water Section or when an authorization certificate is issued, whichever is earlier. However, in order to rely on the 7 calendar day "default" provision, the operator must submit the NOI in a manner that documents the date of ADEQ's receipt (i.e., certified mail, hand delivery, etc.).

Alternatively, applicants that submit a SMART NOI using the electronic signature feature will typically obtain immediate authorization unless the site is located near unique or impaired waters or in areas designated for review due to potential endangered species concerns.

e. Existing Construction Projects. Parts II.B.5.(b),(c), and (d) do not apply to operators of on-going construction projects that were authorized to discharge under Arizona's 2003 Construction General Permit (AZG2003-001), and that comply with the conditions of Part II.B.6.b of this permit.

f. Change in Operators. For construction projects where the operator changes, including instances where an operator is added after an NOI has been submitted, the new operator shall receive an authorization certificate before assuming operational control or commencing work on-site.

6. Deadlines for Notification.

a. New Projects. An operator of a construction project shall receive an NOI authorization or waiver certification prior to taking over operational control or the commencement of construction activities (i.e., the initial disturbance of soils associated with clearing, grading, excavation activities, or other construction activities).

b. Ongoing Construction Projects.
Operators of construction projects ongoing as of the effective date of this permit that received authorization to discharge for these projects under the expired Construction General Permit (AZG2003-001) shall:

i) For the first 120 days from the effective date of this permit, continue to comply with the terms and conditions of the expired Construction General Permit (AZG2003-001);

ii) Update the SWPPP as necessary to comply with the requirements

of Part III of this permit within 90 days of the effective date of this permit (and before submitting a new NOI as described in Part II.B.6.b.iii below); **and**

iii) Submit a complete and accurate NOI according to Part II within 120 days of the effective date of this permit. The previously issued Authorization Number (AZCON-XXXXX) must be included on the NOI for identification purposes.

Note: this is not considered a revision to the original NOI.

Note: If the operator is eligible to submit a Notice of Termination (NOT) (e.g., construction is finished and final stabilization has been achieved) before the 120th day, a new NOI is not required to be submitted, provided a NOT is submitted before the 120th day of the effective date of this permit.

7. Late Applications. The operator is only permitted for discharges that occur after a complete and accurate NOI is received by ADEQ and authorization is granted. ADEQ reserves the right to take enforcement action for any un-permitted discharges or permit noncompliance that occur between the time construction commenced and either permit authorization is granted, denied, or a complete and accurate Permit Waiver Certification for is submitted and the wavier is approved.

C. Submitting a Notice of Termination.

1. Notice Required. The operator shall submit a complete and accurate Notice of Termination (NOT) to ADEQ within 30 days after any of the following conditions have been met:

a. Final stabilization has been achieved on all portions of the site for which the operator is responsible, unless otherwise required in the following parts. Final stabilization means that one of the following conditions (i, ii, or iii) is met:

i. All soil disturbing activities at the site have been completed; all construction materials, waste, and temporary erosion and sediment control BMPs (including any sediment that was being retained by the temporary erosion and sediment control BMPs) have been removed and properly disposed; and either A or B below is met:

A) A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area is in place on all unpaved areas and areas not covered by permanent structures.

When preconstruction native background vegetation covered less than 100% of the ground (e.g., arid areas, beaches), the 70% coverage criteria is adjusted as follows: if the native vegetation covered 50% of the ground, 70% of 50% (.70 X .50 = .35) or 35% cover density would be required, or

B) Equivalent permanent stabilization measures (such as the use of riprap, decomposed granite, gabions, or geotextiles) have been employed.

ii. For individual lots in residential construction, final stabilization means that the homebuilder:

A) Has completed final stabilization as specified in Part II C.1.a.i. above, or

B) Has established temporary stabilization, including

perimeter controls, for an individual lot prior to occupation of the home by the homeowner and has informed the homeowner of the need for, and benefits of, final stabilization.

iii. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to water of the U.S., and areas that are not being returned to their preconstruction agricultural use shall meet the final stabilization criteria above.

b. Another operator who has a valid authorization number under this general permit or an appropriate AZPDES permit has assumed control over all areas of the site that have not been finally stabilized;

c. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner (or a homeowner's association) in accordance with Part II.C.1.a.ii above;

d. The planned construction activity identified on the original NOI was never initiated (i.e, no grading or earthwork was ever started) and plans for construction have been permanently abandoned or indefinitely postponed.

e. The operator has obtained coverage for the site area under another AZPDES permit.

Note: NOTs can only be filed for those sites which obtained timely permit authorization by submitting a complete and accurate NOI. Sites which did not receive permit authorization have no permit coverage to terminate.

2. NOT Requirements. The operator shall submit to ADEQ a complete and accurate AZPDES NOT form (photocopy/fax/email/ electronic). The NOT form at a minimum shall include:

a. The AZPDES authorization number for the stormwater discharge;

b. The basis for submission of the NOT;

c. The name, address, and telephone number of the operator submitting the NOT;

d. The name of the project and street address (or a description of location if no street address is available) of the construction site for which the notification is submitted;

e. An accurate latitude and longitude (in degrees/minutes/seconds format) of the construction project or site at the point nearest to the receiving water; and

f. The following certification, signed by a qualified signatory as defined in Part VIII.K.2 of this permit, the printed name and title of the person who signs, and including the date of signature. For construction projects with more than one operator, the operator shall only make this certification for those portions of the construction site where he was authorized under this permit and not for areas where he was not an operator:

"I certify under penalty of law that all stormwater discharges associated with construction activity from the identified facility that are authorized by a general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is

unlawful under the Clean Water Act where the discharge is not authorized by a NPDES or AZPDES permit. I also understand that the submittal of this Notice of Termination does not release me from liability for any violations of this permit or the Clean Water Act."

3. Where to Submit. The operator shall submit the complete and accurate NOT form electronically via the Smart NOI Web site or submit a paper copy to:

   Arizona Department of Environmental Quality
   Surface Water Section / Stormwater & General Permits
   1110 W. Washington Street, 5415A-1
   Phoenix, Arizona 85007
   or fax to (602) 771-4528

   Note: The permittee shall receive an acknowledgement letter upon ADEQ's receipt of the permittee's completed NOT form.

4. Notification to Municipal Separate Storm Sewer Systems/Local Authorities. If the construction site was located within any municipal boundary or in Pima or Maricopa Counties, the operator shall send a copy of the NOT acknowledgement letter to the local authority.

5. Effective Date of Permit Termination. Authorization to discharge terminates under this permit at midnight on the date the NOT is received by the Department.

PART III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARATION

A. General Information.

1. The operator shall prepare a SWPPP before submitting the NOI for permit coverage and prior to conducting any construction activity

   (*For projects that did not prepare a SWPPP and file an NOI before commencement of construction activity, see late filing in Part II.B.2.i*)

   At least one SWPPP must be developed for each construction project or site covered by this permit. A joint SWPPP may be developed and implemented as a cooperative effort where there is more than one operator at a site. All operators shall either implement their portion of a common SWPPP or develop and implement their own SWPPP.

2. The SWPPP shall be prepared and implemented in accordance with good engineering practices and shall:
   a. Identify all potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site;
   b. Identify, describe, and ensure implementation of BMPs that will be used to reduce pollutants in stormwater discharges from the construction site;
   c. Assure compliance with the terms and conditions of this permit; and
   d. Identify the responsible party for on-site SWPPP implementation.

3. All operator(s) shall sign and certify the SWPPP they will implement in accordance with Part VIII.J.

4. The operator shall implement the SWPPP from initial commencement of construction activity until final stabilization is complete and an NOT is filed, or an NOT transferring the site to a new operator is received by ADEQ.

5. SWPPPs that do not meet all provisions of this permit are considered incomplete. Operating under an incomplete or inadequate SWPPP is a violation of the permit.

B. Types of Operators

1. Definition of Operator. Operator means any person associated with a construction project that meets one or both of the following two criteria:
   a. The person has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
   b. The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

2. Operator Requirements. Either Part III.B.2.a or B.2.b, or both, will apply depending on the type of operational control a person exerts over the site. Part III.B.2.c applies to all operators who have control over only a portion of a construction site.

   a. Operators with Operational Control over Construction Plans and Specifications shall ensure that:
      i. The SWPPP indicates the areas of the project where the operator has operational control over project specifications, including the ability to make modifications in specifications;
      ii. All other operators implementing portions of the SWPPP impacted by any changes made to the SWPPP are notified of such modifications in a timely manner; and
      iii. The SWPPP indicates the name(s) of the party(ies) with day-to-day operational control of those activities necessary to ensure compliance with the SWPPP or other permit conditions.

   b. Operators with Control over Day-to-Day Activities shall ensure that:
      i. The SWPPP identifies the parties responsible for implementation of BMPs identified in the SWPPP;
      ii. The SWPPP indicates areas of the project where each operator has operational control over day-to-day activities; and
      iii. The SWPPP indicates the name(s) of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications).

   c. Operators with Control over Only a Portion of a Larger Project (e.g., one of four homebuilders in a subdivision), are responsible for compliance with the terms and conditions of this permit as it relates to the activities on his/her portion of the construction site (including implementation of BMPs required by the SWPPP). Operators shall ensure either directly or through coordination with other operators, that activities do not render another party's BMP(s) ineffective.

C. Site and Activity Description

1. Identification of Operators. The SWPPP shall identify all operators, including contact information, for the project site and the areas over which each operator has control.

2. Site Description. The SWPPP shall describe the nature of the construction activity, including:
   a. A description of the project and its intended use after the NOT is filed (e.g. low density residential, shopping mall, highway, etc.);

b. A description of the intended sequence of activities that disturb soils at the site (e.g., grubbing, excavation, grading, utilities, infrastructure installation, etc.);

c. The total area of the site, and an estimate of the total area of the site expected to be disturbed by construction activities including off-site supporting activities, borrow and fill areas, staging and equipment storage areas;

d. The percentage of the site that is impervious (e.g., paved, roofed, etc.) before and after construction;

e. A description of the site's soils including potential for erosion; and

f. A general location map (e.g., USGS quadrangle map, a portion of a city or county map, or other map) with enough detail to identify:

   i. The location of the construction site and one mile radius; and

   ii. The waters of the U.S. including tributaries within one mile radius of the site.

3. Site Map. The SWPPP shall contain legible site map(s) completed to scale, showing the entire site that identifies:

   a. Drainage divides and direction of stormwater flow for all drainage areas located within the project limits (i.e., use arrows to show which way stormwater will flow);

   b. Areas of soil disturbance and areas that will not be disturbed;

   c. Locations of temporary and permanent BMPs identified in the SWPPP;

   d. Locations where stabilization BMPs are expected to occur;

   e. Locations of on-site material, waste, borrow areas, or equipment storage areas, and other supporting activities (per Part I.C.1.c);

   f. Locations of all surface water bodies (including dry/ephemeral washes and wetlands). If none exist on site, the SWPPP shall indicate so;

   g. Locations where stormwater discharges to a surface water (including wetlands, ephemeral waters and dry washes) and to a municipal separate storm sewer system (MS4) (i.e., use arrows to indicate discharge location). Where surface waters and/or MS4s receiving stormwater will not fit on the plan sheet, they shall be identified with an arrow indicating the direction and distance to the surface water and/or MS4;

   h. Locations and registration numbers of all on-site dry wells and dry wells on adjacent properties that have the potential to receive stormwater from the site (If none exist the SWPPP shall indicate so);

   i. Areas where final stabilization has been accomplished and no further construction permit requirements apply (if none, the SWPPP shall indicate so); and

   j. Location of trees and boundaries of environmentally sensitive areas and buffer zones to be preserved shall be identified.

   Note: If a marked-up site map is too full to be easily read the operator should date and fold it, put it in the SWPPP for documentation, and start a new one.

4. Receiving Waters. The SWPPP shall identify the nearest receiving water(s), including ephemeral and intermittent streams, dry washes, and arroyos. If applicable, the SWPPP shall also identify the areal extent and describe any wetlands near the site that could be disturbed or that could potentially receive discharges from disturbed areas of the project.

5. Best Management Practices.

   a. The SWPPP shall describe all BMPs as required in Part IV and that will be implemented as part of the construction project to control pollutants in stormwater discharges.

b. For each major activity identified at Part III.C.2.b in the project sequence of activities description, the SWPPP shall clearly describe:
   i. Appropriate BMPs;
   ii. The general sequence during the construction process or schedule that the BMPs will be implemented; and
   iii. Which operator is responsible for the implementation of the BMPs.

c. Standard detail drawings and/or specifications for the structural BMPs, including design or installation details, used on the project shall be included in the SWPPP.

6. Summary of Potential Pollutant Sources. The SWPPP shall identify the location and describe any pollutant sources from areas other than construction (i.e., support activities including stormwater discharges from dedicated asphalt or concrete plants and any other non-construction pollutant sources such as fueling and maintenance operations, materials stored on-site, waste piles, equipment staging yards, etc.). The operator shall implement BMPs in these areas to minimize pollutant discharges and shall detail these BMPs in the SWPPP.

   If any discharge point from the construction site is within ¼ mile of an impaired water, the SWPPP shall identify sources of the pollutants of concern listed on the 303(d) list that may potentially be discharged from the construction site and describe additional or enhanced BMPs to minimize discharges of these pollutants.

D. Permit Related Records

The operator shall include in the SWPPP:

1. A copy of this permit;
2. A copy of the NOI application that was submitted to ADEQ;
3. A copy of the authorization certificate received from ADEQ;
4. Identification of any municipality that received a copy of the authorization certificate; and
5. Copies of any other agreements (such as 404 permits, local grading permits, etc) with any state, local, or federal agencies that would affect the provisions or implementation of the SWPPP, if applicable.

E. Maintaining an Updated SWPPP

The SWPPP shall be revised as necessary during permit coverage to reflect current conditions and to maintain accuracy if there are changes in design or construction of the project, or if the SWPPP is found to be deficient. The operator shall amend the SWPPP within 15 business days whenever:

1. There is a change in design, construction, operation, or maintenance at the construction site that may have a significant effect on the discharge of pollutants to the waters of the U.S. that has not been previously addressed in the SWPPP; or

2. During inspections, monitoring if required, or investigations by the operator or by local, state, municipal separate storm sewer system, or federal officials, it is determined the discharges are causing or contributing to water quality exceedances or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site.

Changes in the revised SWPPP shall be implemented before the next rain event whenever practicable. If this is impracticable, then reason(s) shall be documented in the SWPPP and revisions implemented as soon as possible.

F. Deficiencies in the SWPPP

ADEQ may notify the operator at any time that the SWPPP does not meet one or more of the requirements of this permit. The notification shall identify the parts of this permit that are not being met and parts of the SWPPP that require modification to comply with permit. Within 15 calendar days of receipt of the notification from ADEQ (or as otherwise provided by ADEQ), the operator shall make the required changes to the SWPPP and submit to ADEQ a written certification that the changes have been made. ADEQ may require re-submittal of the SWPPP to confirm all deficiencies have been adequately addressed.

ADEQ also is not precluded from taking enforcement action for any period of time the operator was operating under a SWPPP that did not meet the minimum requirements of this permit.

G. Posting, SWPPP Review and Making SWPPPs Available

1. The operator must post the authorization number(s) in a conspicuous location near the main entrance of the construction site and retain a copy of the authorization certificate in the SWPPP. For linear projects, the authorization number(s) must be posted near the entrance where most of the construction activity is occurring.

2. A copy of the site specific SWPPP shall be made available from commencement of construction activities to the date of final stabilization and NOT submittal as follows:

   a) The SWPPP shall be on-site whenever construction or support activities are actively underway, and

   b) The SWPPP shall be locally available to the Department or any other federal, state or local authority having jurisdiction over the project at any reasonable time (generally Monday through Friday, 8:00 am to 5:00 pm).

3. The SWPPP shall be made available to the Department or any other federal, state, tribal, or local authority having jurisdiction over stormwater discharges from the project at the time of an on-site inspection.

4. Any person, including, tribal authority, state, federal or local agency may view the SWPPP or make a written request to ADEQ for access to a copy of the SWPPP. ADEQ may request, and within 7 calendar days the operator shall provide, a copy for ADEQ to make available for public review.

PART IV. BMP REQUIREMENTS FOR CONSTRUCTION ACTIVITIES

A. General Requirements. The operator shall:

1. Identify and describe all BMPs to be implemented at the construction site in the SWPPP.

2. Properly select, install, and maintain all structural BMPs per the manufacturers' specifications and good engineering practices so BMPs remain functional and effective.

3. Design and implement a combination of erosion and sediment control BMPs to keep sediment in place and to capture sediment to the extent practicable before it leaves the site.

   Note: Soil crusting from water application, a practice commonly used for dust control is not an effective or acceptable erosion control/stabilization BMP for compliance with this permit.

4. Install sediment control/perimeter control BMPs before upgradient land is disturbed. Temporary BMPs shall not be removed until final stabilization is achieved except when temporary control structures must be moved in order to allow construction activities to continue. In this instance, the operator shall implement equivalent measures to ensure the same level of protection in minimizing potential pollutant discharges.

5. Phase or sequence construction activities, as practicable, to minimize the area of disturbance at any one time.

B. Erosion Control/Stabilization BMPs

1. Description. The operator shall implement interim and permanent erosion control and stabilization BMPs on-site and shall comply with the following:

   a. Preserving Natural Vegetation. Where practicable, existing vegetationshould be preserved. If natural vegetation can be preserved, the operator shall clearly mark vegetation before clearing activities begin. Locations of trees and boundaries of environmentally sensitive areas and buffer zones to be preserved shall be identified on the SWPPP site map;

   b. Seeding/Vegetation. If revegetation plans include seeding, the SWPPP shall include seed mix and application specifications that will be used for vegetative stabilization. If the operator uses fertilizers or tackifiers on-site to establish vegetation, BMPs shall be established to minimize the presence of these chemicals in the discharge.

   c. Culvert Stabilization. If culverts are present on the site, the SWPPP shall include measures to sufficiently minimize the threat of erosion at culvert locations to prevent the formation of rills and gullies during construction; and

   d. Run-on Management. If off site areas direct flow onto the construction site, the SWPPP shall include plans to either divert run-on flows, or otherwise provide engineering controls and BMPs to account for off site contributions of stormwater and non-stormwater flow.

2. Schedule and Deadlines for Stabilization.
   The operator must provide temporary stabilization, or initiate permanent stabilization, of disturbed areas within 14 calendar days of the most recent land disturbance in areas where construction or support activities have temporarily been suspended or have permanently ceased, except as follows:

   a. Where stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable;
   b. When the site is using vegetative stabilization but is located in an arid area during dry or drought-type conditions, vegetative stabilization measures shall be initiated as soon as practicable, when growing conditions are best for planting or seeding;
   c. When the site is using vegetative stabilization and is located in an area of the state experiencing drought conditions (see definitions), vegetative stabilization measures shall be initiated as soon as practicable;
   d. Stabilization shall be initiated within 7 calendar days, for areas within 50 feet of an impaired or unique water.
   e. Where disturbed areas are awaiting vegetative stabilization for periods greater than 14 calendar days after the most recent disturbance, non-vegetative

methods of stabilization shall be employed. These methods shall be described in the SWPPP.

3. Records of Stabilization. The operator shall maintain the following records as part of the SWPPP:

   a. Dates when major grading activities occur;
   b. Dates when construction activities temporarily or permanently cease on any portion of the site; and
   c. Dates when stabilization measures are initiated and completed and reasons for delay, if applicable.

C. Sediment Control BMPs

The operator shall implement structural BMPs to divert flows from exposed soils, store flows, or otherwise limit run-off and the discharge of pollutants from exposed areas of the site to the degree attainable. Placement of structural BMPs within the floodplain shall be avoided to the extent practicable.

1. Perimeter Control. The operator shall use silt fences, vegetative buffer strips, sediment traps, or equivalent sediment control BMPs at all times for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin that will store either a calculated volume of runoff from a 2 year, 24 hour storm, or 3,600 cubic feet per acre drained, is provided.

2. Soil Stockpiles. The operator shall use silt fences or other effective sediment control BMPs around soil stockpiles except when stockpiles are being actively worked (i.e., controls must be in place evenings, weekends, and other down times). The operator shall not place stockpiles in washes or other surface waters, or in stormwater conveyances such as curb and gutter systems, or in streets leading to such conveyances.

3. Sediment Basins and Traps.

   a. Where attainable, the operator shall provide temporary (or permanent) sediment basins at sites with common drainage locations that serve an area with 10 or more acres disturbed at one time. The operator shall design and construct basins as follows:

      i. The basin shall provide storage for a calculated volume of runoff from a 2 year, 24 hour rain event from each disturbed acre drained; or
      ii. Where no calculation is performed, a sediment basin providing 3,600 cubic feet of storage per acre drained shall be provided.

      When computing the number of acres draining into a common location it is not necessary to include flows from offsite areas, if such flows are diverted around both the disturbed areas and the sediment basin. It is, however, necessary to include all sources of on-site flow that will reach the basin, including areas that are undisturbed and areas that have undergone final stabilization.

      In determining whether installing a sediment basin is attainable, the operator shall consider physical limitations at the site such as soils, slope, and available on-site area. If non-attainability is claimed, the operator shall explain in the SWPPP why a sediment basin is non-attainable. The operator shall also consider public safety, especially as it relates to children, as a design factor for sediment basin attainability and shall implement alternative

sediment control BMPs if site limitations preclude a safe design.

The SWPPP shall provide sizing and calculation requirements for sediment basin(s) and shall indicate whether the basin(s) will be temporary or permanent.

b. The operator shall use smaller sediment basins and/or sediment traps for linear projects and for drainage locations that serve 10 or more disturbed acres at one time if a sediment basin meeting the provision of Part IV C.3.a is not attainable.

c. The operator shall maintain sediment basin, ponds, and traps, and remove accumulated sediment when design capacity has been reduced by 50%. Sediment basin, ponds, and traps must be maintained until final stabilization of the site is obtained.

d. For linear projects and drainage locations serving less than 10 acres, smaller sediment basins and/or traps shall be used.

4. Discharge of Sediments During Dry Weather. The operator shall implement effective BMPs that ensure there is no discharge of sediments from construction activities to any water body including dry washes during dry weather.

Note: This is not intended to apply to blowing dust, or to track-out that is otherwise managed as required in this permit.

5. Velocity Dissipation Devices. The operator shall place velocity dissipation BMPs along the length of any outfall channel on-site, and at locations where discharges leave the construction site as necessary to provide a non-erosive flow velocity.

6. Storm Drain Inlet Protection. The operator shall at all times during construction provide effective sediment control BMPs at storm drain inlets that discharge, or could discharge, to waters of the U.S. or to a local MS4 until all sources with potential for discharging to the inlet are stabilized.

7. Construction Site Entrance and Egress. The operator shall implement effective BMPs to minimize tracking of sediments, debris and other pollutants from vehicles and equipment entering and leaving the site (e.g., stone pads, concrete or steel wash racks, or equivalent systems).

D. Non-Structural BMPs

1. Good Housekeeping BMPs. The operator shall implement good housekeeping procedures to prevent litter, construction debris, and construction chemicals exposed to stormwater from becoming a pollutant source for stormwater discharges. These procedures shall include storage practices to minimize exposure of the materials to stormwater, and spill prevention and response practices.

2. Fueling and Maintenance Areas. The operator shall implement BMPs to minimize discharges from construction equipment fueling operations and maintenance areas.

3. On-site and Offsite Material Storage. The operator shall identify and describe all material storage areas (including overburden and stockpiles of dirt, borrow areas, etc.) used for the permitted project in the SWPPP unless those areas are covered by another AZPDES permit.

4. Concrete Washout. Where possible, concrete suppliers should conduct washout

activities at their own plants or dispatch facilities.

E. Non-Stormwater Discharge BMPs

1. The operator shall not allow any non-stormwater discharges from the site unless they are specifically authorized in Part I.C.2.
2. The operator shall eliminate or reduce all non-stormwater discharges to the extent practicable. If discharges cannot be eliminated, the operator shall include the following information in the SWPPP for all non-stormwater discharge (except for flows from emergency fire fighting activities),
   i. Identification of each non-stormwater discharge expected to be associated with the project;
   ii. The location(s) where each discharge is likely to occur; and
   iii. Appropriate BMPs that the operator will use to minimize the discharge of pollutants.
3. The operator shall ensure all water from dewatering or basin draining activities is discharged in a manner that does not cause nuisance conditions, including erosion in receiving channels or on surrounding properties.
4. The operator shall retain superchlorinated wastewaters (i.e., containing chlorine above residual levels acceptable in drinking water systems) on-site until the chlorine dissipates, or shall otherwise effectively dechlorinate the water prior to discharge.

   Note. As with any non-stormwater, if acceptable to the local sanitary sewer authority, this wastewater may be discharged to the sanitary sewer. In this case, dechlorination is not required by this permit.

F. Post-Construction Stormwater Management

1. The SWPPP shall include a description of post-construction stormwater management BMPs that will be installed during the construction process to control pollutants in stormwater discharges after construction has been completed.
2. If 'temporary' sediment basins are to be used as/converted to retention or detention basins in the post-construction phase, the operator shall remove and properly dispose of all sediments accumulated in the basin during construction activities prior to filing an NOT.
3. Post-construction structural BMPs shall be placed on upland soils to the degree attainable.
4. New discharge connections or permanent stormwater outfalls to unique waters are prohibited under this permit

.

Note: The installation of these devices may also require a separate permit under section 404 of the Clean Water Act.

Note: This permit only authorizes and requires the operator to install and maintain stormwater management measures up to and including final stabilization of the site, and does not required continued maintenance after stormwater discharges associated with the construction activity have been eliminated form the site and a NOT has been filed. However, post-construction stormwater BMPs that discharge pollutants from point sources once construction is complete, may in themselves, need authorization under separate AZPDES permit.

G. Other BMPs

The SWPPP shall describe:

1. Measures to prevent the discharge of solid materials, including building materials, to waters of the US, except as authorized by a permit issued under section 404 of the Clean Water Act;
2. Specific locations of concrete and vehicle washout activities that will occur at the

construction site. The operator shall employ measures to contain and manage on-site vehicle and equipment washwater and concrete wash-out to prevent discharge (see Part IV.D.3) and consistent with applicable Aquifer Protection Program (APP) permits.

H. Inspections

The operator shall provide "qualified personnel" to perform inspections according to the selected inspection schedule identified in the SWPPP.

1. Inspection Schedule.

a. Routine Inspection Schedule. The operator shall ensure inspections are performed at the site as indicated below to ensure BMPs are functional and that the SWPPP is being properly implemented.

i. The site will be inspected a minimum of once every 7 calendar days, OR

ii. The site will be inspected a minimum of once every 14 calendar days, and also within 24 hours of the end of each rain event of 0.5-inches or greater.

*Note: The Department encourages adding inspections **before** and/or **during** predicted rain events and "spot" inspections to ensure BMPs will be effective in managing stormwater runoff and associated pollutants.*

b. Reduced Inspection Schedule. The operator may reduce inspection If the entire site has been temporarily stabilized; or runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists). In this case, the site shall be inspected at least once every 28 calendar days, and before an anticipated rain event and within 24 hours of the end of each rain event of 0.5 inches or greater in 24 hours.

c. Inspection Schedule for Sites within ¼ mile of Impaired or Unique Waters. If any discharge point from the construction site is within ¼ mile of a unique or impaired water, the operator shall inspect the site at least once every 7 calendar days. In addition, the operator shall visually observe stormwater discharges at all discharge locations within one business day after each rain event of 0.5 inches or greater in 24 hours.

Note: If an inspection day (except those required relative to a rainfall event) falls on a Saturday or holiday, the inspection may be conducted on the preceding workday. If the inspection day falls on a Sunday, the inspection may be conducted on the following Monday.

2. Inspector Qualifications. All Inspections shall be done by qualified personnel. "Qualified personnel" means a person (or personnel) knowledgeable in the principles and practice of erosion and sediment control BMPs, and who possesses the skills and abilities to assess conditions at the site that could impact stormwater quality and the effectiveness of the BMPs selected to control the quality of the stormwater discharges. The inspector(s) name, title and a description of his/her qualifications and a copy of his/her training certificate, if any, shall be included in the SWPPP before construction begins. Inspector information shall be updated whenever a new inspector is brought onto the project.

3. Scope of Inspections.

a. At a minimum, the inspector shall examine each of the following during each inspection:

i. Good housekeeping BMPS;

ii. All erosion and sediment control BMPs identified in the SWPPP to ensure they are in place and functioning as intended;

iii. All areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation;

iv. Locations where vehicles and equipment enter or exit the site for evidence of tracking sediment, debris, and other pollutants onto and off the site;

v. Site conditions for evidence of, or the potential for, pollutants entering the municipal separate storm sewer;

vi. Accessible discharge locations or discharge points to ascertain whether erosion and sediment control BMPs are effective in preventing significant impacts to receiving waters; and

vii. Where discharge locations are inaccessible, nearby downstream locations to the extent that the inspections are practicable.

b. The inspector shall document all areas inspected, the presence and effectiveness of BMPs, and the conditions found at the time of inspection.

c. All nonfunctional and underperforming BMPs shall be repaired, replaced o supplemented with functional BMPs, as specified in Part IV.I.2.

4. Inspection Report. For each inspection, the operator shall complete an inspection report which provides information that is equivalent to the sample form provided in Appendix A. Within 24 hours of completing the inspection, the corresponding inspection report shall be placed with previous reports (in chronological order) and kept with the SWPPP. At a minimum, the report shall include:

a. The inspection date;

b. Name(s) and title(s) of qualified person(s) making the inspection;

c. Weather information for the period since the last inspection (or since commencement of construction activity for the first inspection) including:

i. Best estimate of the beginning of each rain event;

ii. Duration of each event;

iii. Time elapsed since last rain event; and

iv. Approximate amount of rainfall for each event (in inches).

d. Location(s) of discharges of sediment or other pollutants from the site;

e. For inspections occurring during or after a rain event, a description of stormwater that is discharging from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable), when present;

f. Location(s) and identification of BMPs that need to be maintained, failed to operate as designed, or proved inadequate;

g. Location(s) where additional BMPs are needed that did not exist at the time of inspection are needed;

h. Identification of all sources of non-stormwater discharges occurring at the site and associated BMPs inplace;

i. Identification of material storage areas and, evidence of or potential for, pollutant discharge from such areas;

j. Corrective actions required, including any changes to SWPPP necessary, and implementation dates (of corrective actions/maintenance, and SWPPP changes);

k. Identification of any non-compliance with the conditions of this permit, or where the inspector does not identify any incidents of non-compliance, the inspection report shall contain a certification that the construction project or site is being operated in compliance with the SWPPP and this permit; and

l. Certification statement and signature in accordance with Part VIII.J.

5. Revising the SWPPP. Based on the results of the inspection, the operator shall revise the SWPPP as needed to include additional or modified BMPs designed to correct problems identified. The operator shall complete revisions to the SWPPP within 15 business days following the inspection. The revised SWPPP shall be implemented as specified in Part III.E.

I. Maintenance of BMPs.

1. The operator shall maintain all erosion and sediment control measures (BMPs) and other protective measures identified in the SWPPP in effective operating condition.

2. If existing BMPs need to be repaired or modified or if additional BMPs are necessary, implementation shall be completed within 7 calendar days or before the next rain event (whichever is sooner), unless otherwise prescribed in a. through d. below. If implementation before the next rain event is impracticable, the reason(s) for delay shall be documented in the SWPPP and alternative BMPs shall be implemented as soon as possible. Additionally, the following maintenance activities shall be implemented as follows:

   a. Remove accumulated sediment when it reaches a maximum of one-third the height of the silt fence or one-half the height of a fiber roll.

   b. Sediment shall be removed from temporary and permanent sedimentation basins, ponds and traps when the depth of sediment collected in the basin reaches 50% of the storage capacity.

   c. Construction site egress location(s) shall be inspected for evidence of off-site tracking of sediment, debris, and other pollutants onto paved surfaces. Removal of sediment, debris, and other pollutants from all off-site paved areas shall be completed as soon as practicable, or as otherwise required by Federal, State, and local requirements.

   d . Accumulations of sediment, debris, and other pollutants observed in offsite surface waters, drainage ways, catch basins, and other drainage features shall be removed in a manner and at a frequency sufficient to minimize impacts and to ensure no adverse effects on water quality.

PART V. MONITORING REQUIREMENTS FOR DISCHARGES TO UNIQUE OR IMPAIRED WATERS

The provisions of Part V. apply only to operators with projects located within ¼ mile of an impaired or unique water. If any portion of the project area extends within this distance, the operator is subject to the requirements of this Part.

A. Monitoring Program. Operators of projects that are located within ¼ mile of impaired or unique waters shall prepare and implement a monitoring program that meets the requirements of this Part. Operators of sites that are down-gradient of these waterbodies can be exempted from monitoring if the operator provides a demonstration acceptable to ADEQ that there is no potential for discharge to reach the unique or impaired receiving water.

B. General Requirements. The operator shall develop a written site-specific monitoring program including both visual and analytical monitoring. The monitoring program shall be a part of the SWPPP as either an appendix or separate SWPPP section. The monitoring program shall include:

1. Locations of monitoring sites;
2. The name(s) and title of the person(s) who will perform the monitoring;
3. A map showing the segments or portions of the receiving water that are most likely to be impacted by the discharge of pollutant(s);
4. Water quality parameters/pollutants to be sampled;
5. The citation and description of the sampling protocols to be used;
6. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures; and
7. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required. MDLs shall be below applicable surface water quality standards when possible.
8. Additionally, for sites within ¼ mile of an impaired water, the monitoring program shall include:
   a. An identification of the pollutant(s) of concern based on the most recent 305(b)/303(d) listing or other information available; and
   b. A description of potential source(s) of this pollutant(s) from the project, if any.

C. Visual Monitoring Requirements.

1. Visual Monitoring Schedule. At a minimum, visual monitoring activities for projects near impaired or unique waters shall consist of weekly site inspections. In addition, the operator shall visually observe stormwater discharges at all discharge locations within one business day after each 0.5 inch of precipitation from a rain event. Visual observations are only required during daylight hours (sunrise to sunset).
2. Visual Monitoring Locations. The inspector shall visually observe each drainage area for the presence of current (and indications of prior) discharges and their sources.
3. Visual Monitoring Parameters. Visual observations shall document the presence or evidence of any discharge, pollutant characteristics (floating and suspended material - clarity and solids, sheen, color, turbidity, odor, foam etc.), and source.
4. Visual Monitoring. The operator shall document conditions noted during visual monitoring. Documentation shall include photographs of site conditions including sediment loads, erosion and waste control BMPs and any discharges.

D. Analytical Monitoring Requirements.

1. Analytical Monitoring Schedule. Analytical monitoring shall be performed anytime a pollutant (including sediment) is known or suspected to discharge from the construction site. Monitoring shall continue until final stabilization for the project site is established and an NOT is filed.

2. Adverse Conditions Exception. The operator is not required to physically collect samples during dangerous weather conditions such as flooding and electrical storms; or during nighttime hours (sunset to sunrise). Information on any adverse conditions that prevented sampling shall be documented in the SWPPP.

3. Analytical Monitoring Locations.
   a. The operator shall conduct discharge sampling at locations observed or suspected to contain the greatest pollutant load resulting from the construction activities.

   b. Where the construction site is adjacent to or otherwise discharges directly to an unique or impaired stream, the operator shall sample

both immediately upstream and downstream of each discharge point. If there are two or more discharge locations from the site to the same unique or impaired stream, the operator may sample at one upstream and one downstream location in the stream. Additional monitoring points shall be located at the discharge points of the construction site. If the impaired or unique water is a lake, a site specific proposal for sampling the impact area shall be submitted.

c. If the unique or impaired water is a lake, a site-specific proposal for sampling the impact area shall be submitted. Documentation of ADEQ approval of the sampling plan shall be included in the SWPPP.

d. If the construction site is within ¼ mile of an unique or impaired water, but is not located adjacent to or does not otherwise discharge directly to the water, analytical monitoring shall be conducted at each discharge location (unless a discharge point representative of worst case discharge quality can be established as an alternative) at the construction site.

4. Analytical Monitoring Parameters.

a. The operator shall monitor for turbidity. The operator shall compare turbidity values from the sample locations referenced in Part V.D.3.b. If there is a 25% or more increase at the downstream monitoring location, the operator shall evaluate and replace, maintain, or install additional BMPs as necessary to reduce sediment transport.

b. The operator shall sample discharges to unique waters for any pollutants known, or which should be known to be present at the site.

c. The operator shall also sample discharges to impaired waters for any additional pollutants for which the water is impaired. However, if the operator can demonstrate that there is no reasonable expectation that construction activities could be an additional source of a specific pollutant, analytical monitoring for that parameter will not be required. As part of this demonstration, the operator must consider all on-site activities, as well as the potential for any pollutants (metals, nutrients, etc.) to be present in the on-site soils which will be disturbed.

5. Sample Collection, Preservation, Tracking, Handling and Analyses. The operator shall establish written procedures for sample collection, preservation, tracking, analyses, and handling, including the following:

a. Identify sample analyses and associated analytical methods (fixed base laboratory and field analyses);
b. Use of only preserved (as necessary), pre-cleaned sample containers provided by the laboratory;
c. Labeling each sample container with indelible ink noting sampler's name(s), sample identification, date and time of sample collection, sample location (discharge location), requested analyses, project name or number, and preservation (as appropriate);

d. Tracking samples using chain-of-custody (COC) forms. The COC shall include, at a minimum, sampler's name(s), phone number, date and time of sample collection, sample identification, requested analyses, and project name or number. The COC forms shall be included as part of the SWPPP;

e. Transporting and shipping samples for laboratory analyses in a manner that minimizes destruction of the sample or otherwise compromises sample integrity. Samples shall be provided to the analytical laboratory in a timeframe not exceeding analytical method hold times;

f. Designating and training personnel to collect, maintain, and ship samples in accordance with the above sample protocols and good laboratory practices.

E. Monitoring Methods. All monitoring instruments and equipment (including operators' own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' recommendations. All laboratory analyses shall be conducted according to test procedures specified in 40 CFR 136, unless other test procedures have been specified in this general permit.

All samples collected for monitoring shall be analyzed by a laboratory that is licensed by the Arizona Department of Health Service (ADHS) Office of Laboratory Licensure and Certification. This requirement does not apply to parameters that require analysis at the time of sample collection as long as the testing methods used are approved by ADHS or ADEQ. These parameters may include flow, dissolved oxygen, pH, temperature, and total residual chlorine. The operator may conduct field analysis of turbidity if the operator has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to properly perform the field analysis.

F. Records.

1. Analytical Record Submittal. The operator shall submit monitoring records twice a year. Monitoring records for the period between June 1 and October 31 shall be submitted to ADEQ by November 30th of each year or at the time of final stabilization and NOT submittal, whichever is sooner. Monitoring records for the period between November 1 and May 31 shall be submitted to ADEQ by June 30th of each year or at the time of final stabilization and NOT submittal, whichever is sooner.

   Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or other format specified by the Director, and submitted to:

   Arizona Department of Environmental Quality
   Surface Water Section
   Stormwater and General Permits Unit/NOI (5415A-1)
   1110 W. Washington Street
   Phoenix, Arizona 85007

2. Record Retention. The operator shall retain records of all stormwater monitoring information and reports as part of the SWPPP for a period of at least three years from the date the NOT was submitted to ADEQ. In addition to the requirements in Part VIII.I of this permit. These records shall include:

   a. The date, exact place and time of sampling or measurements;

   b. The name and title of the qualified person performing the visual and analytical monitoring and any related measurements;

   c. The date(s) the analyses were performed;

d. The analytical techniques or methods used;
e. The results of such analyses; and
f. The response(s) taken to reduce or prevent pollutants in discharge.

PART VI. SPECIAL CONDITIONS

A. Hazardous Substances or Oil. The operator shall prevent or otherwise minimize the discharge of hazardous substances or oil in the discharge(s) from the construction activities in accordance with the SWPPP. This permit does not relieve the operator of the reporting requirements under 40 CFR 110, 40 CFR 117 and 40 CFR 302 relating to spills or other releases of oils or hazardous substances.

B. Releases in Excess of Reportable Quantities. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117, or 40 CFR 302 occurs, the operator shall:

1. Modify the SWPPP within 14 calendar days of knowledge of the release to: provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, SWPPPs shall identify measures to prevent the reoccurrence of the releases and to respond to such releases; and

2. Provide notice to the National Response Center in accordance with 40 CFR 110, 40 CFR 117, and 40 CFR 302 within a 24 hour period, or as soon as site staff have knowledge of the discharge.

C. Spills. This general permit does not authorize the discharge of any hazardous substances or oil resulting from on-site releases.

D. Compliance with surface water quality standards. The operator must select, install, implement and maintain BMPs at the construction site that minimize pollutants in the discharge as necessary to meet applicable water quality standards. At any time after authorization, ADEQ may determine that stormwater discharges may cause, have reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. If such a determination is made, ADEQ may require you to:

1. Develop a supplemental BMP action plan describing SWPPP modifications to address adequately the identified water quality concerns;
2. Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or
3. Cease discharges of pollutants from construction activity and submit an individual permit application.

E. Continuation of the Expired General Permit. If ADEQ does not reissue this general permit before the expiration date, it will be administratively continued and remain in force and effect. Operators granted general permit coverage before the expiration date will automatically remain covered by the continued general permit until the earlier of:

1. Reissuance or replacement of the general permit, at which time the operator shall comply with the NOI conditions of the new general permit to maintain authorization to discharge; or

2. The date ADEQ receives the operator's NOT; or

3. The date ADEQ issues an individual permit for the project's discharge; or

4. The date ADEQ issues a formal permit decision not to reissue this general permit, at which time operators shall seek coverage under an alternative general permit or an individual permit.

PART VII. RETENTION OF RECORDS

A. Documents. The operator shall retain copies of SWPPPs and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, for at least three years from the date of submittal of an NOT. ADEQ may extend this retention period upon request by notifying the operator in writing at any time prior to the end of the standard three year retention period.

B. Maintaining Inspection Records. The operator shall ensure the inspection report and record of any follow-up actions taken is retained as part of the SWPPP for at least three years from the date that permit coverage expires or is terminated.

PART VIII. STANDARD PERMIT CONDITIONS

A. Duty to Comply. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(a)(1) and A.R.S. § 49-261, 262, 263.01, and 263.02.]

1. The operator shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act; A.R.S. Title 49, Chapter 2, Article 3.1; and A.A.C. Title 18, Chapter 9, Articles 9 and 10, and is grounds for enforcement action, permit termination, revocation and reissuance, or modification, or denial of a permit renewal application.

2. The issuance of this permit does not waive any federal, state, county, or local regulations or permit requirements with which a person discharging under this permit is required to comply.

3. The operator shall comply with any effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

B. Need to Halt or Reduce Activity Not a Defense. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(c)]. It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

C. Duty to Mitigate. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(d)] The operator shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

D. Proper Operation and Maintenance. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(e)] The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the operator to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.

E. Permit Actions. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(f)] This permit may be modified, revoked and reissued, or terminated for cause. The filing of a

request by the operator for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

F. **Property Rights.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(g)] This permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, nor any infringement of federal, state, Indian tribe, or local laws or regulations.

G. **Duty to Provide Information**. [A.A.C.R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(h)] The operator shall furnish to ADEQ, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The operator shall also furnish to ADEQ upon request, copies of records required to be kept by this permit.

H. **Inspection and Entry.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(i)] The operator shall allow the Director, or an authorized representative, upon the presentation of credentials and such other documents as may be required by law, to:

1. Enter upon the operator's premises where a regulated facility or activity is located or conducted, or where records shall be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that shall be kept under the terms of the permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring equipment or control equipment), practices or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by A.R.S. Title 49, Chapter 2, Article 3.1, and A.A.C. Title 18, Chapter 9, Articles 9 and 10, any substances or parameters at any location.

I. **Monitoring and Records**. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(j)]

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

2. The operator shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

3. Monitoring shall be conducted according to test procedures approved under 9 A.A.C. Chapter 14, Article 6 as incorporated by reference in R18-9-A905(B); unless specific test procedures have been otherwise specified in this permit.

4. Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained in this permit is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which includes the possibility of fines and/or imprisonment.

J. **Signatory Requirements.** [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(k) and (l); A.A.C. R18-9-A905(A)(1)(c) which incorporates 40 CFR 122.22]

1. NOIs. All NOIs shall be signed and certified as follows:

a. For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means:

i. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

ii. The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency is the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. Regional Administrators of EPA).

2. Reports and Other Information: All NOTs, SWPPPs, reports, certifications, or information required by this permit and other information requested by ADEQ shall be signed by a person described in Part VIII.J.1 or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Part VIII.J.1;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the operator. (A “duly authorized representative” may be either a named individual or any individual occupying a named position); and

c. The signed and dated written authorization is included in the SWPPP and submitted to ADEQ upon request.

3. Changes to Authorization. If the information on the NOI filed for general permit coverage is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a revised NOI shall be submitted to ADEQ prior to or together with any reports, information, or applications to be signed by the signatory or an authorized representative.

4. Certification. Any person signing documents, including inspection reports under the terms of this permit shall make the following certification:

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

K. Reporting Requirements. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(l)]

1. Planned Changes. The operator shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

   a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b) (incorporated by reference at R18-9-A905(A)(1)(e)); or

   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1) (incorporated by reference at R18-9-A905(A)(3)(b)).

2. Anticipated Noncompliance. The operator shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Monitoring Reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit. If the operator monitors any pollutant more frequently than required by the permit, using test procedures approved under 9 A.A.C. Chapter 14, Article 6 or as specified in the permit, then the results of this monitoring shall be included in the calculation and reporting of the data to ADEQ.

4. Twenty-four hour Reporting.

   a. The operator shall report to ADEQ any permit noncompliance which may endanger human health or the environment. The operator shall orally notify the office listed below within 24 hours:

      Arizona Department of Environmental Quality
      1110 W. Washington, 5515B-1
      Phoenix, Arizona 85007
      Office: 602-771-2330; Fax 602-771-4505

      Note: Additional Federal, State, or Local release reporting may also be required.

   b. A written submission shall also be provided to the office identified above within five days of the time the operator becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the

anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

5. Other Noncompliance. The operator shall report all instances of noncompliance (not otherwise required to be reported as prescribed in Part VIII.K.4) in accordance with Part VIII.K.3.

6. Other Information. When the operator becomes aware that he or she failed to submit any relevant facts in the NOI or in any other report to ADEQ, the operator shall promptly submit the facts or information to the Surface Water Section of ADEQ.

L. **Reopener Clause**. [A.A.C. R18-9-A905(A)(3)(d), which incorporates 40 CFR 122.44(c)]. ADEQ may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

M. **Other Environmental Laws.** No condition of this general permit releases the operator from any responsibility or requirements under other environmental statutes or regulations. For example, this permit does not authorize the "take" of endangered or threatened species as prohibited by section 9 of the Endangered Species Act, 16 U.S.C. 1538. Information regarding the location of endangered and threatened species and guidance on what activities constitute a "take" are available from the U.S. Fish and Wildlife Service at www.fws.gov.

N. **State or Tribal Law**. [Pursuant to A.A.C. R18-9-A904(C)] Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the operator from any responsibilities, liabilities, or penalties established pursuant to any applicable State or Tribal law or regulation under authority preserved by Section 510 of the Clean Water Act.

O. **Severability**. The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstance, is held invalid, the application of the provision to other circumstances, and the remainder of this general permit shall not be affected.

P. **Upset.** [A.R.S. §§ 49-255(8) and 255.01(E), A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41(n)]

1. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the operator. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

2. Effect of an Upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (3) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

3. Conditions Necessary for a Demonstration of Upset. An operator who wishes to establish the affirmative defenses of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that operator can identify the cause(s) of the upset;
   b. The permitted facility was at the time being properly operated; and

c. The operator submitted notice of the upset as required in paragraph (K)(2)(4)(24-hour notice).

d. The operator has taken appropriate measure including all reasonable steps to minimize or prevent any discharge or sewage sludge use or disposal that is in violation of the permit and that has a reasonable likelihood of adversely affecting human health or the environment per A.R.S. § 49-255.01(E)(1)(d).

4. Burden of Proof. In any enforcement proceeding the operator seeking to establish the occurrence of an upset has the burden of proof.

Q. Bypass. [A.A.C. R18-9-A905(A)(3)(a), which incorporates 40 CFR 122.41 (m)]

1. Definitions.
   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
   b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production,

2. Bypass not Exceeding Limitations. The operator may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of paragraphs (3) and (4) of this section.

3. Notice.
   a. Anticipated bypass. If the operator knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of bypass.
   b. Unanticipated bypass. The operator shall submit notice of an unanticipated bypass as required in paragraqph (f)(2) of section 13 (24-hour notice).

4. Prohibition of Bypass. Bypass is prohibited, and the Director may take enforcement action against an operator for bypass, unless:
   a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
   b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
   c. The operator submitted notices as required under paragraph (3) of this section.

   The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above.

PART IX. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

Any permit noncompliance constitutes a violation and is grounds for an enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

A. **Civil Penalties.** A.R.S. § 49-262(C) provides that any person who violates any provision of A.R.S. Title 49, Chapter 2, Article 2, 3 or 3.1 or a rule, permit, discharge limitation or order issued or adopted under A.R.S. Title 49, Chapter 2, Article 3.1 is subject to a civil penalty not to exceed $25,000 per day per violation.

B. **Criminal Penalties.** Any a person who violates a condition of this general permit, or violates a provision under A.R.S. Title 49, Chapter 2, Article 3.1, or A.A.C. Title 18, Chapter 2, Articles 9 and 10 is subject to the enforcement actions established under A.R.S. Title 49, Chapter 2, Article 4, which may include the possibility of fines and/or imprisonment.

PART X. DEFINITIONS

"24 hour period" means any consecutive 24-hour period.

"Anticipated rain event" for the purpose of this permit, means any storm event with at least a 30% chance of precipitation as predicted by the National Weather Service for the area local to the construction site.

"Arid areas" for purposes of this permit, means the parts of the state that receive an annual rainfall of less than 20 inches.

"Best management practices" (BMPs) means those methods, measures or practices to prevent or reduce discharges and includes structural and nonstructural BMPs and operation and maintenance procedures. Best management practices may be applied before, during and after discharges to reduce or eliminate the introduction of pollutants into receiving waters. In addition, the term shall include erosion and sediment control BMPs, stormwater conveyance, stormwater diversion, and treatment structures, and any procedure or facility used to minimize the exposure of pollutants to stormwater or to remove pollutants from stormwater.

"Business day" means Monday through Friday, except legal holidays observed by the state of Arizona.

"Commencement of construction activities" means the initial disturbance of soils associated with clearing, grading, excavating, or stockpiling of fill material activities or other construction-related activities.

"Common plan of development" means a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. A 'plan' is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.

"Construction activity" includes clearing, grading, excavating, stockpiling of fill material and other similar activities resulting in a land disturbance of at least one acre. Construction activity also includes clearing, grading, stockpiling, etc. that occurs in smaller areas if part of a larger common plan of development or sale that will ultimately disturb one or more acres,. This definition encompasses both large construction activities defined in 40 CFR 122.26 (b)(14)(x) and small constructions activities in 40 CFR 122.26 (b)(15)(i).

"Day" means a calendar day or any 24-hour period that reasonably represents the calendar day.

"Department" means the Arizona Department of Environmental Quality.

"Discharge" means any addition of any pollutant to waters of the United States or to a MS4 from any point source.

"Drought" means for purposes of this permit, weather conditions considered "severely" or "extremely" dry (i.e., has a value of -1.50 or less) as evaluated by the 3-month Standardized Precipitation Index (SPI) which compares current cumulative precipitation to average conditions.

“Eligible” means authorization to discharge stormwater under this general permit.

“Ephemeral” means a surface water that has a channel that is at all times above the water table, and that flows only in direct response to precipitation. [A.A.C. R18-11-101(22)]

“Erosion control” means temporary or permanent measures to prevent soil particles from detaching and being transported in stormwater.

“Impaired water” means waters that have been assessed by ADEQ, under the Clean Water Act, Section 303(d), as not attaining a water quality standard for at least one designated use, and are listed in Arizona’s 2004 303(d) List and Other Impaired Waters.

“Municipal separate storm sewer” means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the Clean Water Act (33 U.S.C. 1288) that discharges to waters of the United States;
ii. Designed or used for collecting or conveying stormwater;
iii. Which is not a combined sewer; and
iv. Which is not part of a Publicly Owned Treatment Works.

“Municipal separate storm sewer system” (MS4) means all separate storm sewers defined as “large,” “medium,” or “small” municipal separate storm sewer systems or any municipal separate storm sewers on a system-wide or jurisdiction-wide basis as determined by the Director under A.A.C. R18-9-C902(A)(1)(g)(i) through (iv). [A.A.C. R18-9-A901(23)]. This also includes similar systems owned or operated by separate storm sewer municipal jurisdictions not required to obtain stormwater discharge authorization.

“Notice of Intent” (NOI) means the application to operate under this general permit.

“Notice of Termination” (NOT) means the application to terminate coverage under this general permit.

“Person” means an individual, employee, officer, managing body, trust, firm, joint stock company, consortium, public or private corporation, including a government corporation, partnership, association or state, a political subdivision of this state, a commission, the United States government or any federal facility, interstate body or other entity. [A.R.S. § 49-201(27)]

“Pollutant” means sediment, fluids, contaminants, toxic wastes, toxic pollutants, dredged spoil, solid waste, substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals, incinerator residue, sewage, garbage, sewage sludge, munitions, petroleum products, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt (e.g., overburden material), and mining, industrial, municipal and agricultural wastes or any other liquid, solid, gaseous or hazardous substances. [A.R.S. § 49-201(29)]

“Rain event” as used in this permit is defined as when rain drops (ultimately resulting in 0.5 inch accumulation) reach the ground surface of the construction site. Separate rain events are distinguished by a 24 hour period of no rain reaching the ground surface of the construction site.

“Received,” for the purposes of this permit and in reference to NOIs or NOTs or Permit Waiver Certificate forms means:

1. The day the information was signed electronically via the Smart NOI system and submitted to ADEQ,

2. The day the signed form was faxed to and received by ADEQ,
3. The date of hand-delivery of the signed form to ADEQ, or
4. The date ADEQ signs for certified mail containing the signed form.

“Receiving Water” as used in this permit includes Waters of the U.S. and conveyances thereto (including MS4s).

"Reclaimed water" means water that has been treated or processed by a wastewater treatment plant or an on-site wastewater treatment facility. A.R.S. § 49-201(31).

“Sediment control” means measures designed to intercept and settle out soil particles that have become detached and transported by water. Sediment control measures complement soil stabilization measures (erosion control).

“Stabilization” refers to covering or maintaining an existing cover over soil that reduces and minimizes erosion.

“Stormwater” means stormwater runoff, snow melt runoff, and surface runoff and drainage.

“Stormwater Pollution Prevention Plan” (SWPPP) means a plan which includes narrative information describing how requirements in Permit Parts III through VIII, are met, site map(s), an identification of construction/contractor activities that could cause pollutants in the stormwater, and a description of measures or practices to control these pollutants.

“Total Maximum Daily Load” (TMDL) means an estimation of the total amount of a pollutant from all sources that may be added to a water while still allowing the water to achieve and maintain applicable surface water quality standards. Each total maximum daily load shall include allocations for sources that contribute the pollutant to the water, as required by section 303(d) of the clean water act (33 United States Code, Section 1313(d)) and regulations implementing that statute to achieve applicable surface water quality standards. [A.R.S. § 49-231(4)]

“Turbidity” means the clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

“Unique water” means a surface water that has been designated by ADEQ as an outstanding state resource under A.A.C. R18-11-112. ADEQ anticipates that the term ‘unique water’ will be replaced with ‘outstanding Arizona water’ within the permit term.

“Waters of the United States” (U.S.) is defined in 40 CFR 122.2.

“Wetland” means an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A wetland includes a swamp, marsh, bog, cienega, tinaja, and similar areas. [A.A.C. R18-11-101(49)]

PART XI. ACRONYMS

AAC- Arizona Administrative Code

ADEQ - Arizona Department of Environmental Quality

ARS - Arizona Revised Statute

AZPDES - Arizona Pollutant Discharge Elimination System

BMP - Best Management Practice

CFR - Code of Federal Regulations

CWA - Clean Water Act

DMR - Discharge Monitoring Report

EPA - Environmental Protection Agency

MS4 - Municipal Separate Storm Sewer System

NOI - Notice of Intent

NOT - Notice of Termination

NPDES - National Pollutant Discharge Elimination System

SWPPP - Stormwater Pollution Prevention Plan

TMDL - Total Maximum Daily Load

USGS - United States Geological Survey

Appendix A
Example Inspection Form

Example Sample Inspection Report

Instructions

This sample inspection report has been developed as a helpful tool to aid you in completing your site inspections. It is provided in Microsoft Word format to allow you to easily customize it for your use and the conditions at your site. You should also customize this form to help you meet the requirements in the AZPDES Construction General Permit related to inspections.

Refer to Permit Part IV.H for inspection requirements. Remember to include all areas of the site disturbed by construction activity. If a BMP has been used inappropriately or installed incorrectly, replace or modify the BMP for site situations as soon as practicable and before the next anticipated storm event. When sediment escapes the construction site, offsite accumulations of sediment must be removed at a frequency sufficient to ensure no adverse effects on water quality.

Using the Inspection Report
This inspection report is designed to be customized according to the BMPs and conditions at your site. For ease of use, you should take a copy of your site plan and number all of the stormwater BMPs and areas of your site that will be inspected. A brief description of the BMP and its location should then be listed in the site-specific section of the inspection report. For example, specific structural BMPs such as construction site entrances, sediment ponds, or specific areas with silt fence (e.g., silt fence along Main Street; silt fence along slope in NW corner, etc.) should be numbered and listed on the inspection form. You should also number specific non-structural BMPs or areas that will be inspected (such as trash areas, material storage areas, temporary sanitary waste areas, etc).

You can complete the items in the “General Information” section that will remain constant, such as the project name, AZCON authorization number, and inspector’s name and qualifications. Print out multiple copies of this customized inspection report to use during your inspections.

When conducting the inspection, walk the site by following your site map and numbered BMPs/areas for inspection. Note any required corrective actions and the date and responsible person for the correction. Also note whether any previously identified site issues have been addressed.

Stormwater Construction Site Inspection Report

General Information			
Project Name			
Location			
AZCON number			
Date of Inspection		**Start Time:**	**End time:**
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Qualifications	**(must attach to this report or indicate the portion of the SWPPP that documents the qualifications of the inspector by name)**		
Describe present phase of construction			
Type of Inspection ❑ **Weekly** ❑ **Bi-weekly** ❑ **Monthly** ❑ **Pre-storm event** ❑ **During storm event** ❑ **Post-storm event**			
Weather Information			
Has it rained since the last inspection? ❑Yes ❑No **Weather information/Time Elapsed since last inspection:** **Storm Start Date & Time:** **Storm Duration (hrs):** **Approximate Rainfall (in):**			
Weather at time of this inspection?			
Do you suspect that discharges may have occurred since the last inspection? ❑Yes ❑No			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, provide location(s) and a description of stormwater discharged from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen**			
Non-Stormwater Discharges			
Identify all non-stormwater discharges (i.e. water, other than stormwater, directed to a watercourse, storm drain, or off of the construction site):			

AZCON- _____ Inspection Date: _____

Site-specific BMPs

Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below. ***Include all BMPs implemented to manage erosion, sediment transport, waste disposal, material and equipment storage areas, and non-stormwater discharges.*** *Carry a copy of this numbered site map with you during your inspections. This list will help ensure that you are inspecting all BMPs at your site. Customize this section as needed.*

	BMP Description and Location (indicate if associated with non-stormwater)	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action/responsible person	Corrective Action Implementation Date
1		❑Yes ❑No			
2		❑Yes ❑No			
3		❑Yes ❑No			
4		❑Yes ❑No			
5		❑Yes ❑No			
6		❑Yes ❑No			
7		❑Yes ❑No			
8		❑Yes ❑No			
9		❑Yes ❑No			
10		❑Yes ❑No			
11		❑Yes ❑No			
12		❑Yes ❑No			
13		❑Yes ❑No			
14		❑Yes ❑No			
15		❑Yes ❑No			
16		❑Yes ❑No			
17		❑Yes ❑No			
18		❑Yes ❑No			
19		❑Yes ❑No			
20		❑Yes ❑No			

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

Overall Site Issues

	BMP/Activity	Implemented?	Maintained?	Location/Corrective Action	Date for corrective action/responsible person	Corrective Action Implementation Date
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No			
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No			
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No			
4	Are discharge points and receiving waters free of sediment deposits? **If no, provide locations**	❑Yes ❑No	❑Yes ❑No			

5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No			
6	Is there evidence of sediment being tracked into the street?	❑Yes ❑No	❑Yes ❑No			
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No			
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No			
9	Are vehicle and equipment fueling, cleaning, material storage, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No			
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No			
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No			
12	Are there locations where additional BMPs are necessary?	❑Yes ❑No	❑Yes ❑No			
13	Are changes to the SWPPP necessary?	❑Yes ❑No	❑Yes ❑No			
14	(Other)		❑Yes ❑No			

❑ If there were no incidents of noncompliance noted during the inspection the inspector certifies that the construction project or site is being operated in compliance with the SWPPP and Permit No. AZG2008-001.

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

Print Inspector's Name: _____

Signature:_____

Date: _____

A.2 NPDES Construction General Permit

This document is taken directly from the EPA website http://cfpub.epa.gov/npdes/stormwater/cgp.cfm. Refer to that website periodically for any updates that may have occurred since this manual was published.

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National Pollutant Discharge Elimination System
General Permit for Discharges from
Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA or the Act), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Part 1.1.a and Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) general permit, are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of earth-disturbing activities" (see Appendix A) until "final stabilization" (see Part 2.2).

This permit becomes effective on **February 16, 2012**. For the State of Idaho (except for Indian country), this permit becomes effective on **April 9, 2012**. For areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, this permit becomes effective on **April 13, 2012**. For projects located in the following areas, this permit becomes effective on **May 9, 2012**: Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin.

This permit and the authorization to discharge expire at midnight, **February 16, 2017**.

Signed and issued this 16th day of February, 2012

H. Curtis Spalding
Regional Administrator, Region 1

Signed and issued this 16th day of February, 2012

John Filippelli
Director, Division of Environmental Planning & Protection, Region 2

Signed and issued this 16th day of February, 2012

José C. Font
Acting Division Director, Carribbean Environmental Protection Division, Region 2, Caribbean Office

Signed and issued this 16th day of February, 2012

Catherine A. Libertz
Assistant Director, Water Protection Division, Region 3

Signed and issued this 16th day of February, 2012

James D. Giattina
Director, Water Protection Division, Region 4

Signed and issued this 16th day of February and 9th day of May, 2012

Tinka G. Hyde
Director, Water Division, Region 5

Signed and issued this 16th day of February, 2012

William K. Honker, P.E.
Acting Director, Water Quality Protection Division, Region 6

Signed and issued this 16th day of February, 2012

Karen Flournoy
Director, Wetlands and Pesticides Division, Region 7

Signed and issued this 16th day of February, 2012

Melanie L. Pallman
Acting Assistant Regional Administrator, Office of Partneships and Regulatory Assistance, Region 8

Signed and issued this 16th day of February, 2012

Nancy Woo
Deputy Director, Water Division, Region 9

Signed and issued this 16th day of February and 9th day of April, 2012

Michael J. Lidgard
Acting Director, Office of Water and Watersheds, Region 10

Signed and issued this 13th day of April, 2012

Christine Psyk
Associate Director, Office of Water and Watersheds, Region 10

The signatures are for the permit conditions in Parts 1 through 9 and Appendices A through K.

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1. HOW TO OBTAIN PERMIT COVERAGE UNDER THE CGP.

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for applying for permit coverage in this Part.

1.1. ELIGIBILITY CONDITIONS REQUIRED OF ALL PROJECTS.

Only those projects that meet all of the following eligibility conditions may be covered under this permit:

a. You are an "operator" of the construction project for which discharges will be covered under this permit;

Note: For the purposes of this permit, an "operator" is any party associated with a construction project that meets either of the following two criteria:

1. *The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or*
2. *The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).*

Subcontractors generally are not considered operators for the purposes of this permit.

Note: Where there are multiple operators associated with the same project, all operators are required to obtain permit coverage. The following applies in these situations:

1. *If one operator has control over plans and specifications and a different operator has control over activities at the project site, they may divide responsibility for compliance with the terms of this permit as long as they develop a group SWPPP (see Part 7.1.1), which documents which operator has responsibility for each requirement of the permit.*
2. *If an operator only has operational control over a portion of a larger project (e.g., one of four homebuilders in a subdivision), the operator is responsible for compliance with all applicable effluent limits, terms, and conditions of this permit as it relates to the activities on their portion of the construction site, including protection of endangered species, critical habitat, and historic properties, and implementation of control measures described in the SWPPP in the areas under their control.*
3. *You must ensure either directly or through coordination with other permittees, that your activities do not render another party's pollutant discharge controls ineffective.*
4. *If the operator of a "construction support activity" (see Part 1.3.c) is different than the operator of the main construction site, that operator is also required to obtain permit coverage.*

b. Your project:

i. Will disturb 1 or more acres of land, or will disturb less than 1 acre of land but is part of a common plan of development or sale that will ultimately disturb 1 or more acres of land; or

ii. Your project's discharges have been designated by EPA as needing a permit under § 122.26(a)(1)(v) or § 122.26(b)(15)(ii);

c. Your project is located in an area where EPA is the permitting authority (see Appendix B);

d. Discharges from your project are not:

   i. Already covered by a different NPDES permit for the same discharge; or

   ii. In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[1, 2]

e. You are able to demonstrate that you meet one of the criteria listed in Appendix D with respect to the protection of species that are federally-listed as endangered or threatened under the Endangered Species Act (ESA) or federally-designated critical habitat;

f. You have completed the screening process in Appendix E relating to the protection of historic properties and places; and

g. You have complied with all requirements in Part 9 imposed by the applicable state, Indian tribe, or territory in which your construction activities will occur.

1.2. ELIGIBILITY CONDITIONS THAT APPLY DEPENDING ON TYPE OF PROJECT.

You must also satisfy, if applicable, the conditions in Parts 1.2.1 through 1.2.4 in order to obtain coverage under this permit.

1.2.1. Eligibility for Emergency-Related Construction Activities.

If you are conducting earth-disturbing activities in response to a public emergency *(e.g., natural disaster, widespread disruption in essential public services)*, and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you are authorized to discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing earth-disturbing activities (see Table 1) establishing that you are eligible under this permit. You are also required to provide documentation in your SWPPP to substantiate the occurrence of the public emergency.

1.2.2. Water Quality Standards – Eligibility for New Sources.

If you are a "new source" (as defined in Appendix A), you are not eligible for coverage under this permit for discharges that EPA, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary in accordance with Part 1.4.5. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the stormwater control requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard.

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[1] Parts 1.1.d.i and 1.1.d.ii do not include sites currently covered under the 2003 or 2008 CGPs, which are in the process of obtaining coverage under this permit, and sites covered under this permit, which are transferring coverage to a different operator.

[2] Notwithstanding a project being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.d.i or 1.1.d.ii, above, EPA may waive the applicable requirement after specific review if it determines that coverage under this permit is appropriate.

1.2.3. Discharging to Waters with High Water Quality – Eligibility for New Sources.

If you are a "new source" (as defined in Appendix A), you are eligible to discharge to a Tier 2, Tier 2.5, or Tier 3 water only if your discharge will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the stormwater control requirements of this permit, including the requirements applicable to such discharges in Part 3.3.2, will result in discharges that will not lower the water quality of the applicable water. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

Note: Your project will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first surface water to which you discharge is identified by a state, tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first surface water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

1.2.4. Use of Cationic Treatment Chemicals.

If you plan to use cationic treatment chemicals (as defined in Appendix A), you are ineligible for coverage under this permit, unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

1.3. Types of Discharges Authorized Under the CGP.

The following is a list of discharges that are allowed under the permit provided that appropriate stormwater controls are designed, installed, and maintained:

a. Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR § 122.26(b)(14) or § 122.26(b)(15)(i);

b. Stormwater discharges designated by EPA as needing a permit under 40 CFR § 122.26(a)(1)(v) or § 122.26(b)(15)(ii);

c. Stormwater discharges from construction support activities *(e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)* provided:

   i. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;

   ii. The support activity is not a commercial operation, nor does it serve multiple unrelated construction projects;

   iii. The support activity does not continue to operate beyond the completion of the construction activity at the project it supports; and

   iv. Stormwater controls are implemented in accordance with Part 2 and, if applicable, Part 3, for discharges from the support activity areas.

d. The following non-stormwater discharges from your construction activity, provided that, with the exception of water used to control dust and to irrigate areas to be vegetatively stabilized, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Part 2:

   i. Discharges from emergency fire-fighting activities;

ii. Fire hydrant flushings;

iii. Landscape irrigation;

iv. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;

v. Water used to control dust;

vi. Potable water including uncontaminated water line flushings;

vii. Routine external building washdown that does not use detergents;

viii. Pavement wash waters provided spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used. You are prohibited from directing pavement wash waters directly into any surface water, storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;

ix. Uncontaminated air conditioning or compressor condensate;

x. Uncontaminated, non-turbid discharges of ground water or spring water;

xi. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

xii. Construction dewatering water that has been treated by an appropriate control under Part 2.1.3.4; and

e. Discharges of stormwater listed above in Parts a, b, and c, or authorized non-stormwater discharges in Part d above, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.4. SUBMITTING YOUR NOTICE OF INTENT (NOI).

To be covered under this permit, you must submit to EPA a complete and accurate NOI prior to commencing construction activities. The NOI certifies to EPA that you are eligible for coverage according to Part 1.1 and 1.2, and provides information on your construction operation and discharge.

Note: All "operators" (as defined in Appendix A) associated with your construction project, who meet the Part 1.1 eligibility requirements, and who elect to seek coverage under this permit, are required to submit an NOI.

Note: There are two exceptions to the requirement to submit the NOI prior to the commencement of construction activities: (1) for emergency-related projects, and (2) for new projects scheduled to commence construction activities on or after February 16, 2012, but no later than March 1, 2012. [3] *For these two types of projects, the NOI*

[3] For new projects in the State of Idaho (except Indian country), if you are scheduled to commence construction activities on or after April 9, 2012, but no later than May 9, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities. For new projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, if you are scheduled to commence construction activities on or after April 13, 2012, but no later than May 13, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities. For new projects in the following areas, if you are schedule to commence construction activities on or after May 9, 2012, but no later than June 8, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin.

must be submitted within 30 calendar days after the commencement of earth-disturbing activities (see Part 1.4.2).

Note: You must complete the development of a Stormwater Pollution Prevention Plan (SWPPP) consistent with Part 7 prior to submitting your NOI for coverage under this permit.

1.4.1. How to Submit Your NOI.

You are required to use EPA's electronic NOI system, or "eNOI system", to prepare and submit your NOI. Go to www.epa.gov/npdes/stormwater/cgpenoi to access the eNOI system and file an NOI. If you have a problem with the use of the eNOI system, contact the EPA Regional Office that corresponds to the location of your site. If you are given approval by the EPA Regional Office to use a paper NOI, and you elect to use it, you must complete the form in Appendix J.

1.4.2. Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage.

Table 1 provides the deadlines for submitting your NOI and your official start date of permit coverage, which differ depending on when you commence construction activities. The following terms are used in Table 1 to establish NOI deadlines:

a. New project – a construction project that commences construction activities on or after February 16, 2012, or or April 9, 2012 for the State of Idaho (except for Indian country), or April 13, 2012 for areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, or May 9, 2012 for projects located in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin.

b. Existing project – a construction project that commenced construction activities prior to February 16, 2012, or April 9, 2012 for the State of Idaho (except for Indian country), or April 13, 2012 for areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, or May 9, 2012 for projects located in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin.

c. New operator of a new or existing project – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction project.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Construction Project	Deadlines for Operators to Submit NOI	Official Start Date for Permit Coverage
New project	You must submit your NOI at least 14 calendar days prior to commencing earth-disturbing activities. *Exception:* If your project qualifies as an "emergency-related project" under Part 1.2.1, you must submit your NOI by no later than 30 calendar days after commencing	You are considered covered under this permit 14 calendar days after EPA has acknowledged receipt of your NOI on the Agency's website (www.epa.gov/npdes/stormwater/cgpnoisearch), unless EPA notifies you that your authorization has been delayed or denied. *Exception:* If your project qualifies as

Type of Construction Project	Deadlines for Operators to Submit NOI	Official Start Date for Permit Coverage
	earth-disturbing activities. *Exception:* If you are scheduled to commence construction activities on or after February 16, 2012, but no later than March 1, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities.[4]	an "emergency-related project" under Part 1.2.1, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your authorization has been delayed or denied. *Exception:* If you are scheduled to commence construction activities on or after February 16, 2012, but no later than March 1, 2012, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your authorization has been delayed or denied.[5]

[4] For new projects in the State of Idaho (except Indian country), if you are scheduled to commence construction activities on or after April 9, 2012, but no later than May 9, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities. For new projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, if you are scheduled to commence construction activities on or after April 13, 2012, but no later than May 13, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities. For new projects located in the following areas, if you are scheduled to commence construction activities on or after May 9, 2012, but no later than June 8, 2012, you must submit your NOI by no later than 30 days after commencing earth-disturbing activities: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin.

[5] For new projects in the State of Idaho (except Indian country), if you are scheduled to commence construction activities on or after April 9, 2012, but no later than May 9, 2012, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your authorization has been delayed or denied. For new projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, if you are scheduled to commence construction activities on or after April 13, 2012, but no later than May 13, 2012, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your authorization has been delayed or denied. For new projects located in the following areas, if you are scheduled to commence construction activities on or after May 9, 2012, but no later than June 8, 2012, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your authorization has been delayed or denied: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin.

Type of Construction Project	Deadlines for Operators to Submit NOI	Official Start Date for Permit Coverage
Existing project	You must submit your NOI by no later than May 16, 2012.[6] However, if you have not previously obtained coverage under an NPDES permit, you must submit your NOI immediately.	You are considered covered under this permit 14 calendar days after EPA has acknowledged receipt of your NOI on the Agency's website (www.epa.gov/npdes/stormwater/cgpnoisearch), unless EPA notifies you that your authorization has been delayed or denied.[7]
New operator of a new or existing project	You must submit your NOI at least 14 calendar days before the date the transfer to the new operator will take place.	You are considered covered under this permit 14 calendar days after EPA has acknowledged receipt of your NOI on the Agency's website (www.epa.gov/npdes/stormwater/cgpnoisearch), unless EPA notifies you that your authorization has been delayed or denied.

Note: If you have missed the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the Clean Water Act until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of earth-disturbing activities and discharge authorization.

Note: Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage.

1.4.3. Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

- You terminate permit coverage consistent with Part 8; or
- Your discharges are permitted under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2017; or
- For existing projects that continue after this permit has expired, the deadline has passed for the submission of an NOI for coverage under a reissued or replacement version of this permit and you have failed to submit an NOI by the required deadline.

1.4.4. Continuation of Coverage for Existing Permittees After the Permit Expires.

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and

[6] For existing projects located in the State of Idaho (except Indian country), NOIs must be submitted by no later than July 8, 2012. For existing projects located in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, NOIs must be submitted by no later than July 12, 2012. For existing projects located in the following areas, NOIs must be submitted no later than August 7, 2012: the Fond Du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac Du Flambeau Band of Lake Superior Chippewa in Wisconsin.

[7] Note that if you are currently covered under the 2003 or 2008 CGP, this coverage continues until your coverage under this permit begins, provided you have submitted an NOI by the deadline.

remain in force and effect for discharges that were covered prior to expiration. If you were granted permit coverage prior to the expiration date, you will automatically remain covered by this permit until the earliest of:

- Your authorization for coverage under a reissued or replacement version of this permit following your timely submittal of a complete and accurate NOI requesting coverage under the new permit; or

  Note: If you fail to submit a timely NOI for coverage under the reissued or replacement permit, your coverage will terminate on the date that the NOI was due.

- Your submittal of a Notice of Termination; or
- Issuance or denial of an individual permit for the project's discharges; or
- A final permit decision by EPA not to reissue a general permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will terminate at the end of this time period.

EPA reserves the right to modify or revoke and reissue this permit under 40 CFR 122.62 and 63, in which case you will be notified of any relevant changes or procedures to which you may be subject.

1.4.5. Procedures for Denial of Coverage.

Following your submittal of a complete and accurate NOI, you may be notified in writing by EPA that you are not covered, and that you must either apply for and/or obtain coverage under an individual NPDES permit or an alternate general NPDES permit. This notification will include a brief statement of the reasons for this decision and will provide application information. Any interested person may request that EPA consider requiring an individual permit under this paragraph.

If you are already a permittee with coverage under this permit, the notice will set a deadline to file the permit application, and will include a statement that on the effective date of the individual NPDES permit or alternate general NPDES permit, as it applies to you, coverage under this general permit will terminate. EPA may grant additional time to submit the application if you request it. If you are covered under this permit and fail to submit an individual NPDES permit application or an NOI for an alternate general NPDES permit as required by EPA, then the applicability of this permit to you is terminated at the end of the day specified by EPA as the deadline for application submittal. EPA may take appropriate enforcement action for any unpermitted discharge. If you submit a timely permit application, then when an individual NPDES permit is issued to you or you are provided with coverage under an alternate general NPDES permit, your coverage under this permit is terminated on the effective date of the individual permit or date of coverage under the alternate general permit.

1.5. REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE.

You must post a sign or other notice conspicuously at a safe, publicly accessible location in close proximity to the project site. At a minimum, the notice must include the NPDES Permit tracking number and a contact name and phone number for obtaining additional project information. The notice must be located so that it is visible from the public road that is nearest to the active part of the construction site, and it must use a font large enough to be readily viewed from a public right-of-way.

2. EFFLUENT LIMITATIONS APPLICABLE TO ALL DISCHARGES FROM CONSTRUCTION SITES

You are required to comply with the following effluent limitations in this Part for discharges from your site and/or from construction support activities (see Part 1.3.c).

Note: If your project is an "existing project" (see Part 1.4.2.b) or if you are a "new operator of an existing project" (see Part 1.4.2.c), and it is infeasible for you to comply with a specific requirement in this Part because (1) the requirement was not part of the permit you were previously covered under (i.e., the 2003 or 2008 CGP), and (2) because you are prevented from compliance due to the nature or location of earth disturbances that commenced prior to February 16, 2012 (or prior to April 9, 2012 for projects in the State of Idaho (except for Indian country), or prior to April 13, 2012 for projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, or prior to May 9, 2012 for projects located in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin), or because you are unable to comply with the requirement due to the manner in which stormwater controls have already been installed or were already designed prior to February 16, 2012 (or prior to April 9, 2012 for projects in the State of Idaho (except for Indian country), or prior to April 13, 2012 for projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, or prior to May 9, 2012 for projects located in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin), you are required to document this fact in your SWPPP and are waived from complying with that requirement. This flexibility applies only to the requirements in Parts 2.1, and 2.3.3 through 2.3.5 (except for Parts 2.3.3.1, 2.3.3.2b, 2.3.3.3c.i, and 2.3.3.4). This only applies to those portions of your site that have already commenced earth-disturbing activities or where stormwater controls implemented in compliance with the previous permit have already been installed.

Part 2 includes the following types of requirements:

- Erosion and Sediment Control Requirements (Part 2.1)
- Stabilization Requirements (Part 2.2)
- Pollution Prevention Requirements (Part 2.3)

2.1. EROSION AND SEDIMENT CONTROL REQUIREMENTS.

You must design, install, and maintain erosion and sediment controls that minimize the discharge of pollutants from earth-disturbing activities. To meet this requirement, you must comply with the following provisions.

2.1.1. General Requirements Applicable to All Construction Sites.

2.1.1.1 ***Area of Disturbance.*** You are required to minimize the amount of soil exposed during construction activities. You are also subject to the deadlines for temporarily and/or permanently stabilizing exposed portions of your site pursuant to Part 2.2.

2.1.1.2 ***Design Requirements.***

a. You must account for the following factors in designing your stormwater controls:

i. The expected amount, frequency, intensity, and duration of precipitation;

ii. The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. If any stormwater flow will be channelized at your site, you must design stormwater controls to control both peak flowrates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion; and

iii. The range of soil particle sizes expected to be present on the site.

b. You must direct discharges from your stormwater controls to vegetated areas of your site to increase sediment removal and maximize stormwater infiltration, including any natural buffers established under Part 2.1.2.1, unless infeasible. Use velocity dissipation devices if necessary to prevent erosion when directing stormwater to vegetated areas.

2.1.1.3 ***Installation Requirements.***

a. **Complete installation of stormwater controls by the time each phase of earth-disturbance has begun, unless infeasible.** By the time earth-disturbing activities in any given portion of your site have begun, unless infeasible, you must install and make operational any downgradient sediment controls (*e.g., buffers or equivalent sediment controls, perimeter controls, exit point controls, storm drain inlet protection)* that control discharges from the initial site clearing, grading, excavating, and other land-disturbing activities.

Note: Where it is infeasible to install stormwater controls prior to the initial earth disturbance, it is EPA's expectation that it will be a rare circumstance that will prevent the operator from installing such controls immediately following the initial earth disturbance.

Following the installation of these initial controls, all other stormwater controls planned for this portion of your site and described in your SWPPP must be installed and made operational as soon as conditions on the site allow.

Note: The requirement to install stormwater controls prior to earth-disturbance for each phase of the project does not apply to the earth disturbance associated with the actual installation of these controls.

b. **Use good engineering practices and follow manufacturer's specifications.** You must install all stormwater controls in accordance with good engineering practices, including applicable design specifications.

Note: Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in your SWPPP.

2.1.1.4 ***Maintenance Requirements.***

a. You must ensure that all erosion and sediment controls required in this Part remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

b. You must inspect all erosion and sediment controls in accordance with the applicable requirements in Part 4.1, and document your findings in accordance with Part 4.1.7. If you find a problem (*e.g., erosion and sediment controls need to be replaced, repaired, or maintained*), you must make the necessary repairs or modifications in accordance with the following schedule:

i. Initiate work to fix the problem immediately after discovering the problem, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

ii. When installation of a new erosion or sediment control or a significant repair is needed, you must install the new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery where feasible. If it is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 7 calendar days of completing this work.

2.1.2. Erosion and Sediment Control Requirements Applicable to All Sites.

2.1.2.1 **Provide Natural Buffers or Equivalent Sediment Controls.** (These requirements only apply when a surface water is located within 50 feet of your project's earth disturbances).

Note: EPA does not consider stormwater control features (e.g., stormwater conveyance channels, storm drain inlets, sediment basins) to constitute "surface waters" for the purposes of triggering the requirement to comply with this Part.

Note: Areas that you do not own or that are otherwise outside your operational control may be considered areas of undisturbed natural buffer for purposes of compliance with this part.

You must ensure that any discharges to surface waters through the area between the disturbed portions of the property and any surface waters located within 50 feet of your site are treated by an area of undisturbed natural buffer and/or additional erosion and sediment controls in order to achieve a reduction in sediment load equivalent to that achieved by a 50-foot natural buffer. Refer to Appendix G (Buffer Guidance) for information to assist you in complying with this requirement, and to Part 2.1.2.1e for exceptions to this requirement.

a. **Compliance Alternatives.** You can comply with this requirement in one of the following ways:

i. Provide and maintain a 50-foot undisturbed natural buffer; or

Note: If your earth disturbances are located 50 feet or further from a surface water, then you have complied with this alternative.

ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

iii. If it is infeasible to provide and maintain an undisturbed natural buffer of any size, you must implement erosion and sediment

controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

Note: For the compliance alternatives in Parts 2.1.2.1a.i and 2.1.2.1a.ii, you are not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists (e.g., arid and semi-arid areas). You only need to retain and protect from disturbance the natural buffer that existed prior to the commencement of construction. Any preexisting structures or impervious surfaces are allowed in the natural buffer provided you retain and protect from disturbance the natural buffer area outside the preexisting disturbance. Similarly, for alternatives 2.1.2.1a.ii and 2.1.2.1a.iii, you are required to implement and maintain sediment controls that achieve the sediment load reduction equivalent to the undisturbed natural buffer that existed on the site prior to the commencement of construction. In determining equivalent sediment load reductions, you may consider naturally non-vegetated areas and prior disturbances. See Appendix G for a discussion of how to determine equivalent reductions.

You must document the compliance alternative you have selected in your SWPPP, and comply with the applicable additional requirements described in Parts 2.1.2.1b and 2.1.2.1c below.

The compliance alternative selected above must be maintained throughout the duration of permit coverage, except that you may select a different compliance alternative during your period of permit coverage, in which case you must modify your SWPPP to reflect this change.

b. **Additional Requirements for the Compliance Alternatives in Parts 2.1.2.1a.i and 2.1.2.1a.ii.** If you choose either of the compliance alternatives in Parts 2.1.2.1a.i or 2.1.2.1a.ii above, throughout your period of coverage under this permit, you must comply with the following additional requirements:

   i. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;

   ii. Document in your SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and

   iii. Delineate, and clearly mark off, with flags, tape, or other similar marking device all natural buffer areas.

c. **Additional Requirements for the Compliance Alternatives in Parts 2.1.2.1a.ii and 2.1.2.1a.iii.** If you choose either of the compliance alternatives in Parts 2.1.2.1a.ii and 2.1.2.1a.iii, you must document in your SWPPP the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency.

d. **Additional Requirement for the Compliance Alternative in Part 2.1.2.1a.iii.** If you choose the compliance alternative in Part 2.1.2.1a.iii, you must also

include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

e. **Exceptions.**

i. If there is no discharge of stormwater to surface waters through the area between your site and any surface waters located within 50 feet of your site, you are not required to comply with the requirements in this Part. This includes situations where you have implemented control measures, such as a berm or other barrier, that will prevent such discharges.

ii. Where no natural buffer exists due to preexisting development disturbances *(e.g., structures, impervious surfaces)* that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in this Part, unless you will remove portions of the preexisting development.

Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you are required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction for either Part 2.1.2.1a.ii or 2.1.2.1a.iii above, you are not expected to compensate for the reduction in buffer function from the area covered by these preexisting disturbances. See Appendix G for further information on how to comply with the compliance alternatives in Part 2.1.2.1a.ii or 2.1.2.1a.iii above.

If during your project, you will disturb any portion of these preexisting disturbances, the area disturbed will be deducted from the area treated as natural buffer.

iii. For "linear construction projects" (see Appendix A), you are not required to comply with the requirements in this Part if site constraints (*e.g., limited right-of-way*) prevent you from meeting any of the compliance alternatives in Part 2.1.2.1a, provided that, to the extent practicable, you limit disturbances within 50 feet of the surface water and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the surface water. You must also document in your SWPPP your rationale as to why it is infeasible for you to comply with the requirements in Part 2.1.2.1a, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.

iv. For "small residential lot" construction (*i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre*), you have the option of complying with the requirements in Appendix G (Part G.2.3).

v. The following disturbances within 50 feet of a surface water are exempt from the requirements in this Part:

- Construction approved under a CWA Section 404 permit; or
- Construction of a water-dependent structure or water access area *(e.g., pier, boat ramp, trail)*.

You must document in your SWPPP if any of the above disturbances will occur within the buffer area on your site.

2.1.2.2 ***Install Perimeter Controls.***

a. **Installation Requirements:** You must install sediment controls along those perimeter areas of your site that will receive stormwater from earth-disturbing activities.[8]

For linear projects with rights-of-way that restrict or prevent the use of such perimeter controls, you must maximize the use of these controls where practicable and document in your SWPPP why it is impracticable in other areas of the project.

b. **Maintenance Requirements:** You must remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control.

2.1.2.3 ***Minimize Sediment Track-Out.*** You must minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting your construction site. To comply with this requirement, you must:

a. Restrict vehicle use to properly designated exit points;

b. Use appropriate stabilization techniques[9] at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit;

c. Where necessary, use additional controls[10] to remove sediment from vehicle tires prior to exit; and

d. Where sediment has been tracked-out from your site onto the surface of off-site streets, other paved areas, and sidewalks, you must remove the deposited sediment by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. You must remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance (unless it is connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water.

Note: EPA recognizes that some fine grains may remain visible on the surfaces of off-site streets, other paved areas, and sidewalks even after you have implemented sediment removal practices. Such "staining" is not a violation of Part 2.1.2.3.

2.1.2.4 **Control Discharges from Stockpiled Sediment or Soil.** For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

[8] Examples of perimeter controls include, but are not limited to, filter berms, silt fences, and temporary diversion dikes.

[9] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, or turf mats.

[10] Examples of additional controls to remove sediment from vehicle tires include, but are not limited to, wheel washing, rumble strips, and rattle plates.

Note: For the purposes of this permit, sediment or soil stockpiles are defined as the storage for multiple days of soil or other sediment material to be used in the construction project.

a. Locate the piles outside of any natural buffers established under Part 2.1.2.1a and physically separated from other stormwater controls implemented in accordance with Part 2.1;

b. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier;[11]

c. Where practicable, provide cover or appropriate temporary stabilization to avoid direct contact with precipitation or to minimize sediment discharge;

d. Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water; and

e. Unless infeasible, contain and securely protect from wind.

2.1.2.5 ***Minimize Dust.*** In order to avoid pollutants from being discharged into surface waters, to the extent feasible, you must minimize the generation of dust through the appropriate application of water or other dust suppression techniques.

2.1.2.6 ***Minimize the Disturbance of Steep Slopes.*** You must minimize the disturbance of "steep slopes" (see definition in Appendix A).

Note: The permit does not prevent or prohibit disturbance on steep slopes. For some projects, disturbance on steep slopes may be necessary for construction (e.g., a road cut in mountainous terrain). If a disturbance to steep slopes is required for the project, EPA would recognize that it is not economically achievable to avoid the disturbance to steep slopes. However, in cases where steep slope disturbances are required, minimizing the disturbances to steep slopes consistent with this requirement can be accomplished through the implementation of a number of standard erosion and sediment control practices, such as by phasing disturbances to these areas and using stabilization practices designed to be used on steep grades.

2.1.2.7 ***Preserve Topsoil.*** You must preserve native topsoil on your site, unless infeasible.

Note: Some projects may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain. In these cases, preserving topsoil at the site would not be feasible. Some sites may not have space to stockpile topsoil on site for later use, in which case, it may also not be feasible to preserve topsoil.

Note: Stockpiling of topsoil at off-site locations, or transfer of topsoil to other locations, is an example of a practice that is consistent with the requirements in this Part.

2.1.2.8 ***Minimize Soil Compaction***. In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed, you must either:

[11] Examples include berms, dikes, fiber rolls, silt fences, sandbag, gravel bags, or straw bale.

a. **Restrict vehicle / equipment use.** Restrict vehicle and equipment use in these locations to avoid soil compaction; or

b. **Use soil conditioning techniques.** Prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible.

2.1.2.9 ***Protect Storm Drain Inlets.*** If you discharge to any storm drain inlet that carries stormwater flow from your site directly to a surface water (and it is not first directed to a sediment basin, sediment trap, or similarly effective control), and you have authority to access the storm drain inlet, you must:

a. **Installation Requirements.** Install inlet protection measures[12] that remove sediment from your discharge prior to entry into the storm drain inlet.

Note: Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

b. **Maintenance Requirements.** Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

2.1.3. Requirements Applicable Only to Sites Using These Specific Stormwater Controls.

You are required to comply with the following requirements if you will install any of the following stormwater controls at your site:

2.1.3.1 ***Constructed Stormwater Conveyance Channels.*** Design stormwater conveyance channels to avoid unstabilized areas on the site and to reduce erosion, unless infeasible. Minimize erosion of channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters during discharge conditions through the use of erosion controls and velocity dissipation devices[13] within and along the length of any constructed stormwater conveyance channel, and at any outlet to provide a non-erosive flow velocity.

2.1.3.2 ***Sediment Basins.*** If you install a sediment basin , you must comply with the following:

a. **Design requirements.**

i. Provide storage for either (1) the calculated volume of runoff from a 2-year, 24-hour storm (see Appendix H), or (2) 3,600 cubic feet per acre drained;

ii. When discharging from the sediment basin, utilize outlet structures that withdraw water from the surface in order to minimize the discharge of pollutants, unless infeasible;

[12] Examples of inlet protection measures include fabric filters, sandbags, concrete blocks, and gravel barriers.

[13] Examples of velocity dissipation devices include check dams, sediment traps, riprap, or grouted riprap at outlets.

Note: EPA believes that the circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where surface outlets may not be feasible during certain time periods (although it is expected that they would be used during other periods). If you have determined that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination.

iii. Prevent erosion of (1) the sediment basin using stabilization controls *(e.g., erosion control blankets)*, and (2) the inlet and outlet using erosion controls and velocity dissipation devices; and

iv. Sediment basins must be situated outside of surface waters and any natural buffers established under Part 2.1.2.1a, and must be designed to avoid collecting water from wetlands.

b. **Maintenance requirements.** Keep in effective operating condition and remove accumulated sediment to maintain at least ½ of the design capacity of the sediment basin at all times.

2.1.3.3 ***Use of Treatment Chemicals.*** If you are using polymers, flocculants, or other treatment chemicals at your site, you must comply with the following minimum requirements:

a. **Use conventional erosion and sediment controls prior to and after the application of treatment chemicals.** Use conventional erosion and sediment controls prior to chemical addition to ensure effective treatment. Chemicals may only be applied where treated stormwater is directed to a sediment control *(e.g., sediment basin, perimeter control)* prior to discharge.

b. **Select appropriate treatment chemicals**. Chemicals must be selected that are appropriately suited to the types of soils likely to be exposed during construction and discharged to locations where chemicals will be applied, and to the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area.

c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(e.g., spill berms, decks, spill containment pallets)*, or provide equivalent measures, designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(e.g., storing chemicals in covered area or having a spill kit available on site)*.

d. **Comply with state/local requirements.** Comply with relevant state and local requirements affecting the use of treatment chemicals.

e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** You must also use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document specific departures from these practices or specifications and how they reflect good engineering practice.

f. **Ensure proper training.** Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

g. **Comply with additional requirements for the approved use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.2.4, and the authorization is conditioned on your compliance with additional requirements necessary to ensure that the use of such chemicals will not cause an exceedance of water quality standards, you are required to comply with all such requirements.

h. **Provide proper SWPPP documentation.** You must include documentation in your SWPPP consistent with Parts 7.2.6.9 and 7.2.10.2 on the specific chemicals and chemical treatment systems you will use, and how you will comply with the requirements in this Part.

2.1.3.4 ***Dewatering Practices.*** You are prohibited from discharging ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate controls.[14] Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control.

You must also meet the following requirements for dewatering activities:

a. **Discharge requirements.**

i. Do not discharge visible floating solids or foam;

ii. Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials;

iii. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area;

iv. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.1.3.1;

v. With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and

vi. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

b. **Treatment chemical restrictions.** If you are using polymers, flocculants, or other treatment chemicals to treat dewatering water, you must comply with the requirements in Parts 2.1.3.3.

2.2. STABILIZATION REQUIREMENTS.

You are required to stabilize exposed portions of your site in accordance with the requirements of this Part.

[14] Examples of appropriate controls include, but are not limited to, sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, or filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

Note: For the purposes of this permit, "exposed portions of your site" means areas of exposed soil that are required to be stabilized. Note that EPA does not expect that temporary or permanent stabilization measures to be applied to areas that are intended to be left unvegetated or unstabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).

2.2.1. Deadlines for Initiating and Completing Stabilization.

2.2.1.1 ***Deadline to Initiate Stabilization.*** You must initiate soil stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site.

Note: Earth-disturbing activities have permanently ceased when clearing and excavation within any area of your construction site that will not include permanent structures has been completed.

Note: Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume (i.e., the land will be idle) for a period of 14 or more calendar days, but such activities will resume in the future.

The 14 calendar day timeframe above begins counting as soon as you know that construction work on a portion of your site will be temporarily ceased. In circumstances where you experience unplanned or unanticipated delays in construction due to circumstances beyond your control (e.g., sudden work stoppage due to unanticipated problems associated with construction labor, funding, or other issues related to the ability to work on the site; weather conditions rendering the site unsuitable for the continuation of construction work) and you do not know at first how long the work stoppage will continue, your requirement to immediately initiate stabilization is triggered as soon as you know with reasonable certainty that work will be stopped for 14 or more additional calendar days. At that point, you must comply with Parts 2.2.1.1 and 2.2.1.2.

Note: For the purposes of this permit, EPA will consider any of the following types of activities to constitute the initiation of stabilization:

1. *prepping the soil for vegetative or non-vegetative stabilization;*
2. *applying mulch or other non-vegetative product to the exposed area;*
3. *seeding or planting the exposed area;*
4. *starting any of the activities in # 1 – 3 on a portion of the area to be stabilized, but not on the entire area; and*
5. *finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization in Parts 2.2.1.2 and 2.2.1.3.*

This list of examples is not exhaustive.

Note: The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

2.2.1.2 ***Deadline to Complete Stabilization Activities.*** As soon as practicable, but no later than 14 calendar days after the initiation of soil stabilization measures consistent with Part 2.2.1.1[15], you are required to have completed:

[15] EPA may determine, based on an inspection carried out under Part 4.2 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil

a. For vegetative stabilization, all activities[16] necessary to initially seed or plant the area to be stabilized; and/or

b. For non-vegetative stabilization, the installation or application of all such non-vegetative measures.

2.2.1.3 ***Exceptions to the Deadlines for Initiating and Completing Stabilization.***

a. *Deadlines for projects occurring in arid or semi-arid areas, or drought-stricken areas*. These requirements apply if (1) your site is located in an arid area, a semi-arid area, or a drought-stricken area, as these terms are defined in Appendix A, (2) construction will occur during the seasonally dry period or during a period in which drought is predicted to occur, and (3) you are using vegetative cover for temporary or permanent stabilization. You may also comply with the deadlines in Part 2.2.1.1 instead. The deadlines for these types of projects are as follows:

i. Immediately initiate, and within 14 calendar days of a temporary or permanent cessation of work in any portion of your site complete, the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

ii. As soon as practicable, given conditions or circumstances on your site, complete all activities necessary to initially seed or plant the area to be stabilized; and

iii. If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. You must also include the schedule you will follow for initiating and completing vegetative stabilization.

b. *Deadlines for projects that are affected by circumstances beyond the control of the permittee that delay the initiation and/or completion of vegetative stabilization as required in Parts 2.2.1.1 and/or 2.2.1.2*. If you are unable to meet the deadlines in Parts 2.2.1.1and/or 2.2.1.2 due to circumstances beyond your control[17], and you are using vegetative cover for temporary or permanent stabilization, you may comply with the following stabilization deadlines instead:

i. Immediately initiate, and within 14 calendar days complete, the installation of temporary non-vegetative stabilization measures to prevent erosion;

ii. Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[16] For example, such activities might include, but are not limited to, soil conditioning, application of seed or sod, planting of seedlings or other vegetation, application of fertilizer, and, as deemed appropriate, watering.

[17] Examples include problems with the supply of seed stock or with the availability of specialized equipment, unsuitability of soil conditions due to excessive precipitation and/or flooding.

Note: You are required to have stabilized the exposed portions of your site consistent with Part 2.2.2 prior to terminating permit coverage under Part 8.2.

iii. Document the circumstances that prevent you from meeting the deadlines required in Parts 2.2.1.1and/or 2.2.1.2 and the schedule you will follow for initiating and completing stabilization.

c. *Deadlines for sites discharging to sensitive waters.* For any portion of the site that discharges to a sediment or nutrient-impaired water (see Part 3.2) or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.3), you are required to complete the stabilization activities specified in Parts 2.2.1.2a and/or 2.2.1.2b within 7 calendar days after the temporary or permanent cessation of earth-disturbing activities.

Note: If you qualify for the deadlines for initiating and completing stabilization in Part 2.2.1.3a or b*, you may comply with the stabilization deadlines in Part 2.2.1.3a or* b *for any portion of your site that discharges to a sensitive water.*

2.2.2. Criteria for Stabilization.

To be considered adequately stabilized, you must meet the criteria below depending on the type of cover you are using, either vegetative or non-vegetative.

2.2.2.1 ***Vegetative Stabilization.***

a. ***For all sites, except those located in arid or semi-arid areas or on agricultural lands.***

i. If you are vegetatively stabilizing any exposed portion of your site through the use of seed or planted vegetation, you must provide established uniform vegetation *(e.g., evenly distributed without large bare areas)*, which provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities. You should avoid the use of invasive species;

ii. For final stabilization, vegetative cover must be perennial; and

iii. Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover *(e.g., mulch, rolled erosion control products)* to the area while vegetation is becoming established.

b. ***For sites located in arid or semi-arid areas, or drought-stricken areas.*** If you are located in an arid or semi-arid area, or a drought-stricken area, as these terms are defined in Appendix A, you are considered to have completed final stabilization if both of the following criteria are met:

i. The area you have seeded or planted must within 3 years provide established vegetation that covers 70 percent or more of the density of vegetation prior to commencing earth-disturbing activities; and

ii. In addition to seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded

or planted area, you must select, design, and install non-vegetative erosion controls that provide cover for at least 3 years without active maintenance by you.

c. ***For sites located on land used for agriculture.*** Disturbed areas on land used for agricultural purposes *(e.g., pipelines across crop or range land, staging areas for highway construction*) that are restored to their pre-construction agricultural use are not subject to these final stabilization criteria. Areas disturbed that were not previously used for agricultural activities, and areas that are not being returned to preconstruction agricultural use, must meet the conditions for stabilization in this Part**.**

2.2.2.2 ***Non-Vegetative Stabilization.*** If you are using non-vegetative controls to stabilize exposed portions of your site, or if you are using such controls to temporarily protect areas that are being vegetatively stabilized, you must provide effective non-vegetative cover[18] to stabilize any such exposed portions of your site.

2.3. POLLUTION PREVENTION REQUIREMENTS.

You are required to design, install, and maintain effective pollution prevention measures in order to prevent the discharge of pollutants. Consistent with this requirement, you must:

- Eliminate certain pollutant discharges from your site (see Part 2.3.1);
- Properly maintain all pollution prevention controls (see Part 2.3.2); and
- Comply with pollution prevention standards for pollutant-generating activities that occur at your site (see Part 2.3.3).

These requirements apply to all areas of your construction site and any and all support activities covered by this permit consistent with Part 1.3.c.

2.3.1. Prohibited Discharges.

You are prohibited from discharging the following from your construction site:

2.3.1.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.3.4;

2.3.1.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, unless managed by an appropriate control as described in Part 2.3.3.4;

2.3.1.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

2.3.1.4 Soaps, solvents, or detergents used in vehicle and equipment washing; and

2.3.1.5 Toxic or hazardous substances from a spill or other release.

2.3.2. General Maintenance Requirements.

You must ensure that all pollution prevention controls installed in accordance with this Part remain in effective operating condition and are protected from activities that would reduce their effectiveness. You must inspect all pollutant-generating activities and

[18] For temporary stabilization, examples of temporary non-vegetative stabilization methods include, but are not limited to, hydromulch and erosion control blankets. For final stabilization, examples of permanent non-vegetative stabilization methods include, but are not limited to, riprap, gabions, and geotextiles.

pollution prevention controls in accordance with your inspection frequency requirements in Parts 4.1.2 or 3.2.2.1 to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharges to receiving waters, and must document your findings in accordance with Part 4.1.7. If you find that controls need to be replaced, repaired, or maintained, you must make the necessary repairs or modifications in accordance with the following:

2.3.2.1 Initiate work to fix the problem immediately after discovering the problem, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

2.3.2.2 When installation of a new pollution prevention control or a significant repair is needed, you must install the new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7 calendar day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7 calendar day timeframe. Where these actions result in changes to any of the pollution prevention controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 7 calendar days of completing this work.

2.3.3. Pollution Prevention Standards.

You are required to comply with the pollution prevention standards in this Part if you conduct any of the following activities at your site or at any construction support activity areas covered by this permit (see Part 1.3.c):

- Fueling and maintenance of equipment or vehicles;
- Washing of equipment and vehicles;
- Storage, handling, and disposal of construction materials, products, and wastes; and
- Washing of applicators and containers used for paint, concrete, or other materials.

The pollution prevention standards are as follows:

2.3.3.1 ***Fueling and Maintenance of Equipment or Vehicles***. If you conduct fueling and/or maintenance of equipment or vehicles at your site, you must provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuel, from the area where these activities will take place.[19]

To comply with the prohibition in Part 2.3.1.3, you must:

a. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR 112 and Section 311 of the CWA;

b. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

[19] Examples of effective controls include, but are not limited to, locating activities away from surface waters and stormwater inlets or conveyances, providing secondary containment *(e.g., spill berms, decks, spill containment pallets)*and cover where appropriate, and/or having spill kits readily available.

c. Use drip pans and absorbents under or around leaky vehicles;

d. Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements;

e. Clean up spills or contaminated surfaces immediately, using dry clean up measures where possible, and eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and

f. Do not clean surfaces by hosing the area down.

2.3.3.2 ***Washing of Equipment and Vehicles.***

a. You must provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing;[20] and

b. To comply with the prohibition in Part 2.3.1.4, for storage of soaps, detergents, or solvents, you must provide either (1) cover (*e.g., plastic sheeting or temporary roofs*) to prevent these detergents from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.

2.3.3.3 ***Storage, Handling, and Disposal of Construction Products, Materials, and Wastes.*** You must minimize the exposure to stormwater of any of the products, materials, or wastes specified below that are present at your site by complying with the requirements in this Part.

Note: These requirements do not apply to those products, materials, or wastes that are not a source of stormwater contamination or that are designed to be exposed to stormwater.

To ensure you meet this requirement, you must:

a. *For building products*[21]*:* In storage areas, provide either (1) cover (*e.g., plastic sheeting or temporary roofs*) to prevent these products from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*

   i. In storage areas, provide either (1) cover (e.g., *plastic sheeting or temporary roofs*) to prevent these chemicals from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas; and

   ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label.

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:*

[20] Examples of effective controls include, but are not limited to, locating activities away from surface waters and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

[21] Some examples of building products that are typically stored at construction sites include, but are not limited to, asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures.

i. To comply with the prohibition in Part 2.3.1.3, store chemicals in water-tight containers, and provide either (1) cover *(e.g., plastic sheeting or temporary roofs)* to prevent these containers from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas *(e.g., spill kits)*, or provide secondary containment *(e.g., spill berms, decks, spill containment pallets)*; and

ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

d. *For hazardous or toxic waste*[22]*:*

i. Separate hazardous or toxic waste from construction and domestic waste;

ii. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;

iii. Store all containers that will be stored outside within appropriately-sized secondary containment *(e.g., spill berms, decks, spill containment pallets)* to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(e.g., storing chemicals in covered area or having a spill kit available on site)*;

iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements; and

v. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

e. *For construction and domestic waste*[23]: Provide waste containers *(e.g., dumpster or trash receptacle)* of sufficient size and number to contain construction and domestic wastes. In addition, you must:

(1) On work days, clean up and dispose of waste in designated waste containers; and

(2) Clean up immediately if containers overflow.

[22] Examples of hazardous or toxic waste that may be present at construction sites include, but are not limited to, paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids.

[23] Examples of construction and domestic waste include, but are not limited to, packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, and other trash or building materials.

f. *For sanitary waste:* Position portable toilets so that they are secure and will not be tipped or knocked over.

2.3.3.4 **Washing of Applicators and Containers used for Paint, Concrete, or Other Materials.** To comply with the prohibition in Parts 2.3.1.1 and 2.3.1.2, you must provide an effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, concrete, form release oils, curing compounds, and other construction materials. To comply with this requirement, you must:

a. Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

i. Do not dump liquid wastes in storm sewers;

ii. Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3.3; and

iii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3.3; and

c. Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and, to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.4. Emergency Spill Notification.

You are prohibited from discharging toxic or hazardous substances from a spill or other release, consistent with Part 2.3.1.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302 as soon as you have knowledge of the discharge. You must also, within 7 calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.3.5. Fertilizer Discharge Restrictions.

You are required to minimize discharges of fertilizers containing nitrogen or phosphorus. To meet this requirement, you must comply with the following requirements:

2.3.5.1 Apply at a rate and in amounts consistent with manufacturer's specifications, or document departures from the manufacturer specifications where appropriate in Part 7.2.7.2 of the SWPPP;

2.3.5.2 Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

2.3.5.3 Avoid applying before heavy rains that could cause excess nutrients to be discharged;

2.3.5.4 Never apply to frozen ground;

2.3.5.5 Never apply to stormwater conveyance channels with flowing water; and

2.3.5.6 Follow all other federal, state, tribal, and local requirements regarding fertilizer application.

3. WATER QUALITY-BASED EFFLUENT LIMITATIONS.

3.1. GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Your discharge must be controlled as necessary to meet applicable water quality standards. You must also comply with any additional requirements that your state or tribe requires you to meet in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that your discharge is not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Part 5.2.1, and document the corrective actions as required in Part 5.2.2 and Part 5.4.

EPA will also impose additional water quality-based limitations on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI, or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA established or approved TMDL.

3.2. DISCHARGE LIMITATIONS FOR IMPAIRED WATERS

If you discharge to a surface water that is impaired for (1) sediment or a sediment-related parameter, such as total suspended solids (TSS) or turbidity, and/or (2) nutrients, including impairments for nitrogen and/or phosphorus, you are required to comply with the requirements in Part 3.2.2.

Note: For the purposes of this Part, "impaired waters" are waters identified as impaired on the appropriate CWA Section 303(d) list, or waters with an EPA-approved or established TMDL. Your construction site will be considered to discharge to an impaired water if the first surface water to which you discharge is identified by a state, tribe, or EPA pursuant to Section 303(d) of the CWA as not meeting an applicable water quality standard, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the first surface water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

If you discharge to an impaired water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional limits or controls are necessary for your discharge to be controlled as necessary to meet water quality standards, including for it to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL, or if coverage under an individual permit is necessary in accordance with Part 1.4.5.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of this permit.

3.2.1. Identify If You Discharge To An Impaired Water.

If you discharge to an impaired water, you must provide the following information in your NOI:

- A list of all impaired waters to which you discharge;
- The pollutant(s) for which the surface water is impaired; and

- Whether a TMDL has been approved or established for the waters to which you discharge.

3.2.2. Requirements for Discharges to Sediment or Nutrient-Impaired Waters.

If you discharge to a surface water that is impaired for (1) sediment or a sediment-related parameter *(e.g., total suspended solids (TSS) or turbidity)* and/or (2) nutrients *(e.g., nitrogen and/or phosphorus)*, including impaired waters for which a TMDL has been approved or established for the impairment, you are required to comply with the following stormwater control requirements, which supplement the requirements applicable to your site in other corresponding parts of the permit

3.2.2.1 ***Frequency of Site Inspection.*** You must conduct inspections at the frequency specified in Part 4.1.3.

3.2.2.2 ***Deadline to Complete Stabilization.*** You must comply with the deadlines for completing site stabilization as specified in Part 2.2.1.3c.

3.2.2.3 ***State and Tribal Requirements.*** You must comply with any additional state or tribal impairment-related requirements included in Part 9.

EPA will also impose additional water quality-based limitations on a site-specific basis, or require you to obtain coverage under an individual permit, if it is determined that the controls in the Part will not be sufficient to control discharges consistent with the assumptions and requirements of an applicable wasteload allocation of an approved or established TMDL or to prevent the site from contributing to the impairment.

3.3. DISCHARGES TO WATERS IDENTIFIED AS TIER 2, TIER 2.5, OR TIER 3.

3.3.1. Identify if You Discharge to a Tier 2, Tier 2.5, or Tier 3 Water.

If you discharge to a water identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 water, you must provide on your NOI a list of waters identified as Tier 2, Tier 2.5, or Tier 3 to which you discharge. See Appendix F for a list of Tier 2 and 3 waters.

Note: For the purposes of this permit, you are considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first surface water to which you discharge is identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3. Tiers 2, 2.5 and 3 refer to waters either identified by the state as high quality waters or Outstanding National Resource Waters under 40 CFR §131.12(a)(2) and (3). For discharges that enter a storm sewer system prior to discharge, the surface water to which you discharge is the first surface water that receives the stormwater discharge from the storm sewer system.

3.3.2. Requirements for New Projects Discharging to Tier 2, Tier 2.5, or Tier 3 Waters.

For new projects, if you will discharge to a Tier 2, Tier 2.5, or Tier 3 water, you are required to comply with the requirements in Parts 4.1.3 (inspection frequencies) and 2.2.1.3c (stabilization deadlines), and, if applicable, Part 9 (relevant state or tribal requirements). In addition, on a case-by-case basis, EPA may notify operators of such new projects or operators of existing projects with increased discharges that additional analyses, stormwater controls, or other permit conditions are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary in accordance with Part 1.4.5.

4. INSPECTIONS.

4.1. SITE INSPECTIONS.

4.1.1. Person(s) Responsible for Inspecting Site.

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that the person who conducts inspections is a "qualified person."

Note: A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

4.1.2. Frequency of Inspections.

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to Part 4.1.3 or Part 4.1.4:

4.1.2.1 At least once every 7 calendar days; or

4.1.2.2 Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.1.7.1d.

Note: Inspections are only required during the project's normal working hours.

Note: You are required to specify in your SWPPP which schedule you will be following.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly in accordance with Part 4.1.2.2 and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

4.1.3. Increase in Inspection Frequency for Sites Discharging to Sensitive Waters.

For any portion of the site that discharges to a sediment or nutrient-impaired water (see Part 3.2) or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.3), instead of the inspection frequency specified in Part 4.1.2, you must conduct inspections in accordance with the following inspection frequencies:

4.1.3.1 Once every 7 calendar days; and

4.1.3.2 Within 24 hours of the occurrence of a storm event of 0.25 inches or greater. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that

measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.1.7.1d.

Note: Inspections are only required during the project's normal working hours.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

Note: If you qualify for any of the reduced inspection frequencies in Part 4.1.4, you may conduct inspections in accordance with Part 4.1.4 for any portion of your site that discharges to a sensitive water.

4.1.4. Reductions in Inspection Frequency.

Your inspection frequency may be reduced as follows:

4.1.4.1 ***For Stabilized Areas.*** You may reduce the frequency of inspections to once per month in any area of your site where the stabilization steps in Parts 2.2.1.2a and 2.2.1.2b have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.1.2 or 4.1.3, if applicable. You must document the beginning and ending dates of this period in your records.

4.1.4.2 ***For Arid, Semi-Arid, or Drought-Stricken Areas.*** You may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater if your site is located in an arid, semi-arid, or drought-stricken area, as these terms are defined in Appendix A, and construction is occurring during the seasonally dry period or during a period in which drought is predicted to occur. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.1.7.1d.

Note: Inspections are only required during the project's normal working hours.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

4.1.4.3 ***For Frozen Conditions.***

a. If you are suspending earth-disturbing activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (see Appendix A) begin to occur if:

i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least 3 months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.1.2 or 4.1.3, if applicable;

ii. Land disturbances have been suspended; and

iii. All disturbed areas of the site have been temporarily or permanently stabilized in accordance with Part 2.2.

b. If you are still conducting earth-disturbing activities during frozen conditions, you may reduce your inspection frequency to once per month if:

i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least 3 months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.1.2 or 4.1.3 if applicable; and

ii. Except for areas in which you are actively conducting earth-disturbing activities, disturbed areas of the site have been temporarily or permanently stabilized in accordance with Part 2.2.

You must document the beginning and ending dates of this period in your SWPPP.

4.1.5. Areas that Need to Be Inspected. During your site inspection, you must at a minimum inspect the following areas of your site:

4.1.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2;

4.1.5.2 All stormwater controls (including pollution prevention measures) installed at the site to comply with this permit;

4.1.5.3 Material, waste, borrow, or equipment storage and maintenance areas that are covered by this permit;

4.1.5.4 All areas where stormwater typically flows within the site, including drainageways designed to divert, convey, and/or treat stormwater;

4.1.5.5 All points of discharge from the site; and

4.1.5.6 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.1.6. Requirements for Inspections. During your site inspection, you must at a minimum:

4.1.6.1 Check whether all erosion and sediment controls and pollution prevention controls are installed, appear to be operational, and are working as intended to minimize pollutant discharges. Determine if any controls need to be replaced, repaired, or maintained in accordance with Parts 2.1.1.4 and 2.3.2;

4.1.6.2 Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;

4.1.6.3 Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3;

4.1.6.4 At points of discharge and, if applicable, the banks of any surface waters flowing within your property boundaries or immediately adjacent to your property, check for signs of visible erosion and sedimentation *(i.e., sediment deposits)* that have occurred and are attributable to your discharge; and

4.1.6.5 Identify any and all incidents of noncompliance observed.

4.1.6.6 If a discharge is occurring during your inspection, you are required to:

a. Identify all points of the property from which there is a discharge;

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color, odor, floating, settled, or suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollutants; and

c. Document whether your stormwater controls are operating effectively, and describe any such controls that are clearly not operating as intended or are in need of maintenance.

4.1.6.7 Based on the results of your inspection, initiate corrective action under Part 5.

4.1.7. Inspection Report.

4.1.7.1 ***Requirement to Complete Inspection Report.*** You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.1.6;

d. If you are inspecting your site at the frequency specified in Part 4.1.2.2, Part 4.1.3, or Part 4.1.4.2, and you conducted an inspection because of rainfall measuring 0.25 inches or greater, you must include the applicable rain gauge or weather station readings that triggered the inspection; and

e. If you have determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations that this condition applied to.

4.1.7.2 ***Signature Requirements.*** Each inspection report must be signed in accordance with Appendix I, Part I.11 of this permit.

4.1.7.3 ***Recordkeeping Requirements.*** You are required to keep a current, copy of all inspection reports at the site or at an easily accessible location, so that it can be made available at the time of an onsite inspection or upon request by EPA. For purposes of this permit, your inspection reports may be kept electronically if the records are:

a. In a format that can be read in a similar manner as a paper record;

b. Legally dependable with no less evidentiary value than their paper equivalent; and

c. Accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form.

Note: See Section IX.1.7 of the Fact Sheet for a discussion on ways to ensure that electronic records satisfy this requirement. See Appendix I, Part I.11.5 for requirements relating to electronic signature of these documents.

All inspection reports completed for this Part must be retained for at least 3 years from the date that your permit coverage expires or is terminated.

4.2. INSPECTIONS BY EPA.

You must allow EPA, or an authorized representative of the EPA, to conduct the following activities at reasonable times:

4.2.1. Enter onto areas of your site, including any construction support activity areas covered by this permit (see Part 1.3.c), and onto locations where records are kept under the conditions of this permit;

4.2.2. Access and copy any records that must be kept under the conditions of this permit;

4.2.3. Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.3.c) and any stormwater controls installed and maintained at the site; and

4.2.4. Sample or monitor for the purpose of ensuring compliance.

5. CORRECTIVE ACTIONS.

5.1. "CORRECTIVE ACTIONS" DEFINED.

Corrective actions are actions you take in compliance with this Part to:

- Repair, modify, or replace any stormwater control used at the site;
- Clean up and properly dispose of spills, releases, or other deposits; or
- Remedy a permit violation.

5.2. REQUIREMENTS FOR TAKING CORRECTIVE ACTION.

You must complete the following corrective actions in accordance with the deadlines specified in this Part. In all circumstances, you must immediately take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events.

Note: In this context, the term "immediately" requires construction operators to, on the same day a condition requiring corrective action is found, take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational. However, if the problem is identified at a time in the work day when it is too late to initiative corrective action, the initiation of corrective action must begin on the following work day.

5.2.1. For any of the following conditions on your site, you must install a new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7 calendar day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7-day timeframe.

5.2.1.1 A required stormwater control was never installed, was installed incorrectly, or not in accordance with the requirements in Parts 2 and/or 3; or

5.2.1.2 You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1. In this case, you must notify your EPA Regional Office by the end of the next work day. You are required to submit your notification through EPA's electronic NOI system, or "eNOI", at www.epa.gov/npdes/cgpenoi; or

5.2.1.3 One of the prohibited discharges in Part 2.3.1 is occurring or has occurred.

5.2.2. Where your corrective actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 7 calendar days of completing corrective action work.

5.3. CORRECTIVE ACTION REQUIRED BY EPA.

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.2.

5.4. CORRECTIVE ACTION REPORT.

For each corrective action taken in accordance with this Part, you must complete a corrective action report, which includes the applicable information in Parts 5.4.1 and 5.4.2. Note that these reports must be maintained in your records but do not need to be provided to EPA except upon request.

5.4.1. Within 24 hours of discovering the occurrence of one of the triggering conditions in Part 5.2.1 at your site, you must complete a report of the following:

5.4.1.1 Which condition was identified at your site;

5.4.1.2 The nature of the condition identified; and

5.4.1.3 The date and time of the condition identified and how it was identified.

5.4.2. Within 7 calendar days of discovering the occurrence of one of the triggering conditions in Part 5.2.1 at your site, you must complete a report of the following:

5.4.2.1 Any follow-up actions taken to review the design, installation, and maintenance of stormwater controls, including the dates such actions occurred;

5.4.2.2 A summary of stormwater control modifications taken or to be taken, including a schedule of activities necessary to implement changes, and the date the modifications are completed or expected to be completed; and

5.4.2.3 Notice of whether SWPPP modifications are required as a result of the condition identified or corrective action.

5.4.3. **Signature Requirements.** Each corrective action report must be signed and certified in accordance with Appendix I, Part I.11 of this permit.

5.4.4. **Recordkeeping Requirements.** You are required to keep a current copy of all corrective action reports at the site or at an easily accessible location, so that it can be made available at the time of an onsite inspection or upon request by EPA. For purposes of this permit, your corrective action reports may be kept electronically if the records are:

5.4.4.1 In a format that can be read in a similar manner as a paper record;

5.4.4.2 Legally dependable with no less evidentiary value than their paper equivalent; and

5.4.4.3 Accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form.

Note: See Section IX.1.7 of the Fact Sheet for a discussion on ways to ensure that electronic records satisfy this requirement. See Appendix I, Part I.11.5 for requirements relating to electronic signature of these documents.

All corrective action reports completed for this Part must be retained for at least 3 years from the date that your permit coverage expires or is terminated.

6. STAFF TRAINING REQUIREMENTS.

Prior to the commencement of earth-disturbing activities or pollutant-generating activities, whichever occurs first, you must ensure that the following personnel understand the requirements of this permit and their specific responsibilities with respect to those requirements:

- Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures);
- Personnel responsible for the application and storage of treatment chemicals (if applicable);
- Personnel who are responsible for conducting inspections as required in Part 4.1.1; and
- Personnel who are responsible for taking corrective actions as required in Part 5.

Notes: (1) If the person requiring training is a new employee, who starts after you commence earth-disturbing or pollutant-generating activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit.

(2) For emergency-related construction activities, the requirement to train personnel prior to commencement of earth-disturbing activities does not apply, however, such personnel must have the required training prior to NOI submission.

You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers, but you must ensure that such personnel understand any requirements of the permit that may be affected by the work they are subcontracted to perform.

At a minimum, personnel must be trained to understand the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections):

- The location of all stormwater controls on the site required by this permit, and how they are to be maintained;
- The proper procedures to follow with respect to the permit's pollution prevention requirements; and
- When and how to conduct inspections, record applicable findings, and take corrective actions.

7. STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

7.1. GENERAL REQUIREMENTS.

7.1.1. Requirement to Develop a SWPPP Prior to Submitting Your NOI.

All operators associated with a construction project to be covered under this permit must develop a SWPPP.

Note: You have the option of developing a group SWPPP where you are one of several operators who will be engaged in construction activities at your site. For instance, if both the owner and the general contractor of the construction site are permitted, the owner may be the party responsible for SWPPP development, and the general contractor can choose to use this same SWPPP, as long as the SWPPP addresses the general contractor's scope of construction work and obligations under this permit.

You are required to develop your site's SWPPP prior to submitting your NOI. At a minimum, your SWPPP must include the information required in Part 7.2 and as specified in other parts of the permit. [24] You must also update the SWPPP as required in Part 7.4.

Note: If your project is an "existing project" (see Part 1.4.2.b) or if you are a new operator of an existing project" (see Part 1.4.2.c), and it is infeasible for you to comply with a specific requirement in this Part or in Parts 2.1, and 2.3.3 through 2.3.5 (except for Parts 2.3.3.1, 2.3.3.2b, 2.3.3.3c.i, and 2.3.3.4) because (1) the provision was not part of the permit you were previously covered under (i.e., the 2003 or 2008 CGP), and (2) because you are prevented from compliance due to the nature or location of earth disturbances that commenced prior to February 16, 2012 (or prior to April 9, 2012 for projects in the State of Idaho (except for Indian country), or prior to April 13, 2012 for projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, or prior to May 9, 2012 for projects located in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin), or because you are unable to comply with the requirement due to the manner in which stormwater controls have already been installed or were already designed prior to February 16, 2012 (or prior to April 9, 2012 for projects in the State of Idaho (except for Indian country), or prior to April 13, 2012 for projects in areas in the State of Washington (except for Indian country) subject to construction activity by a Federal Operator, or prior to May 9, 2012 for projects located in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin), you are required to include documentation of the reasons why it is infeasible for you to meet the specific requirement, and then you may be waived from complying with this requirement. You must include a separate justification why it is infeasible for you to meet each of the applicable requirements.

If you prepared a SWPPP for coverage under a previous version of this NPDES permit, you must review and update your SWPPP to ensure that this permit's requirements are addressed prior to submitting your NOI.

7.2. SWPPP CONTENTS.

Your SWPPP must include the following information, at a minimum.

[24] The SWPPP does not establish the effluent limits that apply to your site's discharges; these limits are established in this permit in Parts 2 and 3.

7.2.1. Stormwater Team.

Each operator, or group of multiple operators, must assemble a "stormwater team," which is responsible for overseeing the development of the SWPPP, any later modifications to it, and for compliance with the requirements in this permit.

The SWPPP must identify the personnel (by name or position) that are part of the stormwater team, as well as their individual responsibilities. Each member of the stormwater team must have ready access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7.2.2. Nature of Construction Activities.

The SWPPP must describe the nature of your construction activities, including the size of the property (in acres) and the total area expected to be disturbed by the construction activities (in acres), construction support activity areas covered by this permit (see Part 1.3.c), and the maximum area expected to be disturbed at any one time.

7.2.3. Emergency-Related Projects.

If you are conducting earth-disturbing activities in response to a public emergency (see Part 1.2), you must document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions, etc.)*, information substantiating its occurrence *(e.g., state disaster declaration or similar state or local declaration)*, and a description of the construction necessary to reestablish effected public services.

7.2.4. Identification of Other Site Operators.

The SWPPP must include a list of all other operators who will be engaged in construction activities at your site, and the areas of the site over which each operator has control.

7.2.5. Sequence and Estimated Dates of Construction Activities.

The SWPPP must include a description of the intended sequence of construction activities, including a schedule of the estimated start dates and the duration of the activity, for the following activities:

7.2.5.1 Installation of stormwater control measures, and when they will be made operational, including an explanation of how the sequence and schedule for installation of stormwater control measures complies with Part 2.1.1.3a and of any departures from manufacturer specifications pursuant to Part 2.1.1.3b;

7.2.5.2 Commencement and duration of earth-disturbing activities, including clearing and grubbing, mass grading, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;

7.2.5.3 Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;

7.2.5.4 Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect the applicable deadlines to which you are subject in Part 2.2.1; and

7.2.5.5 Removal of temporary stormwater conveyances/channels and other stormwater control measures, removal of construction equipment and vehicles, and cessation of any pollutant-generating activities.

Note: If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant

to "lock in" the operator to meeting these projections. When departures from initial projections are necessary, this should be documented in the SWPPP itself or in associated records, as appropriate.

7.2.6. Site Map.

The SWPPP must include a legible site map, or series of maps, showing the following features of your project:

Note: Included in the project site are any construction support activities covered by this permit (see Part 1.3.c).

7.2.6.1 Boundaries of the property and of the locations where construction activities will occur, including:

a. Locations where earth-disturbing activities will occur, noting any phasing of construction activities;

b. Approximate slopes before and after major grading activities. Note areas of steep slopes, as defined in Appendix A;

c. Locations where sediment, soil, or other construction materials will be stockpiled;

d. Locations of any crossings of surface waters;

e. Designated points on the site where vehicles will exit onto paved roads;

f. Locations of structures and other impervious surfaces upon completion of construction; and

g. Locations of construction support activity areas covered by this permit (see Part 1.3.c).

7.2.6.2 Locations of all surface waters, including wetlands, that exist within or in the immediate vicinity of the site. Indicate which waterbodies are listed as impaired, and which are identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters;

7.2.6.3 The boundary lines of any natural buffers provided consistent with Part 2.1.2.1a;

7.2.6.4 Areas of federally-listed critical habitat for endangered or threatened species;

7.2.6.5 Topography of the site, existing vegetative cover (*e.g., forest, pasture, pavement, structures*), and drainage pattern(s) of stormwater and authorized non-stormwater flow onto, over, and from the site property before and after major grading activities;

7.2.6.6 Stormwater and allowable non-stormwater discharge locations, including:

a. Locations of any storm drain inlets on the site and in the immediate vicinity of the site; and

Note: The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

b. Locations where stormwater or allowable non-stormwater will be discharged to surface waters (including wetlands) on or near the site.

7.2.6.7 Locations of all potential pollutant-generating activities identified in Part 7.2.7;

7.2.6.8 Locations of stormwater control measures; and

7.2.6.9 Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.7. Construction Site Pollutants.

The SWPPP must include the following:

7.2.7.1 A list and description of all the pollutant-generating activities[25] on your site.

7.2.7.2 For each pollutant-generating activity, an inventory of pollutants or pollutant constituents *(e.g., sediment, fertilizers and/or pesticides, paints, solvents, fuels)* associated with that activity, which could be exposed to rainfall, or snowmelt, and could be discharged from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges. You must also document any departures from the manufacturer's specifications for applying fertilizers containing nitrogen and phosphorus, as required in Part 2.3.5.1.

7.2.8. Non-Stormwater Discharges.

The SWPPP must also identify all sources of allowable non-stormwater discharges listed in Part 1.3.d.

7.2.9. Buffer Documentation.

If you are required to comply with Part 2.1.2.1 because a surface water is located within 50 feet of your project's earth disturbances, you must describe which compliance alternative you have selected for your site, and comply with any additional requirements to provide documentation in Part 2.1.2.1.

7.2.10. Description of Stormwater Control Measures.

7.2.10.1 ***Stormwater Control Measures to be Used During Construction Activity.*** The SWPPP must describe all stormwater control measures that are or will be installed and maintained at your site to meet the requirements of Part 2. For each stormwater control measure, you must document:

a. Information on the type of stormwater control measure to be installed and maintained, including design information;

b. What specific sediment controls will be installed and made operational prior to conducting earth-disturbing activities in any given portion of your site to meet the requirement of Part 2.1.2.2a;

c. For exit points on your site, document stabilization techniques you will use and any additional controls that are planned to remove sediment prior to vehicle exit consistent with Part 2.1.2.3; and

d. For linear projects, where you have determined that the use of perimeter controls in portions of the site is impracticable, document why you believe this to be the case (see Part 2.1.2.2a).

7.2.10.2 ***Use of Treatment Chemicals.*** If you will use polymers, flocculants, or other treatment chemicals at your site, the SWPPP must include:

a. A listing of all soil types[26] that are expected to be exposed during construction and that will be discharged to locations where chemicals

[25] Examples of pollutant-generating activities include, but are not limited to: paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations.

will be applied. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction.

b. A listing of all treatment chemicals to be used at the site, and why the selection of these chemicals is suited to the soil characteristics of your site;

c. If you have been authorized by your applicable EPA Regional Office to use cationic treatment chemicals, include the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards;

d. The dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage;

e. Information from any applicable Material Safety Data Sheets (MSDS);

f. Schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

g. A description of how chemicals will be stored consistent with Part 2.1.3.3b;

h. References to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

i. A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

7.2.10.3 ***Stabilization Practices.*** The SWPPP must describe the specific vegetative and/or non-vegetative practices that will be used to comply with the requirements in Part 2.2, including:

a. If you will be complying with the stabilization deadlines specified in Part 2.2.1.3a, you must indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions; and

b. If you will be complying with the stabilization deadlines specified in Part 2.2.1.3b, you must document the circumstances that prevent you from meeting the deadlines specified in Parts 2.2.1.1 and/or 2.2.1.2.

7.2.11. Pollution Prevention Procedures.

7.2.11.1 ***Spill Prevention and Response Procedures.*** The SWPPP must describe procedures that you will follow to prevent and respond to spills and leaks consistent with Part 2.3, including:

a. Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

[26] Information on soils may be obtained at http://websoilsurvey.nrcs.usda.gov/app/.

b. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.4 and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available.

You may also reference the existence of Spill Prevention Control and Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan onsite.

Note: Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

7.2.11.2 ***Waste Management Procedures.*** The SWPPP must describe procedures for how you will handle and dispose of all wastes generated at your site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

7.2.12. Procedures for Inspection, Maintenance, and Corrective Action.

The SWPPP must describe the procedures you will follow for maintaining your stormwater control measures, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.1.4, Part 2.3.2, Part 4, and Part 5 of the permit. The following information must also be included in your SWPPP:

7.2.12.1 Personnel responsible for conducting inspections;

7.2.12.2 The inspection schedule you will be following, which is based on whether your site is subject to Part 4.1.2 or Part 4.1.3, and whether your site qualifies for any of the allowances for reduced inspection frequencies in Part 4.1.4. If you will be conducting inspections in accordance with the inspection schedule in Part 4.1.2.2 or Part 4.1.3, the location of the rain gauge on your site or the address of the weather station you will be using to obtain rainfall data;

7.2.12.3 If you will be reducing your inspection frequency in accordance with Part 4.1.4.2, the beginning and ending dates of the seasonally-defined arid period for your area or the valid period of drought. If you will be reducing your inspection frequency in accordance with Part 4.1.4.3, the beginning and ending dates of frozen conditions on your site; and

7.2.12.4 Any inspection or maintenance checklists or other forms that will be used.

7.2.13. Staff Training.

The SWPPP must include documentation that the required personnel were trained in accordance with Part 6.

7.2.14. Documentation of Compliance with Other Federal Requirements.

7.2.14.1 *Endangered Species Act*. The SWPPP must include documentation supporting your determination with respect to Part 1.1.e and Appendix D.

7.2.14.2 *Historic Properties.* The SWPPP must include documentation required by Appendix E in relation to potential impacts to historic properties.

7.2.14.3 *Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.* If you are using any of the following stormwater controls at your site, as they are described below, you must document any contact you have had with the applicable state agency or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR Parts 144 -147. Such controls would generally be considered Class V UIC wells:

a. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

b. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

c. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

Note: For state UIC program contacts, refer to the following EPA website: http://water.epa.gov/type/groundwater/uic/whereyoulive.cfm.

7.2.15. SWPPP Certification.

You must sign and date your SWPPP in accordance with Appendix I, Part I.11.

7.2.16. Post-Authorization Additions to the SWPPP.

Once you are notified of your coverage under this permit, you must include the following documents as part of your SWPPP:

7.2.16.1 A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

7.2.16.2 A copy of the acknowledgment letter you receive from the NOI Processing Center or eNOI system assigning your permit tracking number;

7.2.16.3 A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3. ON-SITE AVAILABILITY OF YOUR SWPPP.

You are required to keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a state, tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.

Note: Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR Part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may

be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

If an onsite location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4. REQUIRED SWPPP MODIFICATIONS.

7.4.1. List of Conditions Requiring SWPPP Modification.

You must modify your SWPPP, including the site map(s), in response to any of the following conditions:

7.4.1.1 Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater control measures, pollution prevention measures, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.5 change during the course of construction;

7.4.1.2 To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

7.4.1.3 If inspections or investigations by site staff, or by local, state, tribal, or federal officials determine that SWPPP modifications are necessary for compliance with this permit;

7.4.1.4 Where EPA determines it is necessary to impose additional requirements on your discharge, the following must be included in your SWPPP:

a. A copy of any correspondence describing such requirements; and

b. A description of the stormwater control measures that will be used to meet such requirements.

7.4.1.5 To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater control measures implemented at the site; and

7.4.1.6 If applicable, if a change in chemical treatment systems or chemically-enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2. Deadlines for SWPPP Modifications.

You must complete required revisions to the SWPPP within 7 calendar days following the occurrence of any of the conditions listed in Part 7.4.1.

7.4.3. SWPPP Modification Records.

You are required to maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.15 above) and a brief summary of all changes.

7.4.4. Certification Requirements.

All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix I, Part I.11.b.

7.4.5. Required Notice to Other Operators.

Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8. HOW TO TERMINATE COVERAGE.

Until you terminate coverage under this permit, you are required to comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1. MINIMUM INFORMATION REQUIRED IN NOT.

You will be required to provide the following in your NOT:

8.1.1. NPDES permit tracking number provided by EPA when you received coverage under this permit;

8.1.2. Basis for submission of the NOT (see Part 8.2);

8.1.3. Operator contact information;

8.1.4. Name of project and address (or a description of location if no street address is available); and

8.1.5. NOT certification.

8.2. CONDITIONS FOR TERMINATING PERMIT COVERAGE.

You may terminate permit coverage only if one of the following conditions occurs at your site:

8.2.1. You have completed all earth-disturbing activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.3.c), and you have met the following requirements:

8.2.1.1 For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.2;

8.2.1.2 You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

8.2.1.3 You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable; and

8.2.1.4 You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2. You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3. Coverage under an individual or alternative general NPDES permit has been obtained.

8.3. HOW TO SUBMIT YOUR NOT.

You are required to use EPA's electronic NOI system, or "eNOI system", to prepare and submit your NOT. The electronic NOT form you are required to complete is found at www.epa.gov/npdes/stormwater/cgpenoi. You will use your NOI tracking number *(i.e., the EPA number you were assigned upon authorization under the permit)* to upload the

fillable NOT form, which will ensure that EPA properly records your termination of coverage. If you have a problem with the use of the eNOI system, contact the EPA Regional Office that corresponds to the location of your site. If you are given approval by the EPA Regional Office to use a paper NOT, you must complete the form in Appendix K.

8.4. DEADLINE FOR SUBMITTING NOTS.

You must submit your NOT within 30 calendar days after any one of the triggering conditions in Part 8.2 occur.

8.5. EFFECTIVE DATE OF TERMINATION OF COVERAGE.

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is processed and posted on EPA's website (www.epa.gov/npdes/stormwater/cgpnoisearch).

9. PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and areas in certain states subject to construction projects by Federal Operators. States, Indian country, and areas subject to construction by Federal Operators not included in this Part do not have any modifications or additions to the applicable conditions of this permit

9.1. Region 1

9.1.1. MAR120000: Commonwealth of Massachusetts (except Indian country).

9.1.1.1 You must comply with the Massachusetts Clean Waters Act (Ch. 21, ss. 26-53).

9.1.1.2 You must comply with the conditions in 314 CMR 4.00- Massachusetts Surface Water Quality Standards.

9.1.1.3 You must comply with the conditions in 314 CMR 3.00- Massachusetts Surface Water Discharge Permit Program.

9.1.1.4 You must comply with the Wetlands Protection Act (Ch. 131 s. 40) and its regulations, 310 CMR 10.00 and any Order of Conditions issued by a Conservation Commission or a Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

9.1.1.5 You must comply with the Massachusetts Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL Ch. 21, ss 26-53 and the Wetlands Protection Act, Ch. 131, s. 40.

9.1.1.6 You must comply with the conditions in 314 CMR 9.00 – Water Quality Certification for Discharges of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the United States within the Commonwealth.

9.1.1.7 You must comply with the Massachusetts Endangered Species Act (MESA), MGL Ch. 313A and regulations at 321 CMR 10.00 and any actions undertaken to comply with this stormwater general permit shall not result in non-compliance with the MESA.

9.1.1.8 Activities covered under this general permit shall not interfere with the implementation of mosquito control work conducted in accordance with Chapter 252 including s. 5A thereunder and MassDEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Supplies.

9.1.1.9 The Department may request a copy of the Stormwater Pollution Prevention Plan (SWPPP) and the permittee is required to submit the SWPPP to the Department within 14 days of such request. The Department may conduct an inspection of any facility covered by this permit to ensure compliance with state law requirements, including state water quality standards. The Department may enforce its certification conditions.

9.1.1.10 The Department may require the permit holder to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.

9.1.1.11 The Department may require the permit holder to provide measurable verification of the effectiveness of Best Management Practices (BMPs) and other control measures used in the stormwater management program, including water quality monitoring.

9.1.1.12 The Department has determined that compliance with this permit does not protect the permit holder from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to public health or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act, Ch. 21, ss. 26-53.

9.1.1.13 The Department reserves the right to modify this 401 Water Quality Certification if any changes, modifications, or deletions are made to this general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of this 401 Water Quality Certification to carry out its responsibilities during the term of this general permit with respect to water quality, including any revisions to 314 CMR 4.00, Massachusetts Surface Water Quality Standards.

9.1.1.14 Should any violation of the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, or the conditions of this 401 Water Quality Certification occur, the Department will direct the permit holder to correct the violation(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation(s) of this permit or the Massachusetts Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, s. 42 for discharging into Masachusetts' waters in violation of an order or permit issued by this Department. This 401 Water Quality Certification does not relieve the permit holder of the duty to comply with other applicable Massachusetts statutes and regulations.

9.1.2. NHR120000: State of New Hampshire.

9.1.2.1 If you disturb 100,000 square feet or more of contiguous area, you must also apply for an Alteration of Terrain (AoT) permit from DES pursuant to RSA 485-A:17 and Env-Ws 1500. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Ws 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of <u>any</u> surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule.

9.1.2.2 You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.3.d). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the source of the groundwater to be treated and discharged.

Information on groundwater contamination can be generated over the Internet via the NHDES web site http://des.nh.gov/ at the OneStop Web Geographic Information System at http://www2.des.state.nh.us/gis/onestop. If it is determined that the groundwater to be dewatered is near a remediation or other waste site you must apply for the Remediation General Permit (see http://www.epa.gov/region1/npdes/rgp.html.)

9.1.2.3 You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at a location prior to mixing with stormwater at least once per week during weeks when discharges occur. Samples must be analyzed for total suspended solids (TSS) and must meet monthly average and daily maximum TSS limits of 50 milligrams per liter (mg/L) and 100 mg/L, respectively. TSS (a.k.a. Residue, Nonfilterable) sampling and analysis must be performed in accordance with Tables IB and II in 40 CFR 136.3 (see: http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfr136_02.html). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.

9.1.2.4 Construction site owners and operators must consider opportunities for post-construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the stormwater pollution prevention plan (SWPPP). If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485-C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GAI or GA2 pursuant to RSA 485-C and Env-Ws 420; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Ws 1507.04(e), including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.26). For design considerations for infiltration measures see Volume II of the NH Stormwater Manual.

9.1.2.5 Appendix F contains a list of Tier 2, or high quality waters. Although there is no official list of tier 2 waters, it can be assumed that all NH surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see Surface Water Quality Watershed Report Cards at http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU. A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

9.1.2.6 To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown in Part 9.1.2.7.

a. A site map required in Part 7.2.6, showing the type and location of all post-construction infiltration BMPs utilized at the facility or the reason(s) why none were installed;

b. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.3.d).

c. Records of sampling and analysis of TSS required for construction dewatering discharges (see Part 9.1.2.3).

9.1.2.7 All required or requested documents must be sent to:

NH Department of Environmental Services, Wastewater Engineering Bureau, Permits & Compliance Section
P.O. Box 95
Concord, NH 03302-0095

9.1.2.8 When NHDES determines that additional water quality certification requirements are necessary to protect water quality, it may require individual discharges to meet additional conditions to obtain or continue coverage under the CGP. Any such conditions must be supplied to the permittee in writing. Any required pollutant loading analyses and any designs for structural best management practices necessary to protect water quality must be prepared by a civil or sanitary engineer registered in New Hampshire.

9.2. Region 4

9.2.1. FLR12000I: Indian country within the State of Florida.

9.2.1.1 **Seminole Tribe of Florida**. The following conditions apply only for discharges on federal trust lands of the Seminole Tribe of Florida (Big Cypress, Brighton, Hollywood, Immokalee, and Tampa Reservations):

a. Any discharges into waters of the Seminole Tribe of Florida shall not cause an exceedance in Turbidity of 29 NTU above natural background conditions.

b. Unless otherwise specified by previous permits or criteria, a storm event of three (3) day duration and twenty five (25) year return frequency shall be used in computing off-site discharge on Seminole Lands as agreed upon in the Water Rights Compact agreement attached to Public Law 100-228 (December 31, 1987), Seminole Indian Land Claims Settlement Act of 1987.

c. The Seminole Tribe of Florida accepts a 20' X 20' stabilization at entry/exit points.

9.3. Region 5

MNR12000I: Indian country within the State of Minnesota.

9.3.1.1 **Fond du Lac Band of Lake Superior Chippewa.** The following conditions apply only to discharges on the Fond du Lac Band of Lake Superior Chippewa Reservation.

a. A copy of the Storm Water Pollution Prevention Plan must be submitted to the following office at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

CGP applicants are encouraged to work with the FDL Office of Water Protection in the identification of all proposed receiving waters.

b. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA.

c. The turbidity limit shall NOT exceed 10% of natural background as determined by the Office of Water protection staff.

d. Turbidity sampling must take place within 24 hours of a ½ -inch or greater rainfall event. The results of the sampling must be reported to the Officce of Water Protection staff within 7 days of sample collection. All sample reporting must include the date and time, location (GPS:UTM/Zone 15), and NTU.

e. Discharges to receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff.

f. This certification does not pertain to any new discharge to Outstanding Reservation Resource Waters (ORRW) as described in §105 b.3 of the Fond du Lac Water Quality Standards (Ordinance #12/98). Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake and Jaskari Lake are designated as ORRWs. New dischargers wishing to discharge to an ORRW must obtain an individual permit for stormwater discharges from large and small construction activities.

g. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance 12/98 as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm and cold water fisheries, subsistence fishing (netting), primary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation and commercial.

h. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac reservation, including groundwater.

i. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

9.3.1.2 **Grand Portage Band of Lake Superior Chippewa.** The following conditions apply only to discharges on the Grand Portage Band of Lake Superior Chippewa Reservation.

a. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in

accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the "Certification"). This Certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing as such.

b. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance). As such, appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation (as defined in the Water Resources Ordinance). All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.

c. A copy of the Storm Water Pollution Prevention Plan (the "Plan") required by the CGP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The Board may require monitoring of storm-water discharges as determined on a case-by-case basis. If the Board determines that a monitoring plan is necessary, the monitoring plan must be prepared and incorporated into the Plan before the Notice of Intent is submitted to the EPA. The Plan should be sent to:

   Grand Portage Environmental Resources Board
   P.O. Box 428
   Grand Portage, MN 55605

   Copies of the Notice of Intent and Notice of Termination required under the General Permit must be submitted to the Board at the address above at the same time they are submitted to the EPA.

d. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards.

e. Discharges that the Board has determined to be or that may reasonably be expected to be contributing to a violation of Water Quality Standards or Applicable Federal Standards are not authorized by this Certification.

f. The Board retains full authority provided by the Water Resources Ordinance to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions.

g. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

9.3.2. WIR12000I: Indian country within the State of Wisconsin.

9.3.2.1 **Bad River Band of the Lake Superior Tribe of Chippewa Indians.** The following conditions apply only to discharges on the Bad River Band of the Lake Superior Tribe of Chippewa Indians Reservation.

a. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, or historical sites, or properties that may be eligible for listing as such.[27, 28]

b. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (or Tier 3 water).[29] Outstanding Tribal Resource Waters, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.[30]

c. Projects utilizing cationic treatment chemicals[31] within the Bad River Reservation boundaries are not eligible for coverage under the CGP.[32]

d. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS).[33]

e. An operator proposing to discharge to an Outstanding Resource Water (or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Outstanding Resource Waters, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek.[34] The antidegradation demonstration materials described in provision E.4.iii. must be submitted to the following address:

   Bad River Tribe's Natural Resources Department
   Attn: Water Resources Specialist
   P.O. Box 39
   Odanah, WI 54861

f. An operator proposing to discharge to an Exceptional Resource Water (or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. Exceptional Resource Waters, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal

[27] Bad River Band of Lake Superior Tribe of Chippewa Indians Water Quality Standards adopted by Resolution No. 7-6-11-441 (hereafter, Tribe's WQS).

[28] 36 C.F.R §800.16(l)(2).

[29] Tribe's WQS: See provisions E.3.ii and E.4.iv.

[30] Tribe's WQS: See provision E.2.iii.

[31] See definition of cationic treatment chemicals in Appendix A of the CGP

[32] Tribe's WQS: See provisions E.6.ii.a and E.6.ii.c.

[33] See Footnote 27.

[34] Tribe's WQS: See provision E.2.ii.

Resource Water (Tier 3 water).[35] The antidegradation demonstration materials described in provision E.4.ii. must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

g. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.[36]

h. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.

i. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities.[37] The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39
Odanah, WI 54861

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA.

j. The THPO must be provided 30 days to comment on the project.[38]

k. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties. For more information regarding the specifics

[35] Tribe's WQS: See provision E.2.i.

[36] Tribe's WQS: See provision E.7.iii.

[37] See footnotes 27 and 28.

[38] 36 C.F.R. § 800.3(c)(4).

of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.[39]

l. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI:[40]

Bad River Tribe's Natural Resources Department
Attn: Water Resources Specialist
P.O. Box 39
Odanah, WI 54861

m. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion:[41]

Bad River Tribe's Natural Resources Department
P.O. Box 39
Odanah, WI 54861

n. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.[42]

9.3.2.2 **Lac du Flambeau Band of Lake Superior Chippewa Indians.** The following conditions apply only to discharges on the Lac du Flambeau Band of Lake Superior Chippewa Indians Reservation.

a. A copy of the Storm Water Pollution Prevention Plan must be submitted to the following office at least thirty (30) days in advance of sending the Notice of Intent (NOI) to EPA:

Lac du Flambeau
Tribal Land Management
P. O. Box 279
Lac du Flambeau, WI 54538

CGP applicants are encouraged to work with the LdF Office of Water Protection in the identification of all proposed receiving waters.

b. Copies of the NOI and the Notice of Termination (NOT) must be sent to the LdF Water Resource Program at the same time they are submitted to EPA.

c. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Lac du Flambeau Reservation. This includes, but is not limited to, the

[39] 36 C.F.R. § 800.3(b).

[40] See footnote 27.

[41] See footnote 27.

[42] See footnote 27.

prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Lac du Flambeau Reservation for any of the uses designated in the Water Quality Standards of the Lac du Flambeau Reservation.

d. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Lac du Flambeau Reservation. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the Lac du Flambeau Reservation, including groundwater.

e. This certification does not authorize impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for such listing.

Note: Facilities within the Sokaogon Chippewa Community are not eligible for stormwater discharge coverage under this permit. Contact the Region 5 office for an individual permit application.

9.4. Region 6

9.4.1. NMR120000: State of New Mexico, except Indian country.

9.4.1.1 In addition to all other provisions of this permit, operators who intend to obtain authorization under this permit for all new and existing stormwater discharges must satisfy the following condition:

The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion, and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure that applicable standards in 20.6.4 NMAC, including the antidegradation policy, or waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify, and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs. BMP selection must be made based on the use of appropriate soil loss prediction models (e.g., SEDCAD 4.0, RUSLE, SEDIMOT II, MULTISED, etc.), or equivalent, generally accepted (by professional erosion control specialists), soil loss prediction tools. The operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will assure that the applicable standards or WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from pre-construction, pre-development conditions. The SWPPP must be prepared in accordance with good engineering practices by qualified (e.g., CPESC certified, engineers with appropriate training, etc.) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be

documented in the SWPPP. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

9.4.1.2 Operators are not eligible to obtain authorization under this permit for all new and existing stormwater discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3" waters).

9.4.1.3 For temporary stabilization, instead of the deadline for initiating and completing stabilization in Part 2.2.1.3a, operators must comply with the deadlines in Parts 2.2.1.1 and 2.2.1.2.

9.4.1.4 Instead of the criteria for vegetative stabilization in Part 2.2.2.1.a, operators must provide a uniform vegetation (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for all unpaved areas and areas not covered by permanent structures. The adjustment to allow for less than 100 % native vegetative cover (e.g., 50 % native vegetative cover x 70 % = 35 %) is acceptable.

9.4.1.5 The following replaces the criteria for final vegetative stabilization in Part 2.2.2.1.b:

- The area you have seeded and planted must within 3 years provide established vegetation that achieves 70% of the native background vegetative cover for all unpaved areas and areas not covered by permanent structures; and
- In addition to to seeding or planting the area to be vegetatively stabilized, you must select, design, and install non-vegetative erosion controls that provide cover for at least 3 years without active maintenance by you.

In addition, permittees are only authorized to used this option as a method for final vegetative stabilization for purposes of filing a Notice of Termination (NOT) under the following conditions:

If this option is selected, you must notify NMED at the address listed in Part 9.4.1.6 at the time the NOT is submitted to EPA. The information to be submitted includes:

- A copy of the NOT;
- Contact information, including individual name or title, address, and phone number for the party responsible for implementing the final stabilization measures; and
- The date that the permanent vegetative stabilization practice was implemented and the projected timeframe that the 70 % native vegetative cover requirements are expected to be met. (Note that if more than three years is required to establish 70 % of the natural vegetative cover, this technique cannot be used or cited for fulfillment of the final stabilization requirement – you remain responsible for establishment of final stabilization).

NMED also requires that operators periodically (minimum once/year) inspect and properly maintain the area until the criteria for final stabilization, as specified in Part 2.2 of the CGP, have been met. Operators must prepare an inspection report documenting the findings of these inspections and signed in accordance with Appendix I, Part I.11. This inspection record must be

retained along with the SWPPP for three years after the NOT is submitted for the site and additionally submitted to NMED at the address listed in Part 9.4.1.6. The inspections at a minimum must include the following:

- Observations of all areas of the site disturbed by construction activity;
- Best Management Practices (BMPs)/post-construction stormwater controls must be observed to ensure they are effective;
- An assessment of the status of vegetative re-establishment; and
- Corrective actions required to ensure vegetative success within three years, and control of pollutants in stormwater runoff from the site, including implementation dates.

9.4.1.6 Copies of all documents submitted to EPA in non-electronic format must be sent to the following address:

Program Manager
Point Source Regulation Section
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, New Mexico 87502

9.4.2. NMR12000I: Indian country within the State of New Mexico.

9.4.2.1 **Pueblo of Sandia**. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

a. Copies of all Notices of Intent submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address. Discharges are not authorized by this permit unless an accurate and complete NOI has been submitted to the Pueblo of Sandia.

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

b. The Pueblo of Sandia will not allow the Rainfall Erosivity Waivers (see Appendix C) to be granted for any small construction activities.

c. The Stormwater Pollution Prevention Plan (SWPPP) must be available to the Pueblo of Sandia Environment either electronically or hard copy upon request for review. The SWPPP must be made available at least fourteen (14) days before construction begins. The fourteen (14) day period will give Tribal staff time to become familiar with the project site, prepare for construction inspections, and determine compliance with the Pueblo of Sandia Water Quality Standards. Failure to provide a SWPPP to the Pueblo of Sandia may result in denial of the discharge or construction delay.

d. An "Authorization to Proceed Letter" with site specific mitigation, site and project requirements will be sent out to the permittee when a review of the NOI and SWPPP is completed by the Pueblo of Sandia

Environment Department. This approval will allow the construction to proceed if all applicable requirements are met.

e. Before submitting a Notice of Termination (NOT), permittees must clearly demonstrate to the Pueblo of Sandia Environment Department though a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating the stabilization requirements have been met will be sent to the permittee to add to the permittees NOT submission to EPA.

f. Copies of all NOT submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address:

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

9.4.3. OKR12000F: Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

In accordance with Section 303 of the Clean Water Act and Oklahoma's Water Quality Standards (OAC 785: 45):

9.4.3.1 For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any mineral mining.

9.4.3.2 For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including concrete and asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

9.5. Region 8

9.5.1. MTR12000I: Indian country within the State of Montana

9.5.1.1 **The Confederated Salish and Kootenai Tribes of the Flathead Nation**. The following conditions apply only to discharges on the Confederated Salish and Kootenai Tribes of the Flathead Nation Reservation:

a. Permittees must send the Stormwater Pollution Prevention Plan (SWPPP) to the Tribes at least 30 days before construction starts.

b. Before submitting the Notice of Termination (NOT), permittees must clearly demonstrate to an appointed tribal staff person during an on-site inspection that requirements for site stabilization have been met.

c. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the tribes.

d. Permittees may submit their SWPPPs and NOTs electronically to clintf@cskt.org.

Written NOI's, SWPPPs and NOT's may be mailed to:
Clint Folden, Water Quality Regulatory Specialist
Confederated Salish and Kootenai Tribes
Natural Resources Department
P.O. Box 278
Pablo, MT 59855

9.5.1.2 Fort Peck Tribes. The following conditions apply only to discharges on the Fort Peck Reservation:

Permittees must notify the Fort Peck Office of Environmental Protection (OEP) two weeks prior to commencing construction.

9.6. Region 9

9.6.1. AZR12000I: Indian country within the State of Arizona.

9.6.1.1 **Hualapai Tribal Lands**. The following condition applies only for discharges on the Hualapai Reservation:

All notices of intent for proposed stormwater discharges under the CGP and all pollution prevention plans for stormwater discharges on Hualapai Tribal lands shall be submitted to Water Resources Program through the Tribal Chairman for review and approval, P.O. Box 179, Peach Springs, AZ 86434.

9.6.2. CAR12000I: Indian country within the State of California.

9.6.2.1 **Big Pine Paiute Tribe of the Owens Valley**. Big Pine Tribal Water Quality Standards Section VII(e): If a proposed action has the possibility to adversely affect the water quality of Big Pine Creek, an application must be filed with the Tribal Environmental Office. The application must describe the action proposed and its effects on the creek, how this information was derived, and a justification for the action. Upon satisfying these requirements, the Tribal Environmental Office will recommend or not recommend this proposal to be considered by the Tribal Council. Tribal Council will make a determination whether to consider the proposal further. If the Tribal Council wishes to consider the application further, the public participation process will take place (see paragraph VII(d)). The Tribal Council has the sole authority in permitting degradation to Big Pine Creek. If the Tribal Council makes the decision to allow degradation, they will submit their decision to the USEPA for review and approval.

9.6.3. GUR120000: The Island of Guam. Permittees must adhere with imposed conditions for the project, in accordance with section 307(c)(1), of the Coastal Zone Management Act, 15 CFR part 930.

9.6.4. MPR120000: Commonwealth of the Northern Mariana Islands (CNMI).

9.6.4.1 An Earthmoving and Erosion Control Permit must be obtained from DEQ prior to any construction activity covered under the NPDES General Permit.

9.6.4.2 All conditions and requirements set forth in the United States Environmental Protection Agency (USEPA), National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities must be complied with.

9.6.4.3 A stormwater pollution prevention plan (SWPPP) for stormwater discharges from construction activities must be approved by the Director of DEQ prior to submission of the Notice of Intent (NOI).

9.6.4.4 A NOI to be covered by the General Permit for Discharges from Construction Activities must be submitted to DEQ and USEPA, Region IX, in the form prescribed by USEPA, accompanied by a SWPPP approval letter from DEQ.

9.6.4.5 The NOI must be postmarked fourteen (14) calendar days prior to any stormwater discharges and a copy is submitted to the Director of DEQ no later than seven (7) calendar days prior to any stormwater discharges.

9.6.4.6 Copies of all monitoring reports required by the NPDES General Permit are submitted to DEQ.

9.6.4.7 In accordance with Section 10.3(h) and (i) of the CNMI Water Quality Standards, DEQ reserves the right to deny coverage under this permit and require submittal of an application for an individual NPDES permit based on review of the NOI or other information made available to the Director.

9.6.5. NVR12000I: Indian country within the State of Nevada.

9.6.5.1 **Pyramid Lake Paiute Tribe**. The following conditions apply only for discharges on the Pyramid Lake Paiute Reservation:

a. A SWPPP for stormwater discharges from project construction activities must be submitted to, and approved by, the PLPT Environmental Department director, prior to the submission of a Notice of Intent (NOI or eNOI) to EPA.

b. The applicant is to submit a hard copy of the Notice of Intent (NOI or eNOI) and a draft or final copy of the Stormwater Pollution Prevention Plan (SWPPP) by U.S. Mail to the Pyramid Lake Environmental Department at the address below:

Pyramid Lake Tribe Environmental Department
P.O. Box 256
Nixon, NV 89424

c. The applicant is to concurrently submit to the PLPT Environmental Department, hard copies of any other forms submitted to the EPA, including waivers, reporting, and Notice of Termination (NOT).

9.7. Region 10

9.7.1. IDR120000: The State of Idaho, except those located on Indian country.

For the complete text of Idaho's certification including the full anti-degradation analysis, please visit the IDEQ website at http://www.deq.idaho.gov/media/821491-usepa-npdes-general-permit-storm-water-discharges-401-certification-final-0412.pdf

9.7.1.1 The Idaho Department of Environmental Quality's (DEQ) certification of this permit does not constitute authorization of your permitted activities by any other state or federal agency or private person or entity. DEQ's certification does not excuse you from the obligation to obtain any other necessary

approvals, authorizations or permits, including without limitation, the approval from the owner of a private water conveyance system, if one is required, to use the system in connection with the permitted activities.

9.7.1.2 Idaho's Antidegradation Policy. Idaho Water Quality Standards (WQS) (IDAPA 58.01.02) contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

a. Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.05).
b. Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.06).
c. Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.07).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (Idaho Code § 39-3603(2)(b)(i)). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (Idaho Code § 39-3603(2)(b)(iii)). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (Idaho Code § 39-3603(2)(b)). The primary pollutants of concern associated with stormwater discharges from construction activities are sediment and turbidity (as Total Suspended Solids). Other potential pollutants include the following: phosphorus, nitrogen and other nutrients from fertilizers; pesticides; petroleum products; construction chemicals; and solid wastes.

9.7.1.3 Protection and Maintenance of Existing Uses (Tier 1 Protection). In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters. The permittee must notify the appropriate DEQ Regional Office (see table in Part 9.7.1.8 below for contact information) of any potential discharges to impaired waters - water bodies identified as "impaired" for sediment or a sediment-related parameter, such as total suspended solids (TSS) or turbidity, and/or nutrients, including impairments for nitrogen and/or phosphorus.

To determine the support status of the affected water body, the permittee must use the most current EPA-approved Integrated Report, available on Idaho DEQ's website: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx. Impaired waters are identified in Categories 4 and 5 of the Integrated Report. Category 4(a) reflects impaired waters for which a TMDL has been approved by EPA. Category 5

contains waters which have been identified as "impaired" but do not yet have an EPA-approved TMDL.

DEQ's webpage also has a link to the state's map-based Integrated Report which presents information from the Integrated Report in a searchable, map-based format: http://mapcase.deq.idaho.gov/wq2010/.

In addition to complying with the Part 3.2.2 requirements for any sediment or nutrient-impaired waters, permittee(s) must also comply with Idaho's numeric turbidity criteria, developed to protect aquatic life uses. The criterion states, "Turbidity shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days" (IDAPA 58.01.02250.02.e). For Waters of the State which have been identified as impaired due to sedimentation/siltation, the permittee must conduct turbidity monitoring as described below in Part 9.7.1.6

9.7.1.4 Protection of High-Quality Waters (Tier 2 Protection). To determine the support status of the affected water body, the permittee must use the most current EPA-approved Integrated Report, available on Idaho DEQ's website: http://www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.aspx. DEQ's webpage also has a link to the state's map-based Integrated Report which presents information from the Integrated Report in a searchable, map-based format: http://mapcase.deq.idaho.gov/wq2010/.

DEQ retains the authority to determine that a 303(d) listed water body is actually a high quality water body if there is biological, chemical or physical data to support such a determination. In cases where information submitted with the NOI, or available from other sources, indicates that further Tier 2 analysis is necessary and/or additional conditions are needed, either for a new project or an existing project with a significantly increased discharge, EPA and DEQ will conduct a review and require any appropriate additional controls. If during this review, EPA and DEQ decide that an additional Tier 2 protection is warranted, then EPA may either change the terms of coverage or terminate coverage under the CGP and require an individual permit.

9.7.1.5 Protection of Outstanding Resource Waters (Tier 3 Protection). Idaho's antidegradation policy requires that the quality of outstanding resource waters (ORWs) be maintained and protected from the impacts of point source discharges. No water bodies in Idaho have been designated as outstanding resource waters to date; however, it is possible that waters may become designated during the term of the CGP. Any applicant proposing to discharge to an ORW must obtain an individual NPDES permit from EPA.

9.7.1.6 Turbidity Monitoring. For Waters of the State which are identified in the Integrated Report as impaired for sedimentation/siltation, the permittee must conduct turbidity monitoring each day during construction activities when the project is not stabilized per Part 2.2 or shut down per Part 4.1.4.3 of the CGP. A properly and regularly calibrated turbidimeter is required.

A sample must be taken twice daily at an undisturbed area immediately upstream of the project area to establish background turbidity levels for each monitoring event. Background turbidity, location, date and time must be recorded prior to monitoring downstream of the project area.

A sample must also be taken twice daily immediately downstream from any point of discharge, and within any visible plume. The turbidity, location, date

and time must be recorded. The downstream sample(s) must be taken immediately following the upstream sample(s) in order to obtain meaningful and representative results.

Results from the compliance point sampling or observation must be compared to the background levels to determine whether project activities are causing an exceedance of state WQS. If the downstream turbidity is 50 NTUs or more than the upstream turbidity, or a plume is observed, then the project is causing an exceedance of the WQS. The permittee must inspect the condition of project BMPs. If the BMPs are functioning to their fullest capability, then the permittee must modify project activities and/or BMPs to correct the violation.

Copies of daily logs for turbidity monitoring must be available to DEQ upon request. The report must describe all exceedances and subsequent actions taken, including the effectiveness of the action.

9.7.1.7 Equivalent Analysis Waiver. Use of the "Equivalent Analysis Waiver" in Appendix C (Part C.3) of the CGP is not authorized.

9.7.1.8 Reporting of Discharges Containing Hazardous Materials or Petroleum Products. Any spill of hazardous materials must be immediately reported to the appropriate DEQ regional office (see table of contacts, below) (IDAPA 58.01.02.850.03). Spills of petroleum products that exceed 25 gallons or that cause a visible sheen on nearby surface waters should be reported to DEQ within 24-hours. Petroleum product spills of less than 25 gallons or spills that do not cause a sheen on nearby surface waters shall only be reported to DEQ if clean-up cannot be accomplished within 24-hours (IDAPA 58.01.02.851.04).

DEQ Regional Office	Contact Name	Phone Number
Boise	Lance Holloway	208-373-0550
Coeur d'Alene	June Bergquist	208-769-1422
Idaho Falls	Troy Saffle	208-528-2650
Lewiston	John Cardwell	208-799-4370
Pocatello	Greg Mladenka	208-236-6160
Twin Falls	Balthasar Buhidar	208-736-2190

Outside of regular business hours, qualified spills shall be reported to the State Communications Center (1-800-632-8000 or 208-846-7610).

9.7.2. ORR12000I: Indian country within the State of Oregon.

9.7.2.1 **Confederated Tribes of the Umatilla Indian Reservation**. The following conditions apply only to discharges on the Umatilla Indian Reservation:

a. The operator shall be responsible for achieving compliance with the Confederated Tribes of the Umatilla Indian Reservations (CTUIR) Water Quality Standards.

b. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTUIR Water Resources Program at the address below, at the same time it is submitted to EPA.

c. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this permit to the CTUIR Water Resources Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

d. The operator shall be responsible for reporting an exceedance to Tribal Water Quality Standards to the CTUIR Water Resources Program at the same time it is reported to EPA.

Confederated Tribes of the Umatilla Indian Reservation
Water Resources Program
46411 Timine Way
Pendleton, OR 97801

e. The CTUIR Tribal Historic Preservation Office (THPO) requests copies of each NOI which will define whether or not the undertaking has the potential to affect historic properties, and if so, define the undertaking's area of potential effect (APE).

f. The THPO must be provided 30 days to comment on the APE as defined in the permit application.

g. If the project is an undertaking, a cultural resource investigation must occur. All fieldwork must be conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented using Oregon Reporting Standards (http://egov.oregon.gov/OPRD/HCD/ARCH/arch_pubsandlinks.shtml). The resulting report must be submitted to the THPO and the THOP must concur with the findings and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

h. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties.

i. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800.

Confederated Tribes of the Umatilla Indian Reservation
Cultural Resources Protection Program
Tribal Historic Preservation Office
46411 Timine Way
Pendleton, OR 97801

9.7.2.2 Confederated Tribes of the Warm Springs Reservation of Oregon. The following conditions apply only for discharges on the Warm Springs Reservation:

a. All activities covered by this NPDES general permit occurring within a designated riparian buffer zone as established in Ordinance 74 (Integrated Resource Management Plan or IRMP) must be reviewed, approved and permitted through the Tribe's Hydraulic Permit Application process, including payment of any applicable fees.

b. All activities covered by this NPDES permit must follow all applicable land management and resource conservation requirements specified in the IRMP.

c. Operators of activities covered by this NPDES general permit must submit a Storm Water Pollution Prevention Plan to the Tribe's Water Control Board at the following address for approval at least 30 days prior to beginning construction activity:

Chair, Warm Springs Water Control Board
P.O. Box C
Warm Springs, Oregon 97761

d. The operator shall be responsible for achieving compliance with the Water Quality Standards of the Confederated Tribes of the Warm Springs Reservation of Oregon. The operator shall be responsible for reporting an exceedance to Tribal Water Quality Standards to the Water Control Board at the address above.

e. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTWS, Branch of Natural Resources, Tribal Environmental Office at the address above, at the same time it is submitted to EPA.

f. The CTWS Tribal Historic Preservation Officer (THPO) requests copies of each NOI which will define whether or not the undertaking has the potential to affect historic properties, and if so, define the undertaking's area of potential effect (APE).

g. The THPO must be provided 30 days to comment on the APE as defined in the permit application.

h. If the project is an undertaking, a cultural resource investigation must occur. All fieldwork must be conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented using Oregon Reporting Standards (http://egov.oregon.gov/OPRD/HCD/ARCH/arch_pubsandlinks.shtml). The resulting report must be submitted to the THPO and the THOP must concur with the findings and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

i. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties.

j. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800.

9.7.3. WAR12000F: Areas in the State of Washington, except those located on Indian country, subject to construction by Federal Operators.

9.7.3.1 Discharges shall not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges that are not in compliance with these standards are not authorized.

9.7.3.2 Prior to the discharge of stormwater and non-stormwater to waters of the state, the permittee shall apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate best management practices (BMPs) installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

9.7.3.3 Sampling & Numeric Effluent Limitations – For Sites Discharging to Certain Waterbodies on the 303(d) List

a. Permittees that discharge to water bodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH or phosphorus, shall conduct water quality sampling according to the requirements of this subsection.

Parameter identified in 303(d) listing	Parameter/Units	Analytical Method	Sampling Frequency	Water Quality Standard
Turbidity Fine Sediment Phosphorus	Turbidity/NTU	SM2130 or EPA180.1	Weekly, if discharging	If background is 50 NTU or less: 5 NTU over background; or If background is more than 50 NTU: 10% over background
High pH	pH/Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

b. The operator must retain all monitoring results required by this section as part of the SWPPP. All data and related monitoring records must be provided to EPA or the Washington State Department of Ecology (Ecology) upon request.

c. The operator must notify EPA when the discharge turbidity or discharge pH exceeds the water quality standards as defined in 5.b and 6.b below. All such reports must be submitted within 30 day s of measurement to EPA at the following address:

USEPA – Region 10
NPDES Compliance Unit - Attn: Federal Facilities Compliance Officer
1200 6th Avenue, Suite 900
OCE-133
Seattle, WA 98101
(206) 553-1846

d. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA approved listing of impaired waters that exists on January 29, 2009, or the date when the operator's complete NOI is received by EPA, whichever is later. The most

recent EPA approved 303(d) list is available on Ecology's website at www.ecy.wa.gov/programs/wq/303d/2008/index.html.

e. Discharges to waterbodies on the 303(d) list for turbidity, fine sediment, or phosphorus

i. Permittees which discharge to waterbodies on the 303(d) list for turbidity, fine sediment, or phosphorus shall conduct turbidity sampling at the following locations to evaluate compliance with the water quality standard for turbidity:

(1) Background turbidity shall be measured in the 303(d) listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.

(2) Discharge turbidity shall be measured at the point of discharge into the 303(d) listed receiving waterbody, inside the area of influence of the discharge; or

(3) Alternatively, discharge turbidity may be measured at the point where the discharge leaves the construction site, rather than in the receiving waterbody.

Based on sampling, if the discharge turbidity ever exceeds the water quality standard for turbidity (more than 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or more than a 10% increase in turbidity when the background turbidity is more than 50 NTU), all future discharges shall comply with a numeric effluent limit which is equal to the water quality standard for turbidity. If the receiving water background turbidity is 50 NTU or less, the water quality standard is 5 NTU over background. If the receiving water background turbidity is more than 50 NTU, the water quality standard is 10% over background.

If a future discharge exceeds the water quality standard for turbidity, the permittee shall:

(1) Review the SWPPP for compliance with the permit and make appropriate revisions within seven days of the discharge that exceeded the standard.

(2) Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but no later than ten days of the discharge that exceeded the standard.

(3) Document BMP implementation and maintenance in the site log book.

(4) Continue to sample daily until discharge turbidity meets the water quality standard for turbidity.

f. Discharges to waterbodies on the 303(d) list for High pH

i. Permittees which discharge to waterbodies on the 303(d) list for high pH shall conduct sampling one of the following locations to evaluate compliance with the water quality standard for pH (in the range of 6.5 – 8.5):

(1) pH shall be measured at the point of discharge into the 303(d) listed waterbody, inside the area of influence of the discharge; or,

(2) Alternatively, pH may be measured at the point where the discharge leaves the construction site, rather than in the receiving water.

ii. Based on the sampling set forth above, if the pH ever exceeds the water quality standard for pH (in the range of 6.5 – 8.5), all future discharges shall comply with a numeric effluent limit which is equal to the water quality standard for pH. If a future discharge exceeds the water quality standard for pH, the permittee shall:

(1) Review the SWPPP for compliance with the permit and make appropriate revisions within 7 days of the discharge.

(2) Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but no later than 10 days of the discharge that exceeded the standards.

(3) Document BMP implementation and maintenance in the site log book.

(4) Continue to sample daily until discharge meets the water quality standard for pH (in the range of 6.5 – 8.5).

9.7.3.4 Sampling & Limitations – For Sites Discharging to TMDLs

a. Discharges to a waterbodies subject to an applicable Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus, shall be consistent with the assumptions and requirements of the TMDL.

i. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

(1) Discharges shall be sampled weekly, or as otherwise specified by the TMDL, to evaluate compliance with the specific waste load allocations or requirements.

(2) Analytical methods used to meet the monitoring requirements shall conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136.

ii. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.

iii. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.

iv. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

b. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to February 16, 2012, or prior to the date the operator's complete NOI is received by EPA, whichever is later.

Completed TMDLs are available on Ecology's website at www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/TMDLbyWria.html, or by phone at (360) 407-6460.

9.7.4. WAR12000I: Indian country within the State of Washington

9.7.4.1 **Kalispel Tribe**. The following conditions apply only for discharges on the Kalispel Reservation:

a. The operator shall be responsible for achieving compliance with the Kalispel Tribe's Water Quality Standards, and;

b. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the Kalispel Tribe Natural Resources Department (KNRD) at the same time as it is submitted to the EPA, and;

c. The operator shall submit all Storm Water Pollution Prevention Plans (SWPPP) to KNRD thirty (30) days prior to beginning any discharge activities for review, and;

d. The operator shall be responsible for reporting any exceedance of Tribal Water Quality Standards to KNRD at the same time it is reported to EPA, and;

e. Prior to any land disturbing activities on the Kalispel Indian Reservation and its dependent communities, the operator shall attain a cultural resource clearance letter from KNRD.

f. All tribal correspondence pertaining to the General Permit for Discharges from Construction Activities shall be sent to:

Kalispel Tribe Natural Resources Department
Water Resources Program
PO Box 39
Usk, WA 99180

9.7.4.2 **Lummi Nation**. The following conditions apply only for discharges on the Lummi Reservation:

a. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtain a land use permit from the Lummi Planning Department as provided in Title 15 of the Lummi Code of Laws and regulations adopted thereunder.

b. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Stormwater Pollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

c. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 together with supplements and amendments thereto).

d. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt by EPA.

e. Each operator shall submit a signed hard copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

f. Stormwater Pollution Prevention Plans, Notice of intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager
2616 Kwina Road
Bellingham, WA 98226-9298

g. Please see the Lummi Nation website (www.lummi-nsn.gov) and/or the Lummi Natural Resources Department website (http://lnnr.lummi-nsn.gov/LummiWebsite/Website.php?PageID=53) to review a copy of Title 17 of the Lummi Code of Laws, associated regulations, and the references upon which the conditions identified above are based.

9.7.4.3 **Makah Tribe**. The following conditions apply only for discharges on the Makah Reservation:

a. The operator shall be responsible for achieving compliance with the Makah Tribe's Water Quality Standards.

b. The operator shall submit a Storm Water Pollution Prevention Plan to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division for review and approval at least thirty (30) days prior to beginning any discharge activities.

c. The operator shall submit a copy of the Notice of Intent to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division at the same time it is submitted to EPA.

d. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Ray Colby
Makah Tribal Water Quality
Water Quality Specialist
(360) 645-3162
colby.ray@centurytel.net
PO Box 115
Neah Bay, WA 98357

9.7.4.4 **Puyallup Tribe of Indians**. The following conditions apply only for discharges on the Puyallup Reservation:

a. Each permittee shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards, including antidegradation provisions. The Puyallup Natural Resources Department will conduct an antidegradation review for permitted activities that have the potential to lower water quality. The antidegradation review will be consistent with the Tribe's Antidegradation Implementation Procedures.

b. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation policies if the discharge point is located within 1 linear mile upstream of waters designated by the Tribe.

c. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the Puyallup tribal Natural Resources Department at the address listed below at the same time it is submitted to EPA.

   Puyallup Tribe of Indians
   3009 E. Portland Avenue
   Tacoma, WA 98404
   ATTN: Natural Resources Department – Bill Sullivan and Char Naylor

d. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to Bill Sullivan and Char Naylor in the Puyallup Tribal Natural Resources Department for review.

e. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Bill Sullivan and Char Naylor in the Puyallup Tribal Natural Resources Department at the address listed above.

f. The permittee shall submit all stormwater pollution prevention plans to Bill Sullivan and Char Naylor in the Puyallup Tribal Natural Resources Department for review and approval prior to beginning any activities resulting in a discharge to tribal waters.

g. The permittee shall conduct benchmark monitoring for turbidity and nutrients, complying with Section 3 monitoring requirements.

h. The permittee shall notify Bill Sullivan and Char Naylor prior to conducting inspections at construction sites generating stormwater discharged to tribal waters.

Appendix A - Definitions and Acronyms

Definitions

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. See 50 CFR 402. For the purposes of this permit and for application of the Endangered Species Act requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as listed amphibians) are found in the ditch, swale, or gully.)
- The areas where stormwater from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls. (Example: Where a stormwater retention pond would be built.)
- The areas upstream and/or downstream from the stormwater discharge into a stream segment that may be affected by these discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

"Agricultural Land" - cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

"Antidegradation Policy" or "Antidegradation Requirements" - the water quality standards regulation that requires States and Tribes to establish a three-tiered antidegradation program:

1. Tier 1 maintains and protects existing uses and water quality conditions necessary to support such uses. An existing use can be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur. Where an existing use is established, it must be protected even if it is not listed in the water quality standards as a designated use. Tier 1 requirements are applicable to all surface waters.
2. Tier 2 maintains and protects "high quality" waters -- water bodies where existing conditions are better than necessary to support CWA § 101(a)(2) "fishable/swimmable"

uses. Water quality can be lowered in such waters. However, State and Tribal Tier 2 programs identify procedures that must be followed and questions that must be answered before a reduction in water quality can be allowed. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

3. Tier 3 maintains and protects water quality in outstanding national resource waters (ONRWs). Except for certain temporary changes, water quality cannot be lowered in such waters. ONRWs generally include the highest quality waters of the United States. However, the ONRW classification also offers special protection for waters of exceptional ecological significance, i.e., those which are important, unique, or sensitive ecologically. Decisions regarding which water bodies qualify to be ONRWs are made by States and authorized Indian Tribes.

"Arid Areas" – areas with an average annual rainfall of 0 to 10 inches.

"Bank" (e.g., stream bank or river bank) – the rising ground bordering the channel of a water of the U.S.

"Bluff" – a steep headland, promontory, riverbank, or cliff.

"Borrow Areas" – the areas where materials are dug for use as fill, either onsite or off-site.

"Bypass" – the intentional diversion of waste streams from any portion of a treatment facility. See 40 CFR 122.41(m)(1)(i).

"Cationic Treatment Chemical" – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

"Commencement of Earth-Disturbing Activities" - the initial disturbance of soils (or 'breaking ground') associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material).

"Commencement of Pollutant-Generating Activities" – at construction sites (for the purposes of this permit) occurs in any of the following circumstances:

- Clearing, grubbing, grading, and excavation has begun;
- Raw materials related to your construction activity, such as building materials or products, landscape materials, fertilizers, pesticides, herbicides, detergents, fuels, oils, or other chemicals have been placed at your site;
- Use of authorized non-stormwater for washout activities, or dewatering activities, have begun; or
- Any other activity has begun that causes the generation of or the potential generation of pollutants.

"Construction Activities" – earth-disturbing activities, such as the clearing, grading, and excavation of land.

"Construction and Development Effluent Limitations and New Source Performance Standards" (C&D Rule) – as published in 40 CFR § 450 is the regulation requiring effluent limitations guidelines

(ELG's) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

"Construction Site" – the land or water area where construction activities will occur and where stormwater controls will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether. The construction site is often a smaller subset of the lot or parcel within which the project is taking place.

"Construction Support Activities" – a construction-related activity that specifically supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas.

"Construction Waste" – discarded material (such as packaging materials, scrap construction materials, masonry products, timber, steel, pipe, and electrical cuttings, plastics, and styrofoam).

"Conveyance Channel" – a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

"Corrective Action" – for the purposes of the permit, any action taken to (1) repair, modify, or replace any stormwater control used at the site; (2) clean up and dispose of spills, releases, or other deposits found on the site; and (3) remedy a permit violation.

"Critical Habitat" – as defined in the Endangered Species Act at 16 U.S.C. 1531 for a threatened or endangered species, (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

"CWA" – the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

"Dewatering" – the act of draining rainwater and/or groundwater from building foundations, vaults, and trenches.

"Discharge" – when used without qualification, means the "discharge of a pollutant."

"Discharge of a Pollutant" – any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

"Discharge Point" – for the purposes of this permit, the location where collected and concentrated stormwater flows are discharged from the construction site.

"Discharge-Related Activity" – activities that cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction, and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged.

"Discharge to an Impaired Water" – for the purposes of this permit, a discharge to an impaired water occurs if the first water of the U.S. to which you discharge is identified by a State, Tribe, or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting an applicable water quality standard, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system.

"Domestic Waste" – for the purposes of this permit, typical household trash, garbage or rubbish items generated by construction activities.

"Drainageway" – an open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water.

"Drought-Stricken Area" – for the purposes of this permit, an area in which the National Oceanic and Atomospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif.

"Earth-Disturbing Activity" or "Land-Disturbing Activity" – actions taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

"Effective Operating Condition" – for the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

"Effluent Limitations" – for the purposes of this permit, any of the Part 2 or Part 3 requirements.

"Effluent Limitations Guideline" (ELG) – defined in 40 CFR § 122.2 as a regulation published by the Administrator under section 304(b) of CWA to adopt or revise effluent limitations.

"Electronic Notice of Intent" (eNOI) – EPA's online system for submitting electronic Construction General Permit forms.

"Eligible" – for the purposes of this permit, refers to stormwater and allowable non-stormwater discharges that are authorized for coverage under this general permit.

"Emergency-Related Project" – a project initiated in response to a public emergency (e.g., natural disaster, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

"Endangered Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose

protection under the provisions of this Act would present an overwhelming and overriding risk to man.

"Excursion" – a measured value that exceeds a specified limit.

"Existing Project" – a construction project that commenced construction activities prior to February 16, 2012 (April 9, 2012 for the State of Idaho, except for Indian Country; April 13, 2012 for areas in the state of Washington, except for Indian Country, subject to construction activity by a Federal Operator; May 9, 2012 for projects in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin).

"Exit Points" – any points of egress from the construction site to be used by vehicles and equipment during construction activities.

"Exposed Soils" – for the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

"Federal Operator" – an entity that meets the definition of "Operator" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

"Final Stabilization" – on areas not covered by permanent structures, either (1) vegetation has been established, or for arid or semi-arid areas, will be established that provides a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the natural background vegetative cover, or (2) non-vegetative stabilization methods have been implemented to provide effective cover for exposed portions of the site.

"Hazardous Materials" or "Hazardous Substances" or "Hazardous or Toxic Waste" – for the purposes of this permit, any liquid, solid, or contained gas that contain properties that are dangerous or potentially harmful to human health or the environment. See also 40 CFR §261.2.

"Historic Property" – as defined in the National Historic Preservation Act regulations means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

"Impaired Water" or "Water Quality Impaired Water" or "Water Quality Limited Segment" – for the purposes of this permit, waters identified as impaired on the CWA Section 303(d) list, or waters with an EPA-approved or established TMDL. Your construction site will be considered to discharge to an impaired water if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA pursuant to Section 303(d) of the CWA as not meeting an applicable water quality standard, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

"Impervious Surface" – for the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

"Indian Country" or "Indian Country Lands" – defined at 40 CFR §122.2 as:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

"Infeasible" – for the purpose of this permit, infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices. EPA notes that it does not intend for any permit requirement to conflict with state water rights law.

"Install" or "Installation" – when used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

"Intermittent (or Seasonal) Stream" – one which flows at certain times of the year when groundwater provides water for stream flow, as well as during and immediately after some precipitation events or snowmelt.

"Jar test" – a test designed to simulate full-scale coagulation/flocculation/sedimentation water treatment processes by taking into account the possible conditions.

"Landward" – positioned or located away from a waterbody, and towards the land.

"Level Spreader" – a temporary stormwater control used to spread stormwater flow uniformly over the ground surface as sheet flow to prevent concentrated, erosive flows from occurring.

"Linear Project" – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

"Minimize" – to reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

"Municipal Separate Storm Sewer System" or "MS4" – defined at 40 CFR §122.26(b)(8) as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and

4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"National Pollutant Discharge Elimination System" (NPDES) – defined at 40 CFR §122.2 as the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. The term includes an 'approved program.'

"Native Topsoil" – the uppermost layer of naturally occurring soil for a particular area, and is often rich in organic matter, biological activity, and nutrients.

"Native Vegetation" – the species of plants that have developed for a particular region or ecosystem and are considered endemic to that region or ecosystem.

"Natural Buffer" – for the purposes of this permit, an area of undisturbed natural cover surrounding surface waters within which construction activities are restricted. Natural cover includes the vegetation, exposed rock, or barren ground that exists prior to commencement of earth-disturbing activities.

"Natural Vegetation" – vegetation that occurs spontaneously without regular management, maintenance or species introductions, removals, and that generally has a strong component of native species.

"New Operator of a New or Existing Project" – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction project.

"New Project" – a construction project that commences construction activities on or after February 16 (or on or after April 9, 2012 for the State of Idaho, except for Indian Country; April 13, 2012 for areas in the state of Washington, except for Indian Country, subject to construction activity by a Federal Operator; May 9, 2012 for projects in the following areas: the Fond du Lac Band and Grand Portage Band of Lake Superior Chippewa in Minnesota; and the Bad River Band and Lac du Flambeau Band of Lake Superior Chippewa in Wisconsin).

"New Source" – for the purpose of this permit, a construction project that commenced construction activities after February 1, 2010.

"New Source Performance Standards (NSPS)" – for the purposes of this permit, NSPS are technology-based standards that apply to construction sites that are new sources under 40 CFR 450.24.

"Non-Stormwater Discharges" – discharges that do not originate from storm events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

"Non-Turbid" – a discharge that does not cause or contribute to an exceedence of turbidity-related water quality standards.

"Notice of Intent" (NOI) – the form (electronic or paper) required for authorization of coverage under the Construction General Permit.

"Notice of Termination" (NOT) – the form (electronic or paper) required for terminating coverage under the Construction General Permit.

"Operational" – for the purpose of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

"Operator" – for the purpose of this permit and in the context of stormwater discharges associated with construction activity, any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).

This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of stormwater associated with construction activity.

"Ordinary High Water Mark" – the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

"Outfall" – see "Discharge Point."

"Permitting Authority" – for the purposes of this permit, EPA, a Regional Administrator of EPA, or an authorized representative.

"Point(s) of Discharge" – see "Discharge Point."

"Point Source" – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

"Pollutant" – defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

"Pollutant-Generating Activities" – at construction sites (for the purposes of this permit), those activities that lead to or could lead to the generation of pollutants, either as a result of earth-disturbance or a related support activity. Some of the types of pollutants that are typically found at construction sites are:

- sediment;
- nutrients;
- heavy metals;
- pesticides and herbicides;
- oil and grease;
- bacteria and viruses;

- trash, debris, and solids;
- treatment polymers; and
- any other toxic chemicals.

"Pollution Prevention Measures" – stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

"Polymers" – for the purposes of this permit, coagulants and flocculants used to control erosion on soil or to enhance the sediment removal capabilities of sediment traps or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum chloride, and gypsum.

"Prohibited Discharges" – discharges that are not allowed under this permit, including:

1. Wastewater from washout of concrete;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Soaps or solvents used in vehicle and equipment washing;
5. Toxic or hazardous substances from a spill or other release; and
6. Waste, garbage, floatable debris, construction debris, and sanitary waste from pollutant-generating activities.

"Provisionally Covered Under this Permit" – for the purposes of this permit, EPA provides temporary coverage under this permit for emergency-related projects prior to receipt of a complete and accurate NOI. Discharges from earth-disturbing activities associated with the emergency-related projects are subject to the terms and conditions of the permit during the period of temporary coverage.

"Receiving Water" – a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

"Run-On" – sources of stormwater that drain from land located upslope or upstream from the regulated site in question.

"Semi-Arid Areas" – areas with an average annual rainfall of 10 to 20 inches.

"Site" – for construction activities, the land or water area where earth-disturbing activities take place, including construction support activities.

"Small Construction Activity" – defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A 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.

"Small Residential Lot" – for the purpose of this permit, a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

"Snowmelt" – the conversion of snow into overland stormwater and groundwater flow as a result of warmer temperatures.

"Spill" – for the purpose of this permit, the release of a hazardous or toxic substance from its container or containment.

"Stabilization" – the use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

"Steep Slopes" – where a state, Tribe, local government, or industry technical manual (e.g., stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

"Storm Sewer System" – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) designed or used for collecting or conveying stormwater.

"Stormwater" – stormwater runoff, snow melt runoff, and surface runoff and drainage.

"Stormwater Control Measure" - refers to any stormwater control, BMP, or other method (including narrative effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

"Stormwater Controls" – see "Stormwater Control measure."

"Stormwater Discharge Associated with Construction Activity" – as used in this permit, a discharge of pollutants in stormwater to waters of the United States from areas where land-disturbing activities (e.g., clearing, grading, or excavation) occur, or where 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.

"Stormwater Inlet" – a structure placed below grade to conduct water used to collect stormwater runoff for conveyance purposes.

"Stormwater Team" – the group of individuals responsible for oversight of the development and modifications of the SWPPP, and oversight of compliance with the permit requirements. The individuals on the "Stormwater Team" must be identified in the SWPPP.

"Storm Event" – a precipitation event that results in a measurable amount of precipitation.

"Storm Sewer" – a system of pipes (separate from sanitary sewers) that carries stormwater runoff from buildings and land surfaces.

"Subcontractor" – for the purposes of this permit, an individual or company that takes a portion of a contract from the general contractor or from another subcontractor.

"Surface Water" – a "Water of the United States" as defined in 40 CFR §122.2.

"SWPPP" (Stormwater Pollution Prevention Plan) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes stormwater control measures to reduce or eliminate pollutants in stormwater discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of this general permit.

"Temporary Stabilization" – a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

"Thawing Conditions" – for the purposes of this permit, thawing conditions are expected based on the historical likelihood of two or more days with daytime temperatures greater than 32˚F. This date can be determined by looking at historical weather data. Note: the estimation of thawing conditions is for planning purposes only. During construction the permittee will be required to conduct site inspections based upon actual conditions (i.e., if thawing conditions occur sooner than expected, the permittee will be required to conduct inspections at the regular frequency).

"Threatened Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

"Tier 2 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(2), those waters thatare characterized as having water quality that exceeds the levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

"Tier 2.5 Waters" – for antidegradation purposes, those waters designated by States or Tribes as requiring a level of protection equal to and above that given to Tier 2 waters, but less than that given Tier 3 waters. Some States have special requirements for these waters.

"Tier 3 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(3), Tier 3 waters are identified by states as having high quality waters constituting an Outstanding Natural Resource Water (ONRW), such as waters of National Parks and State Parks, wildlife refuges, and waters of exceptional recreational or ecological significance.

"Total Maximum Daily Load" or "TMDL" – the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

"Toxic Waste" – see "Hazardous Materials."

"Turbidity" – a condition of water quality characterized by the presence of suspended solids and/or organic material.

"Uncontaminated Discharge" – a discharge that does not cause or contribute to an exceedence of applicable water quality standards.

"Upland" - the dry land area above and 'landward' of the ordinary high water mark.

"Upset" – Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

"Water-Dependent Structures" – structures or facilities that are required to be located directly adjacent to a waterbody or wetland, such as a marina, pier, boat ramp, etc.

"Water Quality Standards" – defined in 40 CFR § 131.3, and are provisions of State or Federal law which consist of a designated use or uses for the waters of the United States, water quality criteria for such waters based upon such uses, and an antidegradation policy to protect high-quality waters. Water quality standards protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

"Waters of the United States" – defined at 40 CFR §122.2 as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters, including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    c. Which are used or could be used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (1) through (4) of this definition;
6. The territorial sea; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

In applying this definition, EPA will consider applicable Court cases and current guidance.

"Wetland" – those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. On-site evaluations are typically required to confirm the presence and boundaries of wetlands.

"Work day" – for the purposes of this permit, a work day is a calendar day on which construction activities will take place.

Acronyms

C&D – Construction & Development

CGP – Construction General Permit

CFR – Code of Federal Regulations

CWA – Clean Water Act

eNOI – Electronic Notice of Intent

EPA – United States Environmental Protection Agency

ESA – Endangered Species Act

FWS – United States Fish and Wildlife Service

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi-Sector General Permit

NMFS – United States National Marine Fisheries Service

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

NRC – National Response Center

NRCS – National Resources Conservation Service

POTW – Publicly Owned Treatment Works

SPCC – Spill Prevention Control and Countermeasure

SWPPP – Stormwater Pollution Prevention Plan

TMDL – Total Maximum Daily Load

USGS – United States Geological Survey

WQS – Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage

Permit coverage for stormwater discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits:

B.1 EPA Region 1: CT, MA, ME, NH, RI, VT

US EPA, Region 01
Office of Ecosystem Protection
NPDES Stormwater Program
5 Post Office Square
Boston, MA 02109-3912

The States of Connecticut, Maine, Rhode Island, and Vermont are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
CTR12000I	Indian country within the State of Connecticut
MAR120000	Commonwealth of Massachusetts (except Indian country)
MAR12000I	Indian country within the State of Massachusetts
NHR120000	State of New Hampshire
RIR12000I	Indian country within the State of Rhode Island
VTR12000F	Areas in the State of Vermont subject to construction by a Federal Operator

B.2 EPA Region 2: NJ, NY, PR, VI

For NJ, NY, and VI:
US EPA, Region 02
NPDES Stormwater Program
290 Broadway, 24th Floor
New York, NY 10007-1866

For PR:
US EPA, Region 02
Caribbean Environmental Protection Division
NPDES Stormwater Program
1492 Ponce de Leon Ave
Central Europa Building, Suite 417
San Juan, PR 00907-4127

The State of New York is the NPDES Permitting Authority for the majority of discharges within its state. The State of New Jersey and the Virgin Islands are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR12000I	Indian country within the State of New York
PRR120000	Commonwealth of Puerto Rico

B.3 EPA Region 3: DE, DC, MD, PA, VA, WV

US EPA, Region 03
NPDES Stormwater Program
1650 Arch St
Philadelphia, PA 19103

The State of Delaware is the NPDES Permitting Authority for the majority of discharges within its state. Maryland, Pennsylvania, Virginia, and West Virginia are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
DCR120000	District of Columbia
DER12000F	Areas in the State of Delaware subject to construction by a Federal Operator

B.4 EPA Region 4: AL, FL, GA, KY, MS, NC, SC, TN

US EPA, Region 04
Water Protection Division
NPDES Stormwater Program
61 Forsyth St SW
Atlanta, GA 30303-3104

The States of Alabama, Florida, Mississippi, and North Carolina are the NPDES Permitting Authority for the majority of discharges within their respective States. EPA Region 4 is the NPDES Permitting Authority for all Indian country lands within any other Region 4 State except Catawba lands in South Carolina.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ALR12000I	Indian country within the State of Alabama
FLR12000I	Indian country within the State of Florida
MSR12000I	Indian country within the State of Mississippi
NCR12000I	Indian country within the State of North Carolina
RE412000I	Indian country within any other Region 4 State (except Catawba lands in South Carolina)

B.5 EPA Region 5: IL, IN, MI, MN, OH, WI

US EPA, Region 05
NPDES & Technical Support
NPDES Stormwater Program
77 W Jackson Blvd
(WN-16J)
Chicago, IL 60604-3507

The States of Michigan, Minnesota, and Wisconsin are the NPDES Permitting Authority for the majority of discharges within their respective states. The States of Illinois, Indiana, and Ohio are the NPDES Permitting Authorities for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
MIR10000I	Indian country within the State of Michigan
MNR10000I	Indian country within the State of Minnesota
WIR10000I	Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community

B.6 EPA Region 6: AR, LA, OK, TX, NM (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands)

US EPA, Region 06
NPDES Stormwater Program
1445 Ross Ave, Suite 1200
Dallas, TX 75202-2733

The States of Louisiana, Oklahoma, and Texas are the NPDES Permitting Authority for the majority of discharges within their respective state. The State of Arkansas is the NPDES Permitting Authority for all discharges within its respective state.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
LAR12000I	Indian country within the State of Louisiana
NMR120000	State of New Mexico, except Indian country
NMR12000I	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.
OKR12000I	Indian country within the State of Oklahoma
OKR12000F	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR12000F	Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR12000I	Indian country within the State of Texas

B.7 EPA Region 7: IA, KS, MO, NE (except see Region 8 for Pine Ridge Reservation Lands)

US EPA, Region 07
NPDES Stormwater Program
901 N 5th St
Kansas City, KS 66101

The States of Iowa, Kansas, and Nebraska are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Missouri is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
IAR12000I	Indian country within the State of Iowa
KSR12000I	Indian country within the State of Kansas
NER12000I	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)

B.8 EPA Region 8: CO, MT, ND, SD, WY, UT (except see Region 9 for Goshute Reservation and Navajo Reservation Lands), the Ute Mountain Reservation in NM, and the Pine Ridge Reservation in NE.

US EPA, Region 08
NPDES Stormwater Program
999 18th St, Suite 300
(EPR-EP)
Denver, CO 80202-2466

The States of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
COR12000F	Areas in the State of Colorado, except those located on Indian country, subject to construction activity by a Federal Operator
COR12000I	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR12000I	Indian country within the State of Montana
NDR12000I	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10000I listed below)
SDR12000I	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10000I listed above)
UTR12000I	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR12000I	Indian country within the State of Wyoming

B.9 EPA Region 9: CA, HI, NV, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Goshute Reservation in UT and NV, the Navajo Reservation in UT, NM, and AZ, the Duck Valley Reservation in ID, and the Fort McDermitt Reservation in OR.

US EPA, Region 09
NPDES Stormwater Program
75 Hawthorne St
San Francisco, CA 94105-3901

The States of Arizona, California and Nevada are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Hawaii is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ASR120000	Island of American Samoa
AZR12000I	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR12000I	Indian country within the State of California
GUR120000	Island of Guam
JAR120000	Johnston Atoll
MPR120000	Commonwealth of the Northern Mariana Islands
MWR120000	Midway Island and Wake Island
NVR12000I	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah

B.10 EPA Region 10: AK, WA, ID (except see Region 9 for Duck Valley Reservation Lands), and OR (except see Region 9 for Fort McDermitt Reservation).

US EPA, Region 10
NPDES Stormwater Program
1200 6th Ave (OW-130)
Seattle, WA 98101-1128
Phone: (206) 553-6650

The States of Oregon and Washington are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
AKR12000I	Indian country within the State of Alaska
AKR12-000F	Areas in the the Denali National Park and Preserve subject to construction by a Federal Operator
IDR120000	State of Idaho, except Indian country
IDR12000I	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR12000I	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR12000F	Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator
WAR12000I	Indian country within the State of Washington

Appendix C - Small Construction Waivers and Instructions

These waivers are only available to stormwater discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

C.1 Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity. The operator must certify to EPA that construction activity will occur only when the rainfall erosivity factor is less than 5. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the construction general permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

> *Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.*

EPA has developed an online rainfall erosivity calculator to help small construction sites determine potential eligibility for the rainfall erosivity waiver. You can access the calculator from EPA's website at:www.epa.gov/npdes/stormwater/lew. The R factor can easily be calculated by using the construction site latitude/longitude or address and estimated start and end dates of construction. This calculator may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver. Use this online calculator or the Construction Rainfall Erosivity Waiver Fact Sheet (www.epa.gov/npdes/pubs/fact3-1.pdf) to assist in determining the R Factor for your small construction site.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you can submit a rainfall erosivity waiver electronically via EPA's eNOI system (www.epa.gov/npdes/cgpenoi) or provide the following information on the waiver certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The rainfall erosivity factor calculation that applies to the active construction phase at your project site; and
5. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, which certifies that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five.

You can access the waiver certification form from EPA's website at: (http://www.epa.gov/npdes/pubs/construction_waiver_form.pdf). Paper copies of the form must be sent to one of the addresses listed in Part C.4 of this section.

Note: If the R factor is 5 or greater, you cannot apply for the rainfall erosivity waiver, and must apply for NPDES permit coverage, unless you qualify for the Water Quality Waiver as described in section B below.

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five (5), you must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of your records. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is 5 or above, you must obtain NPDES permit coverage.

C.2 TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern for the impaired water and has determined that controls on stormwater discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at http://www.epa.gov/owow/tmdl/ and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA-established or approved TMDL, you must provide the following information on the Waiver Certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;

3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the TMDL.

C.3 Equivalent Analysis Waiver

This waiver is available for non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his/her small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the equivalent analysis.

C.4 Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.
2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of stormwater associated with small construction activity, provided you qualify for the waiver. Any discharge of stormwater associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must apply for a permit. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate Rainfall Erosivity waiver certifications not otherwise submitted electronically via EPA's eNOI system (www.epa.gov/npdes/cgpenoi) must be sent to one of the following addresses:

Regular U.S. Mail Delivery
EPA Stormwater Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Overnight/Express Mail Delivery
EPA Stormwater Notice Processing Center
Room 7420
U.S. EPA
1201Constitution Avenue, NW
Washington, DC 20004

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Region office specified in Appendix B.

Appendix D - Endangered Species Act Requirements

The purpose of this guidance is to assist you in complying with the requirements in Part 1.1.e of the permit requiring you to demonstrate that you meet one of the criteria listed in this appendix with respect to the protection of any and all species that are federally-listed as endangered or threatened under the Endangered Species Act (ESA) or of habitat that is federally-designated as "critical habitat" under the ESA in order to be eligible for coverage under this permit.

This guidance provides you information on the following:

- **Section D.1:** ESA Eligibility Criteria
- **Section D.2:** Guidance for Determining Which ESA Criteria Applies

D.1 ESA Eligibility Criteria

You must certify in your NOI that you meet one of the eligibility criteria listed below in order to be eligible for coverage under this permit. You must also specify in the NOI the basis for your selection of the applicable eligibility criterion.

> Note: (1) Regardless of the criterion selected, you must provide documentation in your SWPPP that is sufficient to support your determination that you satisfy the requirements of the particular criterion. (2) While coordination between you and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service (together, the "Services") is not necessarily required in all cases, EPA encourages you to coordinate with the Services and to do so early in the planning process prior to submitting your NOI.

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of this permit.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility criteria in this section to remain eligible for coverage under this permit. Documentation of these requirements must be kept as part of your SWPPP (see Part 7.2.14.1).

D.2 Guidance for Determining Which Criterion Applies

Part 1.1.5 of the permit requires that you meet one of the six criteria listed above in order to be eligible for coverage under the permit.

You must follow the procedures in Steps 1through 6 to determine the ESA criterion under which your site is eligible for permit coverage.

D.2.1 Step 1 - Determine if Your Discharges and Discharge-Related Activities Were Already Addressed in Another Operator's Valid Certification that Included Your Action Area.

- **If your discharges and discharge-related activities <u>were</u> already addressed in another operator's valid certification that included your action area** (e.g., a general contractor or developer may have completed and filed an NOI for the entire action area with the necessary ESA certifications (Criterion A, C, D, E, or F)), *you may select eligibility Criterion B on your Notice of Intent form*.

  By certifying eligibility under Criterion B, you must comply with any terms and conditions imposed under the eligibility requirements of Criterion A, C, D, E, or F to ensure that your discharges and discharge-related activities are protective of listed species and/or critical habitat.

  > Note: If you are unable to meet these eligibility requirements, then you may either establish eligibility under one of the other criterion, or you may consider applying to EPA for an individual permit.

  Under Criterion B, you must provide documentation in your SWPPP of any of these terms and conditions, as well as the other operator's basis for establishing eligibility. You must also provide a description of the basis for your selection of Criterion B on your NOI form, including the eligibility criterion (A, C, D, E, or F) that was certified to by the previous operator, and must provide the Tracking Number from the other operator's notification of authorization under this permit.

  If your certification is based on another operator's certification under criterion C, you must provide the documentation required in the NOI for criterion C, namely: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) what is the distance between your site and the listed species or designated critical habitat (in miles).

- **If discharges and discharge-related activities from your site <u>were not</u> addressed in another operator's valid certification that included your action area,** you must follow the applicable procedures in Steps 2 through 5 below.

D.2.2 Step 2 - Determine if Listed Threatened or Endangered Species or their Designated Critical Habitat(s) are Likely to Occur in your Site's Action Area

You must determine, to the best of your knowledge, whether species listed as either threatened or endangered, or their critical habitat(s) (see definitions of these terms in Appendix A), are located in your site's action area. To make this determination, you should first determine if listed species and/or critical habitat are expected to exist in your county or township. The local offices of the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and State or Tribal Heritage Centers often maintain lists of federally listed endangered or threatened species on their internet sites. For FWS

terrestrial and aquatic species information, you can use FWS' on-line mapping tool, the Information, Planning, and Consultation (IPAC) System, located at http://www.fws.gov/ipac/.

Note: To determine the field office that corresponds to your project site, visit http://www.fws.gov/endangered/regions/index.html and http://www.nmfs.noaa.gov/ (under the left tabe for "Regions").

In most cases, species and/or critical habitat lists allow you to determine if any such species or habitat exists in your county or township. You can also find critical habitat designations and associated requirements at 50 CFR Parts 17 and 226. http://www.access.gpo.gov.

- ***If there <u>are</u> listed species and/or critical habitat in your county or township***, you should contact your local FWS, NMFS, or State or Tribal Heritage Center to determine if the listed species are known to exist in your action area and if any critical habitat areas have been designated that overlap your action area.
    - If your local FWS, NMFS, or State or Tribal Heritage Center indicates that these species and/or critical habitat could exist in your action area, you must:
        - Do **one or more** of the following:
            - Conduct visual inspections. This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal stormwater collection systems.
            - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive stormwater discharges, biological surveys may be an appropriate way to assess whether species are located in the action area and whether there are likely to be adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms. A biological survey may in some cases be useful to conduct in conjunction with Steps Two, Three, or Four of these instructions.
            - If required, conduct an environmental assessment under the National Environmental Policy Act (NEPA). Some construction activities might require review under NEPA for specific reasons, such as federal funding or other federal involvement in the project. Note: Coverage under the CGP does not trigger such a review for individual projects/sites. EPA has complied with NEPA in the issuance of the CGP.

and

- Follow the instructions in Steps 3 – 5 below, as applicable. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

- ***If there are <u>no</u> listed species in your county or township and <u>no</u> critical habitat areas in your action area,*** *you may check eligibility criterion A on your NOI form*. You must also provide a description of the basis for the criterion selected on your NOI form and provide documentation supporting the criterion selected in your SWPPP.

D.2.3 Step 3 - Determine if the Construction Activity's Discharges or Discharge-Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat

If in Step 2 you determine based on communication with your local FWS, NMFS, or State or Tribal Heritage Center, or other determination, that listed species and/or critical habitat could exist in your action area, you must next assess whether your discharges or discharge-related activities are likely to adversely affect listed threatened or endangered species or designated critical habitat.

Potential adverse effects from discharges and discharge-related activities include:

- *Hydrological*. Stormwater discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a stormwater discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.

- *Habitat*. Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of stormwater controls, may adversely affect listed species or their habitat. Stormwater may drain or inundate listed species habitat.

- *Toxicity*. In some cases, pollutants in stormwater may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you should contact the appropriate office of the FWS, NMFS or Natural Heritage Center for assistance.

- ***If adverse effects to listed threatened or endangered species or their critical habitat <u>are not</u> likely***, *then you may select eligibility criterion C on the NOI form*. You must provide the following specific information on your NOI form: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) what is the distance between your site and the listed species or

designated critical habitat (in miles). You must also provide a copy of your site map with your NOI.

- ***If adverse effects to listed threatened or endangered species or their critical habitat <u>are</u> likely***, you must follow Step 4 below.

D.2.4 Step 4 - Determine if Measures Can Be Implemented to Avoid Adverse Effects

If you make a preliminary determination in Step 3 that adverse effects from your construction activity's discharges or discharge-related activities are likely to occur, you can still receive coverage under eligibility criterion C of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage.

These measures may involve relatively simple changes to construction activities such as re-routing a stormwater discharge to bypass an area where species are located, relocating stormwater controls, or by modifying the "footprint" of the construction activity. If you are unable to ascertain which measures to implement to avoid the likelihood of adverse effects, you must coordinate or enter into consultation with the FWS and/or NMFS, in which case you would not be eligible for coverage under eligibility criterion C, but may instead be eligible for coverage under eligibility criterion D, E, or F (described in more detail in Step 5).

- **If you are able to install and implement appropriate measures to avoid the likelihood of adverse effects,** *then you may check eligibility criterion C on the NOI form*. The measures you adopt to avoid or eliminate adverse affects must be implemented for the duration of the construction project and your coverage under the CGP. You must also provide a description of the basis for the criterion selected , and the following specific information on your NOI form: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) what is the distance between your site and the listed species or designated critical habitat (in miles).

- **If you cannot ascertain which measures to implement to avoid the likelihood of adverse effects,** you must follow the procedures in Step 5**.**

D.2.5 Step 5 - Determine if the Eligibility Requirements of Criterion D, E, or F Can Be Met

If in Step 4 you cannot ascertain which measures to implement to avoid the likelihood of adverse effects, you must contact the FWS and/or NMFS. You may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting criterion D, E, or F.

- **Criterion D:** You have coordinated with the Services and have addressed the effects of your site's discharges on federally-listed threatened or endangered species and federally-designated critical habitat, which resulted in a written concurrence from the relevant Service(s) that your site's discharges are not likely to adversely affect listed species or critical habitat.

  If you have met the requirements of criterion D, *you may select eligibility criterion D on the NOI form*. You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between you and the applicable Service in your SWPPP.

- **Criterion E:** Formal or informal ESA section 7 consultation is performed with the FWS and/or NMFS and that consultation addresses the effects of your discharges and discharge-related activities on federally-listed and threatened species and designated critical habitat. In order to be eligible for coverage under this permit, consultation must result in a "no jeopardy opinion" or a written concurrence by the Service(s) on a finding that your stormwater discharge(s) and stormwater discharge-related activities are not likely to adversely affect listed species or critical habitat (For more information on consultation, see 50 CFR §402). If you receive a "jeopardy opinion," you may continue to work with the FWS and/or NMFS and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

  Note that most consultations are accomplished through informal consultation. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify FWS and/or NMFS of your intention and agreement to conduct consultation as a non-federal representative.

  Consultation may occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation). Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

  Whether ESA section 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species that may be affected by the operator's activity. In general, NMFS has jurisdiction over marine, estuarine, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

  If you have met the requirements of criterion E, *you may select eligibility criterion E on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

- **Criterion F:** Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and that authorization addresses the effects of your discharge(s) and discharge-related activities on federally-listed species and designated critical habitat. You must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22 for NMFS). Application instructions for section 10 permits for FWS and NMFS can be obtained by accessing the FWS and NMFS websites (http://www.fws.gov and http://www.nmfs.noaa.gov) or by contacting the appropriate FWS and NMFS regional office.

  If you have met the requirements of criterion F, *you may select eligibility criterion F on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

Appendix E – Historic Property Screening Process

Background

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of Federal "undertakings", such as the issuance of this permit, on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. To address any issues relating to historic properties in connection with the issuance of this permit, EPA has developed the screening process in this appendix that enables construction operators to appropriately consider the potential impacts, if any, of their installation of stormwater controls on historic properties and to determine whether actions can be taken, if applicable, to mitigate any such impacts. Although the coverages of individual construction sites under this permit do not constitute separate Federal undertakings, the screening process in this appendix provides an appropriate site-specific means of addressing historic property issues in connection with EPA's issuance of the permit.

Key Terms

Historic property- prehistoric or historic districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and remains that are related to and located within such properties

SHPO – The State Historic Preservation Officer for a particular state

THPO or Tribal representative – The Tribal Historic Preservation Officer for a particular Tribe or, if there is no THPO, the representative designated by such Tribe for NHPA purposes

Instructions for All Construction Operators

You are required to follow the screening process in this appendix to determine if your installation of stormwater controls on your site has the potential to cause effects to historic properties, and whether or not you need to contact your SHPO, THPO, or other tribal representative for further information. You may not submit your NOI until you have completed this screening process. The following four steps describe how applicants can meet the historic property requirements under this permit:

Step 1 *Are you installing any stormwater controls that require subsurface earth disturbance?*

The first step of the screening process is to determine if you will install stormwater controls that cause subsurface earth disturbance. The installation of the following types of stormwater controls require subsurface earth disturbance:

- Dikes
- Berms
- Catch Basins
- Ponds
- Ditches
- Trenches
- Culverts
- Channels
- Perimeter Drains

- Swales

Note: This list is not intended to be exhaustive. Other stormwater controls that are not on this list may involve earth-disturbing activities and must also be examined for the potential to affect historic properties.

Note: You are only required to consider earth-disturbing activities related to the installation of stormwater controls in the NHPA screening process. You are not reqired to conside other earth-disturbing activities a the site. If you are installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, your project has the potential to have an effect on historic properties. If this is the case, then you must proceed to Step 2.

If you are not installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, then you may indicate this on your NOI, and no further screening is necessary. During the 14-day waiting period after submitting your NOI, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

<u>Step 2</u> *Have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances precluded the existence of historic properties?*

If you are installing a stormwater control that requires subsurface earth disturbance, you must next determine if it has already been determined that no historic properties exist on your site based on prior professional cultural resource surveys or other evaluations, or that the existence of historic properties has been precluded because of prior earth disturbances.

If prior to your project it has already been determined that no historic properties exist at your site based on available information, including information that may be provided by your applicable SHPO, THPO, or other tribal representative, then you may indicate this on your NOI, and no further screening steps are necessary. Similarly, if earth disturbances that have occurred prior to your project have eliminated the possibility that historic properties exist on your site, you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

If neither of these circumstances exists for your project, you must proceed to Step 3.

<u>Step 3</u> *If you are installing any stormwater controls that require subsurface earth disturbance, you must determine if these activities will have an effect on historic properties.*

If your answer to the questions in Steps 1 and 2 is "no", *then you must assess whether your earth-disturbing activities related to the installation of stormwater controls will have an effect on historic properties. This assessment may be based on historical sources, knowledge of the area, an assessment of the types of earth-disturbing activities you are engaging in, considerations of*

any controls and/or management practices you will adopt to ensure that your stormwater control-related earth-disturbing activities will not have an effect on historic properties, and any other relevant factors. If you determine based on this assessment that earth disturbances related to the installation of yous stormwater controls will not cause effects to historic properties, you may indicate this on your NOI, and document the basis for your determinatioin in your SWPPP and no further screening steps are necessary. In this case you must also attach a copy of your site map to your NOI. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

If none of the circumstances in Steps 1-3 exist for your project, you must proceed to Step 4.

<u>Step 4:</u> *If you are installing any stormwater controls that require subsurface earth disturbance and you have not satisfied the conditions in Steps 1-3, you must contact and consult with the appropriate historic preservation authorities.*

Where you are installing stormwater controls that require subsurface earth disturbance, and you cannot determine in Step 3 that these activities will not have effects on historic properties, then you must contact the relevant SHPO, THPO, or other tribal representative to request their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of these controls.

> *Note: Addresses for SHPOs and THPOs may be found on the Advisory Council on Historic Preservation's website (www.achp.gov/programs.html). In instances where a Tribe does not have a THPO you should contact the appropriate Tribal government office designated by the Tribe for this purpose when responding to this permit eligibility condition.*

You must submit the following minimum information in order to properly initiate your request for information:

1. Project name (*i.e.*, the name or title most commonly associated with your project);
2. A narrative description of the project;
3. Name, address, phone and fax number, and email address (if available) of the operator;
4. Most recent U.S. Geological Survey (USGS) map section (7.5 minute quadrangle) showing actual project location and boundaries clearly indicated; and
5. Sections of SWPPP site map (see Part 7.2.6) that show locations where stormwater controls that will cause subsurface earth disturbance will be installed (see Step 1).

Without submitting this minimum information, you will not have been considered to have properly initiated your request. You will need to provide the SHPO, THPO, or other tribal representative a minimum of15 calendar days after they receive these materials to respond to your request for information about your project. You are advised to get a receipt from the post office or other carrier confirming the date on which your letter was received.

If you do not receive a response within15 calendar days after receipt by the SHPO, THPO, or other tribal representative of your request, then you may indicate this on your NOI, and no further screening steps are necessary. Or, if the applicable SHPO, THPO, or other tribal representative responds to your request with an indication that no historic properties will be affected by the installation of stormwater controls at your site, then you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

If within 15 calendar days of receipt of your request the applicable SHPO, THPO, or other tribal representative responds with a request for additional information or for further consultation regarding appropriate measures for treatment or mitigation of effects on historic properties caused by the installation of stormwater controls on your site, you must comply with this request and proceed to Step 5.

Step 5: *Consultation with your applicable SHPO, THPO, or other tribal representative*.

If, following your discussions with the appropriate historic preservation authorities in Step 4, the applicable SHPO, THPO, or other tribal represenative requests additional information or further consultation, you must respond with such information or to consult to determine impacts to historic properties that may be caused by the installation of stormwater controls on your site and appropriate measures for treatment or mitigation of such impacts. If as a result of your discussions with the applicable SHPO, THPO, or tribal representative, you enter into, and comply with, a written agreement regarding treatment and/or mitigation of impacts on your site, then you may indicate this on your NOI, and no further screening steps are necessary.

If, however, agreement on an appropriate treatment or mitigation plan cannot be reached between you and the SHPO, THPO, or other tribal representative within 30 days of your response to the SHPO, THPO, or other tribal representative's request for additional information or further consultation, you may submit your NOI, but you must indicate that you have not negotiated measures to avoid or mitigate such effects. You must also include in your SWPPP the following documentation:

1. Copies of any written correspondence between you and the SHPO, THPO, or other tribal representative; and
2. A description of any significant remaining disagreements as to mitigation measures between you and the SHPO, THPO, or other tribal representative.

After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, ACHP or other tribal representative may request that EPA place a hold on authorization based upon concerns regarding potential adverse effects to historic properties. EPA, in coordination with the ACHP, will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

Appendix F - List of Tier 3, Tier 2, and Tier 2.5 Waters

EPA's CGP has special requirements for discharges to waters designated by a state or tribe as Tier 2/2.5 or Tier 3 for antidegradation purposes under 40 CFR 131.12(a). See Parts 1.2.3 and 3.3.

The list below is provided as a resource for operators who must determine whether they discharge to a Tier 2/2.5 or Tier 3 water. Only Tier 2/2.5 or Tier 3 waters specifically identified by a water quality standard authority (e.g., a state, territory, or tribe) are identified in the table below. Many authorities evaluate the existing and protected quality of the receiving water on a pollutant-by-pollutant basis and determine whether water quality is better than the applicable criteria that would be affected by a new discharge or an increase in an existing discharge of the pollutant. In instances where water quality is better, the authority may choose to allow lower water quality, where lower water quality is determined to be necessary to support important social and economic development. Permittees are not required to identify those waters which are evaluated on an individual basis.

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
MAR120000	**Commonwealth of Massachusetts, except Indian Country lands**	
	Tier 2 and Tier 2.5 waters are identified and listed in 314 CMR 4.06 Basin Classification. (314 CMR 4 can be found at DEP's web page at http://www.mass.gov/dep/service/regulations/314cmr04.pdf)	
	Tier 2	Tier 2 waters are listed on a parameter-by-parameter basis.
	Tier 2.5	Tier 2.5 waters are listed as "outstanding resource waters" on the website: http://www.mass.gov/dep/water/laws/tblfig.pdf
NHR120000	**State of New Hampshire**	
	Tier 2/2.5	There is no list of Tier 2/Tier 2.5 waters. New dischargers should contact Ken Edwardson at Kenneth.Edwardson@des.nh.gov.
	Tier 3	Env-Ws 1708.05(a) Surface waters of national forests and surface waters designated as "natural" under RSA 483:7-a, I shall be considered outstanding resource waters (ORW). "Natural waters" are listed at http://www.gencourt.state.nh.us/rsa/html/L/483/483-15.htm. Surface waters of national forests are not included in an official list. For further questions, new dischargers should contact Thelma Murphy (EPA Region 1's stormwater coordinator) at murphy.thelma@epa.gov.
PRR120000	**Commonwealth of Puerto Rico**	
	Tier 3	Tier III waters are those which are classified as either Class SA or Class SE. Class SA waters are defined as "Coastal waters and estuarine waters of high quality and/or exceptional ecological or recreational value whose existing characteristics shall not be altered, except by natural causes, in order to preserve the existing natural phenomena." Class SA waters include bioluminiscent lagoons and bays such as La Parguera and Monsio José on the Southern Coast, Bahía de Mosquito in Vieques, and any other coastal or estuarine waters of exceptional quality of high ecological value or recreational which may be designated by Puerto Rico, through Resolution, as requiring this classification for protection of the waters. Class SE waters are defined

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		as "Surface waters and wetlands of exceptional ecological value, whose existing characteristics should not be altered in order to preserve the existing natural phenomena." Class SE waters include Laguna Tortuguero, Laguna Cartagena and any other surface water bodies of exceptional ecological value as may be designated by Puerto Rico through Resolution.
DCR120000	**District of Columbia**	
	Tier 2/2.5	Rock Creek and its tributaries and Battery Kemble Creek and its tributaries are considered Special Waters of the District of Columbia (SWDC) under its antidegradation program.
MNR12000I	**Fond du Lac Band of MN Chippewa**	
	Tier 3	Six lakes are presently identified as Tier 3: (1) Dead Fish, (2) Jaskari, (3) Miller (Mud), (4) Perch, (5) Rice Portage, (6) Wild Rice.
	Grand Portage Band of MN Chippewa	
	Tier 2/2.5	All waters, not already classified as Tier 3, are high quality Tier 2 waters. (see Grand Portage Reservation Water Quality Standards, Section VI & VII, Pages 14-16).
	Tier 3	"The portion of Lake Superior north of latitude 47 degrees, 57 minutes, 13 seconds, east of Hat Point, south of the Minnesota-Ontario boundary, and west of the Minnesota-Michigan boundary." (see Section VII, Page 16).
WIR12000I	**Lac du Flambeau Band of the Lake Superior Chippewa**	
	Tier 2	All named waters, including wetlands, not specified under an antidegradation classification.
	Tier 2.5	Bills Lake, Birch Lake, Bobidosh Lake, Bog Lake (SE SE Sec. 31, T40NR6E), Bolton Lake, Broken Bow Lake, Chewalah Lake, Clear Lake (Sec. 2, T39NR4E), Corn Great, Great, Corn Lake, Little "Least/Lesser", Crawling Stone Lake, Big, Crawling Stone Lake, Little, Crescent Lake, Crooked Lake, Big, David Lake, Ellerson Lake, Middle, Ellerson Lake, West, Elsie Lake "Boundary Lake", Fat Lake, Fence Lake, Gresham Creek, Green Lake (NW NW Sec. 19, T41R6E), Grey Lake, Gunlock Lake, Haskell Lake, Headflyer Lake (Sec. 19, T41NR5E), Highway Lake (NW NW Sec. 19, T41NR5E), Horsehead Lake (SE SW Sec. 9, T40NR5E), Hutton's Creek, Ike Walton Lake, Lily Lake (SE SW Sec. 35, T40NR5E), Little Ten Lake, Lodge Lake "L. Rice" (NW NW Sec. 8, T41NR6E), Lucy Lake, Mindys Lake (Sec. 8, T40NR5E), Minette Lake, Mitten Lake, Monk's Lake (Sec. 13, T40NR5E), Moving Cloud Lake, Mud Creek, Muskesin Lake, Patterson Lake, Placid Twin Lake (North), Placid Twin Lake (South), Plummer Lake, Poupart Lake, Prairie Lake (NE SW Sec. 13, T40NR4E), Raven Lake, Ross Allen Lake, Sand Lake, Little, Scott Lake (Sec. 22, T40N, R4E), Shishebogama Lake, Signal Lake, Snort Lake (Sec. 5, T41N, R6E), Spring Lake "Jerms", Squirrel Lake, Statenaker Lake "Hollow", Stearns Lake "Hourglass", Sugarbush "Hidden Lake" (NW NW Sec. 17, T41NR5E), Sugarbush Creek, Sugarbush Lake, Little, Sugarbush Lake, Lower, Sugarbush Lake, Middle, Sugarbush Lake, Upper, Sunfish Lake, Tippecanoe Lake, Tomahawk River, To-To Tom Lake, Toulish Lake, Trout River, Warrior Lake, White Sand Lake, Whitefish Lake

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		"Cattail Lake" (Sec. 34, T40N5R), Wishow Lake, Wyandock Lake
	Tier 3	Bear River (1st bridge to Reservation boundary), Big Springs (Sec. 25, T40NR4E), Black Lake, Cranberry Lake, Doud Lake, Eagle Lake, Gene Lake, Johnson Springs, Little Trout Lake, Lost Lake (Sect. 1, T41NR4E), Mishonagon Creek, Munnomin (Jesse, Duck) Lake, Negani (Hegani) Lake, Reservation Line Lake, Spring Creek, Tank Lake, Thomas Lake, Wild Rice Lake, Zee Lake
NMR120000	**State of New Mexico**	
	Tier 3	(1) Rio Santa Barbara, including the west, middle and east forks from their headwaters downstream to the boundary of the Pecos Wilderness; and (2) the waters within the United States forest service Valle Vidal special management unit including: (a) Rio Costilla, including Comanche, La Cueva, Fernandez, Chuckwagon, Little Costilla, Holman, Gold, Grassy, LaBelle and Vidal creeks, from their headwaters downstream to the boundary of the United States forest service Valle Vidal special management unit; (b) Middle Ponil creek, including the waters of Greenwood Canyon, from their headwaters downstream to the boundary of the Elliott S. Barker wildlife management area; (c) Shuree lakes; (d) North Ponil creek, including McCrystal and Seally Canyon creeks, from their headwaters downstream to the boundary of the United States forest service Valle Vidal special management unit; and (e) Leandro creek from its headwaters downstream to the boundary of the United States forest service Valle Vidal special management unit. (3) the named perennial surface waters of the state, identified in Subparagraph (a) below, located within United States department of agriculture forest service wilderness. Wilderness are those lands designated by the United States congress as wilderness pursuant to the Wilderness Act. Wilderness areas included in this designation are the Aldo Leopold wilderness, Apache Kid wilderness, Blue Range wilderness, Chama River Canyon wilderness, Cruces Basin wilderness, Dome wilderness, Gila wilderness, Latir Peak wilderness, Pecos wilderness, San Pedro Parks wilderness, Wheeler Peak wilderness, and White Mountain wilderness. (a) The following waters are designated in the Rio Grande basin: (i) in the Aldo Leopold wilderness: Byers Run, Circle Seven creek, Flower canyon, Holden Prong, Indian canyon, Las Animas creek, Mud Spring canyon, North Fork Palomas creek, North Seco creek, Pretty canyon, Sids Prong, South Animas canyon, Victorio Park canyon, Water canyon; (ii) in the Apache Kid wilderness Indian creek and Smith canyon; (iii) in the Chama River Canyon wilderness: Chavez canyon, Ojitos canyon, Rio Chama; (iv) in the Cruces Basin wilderness: Beaver creek, Cruces creek, Diablo creek, Escondido creek, Lobo creek, Osha creek; (v) in the Dome wilderness: Capulin creek, Medio creek, Sanchez

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		canyon/creek; (vi) in the Latir Peak wilderness: Bull creek, Bull Creek lake, Heart lake, Lagunitas Fork, Lake Fork creek, Rito del Medio, Rito Primero, West Latir creek; (vii) in the Pecos wilderness: Agua Sarca, Hidden lake, Horseshoe lake (Alamitos), Jose Vigil lake, Nambe lake, Nat lake IV, No Fish lake, North Fork Rio Quemado, Rinconada, Rio Capulin, Rio de las Trampas (Trampas creek), Rio de Truchas, Rio Frijoles, Rio Medio, Rio Molino, Rio Nambe, Rio San Leonardo, Rito con Agua, Rito Gallina, Rito Jaroso, Rito Quemado, San Leonardo lake, Santa Fe lake, Santa Fe river, Serpent lake, South Fork Rio Quemado, Trampas lake (East), Trampas lake (West); (viii) in the San Pedro Parks wilderness: Agua Sarca, Cañon Madera, Cave creek, Cecilia Canyon creek, Clear creek (North SPP), Clear creek (South SPP), Corralitos creek, Dove creek, Jose Miguel creek, La Jara creek, Oso creek, Rio Capulin, Rio de las Vacas, Rio Gallina, Rio Puerco de Chama, Rito Anastacio East, Rito Anastacio West, Rito de las Palomas, Rito de las Perchas, Rito de los Pinos, Rito de los Utes, Rito Leche, Rito Redondo, Rito Resumidero, San Gregorio lake; (ix) in the Wheeler Peak wilderness: Black Copper canyon, East Fork Red river, Elk lake, Horseshoe lake, Lost lake, Sawmill creek, South Fork lake, South Fork Rio Hondo, Williams lake. (b) The following waters are designated in the Pecos River basin: (i) in the Pecos wilderness: Albright creek, Bear creek, Beatty creek, Beaver creek, Carpenter creek, Cascade canyon, Cave creek, El Porvenir creek, Hollinger creek, Holy Ghost creek, Horsethief creek, Jack's creek, Jarosa canyon/creek, Johnson lake, Lake Katherine, Lost Bear lake, Noisy brook, Panchuela creek, Pecos Baldy lake, Pecos river, Rio Mora, Rio Valdez, Rito Azul, Rito de los Chimayosos, Rito de los Esteros, Rito del Oso, Rito del Padre, Rito las Trampas, Rito Maestas, Rito Oscuro, Rito Perro, Rito Sebadilloses, South Fork Bear creek, South Fork Rito Azul, Spirit lake, Stewart lake, Truchas lake (North), Truchas lake (South), Winsor creek; (ii) in the White Mountain wilderness: Argentina creek, Aspen creek, Bonito creek, Little Bonito creek, Mills canyon/creek, Rodamaker creek, South Fork Rio Bonito, Turkey canyon/creek. (c) The following waters are designated in the Gila River basin: (i) in the Aldo Leopold wilderness: Aspen canyon, Black Canyon creek, Bonner canyon, Burnt canyon, Diamond creek, Falls canyon, Fisherman canyon, Running Water canyon, South Diamond creek; (ii) in the Gila wilderness: Apache creek, Black Canyon creek, Brush canyon, Canyon creek, Chicken Coop canyon, Clear creek, Cooper canyon, Cow creek, Cub creek, Diamond creek, East Fork Gila river, Gila river, Gilita creek, Indian creek, Iron creek, Langstroth canyon, Lilley canyon, Little creek, Little Turkey creek, Lookout canyon, McKenna creek, Middle Fork Gila river, Miller Spring canyon, Mogollon creek, Panther canyon, Prior creek, Rain creek, Raw Meat creek, Rocky canyon, Sacaton creek, Sapillo creek, Sheep Corral canyon, Skeleton canyon, Squaw creek, Sycamore canyon, Trail canyon, Trail creek, Trout creek, Turkey creek, Turkey Feather creek, Turnbo canyon,

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		West Fork Gila river, West Fork Mogollon creek, White creek, Willow creek, Woodrow canyon. (d) The following waters are designated in the Canadian River basin: in the Pecos wilderness Daily creek, Johns canyon, Middle Fork Lake of Rio de la Casa, Middle Fork Rio de la Casa, North Fork Lake of Rio de la Casa, Rito de Gascon, Rito San Jose, Sapello river, South Fork Rio de la Casa, Sparks creek (Manuelitas creek). (e) The following waters are designated in the San Francisco River basin: (i) in the Blue Range wilderness: Pueblo creek; (ii) in the Gila wilderness: Big Dry creek, Lipsey canyon, Little Dry creek, Little Whitewater creek, South Fork Whitewater creek, Spider creek, Spruce creek, Whitewater creek. (f) The following waters are designated in the Mimbres Closed basin: in the Aldo Leopold wilderness Corral canyon, Mimbres river, North Fork Mimbres river, South Fork Mimbres river. (g) The following waters are designated in the Tularosa Closed basin: in the White Mountain wilderness Indian creek, Nogal Arroyo, Three Rivers. (h) The wetlands designated are identified on the maps and list of wetlands within United States forest service wilderness areas designated as outstanding national resource waters published at the New Mexico state library and available on the department's website.

Appendix G – Buffer Guidance.

The purpose of this guidance is to assist you in complying with the requirements in Part 2.1.2.1 of the permit regarding the establishment of natural buffers or equivalent sediment controls. This guidance is organized as follows:

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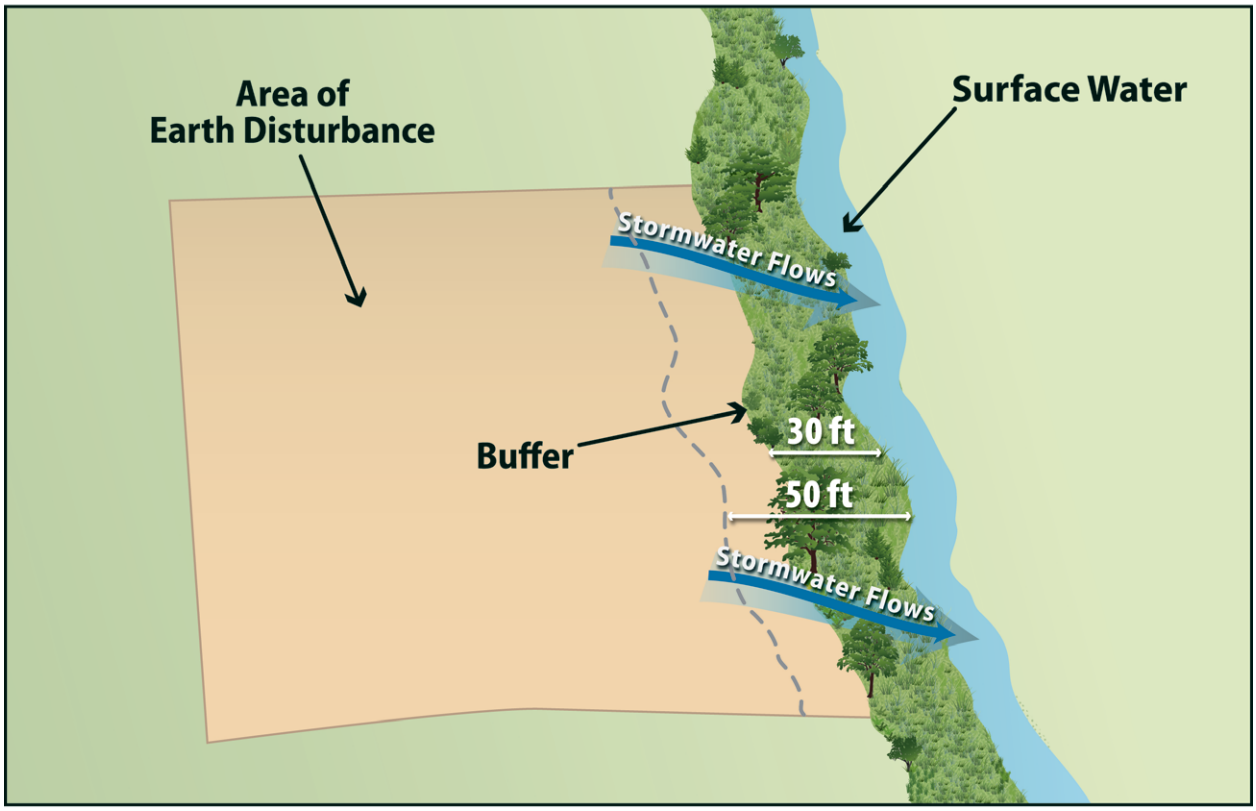
G.1 Sites That Are Required to Comply with Part 2.1.2.1

The purpose of this part is to help you determine if the requirements in Part 2.1.2.1 apply to your site.

G.1.1 Step 1 - Determine if Your Site is Within 50 Feet of a Surface Water

Part 2.1.2.1 applies to you only if your earth-disturbing activities will occur within 50 feet of a surface water that receives stormwater discharges from your site. Figure G – 1 illustrates when a site would be required to comply with the requirements in Part 2.1.2.1 due to their proximity to a surface water. If the surface water is not located within 50 feet of the earth-disturbing activities, Part 2.1.2.1 does not apply.

Figure G - 1. Example of earth-disturbing activities within 50 feet of a surface water.



If you determine that your earth-disturbing activities will occur within 50 feet of a surface water that receives stormwater discharges from your site, the requirements in Part 2.1.2.1 apply, except for certain circumstances that are described in Step 2.

Note that where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, or if a portion of area within 50 feet of the surface water is owned by another party and is not under your control, the buffer requirements in Part 2.1.2.1 still apply, but with some allowances.

Clarity about how to implement the compliance alternatives for these situations is provided in G.2.1.2 and G.2.2.2 below.

Note that EPA does not consider designed stormwater control features *(e.g., stormwater conveyance channels, storm drain inlets, stormwater basins)* that direct storm water to surface waters more than 50 feet from the disturbance to constitute surface waters for the purposes of determining if the buffer requirements apply.

G.1.2 Step 2 - Determine if Any Exceptions to the Requirements in Part 2.1.2.1 Apply

The following exceptions apply to the requirements in Part 2.1.2.1:

- If there is no discharge of stormwater to surface waters through the area between the disturbed portions of the site and any surface waters located within 50 feet of your site, you are not required to comply with the requirements in this Part. This includes situations where you have implemented controls measures, such as a berm or other barrier, that will prevent such discharges.
- Where no natural buffer exists due to preexisting development disturbances *(e.g., structures, impervious surfaces)* that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in this Part.

  Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you <u>are</u> required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction for either compliance alternative 2 or 3 below, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances. Clarity about how to implement the compliance alternatives for these situations is provided in G.2.1.2 and G.2.2.2 below.

  If during your project, you will disturb any portion of these preexisting disturbances, the area removed will be deducted from the area treated as natural buffer.
- For "linear construction projects" (see Appendix A), you are not required to comply with this requirement if site constraints *(e.g., limited right-of-way)* prevent you from complying with the requirements of the alternatives in Part 2.1.2.1a, provided that, to the extent practicable, you limit disturbances within 50 feet of the surface water and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the surface water. You must also document in your SWPPP your rationale for why it is infeasible for you to comply with the requirements in Part 2.1.2.1a, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.
- For "small residential lot" construction *(i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre),* you have the option of complying with the requirements in Part G.2.3 of this appendix.
- The following disturbances within 50 feet of a surface water are exempt from the requirements in this Part:

  - Construction approved under a CWA Section 404 permit; or

- Construction of a water-dependent structure or water access areas *(e.g., pier, boat ramp, trail)*.

Note that you must document in your SWPPP if any disturbances related to any of the above exceptions occurs within the buffer area on your site.

G.2 COMPLIANCE ALTERNATIVES GUIDANCE

If in Part G.1 of this guidance you determine that the buffer requirements apply to your site, you have three compliance alternatives from which you can choose:

1. Provide and maintain a 50-foot buffer undisturbed natural buffer (Part 2.1.2.1a.i);[1] or
2. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (Part 2.1.2.1a.ii);[1] or
3. If it is infeasible to provide and maintain an undisturbed natural buffer of any size, you must implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (Part 2.1.2.1a.iii).[1]

The compliance alternative selected above must be maintained throughout the duration of permit coverage.

The following provides detailed guidance for how you can comply with each of the compliance alternatives. Part G.2.1 below provides guidance on how to provide and maintain natural buffers consistent with the alternatives 1 and 2, above. Part G.2.2 below provides guidance on how to comply with the requirement to provide a 50-foot buffer equivalent through erosion and sediment controls consistent with alternatives 2 and 3, above.

G.2.1 Guidance for Providing and Maintaining Natural Buffers

The following guidance is intended to assist you in complying with the requirements to provide and maintain a natural buffer during construction. This part of the guidance applies to you if you choose either alternative 1 (50-foot buffer) or alternative 2 (a buffer of < 50 feet supplemented by additional erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), or if you are providing a buffer in compliance with one of the small residential lot compliance alternatives in Part G.2.3 below.

[1] *For the compliance alternatives in 1 and 2, you are not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists (e.g., arid and semi-arid areas). You only need to retain and protect from disturbance the natural buffer that existed prior to the commencement of construction. Any preexisting structures or impervious surfaces are allowed in the natural buffer provided you retain and protect from disturbance the natural buffer area outside the preexisting disturbance. Similarly, for alternatives 2 and 3, you are required to implement and maintain sediment controls that achieve the sediment load reduction equivalent to the undisturbed natural buffer that existed on the site prior to the commencement of construction. In determining equivalent sediment load reductions, you may consider naturally non-vegetated areas and prior disturbances. See Part G.2.2 of this Appendix for a discussion of how to determine equivalent reductions.*

G.2.1.1 *Buffer Width Measurement*

Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1. The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
2. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

Refer to Figure G – 2 and Figure G - 3. You may find that specifically measuring these points is challenging if the flow path of the surface water changes frequently, thereby causing the measurement line for the buffer to fluctuate continuously along the path of the waterbody. Where this is the case, EPA suggests that rather than measuring each change or deviation along the water's edge, it may be easier to select regular intervals from which to conduct your measurement. For instance, you may elect to conduct your buffer measurement every 5 to 10 feet along the length of the water.

Additionally, note that if earth-disturbing activities will take place on both sides of a surface water that flows through your site, to the extent that you are establishing a buffer around this water, it must be established on both sides. For example, if you choose alternative 1 above, and your project calls for disturbances on both sides of a small stream, you would need to retain the full 50 feet of buffer on both sides of the water. However, if your construction activities will only occur on one side of the stream, you would only need to retain the 50-foot buffer on the side of the stream where the earth-disturbance will occur.

Figure G - 2. This image shows buffer measurement from the ordinary high water mark of the water body, as indicated by a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, and/or the presence of litter/debris.

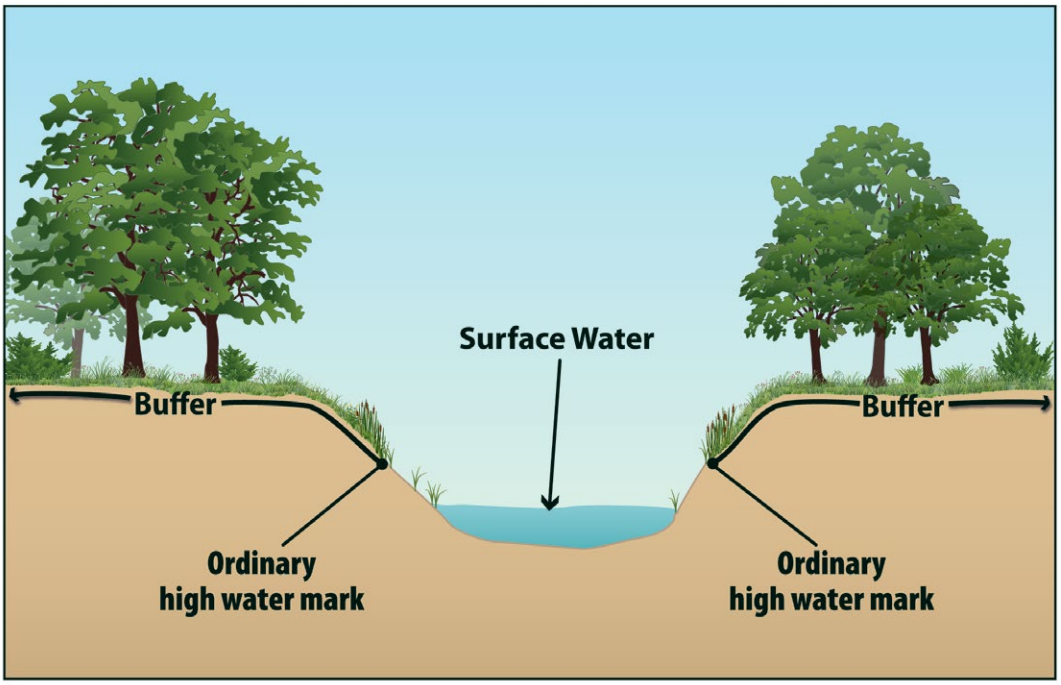
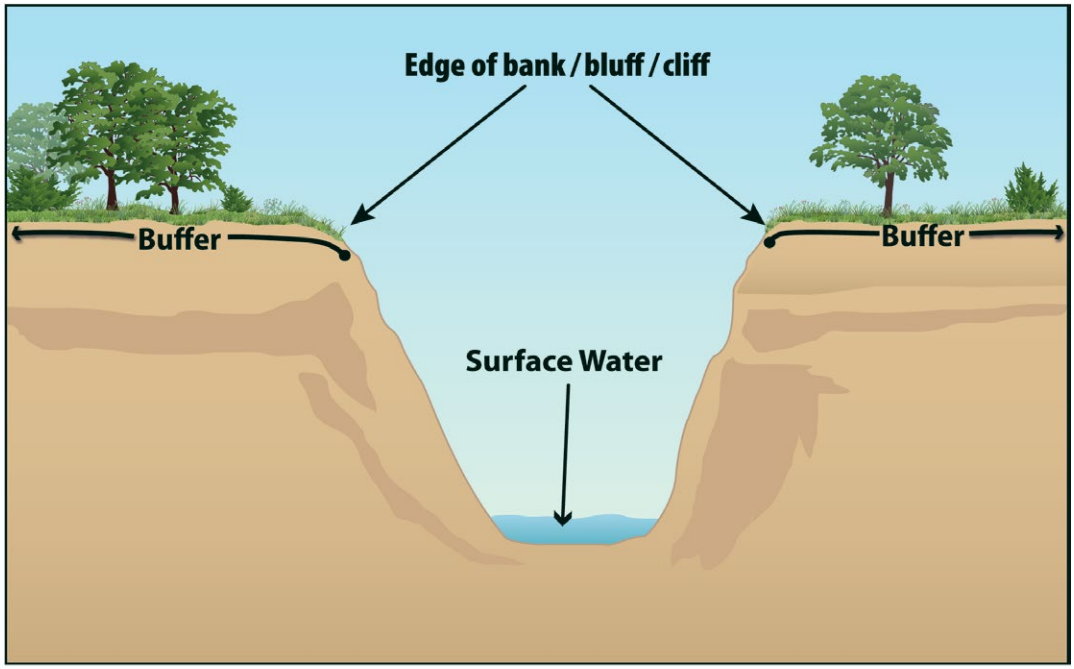


Figure G - 3. This image shows buffer measurement from the edge of the bank, bluff, or cliff, whichever is applicable.



G.2.1.2 *Limits to Disturbance Within the Buffer*

You are considered to be in compliance with this requirement if you retain and protect from construction activities the natural buffer that existed prior to the commencement of construction. If the buffer area contains no vegetation prior to the commencement of construction (e.g., sand or rocky surface), you are not required to plant any additional vegetation. As noted above, any preexisting structures or impervious surfaces are allowed in the buffer provided you retain and protect from disturbance the vegetation in the buffer outside the preexisting disturbance.

To ensure that the water quality protection benefits of the buffer are retained during construction, you are prohibited from conducting any earth-disturbing activities within the buffer during permit coverage. In furtherance of this requirement, prior to commencing earth-disturbing activities on your site, you must delineate, and clearly mark off, with flags, tape, or a similar marking device, the buffer area on your site. The purpose of this requirement is to make the buffer area clearly visible to the people working on your site so that unintended disturbances are avoided.

While you are not required to enhance the quality of the vegetation that already exists within the buffer, you are encouraged to do so where such improvements will enhance the water quality protection benefits of the buffer. (Note that any disturbances within the buffer related to buffer enhancement are permitted and do not constitute construction disturbances.) For instance, you may want to consider targeted plantings where limited vegetation exists, or replacement of existing vegetation where invasive or noxious plant species (see http://plants.usda.gov/java/noxiousDriver) have taken over. In the case of invasive or noxious species, you may want to remove and replace them with a diversity of native trees, shrubs, and herbaceous plants that are well-adapted to the climatic, soil, and hydrologic conditions on the site. You are also encouraged to limit the removal of naturally deposited leaf litter, woody debris, and other biomass, as this material contributes to the ability of the buffer to retain water and filter pollutants.

If a portion of the buffer area adjacent to the surface water is owned by another party and is not under your control, you are only required to retain and protect from construction activities the portion of the buffer area that is under your control. For example, if you elect alternative 1 above (provide and maintain a 50-foot buffer), but 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you must only retain and protect from construction activities the 40-foot buffer area that occurs on the property on which your construction activities are taking place. EPA would consider you to be in compliance with this requirement regardless of the activities that are taking place in the 10-foot area that is owned by a different party than the land on which your construction activities are taking place that you have no control over.

G.2.1.3 *Discharges to the Buffer*

You must ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls (*for example, you must comply with the Part 2.1.2.2 requirement to establish sediment controls around the downslope perimeter of your site disturbances*), and if necessary to prevent erosion caused by stormwater flows within the buffer, you must use velocity dissipation devices. The purpose of this requirement is to decrease the rate of stormwater flow and

encourage infiltration so that the pollutant filtering functions of the buffer will be achieved. To comply with this requirement, construction operators typically will use devices that physically dissipate stormwater flows so that the discharge entering the buffer is spread out and slowed down.

G.2.1.4 *SWPPP Documentation*

You are required to document in your SWPPP the natural buffer width that is retained. For example, if you are complying with alternative 1, you must specify in your SWPPP that you are providing a 50-foot buffer. Or, if you will be complying with alternative 2, you must document the reduced width of the buffer you will be retaining (and you must also comply with the requirements in Part 2.1.2.1c to describe the erosion and sediment controls you will use to achieve an equivalent sediment reduction, as described in Part G.2.2 below). Note that you must also show any buffers on your site plan in your SWPPP consistent with Part 7.2.6.3. Additionally, if any disturbances related to the exceptions in Part 2.1.2.1e occur within the buffer area, you must document this in the SWPPP.

G.2.2 Guidance for Providing the Equivalent Sediment Reduction as the 50-foot Buffer

If you are selecting Alternative 2 (provide and maintain a buffer that is less than 50 feet that is supplemented by additional erosion and sediment controls that, together, achieve the equivalent sediment load reduction as the 50-foot buffer) or Alternative 3 (implement erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), the following guidance is intended to assist you in demonstrating that you will achieve the equivalent sediment reduction as the 50-foot buffer.

G.2.2.1 *Determine Whether it is Feasible to Provide a Reduced Buffer*

EPA recognizes that there will be a number of situations in which it will be infeasible to provide and maintain a buffer of any width. While some of these situations may exempt you from the buffer requirement entirely (see G.1.2), if you do not qualify for one of these exemptions, there still may be conditions or circumstances at your site that make it infeasible to provide a natural buffer. For example, there may be sites where a significant portion of the property on which the earth-disturbing activities will occur is located within the buffer area, thereby precluding the retention of natural buffer areas. EPA believes there are likely to be other examples of situations that make it infeasible to provide any buffer area.

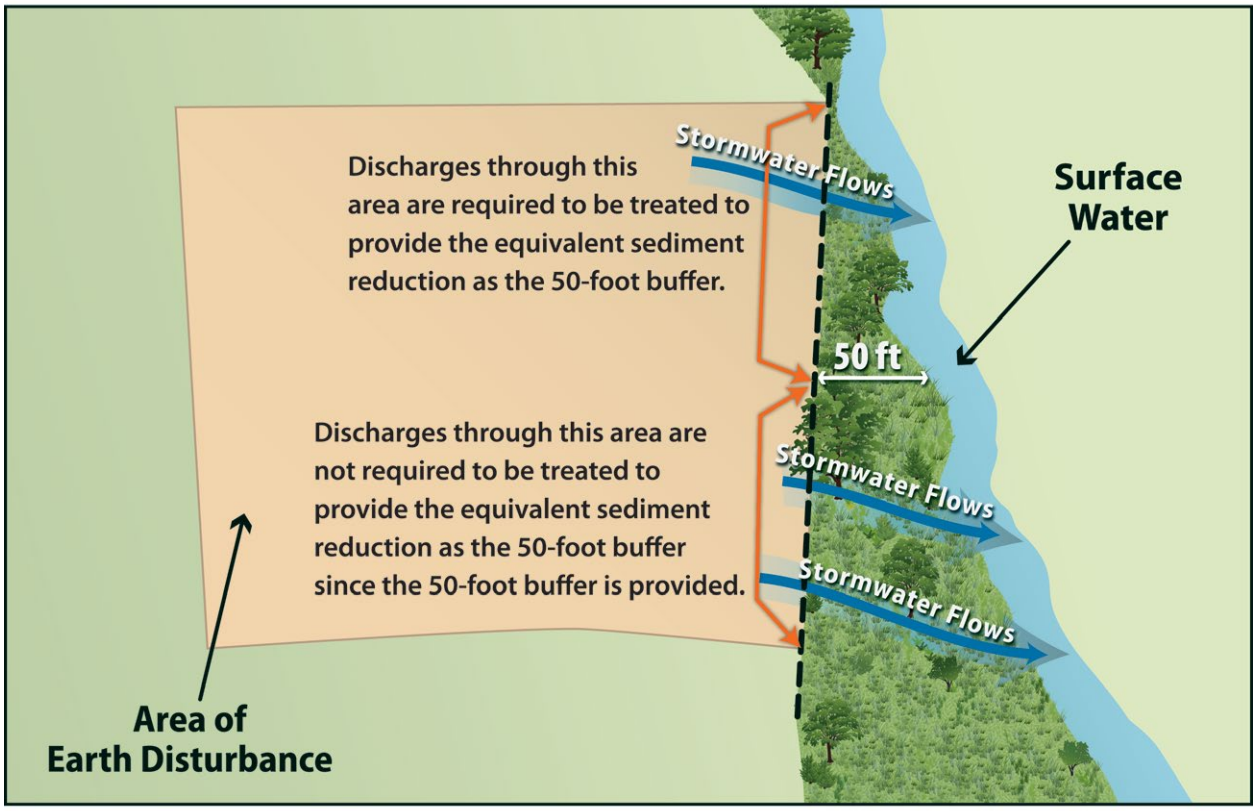
Therefore, in choosing between the 2 different compliance alternatives (Alternative 2 or 3), you should only elect to comply with Alternative 2 if it is feasible for you to retain any natural buffer on your site. (Note: For any buffer width retained, you are required to comply with the requirements in Part G.2.1, above, concerning the retention of vegetation and restricting earth disturbances.) Similarly, if you determine that it is infeasible to provide a natural buffer of any size during construction, you should elect to comply with Alternative 3. After making this determination, you should proceed to Part G.2.2.2 to determine how to provide controls that, together with any buffer areas that is being retained, if applicable, will achieve an equivalent sediment load reduction as the 50-foot buffer.

G.2.2.2 *Design Controls That Provide Equivalent Sediment Reduction as 50-foot Buffer*

You must next determine what additional controls must be implemented on your site that, alone or in combination with any retained natural buffer, achieve a reduction in sediment equivalent to that achieved by a 50-foot buffer.

Note that if only a portion of the natural buffer is less than 50 feet, you are only required to implement erosion and sediment controls that achieve the sediment load reduction equivalent to the 50-foot buffer for discharges through that area. You would not be required to provide treatment of stormwater discharges that flow through 50 feet or more of natural buffer. See Figure G - 4.

Figure G - 4 Example of how to comply with the requirement to provide the equivalent sediment reduction when only a portion of your earth-disturbances discharge to a buffer of less than 50-feet.



To comply with this requirement, you are required to do the following:

Step1 - Estimate the sediment reduction expected from your site if you had retained a 50-foot natural buffer;

Step 2 - Design controls that alone or in combination with any width of buffer retained achieve the equivalent sediment removal efficiency as that expected from the 50-foot buffer; and

Step 3 - Document in your SWPPP how your controls will achieve the equivalent sediment removal efficiency of the 50-foot buffer.

Guidelines to help you work through these requirements are provided below.

a. Step 1 - Estimate the Sediment Reduction from the 50-foot Buffer

In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of sediment controls used to reduce the discharge of sediment prior to the buffer. EPA has simplified this calculation by developing buffer performance tables covering a range of vegetation and soil types for the areas covered by the CGP. See Attachment 1, Tables G - 8 through G - 15. Note: buffer performance values in Tables G - 8 through G - 15 represent the percent of sediment captured through the use of perimeter controls (e.g., silt fences) and 50-foot buffers at disturbed sites of fixed proportions and slopes.[2]

Using Tables G - 8 through G - 15 (see Attachment 1), you can determine the sediment removal efficiency of a 50-foot buffer for your geographic area by matching the vegetative cover type that best describes your buffer area and the type of soils that predominate at your site. For example, if your site is located in Massachusetts (Table G - 9), and your buffer vegetation corresponds most closely with that of tall fescue grass, and the soil type at your site is best typified as sand, your site's sediment removal efficiency would be 81 percent.

In this step, you should choose the vegetation type in the tables that most closely matches the vegetation that would exist naturally in the buffer area on your site regardless of the condition of the buffer. However, because you are not required to plant any additional vegetation in the buffer area, in determining what controls are necessary to meet this sediment removal equivalency in Step 2 below, you will be able to take credit for this area as a fully vegetated "natural buffer."

Similarly, if a portion of the buffer area adjacent to the surface water is owned by another party and is not under your control, you can treat the area of land not

[2] EPA used the following when developing the buffer performance tables:

- The sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 ("Revised Universal Soil Loss Equation 2") model for slope profiles using a 100-foot long denuded slopes.
- Sediment removal was defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from denuded area (tons/yr/acre).
- As perimeter controls are also required by the CGP, sediment removal is in part a function of the reduction due to a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upstream edge of the natural buffer and flow traveling through a 50-foot buffer of undisturbed natural vegetation.
- It was assumed that construction sites have a relatively uniform slope without topographic features that accelerate the concentration for erosive flows.
- It was assumed that vegetation has been removed from the disturbed portion of the site and a combination of cuts and fills have resulted in a smooth soil surface with limited retention of near-surface root mass

To represent the influence of soil, EPA analyzed 11 general soil texture classifications in its evaluation of buffer performance. To represent different types of buffer vegetation, EPA evaluated 4 or more common vegetative types for each state/territory covered under the permit. For each vegetation type evaluated, EPA considered only permanent, non-grazed and non-harvested vegetation, on the assumption that a natural buffer adjacent to the surface water will typically be undisturbed. EPA also evaluated slope steepness and found that sediment removal efficiencies present in Tables G -8 through G - 15 are achievable for slopes that are less than nine percent.

under control as having the equivalent vegetative cover and soil type that predominates on the portion of the property on which your construction activities are occurring.

> *For example, if your earth-disturbances occur within 50 feet of a surface water, but the 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10 foot area adjacent to the stream as having the equivalent soil and vegetation type as predominates in the 40 foot area under your control. You would then make the same assumption in Step 2 for purposes of determining the equivalent sediment removal.*

Alternatively, you may do your own calculation of the effectiveness of the 50-foot buffer based upon your site-specific conditions, and may use this number as your sediment removal equivalency standard to meet instead of using Tables G - 8 through G - 15. This calculation must be documented in your SWPPP.

b. <u>Step 2 - Design Controls That Match the Sediment Removal Efficiency of the 50-foot Buffer</u>

Once you have determined the estimated sediment removal efficiency of a 50-foot buffer for your site in Step 1, you will be required to select stormwater controls that will provide an equivalent sediment load reductions. These controls can include the installation of a single designed control, such as a sediment pond, additional perimeter controls, or other type of device. Alternatively, you may elect to install a combination of stormwater controls and to retain some amount of a buffer. Whichever control(s) you select, you must demonstrate in your SWPPP that the controls will provide at a minimum the same sediment removal capabilities as the 50-foot buffer (Step 1). You are allowed to take credit for the removal efficiencies of your required perimeter controls in your calculation of equivalency, because these were included in calculating the buffer removal efficiencies in tables G - 8 through G - 15. (Note: You are reminded that the controls must be kept in effective operating condition until you have completed final stabilization on the disturbed portions of the site discharging to the surface water.)

To make the determination that your controls and/or buffer area achieve an equivalent sediment load reduction as the 50-foot buffer, you will need to use a model or other type of calculator. As mentioned above, there are a variety of models available that can be used to support your calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other models. A couple of examples are provided in Attachment 3 to help illustrate how this determination could be made.

If you are retaining a buffer of less than 50 feet, you may take credit for the removal that will occur from the reduced buffer and only need to provide additional controls to make up the difference between the removal efficiency of a 50 foot buffer and the removal efficiency of the narrower buffer. For example, if you are retaining a 30 foot buffer, you can account for the sediment removal provided by the 30-foot buffer retained, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided. To do this, you would plug the width of the buffer that is

retained into RUSLE or another model, along with other stormwater controls that will together achieve a sediment reduction equivalent to a natural 50-foot buffer.

As described in Step 1 above, you can take credit for the area you have retained as a "natural buffer" as being fully vegetated, regardless of the condition of the buffer area.

> *For example, if your earth-disturbances occur 30 feet from a surface water, but the 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10-foot area as a natural buffer, regardless of the activities that are taking place in the area. Therefore, you can assume (for purposes of your equivalency calculation) that your site is providing the sediment removal equivalent of a 30-foot buffer, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided.*

c. <u>Step 3 - Document How Site-Specific Controls Will Achieve the Sediment Removal Efficiency of the 50-foot Buffer</u>

In Steps 1 and 2, you determined both the expected sediment removal efficiency of a 50-foot buffer at your site, and you used this number as a performance standard to design controls to be installed at your site, which alone or in combination with any retained natural buffer, achieves the expected sediment removal efficiency of a 50-foot buffer at your site. The final step is to document in your SWPPP the information you relied on to calculate the equivalent sediment reduction as an undisturbed natural buffer.

EPA will consider your documentation to be sufficient if it generally meets the following:

- For Step 1, refer to the table in Attachment 1 that you used to derive your estimated 50-foot buffer sediment removal efficiency performance. Include information about the buffer vegetation and soil type that predominate at your site, which you used to select the sediment load reduction value in Tables G - 8 through G - 15. Or, if you conducted a site-specific calculation for sediment removal efficiency, provide the specific removal efficiency, and the information you relied on to make your site-specific calculation.
- For Step 2: (1) Specify the model you used to estimate sediment load reductions from your site; and (2) the results of calculations showing how your controls will meet or exceed the sediment removal efficiency from Step 1.

If you choose Alternative 3, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

G.2.3 Small Residential Lot Compliance Alternatives

In this part of Appendix G, EPA provides additional compliance alternatives for operators of small residential lots. In accordance with Part 2.1.2.1e.iv, operators of small residential lots who do not provide a 50-foot buffer are not required to make the demonstration outlined in Part G.2.2.2. Instead, qualifying operators can comply with the buffer requirement by choosing to implement a set of traditional sediment and erosion controls from the menu of practices provided in Part G.2.3.2.

> A **small residential lot** is a lot or grouping of lots being developed for residential purposes that will disturb less than 1 acre of land, but that is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

EPA has developed two different alternatives for compliance. The following steps describe how a small residential lot operator would achieve compliance with these 2 alternatives.

G.2.3.1 *Step 1 – Determine if You are Eligible for the Small Residential Lot Compliance Alternatives*

In order to be eligible for the small residential lot compliance alternatives, the following conditions must be met:

a. The lot or grouping of lots meets the definition of "small residential lot"; and

b. The operator must comply with all other requirements in Part 2.1.2.1, including:

- **i.** Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;
- **ii.** Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and
- **iii.** Delineate, and clearly mark off, with flags, tape, or other similar marking device, all natural buffer areas.

G.2.3.2 *Step 2 – Implement the Requirements of the Small Residential Lot Compliance Alternative Selected*

You must next choose from one of two small residential lot compliance alternatives and implement the stormwater control practices associated with that alternative.

Note: The compliance alternatives provided below are not mandatory. Operators of small residential lots can alternatively choose to comply with the any of the options that are available to other sites in Part 2.1.2.1a, described in Parts G.2.1 and G.2.2 in this appendix.

a. <u>**Small Residential Lot Compliance Alternative 1**</u>

Alternative 1 is a straightforward tiered- technology approach that specifies the controls that a small residential lot must implement based on the buffer width retained. To achieve compliance with Alternative 1, you must implement the

controls specified in Table G – 1 based on the buffer width to be retained. See footnote 3, below, for a description of the controls you must implement.

For example, if you are an operator of a small residential lot that will be retaining a 35-foot buffer and you choose Small Residential Lot Compliance Alternative 1, you must implement double perimeter controls between earth disturbances and the surface water.

In addition to implementing the applicable control, you must also document in your SWPPP how you will comply with Alternative 1.

Table G - 1. Alternative 1 Requirements[3]

Retain 50-foot Buffer	Retain <50 and >30 foot Buffer	Retain ≤ 30 foot Buffer
No Additional Requirements	Double Perimeter Controls	Double Perimeter Controls and 7-Day Site Stabilization

b. <u>Small Residential Lot Compliance Alternative 2</u>

Alternative 2 specifies the controls that a builder of a small lot must implement based on both the buffer width retained and their risk of sediment discharge. By incorporating the sediment risk, this approach may result in the implementation of controls that are more appropriate for the site's specific conditions.

Step 1 – Determine Your Site's Sediment Risk Level

To meet the requirements of Alternative 2, you must first determine your site's sediment discharge "risk level" based on the site's slope, location, and soil type. To help you to determine your site's sediment risk level, EPA has developed five different tables for different slope conditions. You must select the table that most closely corresponds to your site's average slope.

For example, if your site's average slope is 7 percent, you would use Table G – 4 to determine your site's sediment risk.

After you determine which table applies to your site, you must then use the table to determine the "risk level" (e.g., "low", "moderate", or "high") that corresponds to your site's location and predominant soil type.[4]

For example, based on Table G - 3, a site located in New Hampshire with a 4 percent average slope and with predominately sandy clay loam soils would fall into the "moderate" risk level.

[3] **Description of Additional Controls Applicable to Small Residential Lot Compliance Alternatives 1 and 2:**

- **No Additional Requirements:** If you implement a buffer of 50 feet or greater, then you are not subject to any additional requirements. Note that you are required to install perimeter controls between the disturbed portions of your site and the buffer in accordance with Part 2.1.2.2.
- **Double Perimeter Control:** In addition to the reduced buffer width retained on your site, you must provide a double row of perimeter controls between the disturbed portion of your site and the surface water spaced a minimum of 5 feet apart.
- **Double Perimeter Control and 7-Day Site Stabilization:** In addition to the reduced buffer width retained on your site and the perimeter control implemented in accordance with Part 2.1.2.2, you must provide a double row of perimeter controls between the disturbed portion of your site and the surface water spaced a minimum of 5 feet apart, and you are required to complete the stabilization activities specified in Parts 2.2.1.2a and/or 2.2.1.2b within 7 calendar days of the temporary or permanent cessation of earth-disturbing activities.

[4] One source for determining your site's predominant soil type is the USDA's Web Soil Survey located at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Table G - 2. Risk Levels for Sites with Average Slopes of ≤ 3 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Low	Moderate	Low	Moderate	Moderate
American Samoa	Moderate	Moderate	Moderate	Moderate	High
Massachusetts and New Hampshire	Low	Moderate	Low	Low	Moderate
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Low
Washington D.C.	Low	Moderate	Low	Low	Moderate

Table G - 3. Risk Levels for Sites with Average Slopes of > 3 Percent and ≤ 6 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	Moderate	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Low	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G - 4. Risk Levels for Sites with Average Slopes of > 6 Percent and ≤ 9 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	High	Moderate	High	High
Puerto Rico	Moderate	High	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G - 5. Risk Levels for Sites with Average Slopes of > 9 Percent and ≤ 15 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	Moderate	High	Moderate	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Moderate	Low	Moderate	Moderate
Washington D.C.	Moderate	High	Moderate	Moderate	High

Table G - 6. Risk Levels for Sites with Average Slopes of > 15 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	High	High	High	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	High	High	Moderate	High	High
Idaho	Low	Low	Low	Low	Moderate
New Mexico	Moderate	Moderate	Moderate	Moderate	High
Washington D.C.	High	High	Moderate	High	High

Step 2 – Determine Which Additional Controls Apply

Once you determine your site's "risk level", you must next determine the additional controls you need to implement on your site, based on the width of buffer you plan to retain. Table G - 7 specifies the requirements that apply based on the "risk level" and buffer width retained. See footnote 3, above, for a description of the additional controls that are required.

> *For example, if you are the operator of a small residential lot that falls into the "moderate" risk level, and you decide to retain a 20-foot buffer, using Table G-7 you would determine that you need to implement double perimeter controls to achieve compliance with Part 2.1.2.1.*

You must also document in your SWPPP your compliance with Alternative 2.

Table G - 7. Alternative 2 Requirements[2]

Risk Level Based on Estimated Soil Erosion	Retain ≥ 50' Buffer	Retain <50' and >30' Buffer	Retain ≤30' and >10' Buffer	Retain ≤ 10' Buffer
Low Risk	No Additional Requirements	No Additional Requirements	Double Perimeter Control	Double Perimeter Control
Moderate Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization
High Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization	Double Perimeter Control and 7-Day Site Stabilization

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ATTACHMENT 1

Sediment Removal Efficiency Tables[5]

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table G - 8. Estimated 50-foot Buffer Performance in Idaho*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 9. Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

[5] The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.1.2.2).

Table G - 10. Estimated 50-foot Buffer Performance in New Mexico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue grass	71	85	80	86	90
Medium-density Weeds	56	73	55	66	78
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	53	70	51	62	67
Southern Mixed Prairie Grass	53	71	52	63	50
Southern Range Cold Desert Shrubs	56	73	55	65	53

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 11. Estimated 50-foot Buffer Performance in Washington, DC*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	81	90	90	90	90
Tall Fescue Grass	79	90	83	89	90
Medium-density Weeds	71	79	66	75	74

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 12. Estimated 50-foot Buffer Performance in American Samoa*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	82	90	90	90	83
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	85
Dense Grass	82	90	90	90	83
Tall Fescue Grass	82	89	82	89	79
Medium-density Weeds	70	73	62	75	59

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 13. Estimated 50-foot Buffer Performance in Guam*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	80	90	90	90	89
Warm-season Grass (i.e., Switchgrass, Lemongrass)	80	90	90	90	90
Dense Grass	79	90	90	90	89
Tall Fescue Grass	76	90	80	88	87
Medium-density Weeds	63	73	53	68	61

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 14. Estimated 50-foot Buffer Performance in Puerto Rico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	83	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	83	90	90	90	90
Dense Grass	83	90	90	90	90
Tall Fescue Grass	82	90	84	90	89
Medium-density Weeds	72	78	65	76	64

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 15. Estimated 50-foot Buffer Performance in Virgin Islands*

Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	85	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	86	90	90	90	90
Dense Grass	85	90	90	90	90
Tall Fescue Grass	85	90	88	90	89
Medium-density Weeds	75	77	71	78	63

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

ATTACHMENT 2

Using the Sediment Removal Efficiency Tables – Questions and Answers

- *What if my specific buffer vegetation is not represented in Tables G - 8 through G - 15?* Tables G - 8 through G - 15 provide a wide range of factors affecting buffer performance; however, there may be instances where the specific buffer vegetation type on your site is not listed. If you do not see a description of the type of vegetation present at your site, you should choose the vegetation type that most closely matches the vegetation type on your site. You can contact your local Cooperative Extension Service Office (www.csrees.usda.gov/Extension) for assistance in determining the vegetation type in Tables G - 8 through G - 15 that most closely matches your site-specific vegetation.
- *What if there is high variability in local soils?* EPA recognizes that there may be a number of different soil type(s) on any given construction site. General soil information can be obtained from USDA soil survey reports (http://websoilsurvey.nrcs.usda.gov) or from individual site assessments performed by a certified soil expert. Tables G - 8 through G - 15 present eleven generic soil texture classes, grouping individual textures where EPA has determined that performance is similar. If your site contains different soil texture classes, you should use the soil type that best approximates the predominant soil type at your site.
- *What if my site slope is greater than 9 percent after final grade is reached?* As indicated in the buffer performance tables, the estimated sediment removal efficiencies are associated with disturbed slopes of up to 9 percent grade. Where your graded site has an average slope of greater than 9 percent, you should calculate a site-specific buffer performance.
- *How do I calculate my own estimates for sediment reduction at my specific site?* If you determine that it is necessary to calculate your own sediment removal efficiency using site-specific conditions (e.g., slopes at your site are greater than 9 percent), you can do so by choosing from a range of available mathematical models that are available to facilitate this calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other equivalent models.
- *What is my estimated buffer performance if my site location is not represented by Tables G - 8 through G - 15?* If your site is located in an area not represented by Tables G - 8 through G - 15, you should use the table that most closely approximates conditions at your site. You may also choose to conduct a site-specific calculation of the buffer performance.
- *What if only a portion of my site drains to the buffer area?* If only a portion of your site drains to a surface water, where that water is within 50 feet of your construction activities, you are only required to meet the equivalency requirement for the stormwater flows corresponding to those portions of the site. See Example 2 below for an example of how this is expected to work.

ATTACHMENT 3

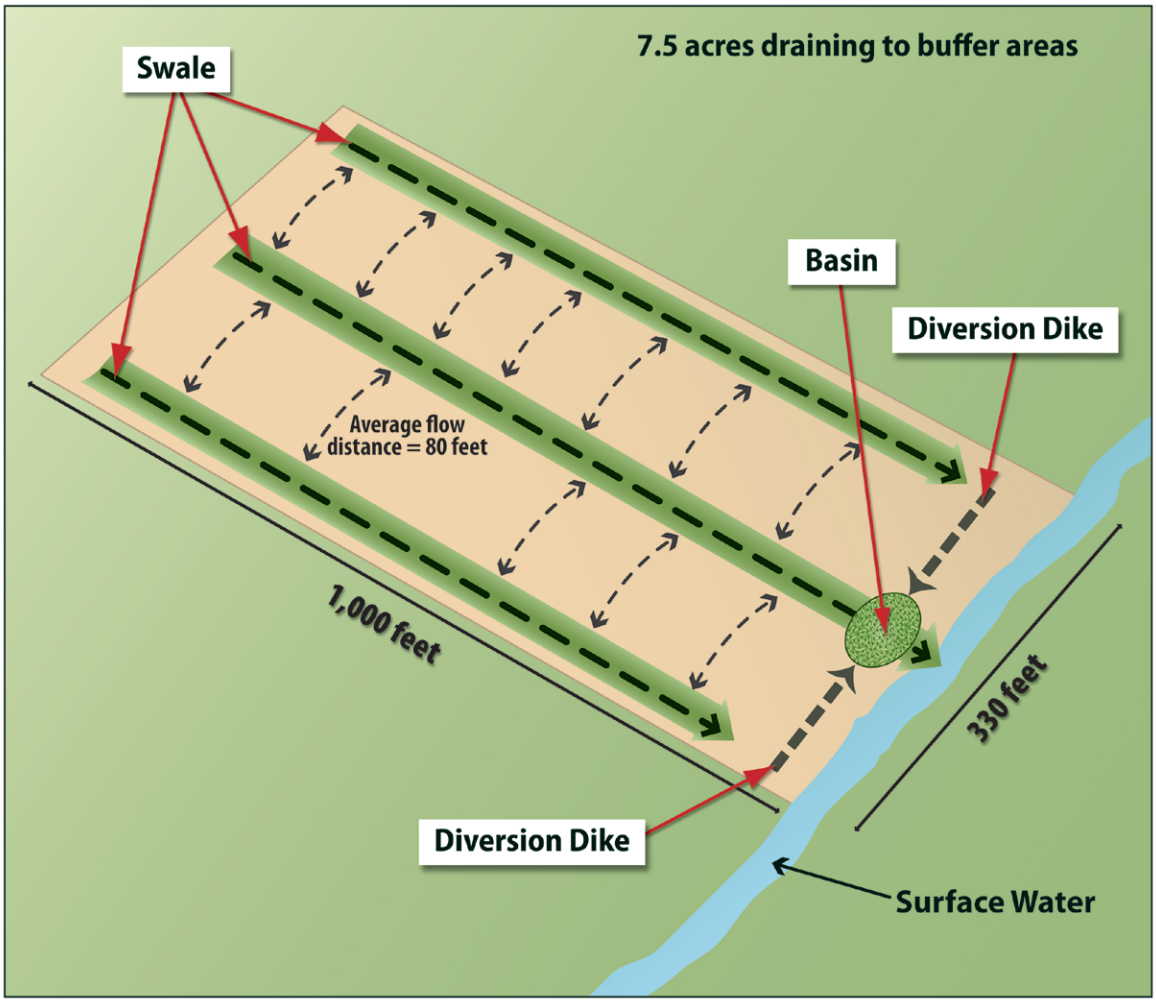
Examples of How to Use the Sediment Removal Efficiency Tables

Example 1. Comparatively Wet Location (7.5 acre site located in Massachusetts)

The operator of a 7.5-acre construction site in Massachusetts has determined that it is infeasible to establish a buffer of any size on their site, and is now required to select and install controls that will achieve an equivalent sediment load reduction as that estimated in G - 9 for their site conditions. The first step is to identify what percentage of eroded sediment is estimated to be retained from a 50-foot buffer. For this example, it is assumed that the site has a relatively uniform gentle slope (3 percent), so Table G - 9 can be used to estimate the 50-foot buffer sediment load reduction. If the site's buffer vegetation is best typified by cool-season dense grass and the underlying soil is of a type best described as loamy sand, the 50-foot buffer is projected to capture 90 percent of eroded sediment from the construction site.

The second step is to determine what sediment controls can be selected and installed in combination with the perimeter controls already required to be implemented at the site (see Part 2.1.2.2), which will achieve the 90 percent sediment removal efficiency from Table G - 9. For this example, using the RUSLE2 profile model, it was determined that installing a pair of shallow-sloped diversion ditches to convey runoff to a well-designed and maintained sediment basin provides 99 percent sediment removal. Because the estimated sediment reduction is greater than the required 90 percent that a 50-foot buffer provides, the operator will have met the buffer requirements. See Figure G - 5. The operator could also choose a different set of controls, as long as they achieve at least a 90 percent sediment removal efficiency.

Figure G - 5. Example 1 – Equivalent Sediment Load Reductions at a 7.5 ac Site in MA.



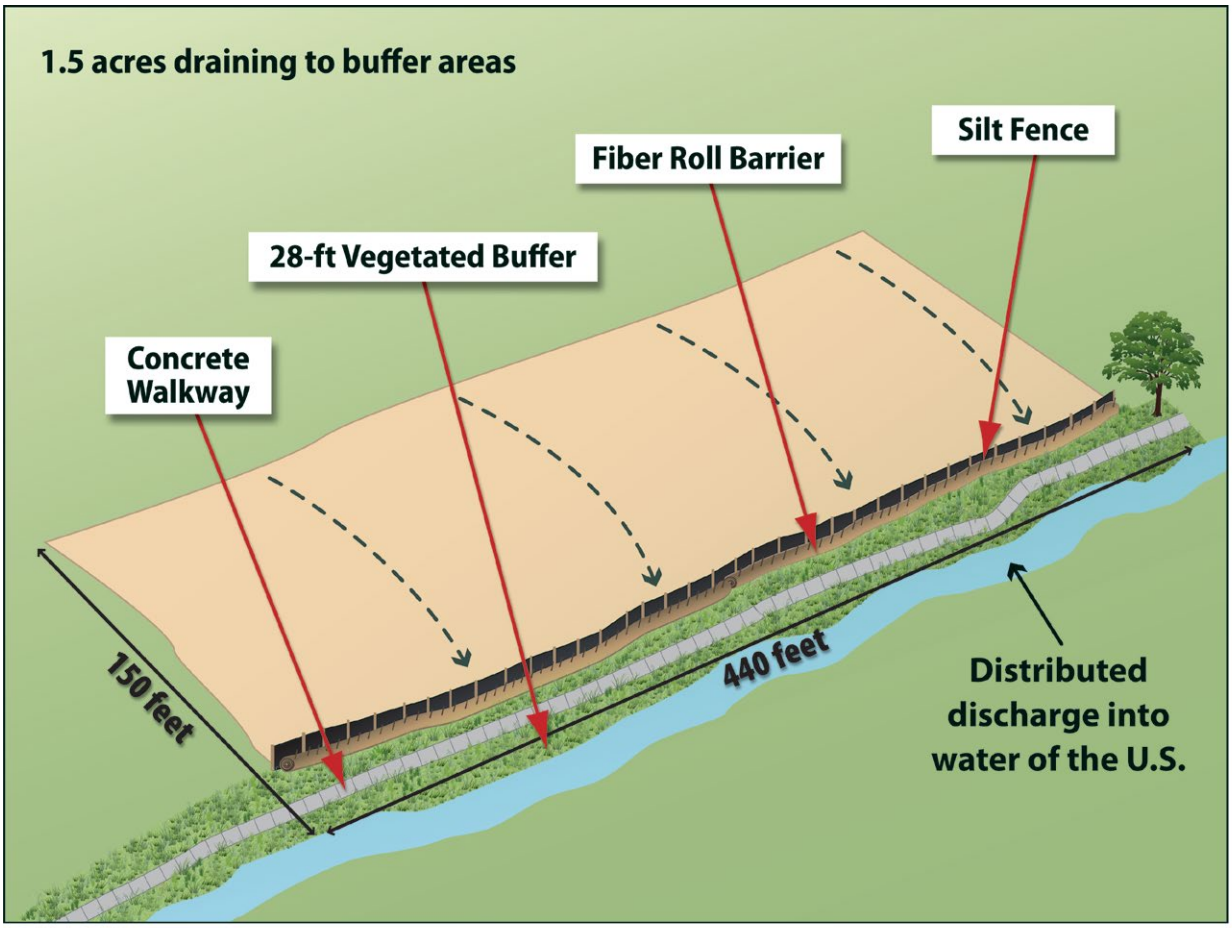
Example 2. Arid Location With Pre-existing Disturbances in the Natural Buffer (6.5 acre site located in New Mexico)

An operator of a site in New Mexico determines that it is not practicable to provide a 50-foot buffer, but a 28-foot buffer can be provided. Because the operator will provide a buffer that is less than 50 feet, the operator must determine which controls, in combination with the 28-foot buffer, achieve a sediment load reduction equivalent to the 50-foot buffer. In this example, the project will disturb 6.5 acres of land, but only 1.5 acres of the total disturbed area drains to the buffer area. Within the 28-foot buffer area is a preexisting concrete walkway. Similar to Example 1, the equivalence analysis starts with Step 1 (Part G.2.2.2) with a review of the New Mexico buffer performance (Table G - 10). The operator determines that the predominate vegetation type in the buffer area is prairie grass and the soil type is similar to silt, and that the site is of a uniform, shallow slope (e.g., 3 percent grade). Although the operator will take credit for the disturbance caused by the concrete walkway as a natural buffer in Step 2, here the operator can treat the entire buffer area as being naturally vegetated with prairie grass. Based on this information, the operator refers to Table G - 10 to estimate that the 50-foot buffer would retain 50 percent of eroded soil.

The second step is to determine, based on the 50 percent sediment removal efficiency found in Table G - 10, what sediment controls in combination with the 28-foot buffer area, can be

implemented to reduce sediment loads by 50 percent or more. The operator does not have to account the reduction in buffer function caused by the preexisting walkway, and can take credit for the entire 28-foot buffer being fully vegetated in the analysis. For this example, using the RUSLE2 profile model, the operator determined that installing a fiber roll barrier between the silt fence (already required by Part 2.1.2.2) and the 28-foot buffer will achieve an estimated 84 percent sediment removal efficiency. See Figure G - 6. Note that this operator is subject to the requirement in Part 2.1.2.1b.i to ensure that discharges through the silt fence, fiber roll barrier, and 28-foot buffer do not cause erosion within the buffer. The estimated sediment reduction is greater than the required 50 percent; therefore the operator will have met the buffer alternative requirement.

Figure G - 6. Example 2 – Equivalent Sediment Load Reductions at a 6.5 ac Site in NM.



Appendix H – 2-Year, 24-Hour Storm Frequencies

Part 2.1.3.2 of the permit indicates that if you install a sediment basin, one of the design requirements is to provide storage for either (1) the calculated volume of runoff from a 2-year, 24-hour storm, or (2) 3,600 cubic feet per acre drained. This appendix is intended to provide a guide to permittees to determine the volume of precipitation associated with their local 2-year, 24-hour storm event.

The permittee should start out by determining their local 2-year, 24-hour storm volume. The rainfall frequency atlases, technical papers, and the Precipitation Frequency Data Server (PFDS) developed by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) serve as national standards for rainfall intensity at specified frequencies and durations in the United States. Operators of construction projects subject to the numeric effluent limits can use these standards to determine their local 2-year, 24-hour storm. Table H-1 identifies methods for determining precipitation frequency based on permit area. EPA notes that permittees may also use alternative peer-reviewed data sources not listed in Table H - 1 to determine the 2-year, 24-hour storm for their site.

Table H -1 – Method to Determine Precipitation Frequency Based on Permit Area

PERMIT AREA	METHOD TO DETERMINE PRECIPITATION FREQUENCY
District of Columbia	PFDS; NOAA Atlas 14, Vol. 2
Idaho	NOAA Atlas 2, Vol. 5; Technical Paper 40
Massachusetts	Technical Paper 40
New Hampshire	Technical Paper 40
New Mexico	PFDS; Technical Paper 40
Selected Pacific Islands	PFDS; Technical Paper 40
Puerto Rico and the U.S Virgin Islands	PFDS; Technical Paper 40
Other	PFDS; Technical Paper 40; NOAA Atlas 2 or 14

How to Determine Your Local 2-year, 24-hour Storm Size

Projects located in the **District of Columbia, New Mexico, Puerto Rico, U.S. Virgin Islands, or Pacific Island**s can use the PFDS at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html or use NOAA's Atlas 14 Volumes 2, 3, and 5, respectively at http://www.nws.noaa.gov/oh/hdsc/currentpf.htm to determine their precipitation frequency.

The PFDS is an easy to use, point-and-click interface to official U.S. precipitation frequency estimates and intensities. The opening PFDS screen is a clickable map of the United States. Upon clicking on a state, a state-specific interface appears. From this page the user selects the following:

- A location: Either via clicking on the map or manually entering a longitude/latitude coordinate;
- Type of output: Depth-Duration Frequency (DDF) or Intensity-Duration-Frequency (IDF)
- Units: millimeters or inches; and
- Type of estimate: Point or areal.

Additionally, PFDS also serves as a tool for providing references and other information for other current precipitation frequency standards that are not yet updated.

Projects located in the **District of Columbia, Puerto Rico, U.S. Virgin Islands, or Pacific Islands** can use NOAA's Atlas 14 Volumes 2, 3, and 5, respectively at http://www.nws.noaa.gov/oh/hdsc/currentpf.htm or access the PFDS at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html to determine their precipitation frequency.

Projects located in **Massachusetts and New Hampshire**, or other areas not covered by the PFDS or NOAA Atlases will need to use TP-40 to identify the precipitation frequency. TP-40 provides a map of the continental U.S. for the 2-year, 24-hour rainfall. TP40 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/TechnicalPaper_No40.pdf. (See also attached map of TP-40)

Projects located in **Idaho** can use the NOAA Atlas 2, Vol. 5 to determine their precipitation frequency. NOTE: Precipitation Frequencies on the NOAA Atlas 2, Vol. 5 are in tenths of an inch and will have to be converted to inches to determine precipitation frequency. NOAA Atlas 2, Vol. 5 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas2_Volume5.pdf. (See also attached map of NOAA Atlas 2, Vol. 5)

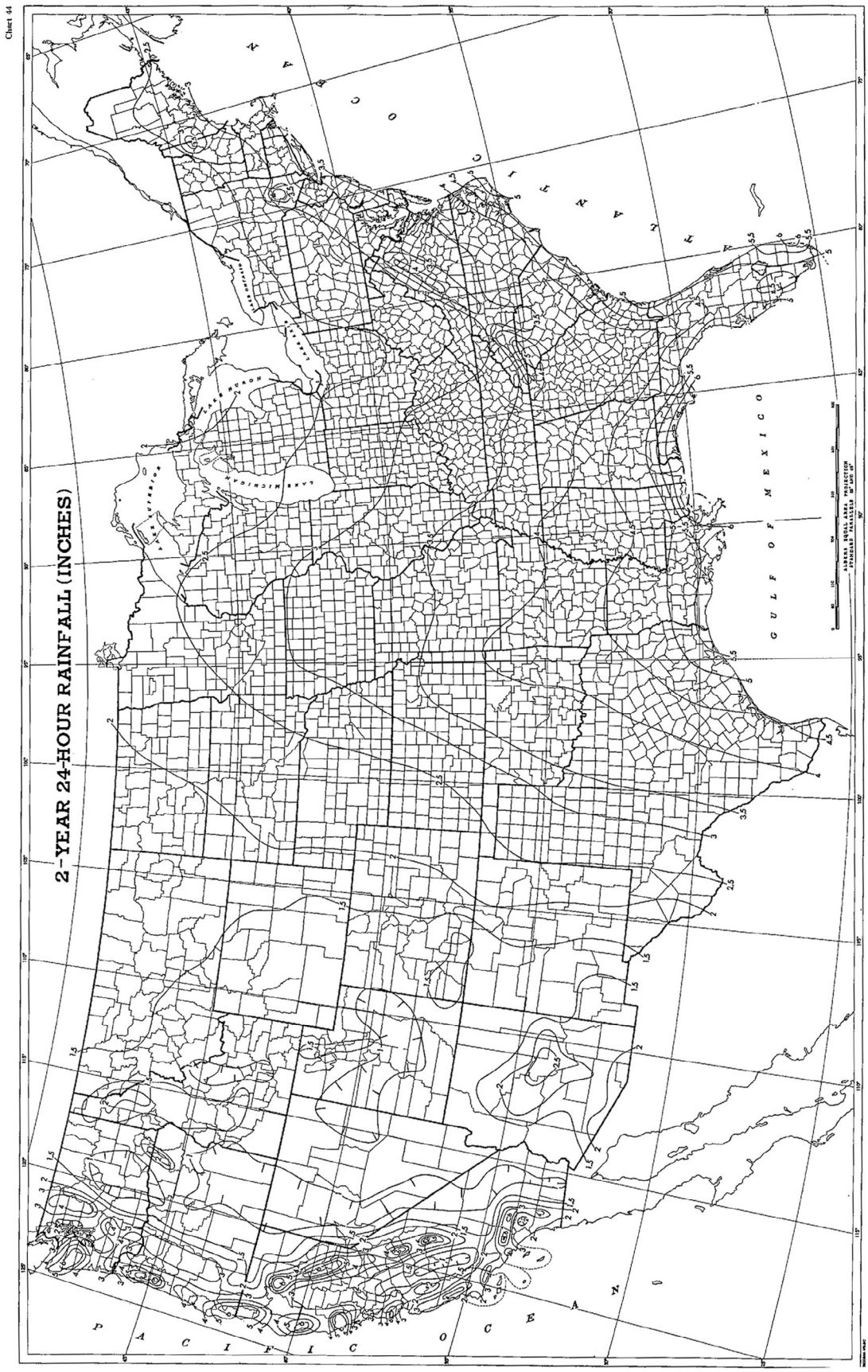
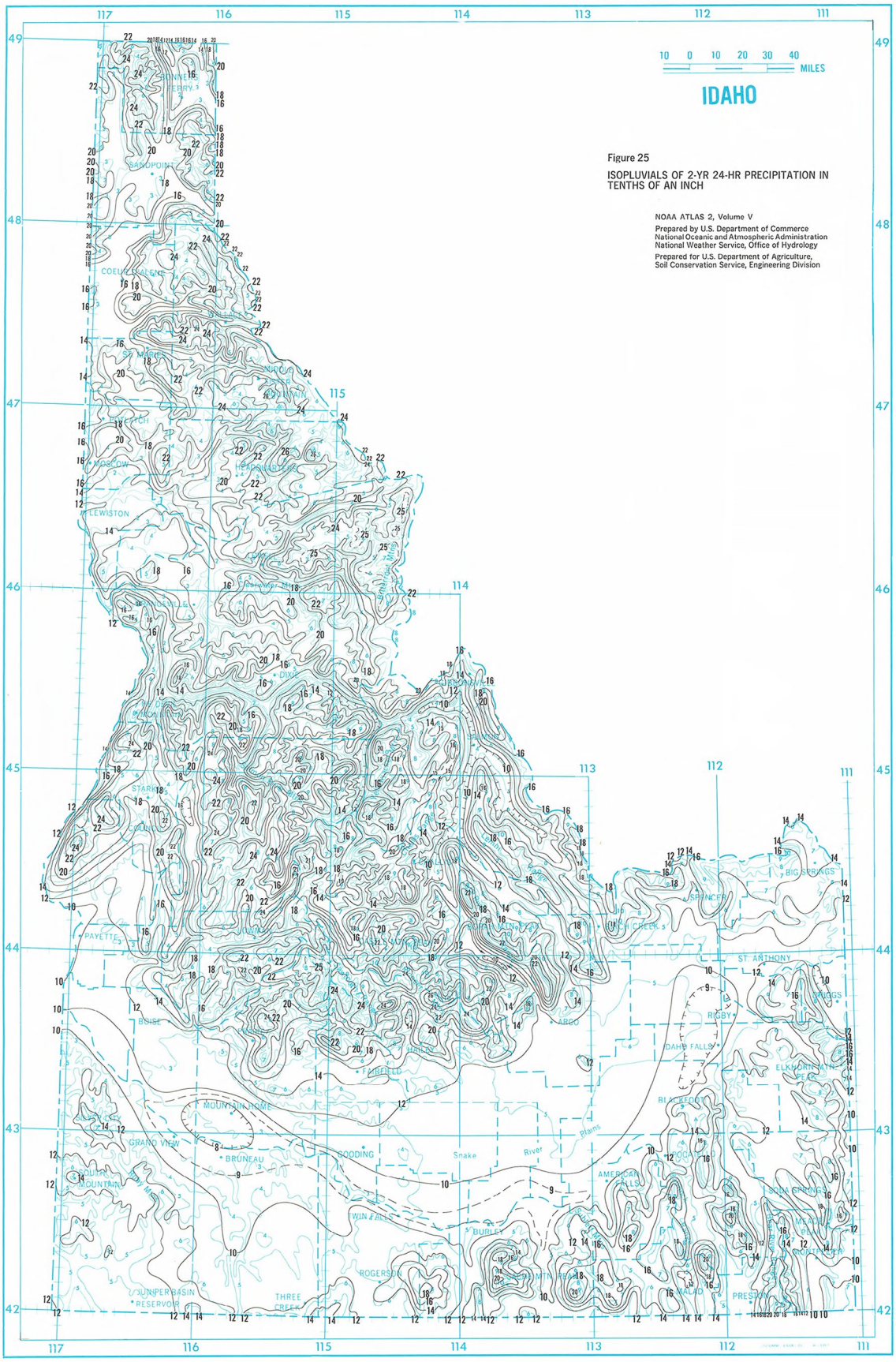


Chart 44
2-YEAR 24-HOUR RAINFALL (INCHES)
GULF OF MEXICO
PACIFIC OCEAN


10 0 10 20 30 40
MILES
IDAHO
Figure 25
ISOPLUVIALS OF 2-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH
NOAA ATLAS 2, Volume V
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division
SANDPOINT
COEUR D'ALENE
LEWISTON
PAYETTE
BOISE
MOUNTAIN HOME
GRAND VIEW
BRUNEAU
GOODING
TWIN FALLS
BURLEY
ROGERSON
JUNIPER BASIN RESERVOIR
THREE CREEK
ARCO
RIGBY
IDAHO FALLS
ST ANTHONY
BIG SPRINGS
SPENCER
BRIGGS
ELKHORN MTN
BLACKFOOT
AMERICAN FALLS
SODA SPRINGS
MALAD
PRESTON
Snake
River
Plains

Appendix I - Standard Permit Conditions

Standard permit conditions in Appendix I are consistent with the general permit provisions required under 40 CFR 122.41.

I.1 Duty To Comply.

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

I.1.1 You must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards, even if the permit has not yet been modified to incorporate the requirement.

I.1.2 Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (61 FR 252, December 31, 1996, pp. 69359-69366, as corrected in 62 FR 54, March 20, 1997, pp.13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every 4 years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties following were adjusted for inflation starting in 1996.

I.1.2.1 *Criminal Penalties.*

a. *Negligent Violations*. The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than two years, or both.

b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon

conviction of violating the imminent danger provision be subject to a fine of not more than $1,000,000 and can fined up to $2,000,000 for second or subsequent convictions.

d. *False Statement*. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.1.2.2 *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $37,500 per day for each violation).

I.1.2.3 *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows

a. *Class I Penalty*. Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $37,500).

b. *Class II Penalty*. Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $177,500).

I.2 Duty to Reapply.

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain authorization as required by the new permit once EPA issues it.

I.3 Need to Halt or Reduce Activity Not a Defense.

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

I.4 Duty to Mitigate.

You must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

I.5 Proper Operation and Maintenance.

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

I.6 Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

I.7 Property Rights.

This permit does not convey any property rights of any sort, or any exclusive privileges.

I.8 Duty to Provide Information.

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information that EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA or an authorized representative upon request, copies of records required to be kept by this permit.

I.9 Inspection and Entry.

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

I.9.1 Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

I.9.2 Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

I.9.3 Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

I.9.4 Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

I.10 Monitoring and Records.

I.10.1 Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

I.10.2 You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the permittee's authorization is terminated. This period may be extended by request of EPA at any time.

I.10.3 Records of monitoring information must include:

I.10.3.1 The date, exact place, and time of sampling or measurements;

I.10.3.2 The individual(s) who performed the sampling or measurements;

I.10.3.3 The date(s) analyses were performed

I.10.3.4 The individual(s) who performed the analyses;

I.10.3.5 The analytical techniques or methods used; and

I.10.3.6 The results of such analyses.

I.10.4 Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

I.10.5 The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

I.11 Signatory Requirements.

I.11.1 All applications, including NOIs, must be signed as follows:

I.11.1.1 For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

I.11.1.2 For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

I.11.1.3 For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive

officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

I.11.2 Your SWPPP, including changes to your SWPPP, inspection reports, and any other compliance documentation required under this permit, must be signed by a person described in Appendix I, Subsection I.11.1 above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

I.11.2.1 The authorization is made in writing by a person described in Appendix I, Subsection I.11.1;

I.11.2.2 The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

I.11.2.3 The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

I.11.3 Changes to Authorization. If an authorization under Part 1.7 is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI satisfying the requirements of Part 1.7 must be submitted to EPA. See Table 1 in Part 1.7.2 of the permit. However, if the only change that is occurring is a change in contact information or a change in the facility's address, the operator need only make a modification to the existing NOI submitted for authorization.

I.11.4 Any person signing documents in accordance with Appendix I, Subsections I.11.1 or I.11.2 above must include the following certification:

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

I.11.5 For persons signing documents electronically, in addition to meeting other applicable requirements in Appenidx I, Subsection I.11, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication).

I.11.6 The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.12 Reporting Requirements.

I.12.1 Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

I.12.1.1 The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

I.12.1.2 The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

I.12.2 Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

I.12.3 Transfers. This permit is not transferable to any person except after notice to EPA. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination pursuant to Part 8. The new owner or operator must submit a Notice of Intent in accordance with Part 1.7 and Table 1. See also requirements in Appendix I, Subsections I.11.1 and I.11.2.

I.12.4 Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

I.12.4.1 Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.

I.12.4.2 If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.

I.12.5 Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

I.12.6 Twenty-four hour reporting. In addition to reports required elsewhere in this permit:

I.12.6.1 You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

I.12.6.2 The following shall be included as information which must be reported within 24 hours under this paragraph.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR 122.41(m)(3)(ii))

b. Any upset which exceeds any effluent limitation in the permit

c. Violation of a maximum daily discharge limit for any numeric effluent limitation. (See 40 CFR 122.44(g).)

I.12.6.3 EPA may waive the written report on a case-by-case basis for reports under Appendix I, Subsection I.12.6.2 if the oral report has been received within 24 hours.

I.12.7 Other noncompliance. You must report all instances of noncompliance not reported under Appendix I, Subsections I.12.4, I.12.5, and I.12.6, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix I, Subsection I.12.6.

I.12.8 Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

I.13 Bypass.

I.13.1 Definitions.

I.13.1.1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility See 40 CFR 122.41(m)(1)(i).

I.13.1.2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).

I.13.2 Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix I, Subsections I.13.3 and I.13.4. See 40 CFR 122.41(m)(2).

I.13.3 Notice.

I.13.3.1 Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass. See 40 CFR 122.41(m)(3)(i).

I.13.3.2 Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix I, Subsection I.12.6 (24-hour notice). See 40 CFR 122.41(m)(3)(ii).

I.13.4 Prohibition of bypass. See 40 CFR 122.41(m)(4).

I.13.4.1 Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix I, Subsection I.13.3.

I.13.4.2 EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix I, Subsection I.13.4.1.

I.14 Upset.

I.14.1 Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

I.14.2 Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix I, Subsection I.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. See 40 CFR 122.41(n)(2).

I.14.3 Conditions necessary for a demonstration of upset. See 40 CFR 122.41(n)(3). A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

I.14.3.1 An upset occurred and that you can identify the cause(s) of the upset;

I.14.3.2 The permitted facility was at the time being properly operated; and

I.14.3.3 You submitted notice of the upset as required in Appendix I, Subsection I.12.6.2.b (24 hour notice).

I.14.3.4 You complied with any remedial measures required under Appendix I, Subsection I.4.

I.14.4 Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, have the burden of proof. See 40 CFR 122.41(n)(4).

I.15 Retention of Records.

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

I.16 Reopener Clause.

I.16.1 Procedures for modification or revocation. Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

I.16.2 Water quality protection. If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit in accordance with Part 1.7.5 of this permit, or the permit may be modified to include different limitations and/or requirements.

I.16.3 Timing of permit modification. EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

I.17 Severability.

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA's intent is that the permit is to remain in effect to the extent possible; in the event that any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

Appendix J - Notice of Intent (NOI) Form and Instructions

Part 1.7.1 requires you to use the electronic NOI system, or "eNOI" system, to prepare and submit your NOI. However, if you are given approval by the EPA Regional Office to use a paper NOI form, and you elect to use it, you must complete and submit the following form.

NPDES FORM 3510-9	EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF INTENT (NOI) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AN NPDES GENERAL PERMIT	Form Approved. OMB No. 2040-0004

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section I of this form. Submission of this NOI also constitutes notice that the operator identified in Section II of this form meets the eligibility requirements of Parts 1.1 and 1.2 of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOI Form

Have you been given approval from the Regional Office to use this paper NOI form*? ☐ YES ☐ NO

If yes, provide the reason you need to use this paper form, the name of the EPA Regional Office staff person who approved your use of this form, and the date of approval:

Reason for using paper form: _____

Name of EPA staff person: _____

Date approval obtained: _____

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form.**

II. Permit Information

Tracking Number (EPA Use Only):

Permit Number: (see Appendix B of the CGP for the list of eligible permit numbers)

III. Operator Information

Name:

Phone: - - Ext. Fax (optional): - -

E-mail:

IRS Employer Identification Number (EIN): –

Point of Contact:

First Name, Middle Initial, Last Name:

Mailing Address:

Street:

City: State: Zip Code: -

NOI Preparer (Complete if NOI was prepared by someone other than the certifier):

Prepared by:

First Name, Middle Initial, Last Name:

Organization:

Phone: - - Ext. Fax (optional): - -

E-mail:

IV. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

County or similar government subdivision: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

For the project/site for you are seeking permit coverage, provide the following information:

Latitude/Longitude (Use one of three possible formats, and specify method):

Latitude
1. ___ ___° ___ ___' ___ ___" N (degrees, minutes, seconds)
2. ___ ___° ___ ___. ___ ___' N (degrees, minutes, decimal)
3. ___ ___. ___ ___ ___ ___° N (degrees decimal)

Longitude
1. ___ ___ ___° ___ ___' ___ ___" W (degrees, minutes, seconds)
2. ___ ___ ___° ___ ___. ___ ___' W (degrees, minutes, decimal)
3. ___ ___ ___. ___ ___ ___ ___° W (degrees decimal)

Latitude/Longitude Data Source: ☐ U.S.G.S. topographic map ☐ EPA web site ☐ GPS ☐ Other: _____

If you used a U.S.G.S. topographic map, what was the scale? _____

Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 or WGS 84 ☐ Unknown

Is your project/site located in Indian Country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ YES ☐ NO

If yes, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: _____

Are you requesting coverage under this NOI as a "federal operator" as defined in Appendix A? ☐ YES ☐ NO

Estimated Project Start Date: ☐☐ / ☐☐ / ☐☐☐☐ Estimated Project Completion Date: ☐☐ / ☐☐ / ☐☐☐☐

Estimated Area to be Disturbed (to the nearest quarter acre): ☐☐☐☐ . ☐☐

Have earth-disturbing activities commenced on your project/site? ☐ YES ☐ NO

If yes, is your project an "emergency-related project? ☐ YES ☐ NO

Have stormwater discharges from your project/site been covered previously under an NPDES permit? ☐ YES ☐ NO

If yes, provide the Tracking Number if you had coverage under EPA's CGP or the NPDES permit number if you had coverage under an EPA individual permit: ☐☐☐☐☐☐☐☐☐

V. Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ YES ☐ NO

Are there any surface waters within 50 feet of your project's earth disturbances? ☐ YES ☐ NO

Receiving Waters and Wetlands Information: (Attach a separate list if necessary)

Provide the name(s) of the first surface water that received stormwater directly from your site and/or from the MS4:	Provide the names of any impaired waters to which you discharge and the pollutant(s) for which they are impaired		Provide the names of any waters to which you discharge for which there is an EPA approved or established TMDL, the name of the TMDL, and the pollutant(s) for which there is a TMDL		
	Surface water name:	Pollutant(s) causing the impairment:	Surface water name:	TMDL name:	Pollutant(s) for which there is a TMDL:

Impaired Waters

Describe the methods you used to complete the above table:

_____

_____

Are any of the surface waters to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding Natural Resource Water)? (See Appendix F).

☐ YES ☐ NO

If yes, name(s) of receiving water(s) and its designation (Tier 2, Tier 2.5 or Tier 3): _____

VI. Chemical Treatment Information

Will you use polymers, flocculants, or other treatment chemicals at your construction site? ☐ YES ☐ NO

If yes, will you use cationic treatment chemicals at your construction site*? ☐ YES ☐ NO

If yes, have you been authorized to use cationic treatment chemicals by your applicable EPA Regional Office in advance of filing your NOI*?
☐ YES ☐ NO

If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

Please indicate the treatment chemicals that you will use: _____

_____

* Note: You are ineligible for coverage under this permit unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

VII. Stormwater Pollution Prevention Plan (SWPPP) Information

Has the SWPPP been prepared in advance of filing this NOI? ☐ YES ☐ NO

SWPPP Contact Information:

First Name, Middle Initial Last Name: _____ _____ _____

Organization Name: _____

Phone: ___ - ___ - ____ Ext. ____ Fax (optional): ___ - ___ - ____

E-mail: _____

VIII. Endangered Species Protection

Using the instructions in Appendix D of the CGP, under which criterion listed in Appendix D are you eligible for coverage under this permit (only check 1 box)?

☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

Provide a brief summary of the basis for criterion selection listed in Appendix D (e.g., communication with U.S. Fish and Wildlife Service or National Marine Fisheries Service, specific study): _____

_____

If you select criterion B, provide the Tracking Number from the other operator's notification of authorization under this permit: _____

If you select criterion C, you must attach a copy of your site map (see Part 7.2.6 of the permit), and you must answer the following questions:

What federally-listed species or federally-designated critical habitat are located in your "action area": _____

_____

What is the distance between your site and the listed species or critical habitat (miles): _____

_____

If you select criterion D, E, or F, attach copies of any letters or other communications between you and the U.S. Fish and Wildlife Service or National Marine Fisheries Service.

IX. Historic Preservation

Are you installing any stormwater controls as described in Appendix E that require subsurface earth disturbance? (Appendix E, Step 1) ☐ YES ☐ NO

If yes, have prior surveys or evaluations conducted on the site have already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E, Step 2) ☐ YES ☐ NO

If no, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? (Appendix E, Step 3) ☐ YES ☐ NO

If no, did the SHPO, THPO, or other tribal representative (whichever applies) respond to you within the 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? (Appendix E, Step 4) ☐ YES ☐ NO

If yes, describe the nature of their response:

☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions

☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls

☐ Other: _____

_____

X. Certification Information

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

First Name, Middle Initial, Last Name: _____ ___ _____

Title: _____

Signature: _____ Date: __ / __ / ____

Email: _____

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form Date (2/16) This Form Replaces Form 3510-9 (11/08) Form Approved OMB No. 2040-0004

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), federal law prohibits stormwater discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) permit. Operator of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with the permit conditions. If you have questions about whether you need a NPDES stormwater permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to www.epa.gov/npdes/stormwater/cgp or telephone EPA's NOI Processing Center at (866) 352-7755.

Completing the Form

Obtain and read a copy of the 2012 Construction General Permit, viewable at www.epa.gov/npdes/stormwater/cgp. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to www.epa.gov/npdes/stormwater/cgp or telephone EPA's NOI Processing Center at (866) 352-7755. Please submit the original document with signature in ink - do not send a photocopied signature.

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been given approval by the EPA Regional Office to use a paper NOI. Note that you are not authorized to use this paper NOI form unless the Regional Office has approved its use. Verbal approval from the Regional Office is sufficient. Where you have obtained approval to use this form, indicate the reason you need to use this form, the name of the EPA Regional Office staff person who provided approval for use of this form, and the date that approval was provided. See www.epa.gov/npdes/stormwater/contacts for a list of EPA Regional Office contacts.

Section II. Permit Number

Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. Refer to Appendix A of the permit for the definition of "operator". Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter "NA" in the space provided. Also provide a point of contact, the operator's mailing address, telephone number, fax number (optional) and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the full name, organization, phone number and email address of the NOI preparer.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

Provide the latitude and longitude of your facility either in degrees, minutes, seconds; degrees, minutes, decimal; or degrees decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA's web-based siting tools, among others. Refer to www.epa.gov/npdes/stormwater/cgp for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum used on USGS topographic maps is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers. If you use EPA's web siting tool, or if you are unsure of the horizontal reference datum for your site, please check the "unknown" box.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian tribe, and if so, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property.

Indicate whether you are seeking coverage under this permit as a "federal operator" as defined in Appendix A.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 10/06/2012). Indicate to the nearest quarter acre the estimated area to be disturbed.

Indicate whether earth-disturbing activities have already commenced on your project/site. If earth-disturbing activities have commenced on your site because stormwater discharges from the site have been previously covered under a NPDES permit, you must provide the CGP Tracking Number or the NPDES permit number if coverage was under an individual permit.

Section V. Discharge Information

Indicate whether discharges from the site will enter into a municipal separate storm sewer system (MS4), as defined in Appendix A.

Also, indicate whether any surface waters (as defined in Appendix A) exist either on or within 50 feet from your site. Note that if "yes", you are required to comply with the requirement in Part 2.1.2.1 of the permit to provide natural buffers or equivalent sediment controls.

You must specify the names of any surface waters that receive stormwater directly from your site and/or from the MS4 to which you discharge. You must also specify the names of any surface waters that you discharge to that are listed as "impaired" as defined in Appendix A, including any waters for which there is an approved or established TMDL, and the pollutants for which the water is impaired or for which there is a TMDL. This information will be used to determine if the site discharges to an impaired waterbody, which triggers additional requirements in Part 3.2.2 of the permit. Applicants must specify which method they used to determine whether or not their site discharges to impaired waters. Also, if a TMDL has been approved or established, identify the title or reference of the TMDL document.

Indicate whether discharges from the site will enter into a surface water that is designated as a Tier 2, Tier 2.5, or Tier 3 water. A list of Tier 2, 2.5, and 3 waters is provided as Appendix F. If the answer is "yes", name all waters designated as Tier 2, Tier 2.5, or Tier 3 to which the site will discharge.

Section VI. Chemical Treatment Information

Indicate whether the site will use polymers, flocculants, or other treatment chemicals. Indicate whether the site will employ cationic treatment chemicals. If the answer is "yes" to either question, indicate which chemical(s) you will use. Note that you are not eligible for coverage under this permit to use cationic treatment chemicals unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. Examples of cationic treatment chemicals include, but are not limited to, cationic polyacrylamide (C-PAM), PolyDADMAC (POLYDIALLYLDIMETHYLAMMONIUM CHLORIDE), and chitosan.

Section VII. Stormwater Pollution Prevention Plan (SWPPP) Information

All sites eligible for coverage under this permit are required to prepare a SWPPP in advance of filing the NOI, in accordance with Part 7. Indicate whether the SWPPP has been prepared in advance of filing the NOI.

Indicate the street, city, state, and zip code where the SWPPP can be found. Indicate the contact information (name, organization, phone, fax (optional), and email) for the person who developed the SWPPP for this project.

Section VIII. Endangered Species Information

Using the instructions in Appendix D, indicate under which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species and designated critical habitat. A description of the basis for the criterion selected must also be provided.

If criterion B is selected, provide the Tracking Number for the other operator who had previously certified their eligibility under criterion A, C, D, E, or F. The Tracking Number was assigned when the operator received coverage under this permit, and is included in the notice of authorization.

If criterion C is selected, you must attach copies of your site map. See Part 7.2.6 of the permit for information about what is required to be in your site map. You must also specify the federally-listed species or federally-designated critical habitat that are located in the "action area" of the project, and provide the distance between the construction site and any listed endangered species or their critical habitat.

If criterion D, E, or F is selected, attach copies of any communications between you and the U.S. Fish and Wildlife Service and National Marine Fisheries Service.

Section IX. Historic Preservation

Use the instructions in Appendix E to complete the questions on the NOI form regarding historic preservation.

Section X. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form Date (2/16) This Form Replaces Form 3510-9 (11/08) Form Approved OMB No. 2040-0004

Modifying Your NOI

If after submitting your NOI you need to correct or update any fields on this NOI form, you may do so by submitting a paper modification form, which you can obtain at the following link: http://www.epa.gov/npdes/pubs/cgp_modify.pdf

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Submitting Your Form

Submit your NOI form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
EPA East Building - Room 7420
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/cgpenoi

Appendix K - Notice of Termination (NOT) Form and Instructions

Part 8.3 requires you to use the electronic NOI system, or "eNOI" system, to prepare and submit your NOT. However, where your EPA Regional Office specifically authorizes you to use a paper NOT form, you are required to complete and submit the following form.

NPDES FORM 3510-13	EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF TERMINATION (NOT) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AN NPDES GENERAL PERMIT	Form Approved. OMB No. 2040-0004

Submission of this Notice of Termination constitutes notice that the operator identified in Section II of this form is no longer authorized discharge pursuant to the NPDES Construction General Permit (CGP) from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOT Form

Have you been given approval from the Regional Office to use this paper NOT form*? ☐ YES ☐ NO

*** Note: You must have been given approval by the Regional Office prior to using this paper NOT form.**

II. Permit Information

NPDES Stormwater General Permit Tracking Number: _____

Reason for Termination (Check only one):

- ☐ You have completed earth-disturbing activities at your site, and you have met all other requirements in Part 8.2.1.
- ☐ Another operator has assumed control over all areas of the site and that operator has submitted an NOI and obtained coverage under the CGP.
- ☐ You have obtained coverage under an individual permit or another general NPDES permit addressing stormwater discharges from the construction site.

III. Operator Information

Name: _____

IRS Employer Identification Number (EIN): __ – _____

Mailing Address:

Street: _____

City: _____ State: __ Zip Code: _____ - ____

Phone: ___ - ___ - ____ Ext. ____ Fax (optional): ___ - ___ - ____

E-mail: _____

IV. Project/Site Information

Project/Site Name: _____

Project/Site Address:

Street/Location: _____

City: _____ State: __ Zip Code: _____ - ____

County or similar government subdivision: _____

V. Certification Information

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

First Name, Middle Initial, Last Name: _____ _____

Title: _____

Signature: _____ Date: __ / __ / ____

Email: _____

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

NPDES Form Date (2/16) This Form Replaces Form 3510-13 (12/08) Form Approved OMB No. 2040-0004

Who May File an NOT Form

Permittees who are presently covered under the EPA-issued 2012 Construction General Permit (CGP) for Stormwater Discharges Associated with Construction Activity may submit an NOT form when: (1) earth-disturbing activities at the site are completed and the conditions in Parts 8.2.1.1 thru 8.2.1.5 are met; or (2) the permittee has transferred all areas under its control to another operator, and that operator has submitted and obtained coverage under this permit; or (3) the permittee has obtained coverage under a different NPDES permit for the same discharges.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to www.epa.gov/npdes/stormwater/cgp or telephone EPA's NOI Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Approval to Use Paper NOT Form

You must indicate whether you have been given approval by the EPA Regional Office to use a paper NOT. Note that you are not authorized to use this paper NOT form unless the Regional Office has approved its use.

Section II. Permit Number

Enter the existing NPDES Stormwater General Permit Tracking Number assigned to the project by EPA's Stormwater Notice Processing Center. If you do not know the permit tracking number, refer to http://www.epa.gov/npdes/stormwater/cgp or contact EPA's NOI Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

You have completed earth-disturbing activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.6.3) and you have met all other requirements in Part 8.2.1.

Another operator has assumed control over all areas of the site and that operator has submitted an NOI and obtained coverage under the CGP.

You have obtained coverage under an individual permit or another general NPDES permit addressing stormwater discharges from the construction site.

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. Refer to Appendix A of the permit for the definition of "operator". Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address, telephone number, and email address of the operator. Optional: enter the fax number of the operator.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section V. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

NPDES Form Date (2/16) This Form Replaces Form 3510-13 (12/08) Form Approved OMB No. 2040-0004

Submitting Your Form:
Submit your NOI form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
EPA East Building - Room 7420
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/cgpenoi

Appendix B FORMS

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APPENDIX B FORMS

This appendix contains the required Notice of Intent (NOI) and Notice of Termination (NOT) forms, for both ADEQ and EPA Construction General Permits. The Arizona NOI must be submitted electronically, so a hard-copy form for it is not included, only a web link. The EPA NOI form is also available for electronic submittal.

ADEQ Smart NOI: http://az.gov/webapp/noi/main.doc

EPA eNOI: http://cfpub2.epa.gov/npdes/stormwater/enoi.cfm

This chapter also contains other forms, such as the AZPDES SWPPP Checklist, permit waivers, fact sheets and applications, and lists of impaired and unique surface waters.

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B.1 AZPDES SWPPP Checklist

This document is taken directly from the ADEQ website http://www.azdeq.gov/environ/water/permits/. Refer to that website periodically for any updates that may have occurred since this manual was published.

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2008 Construction General Permit SWPPP Guidance Checklist

This optional checklist is provided to assist owners and operators in preparing their AZPDES Stormwater Pollution Prevention Plan (SWPPP) to meet the requirements of Arizona's 2008 Construction General Permit (AZG2008-001). The "Descriptions" provided below do not necessarily reflect the exact wording used in the permit; rather these are stated in simplified language to provide additional guidance. (Note if any inadvertent conflict exists between this document and the permit, the permit language prevails). The "Permit Citation" column shows you where each particular requirement is found in the 2008 CGP. Use the "Location" column to note the page where the requirement is addressed in your SWPPP. Please leave the "For ADEQ Use Only" column blank. Using this SWPPP checklist will help you ensure that all the permit requirements are addressed in your SWPPP and will also assist the Department in conducting a more efficient review of your SWPPP if it is required to be submitted.

Please note that your SWPPP does not have to follow the format of this checklist; the purpose of this checklist is only to ensure that your SWPPP contains all required components. While this checklist is intended for use in preparing your initial SWPPP, your SWPPP is a "living" document and it is important that it be updated to document changes in your project, best management practices (BMPs), Inspections, and other pertinent information.

Permit Citation	Description	Location in SWPPP & Notes	For ADEQ Use Only
	OPERATOR RESPONSIBILITIES		
Part III.A.2.d	Identify who is responsible for on-site SWPPP implementation		
Part III.B.2.a.	Indicate or show the areas of the project where the operator has control over project specifications, including the ability to make changes in specifications		
Part III.B.2.a	Provide name(s) of the person(s) who have day-to-day control over construction plans and specifications		
Part III.B.2.b	Identify who is responsible for installing, implementing, and maintaining the BMPs in the plan		
Part III.B.2.b	Identify or show the areas of the project where each operator has control over day-to-day activities		
Part III.B.2.b	Provide name(s) of the person(s) having control over project specifications, including the ability to make changes in specifications		
Part III.C.1	Provide the name and contact information for all operators and indicate the areas of the project each operator controls		
	PROJECT DESCRIPTION		
Part III.A.2.a	Identify all potential sources of pollutants/pollution from construction activities that could possibly contact stormwater		
Part III.C.2.	Describe the construction activity (what is being built, what is being disturbed, how long it is expected to take, etc.)		
Part III.C.2.a	Describe the project and what it will be used for when completed (after Notice of Termination (NOT) is filed)		

Permit Citation	Description	Location in SWPPP & Notes	For ADEQ Use Only
Part III.C.2.b	Describe the planned phasing or sequencing of land disturbance activities. The amount of open/disturbed dirt left open at one time should be minimized where possible		
Part III.C.2.c	Indicate the **total** acres of the site and number of acres that will be **disturbed** (include off-site borrow and fill area, staging and equipment storage areas)		
Part III.C.2.d	Indicate the percentage of the site that is impervious (e.g., paved, roofed, etc.) **before** and **after** construction		
Part III C.2.e	Describe the soil (e.g., sand, clay, etc.) at the site and its potential for erosion (Suggestion: reference the Soil Survey covering the project site prepared by the U.S. Department of Agriculture, Natural Resource Conservation Service for soil information http://soils.usda.gov/survey/)		
Part III.C.2.f	Include a map showing the project location (e.g. U.S.G.S. quadrangle, portion of a city or county map). The map must also show any washes or other waterbodies within 1 mile of the site		
Part III.C.4	Identify the nearest receiving water(s). A receiving water is a natural watercourse into which stormwater would flow in a storm event and includes dry washes, streams, tributaries, and other waters of the U.S. (such as designated canals). Man-made structures such as retention basins, storm sewer systems, or city storm drains are not receiving waters.		
Part III.C.4	Identify the areal extent where soils may be disturbed and show any wetlands near the site that could receive dirt or run-off from the construction activity		
Part III.C.6	Describe any pollutant sources from areas other than dirt moving (e.g., dedicated concrete and asphalt plants, fueling operations, material or waste storage etc. that are associated with the construction project). Identify where these sources are or will occur on site		
	SITE MAP (note multiple maps may be used) All the following are to be shown on the site map or maps		
Part III.C.3.	Include a site map completed to scale		
Part III.C.3.a.	Use arrows to show the direction(s) where stormwater will flow for all areas within the project limits (This is for the period during construction, not final contours. Flow direction may change as project grading progresses; when this occurs, maps are to be updated.)		
Part III.C.3.b.	Show areas of soil disturbance **and** areas that will not be disturbed		
Part III.C.3.c.	Show all structural BMPs identified in the SWPPP		
Part III.C.3.d.	Show locations where stabilization BMPs are expected to occur		
Part III.C.3.e.	Show locations of on-site material storage, waste storage or receptacles, borrow areas, equipment storage or other supporting activities		

Permit Citation	Description	Location in SWPPP & Notes	For ADEQ Use Only
Part III.C.3.f.	Identify any water bodies (including dry washes and wetlands) on the site. If there are no water bodies, indicate this on the map		
Part III.C.3.g.	Show locations where stormwater discharges to surface water (including wetlands, ephemeral waters and dry washes) and to municipal storm sewer systems (MS4s) (use an "X" to indicate discharge location(s)). Where surface waters and/or MS4s receiving stormwater do not fit on the map, use arrows to show the direction and indicate the approximate distance to the surface water and/or MS4		
Part III.C.3.h.	Show the location and registration number of all onsite dry-wells and dry-wells located on adjacent properties that could receive stormwater from the site (if none exist, indicate that)		
Part III.C.3.i.	Identify any areas of the site where final stabilization has been achieved		
Part III.C.3.j	Specify existing vegetated areas (trees, brush, etc.) and boundaries of environmentally sensitive areas and buffer zones that are to be preserved		
	BMP (Best Management Practices) REQUIREMENTS		
Part III.A.2.b, III.C.5.a, and IV.A.1	Identify BMPs selected for the site and describe how each will reduce pollutants in stormwater		
Part III.C.5.b	Describe how BMPs will be added, modified, or replaced for each phase or sequence of construction activities. Also, identify which operator is responsible for the implementation of BMPs		
Part III.C.5.c	Provide drawings and/or specifications of structural BMPs that include design or installation details		
Part IV.B.1.a	Describe where natural/existing vegetation will be preserved. Locations of trees and boundaries of environmentally sensitive areas and buffer zones to be preserved are also to be on the SWPPP site map		
Part IV.B.1.b	If using seed to revegetate, provide the mixture and application specifications. (These may be obtained from product provider)		
Part IV.B.1.c	If culverts are present on-site, describe measures that will be used to minimize erosion at and around the culvert(s)		
Part IV.B.1.d	Describe how off site stormwater that may run onto the project site will be diverted or otherwise managed with on-site engineering controls, containment, or BMPs		
Part IV.B.3.a.	Identify how records of dates when major grading activities occur will be kept		
Part IV.B.3.b.	Identify how records of when construction activities temporarily or permanently cease on all portions of the site will be kept		
Part IV.B.3.c.	Identify how records of when stabilization measures are initiated and completed and reason(s) for delay will be kept		

Permit Citation	Description	Location in SWPPP & Notes	For ADEQ Use Only
Part IV.C.3	Provide sizing criteria and show calculations for sediment basin(s) and indicate whether basin(s) will be temporary or permanent (i.e., post-construction)		
Part IV.C.3	Provide reason(s) or rationale why a sediment basin was determined to **not** be possible at the project site (If applicable)		
Part IV.D.3.	Describe the location(s) and how materials will be stored or staged both on-site and offsite; including overburden, soil stockpiles, and borrow areas		
Part IV.E.2.	Identify and provide the location(s) of all non-stormwater discharges allowed by this permit expected to be associated with the project and describe BMPs used to minimize discharge of pollutants		
Part VI.B.1	Describe measures for preventing and responding to spills, including spill notification requirements		
	POST-CONSTRUCTION CONTROLS		
Part IV.F.1.	Identify post-construction stormwater BMPs (e.g., porous pavement, open space preservation, etc.) that will be installed as part of this project. Note: temporary BMPs (e.g., straw waddles, etc.) must be removed prior to submitting your Notice of Termination		
	INSPECTIONS		
Part IV.H.1	Identify the minimum inspection frequency as well as goals for more frequent inspections		
Part IV.H.2.	Provide name, title, and qualifications of person(s) who will be conducting inspections		
Part IV.H.3.a	Describe how inspection of the following items will be conducted:		
	Good housekeeping BMPs (e.g., solid waste storage and pickup; chemical storage, use, and cleanup; fueling; etc.)		
	Erosion and sediment control BMPs		
	Construction site entrance and egress location(s) including looking for evidence of sediment, debris, and other pollutants tacked offsite onto paved surfaces (e.g., streets, sidewalks, parking lots, etc)		
	Municipal storm sewer systems, including streets, inlets, etc. which can be observed at ground level. Should focus on discharge (and potential for discharge) and accumulation of sediment, trash, and other pollutants		
	Observation and assessment of accessible discharge locations to determine if erosion control BMPs are adequate and effective in reducing discharge of sediments		
	For discharge points that are inaccessible, inspection of downstream locations should occur, where practicable		
Part IV.H.3.b	Describe how inspections will be documented (note: inspection reports must be added to the SWPPP in chronological order, Permit Part IV.H.4)		
Part IV.H.3.c	Describe procedures for repairing, replacing, and/or supplementing nonfunctional and underperforming BMPs (see Permit Part IV.I.2)		

Permit Citation	Description	Location in SWPPP & Notes	For ADEQ Use Only
	INSPECTION REPORT		
Part IV.H.4	Provide a copy of the inspection report form to be used to document site inspections. At a minimum, the report form must include the following information (note, an example form is provided in the permit and may be used to satisfy this permit requirement):		
	Date of inspection		
	Name and title of person(s) conducting the inspection		
	Information about weather conditions since the last inspection, including: best estimate of the beginning and end of each rain event; time elapsed since last rain event; and approximate amount of rainfall for each event (in inches)		
	Locations where sediment and other pollutants are or were discharged from the site		
	For inspections conducted while stormwater can be observed discharging from the site, provide a description of the physical characteristics (e.g., presence of suspended sediment, turbid water, discoloration, oil sheen, etc.)		
	Location and identification of BMPs in that need to be maintained, failed to operate, or proved inadequate		
	Location(s) where additional BMPs are needed that did not exist at the time of inspection		
	Identification of all sources of non-stormwater and the associated pollution prevention control BMPs		
	Identification of material storage areas and evidence of or potential for pollutant discharge from such areas		
	Corrective actions required, including any changes to SWPPP necessary, and implementation dates (of corrective actions/maintenance, and SWPPP changes)		
	Identification of any non-compliance with the conditions of this permit, or where the inspector does not identify any incidents of non-compliance, the inspection report shall contain a certification that the construction project or site is being operated in compliance with the SWPPP and permit		
	Certification statement and signature for inspection report in agreement with Part VIII.J.		
	MONITORING PLAN - (if applicable)		
Part III.C.6	If discharging to an impaired water, identify sources of pollutants of concern listed on the 303(d) list that may be potentially discharged through construction site activities and soil disturbances. If these exist, describe added or better BMPs to minimize discharges of these pollutants		
Part V.B.1	For projects located within ¼-mile of a unique or impaired water, your SWPPP must include a Monitoring Plan that (at a minimum) contains the following information		
	Specific location(s) at the site where visual and analytical monitoring activities will be conducted		

Permit Citation	Description	Location in SWPPP & Notes	For ADEQ Use Only
	The name(s) and titles of the person(s) who will perform the monitoring		
	Map showing the segments or portions of the receiving water (stream, lake, etc.) that are most likely to be impacted by the discharge of pollutant(s)		
	Water quality parameters/pollutants to be sampled		
	The citation and description of the sampling protocols to be used (should include Standard Operation Procedure for sample collection, preservation, etc.)		
Part V.B.1, continued	Identify analytical methods and related method detection limits (if applicable) for each parameter to be monitored		
	Identify any special pollutants of concern based on the most recent 305(b)/303(d) listing or other information available		
	Describe the potential sources of this pollutant from the project, if any (including disturbances of soil containing this pollutant)		
Part V.D.3	If the unique or impaired water is a lake, your monitoring plan (including monitoring locations) must be submitted to and approved by the Department		
Part V.D.5	Chain-of-custody (COC) forms including: sampler's name, phone number, date and time of sample collection, sample identification, requested analysis, and project name or number		
	ADMINISTRATIVE		
Part III.A.3 Part VIII.J.2	Ensure the SWPPP is signed by a person meeting the certification requirements of Permit Part VIII.J		
Part III.D.1	Include a copy of AZPDES permit (AZG2008-001) with the SWPPP		
Part III.D.2	Include a copy of the completed NOI form that was submitted to ADEQ		
Part III.D.3	Include a copy of the authorization certificate received from ADEQ		
Part III.D.4	Identify any city or county which received a copy of the authorization certificate		
Part III.D.5	Include copies of other agreements with any state, local or federal agencies that would affect the provisions or implementation of the SWPPP, **if** applicable (404 permits, local grading permits, etc.)		

B.2 EPA Permit Waiver

This document is taken directly from the EPA website http://cfpub1.epa.gov/npdes/stormwater/waiver.cfm. Refer to that website periodically for any updates that may have occurred since this manual was published.

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See page three for instructions

Form Approved OMB No. 2040-0004

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Low Erosivity Waiver Certification

This form provides notice to EPA that you, the project operator identified in Section I of this form, are certifying that construction activity at the project site identified in Section II, will take place during a period when the rainfall erosivity factor is less than five [40 CFR 122.26(b)(15)(i)(A)]. By submitting a complete and accurate form, the otherwise applicable NPDES permitting requirements for stormwater discharges associated with construction activity, are waived. Based on your certification, a waiver is granted for the period beginning on the date this Low Erosivity Waiver Form is mailed to EPA (i.e., postmark date), or the project start date specified in Part III of this form, whichever shall occur last, and ending on the project completion date specified in Part III. Refer to the instructions at the end of this form for more details.

I. Operator Information

Company Name:

IRS Employer Identification Number (EIN): –

Mailing Address:

Street:

City: State: Zip Code: -

Contact Name:

Phone: - - Fax (optional): - -

Email:

II. Construction Project/Site Information

Project/Site Name:

Project Street/Location:

City: State: Zip Code: -

County or similar government subdivision:

Latitude and Longitude (Use one of three formats given, and specify the source)

1. Degrees, minutes, seconds (e.g., 76°, 30´, 45″) Latitude: __ __°__ __´__ __″ N Longitude: __ __ __°__ __´__ __″ W
2. Degrees, minutes with 2 decimal places (e.g., 76° 30.75´) __ __°__ __.__ __´ N __ __ __°__ __.__ __´ W
3. Degrees, minutes with 4 decimal places (e.g., 76.5125°) __ __.__ __ __ __° N __ __ __.__ __ __ __° W

- Lat/Lon source? ☐ USGS topographic map ☐ EPA Web siting tool ☐ GPS ☐ Other (specify source): _____
- If you used a USGS topographic map, what is the scale? _____
- Horizontal Reference Datum? ☐ NAD 27 ☐ NAD 83 or WGS 84 ☐ Unknown
- Is the project located on Indian country? ☐ Yes ☐ No If yes, enter Indian reservation name _____
- Is the project a federal facility or part of a federal facility? ☐ Yes ☐ No
- Is the project located in the State of Oklahoma and associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171)? ☐ Yes ☐ No
- Is the project located in the State of Oklahoma and associated with agricultural production, services and silviculture (includes SIC Groups 01, 02, 07, 08 and 09)? ☐ Yes ☐ No
- Is the project located in the State of Texas and associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation or crude oil or natural gas by pipeline? ☐ Yes ☐ No

Estimated Area to be Disturbed (to the nearest quarter acre): -

III. Rainfall Erosivity Factor Calculation Data

Project Start Date: ___ / ___ / ____ (Month Day Year) Project Completion Date: ___ / ___ / ____ (Month Day Year)

Are interim non-vegetative site stabilization measures used to establish the project completion date for purposes of obtaining this waiver? ☐ Yes ☐ No

Rainfall erosivity factor (R factor): __.__ __

Note: To qualify for this waiver, the construction activity must take place during a period when the R factor is less than five.

Rainfall erosivity factor was calculated by using: ☐ Online calculator ☐ EPA Fact Sheet 3-1 ☐ USDA Handbook 703

IV. Operator Certification

I certify under penalty of law that: (1) construction activity at the project or site specified in Part II shall disturb less than five acres and shall take place during a period when the rainfall erosivity factor is less than five, (2) final stabilization will be completed as defined in the Construction General Permit, and (3) this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, if interim non-vegetative measures are used to establish the end of the construction period for the purposes of obtaining this waiver, I commit to periodically inspect and properly maintain the area until the criteria for final vegetative stabilization have been met.

Print Name: _____

Print Title: _____

Signature: _____ Date: ___ / ___ / ____ (Month Day Year)

Email: _____

Low Erosivity Waiver Certification

NPDES Form

Form Approved OMB No. 2040-0004

Who May Qualify for a Low Erosivity Waiver
Under the National Pollutant Discharge Elimination System (NPDES) Program, operators of construction projects that result in land disturbances equal to or greater than one acre, including sites that are less than one acre but are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, are required to obtain coverage under an NPDES permit for stormwater discharges associated with construction activity. EPA may waive the otherwise applicable permit requirements for stormwater discharges from construction activities that disturb less than five acres if the construction activity will take place during a period when the rainfall erosivity factor (R factor) is less than five. More information on the low erosivity waiver is available on the web in the Construction Rainfall Erosivity Waiver Fact Sheet at www.epa.gov/npdes/pubs/fact3-1.pdf and can be accessed from www.epa.gov/npdes/stormwater/cgpenoi. For questions related to completion of this form, you may contact EPA's Stormwater Notice Processing Center toll free at 1-866-352-7755.

Completing the Form
Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. **Please submit the original form with a signature in ink. EPA will not accept a photocopied signature.**

Section I. Operator Information
Each legal entity that meets EPA's definition of "operator" (see definitions in Appendix A of EPA's NPDES Construction General Permit) and that meets the eligibility conditions for the low erosivity waiver must file this form to have the permit requirements waived. The operator is any party associated with a construction activity that meets either of the following two criteria: (1) the party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) the party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit). It is possible that there will be more than one operator at a site and, in such cases, each entity that meets the operator definition must complete a Low Erosivity Waiver Certification. Provide the legal name of your firm, public organization, or other entity that operates the project described in this waiver certification. Usually this will be a company or organization's name but for construction activities undertaken by you as an individual, this should be your name. Provide the operator's Internal Revenue Service (IRS) employer identification number (EIN), commonly referred to as the "taxpayer ID." If you are completing this form as an individual (i.e., not representing a company or organization), enter "NA" in the space provided for EIN. Enter the operator's complete mailing address and name of contact person, telephone number and email who can answer questions about the site (e.g., a project or site manager). *Optional:* to facilitate communication, provide a fax number for the contact person.

To determine whether EPA is the permitting authority for the construction project, and thus has authority to waive the otherwise applicable requirements of the Construction General Permit, it is necessary to know whether the project is located in Indian country, is a federal facility or part of a federal facility; and to answer the other three questions on projects located in Oklahoma and Texas.

Section II. Construction Project/Site Information
Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project lacks a street address, indicate the general location of the site (e.g., intersection of State Highways 61 and 34).

The applicant must also provide the latitude and longitude of the approximate center of the project/site using one of three formats given in the form. The latitude and longitude of your facility can be determined from several sources, including global positioning system (GPS) receivers, U.S. Geological Survey (USGS) topographic or quadrangle maps, and EPA's Web-based siting tool, among others. Information on using these methods to find your construction site's latitude and longitude is available on the web at www.epa.gov/npdes/stormwater/cgp. This web page describes EPA's web-based siting tool, which combines interactive maps and aerial photographs to help find your construction site's latitude and longitude. Specify which source you used to determine latitude and longitude. If a USGS topographic map is used, specify the scale of the map used.

Enter the horizontal reference datum for your latitude and longitude. The 1927 North American Datum (NAD 27) is a set of ellipsoid constants that describe the earth's shape and are used to calculate locations on the earth's latitude-longitude grid. This 1927 datum provides the mathematical basis for latitude and longitude coordinates on most USGS topographic maps. However, this datum is being phased out. Latitude and longitude on new or revised maps are now being calculated using the 1983 North American Datum (NAD 83), which is based on a newer definition of the earth ellipsoid. The World Geodetic System datum (WGS 84) was developed for the Department of Defense (DOD), who wanted a new coordinate system for the entire earth not just North America. DOD was willing to sacrifice a little accuracy in North America to get a better world system. For our purposes we don't have to be concerned about WGS 84 to NAD 83 coordinate conversions because the differences are negligible. The horizontal reference datum used on USGS topographic maps is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers; but it is not provided on EPA's web-based siting tool. If you use EPA's web siting tool, please check the "unknown" box. NAD 83 is the most accurate reference datum and, as such, is preferred.

Enter the area (estimated to the nearest quarter acre) to be disturbed including, but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Note: 1 acre = 43,560 sq. ft.

Section III. Rainfall Erosivity Factor Calculation Data
The construction period begins with the initial earth disturbance and ends with final site stabilization. To qualify for this waiver, the rainfall erosivity factor for the project must be less than five during the entire construction period. Specify the construction period by entering the project start date (date of initial earth disturbance) and project completion date (date of final site stabilization). For example, a grading contractor that is operating on-site for only one week during a nine month construction project, must enter the start date and completion date of the entire nine month construction period.

Low Erosivity Waiver Certification

NPDES Form

Form Approved OMB No. 2040-0004

EPA believes, where the environmental threat is low (i.e., in arid and semi-arid climates), that “final stabilization” can include techniques that employ re-vegetation combined with other stabilization measures, consisting of temporary degradeable rolled erosion control products, also known as “erosion control blankets (ECBs). With proper selection, design, and installation of the combination re-vegetation/ECB technique in arid or semi-arid areas, an operator can be considered to have achieved final stabilization upon completion of the installation process. Note that if more than three years is required to establish 70 percent of the natural vegetative cover, this technique cannot be used or cited for fulfillment of the final stabilization requirement. If your waiver is based on use of interim non-vegetative stabilization measures, such as erosion control blankets, to establish the end of the construction period, you must indicate so on this form. In doing so, you must commit and certify (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization, as defined in the Construction General Permit, have been met.

The rainfall erosivity factor "R" is determined in accordance with the U.S. Department of Agriculture *Agriculture Handbook Number 703, Prediciting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)*, Chapter 2 pages 21-64, dated January 1997. EPA's Construction Rainfall Erosivity Waiver Fact Sheet (EPA 833-F-00-014), available online at www.epa.gov/npdes/pubs/fact3-1.pdf, defines rainfall erosivity and provides numerical examples showing how to calculate your rainfall erosivity factor. You may use the fact sheet approach or the online rainfall erosivity factor calculator available at:
www.epa.gov/npdes/stormwater/lew/lewcalculator.cfm to calculate your rainfall erosivity factor for your project.

If the R factor is five or greater during the project’s construction period, you must have or obtain coverage under an NPDES stormwater permit. If the project was eligible for the waiver during the original construction period, but the construction activity will extend past the project completion date specified in the Low Erosivity Waiver Certification, the operator must recalculate the R factor using the original start date and a new project completion date. If the recalculated R factor is still less than five, a new waiver certification form must be submitted before the end of the original construction period. If the new R factor is five or greater, the operator must submit a Notice of Intent to be covered by the Construction General Permit before the original project completion date. The Notice of Intent (NOI) form may be submitted electronically using EPA’s eNOI system at www.epa.gov/npdes/stormwater/cgpenoi or submitted by mailing the paper NOI form (EPA Form 3510-9) available on the EPA website at www.epa.gov/npdes/stormwater/cgp.

Section IV. Operator Certification
All Low Erosivity Waiver Certification forms must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public facility: By either a principal executive officer or ranking elected official. For purposes of this Section, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the signature date. An unsigned or undated Low Erosivity Waiver Certification will not be considered valid.

Where to File This Form
Low Erosivity Waiver Certification forms must be sent to one of the following two addresses.

Regular U.S. Mail Delivery	Overnight/Express Mail Delivery
EPA Stormwater Notice	EPA Stormwater Notice
Processing Center	Processing Center
Mail Code 4203M	Room 7420
U.S. EPA	U.S. EPA
1200 Pennsylvania Avenue, NW	1201 Constitution Avenue, NW
Washington, DC 20460	Washington, DC 20004

Please submit the original form with a signature in ink. Do not send a photocopied signature!

Paperwork Reduction Act Notice
Public reporting burden for this certification form is estimated to average 1.0 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Strategies Branch (2822T), U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

B.3 Erosivity Fact Sheet

This document is taken directly from the EPA website http://www.epa.gov/npdes/pubs/fact3-1.pdf. Refer to that website periodically for any updates that may have occurred since this manual was published.

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United States Environmental Protection Agency
Office of Water (4203)
EPA 833-F-00-014
Revised March 2012
Fact Sheet 3.1[1]

Stormwater Phase II Final Rule

Construction Rainfall Erosivity Waiver

Stormwater Phase II Final Rule Fact Sheet Series

Overview

1.0 – Stormwater Phase II Proposed Rule Overview

Small MS4 Program

2.0 – Small MS4 Stormwater Program Overview

2.1 – Who's Covered? Designation and Waivers of Regulated Small MS4s

2.2 – Urbanized Areas: Definition and Description

Minimum Control Measures

2.3 – Public Education and Outreach

2.4 – Public Participation/ Involvement

2.5 – Illicit Discharge Detection and Elimination

2.6 – Construction Site Runoff Control

2.7 – Post-Construction Runoff Control

2.8 – Pollution Prevention/Good Housekeeping

2.9 – Permitting and Reporting: The Process and Requirements

2.10 – Federal and State-Operated MS4s: Program Implementation

Construction Program

3.0 – Construction Program Overview

3.1 – Construction Rainfall Erosivity Waiver

Industrial "No Exposure"

4.0 – Conditional No Exposure Exclusion for Industrial Activity

The 1972 amendments to the Federal Water Pollution Control Act, later referred to as the Clean Water Act (CWA), prohibit the discharge of any pollutant to navigable waters of the United States unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Because construction site stormwwater runoff can contribute significantly to water quality problems, the Phase I Stormwater Rule imposed a requirement that all construction sites with a planned land disturbance of 5 acres or more obtain an NPDES permit and implement stormwater runoff control plans. Phase II extends the requirements of the stormwater program to sites of between 1 and 5 acres. The Rainfall erosivity waiver allows permitting authorities to waive those sites that do not have adverse water quality impacts.

What is Erosivity?

Erosivity is the term used to describe the potential for soil to wash off disturbed, devegetated earth during storms. The potential for erosion is in part determined by the soil type and geology of the site. For instance, dense, clay-like soils on a glacial plain will erode less readily when it rains than will sandy soils on the side of a hill. Another important factor is the amount and force of precipitation expected during the time the earth will be exposed. While it is impossible to predict the weather several months in advance of construction, for many areas of the country, there are definite optimal periods, such as a dry season when rain tends to fall less frequently and with less force. When feasible, this is the time to disturb the earth, so that the site can be stabilized by the time the seasonal wet weather returns. There are many other important factors to consider in determining erosivity, such as freeze/thaw cycles and snow pack.

How Is Site Erosivity Determined?

The Universal Soil Loss Equation (USLE) was developed by the U.S. Department of Agriculture (USDA) in the 1950s to help farmers conserve their valuable topsoil. The methodology for determining if a site qualifies for the erosivity waiver provided in this guide is based on the *USDA Handbook 703 - Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)*, dated January 1997. (Note that a more updated version of USLE, the Revised USLE, Version 2 (RUSLE2), is available and can be used as an alternative method for determining if a site qualifies for the erosivity waiver. Information about the RUSLE2 computer program is provided later in this fact sheet.)

Using a computer model supported by decades' worth of soil and rainfall data, USDA established estimates of annual erosivity values (R factors) for sites throughout the country. These R factors are used as surrogate measures of the impact that rainfall had on erosion from a particular site. They have been mapped using isoerodent contours, as shown in Figures 2 through 5.

USDA developed the Erosivity Index Table (EI Table, provided here in Table 1), to show how the annual erosivity factor is distributed throughout the year in two-week increments. Table 1 is based on 120 rainfall distribution zones for the continental U.S. Detailed instructions for calculating a project R factor are provided later in this fact sheet.

[1] This revised fact sheet corrects errors identified in calculating the R factor from the 2001 version, and includes updated information about the USLE.

The Stormwater Phase II rule allows permitting authorities to waive NPDES requirements for small construction sites if the value of the rainfall erosivity factor is less than 5 during the period of construction activity (see § 122.26(b)(15)(i)(A)). Note that the permitting authority has the option to not allow waivers for small construction activity.

If the R factor for the period of construction calculates to less than 5, and the permitting authority allows the use of the waiver, the site owner may apply for a waiver under the low rainfall erosivity provision of the applicable EPA or State NPDES regulations. When applying, owners are encouraged to consider other site-specific factors, such as proximity to water resources and the sensitivity of receiving waters to sedimentation impacts. The small construction operator must certify to the permitting authority that the construction activity will take place during a period when the rainfall erosivity factor is less than 5.

The start and end dates used for the construction activity will be the initial date of disturbance and the anticipated date when the site will have achieved final stabilization as defined by the permit, respectively. If the construction continues beyond this period, the operator will need to recalculate the Erosivity Index for the site based on this new ending date (but keeping the old start date) and either resubmit the certification form or apply for NPDES permit coverage.

What Other Factors Can Affect Waiver Availability and Eligibility?

EPA has established the R factor of less than 5 as the criteria for determining waiver eligibility. However, since the intent is to waive only those construction activities that will not adversely impact water quality, State and Tribal permitting authorities have considerable discretion in determining where, when, and how to offer it. They can establish an R factor threshold lower than 5, or they can suspend the waiver within an area where watersheds are known to be heavily impacted by, or sensitive to, sedimentation. They can also suspend the waiver during certain periods of the year. They may opt not to offer the waiver at all. NOTE: This waiver is not available to sites that will disturb more than 5 acres of land (large construction).

What if My Site Is Not Eligible?

If your site is not eligible for a waiver, you must submit a Notice of Intent, or whichever type of application is required, to obtain coverage under the applicable NPDES construction stormwater permit, and comply with its requirements. For information about EPA's Construction General Permit (CGP), see http://www.epa.gov/npdes/stormwater/cgp. State program information is available at http://cfpub.epa.gov/npdes/contacts.cfm?program_id=6&type=STATE.

Examples

1. Construction started and completed in one calendar year.

Find the R factor value of a construction site in Denver, Colorado. Assume the site will be disturbed from March 10 to May 10 of the same year.

The EI distribution zone is 84 (Figure 1). Referring to Table 1, the project period will span from March 1 (from Table 1, the closest date prior to the actual March 10 start date) to May 15 (from Table 1, the closest date after the actual May 10 end date). The difference in values between these two dates is 9.7% (9.9 - 0.2 = 9.7). Since the annual erosion index for this location is about 45 (interpolated from Figure 2), the R factor for the scheduled construction project is 9.7% of 45, or 4.4.

Because 4.4 is less than 5, the operator of this site would be able to seek a waiver under the low rainfall erosivity provision.

2. Construction spanning two calendar years.

Find the R factor value for a construction site in Pittsburgh, Pennsylvania. Assume the site will be disturbed from August 1 to April 15.

The EI distribution zone is 111 (Figure 1). Referring to Table 1, the project period will span from July 29 (from Table 1, the closest date prior to the actual August 1 start date) to April 15. The difference in values between July 29 and December 31 is 35% (100 - 65.0 = 35.0). The difference between January 1 and April 15 is 8%. The total percentage EI for this project is 43% (35 + 8 = 43). Since the annual erosion index for this location is 112 (interpolated from Figure 2), the R factor for the scheduled construction is 43% of 112, or 48.

Since 48 is greater than 5, the operator of this site would not be able to seek a waiver under the low rainfall erosivity provision.

How Do I Compute the R factor for My Project?

1. Estimate the construction start date. This is the day you expect to begin disturbing soils, including grubbing, stockpiling, excavating, and grading activities.
2. Estimate the day you expect to achieve final stabilization, as defined by your permitting authority's regulations or NPDES construction stormwater permit, over all previous disturbed areas. This is your construction end date.
3. Refer to Figure 1 to find your Erosivity Index (EI) Zone based on your geographic location.

4. Refer to Table 1, the Erosivity Index (EI) Table. Find the number of your EI Zone in the left column. Locate the EI values for the dates that correspond to the project start and end dates you identified in Steps 1 and 2. If your specific date is not on the table, either interpolate between dates to obtain your %EI value, or use the closest date prior to your proposed start date and the closest date after your proposed end date. Subtract the start value from the end value to find the % EI for your site. The maximum annual EI value for a project is 100%. NOTE: If your project lasts for one year or more, your EI value is 100%.
5. Refer to the appropriate Isoerodent Map (Figures 2 through 5). Interpolate the annual isoerodent value for your area. This is the annual R factor for your site.
6. Multiply the percent value obtained in Step 4 by the annual isoerodent value obtained in Step 5. This is the R factor for your scheduled project.

Can I Use a Personal Computer to Calculate the R factor?

The computer program used by USDA to evaluate erosion potential is called the Revised Universal Soil Loss Equation, or RUSLE. The current version of RUSLE (RUSLE2) is a Windows-based model that uses extensive databases that are geographically-linked. RUSLE2 can be used to calculate the R factor for a proposed construction site; however, RUSLE2 can require a large investment of time to set up. RUSLE2 can be downloaded free of charge from the Internet at http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm. Note that RUSLE2 is an upgrade of RUSLE, and contains more detailed data. Therefore, your calculated R factor may differ based on whether you calculate your R factor using the methods specified above, which utilizes data from *USDA Handbook 703 - Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)*, January 1997, or whether you calculate your R factor using the more updated RUSLE2. EPA notes that either method of calculation is acceptable for determining eligibility for the construction rainfall erosivity waiver.

Where Can I Get Help?

- A copy of "Chapter 2, Rainfall-Runoff Erosivity Factor (R)" from the *USDA Handbook 703 - Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)*, January 1997, is available on EPA's web site at http://www.epa.gov/npdes/pubs/ruslech2.pdf.
- Information about RUSLE2, and a download of the program, is available at http://fargo.nserl.purdue.edu/rusle2_dataweb/.
- Your local USDA Service Center may be able to provide assistance with calculating R factors and other conservation-related issues. To find the office nearest you, go to http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/contact/local.

For Additional Information

Reference Documents

Stormwater Phase II Final Rule Fact Sheet Series
- Internet: cfpub.epa.gov/npdes/stormwater/swfinal.cfm

Stormwater Phase II Final Rule (64 *FR* 68722)
- Internet: www.epa.gov/npdes/regulations/phase2.pdf
- Contact the U.S. EPA Water Resource Center (Phone: (202) 564-9545)

Agricultural Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), Chapter 2, pp. 21-64, January 1997.
- Internet: www.epa.gov/npdes/pubs/ruslech2.pdf

Figure 1. Erosivity Index Zone Map

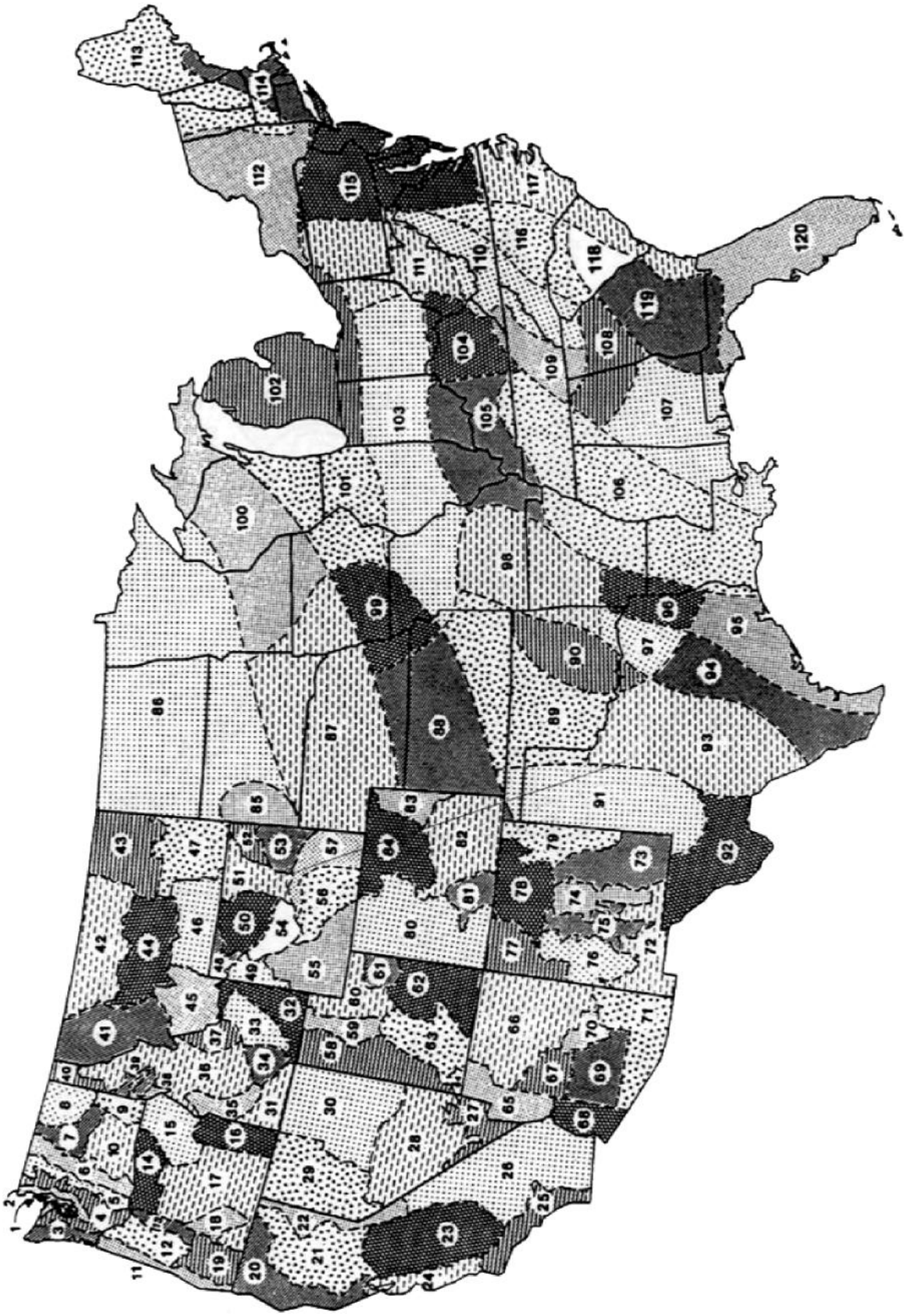
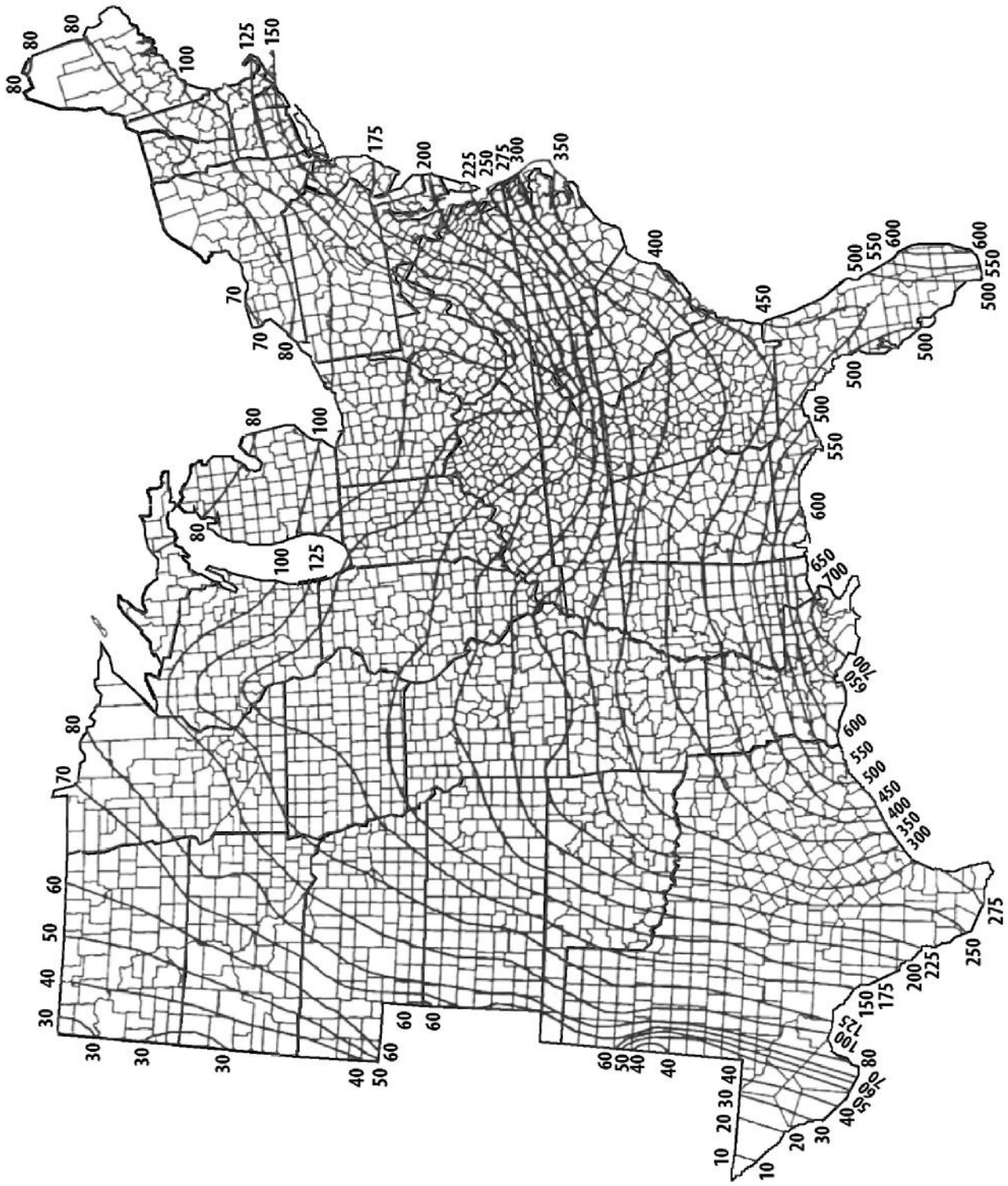


Figure 2. Isoerodent Map of the Eastern U.S.

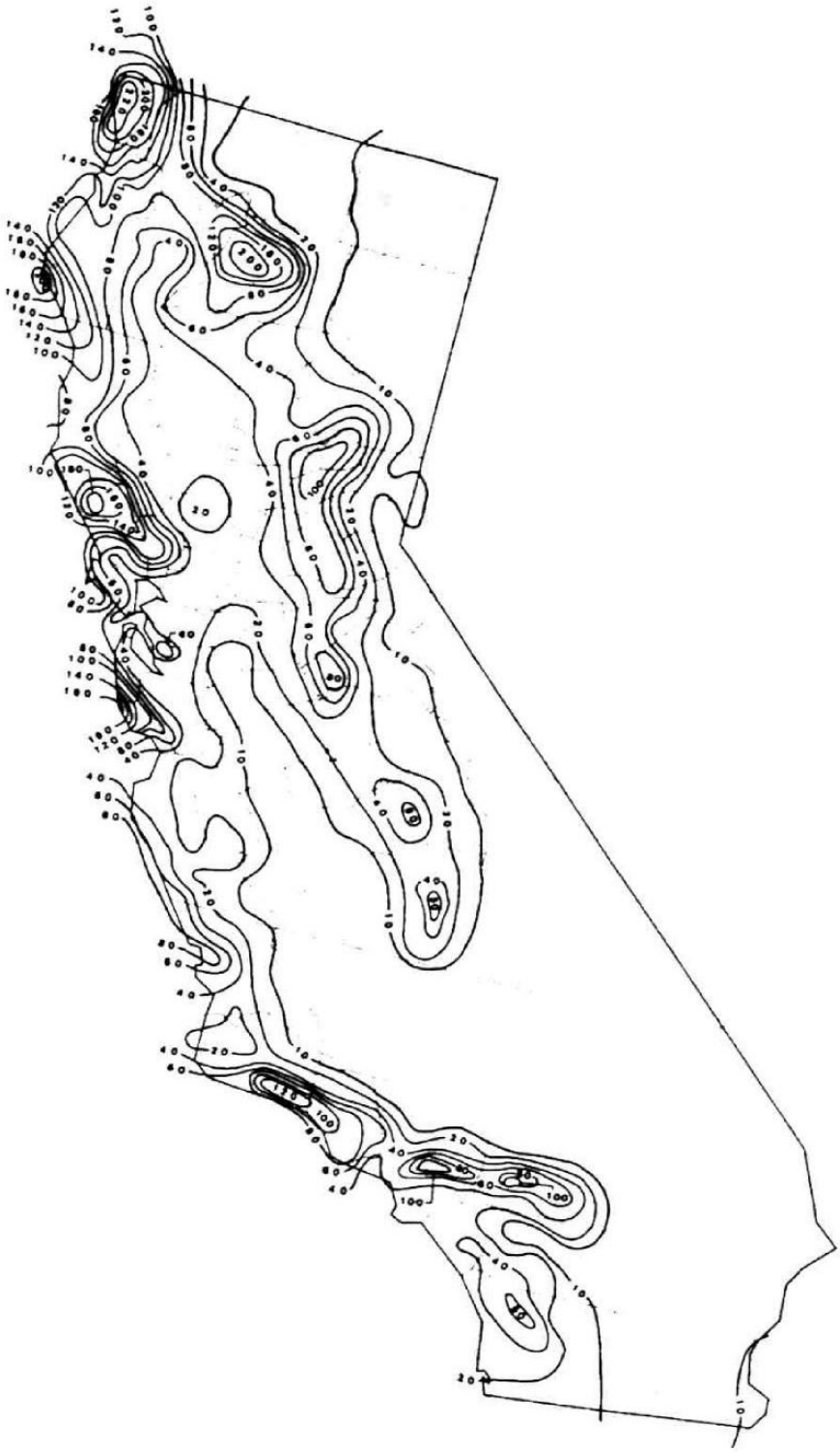


Note: Units for all maps on this page are hundreds ft•tonf•in(ac•h•yr)$^{-1}$

Figure 3. Isoerodent Map of the Western U.S.

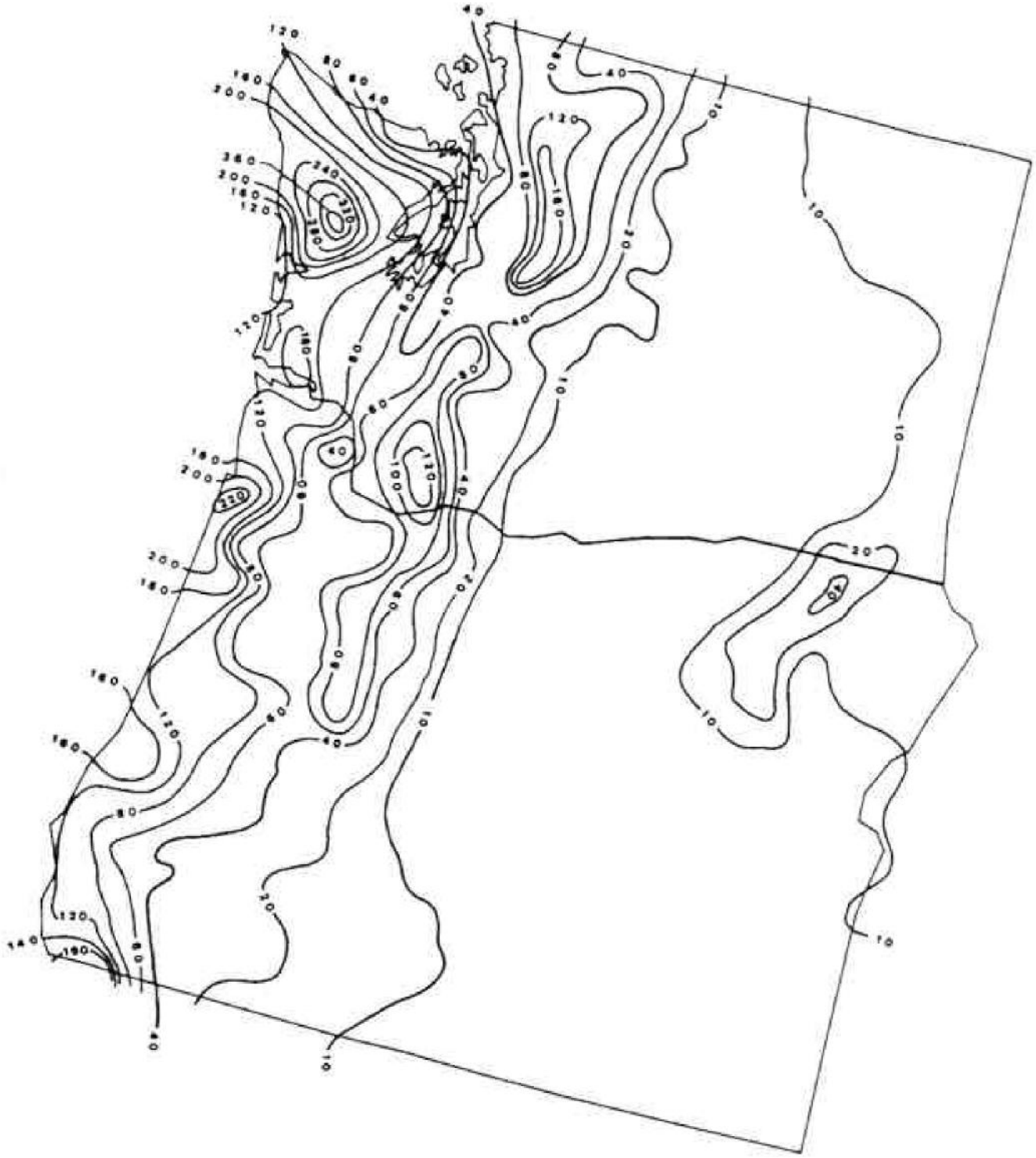
Note: Units for all maps on this page are hundreds ft•tonf•in(ac•h•yr)$^{-1}$

Figure 4. Isoerodent Map of California



Note: Units for all maps on this page are hundreds ft•tonf•in(ac•h•yr)$^{-1}$

Figure 5. Isoerodent Map of Oregon and Washington



Note: Units for all maps on this page are hundreds ft•tonf•in(ac•h•yr)$^{-1}$

Table 1. Erosivity Index (%EI Values extracted from USDA Manual 703)

All values are at the end of the day listed below - Linear interpolation between dates is acceptable.
EI as a percentage of Average Annual R Value Computed for Geographic Areas Shown in Figure 1

Month	Jan	Jan	Jan	Feb	Mar	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul	Jul	Aug	Aug	Sept	Sept	Oct	Oct	Nov	Nov	Dec	Dec
Day	1	16	31	15	1	16	31	15	30	15	30	14	29	14	29	13	28	12	27	12	27	11	26	11	31
EI Zone																									
1	0	4.3	8.3	12.8	17.3	21.6	25.1	28	30.9	34.9	39.1	42.6	45.4	48.2	50.8	53	56	60.8	66.8	71	75.7	82	89.1	95.2	100
2	0	4.3	8.3	12.8	17.3	21.6	25.1	28.0	30.9	34.9	39.1	42.6	45.4	48.2	50.8	53.0	56.0	60.8	66.8	71.0	75.7	82.0	89.1	95.2	100
3	0	7.4	13.8	20.9	26.5	31.8	35.3	38.5	40.2	41.6	42.5	43.6	44.5	45.1	45.7	46.4	47.7	49.4	52.8	57.0	64.5	73.1	83.3	92.3	100
4	0	3.9	7.9	12.6	17.4	21.6	25.2	28.7	31.9	35.1	38.2	42.0	44.9	46.7	48.2	50.1	53.1	56.6	62.2	67.9	75.2	83.5	90.5	96.0	100
5	0	2.3	3.6	4.7	6.0	7.7	10.7	13.9	17.8	21.2	24.5	28.1	31.1	33.1	35.3	38.2	43.2	48.7	57.3	67.8	77.9	86.0	91.3	96.9	100
6	0	0.0	0.0	0.5	2.0	4.1	8.1	12.6	17.6	21.6	25.5	29.6	34.5	40.0	45.7	50.7	55.6	60.2	66.5	75.5	85.6	95.9	99.5	99.9	100
7	0	0.0	0.0	0.0	0.0	1.2	4.9	8.5	13.9	19.0	26.0	35.4	43.9	48.8	53.9	64.5	73.4	77.5	80.4	84.8	89.9	96.6	99.2	99.7	100
8	0	0.0	0.0	0.0	0.0	0.9	3.6	7.8	15.0	20.2	27.4	38.1	49.8	57.9	65.0	75.6	82.7	86.8	89.4	93.4	96.3	99.1	100.0	100.0	100
9	0	0.8	3.1	4.7	7.4	11.7	17.8	22.5	27.0	31.4	36.0	41.6	46.4	50.1	53.4	57.4	61.7	64.9	69.7	79.0	89.6	97.4	100.0	100.0	100
10	0	0.3	0.5	0.9	2.0	4.3	9.2	13.1	18.0	22.7	29.2	39.5	46.3	48.8	51.1	57.2	64.4	67.7	71.1	77.2	85.1	92.5	96.5	99.0	100
11	0	5.4	11.3	18.8	26.3	33.2	37.4	40.7	42.5	44.3	45.4	46.5	47.1	47.4	47.8	48.3	49.4	50.7	53.6	57.5	65.5	76.2	87.4	94.8	100
12	0	3.5	7.8	14.0	21.1	27.4	31.5	35.0	37.3	39.8	41.9	44.3	45.6	46.3	46.8	47.9	50.0	52.9	57.9	62.3	69.3	81.3	91.5	96.7	100
13	0	0.0	0.0	1.8	7.2	11.9	16.7	19.7	24.0	31.2	42.4	55.0	60.0	60.8	61.2	62.6	65.3	67.6	71.6	76.1	83.1	93.3	98.2	99.6	100
14	0	0.7	1.8	3.3	6.9	16.5	26.6	29.9	32.0	35.4	40.2	45.1	51.9	61.1	67.5	70.7	72.8	75.4	78.6	81.9	86.4	93.6	97.7	99.3	100
15	0	0.0	0.0	0.5	2.0	4.4	8.7	12.0	16.6	21.4	29.7	44.5	56.0	60.8	63.9	69.1	74.5	79.1	83.1	87.0	90.9	96.6	99.1	99.8	100
16	0	0.0	0.0	0.5	2.0	5.5	12.3	16.2	20.9	26.4	35.2	48.1	58.1	63.1	66.5	71.9	77.0	81.6	85.1	88.4	91.5	96.3	98.7	99.6	100
17	0	0.0	0.0	0.7	2.8	6.1	10.7	12.9	16.1	21.9	32.8	45.9	55.5	60.3	64.0	71.2	77.2	80.3	83.1	87.7	92.6	97.2	99.1	99.8	100
18	0	0.0	0.0	0.6	2.5	6.2	12.4	16.4	20.2	23.9	29.3	37.7	45.6	49.8	53.3	58.4	64.3	69.0	75.0	86.6	93.9	96.6	98.0	100.0	100
19	0	1.0	2.6	7.4	16.4	23.5	28.0	31.0	33.5	37.0	41.7	48.1	51.1	52.0	52.5	53.6	55.7	57.6	61.1	65.8	74.7	88.0	95.8	98.7	100
20	0	9.8	18.5	25.4	30.2	35.6	38.9	41.5	42.9	44.0	45.2	48.2	50.8	51.7	52.5	54.6	57.4	58.5	60.1	63.2	69.6	76.7	85.4	92.4	100
21	0	7.5	13.6	18.1	21.1	24.4	27.0	29.4	31.7	34.6	37.3	39.6	41.6	43.4	45.4	48.1	51.3	53.3	56.6	62.4	72.4	81.3	88.9	94.7	100
22	0	1.2	1.6	1.6	1.6	1.6	1.6	2.2	3.9	4.6	6.4	14.2	32.8	47.2	58.8	69.1	76.0	82.0	87.1	96.7	99.9	99.9	99.9	99.9	100
23	0	7.9	15.0	20.9	25.7	31.1	35.7	40.2	43.2	46.2	47.7	48.8	49.4	49.9	50.7	51.8	54.1	57.7	62.8	65.9	70.1	77.3	86.8	93.5	100
24	0	12.2	23.6	33.0	39.7	47.1	51.7	55.9	57.7	58.6	58.9	59.1	59.1	59.2	59.2	59.3	59.5	60.0	61.4	63.0	66.5	71.8	81.3	89.6	100
25	0	9.8	20.8	30.2	37.6	45.8	50.6	54.4	56.0	56.8	57.1	57.1	57.2	57.6	58.5	59.8	62.2	65.3	67.5	68.2	69.4	74.8	86.6	93.0	100
26	0	2.0	5.4	9.8	15.6	21.5	24.7	26.6	27.4	28.0	28.7	29.8	32.5	36.6	44.9	55.4	65.7	72.6	77.8	84.4	89.5	93.9	96.5	98.4	100
27	0	0.0	0.0	1.0	4.0	5.9	8.0	11.1	13.0	14.0	14.6	15.3	17.0	23.2	39.1	60.0	76.3	86.1	89.7	90.4	90.9	93.1	96.6	99.1	100
28	0	0.0	0.0	0.0	0.2	0.5	1.5	3.3	7.2	11.9	17.7	21.4	27.0	37.1	51.4	62.3	70.6	78.8	84.6	90.6	94.4	97.9	99.3	100.0	100
29	0	0.6	0.7	0.7	0.7	1.5	3.9	6.0	10.5	17.9	28.8	36.6	43.8	51.5	59.3	68.0	74.8	80.3	84.3	88.8	92.7	98.0	99.8	99.9	100
30	0	0.0	0.0	0.0	0.0	0.2	0.8	2.8	7.9	14.2	24.7	35.6	45.4	52.2	58.7	68.5	77.6	84.5	88.9	93.7	96.2	97.6	98.3	99.6	100
31	0	0.0	0.0	0.0	0.0	0.2	1.0	3.5	9.9	15.7	26.4	47.2	61.4	65.9	69.0	77.2	86.0	91.6	94.8	98.7	100.0	100.0	100.0	100.0	100
32	0	0.1	0.1	0.1	0.1	0.6	2.2	4.3	9.0	14.2	23.3	34.6	46.3	54.2	61.7	72.9	82.5	89.6	93.7	98.2	99.7	99.9	99.9	99.9	100
33	0	0.0	0.0	0.0	0.0	0.6	2.3	4.2	8.8	16.1	30.0	46.9	57.9	62.8	66.2	72.1	79.1	85.9	91.1	97.0	98.9	98.9	98.9	98.9	100
34	0	0.0	0.0	0.0	0.0	1.8	7.3	10.7	15.5	22.0	29.9	35.9	42.0	48.5	56.9	67.0	76.9	85.8	91.2	95.7	97.8	99.6	100.0	100.0	100
35	0	0.0	0.0	0.0	0.0	2.5	10.2	15.9	22.2	27.9	34.7	43.9	51.9	56.9	61.3	67.3	73.9	80.1	85.1	89.6	93.2	98.2	99.8	99.8	100

Month	Jan	Jan	Jan	Feb	Mar	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul	Jul	Aug	Aug	Sept	Sept	Oct	Oct	Nov	Nov	Dec	Dec
Day	1	16	31	15	1	16	31	15	30	15	30	14	29	14	29	13	28	12	27	12	27	11	26	11	31
El Zone																									
36	0	0.0	0.0	0.0	0.0	0.9	3.4	6.7	12.7	18.5	26.6	36.3	46.0	53.5	60.2	68.3	75.8	82.6	88.3	96.3	99.3	99.9	100.0	100.0	100
37	0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.9	9.1	19.1	26.7	36.3	47.9	61.4	75.1	84.5	92.3	96.0	99.1	100.0	100.0	100.0	100.0	100
38	0	0.0	0.0	1.1	4.3	7.2	11.0	13.9	17.9	22.3	30.3	43.1	55.1	61.3	65.7	72.1	77.9	82.6	86.3	90.3	93.8	98.4	100.0	100.0	100
39	0	0.0	0.0	0.0	0.0	1.6	6.5	11.0	17.8	24.7	33.1	42.8	50.3	54.9	59.7	68.9	78.1	83.6	87.5	93.0	96.5	99.2	100.0	100.0	100
40	0	0.0	0.0	0.0	0.0	1.5	6.2	10.1	16.3	23.3	32.5	42.2	50.1	55.6	60.5	67.5	74.3	79.4	84.1	91.1	95.8	99.1	100.0	100.0	100
41	0	0.1	0.2	0.2	0.2	0.2	0.2	0.4	1.1	6.8	22.9	40.1	54.9	63.8	70.7	81.5	89.8	96.3	98.7	99.2	99.3	99.4	99.4	99.7	100
42	0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9	5.2	17.3	33.8	53.2	66.5	75.9	87.6	93.7	97.5	99.0	99.7	100.0	100.0	100.0	100.0	100
43	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	2.7	9.5	21.9	42.7	58.6	71.1	84.6	91.9	97.1	99.0	99.8	100.0	100.0	100.0	100.0	100
44	0	1.7	2.3	2.4	2.4	2.4	2.4	2.7	3.5	7.6	18.5	34.3	52.5	64.0	72.3	83.3	90.0	95.1	97.3	98.5	98.9	98.9	98.9	99.2	100
45	0	0.2	0.2	0.3	0.3	0.4	0.6	0.8	1.4	3.7	10.2	22.6	41.8	54.0	64.5	78.7	88.4	96.0	98.7	99.4	99.7	99.7	99.8	99.9	100
46	0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.6	7.5	19.6	32.9	48.9	63.0	73.5	83.3	89.5	95.6	98.3	99.6	100.0	100.0	100.0	100.0	100
47	0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.6	5.8	17.0	33.0	52.5	66.4	75.7	85.5	91.3	96.5	98.8	100.0	100.0	100.0	100.0	100.0	100
48	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	8.1	15.4	27.8	40.7	52.6	61.1	69.3	82.6	92.0	98.0	100.0	100.0	100.0	100.0	100
49	0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.7	8.3	20.0	27.5	35.6	44.6	46.0	70.2	81.3	89.2	93.6	98.5	100.0	100.0	100.0	100.0	100
50	0	0.0	0.0	0.0	0.0	0.1	0.4	2.4	8.2	13.7	23.8	38.8	55.1	66.1	73.6	81.8	87.7	93.8	97.0	99.4	100.0	100.0	100.0	100.0	100
51	0	0.0	0.0	0.0	0.0	0.3	1.0	3.1	8.7	18.8	35.8	49.6	60.4	70.2	77.0	84.0	88.8	93.8	96.6	99.1	100.0	100.0	100.0	100.0	100
52	0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.5	6.8	17.5	29.8	46.1	60.5	72.7	86.0	92.8	96.8	98.4	99.7	100.0	100.0	100.0	100.0	100
53	0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.0	9.5	24.2	35.3	48.0	63.1	76.1	87.7	93.5	97.2	98.6	99.5	99.8	99.9	100.0	100.0	100
54	0	0.0	0.0	0.0	0.0	0.2	0.7	2.4	7.2	14.7	27.2	37.2	47.3	58.8	67.6	74.0	79.2	86.7	92.6	97.9	99.8	99.9	100.0	100.0	100
55	0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.4	13.3	25.5	31.6	38.8	52.5	66.8	75.5	81.2	87.9	92.8	98.3	100.0	100.0	100.0	100.0	100
56	0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.1	11.4	22.3	29.5	38.5	51.1	65.2	77.8	85.6	91.7	95.0	98.7	100.0	100.0	100.0	100.0	100
57	0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	3.5	9.2	21.5	31.0	43.5	60.4	75.1	86.1	91.6	96.2	98.1	99.4	99.9	99.9	100.0	100.0	100
58	0	0.0	0.0	0.0	0.0	0.2	0.9	2.9	8.0	13.2	21.0	29.1	38.0	45.9	54.5	65.4	74.8	82.1	87.5	95.4	98.8	99.7	100.0	100.0	100
59	0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	8.9	15.6	24.2	31.1	38.3	46.0	54.9	64.2	73.2	81.9	88.5	95.7	98.6	99.4	99.7	99.7	100
60	0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.5	4.0	9.5	13.3	20.5	33.6	52.8	66.5	76.7	88.1	94.2	98.6	100.0	100.0	100.0	100.0	100
61	0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.0	8.5	15.5	29.8	41.8	46.0	49.2	56.0	65.1	71.6	78.6	91.1	97.3	99.3	100.0	100.0	100
62	0	0.0	0.0	0.1	0.3	0.8	2.1	3.6	6.5	9.7	13.7	16.5	20.8	27.3	40.1	56.9	72.6	83.4	89.4	95.5	98.1	99.6	100.0	100.0	100
63	0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.7	7.8	13.3	15.8	19.9	29.0	46.8	64.7	78.3	88.8	93.9	98.5	100.0	100.0	100.0	100.0	100
64	0	0.0	0.0	0.7	2.8	7.4	12.4	14.4	15.6	17.3	19.4	21.0	24.4	32.3	48.0	61.4	72.1	81.9	87.0	90.1	92.4	98.1	100.0	100.0	100
65	0	3.6	7.0	9.6	11.4	13.0	14.4	16.3	17.7	18.4	19.3	20.5	23.6	32.0	50.0	66.2	77.2	85.4	88.8	90.4	91.3	92.7	94.8	97.0	100
66	0	0.0	0.0	0.0	0.0	0.1	0.5	1.1	2.2	3.6	6.0	7.6	11.1	19.8	38.9	59.7	74.4	83.2	88.1	94.6	97.7	99.4	100.0	100.0	100
67	0	0.0	0.0	0.0	0.0	0.1	0.4	0.9	1.6	1.9	2.4	5.0	12.1	24.8	48.3	73.6	86.5	92.0	94.3	96.6	97.9	99.5	100.0	100.0	100
68	0	2.3	4.5	7.8	10.4	12.0	13.3	16.3	17.7	18.1	18.2	18.3	18.4	19.9	24.5	35.0	54.4	69.4	78.6	85.7	89.2	91.9	93.9	97.0	100
69	0	2.0	3.7	5.7	7.8	10.5	12.4	13.7	14.3	14.7	15.1	15.7	17.1	22.7	36.7	50.4	63.6	75.0	81.8	87.8	90.8	93.2	94.9	97.5	100
70	0	0.5	0.7	1.0	1.3	1.7	2.2	2.8	3.4	3.9	4.7	5.4	7.4	15.7	36.5	55.8	70.3	80.9	86.4	90.9	93.4	96.4	98.1	99.4	100
71	0	0.7	1.2	1.6	2.1	2.8	3.3	3.6	4.0	4.5	5.6	6.5	9.1	18.5	40.6	59.7	74.0	86.3	91.7	94.7	96.0	96.7	97.3	98.8	100
72	0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.8	1.3	3.5	9.9	24.7	51.4	71.5	83.6	93.8	97.7	99.2	99.8	99.9	99.9	100.0	100
73	0	0.0	0.1	0.1	0.2	0.2	0.3	0.6	1.3	4.1	11.5	18.1	28.3	40.2	54.1	67.0	77.2	87.7	93.3	97.5	99.1	99.6	99.8	100.0	100
74	0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.2	2.7	6.4	10.2	18.4	31.0	50.7	68.7	81.2	91.6	96.1	98.4	99.2	99.8	100.0	100.0	100
75	0	0.1	0.1	0.1	0.2	0.5	1.3	1.9	3.0	4.1	6.6	10.0	17.6	28.3	44.7	59.4	71.6	83.9	90.3	94.7	96.7	98.8	99.6	99.9	100

Month	Jan	Jan	Jan	Feb	Mar	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul	Jul	Aug	Aug	Sept	Sept	Oct	Oct	Nov	Nov	Dec	Dec
Day	1	16	31	15	1	16	31	15	30	15	30	14	29	14	29	13	28	12	27	12	27	11	26	11	31
El Zone																									
76	0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	1.3	2.0	3.5	4.9	8.4	17.4	37.3	57.5	72.9	83.7	89.5	95.8	98.4	99.6	100.0	100.0	100
77	0	0.2	0.3	0.3	0.4	0.8	1.5	2.0	2.8	3.9	5.9	7.2	10.3	21.5	46.5	66.3	78.3	86.5	90.8	96.0	98.2	99.1	99.5	99.8	100
78	0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.6	3.8	8.9	13.2	21.8	35.8	56.6	75.4	86.0	92.9	95.9	98.2	99.2	99.8	100.0	100.0	100
79	0	0.0	0.0	0.0	0.0	0.2	0.7	1.3	2.7	5.8	12.7	18.8	28.8	41.6	58.4	75.7	86.5	94.2	97.3	98.9	99.5	99.9	100.0	100.0	100
80	0	0.6	1.2	1.6	2.1	2.5	3.3	4.5	6.9	10.1	15.5	19.7	26.6	36.4	51.7	67.5	79.4	88.8	93.2	96.1	97.3	98.2	98.7	99.3	100
81	0	0.1	0.1	0.2	0.4	0.5	0.8	0.9	1.5	3.9	9.9	12.8	18.2	30.7	54.1	77.1	89.0	94.9	97.2	98.7	99.3	99.6	99.7	99.9	100
82	0	0.0	0.1	0.1	0.2	0.2	0.5	1.2	3.1	6.7	14.4	20.1	29.8	44.5	64.2	83.1	92.2	96.4	98.1	99.3	99.7	99.8	99.8	99.9	100
83	0	0.0	0.1	0.1	0.1	0.3	0.9	1.6	3.5	8.3	19.4	30.0	44.0	59.2	72.4	84.6	91.2	96.5	98.6	99.5	99.8	99.9	100.0	100.0	100
84	0	0.0	0.1	0.1	0.2	0.3	0.6	1.7	4.9	9.9	19.5	27.2	38.3	52.8	68.8	83.9	91.6	96.4	98.2	99.2	99.6	99.8	99.8	99.9	100
85	0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	3.0	6.0	11.0	23.0	36.0	49.0	63.0	77.0	90.0	95.0	98.0	99.0	100.0	100.0	100.0	100.0	100
86	0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	3.0	6.0	11.0	23.0	36.0	49.0	63.0	77.0	90.0	95.0	98.0	99.0	100.0	100.0	100.0	100.0	100
87	0	0.0	0.0	0.0	1.0	1.0	2.0	3.0	6.0	10.0	17.0	29.0	43.0	55.0	67.0	77.0	85.0	91.0	96.0	98.0	99.0	100.0	100.0	100.0	100
88	0	0.0	0.0	0.0	1.0	1.0	2.0	3.0	6.0	13.0	23.0	37.0	51.0	61.0	69.0	78.0	85.0	91.0	94.0	96.0	98.0	99.0	99.0	100.0	100
89	0	1.0	1.0	2.0	3.0	4.0	7.0	12.0	18.0	27.0	38.0	48.0	55.0	62.0	69.0	76.0	83.0	90.0	94.0	97.0	98.0	99.0	100.0	100.0	100
90	0	1.0	2.0	3.0	4.0	6.0	8.0	13.0	21.0	29.0	37.0	46.0	54.0	60.0	65.0	69.0	74.0	81.0	87.0	92.0	95.0	97.0	98.0	99.0	100
91	0	0.0	0.0	0.0	1.0	1.0	1.0	2.0	6.0	16.0	29.0	39.0	46.0	53.0	60.0	67.0	74.0	81.0	88.0	95.0	99.0	99.0	100.0	100.0	100
92	0	0.0	0.0	0.0	1.0	1.0	1.0	2.0	6.0	16.0	29.0	39.0	46.0	53.0	60.0	67.0	74.0	81.0	88.0	95.0	99.0	99.0	100.0	100.0	100
93	0	1.0	1.0	2.0	3.0	4.0	6.0	8.0	13.0	25.0	40.0	49.0	56.0	62.0	67.0	72.0	76.0	80.0	85.0	91.0	97.0	98.0	99.0	99.0	100
94	0	1.0	2.0	4.0	6.0	8.0	10.0	15.0	21.0	29.0	38.0	47.0	53.0	57.0	61.0	65.0	70.0	76.0	83.0	88.0	91.0	94.0	96.0	98.0	100
95	0	1.0	3.0	5.0	7.0	9.0	11.0	14.0	18.0	27.0	35.0	41.0	46.0	51.0	57.0	62.0	68.0	73.0	79.0	84.0	89.0	93.0	96.0	98.0	100
96	0	2.0	4.0	6.0	9.0	12.0	17.0	23.0	30.0	37.0	43.0	49.0	54.0	58.0	62.0	66.0	70.0	74.0	78.0	82.0	86.0	90.0	94.0	97.0	100
97	0	1.0	3.0	5.0	7.0	10.0	14.0	20.0	28.0	37.0	48.0	56.0	61.0	64.0	68.0	72.0	77.0	81.0	86.0	89.0	92.0	95.0	98.0	99.0	100
98	0	1.0	2.0	4.0	6.0	8.0	10.0	13.0	19.0	26.0	34.0	42.0	50.0	58.0	63.0	68.0	74.0	79.0	84.0	89.0	93.0	95.0	97.0	99.0	100
99	0	0.0	0.0	1.0	1.0	2.0	3.0	5.0	7.0	12.0	19.0	33.0	48.0	57.0	65.0	72.0	82.0	88.0	93.0	96.0	98.0	99.0	100.0	100.0	100
100	0	0.0	0.0	0.0	1.0	1.0	2.0	3.0	5.0	9.0	15.0	27.0	38.0	50.0	62.0	74.0	84.0	91.0	95.0	97.0	98.0	99.0	99.0	100.0	100
101	0	0.0	0.0	1.0	2.0	3.0	4.0	6.0	9.0	14.0	20.0	28.0	39.0	52.0	63.0	72.0	80.0	87.0	91.0	94.0	97.0	98.0	99.0	100.0	100
102	0	0.0	1.0	2.0	3.0	4.0	6.0	8.0	11.0	15.0	22.0	31.0	40.0	49.0	59.0	69.0	78.0	85.0	91.0	94.0	96.0	98.0	99.0	100.0	100
103	0	1.0	2.0	3.0	4.0	6.0	8.0	10.0	14.0	18.0	25.0	34.0	45.0	56.0	64.0	72.0	79.0	84.0	89.0	92.0	95.0	97.0	98.0	99.0	100
104	0	2.0	3.0	5.0	7.0	10.0	13.0	16.0	19.0	23.0	27.0	34.0	44.0	54.0	63.0	72.0	80.0	85.0	89.0	91.0	93.0	95.0	96.0	98.0	100
105	0	1.0	3.0	6.0	9.0	12.0	16.0	21.0	26.0	31.0	37.0	43.0	50.0	57.0	64.0	71.0	77.0	81.0	85.0	88.0	91.0	93.0	95.0	97.0	100
106	0	3.0	6.0	9.0	13.0	17.0	21.0	27.0	33.0	38.0	44.0	49.0	55.0	61.0	67.0	71.0	75.0	78.0	81.0	84.0	86.0	90.0	94.0	97.0	100
107	0	3.0	5.0	7.0	10.0	14.0	18.0	23.0	27.0	31.0	35.0	39.0	45.0	53.0	60.0	67.0	74.0	80.0	84.0	86.0	88.0	90.0	93.0	95.0	100
108	0	3.0	6.0	9.0	12.0	16.0	20.0	24.0	28.0	33.0	38.0	43.0	50.0	59.0	69.0	75.0	80.0	84.0	87.0	90.0	92.0	94.0	96.0	98.0	100
109	0	3.0	6.0	10.0	13.0	16.0	19.0	23.0	26.0	29.0	33.0	39.0	47.0	58.0	68.0	75.0	80.0	83.0	86.0	88.0	90.0	92.0	95.0	97.0	100
110	0	1.0	3.0	5.0	7.0	9.0	12.0	15.0	18.0	21.0	25.0	29.0	36.0	45.0	56.0	68.0	77.0	83.0	88.0	91.0	93.0	95.0	97.0	99.0	100
111	0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	11.0	15.0	20.0	28.0	41.0	54.0	65.0	74.0	82.0	87.0	92.0	94.0	96.0	97.0	98.0	99.0	100
112	0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	7.0	12.0	17.0	24.0	33.0	42.0	55.0	67.0	76.0	83.0	89.0	92.0	94.0	96.0	98.0	99.0	100
113	0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	13.0	17.0	22.0	31.0	42.0	52.0	60.0	68.0	75.0	80.0	85.0	89.0	92.0	96.0	98.0	100
114	0	1.0	2.0	4.0	6.0	8.0	11.0	13.0	15.0	18.0	21.0	26.0	32.0	38.0	46.0	55.0	64.0	71.0	77.0	81.0	85.0	89.0	93.0	97.0	100
115	0	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	14.0	19.0	26.0	34.0	45.0	56.0	66.0	76.0	82.0	86.0	90.0	93.0	95.0	97.0	99.0	100

Month	Jan	Jan	Jan	Feb	Mar	Mar	Mar	Apr	Apr	May	May	Jun	Jun	Jul	Jul	Aug	Aug	Sept	Sept	Oct	Oct	Nov	Nov	Dec	Dec
Day	1	16	31	15	1	16	31	15	30	15	30	14	29	14	29	13	28	12	27	12	27	11	26	11	31
EI Zone																									
116	0	1.0	3.0	5.0	7.0	9.0	12.0	15.0	18.0	21.0	25.0	29.0	36.0	45.0	56.0	68.0	77.0	83.0	88.0	91.0	93.0	95.0	97.0	99.0	100
117	0	1.0	2.0	3.0	4.0	5.0	7.0	9.0	11.0	14.0	17.0	22.0	31.0	42.0	54.0	65.0	74.0	83.0	89.0	92.0	95.0	97.0	98.0	99.0	100
118	0	1.0	2.0	3.0	5.0	7.0	10.0	14.0	18.0	22.0	27.0	32.0	37.0	46.0	58.0	69.0	80.0	89.0	93.0	94.0	95.0	96.0	97.0	97.0	100
119	0	2.0	4.0	6.0	8.0	12.0	16.0	20.0	25.0	30.0	35.0	41.0	47.0	56.0	67.0	75.0	81.0	85.0	87.0	89.0	91.0	93.0	95.0	97.0	100
120	0	1.0	2.0	4.0	6.0	7.0	9.0	12.0	15.0	18.0	23.0	31.0	40.0	48.0	57.0	63.0	72.0	78.0	88.0	92.0	96.0	97.0	98.0	99.0	100
121	0	8.0	16.0	25.0	33.0	41.0	46.0	50.0	53.0	54.0	55.0	56.0	56.5	57.0	57.8	58.0	58.8	60.0	61.0	63.0	66.5	72.0	80.0	90.0	100
122	0	7.0	14.0	20.0	25.5	33.5	38.0	43.0	46.0	50.0	52.5	54.5	56.0	58.0	59.0	60.0	61.5	63.0	65.0	68.0	72.0	79.0	86.0	93.0	100
123	0	4.0	8.0	12.0	17.0	23.0	29.0	34.0	38.0	44.0	49.0	53.0	56.0	59.0	62.0	65.0	69.0	72.0	75.0	79.0	83.0	88.0	93.0	96.0	100
124	0	4.0	9.0	15.0	23.0	29.0	34.0	40.0	44.0	48.0	50.0	51.0	52.0	53.0	55.0	57.0	60.0	62.0	64.0	67.0	72.0	80.0	88.0	95.0	100
125	0	7.0	12.0	17.0	24.0	30.0	39.0	45.0	50.0	53.0	55.0	56.0	57.0	58.0	59.0	61.0	62.0	63.0	64.0	66.0	70.0	77.0	84.0	92.0	100
126	0	9.0	16.0	23.0	30.0	37.0	43.0	47.0	50.0	52.0	54.0	55.0	56.0	57.0	58.0	59.0	60.0	62.0	64.0	67.0	71.0	77.0	86.0	93.0	100
127	0	8.0	15.0	22.0	28.0	33.0	38.0	42.0	46.0	50.0	52.0	53.0	53.0	53.0	53.0	54.0	55.0	57.0	59.0	63.0	68.0	75.0	83.0	92.0	100
128	0	8.0	15.0	22.0	29.0	34.0	40.0	45.0	48.0	51.0	54.0	57.0	59.0	62.0	63.0	64.0	65.0	66.0	67.0	69.0	72.0	76.0	83.0	91.0	100
129	0	9.0	16.0	22.0	27.0	32.0	37.0	41.0	45.0	48.0	51.0	53.0	55.0	56.0	57.0	57.0	58.0	59.0	61.0	64.0	68.0	73.0	79.0	89.0	100
130	0	10.0	20.0	28.0	35.0	41.0	46.0	49.0	51.0	53.0	55.0	56.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0	65.0	69.0	74.0	81.0	90.0	100
131	0	8.0	15.0	22.0	28.0	33.0	38.0	41.0	44.0	47.0	49.0	51.0	53.0	55.0	56.0	58.0	59.0	60.0	63.0	65.0	69.0	75.0	84.0	92.0	100
132	0	10.0	18.0	25.0	29.0	33.0	36.0	39.0	41.0	42.0	44.0	45.0	46.0	47.0	48.0	49.0	51.0	53.0	56.0	59.0	64.0	70.0	80.0	90.0	100
133	0	8.0	16.0	24.0	32.0	40.0	46.0	51.0	54.0	56.0	57.0	58.0	58.0	59.0	59.0	60.0	60.0	61.0	62.0	64.0	68.0	74.0	83.0	91.0	100
134	0	12.0	22.0	31.0	39.0	45.0	49.0	52.0	54.0	55.0	56.0	56.0	56.0	56.0	57.0	57.0	57.0	57.0	58.0	59.0	62.0	68.0	77.0	88.0	100
135	0	7.0	15.0	22.0	30.0	37.0	43.0	49.0	53.0	55.0	57.0	58.0	59.0	60.0	61.0	62.0	63.0	65.0	67.0	70.0	74.0	79.0	85.0	92.0	100
136	0	11.0	21.0	29.0	37.0	44.0	50.0	55.0	57.0	59.0	60.0	60.0	60.0	60.0	61.0	61.0	61.0	62.0	63.0	64.0	67.0	71.0	78.0	89.0	100
137	0	10.0	18.0	25.0	30.0	39.0	46.0	51.0	54.0	57.0	58.0	59.0	59.0	60.0	60.0	60.0	61.0	62.0	63.0	64.0	67.0	72.0	80.0	90.0	100
138	0	11.0	22.0	31.0	39.0	46.0	52.0	56.0	58.0	59.0	60.0	61.0	61.0	61.0	61.0	62.0	62.0	62.0	63.0	64.0	66.0	71.0	78.0	89.0	100
139	0	8.0	14.0	20.0	25.0	32.0	37.0	42.0	47.0	50.0	53.0	55.0	56.0	58.0	59.0	61.0	63.0	64.0	66.0	68.0	71.0	76.0	85.0	93.0	100
140	0	13.0	18.0	43.0	56.0	65.0	69.0	69.4	69.7	70.1	70.4	70.8	71.1	71.5	71.9	72.2	72.6	73.0	73.3	73.6	74.0	76.0	81.0	89.0	100

B.4 ADEQ NOI

The ADEQ Notice of Intent (NOI) form must now be submitted electronically via the ADEQ SMART NOI system (https://az.gov/app/smartnoi/). Payment of the permit fee is required at the time of submittal. Check the ADEQ website periodically for any updates to this process that may have occurred since this manual was published. A hard copy form is no longer available. Please use the link above.

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NOTICE OF INTENT (NOI)

for Construction Activity Discharges

to Waters of the United States under the
AZPDES Stormwater Construction General Permit
(AZG2008-001)

FOR COVERAGE, A COMPLETE AND ACCURATE NOI (INCLUDING REQUIRED FEE) MUST BE SUBMITTED TO:
Arizona Department of Environmental Quality, Surface Water Section / Stormwater and General Permits Unit
1110 West Washington Street, 5415A-1, Phoenix, Arizona 85007

Is this NOI a revision to a project filed under the 2008 AZPDES Stormwater Construction General Permit? _____YES _____NO If Yes, complete the following:

- Provide your current authorization number: AZCON - _____
- Provide the name of the project / site in Part II below. You do not need to complete the entire form. Provide only the information that is being changed from the original NOI.
- Complete the certification in Part VI (including signature of authorized signer).

Is the site located on Indian Country Lands?

_____ YES _____ NO

I. OPERATOR (Applicant) INFORMATION:

- Contact Name: _____
- Phone Number: _____ Fax Number: _____
- Operator's Business Name: _____
- Operator's Mailing Address: _____
- City: _____ State: _____ Zip Code: _____
- Business Status: Federal: _____ State: _____ Other Public: _____ Private: _____

II. CONSTRUCTION SITE INFORMATION:

- Project/Site Name: _____
- County Parcel No. (at main entrance): _____ Phone Number: _____
- Type of Project (subdivision, commercial, road, pipeline, utility, ADOT project, etc.): _____

  If a subdivision, has state or local subdivision approval been obtained? _____YES _____NO

  If yes, provide the Subdivision Certificate of Approval Number: _____
- Is the project part of a larger common plan of development? _____YES _____NO

Name of Project: _____

II. CONSTRUCTION SITE INFORMATION *(continued)*

- Does the project have/need other environmental permits or approvals? If so, list them and provide the permit/approval number for each: _____

  _____

- Site physical location (Provide address. If no address, provide driving directions from nearest municipality):

  _____

  _____

- City: _____ State: AZ Zip Code: _____ County: _____

- Estimated Project Start Date: _____ Estimated Project Completion Date: _____
  Month/Day/Year Month/Day/Year

- Estimate of total acres (to nearest whole acre) to be disturbed by the entire construction activity: _____

- Estimate of total acres (to nearest whole acre, round up if < 1) to be disturbed by your operations: _____

- **Select the non-stormwater discharges expected to be associated with your construction-related activities:**

_____ None	_____ Foundation or footing drains – uncontaminated
_____ Discharges from emergency fire-fighting activities	_____ Potable water well flushing – ephemeral receiving waters only
_____ Fire hydrant flushing – ephemeral receiving waters only	_____ Waters used for compacting soil – no reclaimed or other wastewaters
_____ Waters used to control dust – no reclaimed or other wastewaters	_____ Water used for drilling and coring (e.g., for evaluation of foundation materials) uncontaminated
_____ Potable waterline flushing – ephemeral receiving waters only	_____ Uncontaminated water from dewatering operations or foundations
_____ Routine external building wash down (no detergents)	_____ Other (specify) _____
_____ Pavement wash waters – no spills or leaks of toxic or hazardous materials and no detergents	_____
_____ Uncontaminated air conditioning or compressor condensate	_____
_____ Uncontaminated groundwater	

Name of Project: _____

III. DISCHARGE LOCATION

- Provide the latitude and longitude of the construction site at the point nearest the receiving water (natural water course):

  Latitude: |__ı__|° |__ı__|' |__ı__| . |_____|" Longitude: |__ı__ı__|° |__ı__|' |__ı__| . |_____|"

  (Degrees, minutes, seconds) (Degrees, minutes, seconds)

- Identify the closest receiving water to the construction site (e.g., dry washes, named and unnamed waterbodies, etc.):

  _____

- Is there a potential for any discharges from the site to enter a municipal separate storm sewer system (MS4), canal, or a privately owned conveyance? _____YES _____ NO

  If yes, enter the name of the MS4, canal, or conveyance owner: _____

IV. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) – A SWPPP must be developed in accordance with the terms of the general permit before completing and submitting this NOI.

- ____ I confirm that a SWPPP meeting the requirements of the Stormwater Construction General Permit (No. AZG2008-001) has been developed and will be implemented prior to commencing construction activities at this site. The SWPPP will be located at the site during construction activities. If this is a late NOI, a SWPPP has been developed and implemented prior to submitting this NOI. NOTE: ADEQ retains the authority to take enforcement action(s) for any unpermitted discharge or other non-compliance that occurs between the time construction commenced and discharge authorization is issued.

- When construction activities are not actively underway, the SWPPP will be available at the following location:

  _____

- Name of SWPPP Contact Person: _____

- Telephone Number of SWPPP Contact Person: _____

- This project may discharge within 1/4 mile of an Impaired or Outstanding Arizona Water: _____ YES _____NO

  ____ If yes, a copy of my SWPPP is included with this NOI for review by ADEQ.

Name of Project: _____

V. FEES

____ I confirm that the correct fee payment is included with the NOI:

____ Less than or equal to I acre: $250.00 *

____ Greater than 1 acre, but less than or equal to 50 acres: $350.00

____ Greater than 50 acres: $500.00

____ Review of SWPPP by ADEQ, if required (see section IV above): add $1,000.00

Total fee payment included: $_____

____ No fee is required. The signer below represents an Arizona state agency (exempt from AZPDES fees).

____ No fee is required. This is an amendment of an NOI previously filed under the 2008 Stormwater Construction General Permit, for which the fee was paid or not required.

* *(If the project will disturb less than one acre, Stormwater Construction General Permit coverage is required only if the project is part of a larger common plan of development or sale that will ultimately disturb one acre or more.)*

VI. CERTIFICATION BY AUTHORIZED SIGNATORY (see Part VIII.J.1 of the General Permit for requirements)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision, in accordance with a system designed to ensure that qualified personnel gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, I believe the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, as the operator, I certify that I have reviewed and will comply with all the terms and conditions stipulated in the Stormwater Construction General Permit (AZG2008-001)."

- Printed Name: _____ Title: _____
- Signature: _____ Date: _____
- Business Name: _____
- Address: _____
- City: _____ State: _____ Zip Code: _____ Phone: _____

B.5 EPA NOI

This document is taken directly from the EPA website http://www.epa.gov/npdes/pubs/cgp2008_appendixf.pdf. Refer to that website periodically for any updates that may have occurred since this manual was published.

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This Form Replaces Form 3517-7 (8-98)
Refer to the Following Page for Instructions

Form Approved OMB Nos. 2040-0086 and 2040-0211

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge stormwater associated with construction activity under the NPDES program from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Permit Information

NPDES Stormwater General Permit Tracking Number: ☐☐☐☐☐☐☐☐☐

Reason for Termination (Check only one):

- ☐ Final stabilization has been achieved on all portions of the site for which you are responsible.
- ☐ Another operator has assumed control, according to Appendix G, Section 11.C of the CGP, over all areas of the site that have not been finally stabilized.
- ☐ Coverage under an alternative NPDES permit has been obtained.
- ☐ For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

II. Operator Information

Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

IRS Employer Identification Number (EIN): ☐☐ – ☐☐☐☐☐☐☐

Mailing Address:

Street: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

Phone: ☐☐☐ - ☐☐☐ - ☐☐☐☐ Fax (optional): ☐☐☐ - ☐☐☐ - ☐☐☐☐

E-mail: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

III. Project/Site Information

Project/Site Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Project Street/Location: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

County or similar government subdivision: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

IV. Certification Information

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

Print Name: _____

Print Title: _____

Email: _____

Signature: _____

Date: _____

Instructions for Completing EPA Form 3510-13

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

NPDES Form | This Form Replaces Form 3517-7 (8-98) | Form Approved OMB Nos. 2040-0086 and 2040-0211

Who May File an NOT Form
Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity may submit an NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

Completing the Form
Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Stormwater Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number
Enter the existing NPDES Stormwater General Permit Tracking Number assigned to the project by EPA's Stormwater Notice Processing Center. If you do not know the permit tracking number, refer to *www.epa.gov/npdes/stormwater/cgp* or contact the Stormwater Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner.

Section II. Operator Information
Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. The operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address, telephone number, and email address of the operator. Optional: enter the fax number of the operator.

Section III. Project/Site Information
Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section IV. Certification Information
All applications, including NOIs, must be signed as follows:
For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice
Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Visit this website for mailing instruction:
www.epa.gov/npdes/stormwater/mail

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/enoi

B.6 ADEQ NOT

This document is taken directly from the ADEQ website http://www.azdeq.gov/environ/water/permits/download/constnot.pdf. Refer to that website periodically for any updates that may have occurred since this manual was published.

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NOTICE OF TERMINATION (NOT)

for Construction Activity Discharges to Waters of the United States

Submission of this NOT constitutes notice that the party identified on this form is terminating coverage under the AZPDES general permit. Authorization to construction activity discharges to waters of the United States terminates at midnight on the day the NOT is received by ADEQ. To terminate your project, fax or submit a complete and accurate NOT to:

Arizona Department of Environmental Quality
Water Permits Section — Stormwater & General Permits Unit
1110 West Washington, 5415A-1; Phoenix, Arizona 85007
FAX: (602) 771-4528

I. PERMITTEE INFORMATION

AZPDES Stormwater Construction NOI Authorization Number: AZCON — _____.

Name of Operator submitted on Notice of Intent (NOI): _____

Operator Business: _____ Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

II. CONSTRUCTION SITE INFORMATION

Project/Site Name: _____

Site address or physical location: _____

_____

City: _____ State: _____ Zip: _____ County: _____

Provide the latitude/longitude of the specified on the NOI:

Latitude: |__ı__|° |__ı__|' |__ı__|" . |_____| (Degrees, minutes, seconds)

Longitude: |__ı__ı__|° |__ı__|' |__ı__|" . |_____| (Degrees, minutes, seconds)

III. REASON FOR TERMINATING COVERAGE: (Check as applicable)

____ Final stabilization has been achieved on all portions of the site for which the operator is responsible.

____ Another operator has assumed control over all areas of the site that have not been finally stabilized. (To qualify for this condition, ADEQ must receive the new operator's NOI application or the new AZCON # with this NOT submittal.) (AZCON-_____)

____ For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

____ The operator has obtained coverage under another AZPDES permit. List new permit #(s)._____

____ Construction activity was never initiated and plans for construction have been permanently abandoned or indefinitely postponed.

IV. CERTIFICATION BY AUTHORIZED SIGNATORY

"I certify under penalty of law that all stormwater discharges associated with construction activity from the identified facility that are authorized by a general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by an AZPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

Printed Name: _____ Title: _____

Signature: _____ Date: _____

Business Name (if different from above): _____

Address (if different from above): _____

City: _____ State: _____ Zip: _____ Phone: _____

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B.7 EPA NOT

This document is taken directly from the EPA website http://www.epa.gov/npdes/pubs/cgp2008_appendixf.pdf. Refer to that website periodically for any updates that may have occurred since this manual was published.

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This Form Replaces Form 3517-7 (8-98)
Refer to the Following Page for Instructions

Form Approved OMB Nos. 2040-0086 and 2040-0211

NPDES FORM

United States Environmental Protection Agency
Washington, DC 20460

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge stormwater associated with construction activity under the NPDES program from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Permit Information

NPDES Stormwater General Permit Tracking Number: ☐☐☐☐☐☐☐☐☐

Reason for Termination (Check only one):

- ☐ Final stabilization has been achieved on all portions of the site for which you are responsible.
- ☐ Another operator has assumed control, according to Appendix G, Section 11.C of the CGP, over all areas of the site that have not been finally stabilized.
- ☐ Coverage under an alternative NPDES permit has been obtained.
- ☐ For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

II. Operator Information

Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

IRS Employer Identification Number (EIN): ☐☐ – ☐☐☐☐☐☐☐

Mailing Address:

Street: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

Phone: ☐☐☐ - ☐☐☐ - ☐☐☐☐ Fax (optional): ☐☐☐ - ☐☐☐ - ☐☐☐☐

E-mail: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

III. Project/Site Information

Project/Site Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Project Street/Location: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

County or similar government subdivision: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

IV. Certification Information

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

Print Name: _____

Print Title: _____

Email: _____

Signature: _____

Date: _____

Instructions for Completing EPA Form 3510-13

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

NPDES Form | This Form Replaces Form 3517-7 (8-98) | Form Approved OMB Nos. 2040-0086 and 2040-0211

Who May File an NOT Form
Permittees who are presently covered under the EPA-issued National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity may submit an NOT form when final stabilization has been achieved on all portions of the site for which you are responsible; another operator has assumed control in accordance with Appendix G, Section 11.C of the General Permit over all areas of the site that have not been finally stabilized; coverage under an alternative NPDES permit has been obtained; or for residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

"Final stabilization" means that all soil disturbing activities at the site have been completed and that a uniform perennial vegetative cover with a density of at least 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed. See "final stabilization" definition in Appendix A of the Construction General Permit for further guidance where background native vegetation covers less than 100 percent of the ground, in arid or semi-arid areas, for individual lots in residential construction, and for construction projects on land used for agricultural purposes.

Completing the Form
Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Stormwater Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number
Enter the existing NPDES Stormwater General Permit Tracking Number assigned to the project by EPA's Stormwater Notice Processing Center. If you do not know the permit tracking number, refer to *www.epa.gov/npdes/stormwater/cgp* or contact the Stormwater Notice Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

Final stabilization has been achieved on all portions of the site for which you are responsible.

Another operator has assumed control according to Appendix G, Section 11.C over all areas of the site that have not been finally stabilized.

Coverage under an alternative NPDES permit has been obtained.

For residential construction only, if temporary stabilization has been completed and the residence has been transferred to the homeowner.

Section II. Operator Information
Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. The operator of the project is the legal entity that controls the site operation, rather than the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address, telephone number, and email address of the operator. Optional: enter the fax number of the operator.

Section III. Project/Site Information
Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section IV. Certification Information
All applications, including NOIs, must be signed as follows:
For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice
Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Visit this website for mailing instruction:
www.epa.gov/npdes/stormwater/mail

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/enoi

B.8 Arizona Impaired Surface Waters List

This document is taken directly from the ADEQ website http://www.azdeq.gov/environ/water/assessment/assess.html. Refer to that website periodically for any updates that may have occurred since this manual was published.

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Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

ADEQ'S 303(d) Impaired Waters

This list contains assessment units that were assessed as impaired by ADEQ during current and previous assessment listing cycles. The year each parameter was listed is located in parentheses after each parameter. The most current listings are in **bold.**

Assessment Unit	Size (acres/miles)	Cause(s) of Impairment	Category*	Status of TMDL Development
Bill Williams Watershed				
Alamo Lake 15030204-0040A	14,150 a	Ammonia (2004), High pH (1996) Low dissolved oxygen (**2006**)	5	Nutrient TMDL to be initiated in 2010.
Bill Williams River From Alamo Lake to Castaneda Wash 15030204-003	35.9 mi	Ammonia, low dissolved oxygen, and high pH (**2006**)	5	Nutrient TMDL to be initiated in 2010.
Santa Maria River From Little Sycamore Creek to Little Shipp Wash 15030203-013	6.8 mi	Mercury[(d)] (**2006**)	5	Alamo Lake TMDL may address mercury loadings affecting this reach. TMDL to be initiated in 2010.
Colorado – Grand Canyon Watershed				
Colorado River From Lake Powell to Paria River 14070006-001	16.3 mi	Selenium[(t)] (**2006**)	5	TMDL to be initiated in 2008.
Colorado River From Parashant Canyon to Diamond Creek 15010002-003	27.6 mi	Selenium[(t)] and suspended sediment (2004)	5	TMDL to be initiated in 2010.
Paria River From Utah border to Colorado River 14070007-123	29.4 mi	Suspended sediment (2004), *E. coli* (**2006**)	5	TMDL to be initiated in 2010.
Virgin River From Beaver Dam Wash to Big Bend Wash 15010010-003	10.1 mi	Selenium[(t)] and suspended sediment (2004)	5	TMDL to be initiated in 2011.
Colorado – Lower Gila Watershed				
Colorado River From Hoover Dam to Lake Mohave 15030101-015	40.4 mi	Selenium[(t)]	5	TMDL to be initiated in 2010.
Colorado River From Main Canal to Mexico border 15030107-001	32.2 mi	Low dissolved oxygen and selenium[(t)] (**2006**)	5	TMDL to be initiated in 2010.
Gila River From Coyote Wash to Fortuna Wash 15070201-003	28.3 mi	Selenium[(t)] and boron[(t)] (2004)	5	TMDL to be initiated in 2009.
Painted Rock Borrow Pit Lake 15070201-1010	185 a	Low dissolved oxygen (1992)	5	The low dissolved oxygen TMDL will be initiated when the lake refills and stabilizes.
Little Colorado Watershed				
Little Colorado River From Silver Creek to Carr Wash 15020002-004	6.1 mi	*E. coli* (2004)	5	To initiate in 2007.
Little Colorado River From Porter Tank Draw to McDonalds Wash 15020008-017	17.4 mi	Copper[(d)] and silver[(d)] (1992), suspended sediment (2004)	5	To initiate in 2007.
Middle Gila Watershed				
Alvord Lake 15060106B-0050	27 a	Ammonia (2004)	5	To initiate in 2007.
Chaparral Park Lake 15060106B-0300	12 a	Low dissolved oxygen and *E. coli* (2004)	5	To initiate in 2007.
Cortez Park Lake 15060106B-0410	2 a	Low dissolved oxygen and high pH (2004)	5	To initiate in 2007.

Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

Assessment Unit	Size (acres/miles)	Cause(s) of Impairment	Category*	Status of TMDL Development
Gila River From San Pedro River to Mineral Cr. 15050100-008	19.8 mi	Suspended sediment (**2006**)	5	TMDL to be initiated in 2009.
Gila River From Centennial Wash to Gillespie Dam 15070101-008	5.3 mi	Boron[(t)] (1992), selenium[(t)] (2004)	5	To be initiated in 2012.
Hassayampa River From headwaters to Copper Creek 15070103-007A *Also on Not Attaining List	11 mi	Low pH (**2006**)	5	Mine remediation actions should also address low pH.
Mineral Creek From Devil's Canyon to Gila River 15050100-012B	19.6 mi	Copper[(d)] (1992), selenium[(t)] (2004), and low dissolved oxygen (**2006**)	5	Terms of consent decree should negate need for TMDL.
Queen Creek From headwaters to mining discharge 15050100-014A	8.8 mi	Copper (2002)	5	Copper TMDL in progress. To be completed in 2009.
Queen Creek From mining WWTP discharge to Potts Canyon 15050100-014B	5.9 mi	Copper (2004)	5	Copper TMDL in progress. To be completed in 2009.
Salt Watershed				
Apache Lake 15060106A-0070	2,190 a	Low dissolved oxygen (**2006**)	5	Salt River Reservoir nutrient TMDL to be initiated in 2010.
Canyon Lake 15060106A-0250	450 a	Low dissolved oxygen (2004)	5	Salt River Reservoir nutrient TMDL to be initiated in 2010.
Christopher Creek From headwaters to Tonto Creek 15060105-353 *Also on Not Attaining List	8 mi	Phosphorus (**2006**)	5	Nutrient reduction strategies should also address phosphorus.
Five Point Tributary From headwaters to Pinto Creek 15060103-885	2.9 mi	Copper[(d)] (**2006**)	5	Loadings from this tributary should be addressed in the Pinto Creek Phase II TMDL.
Pinto Creek From West Fork Pinto Creek to Roosevelt Lake 15060103-018C *Also on Not Attaining List	17.8 mi	Selenium[(t)] (2004)	5	To be initiated in 2009.
Salt River From Pinal Creek to Roosevelt Lake 15060106A-004	7.5 mi	Suspended sediment (**2006**)	5	To be initiated in 2010.
Salt River From Stewart Mountain Dam to Verde River 15060106A-003	10.1 mi	Low dissolved oxygen (2004)	5	Salt River Reservoir nutrient TMDL to be initiated in 2010.
Tonto Creek From headwaters to 341810/1110414 15060105-013A *Also on Not Attaining List	8.1 mi	Phosphorus (**2006**)	5	Nutrient reduction strategies should reduce phosphorus loadings. TMDL will be initiated in 2010 if needed.
San Pedro Watershed				
Brewery Gulch From headwaters to Mule Gulch 15080301-337	1 mi	Copper[(d)] (2004)	5	Copper loadings from this tributary will be addressed in the Mule Creek copper TMDL.
Mule Gulch From headwaters to above Lavender Pit 15080301-090A	3 mi	Copper[(d)] (1990)	5	Ongoing TMDLs to be completed in 2009 to establish site-specific criteria for copper.

Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

Assessment Unit	Size (acres/miles)	Cause(s) of Impairment	Category*	Status of TMDL Development
Mule Gulch From above Lavender Pit to Bisbee WWTP discharge 15080301-090B	0.8 miles	Copper[(d)] (1990)	5	Ongoing TMDLs to be completed in 2009 to establish site-specific criteria for copper.
Mule Gulch From Bisbee WWTP discharge to Highway 80 bridge 15080301-090C	3.8 mi	Cadmium[(d)], copper[(d)(t)], low pH, zinc[(d)] (1990)	5	Ongoing TMDLs to be completed in 2009 to establish site-specific criteria for copper.
San Pedro River From Babocomari Creek to Dragoon Wash 15050202-003	17 mi	*E. coli* (2004)	5	Initiated TMDL in 2006. To complete in 2009.
San Pedro River From Dragoon Wash to Tres Alamos Wash 15050202-002	15.5 mi	Nitrate (1990)	5	Ongoing Superfund remediation and monitoring. Will initiate TMDL if WQARF cleanup is not effective.
San Pedro River From Aravaipa Creek to Gila River 15050203-001	14.8 mi	*E. coli* and selenium[(t)] (2004)	5	Initiated TMDL in 2006. To complete in 2009.
Santa Cruz Watershed				
Nogales Wash From Mexico border to Potrero Creek 15050301-011	6.2 mi	Ammonia (2004), chlorine (1996), copper[(d)] (2004), *E. coli* (1998)	5	Necessity of TMDL development will be based on outcome of current international remediation activities on infrastructure in Mexico.
Santa Cruz River From Mexico border to Nogales Intl WWTP discharge 15050301-010	17 mi	*E. coli* (2004)	5	Will initiate TMDL when stream flow returns. (Current drought.)
Sonoita Creek From 750 feet below Patagonia WWTP discharge to Santa Cruz R. 15050301-013C	18.6 mi	Zinc[(d)] (2004), low dissolved oxygen (**2006**)	5	To initiate in 2006 and complete in 2009.
Upper Gila Watershed				
Blue River From Strayhorse Creek to San Francisco River 15040004-025B	25.4 mi	*E. coli* (**2006**)	5	To initiate in 2009.
Cave Creek From headwaters to South Fork Cave Creek 15040006-852A	7.5 mi	Selenium[(t)] (2004)	5	Initiated TMDL in 2006. To complete in 2009.
Gila River From New Mexico border to Bitter Cr 15040002-004	16.3 mi	*E. coli* and suspended sediment (**2006)**	5	Initiated TMDL in 2006. To complete in 2009.
Gila River From Bonita Creek to Yuma Wash 15040005-022	5.8 mi	*E. coli* (2004)	5	Initiated TMDL in 2006. To complete in 2009.
Gila River From Skully Creek to San Francisco River 15040002-001	15.2 mi	Selenium[(t)] (2004)	5	Initiated TMDL in 2006. To complete in 2009.
San Francisco River From Blue River to Limestone Gulch 15040004-003	18.7 mi	*E. coli* (**2006)**	5	To initiate TMDL in 2009. To complete in 2011.
Verde Watershed				
East Verde River From American Gulch to Verde River 15060203-022C	25.8 mi	Arsenic[(t)] and boron[(t)] (**2006)**	5	To initiate TMDL in 2009. To complete in 2011.
East Verde River From Ellison Creek to American Gulch 15060203-022B	20.3 mi	Selenium[(t)] (2004)	5	To initiate TMDL in 2011.
Oak Creek From headwaters to West Fork Oak Creek	7.4 mi	*E. coli* (**2006**)	5	Initiated Phase II bacteria TMDL in 2004. To complete in 2009.

Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

Assessment Unit	Size (acres/miles)	Cause(s) of Impairment	Category*	Status of TMDL Development
15060202-019				
Oak Creek From West Fork Oak Creek to tributary at 345709/1114513 15060202-018A	5 mi	*E. coli* (**2006**)	5	Initiated Phase II bacteria TMDL in 2004. To complete in 2009.
Oak Creek From tributary at 345709/1114513 to downstream boundary of Slide Rock State Park 15060202-018B	1 mi	*E. coli* (1992)	5	Initiated Phase II bacteria TMDL in 2004. To complete in 2009.
Oak Creek From Slide Rock State Park to Dry Creek 15060202-018C	20 mi	*E. coli* (**2006**)	5	Initiated Phase II bacteria TMDL in 2004. To complete in 2009.
Oak Creek From Dry Creek to Spring Creek 15060202-017	10 mi	*E. coli* (**2006**)	5	Initiated Phase II bacteria TMDL in 2004. To complete in 2009.
Spring Creek From Coffee Creek to Oak Creek 15060202-022	6.4 mi	*E. coli* (**2006**)	5	To address bacteria loading from this tributary in the Oak Creek Phase II bacteria TMDL.

Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

EPA'S 303(d) IMPAIRED WATERS

These assessment units were assessed as impaired by EPA and will remain on Arizona's list of impaired waters until EPA determines that they are no longer impaired or a TMDL is approved.

Assessment Unit	Size (acres/miles)	Cause(s) of Impairment	Status of TMDL Development
Bill Williams Watershed			
Alamo Lake 15030204-0040	14,150 a	Mercury in fish tissue (2002)	Initiated in 2004. To complete in 2009.
Boulder Creek From unnamed wash at 34°41'14"/113°03'34" to Wilder Creek 15030202-006B	14.4 mi	Mercury[(d)] (2004)	Initiate in 2011. Complete in 2013.
Boulder Creek From Wilder Creek to Butte Creek 15030202-005A	1.4 mi	Mercury[(d)] (2004)	Initiate in 2011. Complete in 2013.
Burro Creek From Boulder Creek to Black Canyon Creek 15030202-004	17.2 mi	Mercury[(d)] (2004)	Initiate in 2011. Complete in 2013.
Coors Lake 15030202-5000	230 a	Mercury in fish tissue (2004)	Initiate in 2011. Complete in 2013.
Colorado - Grand Canyon Watershed			
There are no listings of this type for this watershed. See other lists.			
Colorado – Lower Gila Watershed			
Painted Rock Borrow Pit Lake 15070201-1010	180 a	DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Little Colorado – San Juan Watershed			
Bear Canyon Lake 15020008-0130	55 a	High pH (2004)	Initiate in 2009.
Lake Mary (lower) 15020015-0890		Mercury in fish tissue (2002)	Initiated in 2003. To complete in 2009.
Lake Mary (upper) 15020015-0900		Mercury in fish tissue (2002)	Initiated in 2003. To complete in 2009.
Little Colorado River From Silver Creek to Carr Wash 15020002-004	6 mi	Suspended sediment (2004)	Initiated in 2007. To complete in 2009.
Long Lake (lower) 15020008-0820		Mercury in fish tissue (2002)	Initiated in 2003. To complete in 2009.
Lyman Lake 15020001-0850	1308 a	Mercury in fish tissue (2002)	Initiated in 2008.
Soldier's Annex Lake 15020008-1430		Mercury in fish tissue (2002)	Initiated in 2003. To complete in 2009.
Soldier's Lake 15020008-1440		Mercury in fish tissue (2002)	Initiated in 2003. To complete in 2009.
Middle Gila Watershed			
Gila River Salt River - Agua Fria River 15070101-015		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Gila River Agua Fria River - Waterman Wash 15070101-014		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Gila River Waterman Wash - Hassayampa River 15070101-010		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Gila River Hassayampa River - Centennial Wash 15070101-009		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.

Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

Assessment Unit	Size (acres/miles)	Cause(s) of Impairment	Status of TMDL Development
Gila River Centennial Wash - Gillespie Dam 15070101-008		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Gila River Gillespie Dam - Rainbow Wash 15070101-007		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Gila River Rainbow Wash - Sand Tank 15070101-005		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Gila River Sand Tank - Painted Rocks Reservoir 15070101-001		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Hassayampa River Buckeye Canal – Gila River 15070103-001B		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Painted Rocks Reservoir 15070101-1020A		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Salt River 23rd Ave WWTP - Gila River 15060106B-001D		DDT metabolites, toxaphene and chlordane in fish tissue (2002)	Initiate in 2009. To complete in 2011.
Salt River Watershed			
Crescent Lake 15060101-0420	157 a	High pH (2002)	Initiate in 2010. To complete in 2012.
Tonto Creek From headwaters to unnamed tributary 15060105-013A	8.1 mi	Low dissolved oxygen (2004)	Initiate in 2010. To complete in 2012.
San Pedro – Willcox Playa – Rio Yaqui Watershed			
Brewery Gulch From headwaters to Mule Gulch 15080301-337	1 mi	Copper[(d)] (2004)	Copper loadings from this tributary will be addressed in the Mule Creek copper TMDL.
Mule Gulch From above Lavender Pit to Bisbee WWTP 15080301-090B	0.8 mi	Low pH (2002)	Initiated in 2000. Complete TMDL after site specific criteria are established (2009).
Santa Cruz – Rio Magdalena – Rio Sonoyta Watershed			
Parker Canyon Lake 15050301-1040	130 a	Mercury in fish tissue (2004)	Initiated in 2006. To complete in 2009.
Rose Canyon Lake 15050302-1260	7 a	Low pH (2004)	Initiate in 2009. To complete in 2011.
Upper Gila Watershed			
Cave Creek From headwaters to South Fork of Cave Creek 15040006-852A	8 mi	Selenium[(t)] (2004)	Initiated in 2006. To complete in 2009.
Gila River From Bonita Creek to Yuma Wash 15040005-022	6 mi	Sediment (2004)	Initiated in 2006. To complete in 2009.
San Francisco River From headwaters to New Mexico Border 15040004-023	13.1 mi	Sediment (2004)	Initiate in 2009. To complete in 2011.
Verde Watershed			
Granite Creek From headwaters to Willow Creek 15060202-059A	13 mi	Low dissolved oxygen (2004)	Initiate in 2010. To complete in 2012.
Watson Lake 15060202-1590	150 a	Nitrogen, low dissolved oxygen, high pH (2004)	Initiate in 2008. To complete in 2010.
Whitehorse Lake 15060202-1630	40 a	Low dissolved oxygen (2004)	Initiate in 2010. To complete in 2012.

Arizona's 2006/2008 Impaired Waters

Arizona's 303(d) Impaired Waters List consists of two sections: the first section consists of ADEQ 303(d) listings, while the second consists of EPA 303(d) listings.

*Assessment Categories:

Category 5 – Impaired surface waters where a Total Maximum Daily Load (TMDL) analysis is required.

Category 4 – At least one designated use is impaired or threatened but development of a TMDL is not needed (at this time). Note that these assessment units are considered impaired under permit requirements. Three subcategories exist in Arizona:

4A – The TMDL has been completed, is being implemented, and appears to be sufficient;
4B – Alternative pollution control requirements or actions are expected to result in the attainment of water quality standards;
4C – The impairment is caused by pollution but not a pollutant; or
4N – Impairment is caused *solely* due to natural conditions (no human contribution).

(Further information is provided in the *Surface Water Assessment Methods and Technical Support* document.)

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B.9 Arizona Impaired Surface Waters Map

This document is taken directly from the ADEQ website http://www.azdeq.gov/environ/water/permits/stormwater.html. Refer to that website periodically for any updates that may have occurred since this manual was published.

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2006/2008 Statewide Impaired Waters

Colorado/Grand Canyon

VIRGIN RIVER
Beaver Dam W. - Big Bend W.
Selenium, suspended sediment

PARIA RIVER
Utah border - Colorado R.
SSC, E. coli

COLORADO RIVER
Lake Powell - Paria R.
Selenium

COLORADO RIVER
Parashant Canyon Diamond Crk
Selenium, suspended sediment

COLORADO RIVER
Hoover Dam - Lake Mohave
Selenium

Little Colorado/San Juan

Colorado/Lower Gila

Bill Williams

Verde

Middle Gila

Salt

Upper Gila

Santa Cruz

San Pedro

WHITEHORSE LAKE
(EPA) Low DO

LAKE MARY (UPPER & LOWER)
(EPA) Mercury in fish tissue

SOLDIERS & SOLDIERS ANNEX LAKE
(EPA) Mercury in fish tissue

LITTLE COLORADO RIVER
Porter Tank Draw - McDonalds W.
Copper, silver, sediment

PECK'S LAKE
Nuts, low DO, high pH

STONEMAN LAKE
Nuts, low DO, high pH

LONG LAKE (LOWER)
(EPA) Mercury in fish tissue

BURRO CREEK
Boulder Crk - Black Canyon Crk
mercury

VERDE RIVER
Sediment/turbidity

LITTLE COLORADO RIVER
Silver Creek - Carr Wash
Sediment, E. coli

LYMAN LAKE
(EPA) Mercury in fish tissue

EAST VERDE RIVER
Ellison Crk - American Gulch
Selenium

TONTO CREEK
Headwaters - 341810/1110414
E. coli (4A), phosphorus (5), low DO (5)

LITTLE COLORADO RIVER
Unnamed reach - Lyman Lake
Sediment/turbidity

NUTRIOSO CREEK
Nelson Reservoir - Picnic Creek
Sediment/turbidity

SANTA MARIA RIVER
Little Sycamore Crk Little Shipp W.
Mercury

BILL WILLIAMS RIVER
Alamo Lake - Castaneda W.
Ammonia, low DO, high pH

ALAMO LAKE
(EPA) Mercury in fish tissue

FRENCH GULCH
Hdwtrs - Hassayampa R.
Cadmium, copper, zinc

TURKEY CREEK
Unnamed Trib. - Poland Crk
Copper, lead

EAST VERDE RIVER
American Gulch - Verde R.
Arsenic, boron

TONTO CREEK
341810/1110414 - Haigler Crk
E. coli

CHRISTOPHER CREEK
Headwaters - Tonto Creek
E. coli (4A), phosphorus (5)

LITTLE COLORADO RIVER
WF LCR - Carnero Crk
Sediment/turbidity

RAINBOW LAKE
Nutrients, low DO, high pH

SALT RIVER
Stewart Mtn Dam - Verde R.
Low DO

APACHE LAKE
Low DO

CANYON LAKE
Low DO

CRESCENT LAKE
(EPA) high pH

SAN FRANCISCO RIVER
Hdwtrs - New Mexico border
suspended sediment

LUNA LAKE
Nutrients, low DO, high pH

HASSAYAMPA RIVER
Buckeye Canal - Gila R.
Pesticides in fish tissue

SALT RIVER
23rd Ave WWTP - Gila River
Pesticides in fish tissue

QUEEN CREEK
Hdwtrs - Potts Canyon
Copper

MINERAL CREEK
Devil's Canyon - Gila R.
Copper, selenium, low DO

BLUE RIVER
Strayhorse Crk - San Francisco R.
E. coli

GILA RIVER
Centennial W. - Gillespie
Selenium, boron

GILA RIVER
Salt R. - Centennial W.
Pesticides in fish tissue

PAINTED ROCK BORROW PIT LAKE,
PAINTED ROCK RESERVOIR
(EPA) Pesticides in fish

SAN FRANCISCO RIVER
Blue R. - Limestone Gulch
E. coli

COLORADO RIVER
Main Canal - Mexico border
Low DO, selenium

GILA RIVER
Coyote Wash - Fortuna Wash
Selenium, boron

GILA RIVER
Gillespie Dam - Painted Rocks
Pesticides in fish tissue

GILA RIVER
San Pedro R. to Mineral Crk
Suspended sediment

GILA RIVER
Bonita Crk - Yuma W.
E. coli

SAN PEDRO RIVER
Aravaipa Crk - Gila R.
Selenium, E. coli

GILA RIVER
Skully Creek - San Francisco River
Selenium

GILA RIVER
New Mexico border - Bitter Creek
Suspended sediment, E. coli

ROSE CANYON LAKE
(EPA) pH

LAKESIDE LAKE
chlorophyll, nitrogen, phosphorous

SAN PEDRO RIVER
Dragoon W. - Tres Alamos W.
Nitrate

CAVE CREEK
Hdwtrs - S. Fork Cave Creek
Selenium

SAN PEDRO RIVER
Babocomari Crk - Dragoon W.
E. coli

MULE GULCH
Hdwtrs - above Lavender Pit
Copper

ARIVACA LAKE
(EPA) Mercury in fish tissue

BREWERY GULCH
Hdwtrs - Mule Gulch
Copper

PEÑA BLANCA LAKE
(EPA) Mercury in fish tissue

NOGALES WASH
Mexico border - Potrero Creek
Copper, ammonia, E. coli, chlorine

PARKER CANYON LAKE
(EPA) Mercury in fish tissue

MULE GULCH
Bisbee WWTP - H-80 bridge
Cadmium, copper, low pH, zinc

SANTA CRUZ RIVER
Mexico border - Nogales Intl WWTP
E. coli

Patagonia/Sonoita Area

Sonoita Creek
750 ft blw Patagonia WWTP - Patagonia Lake
Zinc, low dissolved oxygen

Harshaw Creek
Hdwtrs - Sonoita Crk
Copper, pH

Humbolt Canyon
Hdwtrs - Alum Gulch
Copper

THREE R CANYON, COX GULCH,
UNNAMED TRIB TO COX GULCH
Cadmium, copper, zinc, pH

ADEQ
Arizona Department of Environmental Quality

** This map is for general reference only and may not be all inclusive. Neither the information presented nor the maps themselves are official documents. More detailed information and specific locations can be obtained by contacting the Arizona Department of Environmental Quality's Surface Water Section.

Bagdad Area

BOULDER CREEK
Unnamed trib - Butte Creek
mercury

BOULDER CREEK
Butte Creek - Copper Creek
Mercury

COORS LAKE
(EPA) mercury

0 5 10 Miles
*Scale bar only applies to these areas

Oak Creek TMDL Area

OAK CREEK
Headwaters - unnamed tributary
E. coli

OAK CREEK (SLIDE ROCK)
Unnamed trib - Slide Rock S.P.
E. coli

OAK CREEK
Slide Rock S. P. - Spring Crk
E. coli

SPRING CREEK
Coffee Creek - Oak Creek
E. coli

Pinto Creek TMDL Area

SALT RIVER
Pinal Creek - Roosevelt Lake
Suspended sediment

PINTO CREEK
W.F. Pinto Crk- Roosevelt Lake
Copper (4A), selenium (5)

PINTO CREEK
Headwaters - W. Fork Pinto Crk
Copper

FIVE POINT MTN TRIB.
Copper

GIBSON MINE TRIB.
Copper

Prescott Area

WATSON LAKE
nitrogen, dissolved oxygen, pH

GRANITE CREEK
Hdwtr - Willow Creek
Dissolved oxygen

HASSAYAMPA RIVER
Cadmium (4A), copper (4A),
zinc (4A), low pH (5)

CASH MINE CREEK & UNNAMED TRIB
Headwaters - Hassayampa River
Cadmium, copper, zinc, low pH

Legend

Impaired Waterbodies
- 4 (Not Attaining)
- 5 (Impaired)
- Not Attaining/Impaired (EPA)
- Major Streams
- Lakes

Land Ownership
- State/County/Municipal
- Federal
- Private
- Tribal

- Watersheds
- COUNTIES
- INCORPORATED CITIES
- Towns

0 25 50 75 100 Miles

Mapmaker: Anel Avila
Date: November 13, 2008
Datum: NAD 83

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B.10 Arizona List of Unique Waters

This document is taken directly from the ADEQ website http://www.azdeq.gov/environ/water/permits/stormwater.html. Refer to that website periodically for any updates that may have occurred since this manual was published.

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OUTSTANDING ARIZONA WATERS (OAWs)

A.A.C. R18-11-112(G)

1. West Fork of the Little Colorado River, from its headwaters at 33°55'02"/109°33'30" to Government Springs at 33°59'33"/109°27'54" (approximately 9.1 river miles);
2. Oak Creek, from its headwaters at 35°01'30"/111°44'12" to its confluence with the Verde River at 34°40'41"/111°56'30 (approximately 50.3 river miles);
3. West Fork of Oak Creek, from its headwaters at 35°02'44"/111°54'48" to its confluence with Oak Creek at 34°59'14"/111°44'46" (approximately 15.8 river miles);
4. Peeples Canyon Creek, from its headwaters at 34°23'57"/113°19'45" to its confluence with the Santa Maria River at 34°20'36"/113°15'12" (approximately 8.1 river miles);
5. Burro Creek, from its headwaters at 34°52'46.5"/113°05'13.5" to its confluence with Boulder Creek at 34°374.5"/113°18'36" (approximately 29.5 miles);
6. Francis Creek, from its headwaters at 34°54'38"/113°20'30" to its confluence with Burro Creek at 34°44'29"/113°14'37" (approximately 22.9 river miles);
7. Bonita Creek, from its boundary of the San Carlos Indian Reservation at 33°03'08"/109°33'41" to its confluence with the Gila River at 32°53'36"/109°28'43" (approximately 14.7 river miles);
8. Cienega Creek, from its confluence with Gardner Canyon and Spring Water Canyon at 31°47'38.5"/110°35'21.5" to the USGS gaging station at 32°02'09"/110°40'34" (approximately 28.3 river miles);
9. Aravaipa Creek, from its confluence with Stowe Gulch at 32°52'10"/110°22'03" to the downstream boundary of the Aravaipa Canyon Wilderness Area at 32°54'23"/110°33'42" (approximately 15.5 river miles);
10. Cave Creek, from its headwaters at 31°50'30"/109°17'04.5" to the Coronado National Forest boundary at 31°54'38"/109°08'40" (approximately 10.4 river miles);
11. South Fork of Cave Creek, from its headwaters at 31°50'20"/109°16'33" to its confluence with Cave Creek at 31°53'04"/109°10'30" (approximately 8.6 river miles);
12. Buehman Canyon Creek, from its headwaters at 32°52'0.5"/110°39'54.5" to its confluence with unnamed tributary at 32°24'31.5"/110°32'08" (approximately 9.8 river miles);
13. Lee Valley Creek, from its headwaters at 33°55'49"/109°31'34" to its confluence with Lee Valley Reservoir at 33°56'28"/109°30'15.5" (approximately 1.6 river miles);
14. Bear Wallow Creek, from its headwaters at 33°35'54"/109°26'54.5" to the boundary of the San Carlos Indian Reservation at 33°37'52"/109°29'44" (approximately 4.25 river miles);
15. North Fork of Bear Wallow Creek, from its headwaters at 33°34'47.5"/109°21'59.5" to its confluence with Bear Wallow Creek at 33°35'54"/109°26'54.5" (approximately 3.8 river miles);
16. South Fork of Bear Wallow Creek, from its headwaters at 33°34'38.5"/109°23'58" to its confluence with Bear Wallow Creek at 33°35'54"/109°26'54.5" (approximately 3.8 river miles);
17. Snake Creek, from its headwaters at 33°37'21.5"/109°26'11" to its confluence with the Black River at 33°40'31.5"/109°28'58.5" (approximately 6.2 river miles);
18. Hay Creek, from its headwaters at 33°51'00"/109°28'48" to its confluence with the West Fork of the Black River at 33°48'30"/109°25'19" (approximately 5.5 river miles);
19. Stinky Creek, from the White Mountain Apache Indian Reservation boundary at 33°52'36.5"/109°29'45" to its confluence with the West Fork of the Black River at 33°51'21.5"/109°27'09.5" (approximately 3.0 river miles);
20. KP Creek, from its headwaters at 33°34'03"/109°21'19" to its confluence with the Blue River at 33°31'44"/109°12'04.5" (approximately 12.7 river miles);
21. Davidson Canyon, from the unnamed spring at 31°59'00"/110°38'46" to its confluence with Cienega Creek; and
22. Fossil Creek, from its headwaters at the confluence of Sandrock and Calf Pen Canyons above Fossil Springs at 34°26'48.7"/111°32'25" to its confluence with the Verde River at 34°18'21.8"/111°40'31.6" (approximately 17.2 river miles).

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B.11 Sample Inspection Report and Rainfall Data Form

This document is taken directly from the ADEQ website http://www.azdeq.gov/function/forms/appswater.html. Refer to that website periodically for any updates that may have occurred since this manual was published.

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Example Sample Inspection Report

Instructions

This sample inspection report has been developed as a helpful tool to aid you in completing your site inspections. It is provided in Microsoft Word format to allow you to easily customize it for your use and the conditions at your site. You should also customize this form to help you meet the requirements in the AZPDES Construction General Permit related to inspections.

Refer to Permit Part IV.H for inspection requirements. Remember to include all areas of the site disturbed by construction activity. If a BMP has been used inappropriately or installed incorrectly, replace or modify the BMP for site situations as soon as practicable and before the next anticipated storm event. When sediment escapes the construction site, offsite accumulations of sediment must be removed at a frequency sufficient to ensure no adverse effects on water quality.

Using the Inspection Report
This inspection report is designed to be customized according to the BMPs and conditions at your site. For ease of use, you should take a copy of your site plan and number all of the stormwater BMPs and areas of your site that will be inspected. A brief description of the BMP and its location should then be listed in the site-specific section of the inspection report. For example, specific structural BMPs such as construction site entrances, sediment ponds, or specific areas with silt fence (e.g., silt fence along Main Street; silt fence along slope in NW corner, etc.) should be numbered and listed on the inspection form. You should also number specific non-structural BMPs or areas that will be inspected (such as trash areas, material storage areas, temporary sanitary waste areas, etc).

You can complete the items in the “General Information” section that will remain constant, such as the project name, AZCON authorization number, and inspector’s name and qualifications. Print out multiple copies of this customized inspection report to use during your inspections.

When conducting the inspection, walk the site by following your site map and numbered BMPs/areas for inspection. Note any required corrective actions and the date and responsible person for the correction. Also note whether any previously identified site issues have been addressed.

Stormwater Construction Site Inspection Report

General Information			
Project Name			
Location			
AZCON number			
Date of Inspection		**Start Time:**	**End time:**
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Qualifications	**(must attach to this report or indicate the portion of the SWPPP that documents the qualifications of the inspector by name)**		
Describe present phase of construction			
Type of Inspection **❑ Weekly ❑ Bi-weekly ❑ Monthly** **❑ Pre-storm event ❑ During storm event ❑ Post-storm event**			
Weather Information			
Has it rained since the last inspection? ❑Yes ❑No **Weather information/Time Elapsed since last rain event:** **Storm Start Date & Time: Storm Duration (hrs): Approximate Rainfall (in):**			
Weather at time of this inspection?			
Do you suspect that discharges may have occurred since the last inspection? ❑Yes ❑No			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, provide location(s) and a description of stormwater discharged from the site (presence of suspended sediment, turbid water, discoloration, and/or oil sheen**			
Non-Stormwater Discharges			
Identify all non-stormwater discharges (i.e. water, other than stormwater, directed to a watercourse, storm drain, or off of the construction site):			

Site-specific BMPs

Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below. ***Include all BMPs implemented to manage erosion, sediment transport, waste disposal, material and equipment storage areas, and non-stormwater discharges.*** *Carry a copy of this numbered site map with you during your inspections. This list will help ensure that you are inspecting all BMPs at your site. Customize this section as needed.*

	BMP Description and Location (indicate if associated with non-stormwater)	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action/responsible person	Corrective Action Implementation Date
1		❑Yes ❑No			
2		❑Yes ❑No			
3		❑Yes ❑No			
4		❑Yes ❑No			
5		❑Yes ❑No			
6		❑Yes ❑No			
7		❑Yes ❑No			
8		❑Yes ❑No			
9		❑Yes ❑No			
10		❑Yes ❑No			
11		❑Yes ❑No			
12		❑Yes ❑No			
13		❑Yes ❑No			
14		❑Yes ❑No			
15		❑Yes ❑No			
16		❑Yes ❑No			
17		❑Yes ❑No			
18		❑Yes ❑No			
19		❑Yes ❑No			
20		❑Yes ❑No			

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

Overall Site Issues

	BMP/Activity	Implemented?	Maintained?	Location/Corrective Action	Date for corrective action/responsible person	Corrective Action Implementation Date
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No			
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No			
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No			
4	Are discharge points and receiving waters free of sediment deposits? **If no, provide locations**	❑Yes ❑No	❑Yes ❑No			
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No			
6	Is there evidence of sediment being tracked into the street?	❑Yes ❑No	❑Yes ❑No			

	BMP/Activity	Implemented?	Maintained?	Location/Corrective Action	Date for corrective action/responsible person	Corrective Action Implementation Date
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No			
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No			
9	Are vehicle and equipment fueling, cleaning, material storage, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No			
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No			
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No			
12	Are there locations where additional BMPs are necessary?	❑Yes ❑No	❑Yes ❑No			
13	Are changes to the SWPPP necessary?	❑Yes ❑No	❑Yes ❑No			
14	(Other)		❑Yes ❑No			

❑ If there were no incidents of noncompliance noted during the inspection the inspector certifies that the construction project or site is being operated in compliance with the SWPPP and Permit No. AZG2008-001.

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

Print Inspector's Name: _____

Signature:_____

Date: _____

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Appendix C LINKS AND MS4 CONTACT LIST

This appendix includes links and contact information for other stormwater discharge permit sources of information and tools; including regulatory agency links, electronic NOI submittal links, fugitive dust regulations, emergency response and notification phone numbers, and interactive BMP databases.

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C.2 Phase I MS4 Systems within Maricopa County Contact List.....C-5

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C.1 Storm Water Links

Arizona Department of Environmental Quality

- Arizona Pollutant Discharge Elimination System (AZPDES):

  www.azdeq.gov/environ/water/permits/azpdes.html

- Smart NOI submittal:

  http://az.gov/webapp/noi/main.do

- Downloadable NOI form:

  https://az.gov/app/smartnoi/Default.aspx?NOIMenu

- Downloadable NOT form:

  www.azdeq.gov/environ/water/permits/download/constnot.pdf

- Construction SWPPP checklist:

  www.azdeq.gov/environ/water/permits/download/cswppp.pdf

Arizona Department of Water Resources

- Drought tolerant / low water use plant lists:

  www.water.az.gov/adwr/Content/Conservation/LowWaterPlantLists/

Arizona Emergency Response Commission

- Emergency contact phone numbers:

  www.dem.state.az.us/azserc/epcra.doc

Environmental Protection Agency

- National Pollutant Discharge Elimination System (NPDES) Construction General Permit:

  http://cfpub1.epa.gov/npdes/stormwater/cgp.cfm

- Developing SWPPPs and Best Management Practices:

  http://cfpub1.epa.gov/npdes/stormwater/swppp.cfm

- eNOI submittal:

  http://cfpub2.epa.gov/npdes/stormwater/enoi.cfm

- Construction Rainfall Erosivity Waiver Fact Sheet:

  www.epa.gov/npdes/pubs/fact3-0.pdf

Maricopa Association of Governments

- Environmental Services – Fugitive Dust Rule 310:

  http://www.maricopa.gov/aq/divisions/planning_analysis/rules/docs/310-0404.pdf

- Environmental Services – Construction Dust Control Guide:

  http://www.maricopa.gov/aq/divisions/compliance/dust/Resources.aspx#Handbook_Guide

- Environmental Services – Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area:

  www.mag.maricopa.gov/archive/PUB/Document/pm-10%20summary.pdf

Interactive BMP Database

- Idaho Department of Environmental Quality – Catalog of Stormwater Best Management Practices:

  http://www.deq.state.id.us/water/stormwater_catalog/index.asp

- International Stormwater Best Management Practices (BMP) Database:

  http://www.bmpdatabase.org/

- Texas Nonpoint Source Book – Runoff Quality Best Management Practices:

  http://www.txnpsbook.org/BMPs/URBMPS.htm

Other Erosion Control Resources

- Official NRCS database and RUSLE2 Program website:

  http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm

Phase I and II Municipal Separate Storm Sewer Systems (MS4) within Maricopa County Contact List

Contact List of MS4s within Maricopa County

C.2 Phase I MS4 Systems within Maricopa County Contact List

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Phase I Municipal Separate Storm Sewer Systems (MS4) within Maricopa County Contact List

City	Stormwater Related Contact Information
Glendale	City of Glendale Engineering Department 5850 W. Glendale Avenue Glendale, AZ 85301 (P) 623-930-2800; (F) 623-915-2695 www.ci.glendale.az.us
Mesa	City of Mesa Engineering Design and Administration 20 E. Main Street, #500 P.O. Box 1466 Mesa, AZ 85211 (P) 480-644-2251; (F) 480-644-3392 www.ci.mesa.az.us
Phoenix	City of Phoenix Engineering and Architectural Services Department Environmental Engineering Manager 200 W. Washington Street Phoenix, AZ 85003 (P) 602-262-6011; (F) 602-256-3325 www.phoenix.gov
Scottsdale	City of Scottsdale Planning and Community Development 3939 Civic Center Boulevard Scottsdale, AZ 85251 (P) 480-312-6500; (F) 480-312-2738 www.scottsdaleaz.gov
Tempe	City of Tempe Public Works - Engineering P.O. Box 5002 Tempe, AZ 85281 (P) 480-967-2001; (F) 480-350-8996 www.tempe.gov
Unincorporated Maricopa County	Maricopa County Planning and Development Division 411 N. Central Ave. Phoenix, AZ 85004 (P) 602-506-3301; (F) 602-506-8762 www.maricopa.gov

Phase II Municipal Separate Storm Sewer Systems (MS4) within Maricopa County Contact List

City	Local Stormwater Agency
Apache Junction	City of Apache Junction Development Services 1001 N. Idaho Road Apache Junction, AZ 85219 (P) 480-982-8002; (F) 480-982-7018 www.ajcity.net
Avondale	City of Avondale Engineering Department 11465 West Civic Center Drive Avondale, AZ 85323 (P) 623-478-3270; (F) 623-478-3812 www.ci.avondale.az.us
Chandler	City of Chandler Development Services Division 55 North Arizona Place, #301 Chandler, AZ 85225 (P) 480-782-2220; (F) 480-782-2209 www.chandleraz.org
El Mirage	City of El Mirage Engineering Division 14405 North Palm Street El Mirage, AZ 85335 (P) 623-972-8318; (F) 623-972-8418 www.cityofelmirage.org
Gilbert	Town of Gilbert Community Development 50 East Civic Center Drive Gilbert, AZ 85296 (P) 480-503-6000; (F) 480-497-4943 www.ci.gilbert.az.us
Goodyear	City of Goodyear Community Development Department 190 North Litchfield Road P.O. Box 5100 Goodyear, AZ 85338 (P) 623-932-3910; (F) 623-932-1177 www.ci.goodyear.az.us

Phase II Municipal Separate Storm Sewer Systems (MS4) within Maricopa County
Contact List (continued)

City	Local Stormwater Agency
Guadalupe	Town of Guadalupe Community Development Department 9241 South Avenida del Yaqui Guadalupe, AZ 85283 (P) 480-730-3080; (F) 480-505-5368 www.guadalupeaz.org
Litchfield Park	City of Litchfield Park Building Department 214 West Wigwam Boulevard Litchfield Park, AZ 85340 (P) 623-935-5033; (F) 623-935-5427 www.litchfield-park.org
Paradise Valley	Town of Paradise Valley Community Development Department 6401 East Lincoln Drive Paradise Valley, AZ 85253 (P) 480-948-7411; (P) 480-348-3689 www.ci.paradise-valley.az.us
Peoria	City of Peoria Engineering Division 8401 W. Monroe Peoria, AZ 85345 (P) 623-773-7000; (F) 623-773-7309 www.peoriaaz.com
Surprise	City of Surprise Development Services Division 12425 W Bell Road, Suite D-100 Surprise, AZ 85374 (P) 623-583-1000; (F) 623-583-1399 www.surpriseaz.com
Tolleson	City of Tolleson Building and Zoning Enforcement Department 9555 West Van Buren Tolleson. AZ 85353 (P) 623-936-7111; (F) 623-907-2629 www.tollesonaz.org
Youngtown	Town of Youngtown Public Works/Building Inspector 12030 Clubhouse Square Youngtown, AZ 85363 (P) 623-933-8286; (F) 623-933-5951 www.youngtownaz.org

Appendix D GLOSSARY

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APPENDIX D GLOSSARY

This appendix includes definitions for those terms most commonly used for stormwater quality and erosion control, and within state and federal regulations (IECA, 2002; NPDES, 2003). For regulatory purposes, NPDES or AZPDES definitions will supercede the definitions below.

Term	Definition
Accretion:	Outward growth of bank or shore by sedimentation. Increase or extension of boundaries of land by action of natural forces.
Active Construction Area:	The area where the contractor intends to be actively involved in soil disturbing work. This may include areas where soils have been disturbed as well as areas where soil disturbance has not yet occurred.
Aggradation:	General and progressive raising of stream bed by deposition of sediment. Modification of the earth's surface in the direction of uniformity of grade, or slope, by deposition as in a riverbed.
Alluvial:	Referring to deposits of silts, sands, gravels and similar detrital material that have been transported by running water.
Alluvium:	Stream-borne materials deposited in and along a channel.
Apron:	A lining of the bed of the channel upstream or downstream from a lined or restricted waterway. A floor or lining concrete, rock, etc., to protect a surface from erosion such as the pavement below chutes, spillways, at the toes of dams, or along the toe of bank protection.
Aqueduct:	(1) A major conduit. (2) The entire transmission main for a municipal water supply that may consist of a succession of canals, pipes, tunnels, etc. (3) Any conduit for water; especially one for a large quantity of flowing water. (4) A structure for conveying a canal over a river or hollow.
Aquifer:	Water-bearing geologic formations that permit the movement of ground water.
Arid Area:	Any area receiving less than 10 inches of rainfall per year.
ADEQ:	Arizona Department of Environmental Quality (ADEQ) is a state agency that issues the regulations to control pollutants in stormwater runoff discharges (AZDES permit requirements).
Armor:	Artificial surfacing of bed, banks, shore or embankment to resist erosion or sour.

Arroyo: Waterway of an ephemeral stream deeply carved in rock or ancient alluvium.

Avulsion: (1) A Forcible separation; also, a part torn off. (2) The sudden removal of land from the estate of one person to that of another, as by a sudden change in a river. (3) A sudden shift in channel location.

AZPDES Permit: Arizona Pollutant Discharge Elimination System; the Arizona specific version of the Arizona specific version of the National Pollutant Discharge Elimination System (see NPDES below). This permit is an authorization, license, or equivalent control document issued by ADEQ to implement the requirements of the NPDES program.

Backfill: Earth refilling a trench or an excavation.

Backing Layer: A layer of graded rock between rock riprap and underlying engineering fabric or filter layer to prevent extrusion of the soil or filter layer material through the riprap.

Backwater: An unnaturally high level in a stream caused by obstruction or confinement of flow, such as a dam, bridge, or levee.

Baffle: A pier, vane, sill, fence, wall or mound built on the bed of a stream to parry, deflect, check or disturb the flow or to float on the surface to deflect or dampen cross currents or waves.

Bank: The lateral boundary of a stream confining water flow. The bank on the left side of a channel looking downstream is called the left bank, etc.

Bank Protection: Revetment, or other armor protecting a bank of a stream from erosion, includes devices used to deflect the forces of erosion away from the bank.

Bar: An elongated deposit of alluvium within a channel or across its mouth.

Barrier: A low dam or rack built to control flow of debris.

Base Flood: The flood or tide having a 1 percent chance of being exceeded in any given year (100-year flood). The “base flood” is commonly used as the “standard flood” in Federal flood insurance studies.

Base Floodplain: The area subject to flooding by the base flood.

Base Flow: The flow contribution to a creek by groundwater. During dry periods, base flow constitutes the majority of stream flow.

Basin: (1) The surface area tributary to a stream or lake. (2) Space above or below ground capable of retaining or detaining water or debris.

Bed: The earth below any body of water, limited laterally by bank or shore.

Bed Load: Sediment that moves by rolling, sliding, or skipping along the bed and is essentially in contact with the streambed.

Bedding: The foundation under a drainage structure.

Berm: An earthen mound used to direct the flow of runoff around or through a structure.

Best Available Treatment: A level of technology based on the best (state of the art) control and treatment measures that have been developed or are capable of being developed and that are economically achievable within the appropriate industrial category.

Best Management Practice: Structural devices or nonstructural practices that are designed to prevent pollutants from entering into stormwater flows, to direct the flow of stormwater or to treat polluted stormwater flows.

Bluff: A high, steep bank composed of erodible materials**.**

Boulder: Largest rock transported by a stream or rolled in the surf; arbitrarily heavier that 12kg and larger than 200mm.

Braided Stream: A stream in which flow is divided at normal stage by small islands. This type of stream has the aspect of a single large channel with which there are subordinate channels.

Buffer Strip or Zone: Strip of erosion-resistant vegetation between a waterway and an area of more intensive land use.

Bulkhead: A steep or vertical structure placed on a bank, bluff, or embankment to retain or prevent sliding of the land and protect the inland area against damage.

Bulking: The increase in volume of flow due to air entrainment, debris, bed load, or suspended sediment.

Canal: An artificial open channel.

Canvas: A sheet of waterproof material used to cover and protect materials, equipment, or vehicles.

Capacity: The effective carrying ability of a drainage structure. Generally measured in cubic feet per second.

Capillary Water: Water that clings to soil particles by capillary action. It is normally associated with fine sand, silt, or clay, but not normally with coarse sand and gravel.

Catch Basin: A drainage structure that collects water. May be either a structure where water enters from the side or through a grating.

CERCLA: Comprehensive Environmental Responsibility Compensation and Liabilities Act.

Channel: The space above the bed and between banks occupied by a stream.

Channelization: The process of making a channel of channels. A channel is the bed of a stream or river, or hollow or course in which a stream flows.

Check: A sill or weir in a channel to control stage or velocity.

Check Dam: A temporary dam across a swale or gully to reduce gully erosion, or placed bank to bank downstream from a headcut; often used in series. A small dam generally placed in steep ditches for the purpose of reducing the velocity in the ditch.

Cienega: A swamp formed by water rising to the surface at a fault.

Clean Water Act: The Federal Water Pollution Control Act enacted in 1972 by Public Law 92-500 and amended by the Water Quality Act of 1987. The Clean Water Act prohibits the discharge of pollutants to Waters of the United States unless said discharge is in accordance with NPDES permit. The 1987 amendments include guidelines for regulating municipal, industrial, and construction stormwater discharges under the NPDES program.

Cleanout: An access opening to a roadway drainage system. Usually consists of a manhole shaft, a special chamber or opening into a shallow culvert or drain.

Cloudburst: Rain storm of great intensity usually over a small area for a short duration.

Cobble: Rock smaller than a boulder and larger that gravel; arbitrarily 0.5 to 12 kg, or 75 to 200 mm in diameter.

Coefficient of Runoff: Percentage of gross rainfall that appears as runoff.

Composite Hydrograph: A plot of mean daily discharges for a number of years of record on a single year time base for the purpose of showing the occurrence of high and low flows.

Concentrated Flow: Flowing water that has been accumulated into a single fairly narrow stream.

Concentration: In addition to its general sense, means the unnatural collection or convergence of waters so as to discharge in a narrower width, and at greater depth or velocity.

Concrete Aprons: A pad of non-erosive material designed to prevent scour holes developing at the outlet ends of culverts, outlet pipes, grade stabilization structures, and other water control devices.

Conduit: Any channel or pipe for directing the flow of water.

Cone: Physiographic form of sediment deposit washed from a gorge channel onto an open plain; a debris cone, also called an alluvial fan.

Confluence: A junction of streams.

Constriction: An obstruction narrowing a waterway.

Construction Activity: Includes clearing, grading, or excavation and contractor activities that result in soil disturbance.

Construction Site: The area involved in a construction project as a whole.

Contraction: The reduction in cross sectional area of flow.

Contractor: Party responsible for carrying out the contract per plans and specifications.

Control: (1) A section or reach of an open conduit or stream channel that maintains a stable relationship between stage and discharge. (2) For flood, erosion, debris, etc., remedial means or procedure restricting damage to a tolerable level.

Conveyance: (1) A measure of the water carrying capacity of a stream or channel. (2) Any natural or man-made channel or pipe in which concentrated water flows.

Corrasion: Erosion or scour by abrasion in flowing water.

Corrosion: Erosion by chemical action.

Creek: A small stream, usually active.

Culvert: A covered channel or a large-diameter pipe that directs water flow below the ground level.

Current: Flow of water, both as a phenomenon and as a vector. Usually qualified by adjectives like downward, littoral, tidal, etc. to show relation to a pattern of movement.

Current Meter: An instrument for measuring the velocity of a current. It is usually operated by a wheel equipped with vanes or cups that is rotated by the action of the impinging current. An indicating or recording device is provided to indicate the speed of rotation, which is correlated with the velocity of the current.

Debris: Any material including floating woody material and other trash, suspended sediment, or bed load moved by a flowing stream.

Debris Barrier: A deflector placed at the entrance of a culvert upstream, which tends to deflect heavy floating debris or boulders away from the culvert entrance during high-velocity flow.

Degradation: General and progressive lowering of the longitudinal profile of a channel by erosion.

Delta: System of channels through an alluvial plain at the mouth of a stream.

Denuded: Land stripped of vegetation such as grass, or land that has been worn down due to impacts from the elements or humans.

Deposit: An earth mass of particles settled or stranded from moving water or wind.

Depth: Vertical distance, (1) from surface to bed of a body of water, or (2) from crest or crown to invert of a conduit.

Design Flood: The peak discharge (when appropriate, the volume, stage, or wave crest elevation) of the flood associated with the probability of exceedance selected for the design of an encroachment in a FEMA flood plain.

Design Frequency: The recurrence interval for hydrologic events used for design purposes. As an example, a design frequency of 50 years means a storm of a magnitude that would be expected to recur on the average of every 50 years.

Design Storm: That particular storm that contributes runoff that drainage facilities were designed to handle. This storm is selected for design on the basis of its probability of exceedance or average recurrence interval.

Detention: A stormwater system that delays the downstream progress of stormwater runoff in a controlled manner, typically by using temporary storage areas and a metered outlet device.

Detention Storage: Surface water allowed to temporarily accumulate in ponds, basins, reservoirs or other types of holding facility and that is ultimately returned to a watercourse or other drainage system as runoff.

Detritus: Loose material such as: rock, sand, silt, and organic particles.

Dike: An embankment to confine or control water, often built along the banks of a river to prevent overflow of lowlands; a levee.

Discharge: A release or flow of stormwater or other substance from a conveyance or storage container.

Dissipate: Expend or scatter harmlessly, as of energy of moving water.

Disturbed Areas: Areas that have been purposefully cleared, grubbed, excavated, or graded by the contractor; ground surface that has been disrupted by construction activities, including construction access/roads, staging, and storage sites producing significant areas of exposed soil and soil piles.

Ditch: Small artificial channel, usually unlined.

Diversion: (1) The change in character, location, direction, or quantity of flow of a natural drainage course (a deflection of floodwater is not a diversion). (2) Draft of water from one channel to another. (3) Interception of runoff by works that discharge it through unnatural channels.

Downdrain: A prefabricated drainage facility assembled and installed in the field for the purpose of transporting water down steep slopes.

Drainage: (1) The process of removing surplus ground or surface water by artificial means. (2) The system by which the waters of an area are removed. (3) The area from which waters are drained; a drainage basin.

Drainage Area: *(Drainage Basin) (Basin)* That portion of the earth's surface upon which falling precipitation flows to a given location.

Drainage Course: Any path along which water flows when acted upon by gravitational forces.

Drainage Divide: The rim of a drainage basin. A series of high points from which water flows in two directions, to the basin and away from the basin.

Drainage System: Usually a system of underground conduits and collector structures that flows to a single point of discharge.

Drift: (1) Floating or non-mineral burden of a stream. (2) Deviation from a normal course in a cross current, as in littoral drift.

Drip Guard: A device used to prevent drips of fuel, or corrosive or reactive chemicals from contacting other materials or areas.

Dry Weather Flows: A small amount of water that flows almost continually due to lawn watering, irrigation or springs.

Dune: A sand wave of approximately triangular cross section (in a vertical plane in the direction of flow) formed by moving water or wind, with gentle upstream slope and steep downstream slope and deposition on the downstream slope.

Easement: Right to use the land of others.

Eddy: Rotational flow around a vertical axis.

Embankment: The part of the soil next to a stream, lake, or body of water where the soil elevation adjacent to the water is higher than the water level; usually referred to as the bank.

Endwall: A wall placed at the end of a culvert. It may serve three purposes: One, to hold the embankment away from the pipe and prevent sloughing into the pipe outlet channel; two, to provide a wall that will prevent erosion of the roadway fill; and three, to prevent flotation of the pipe.

Energy Dissipater: A structure for the purpose of slowing the flow of water and reducing the erosive forces present in any rapidly flowing body of water.

Entrance: The upstream approach transition to a constricted waterway.

Entrance Head: The head required to cause flow into a conduit or other structure; it includes both entrance loss and velocity head.

Entrance Loss: The head lost in eddies and friction at the inlet to a conduit or structure.

EPA: The Environmental; Protection Agency is a federal agency that issues the regulations to control pollutants in stormwater runoff discharges (The Clean Water Act and NPDES permit requirements).

Ephemeral Stream: A stream that flows in an arid region in response only to a precipitation event.

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or runoff but can be intensified by land-clearing practices related to farming, residential or industrial development, road building, or timber cutting.

Erosion Control Blanket: Blanket made from straw, coir, excelsior, or synthetic material and enveloped in plastic or biodegradable netting. Used to stabilize disturbed or highly erosive soils while vegetation is established. Temporary blankets made from biodegradable or photodegradable components last several months to a year, and permanent blankets (also called turf reinforcement mats) can last for several years.

Evaporation: A process whereby water as a liquid is changed into water vapor, typically through heat supplied from the sun.

Excavation: The process of removing earth, stone, or other materials.

Existing Vegetation: Any vegetated area that has not already been cleared and grubbed.

Fertilizer: Materials such a nitrogen and phosphorus that provide nutrients for plants. Commercially sold fertilizers may contain other chemicals or may be in the form of processed sewage sludge.

Filter Fabric: Textile of relatively small mesh or pore size that is used to (a) allow water to pass through while keeping sediment out (permeable), or (b) prevent both runoff and sediment from passing through (impermeable).

Flood Frequency: Also referred to as exceedance interval, recurrence interval or return period; the average time interval between actual occurrences of a hydrological event of a given or greater magnitude; the percent chance of occurrence is the reciprocal of flood frequency, e.g., a 2 percent chance of occurrence is the reciprocal statement of a 50-year flood.

Flood Plain: The position occupied by the water surface of a stream during a particular flood. Also, loosely, the elevation of the water surface at various points along the stream during a particular flood.

Flood Stage: The elevation at which overflow of the natural banks of a stream begins to cause damage in the reach in which the elevation is measured.

Floodplain: Normally dry land areas subject to periodic temporary inundation by stream flow or tidal overflow. Land formed by deposition of sediment by water; alluvial land.

Floodplain Encroachment: An action within the limits of the base flood plain.

Flow: A term used to define the movement of water, silt, sand, etc.; discharge; total quantity carried by a stream.

Flow Regime: The system or order characteristic of stream flows with respect to velocity, depth and specific energy.

Friction: Energy-dissipating conflict among turbulent water particles disturbed by irregularities of channel surface.

Gabion: Baskets (usually made of wire) filled with rock or broken pieces of concrete, used for building erosion control structures

General Permit: A permit applicable to a class or category of dischargers.

Grading: The cutting and/or filling of the land surface to a desired slope or elevation.

Gradient (Slope): The rate of ascent or descent expressed as a percent or as decimal as determined by the ratio of the change in elevation to the length.

Gravel: Soil particles ranging from 1/5 inch to 3 inches in diameter

Gulch: A relatively young, well-defined and sharply cut erosional channel.

Gully: Diminutive of gulch.

Hazardous Substance: 1. Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive.

2. EPA reports hazardous quantities of certain substances if they are spilled or discharged into the waters of the United States.

Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (flammable, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Head: Represents an available force equivalent to a certain depth of water. This is the motivating force in effecting the movement of water. The height of water above any point or plane of reference. Used also in various compound expressions, such as energy head, entrance head, friction head, static head, pressure head, lost head, etc.

Holding Pond: A pond or reservoir, usually made of earth, built to store polluted runoff for a limited time.

Hydraulic: Pertaining to water in motion and the mechanics of the motion.

Hydraulic Gradient: A line that represents the relative force available due to the potential energy available. This is a combination of energy due to the height of the water and the internal pressure. In any open channel, this line corresponds to the water and the internal pressure.

Hydrologic: Pertaining to the cyclic phenomena of waters of the earth; successively as precipitation, runoff, storage and evaporation, and quantitatively as to distribution and concentration.

Hydrophyte: A perennial vascular aquatic plant having its overwriting buds under water; a plant growing in water or in soil too waterlogged for most plants to survive.

Hydrostatic: Pertaining to pressure by and within water due to gravitation acting through depth.

Hyetograph: Graphical representation of rainfall intensity against time.

Illicit Connection: Any man-made conveyance connecting a discharge (not composed entirely of stormwater) directly to a municipal separate storm sewer (MS4). Such discharges may be conveying sewage, process wastewater, and wash water to the storm drain system.

Illicit Discharge: Any non-stormwater flow either intentionally or inadvertently discharged to the municipal separate storm sewer (MS4). This does not include discharges authorized by an NPDES or AZPDES permit or discharges resulting from firefighting activities.

Impervious Surface: Hard ground cover that prevents or retards the entry of water into the soil and increases runoff, such as asphalt, concrete, rooftops.

Incised Channel: Channel that has been cut relatively deep into underlying formation by natural processes. Characteristics include relatively straight alignment and high, steep banks such that overflow rarely occurs, if ever.

Infiltration: 1. The penetration of water through the ground surface into subsurface soil or the penetration of water from the soil into sewer or other pipes through defective joints, connections, or manhole walls.

2. A land application technique where large volumes of wastewater are applied to land and allowed to penetrate the surface and percolate through the underlying soil.

Inlet: An entrance into a ditch, storm sewer, or other waterway.

Inlet Transition: A special entrance to a box or pipe culvert that is shaped in such a manner that in passing from one flow condition to another, the minimum turbulence or interference with flow is permitted.

Isohyet/Isohyetal Line: A line drawn on a map or chart joining points that receive the same amount of precipitation.

Isohyetal Map: A map containing isohyetal lines and showing rainfall intensities.

Jet: An effluent stream from a restricted channel, including a fast current through a slower stream.

Lag: Variously defined as time from beginning (or center of mass) of rainfall to peak (or center of mass) of turnoff.

Laminar Flow: That type of flow in which each particle moves in a direction parallel to every other particle and in which the head loss is approximately proportional to the velocity (as opposed to turbulent flow).

Leaching: The process by which soluble constituents are dissolved in solvent such as water and carried down through the soil.

Level Spreader: A device used to spread out stormwater runoff uniformly over the ground surface as sheet flow (i.e., not through channels). The purposes of level spreaders are to prevent concentrated erosive flows from occurring and to enhance infiltration.

Liner: 1. A relatively impermeable barrier designed to prevent leachate from leaking from a landfill. Liner materials include plastic and dense clay.

2. An insert or sleeve for sewer pipes to prevent leakage or infiltration.

Local Depression: A low area in the pavement or in the gutter established for the special purpose of collecting surface waters on a street and directing these waters into a drainage inlet.

Material Storage Areas: On site locations where raw materials, products, final products, by-products, or waste materials are stored.

Mature: Classification for streams that have established flat gradients not subject to further scour.

Maximum Extent A standard for water quality that applies to all MS4 operators regulated under the NPDES Stormwater Program. Since no precise definition of MEP exists, it allows for maximum flexibility on the part of MS4 operators as they develop and implement their programs.

Mean Depth: For a stream at any stage, the wetted normal section divided by the surface width. Hydraulic mean depth.

Meander Plug (Clay Plug): Deposits of cohesive materials in old channel bend-ways. These plugs are sufficiently resistant to erosion to serve as essentially semi-permanent geological controls to advancing channel migrations.

Mulch: A natural or artificial layer of plant residue or other materials covering the land surface which conserves moisture, holds soil in place, aids in establishing plant cover, and minimizes temperature fluctuations.

MSGP: Multi-Sector General Permit (MSGP) is an NPDES permit that regulates stormwater discharges from eleven categories of industrial activities.

MS4 Municipal separate storm sewer systems (MS4s) are publically-owned conveyance or system of conveyances that discharges to waters of the U.S. and is designed or used for collecting or conveying stormwater, is not a combined sewer, and is not part of a publicly-owned treatment works.

Nonactive Construction Any area not considered to be an active construction area. Typically, active construction areas become nonactive construction areas whenever construction activities are expected to be discontinued.

Non-Point Sources (NPS): Diffuse sources from which contaminants originate (i.e. airborne, urban runoff) to accumulate in surface water or groundwater. These sources can add to a cumulative problem with serious health or environmental consequences.

Nonuniform Flow: A flow in which the velocities vary from point to point along the stream or conduit, due to variations in cross section, slope, etc.

Notice of Intent (NOI): An application to notify the permitting authority of a facility's intention to be covered by a general permit; exempts a facility from having to submit an individual or group application. Facilities can now submit electronic NOIs in Arizona through the SmartNOI program.

Notice of Termination (NOT: Form to notify authorities when a construction project is complete.

NPDES: National Pollutant Discharge Elimination System (NPDES).

NPDES Permit: An authorization, license, or equivalent control document issued by EPA or an approved State agency to implement the requirements of the NPDES program.

Offsite Drainage: Flow of water that originates outside the property.

Oil and Grease Traps: Devices which collect oil and grease, removing them from water flows.

Oil Sheen: A thin, glistening layer of oil on water.

Oil/Water Separator: A device installed, usually at the entrance to a drain, which remove soil and grease from water flows entering the drain.

Onsite Drainage: Flow of water that originates inside the property.

Open Channel: Any conveyance in which water flows with a free surface.

Organic Pollutants: Substances containing carbon which may cause pollution problems in receiving streams.

Organic Solvents: Liquid organic compounds capable of dissolving solids, gases, or liquids.

Outfall: The point, location, or structure where wastewater or drainage discharges from a sewer pipe, ditch, or other conveyance to a receiving body of water.

Permeability: The property of soils that permits the passage of any fluid. Permeability depends on grain size, void ratio, shape and arrangement of pores.

Permeable: Open to passage of fluids, as for (1) pervious soils and (2) bank-protection structures.

Permit: An authorization, license, or equivalent control document issued by EPA or an approved state agency to implement the requirements of an environmental regulation; e.g., a permit to operate a wastewater treatment plant or to operate a facility that may generate harmful emissions.

Permit Issuing Authority: The state agency or EPA Regional office which issues NPDES or other environmental permits to regulated facilities.

Physiographic Region: A geographic area whose pattern of landforms differ significantly from that of adjacent regions.

Plunge Pool: A basin used to slow flowing water; usually constructed to a design depth and shape. The pool may be protected from erosion by various lining materials.

Point of Concentration: That point at which the water flowing from a given drainage area concentrates.

Point Sources: A source of pollutants from a single point of conveyance such as a pipe, conduit, ditch, channel, tunnel, or container.

Pollutant:: Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

Porous Pavement: A surface that will allow water to penetrate through and percolate into soil (porous asphalt pavement). Pavement is comprised of irregular shaped crush rock pre-coated with asphalt binder. Water seeps through into lower layers of gravel for temporary storage, and then filters naturally into the soil.

Potamology: The hydrology of streams.

Practicable: Capable of being done within reasonable natural, social and economic constraints.

Precipitation: Discharge of atmospheric moisture as rain, snow, or hail, measured in depth of fall or in terms of intensity of fall in unit time.

Preventative Maintenance: A schedule of inspections and testing at regular intervals intended to prevent equipment failures and deterioration.

Rainwash: The creep of soil lubricated by rain.

Rapidly Varied Flow: In this type of flow, changes in depth and velocity take place over short distances, acceleration forces dominate, and energy loss due to friction is minor.

RCRA: Resource Conservation and Recovery Act.

Reportable Quantity (RQ): The quantity of a hazardous substance or oil that triggers reports under CERCLA or the Clean Water Act. If a substance is released in amounts exceeding its RQ, the release must be reported to the National Response Center, the State Emergency Response Commission, and community emergency coordinators for areas likely to be affected.

Retarding Basin: Either a natural or man-made basin with the specific function of delaying the flow of water from one point to another. This tends to increase the time that it takes all the water falling on extremities of the drainage basin to reach a common point, resulting in a reduced peak flow at that point.

Residual: Amount of pollutant remaining in the environment after a natural or technological process has taken place, e.g., the sludge remaining after initial wastewater treatment, or particulates remaining in air after the air passes through a scrubbing or other pollutant removal process.

Retention: The storage of stormwater to prevent it from leaving the development site; may be temporary or permanent.

Retrofit: The modification of stormwater management systems in developed areas through the construction of wet ponds, infiltration systems, wetland plantings, stream bank stabilization, and other BMP techniques for improving water quality. A retrofit can consist of the construction of a new BMP in the developed area, the enhancement of an older stormwater management structure, or a combination of improvement and new construction.

Revegetation: Reestablishing vegetative cover on ground that has been disturbed, such as a construction site.

RUSLE Revised Universal Soil Loss Equation (RUSLE) is an equation developed to estimate annual soil loss based on watershed characteristics. Every factor in the predecessor equation, USLE, was updated and revised to better reflect actual field conditions.

Rill Erosion: The formation of numerous, closely spread streamlets due to uneven removal of surface soils by stormwater or other water.

Riparian Habitat: Areas adjacent to rivers and streams that have a high density, diversity, and productivity of plant and animal species relative to nearby uplands.

Riprap: A layer, facing, or protective mound of stones, randomly placed to prevent erosion or scour at a structure or embankment; also the stone so used

Runon: Stormwater surface flow or other surface flow which enters property other than that where it originated.

Runoff: That part of precipitation, snowmelt, or irrigation water that runs off the land into streams or other surface water. It can carry pollutants from the air and land into the receiving waters.

Scour: The clearing and digging action of flowing water, especially the downward erosion caused by stream water in sweeping away mud and silt from the stream bed and outside bank of a curved channel.

Secondary Containment: Structures, usually dikes or berms, surrounding tanks or other storage containers and designed to catch spilled material from the storage containers.

Sediment Trap: A device for removing sediment from water flows; usually installed at outfall points.

Sedimentation: The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

Sediments: Soil, sand, and minerals washed from land into water usually after rain, that pile up in reservoirs, rivers, and harbors, destroying fish-nesting areas and holes of water animals and clouding the water so that needed sunlight might not reach aquatic plants. Careless farming, mining, and building activities will expose sediment materials, allowing them to be washed off the land after rainfalls.

Seepage: Groundwater emerging on the face of a stream bank

Sheet Erosion: Erosion of thin layers of surface materials by continuous sheets of running water.

Sheet flow: The portion of precipitation that moves initially as overland flow in very shallow depths before eventually reaching a stream channel

Slide: Gravitational movement of an unstable mass of earth from its natural position.

Slipout: Gravitational movement of an unstable mass of earth from its constructed position. Applied to embankments and other man-made earthworks.

Sloughing: The movement of unstabilized soil layers down a slope due to excess water in soils.

Soil: The unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

Source Control: A practice or structural measure (such as covering) to prevent pollutants from entering stormwater runoff or other waste materials.

Spill Guard: A device used to prevent spills of liquid materials from storage containers.

Spill Prevention Control Plan consisting of structures, such as curbing, and action plans to prevent and respond to spills of hazardous substances as defined in the Clean Water Act.

Steady Flow: A flow in which the flow rate or quantity of fluid passing a given point per unit of time remains constant.

Storage: Detention, or retention of water for future flow, naturally in channel and marginal soils or artificially in reservoirs.

Storm Drain: A slotted opening leading to an underground pipe or an open ditch for carrying surface runoff.

Stormwater: Precipitation and surface runoff that accumulates from a storm event and/or snow melt runoff.

Stormwater Discharge: Any discharge to surface waters, storm drains, or any other stormwater drainage facility that is composed entirely of runoff due to a storm event and/or snow melt runoff.

Stormwater Management: Functions associated with planning, designing, constructing, maintaining, financing, and regulating the facilities (both constructed and natural) that collect, store, control, and/or convey stormwater

Stormwater Pollution: A plan to describe a process through which a facility thoroughly evaluates potential pollutant sources at a site and selects and implements appropriate measures designed to prevent or control the discharge of pollutants in stormwater runoff

Stormwater Pollution A plan to describe a process whereby a facility thoroughly evaluates potential pollutant sources at a site and selects and implements appropriate measures designed to prevent or control the discharge of pollutants in stormwater runoff.

Subdrain: A conduit for collecting and disposing of underground water. It generally consists of a pipe, with perforations in the bottom through which water can enter.

Subsoil: The bed or stratum of earth lying below the surface soil.

Sump: A pit or tank that catches liquid runoff for drainage or disposal.

Surface Impoundment: Treatment, storage, or disposal of liquid wastes in ponds.

Surface runoff: The portion of rainfall that moves over the ground toward a lower elevation and does not infiltrate the soil

Surface Water: All waters naturally open to the atmosphere (rivers, lakes, reservoirs, streams, wetlands impoundments, seas, estuaries, etc.); also refers to springs, wells, or other collectors which are directly influenced by surface water.

Suspended Sediments: Organic or inorganic particles that are suspended in and carried by the water. The term includes sand, mud, and clay particles as well as solids in wastewater.

Swale: A swallow, gentle depression in earth's surface. This tends to collect the waters to some extent and is considered in a sense as a drainage course, although waters in swale are not considered stream waters.

Temporary Construction BMPs that are required only temporarily to address a short-term stormwater contamination threat. For example, silt fences are located near the base of newly graded slopes that have a substantial area of exposed soil. Then, during rainfall, the silt fences filter and collect sediment from runoff flowing off the slope.

Time of Concentration: The time required for storm runoff to flow from the most remote point, in flow time, of a drainage area to the point under consideration. It is usually associated with the design storm.

Topography: The physical features of a surface area including relative elevations and the position of natural and man-made features. Total dissolved solids (TDS) means the total dissolved (filterable) solids as determined by the use of methods specified in 40 CFR part 136.

Total Maximum The maximum allowable loading of a pollutant that a designated water body can assimilate and still meet numeric and narrative water quality standards. TMDLs were established by the 1972 Clean Water Act. Section 303(d) of the US Water Quality Act requires states to identify water bodies that do not meet federal water quality standards. In 1996 the states developed (with EPA approval) a list of water bodies that failed to meet section 303(d) standards. These are the focus of TMDLs. Allocation of named pollutants is on percentage basis.

Toxic Pollutants: Materials contaminating the environment that cause death, disease, and/or birth defects in organisms that ingest or absorb them. The quantities and length of exposure necessary to cause these effects can vary widely.

Transport: To carry solid material in a stream in solution, suspension, saltation, or entrainment.

Trash Rack: A grid or screen across a stream designed to catch floating debris.

Treatment: The act of applying a procedure or chemicals to a substance to remove undesirable pollutants.

Tributary: A river or stream that flows into a larger river or stream.

Turbidity: A measure of the amount of material suspended in water. Increasing the turbidity of the water decreases the amount of light that

penetrates the water column. High levels of turbidity are harmful to aquatic life.

Undercut: Erosion of the low part of a steep bank so as to compromise stability of the upper part.

Underflow: The downstream flow of water through permeable deposits that underlie a stream. (1) Movement of water through a pervious subsurface stratum, the flow of percolating water, or water under ice, or under a structure. (2) The rate of flow or discharge of subsurface water.

Unsteady Flow: A flow in which the velocity changes with respect to space and time.

Urbanized Area (UA): A Bureau of the Census determination of a central place (or places) and the adjacent densely settled surrounding territory that together have a minimum residential population of 50,000 people and a minimum average density of 1,000 people/square mile.

Urban Runoff: Stormwater runoff from urban areas, which tends to contain high concentrations of pollutants (compared to outlying, lower density developments). The source of the increased concentration of pollutants are due to urban activities, such as petroleum products on streets and parking lots and offsite drainage from residential and a variety of industrial sources.

Velocity: The rate of motion of objects or particles, or of a stream of particles.

Vegetative Filter Strip: Usually long, relatively narrow area of undisturbed or planted vegetation used to retard or collect sediment for the protection of watercourses, reservoirs, or adjacent properties.

Wash: Floodplain or active channel of an ephemeral stream, usually in recent alluvium.

Water Table: The depth or level below which the ground is saturated with water.

Waters of the United As defined by 40 FRC 404;

(1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters, including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign com-

merce including any such waters:

(a) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(c) Which are used or could be used for industrial purposes by industries in interstate commerce;

(4) All impoundments of waters otherwise defined as waters of the United States under this definition;

(5) Tributaries of waters identified in paragraphs (1) through (4) of this definition;

(6) The territorial sea; and

(7) 'Wetlands' adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition.

Watershed: Geographical area that drains to a specified point on a water course, usually a confluence of streams or rivers. Also known as drainage area, catchment, or river basin. (In the UK the term "watershed" refers to what in the US is called the drainage divide, and the term "catchment" refers to what in the US is called a watershed.)

Waterway: A channel for the passage or flow of water.

Weephole: Opening left in a revetment or bulkhead to allow groundwater drainage

Wet Well: A chamber used to collect water or other liquid, and to which a pump is attached.

Wetlands: An area that is regularly saturated by surface or ground water and subsequently is characterized by a prevalence of vegetation that is adapted for life in saturated soil conditions. Examples include: swamps, bogs, fens, marshes, and estuaries.

Windbreak: (1) A barrier fence or line of trees to break or deflect the velocity of wind. (2) Any device designed to block wind flow and intended for protection against any ill effects of wind, particularly wind erosion.

Young: Immature, said of stream on a steep gradient actively scouring its bed toward a more stable grade.

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