

Drainage Design Manual for Maricopa County, Arizona

Volume III Erosion Control

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for Maricopa County,
Arizona
Volume III
Erosion Control**

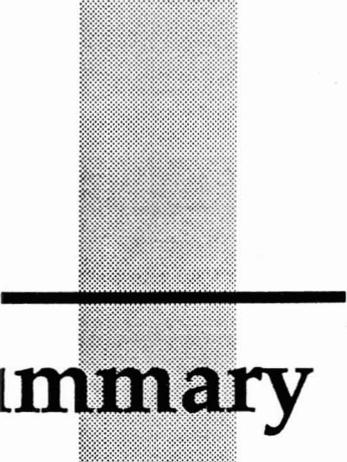
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Executive Summary

The objective of the *Best Management Practices and Erosion Control Manual* is to provide guidance to agencies, engineers, and contractors in complying with the United States Environmental Protection Agency's (EPA) requirements and procedures for the National Discharge Elimination System (NPDES) General Permit for stormwater discharges from construction sites. The NPDES General Permit which regulates construction activities took effect on October 1, 1992; after that date all operators of construction projects with a total area of five (5) or more acres must comply with the NPDES General Permit.

This manual is a working document which has been prepared with the help and assistance of the Erosion Control Task Force Technical Committee. The draft and final NPDES General Permit guidelines from the EPA were used in developing this manual. As engineers and contractors use this manual, refinement of the management practices and processes will be incorporated as revisions into future manual publications. It is the intent of the Flood Control District of Maricopa County (FCD) that many of the Best Management Practices (BMPs) will eventually be included in the Maricopa Association of Government (MAG) Specifications in the future.

This manual has been written to address technical and administrative questions that may arise in complying with the NPDES General Permit conditions for construction projects of varying sizes and complexities. The manual uses the NPDES General Permit requirements for the Notice of Intent (NOI) and Stormwater Pollution Prevention Plans (SWPPPs) and provides examples, references, and forms which are practical for the climate, soils, and construction practices of Maricopa County.

A brief discussion of the contents of the *Best Management Practices and Erosion Control Manual for Construction Sites* follows:

Chapter 1, *Introduction*: The introduction states the manual's purpose and organization, and provides definitions for the NPDES General Permit.

Chapter 2, *Requirements*: The NPDES regulatory requirements for the NPDES General Permit and the NPDES Municipal Permits are provided. Responsibilities of the permittee and the regulatory roles and authority are explained.

Executive Summary

Chapter 3, *Controls*: The NPDES stormwater program objectives are provided. 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.

Chapter 4, *Management Strategies*: 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 on-site good housekeeping to minimize pollutants. Permanent erosion controls to minimize erosive velocities and minimize sediment are also discussed.

Chapter 5, *Permitting*: Explanations of the requirements and processes for preparing Notices of Intent (NOIs), Stormwater Pollution Prevention Plans (SWPPPs), inspection, maintenance, and Notices of Termination (NOTs) are given with sample checklists for preparing and implementing the plan elements.

Chapter 6, *Best Management Practices*: Methods of selecting and implementing BMPs are given as a five-step process which includes construction scheduling; limiting exposed areas; runoff velocity reduction; sediment trapping; and good housekeeping. References for the manual and BMPs are provided.

Example 1, *Best Management Practice Examples*: Fact sheets for each of the BMPs are provided with a description of the practice, planning criteria, design requirements, construction standards, and inspection and maintenance requirements.

Example 2, *Stormwater Pollution Prevention Plan Examples*: Typical construction project SWPPPs are provided for private and public projects for reference and illustration.

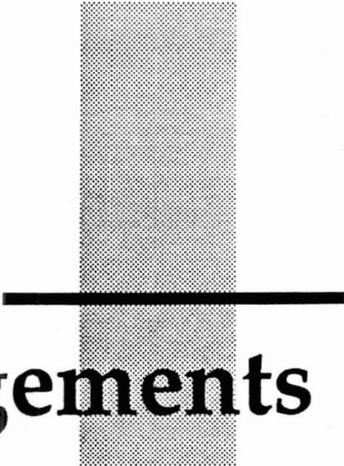
Appendix A, *Definitions*: Terms used for stormwater quality control, construction, and within the federal regulations are defined.

Appendix B, *EPA Forms*: The required NOI and NOT forms for construction activities are provided.

Appendix C, *Arizona Department of Water Resources' Approved Plant List for Maricopa County*: Low water-use plant list is provided reference material.

Appendix D, *Dust Control for Maricopa County*: Dust control requirements from the Maricopa County Air Quality Division are provided.

Appendix E, *EPA Regulations*: Copy of the September 9, 1992, *Federal Register* "Final NPDES General Permits for Stormwater Discharges from Construction Sites."



Acknowledgements

The information, practices, and guidelines that are presented in this manual are mainly the result of previously published efforts of many diligent and talented engineers and scientists. The authors of this manual are grateful to these original authors and have made every effort to cite the original authors and researchers.

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Special recognition is given to the following authors and reference materials:

Goldman, S.J., K. Jackson, T.A. Bursztynsky PE, *Erosion and Sediment Control Handbook*, McGraw Hill Book Co., 1986.

US Environmental Protection Agency, Office of Wastewater Enforcement and Compliance, *Draft - Storm Water Pollution Prevention for Construction Activities*, April 1992.

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, *Virginia Erosion and Sedimentation Control Regulations*, 1991.

Washington State Department of Ecology, *Public Review Draft - Stormwater Management Manual for the Puget Sound Basin*, June 1991, Publication #90-73.

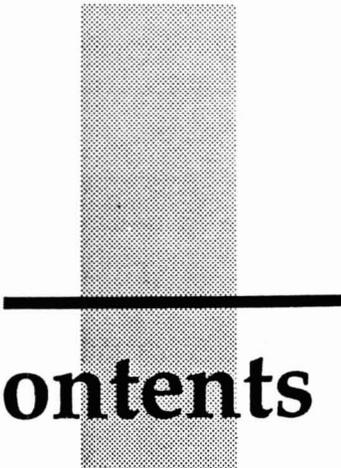


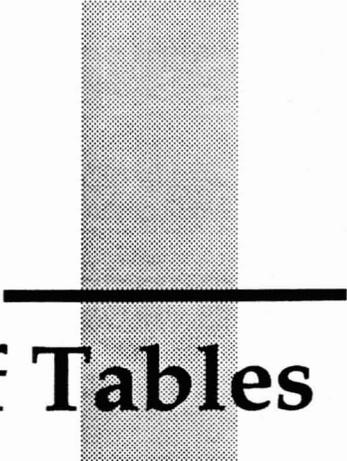
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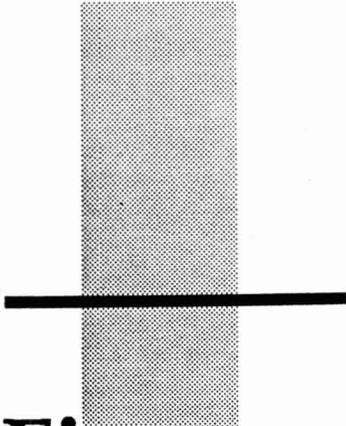


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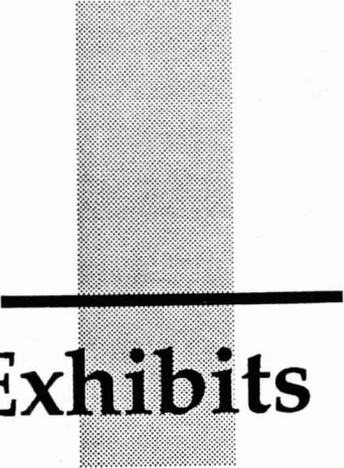
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1

Introduction

After October 1, 1992, all construction activities¹ which grade or disturb five² or more acres of land must be covered by a permit from the Environmental Protection Agency (EPA) prior to construction. The permit coverage is derived from the National Pollutant Discharge Elimination System (NPDES) General Permit for the control of pollution from stormwater discharge. To meet this federal permit requirement, the Flood Control District of Maricopa County (FCD) has prepared this manual, *Best Management Practices and Erosion Control Manual For Construction Sites*, to provide information and guidelines for private and public construction projects which fall under the NPDES regulations to *reduce* erosion, *minimize* sedimentation, and *eliminate* non-stormwater discharges from construction sites.

1.1 Purpose

The purpose of this erosion control manual is to provide guidance to agencies, developers, engineers, and contractors in complying with the new NPDES permitting process for construction activities. This manual provides information and potential strategies in two areas of the NPDES permitting process:

1. Explanations of the requirements of the NPDES permit process, including the Notice of Intent (NOI), Stormwater Pollution Prevention Plan (SWPPP), Notice of Termination (NOT), Certification, and site inspection requirements under the NPDES General Permit.

1 EPA regulations currently do not require permits for municipally-owned industrial facilities (including municipal construction projects which are done in-house by municipal workers) if the municipality's population is less than 100,000. But a private contractor performing work for these municipalities is still required to obtain permit coverage.

2 U.S. Ninth Circuit Court ruling removed the five acre exemption. The EPA is currently reviewing the regulations and is expected to issue new rules clarifying what requirements apply to small construction sites.

Manual Organization

2. Information on strategies for reduction of sedimentation and erosion at construction sites and pollution prevention techniques for construction site management. This information includes Best Management Practices (BMPs) which may apply under varying site and project conditions.

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:

- » Review existing local design and construction processes to develop a guideline for development of SWPPPs and submittal of NOIs compatible with typical construction project development, design, and scheduling practices.
- » 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.
- » 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.
- » Provide information and guidelines for structural and non-structural BMPs which are applicable to an arid and semi-arid region and comply with the EPA's requirements as specified in the NPDES General Permit.

1.2 Manual Organization

This manual has been organized to present general information on the NPDES stormwater construction permit requirements to planners, architects, engineers, contractors, agencies, property owners, and the general public. More specific design criteria for sediment control and construction standards may be obtained by contacting the local stormwater control jurisdiction. References are provided for specific design criteria and details.

The manual is developed as a user guide for preparing NOIs and SWPPPs. Sample projects and sample SWPPPs are also provided. The manual is intended to complement existing standards for erosion and sedimentation control, dust control, zoning requirements, and environmental regulations. Users of the manual should understand that the intent of the manual is to provide guidance for the stormwater construction permit and that the scope of the manual has been limited to these NPDES stormwater pollutant control requirements. Erosion control, air quality, and other environmental controls may be addressed in more detail and be subject to stricter standards within other federal, state, or local regulations.

1.3 Definitions

Requirements as established in federal regulations or the NPDES General Permit will be highlighted by bold-faced italics (as in *requirement*). Many of the common definitions for stormwater control methods are found in Appendix A. Throughout the manual the reader will find references to specific terms. To understand the process and goal of the stormwater program, these specific terms are listed below with definitions as determined by the EPA in the draft manual *Storm Water Pollution Prevention for Construction Activities (Reference 21)*.

- » *National Pollutant Discharge Elimination System (NPDES)* is the national program for administering and regulating Sections 307, 318, 402, and 405 of the Clean Water Act (CWA). A stormwater permit issued under NPDES is authorization by the EPA to discharge stormwater under certain specified conditions. The NPDES General Permit provides those specified conditions for construction.
- » *Notice of Intent (NOI)* is a formal notice to the EPA that under the NPDES General Permit a stormwater discharge will take place. The NOI provides information on the permittee, location of discharge, type of discharge, and certifies that the permittee will comply with certain specified conditions as outlined in the General Permit.
- » *Stormwater Pollution Prevention Plan (SWPPP)* is a plan consisting of a series of planning, design, construction, and inspection activities which characterizes the site, and identifies specific actions to prevent pollution of stormwater.
- » *Best Management Practices (BMPs)* are management measures or practices used to reduce the amount of pollution to stormwater, surface water, air, soil, or groundwater. BMPs may be a structural device or non-structural practice, including processes, land use alternatives, activities, or physical structures.

1.4 Limitations of this Manual

This manual is designed to provide guidance in the NPDES application and permit process. The NPDES stormwater permit program is a Federal program developed under the Clean Water Act. The manual user should be familiar with the Federal Regulations to be able to apply this manual correctly.

This manual was developed for Maricopa County to meet the requirements of some of the local regulations as well as the NPDES program. The manual may be used in other areas, but the best management practices may need modification for conditions not similar to Maricopa County.

Limitations of this Manual

This manual also provides information regarding the development of stormwater pollution prevention plans as well as application of best management practices for construction sites. This manual describes many BMPs in detail. The user must pay careful consideration when selecting BMPs for a specific site and in designing any necessary site modifications. Many of the suggested BMPs have not been fully tested in the Southwest. The suggested BMPs should be used only as a guide, and should not substitute for engineering judgment.



2

Requirements

2.1 NPDES Regulations

The NPDES stormwater permitting program in Arizona is administered by the U.S. Environmental Protection Agency (EPA). Requirements for the NPDES stormwater discharge permit are defined by federal law in Section 402(p) of the Clean Water Act, as added by section 405 of the Water Quality Act of 1987.

In November 1990, EPA published regulations for NPDES permits for certain stormwater discharges. On September 9, 1992, EPA issued a NPDES General Permit that applies to Arizona and covers the majority of stormwater discharges associated with specific industrial activities, including construction which disturbs five acres or more. The EPA has also issued or is in the process of issuing NPDES permits for municipal separate storm sewer systems (MS4s) in municipalities with populations of 100,000 or greater, based on the 1980 census. In Arizona, these "municipal" agencies include the Arizona Department of Transportation (ADOT), Phoenix, Tempe, Mesa, Tucson, and Pima County. Based on the 1990 census, the EPA will soon notify other municipalities with populations greater than 100,000, including: Glendale and Scottsdale.

2.2 NPDES Permits

Construction activities and MS4s are covered by separate NPDES permits with distinct conditions, but the federal compliance requirements for these two NPDES permits include related activities. Table 2.1 briefly describes the permits, federal requirements, and interrelationships between the activities associated with municipal storm drains and construction activities.

The NPDES General Permits are termed "baseline permits" and will consolidate permit compliance requirements for many common sources of pollutants, activities, and sites under one permit. The coverage of these baseline permits is broad, with general compliance requirements, and is effective for five (5) years. Future permitting strategies will be more specific to individual facilities, specific types of activi-

**Table 2.1
Summary and Comparison of NPDES Construction Permit and
NPDES Municipal Separate Storm Sewer System (MS4) Permit Components**

2.1.A NPDES Permits for Construction Activities	
Permittee	» Property owner and/or contractor for construction which disturbs a total of 5 or more acres
Federal Requirements	<ul style="list-style-type: none"> » Submit Notice of Intent to US EPA and local municipality. » Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) including: <ul style="list-style-type: none"> - Temporary erosion controls. - Permanent stormwater controls. - Housekeeping measures. » Revise SWPPP as construction conditions change. » Inspect the site monthly (in arid regions) and after each rainfall event equal to or greater than 0.5 inches. » Submit Notice of Termination (NOT).
2.1.B NPDES Municipal Separate Storm Sewer System (MS4) Permits	
Permittee	» Local stormwater agencies in jurisdictions with populations greater than 100,000.
Federal Requirements	<ul style="list-style-type: none"> » Prohibit, detect, and eliminate non-stormwater discharges. » Identify pollutant sources. » Characterize existing discharges with screening and monitoring. » Describe existing structural and non-structural controls. » Provide local regulatory authority. » Prepare and implement stormwater management program. » Ensure adequate funding.
2.1.C Relationship between NPDES Construction and Municipal Components	
<ul style="list-style-type: none"> » EPA will expect the municipality to enforce all local stormwater ordinances, floodplain management regulations, and local standards for grading, erosion, and sedimentation. » NOI for construction provides the municipality with a method of recordkeeping for: <ul style="list-style-type: none"> - New public storm drain systems. - New source identification. - New outfall identification. - Pollution control Best Management Practices. » Municipal stormwater management and pollution control program defined in parts of the NPDES application will provide construction policies and standards for: <ul style="list-style-type: none"> - Site planning. - Design and construction. - Public inspection. - Maintenance. - Training programs. - Review and inspection staff. - Guidelines and training manuals. - Technical standards and specifications. » Permanent controls (e.g., final site grading, erosion control, and stormwater treatment controls) required under the NPDES General Permit are subject to municipal review and approval under local ordinances. 	

ties, and watershed areas. The permitting strategy developed by EPA outlines the method of compliance and the role of the permittee.

Regulated municipalities are responsible for development of a management program for construction activities in their jurisdiction under Part 2 of their NPDES permit application. The Part 2 application addresses appropriate planning and construction procedures; ensures the implementation, inspection, and monitoring of construction sites which discharge stormwater into their MS4s; and provides for education or training for construction site operators.

2.3 NPDES General Permit

The NPDES General Permit has established general compliance *requirements*¹ which the permittee must observe. The program is intended to be self regulating and *requires* the permittee to prepare and implement the project Stormwater Pollution Prevention Plan (SWPPP). During the construction phase, the permittee is responsible for:

- » Maintaining a copy of the SWPPP on-site.
- » Inspecting the site to ensure the SWPPP improvements are in place and functional.
- » Revising the SWPPP as site conditions and construction activities change.
- » Maintaining temporary erosion and sediment controls and housekeeping measures.
- » Recordkeeping.

Figure 2.1 identifies key components of the SWPPP process.

Each construction project will vary in scope and responsible parties. For the purpose of pollutant controls for stormwater discharges, the *construction project site and construction activities to be covered by the SWPPP* include:

- » Areas cleared or disturbed for installation of improvements.
- » Areas cleared for construction activities, such as temporary construction yards, material storage, and preparation areas.
- » On-site and off-site areas excavated for fill or borrow material.
- » Disposal areas, when not within a controlled landfill.
- » Transportation of loose fill, materials, or debris to and from the site.

¹ Federal requirements either in the NPDES General Permit or other federal regulations, policies, or guidelines are shown in *bold-faced italics* for the reader's information.

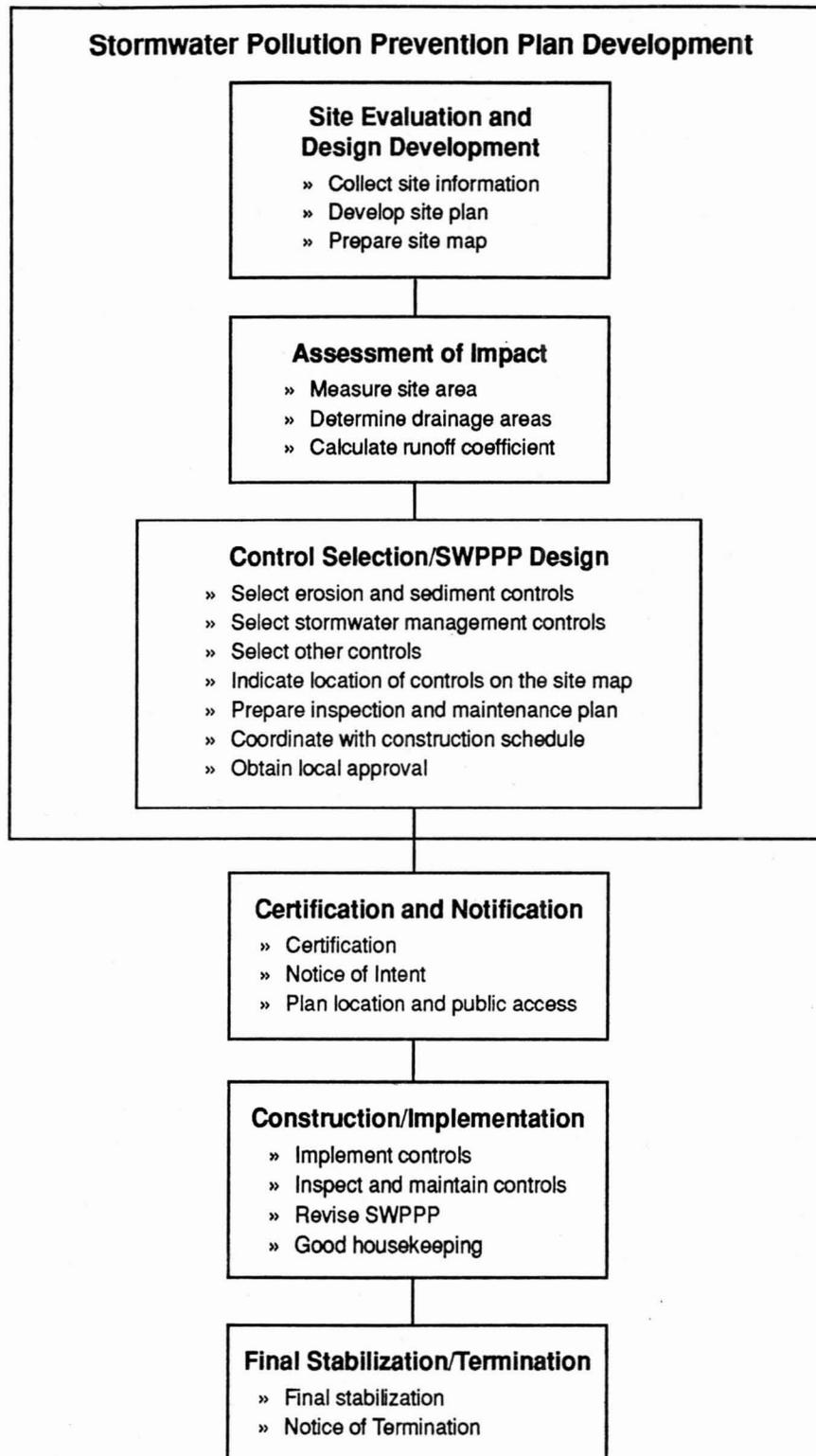


Figure 2.1
Developing and Implementing a SWPPP for Construction
(Reference 21)

2.4 Permittees

The *operator* of a construction site is the *permittee*, and is responsible for submitting a Notice of Intent (NOI) and complying with the NPDES permit. The term operator is defined by the EPA as *the responsible party who has day-to-day supervision and control of activities occurring at the site*. The operator may be the owner, developer, engineer, or general contractor. Other parties responsible for construction activities on the site are to be identified as *co-permittees*. Table 2.2 may be used to identify the permittee and co-permittee as well as their responsibilities under alternative permitting approaches. The construction contract is an appropriate place for the permittee and any co-permittee to be identified and their respective responsibilities listed. For the

Table 2.2
NPDES Stormwater Permit Construction Activities:
Guidelines for Designation of Permittee and Co-Permittees

Entity	Designation	Responsibility
Property Owner	Permittee	» Project Developer, responsible for day-to-day operations and directing the Contractor.
Property Owner	None	» Passive Owner where construction is by others within a temporary construction easement.
Property Owner	Co-Permittee	» Shares construction responsibility with Contractor or other responsible party.
Public Agency as Right-of-Way Owner	Permittee	» Public agency has direct responsibility to manage and construct the project and uses their own agency forces to perform the work.
Public Agency as Right-of-Way Owner	None	» Right-of-way is used by another public agency, private party, or utility for a separate project.
Public Agency as Right-of-Way Owner	Co-Permittee	» When the contractor or other agent is identified as the permittee in the agency's construction specification and contract.
General Contractor	Permittee	» Responsible for oversight of day-to-day operations.
General Contractor	Co-Permittee	» Responsible for construction under the direction of the permittee.
Construction Management Consultant	Permittee	» Responsible for day-to-day operation and directing the contractors.
Construction Management Consultant	Co-Permittee	» Responsible for construction activities under the direction of others.
Subcontractors	Co-Permittees	<ul style="list-style-type: none"> » Responsible for demolition. » Responsible for blasting. » Responsible for disposal of fill or construction wastes. » Utilizes off-site borrow area. » Stores construction equipment

purpose of this manual, the term permittee and operator will be interchangeable and used to identify the responsible party.

2.5 Regulatory Roles

The EPA recognizes the role of the local municipality in construction practices and their efforts to administer and enforce those land-use, environmental, or construction regulations which are under the authority of the local agencies. Table 2.3 lists the general regulatory roles of the EPA and local agencies.

Table 2.3
Regulatory Roles of the EPA and Local Agencies in Stormwater Management, Erosion Control, and Non-Point Source Pollution Control for Construction

NPDES Stormwater Permit for Construction	
US EPA	» Lead agency. » Administration and enforcement.
ADEQ	» No direct regulatory role other than enforcement of state water quality and environmental regulations.
Local Agencies	» No direct regulatory role other than enforcement of local zoning, building, stormwater, and grading codes and ordinances.
Other Non-NPDES Regulatory Programs	
US Corp of Engineers	» Stream bank modifications and wetlands, Section 404 of CWA.
ADEQ	» Stream bank modifications and wetlands, Section 401 of CWA. » Environmental quality regulations. – Dry wells. – Pesticide contamination. – Hazardous waste management. – Disposal of solid wastes, special wastes and hazardous wastes.
ADOT	» Transportation of hazardous materials, OSHA regulations.
Flood Control District	» Guidance only. No regulatory role.
Local Agencies	» Zoning codes. » Uniform building codes. » Grading. » Floodplain and stormwater management. » Uniform fire code. » Air quality standards and dust control.
Notes:	
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
CWA	Clean Water Act



3

Controls

3.1 NPDES Stormwater Objectives

The intent of the NPDES stormwater permitting program for construction activities is to focus on the **stormwater quality** issues associated with construction practices and activities. The three main design goals of the NPDES permitting program for stormwater discharges associated with construction activities are to:

- » Reduce erosion.
- » Minimize sedimentation.
- » Eliminate the discharge of non-stormwater pollutants.

Erosion and sediment transport may be part of the natural stream flow balance, but human activities during and after construction may disturb that balance and result in excessive erosion and sedimentation problems. In Arizona, modifications to stream channels have long been reviewed for the short-term and long-term impacts to the streamcourse sediment transport balance and the channel slope. Maintaining the natural sediment transport characteristics of the native ephemeral streams or arroyos is an important part of the stormwater quality management planning for Maricopa County.

The designer should consult with the local stormwater jurisdiction for local erosion control standards and requirements. The goal of erosion and sediment control, with regard to stormwater quality control, is to prevent **unnatural** erosion or sedimentation from occurring and to recognize that soil particles often transport pollutants via wind or storm runoff.

3.2 Reduce Erosion

Soil erosion is the process by which soil particles are removed from the land surface by wind, water or gravity (Figure 3.1). Most natural erosion occurs at slow rates; however, large flood events may cause channels to meander and cause stream bank

Reduce Erosion

erosion. Surface erosion is caused by rainfall and sheet flow, and stream erosion is caused by concentrated flow in rills, gullies, and channels (Reference 1). These two types of erosion are distinguished because different methods are employed in the prediction of the volume of soil lost during surface erosion or by stream channel erosion.

3.2.1 Surface Erosion

Rainfall events cause erosion from: 1) the impact of raindrops on bare soil; and 2) sheet erosion, or soil loss, occurring from shallow flow of water running across the land surface. Because the rainfall impact and sheet flow have low velocities, this type of erosion will 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 evaporites), provide protection against surface erosion. Construction

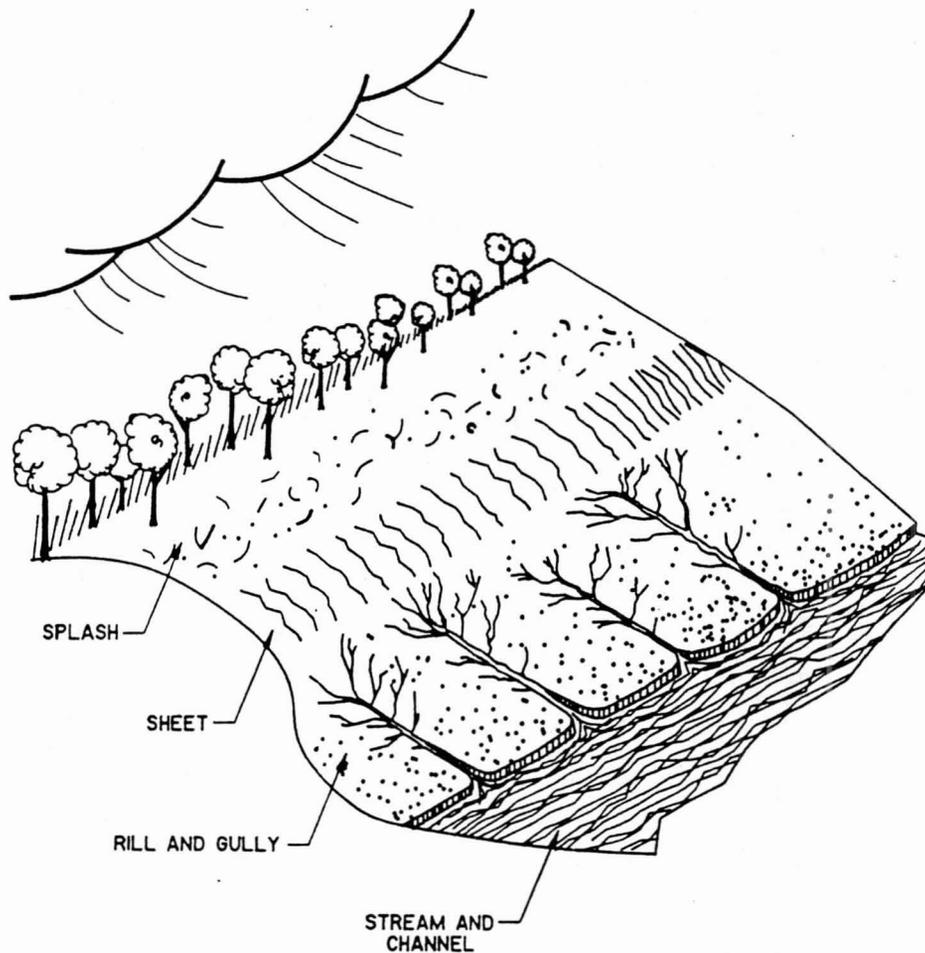


Figure 3.1
The Four Types of Soil Erosion on Exposed Slopes
(Reference 11)

activities remove the protective cover of vegetation and the natural soil resistance to erosion.

Surface erosion is most often predicted by the Universal Soil Loss Equation (USLE) which predicts the annual soil loss in tons per acre from rainfall and sheet erosion. The USLE 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 US Soil Conservation Service (SCS) 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 (Reference 18).

3.2.2 Stream Erosion

Urbanization increases downstream erosion through construction activities, increased impervious area, reduced natural sediment supply, and permanent drainage improvements. These changes to the natural flow pattern increase the flow velocity and peak volume, increasing the erosion potential. 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 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, Volume II Hydraulics* (Reference 20), contains information on design parameters for culvert outlet protection and design of stream channel protection.

Methods of stream erosion prediction have been developed 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.

3.2.3 Erosion Controls

The type of construction, construction schedules, and the site characteristics impact the degree of erosion that may be expected. The erosion control measures included in the site Stormwater Pollution Prevention Plan (SWPPP) should be developed based on a site evaluation and assessment of the soil characteristics and erosion potential. Table 3.1 lists the general factors to be addressed in the erosion control plan; Chapter 4 of this manual outlines the specific requirements for preparing a SWPPP. The NPDES General Permit design goal is for the reduction of flow velocities to non-erosive velocities wherever practicable.

Minimize Sedimentation

Table 3.1
Erosion Control Plan for a
Typical Construction Project SWPPP
(Reference 21)

- » Minimize the off-site runoff volume flowing across disturbed areas.
- » Reduce the velocity and concentration of storm runoff flowing across the site.
- » Install permanent soil stabilization, velocity controls, energy dissipators, and/or check dams sufficient to restore the natural sediment balance and velocities.

3.3 Minimize Sedimentation

Providing for on-site erosion control will also minimize soil loss during construction. Methods to reduce flow velocities and prevent runoff from flowing across disturbed areas will reduce the volume of sediment which must be controlled. In addition to the methods for erosion control, sediment control includes management and structural measures which prevent excessive sediment from being transported off-site in runoff or as air-borne particulates.

3.3.1 Sediment Control

Methods of sediment control for water-borne sediment include passive measures to trap sediment as well as structural controls (such as sediment traps or basins). Downstream buffer zones of natural vegetation are suitable for sediment removal for shallow runoff from a graded site. Perimeter methods for sediment control during construction are appropriate for removing sediment from shallow sheet flow from upstream drainage areas of 10 acres or less. Perimeter sediment controls include berms, silt fences, straw bales, and other barrier methods which slow the flow and remove sediment before the flow leaves the construction site.

For drainage areas of 10 acres or less with concentrated flow, temporary sediment traps, sandbag barriers, and gravel filter berms are more appropriate. When the upstream disturbed drainage area is 10 acres or more, a temporary sediment basin with a sediment storage volume of 3,600 cubic feet per disturbed acre is recommended.

In designing a SWPPP, the engineer or contractor should determine which method is most effective: breaking a large site into drainage areas of less than 10 acres for sediment control, or maintaining larger drainage areas and using sediment basins. The choice will depend on the project configuration, final drainage plans, and construction sequencing. Table 3.2 provides information on sediment control. The NPDES General Permits design goal is the reduction, wherever practicable, of the sediment which results from post-construction conditions.

Table 3.2
Sediment Control Plan for a Typical Construction Project
SWPPP
(Reference 21)

- » Maintain vegetation buffers where possible.
- » Minimize the area disturbed and the time period of the disturbance without stabilization.
- » Provide perimeter controls, sediment traps, and/or sedimentation basins for sediment-laden runoff.
- » Provide sediment filters or traps at storm drain inlets.
- » Provide final stabilization of disturbed areas.

3.3.2 Dust Control

In semi-arid regions, control of wind-borne sediment as dust is an important part of pollutant source control. Sediments can be transported from construction sites by stormwater runoff, wind, erosion, and vehicle trackout. Once these fine sediments leave a site, they are often re-dispersed into the atmosphere or into the public storm sewer systems by subsequent vehicular traffic, wind, and rainfall. Control measures which minimize the generation of fugitive dust from construction sites limit the quantity of sediments in stormwater.

Dust is defined as solid particles or particulate matter which are predominately large enough to eventually settle out from the air but small enough to remain temporarily 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 uncompacted soil surfaces. The most common sources of fugitive dust generated by construction activities are listed in Table 3.3. Appendix D provides additional information on dust control from the Maricopa County's Air Quality Division.

Table 3.3
Generic Categories of Open Dust Sources at Construction Sites or from Construction Activities
(Reference 21)

<p>Unpaved Travel Surfaces</p> <ul style="list-style-type: none">» Temporary parking lots and staging areas.» Construction stock piles.» Construction traffic.» Construction access driveways and sediment tracking off-site. <p>Exposed Areas</p> <ul style="list-style-type: none">» Construction sites, bare ground areas.» Land clearing and grubbing activities.» Earthwork, dozing, grading, scraping.» Drilling and blasting.» Soil and debris piles.» Tilling. <p>Materials Handling</p> <ul style="list-style-type: none">» Batch drop, dumping.» Conveyor transfer and stacking.» Material transfer points.» Crushing, milling, and screening operations.» Spilled materials.» Demolition and debris disposal.
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3.4 Non-Stormwater Discharge Control

The NPDES General Permit for construction sites generally prohibits most discharges which are not stormwater. Table 3.4 lists typical non-stormwater discharges which *are* allowed. These exempted non-stormwater discharges are allowed by the permit if the permittee demonstrates that they do not cause a significant pollution problem. The NPDES General Permit *requires* that these non-stormwater discharges be reviewed and treated in the same manner as stormwater discharges. Further, any sediment-laden waters *should* be filtered or detained in sediment traps or basins; the discharges *should not* occur where the flow may encounter oil, grease, or other potential pollutants; and care *should* be taken to make sure the release of these waters does not cause downstream erosion or any other adverse impacts.

Table 3.4
Allowable Non-Stormwater Discharges Under the NPDES
General Stormwater Permit For Construction Sites

(Reference 21)

<ul style="list-style-type: none"> » Discharges from fire fighting. » Fire hydrant flushing. » Potable water sources, including water line flushing from the disinfection of newly installed potable water systems. » Uncontaminated groundwater, including dewatering activities. » Foundation or footing drains where the flows are not contaminated with process materials such as solvents. » Naturally occurring water such as springs, wetlands, and riparian habitat » Irrigation water discharged during seeding, planting, and maintenance. » Pavement wash waters for dust control and general housekeeping practices, provided spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used.
--

Construction activities might include handling potential pollutants, special wastes, or certain hazardous wastes which could be accidentally discharged. These materials might be brought to the site as part of the construction project, or the materials may be existing on-site. During construction, spills of potential pollutants might take place. If the spill is equal to 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 by federal law the contractor *must* report the spill and take appropriate measures to clean up the spill. The permittee *must*:

- » **Notify** the National Response Center at 1-800-424-8802 within 24 hours.
- » **Revise** the SWPPP to show what corrective actions have been taken.
- » **Notify** the local EPA region office within 14 days per the NPDES General Permit.

Spill events are best avoided and managed by addressing the potential for a spill or discharge of materials within the SWPPP as part of the good housekeeping practices for control and prevention of release of non-stormwater discharges and elimination of pollutant sources. Other approaches would be to: establish construction specifications covering the type of acceptable materials allowed on-site and construction practices; develop a Health and Safety Plan; or establish an inspection procedure with threshold for implementing more stringent requirements in the SWPPP. Table 3.5 lists construction materials which are potential sources of pollutants in stormwater runoff.

Table 3.5
Potential Pollutant Sources From Construction Activities and
Materials to be Addressed in the SWPPP
(Reference 21)

- » Acids
- » Concrete trucks and concrete wash water
- » Construction chemicals
- » Construction waste
- » Contaminated soils
- » Dewatering
- » Demolition materials and site waste materials
- » Fertilizers/ detergents
- » Hazardous products
- » Paint
- » Pesticides and sterilization agents
- » Petroleum products
- » Sandblasting grit
- » Sanitary, domestic, and special wastes
- » Solvents

3.5 Minimum Controls

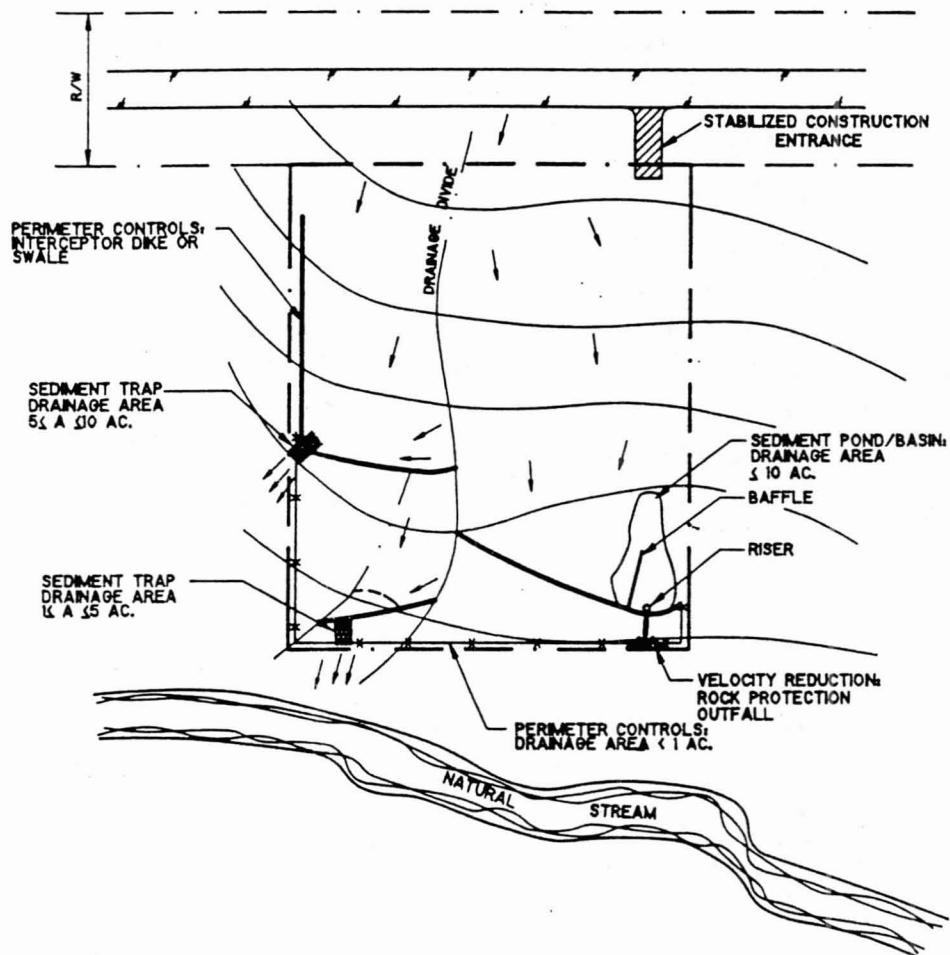
As part of the development of a SWPPP, the applicant will review the site conditions relative to soils, slopes, and erosion potential and the construction plans, specifications, and schedule to develop a site-specific SWPPP. Chapters 4, 5, and 6 provide details on how to prepare a SWPPP.

The minimum design goals for a SWPPP as requested by the EPA, are listed in Table 3.6. Figure 3.2 illustrates these design goals for control of erosion, sediment, non-stormwaters, and potential pollutants. If these controls are not applicable to the site or project, or if these controls are not practicable, then a statement to that effect should be included in the SWPPP.

Table 3.6
Minimum SWPPP Design Goals

- » Reduce Erosion
- » Minimize the volume of upstream flow crossing the disturbed area.
- » Provide outflow protection to reduce velocities and disperse flow.
- » Meet local and state standards for drainage, grading
- » Minimize Sedimentation
- » Minimize the amount of time and area which is disturbed and without cover.
- » Filter and/or trap sediment-laden runoff.
- » Provide sediment filter, sediment trap or sediment basin to remove sediment-laden runoff from on-site disturbed areas.
- » Provide on-site dust control for site work and materials handling.
- » Provide construction entrance sediment apron.
- » Eliminate Non-Stormwater Discharges
- » Identify the sources, quantities, and constituents borne in these waters.
- » Avoid release of sediment-laden water.
- » Release water in a manner that avoids contact with potential pollutants and minimizes downstream erosion.
- » Identify and implement control measures for material storage yards.
- » Observe proper procedures in handling materials.
- » Provide an emergency response procedure for spills.

Minimum Controls



SWPPP DESIGN GOALS

- MINIMIZE SEDIMENT (TSS) WHICH EXCEEDS THE NATURAL CONDITIONS
- NON-EROSIVE DOWNSTREAM VELOCITIES
- MINIMIZE OFF-SITE TRACKING
- MINIMUM STRUCTURAL PRACTICES
 - ≤ 10 ACRES: PERIMETER CONTROLS & SILT TRAPS
 - >10 ACRES: SEDIMENT BASIN (3600 CU. FT. PER ACRE)
- GOOD HOUSEKEEPING
- DUST CONTROL

Figure 3.2
Illustration of Minimum SWPPP Design Goals



4

Management Strategies

4.1 Erosion and Sediment Controls

This chapter reviews the impact of stormwater pollution management and the NPDES permitting process on project planning, design, and construction. The second half of this chapter provides a qualitative overview of the best management practices (BMPs) which may be appropriate during construction, and establishes a general guide or time-line for implementing the Stormwater Pollution Prevention Plan (SWPPP). General considerations are discussed for the selection of permanent pollution controls, temporary construction controls, and non-sediment pollution controls or housekeeping measures.

4.2 Project SWPPP Development

Preparing and implementing the SWPPP need not be time-consuming, and can easily be accomplished through minor revisions to currently acceptable design and construction practices as shown in Figure 4.1. All construction projects can be broken down into three distinct phases:

- » Planning
- » Design
- » Construction

Development of SWPPPs for various types of construction projects is discussed below.

Private Construction Projects: Integration of erosion and sediment control BMPs into existing land planning and development processes will ensure compliance with the NPDES program with the least amount of duplication of effort on the part of developers, contractors, and local agencies. Figure 4.2 (Page 4-3) illustrates the typical sequence for land development from planning through construction and

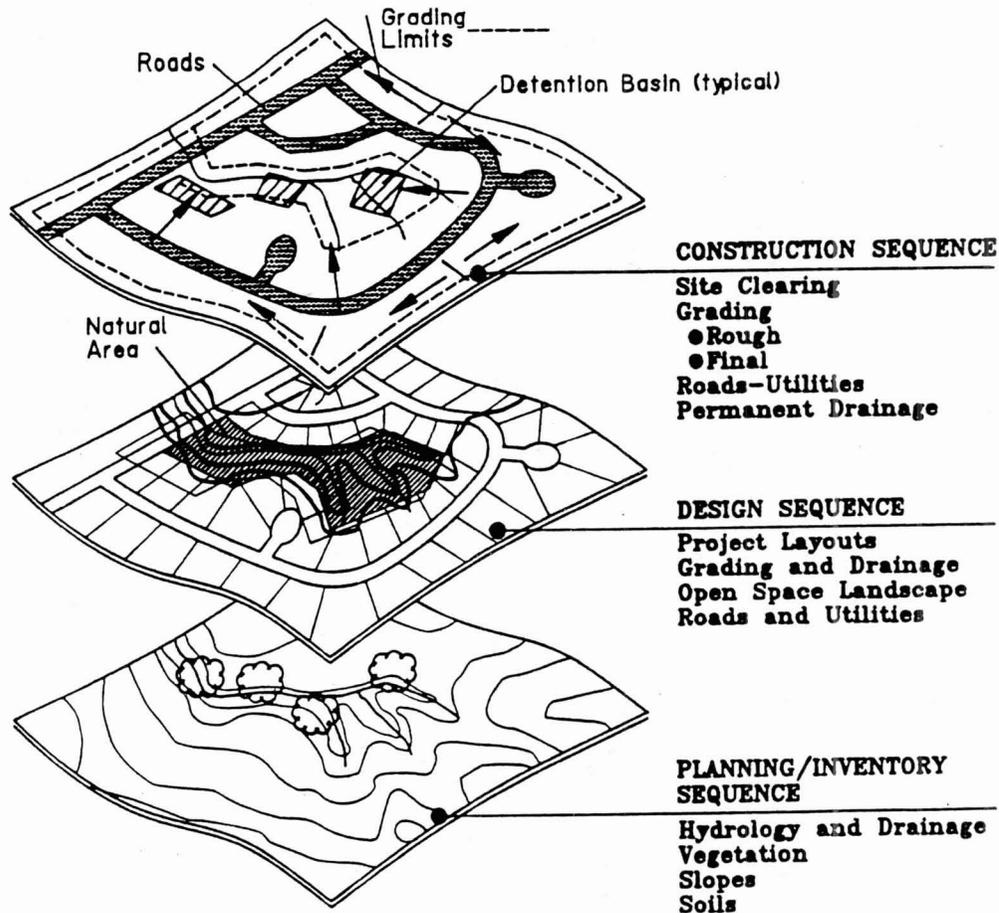


Figure 4.1
Sequences for Project Planning/Inventory, Design, and Construction in SWPPP Development

illustrates a potential strategy for the developer or contractor to use in developing a SWPPP and implementing the plan during construction.

Public Construction Projects: Determination of BMPs for public works will follow a similar planning, design, and construction strategy. Figure 4.3 (page 4-4) illustrates a potential project planning, design, and construction sequence for a typical public improvement project. In the case of public capital projects, the initial planning may include route location studies, environmental assessments, and advanced planning reports. Part of management strategy for public projects will be defining the appropriate role and responsibilities of the engineer, contractor, and agency in developing BMPs and SWPPPs.

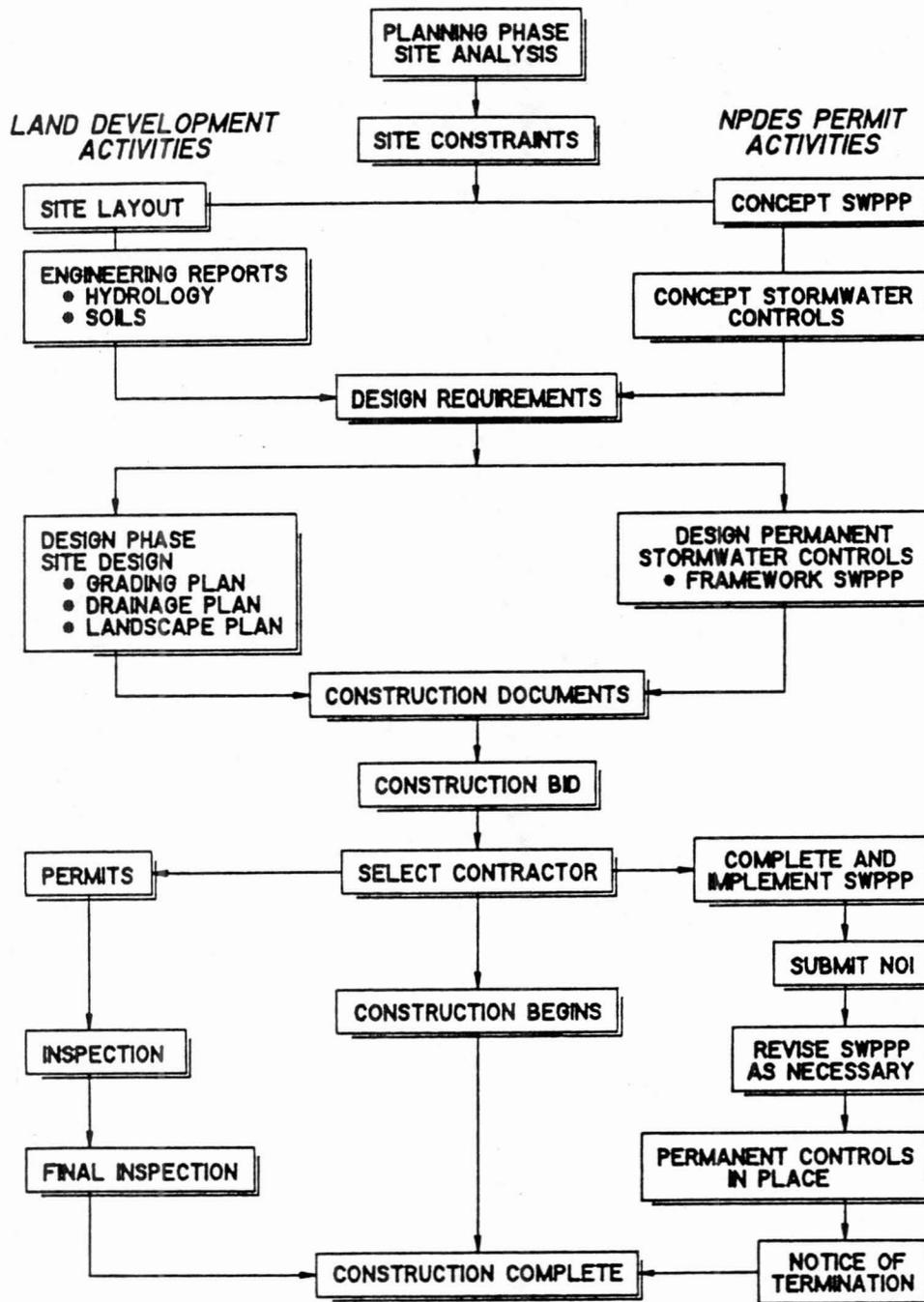


Figure 4.2
Example Stormwater Management Strategies for Pollution Control
for General Development Projects

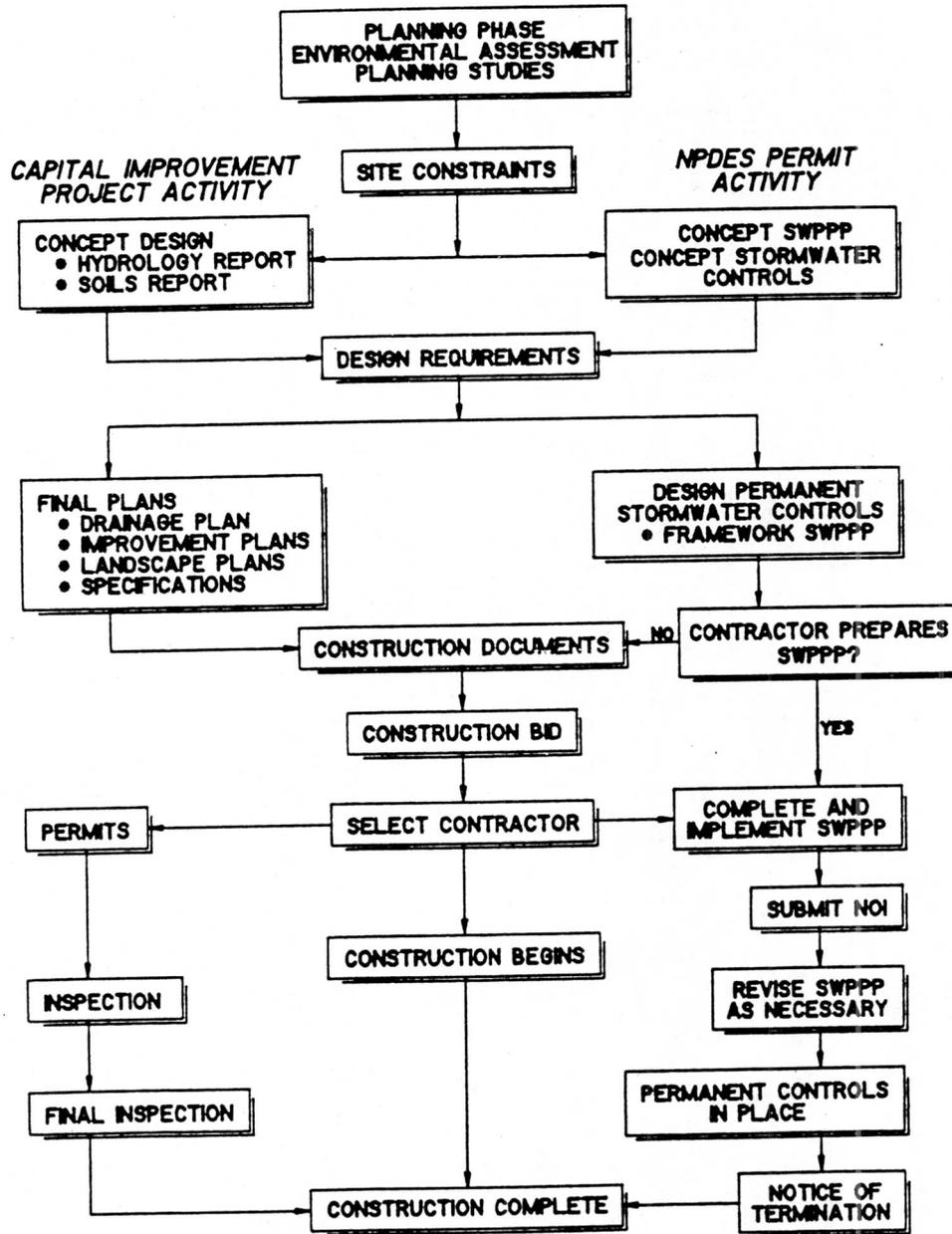


Figure 4.3
Example Stormwater Management Strategies for
Pollution Control for Public Improvement Projects

Potential Best Management Practices for Construction Activities: Potential BMPs which *may be applicable* for construction activities have been summarized in Table 4.1. These potential BMPs represent regulations, policies, or design standards which are already employed in Maricopa County, Arizona. The purpose of presenting these practices for stormwater pollution control is to inform the permittee that they may *take advantage of and receive credit* for these current local requirements under the NPDES stormwater permit process. These practices are not intended to duplicate any existing regulations, and the owner or operator should only list a practice from this list, if the construction project will include the activity as part of the local site conditions.

Table 4.1
Existing Arizona Laws and Typical Local Ordinances with
Potential Applications as BMPs for Stormwater Pollution Control

Regulation	Activity	Potential BMP
Floodplain Management and Drainage Standards	Control of velocity Detention/retention	» Control of erosion. » Runoff control of sediment, pollutants, and quantity.
	Bank stabilization and outlet controls	» Erosion and sediment controls.
ADEQ and US Corps of Engineers	401 and 404 Permits BMPs for construction	» Erosion control, sediment control, long term sediment balance, and minimize pollutants. » Vegetative controls to preserve riparian areas.
Zoning Regulations	Cluster Development Hillside Development	» Minimize runoff and impervious areas. » Slope and erosion restriction. May include revegetation or stabilization.
	Landscape/Open space	» Vegetative BMPs perimeter controls and reduction of runoff.
Uniform Building Codes	Chapter 70 - Excavating and Grading	» Minimize erosion and sedimentation. » Standards for stable cut and fill slopes.
	Plumbing Code	» Prevention of illicit connections.
Fire Code	Storage of Materials	» Pollutant controls. Hazardous materials.
Air Quality	Dust Controls	» Sediment and dust controls.
ADEQ-Sanitary Sewer	Approval to construct	» Control of illicit plumbing connections to sanitary and storm sewers.

Other current planning, design, or construction practices that are being used currently in Maricopa County by public agencies, private developers, and contractors may also be appropriate as part of a SWPPP. Examples of practices include typical construction contract requirements for establishment of a construction yard, requirements for using trained personnel for appropriate construction tasks, identification of suitable and unsuitable materials or construction practices, and requirements for project cleanup after construction is complete. Operators should review their normal construction practices to identify their existing practices which may limit in some way the potential for erosion, sedimentation, or pollution from a construction site.

4.2.1 Site Planning

Erosion and sediment controls are an integral part of project planning and design. Normal project planning and design includes consideration of drainage, soil, topography, and special site features such as native vegetation. Many of the federal NPDES *requirements*¹ are compatible with the normal development standards and public works planning practices used in Arizona. Typical local standards in Arizona generally include:

1. Floodplain and stormwater management and drainage design:

- » Preservation of floodplains and washes.
- » Local detention and retention requirements.
- » Erosion protection and sediment transport balance.
- » Drainage design standards.

2. Grading standards and erosion protection:

- » Uniform Building Codes, Chapter 70.
- » Hillside development regulations.
- » Grading ordinances or grading design standards.
- » Roadway drainage standards.
- » Dust control requirements.

3. Land use requirements

- » Protection of native plants.
- » Buffer areas and open space requirements.
- » Landscape requirements and design manuals.

1 Where the NPDES General Permit or other Federal regulations have a required standard, the Federal requirement is highlighted in bold-face italics.

During the planning process for a specific site, the site designer will typically prepare a site analysis as a formal document or as an informal plan. The site analysis is a review of the site's physical conditions, adjacent areas, site constraints, and applicable land-use and development requirements. To avoid duplication of effort and reduce costs, the owner and the site designer should use the information from the site analysis, such as topographic maps, slope analysis, soils, etc., as part of the preliminary site review for conformance to NPDES requirements and the development of the SWPPP. By including the SWPPP as part of the site layout strategy, the designer will assure that the grading and drainage plans will comply with NPDES permitting requirements, and site erosion problems can be addressed early on in the design process.

4.2.2 Site Design

Normal engineering and development criteria for design of a project will include review of the hydrology and drainage for preparation of a drainage statement or drainage report with the preliminary development plan and tentative plat for private projects, or preliminary improvement plans or concept plans for public projects. During the preliminary design phase, a soils report may normally be prepared based upon soil tests which will identify soil constraints, design criteria, stable slope requirements, etc. Both of these engineering studies are used by the engineer in preparation of the preliminary grading and drainage plan. Within the NPDES process, the engineer can also use this information to review suitable BMPs for the SWPPP and to ensure the site construction costs will be minimal.

During the final improvement plan design process, the engineer, architect or landscape architect will prepare grading, paving, drainage, landscape, and other plans as necessary for the successful construction of the project. These plans provide the construction design requirements, specifications, and other construction documents necessary for the construction bidding, permitting, and inspection. For the final SWPPP to be compatible with the other engineering plans, a practical process may be for the engineer or architect to prepare a framework SWPPP based on the grading design for a specific site. The framework SWPPP provides a *general site illustration* of areas requiring stabilization, erosion control, sediment control, and a basis for the selection of BMPs by the contractor or operator. A framework SWPPP prepared as part of the improvement plan and construction document process could be included in the bid package and/or construction documents for consideration by the contractor. The contractor as the operator would select BMPs based on a more thorough evaluation of construction techniques and project phasing. The Notice of Intent (NOI) could then be submitted to the EPA and the local jurisdiction 48 hours before construction begins.

4.2.3 Construction

For site construction, the operator would select the BMPs (as provided in Chapter 6) based upon construction requirements, specific site conditions, and the construction sequence. During site construction, the operator would be responsible for implementing the SWPPP, maintenance and inspection of the erosion and sediment controls, and final installation of the permanent controls as shown on the approved

Project SWPPP Development

plans. Because site conditions will vary during construction, the SWPPP should be revised as necessary with any changes highlighted on the copy maintained at the construction site. There is no formal revision process; the operator should note the revisions and changes as part of the permittee's inspection process.

The SWPPP may have a Phase I plan which includes perimeter controls for the initial site clearing and rough grading, and a Phase II plan which includes controls of erosion and sediment once the rough grades are established. For simple projects or where the natural grades and flow patterns are approximately the same as the final developed grades, a single phase for the SWPPP may suffice. A typical sequence of the NPDES process for construction may include:

1. Prepare a general framework SWPPP as part of the plans and specifications of the construction documents.
2. Prepare construction bid and select contractor(s).
3. Prepare NOI and finalize SWPPP with selected BMPs; submit NOI to EPA and local jurisdiction; and maintain SWPPP on-site.
4. Obtain grading and other permits.
5. Install Phase I SWPPP controls.
6. Clear and rough grade site.
7. Install construction yard, storage areas, etc., as suggested by the BMP for operation and housekeeping to prevent non-sediment pollution.
8. Establish general grading and drainage patterns.
9. Install Phase II SWPPP sediment and erosion controls.
10. Continue construction on-site.
11. Provide inspection, maintenance and revisions to SWPPP as necessary.
12. Complete construction with permanent controls in place. Permanent controls may include:
 - Drainage and sediment controls.
 - Landscaping.
 - Maintenance and cleaning of streets, drainage structures, and removal and proper disposal of construction debris.
13. Submit a Notice of Termination (NOT) to EPA and local jurisdiction.

4.3 Best Management Strategies

The NPDES Permit for Stormwater Discharges associated with construction activities is intended to limit the pollution of stormwater by excessive sediment and erosion from construction sites. Construction activities may also generate other pollutants like phosphorous, nitrogen, and other components of fertilizers, pesticides, herbicides, petroleum-based products, various other construction chemicals, and solid waste materials.

To effectively control stormwater pollution from a construction project, the contractor must implement and maintain BMPs which will prevent or reduce stormwater pollution from both sediments and man-made pollutants. Before any of these BMPs are installed, the contractor should carefully evaluate the physical conditions of the project site and develop strategies for stormwater pollution controls which are best suited for the site and the construction stage. The three management strategies for controlling stormwater pollution are:

1. *Temporary controls* for the site during construction.
2. *Permanent controls* which provide long term protection after construction is complete.
3. *Non-sediment pollution controls* or housekeeping and operation controls of chemicals, materials, and waste products associated with the construction activities.

4.3.1 Temporary Controls

For control of site erosion and sedimentation problems during construction, the best management strategies for a construction site need to be developed based upon the following criteria:

1. Site conditions affecting sedimentation and erosion:
 - a. Soil type.
 - b. Natural terrain and slope.
 - c. Final slopes and grades.
 - d. Location of concentrated flows, storm drains, and streams.
 - e. Existing vegetation and ground cover.
2. Climatic factors, which in arid and semi-arid regions include:
 - a. Seasonal rainfall patterns.
 - b. Quantity of rainfall.
 - c. Intensity of rainfall.
3. Type of construction activity.

Best Management Strategies

4. Construction schedules.
5. Construction sequencing and phasing of construction.
6. Size of construction project and area to be graded.
7. Location of the construction activity relative to adjacent uses and public improvements.

Temporary Erosion and Sediment Controls

1. Limiting Exposure of Disturbed Areas

The staging and timing of construction can minimize the size of exposed areas and the length of time the areas are exposed and subject to erosion.

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 (Reference 11).

2. Stabilize Disturbed Areas with Vegetation, Mulch or by Other Means

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 (Reference 11).

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 (Reference 11).

3. Slope Protection

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.

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 up and down a slope (called trackwalking) creates tread marks parallel to the contours. These miniature terraces both slow runoff velocity and provide flat places for vegetation to hold. Raking or discing the soil surface before seeding also keeps runoff velocities down and increases plant establishment rates. Vegetation, once established, will further reduce runoff rates (Reference 11).

4. Perimeter Controls

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, slope, and other factors affecting erosion, the diverted water may require a spreading basin or other temporary form of energy dissipator 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 (Reference 11).

5. Sediment Trapping

Some erosion during construction is unavoidable. The function of a sediment barrier is to prevent sediment from leaving a site after the soil has been eroded from its place of origin. Sediment-laden runoff should be detained on-site so that the soil particles can settle out before the runoff enters receiving waters.

Best Management Strategies

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.

Storm runoff temporarily ponds up behind these barriers, which allows sediment to settle out. Gradually the water seeps out, leaving the silt behind (Reference 11).

4.3.2 Permanent Controls

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. However, unforeseen natural or man-made factors may require revisions to the permanent improvements planned or the addition of permanent measures. Permanent controls typically include the following design elements:

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

These design elements are controlled by zoning, building codes, floodplain use regulations, construction codes, and design criteria.

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 on-site and off-site 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. Project planning and the design of permanent controls are typically necessary. Permanent controls for long term erosion protection in desert regions may include permanent irrigation and landscape improvements to increase effectiveness.

Permanent controls are designed before the contractor begins site construction. During construction, the contractor is responsible for installation of the permanent controls. 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 which exceed the pre-development conditions.



5

Permitting

5.1 Permit Documentation

The NPDES General Permit, which applies to Arizona, has established the required documentation for submittal of a Notice of Intent (NOI) and the Stormwater Pollution Prevention Plan (SWPPP) requirements for monitoring, inspection, and compliance. For owners or operators who need to obtain permit coverage under the NPDES General Permit, this chapter provides the procedures for preparing and submitting the required permit documentation or NOI. Figure 5.1 provides an overview of the process for obtaining permit coverage for construction activities and will serve as the basis for this chapter.

5.2 Notice of Intent

The General Permit, under which owners or contractors may obtain coverage to comply with the 1987 Clean Water Act, requires that individuals seeking such coverage prepare and submit a NOI to the EPA, Arizona Department of Environmental Quality (ADEQ), and to the local stormwater control agency for the jurisdiction in which the project is located.

Unless notified otherwise by the Director of the EPA, owners or operators who submit NOIs are authorized to discharge stormwater under the terms and conditions of the NPDES General Permit 48-hours after their submittal. The applicant may wish to send the NOI by registered mail to provide a documentation that the submittal was made 48-hours before beginning construction.

A copy of the NOI or other indication that stormwater discharges from the site are covered under a NPDES permit, and a brief description of the project shall be posted at the construction site in a prominent place for public viewing (such as alongside a building permit).

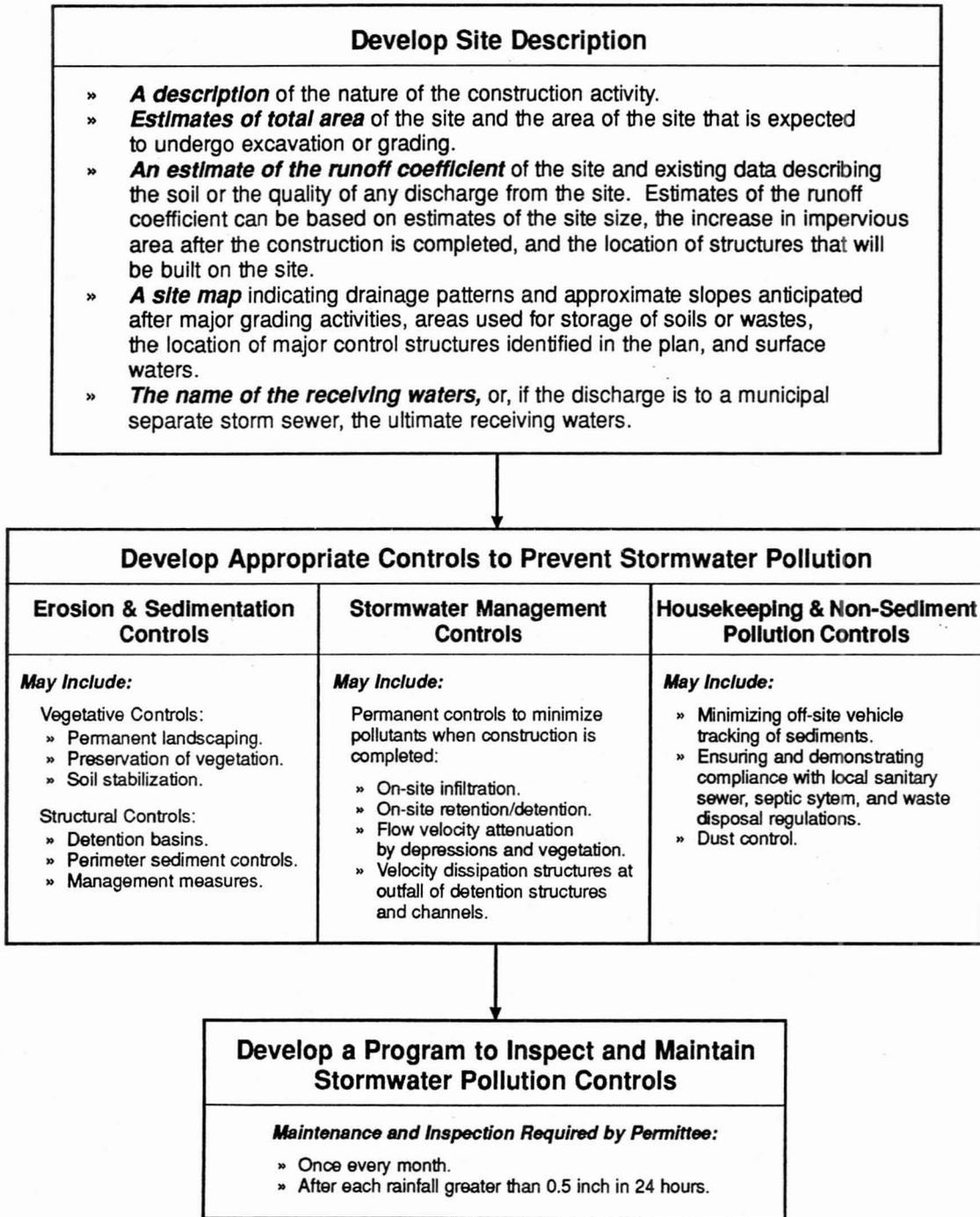


Figure 5.1
The SWPPP Process

5.2.1 Permitting Authorities

In Maricopa County, all permit correspondence regarding your NPDES permit, including the NOI or individual permit applications, are to be submitted to:

- » EPA
Stormwater Notice of Intent
P.O. Box 1215
Newington, VA 22122

According to the General Permit for Construction, ADEQ must also be copied with the NOI and NOT. The forms for a project should be sent to:

- » ADEQ
Stormwater Coordinator
P.O. Box 600
Phoenix, AZ 85001-0600

The permittee is also required to submit NOIs (and all other NPDES permit correspondence) to the local county or municipal stormwater agency if stormwater will be discharged to a county or municipal separate storm sewer system (MS4) covered by a NPDES Municipal Permit. The appropriate local stormwater agency can be determined from Table 5.1.

5.2.2 Permitting Non-Stormwater Discharges

The NPDES General Permit is intended to regulate discharges composed entirely of stormwater, and prohibits non-stormwater discharges. A stormwater discharge mixed with other sources of non-stormwater prior to discharge is not authorized by the NPDES General Permit unless the discharge is listed as allowable in the NPDES General Permit (Table 3.4, page 3-7, lists these allowable non-stormwater discharges). The non-stormwater discharges not listed must be covered by an *individual* NPDES permit for the specific type of non-stormwater discharge occurring. The allowable non-stormwater discharges may occur as part of construction activities when identified and listed in the SWPPP.

The discharge of accepted non-stormwater must comply with the same standards as stormwater discharges, including:

- » Suspended solids *must* be removed.
- » Discharge velocities *must* be non-erosive.
- » Discharges *must* be free of pollutants.

5.2.3 Application Deadlines

All construction sites with disturbed areas larger than five acres or more must have permits after October 1, 1992. Individuals who intend to obtain coverage for a new construction site with one or more stormwater discharge locations are required by the NPDES General Permit to submit a NOI 48-hours before beginning construction.

**Table 5.1
Local Stormwater and Development Jurisdictions
in Maricopa County, Arizona**

Project Location	Local Stormwater Agency
Glendale	City of Glendale Development Services Center 5850 W. Glendale Avenue Glendale, AZ 85301 (602) 435-4198
Mesa	City of Mesa Engineering Department P.O. Box 1466 Mesa, AZ 85211-1466 (602) 644-2514
Peoria	City of Peoria Engineering Division 8401 W. Monroe, Room 210 Peoria, AZ 85345 (602) 412-7210
Phoenix	City of Phoenix Development Services Department 125 E. Washington Street Phoenix, AZ 85004 (602) 534-3906
Scottsdale	City of Scottsdale Project Review 7447 E. Indian School Road, Suite 125 Scottsdale, AZ 85251 (602) 994-7080
Tempe	City of Tempe City Engineer P.O. Box 5002 Tempe, AZ 85280 (602) 350-8200
Unincorporated Maricopa County	Maricopa County Current Planning Planning and Development Division Third Floor 301 W. Jefferson Phoenix, AZ 85003 (602) 506-3301
Other Municipalities	When provided

Municipalities with populations of less than 100,000 will not be required to be permitted for construction conducted by municipal personnel. All private contractors are *required*¹ to be permitted when working on projects five acres or larger in size regardless of project location. Private contractors working on projects for a municipality with a population of less than 100,000 are also *required* to submit a NOI.

5.2.4 Signatory Requirements

All NOIs, SWPPPs, reports, certifications, or information either submitted to the Director or the operator of a large or medium municipal separate storm sewer system, or that this permit requires to be maintained by the permittee, shall be signed as follows:

NOIs

1. **Corporations:** By a responsible corporate officer (president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25,000,000), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
2. **Partnership/Sole Proprietor:** By a general partner or the proprietor, respectively.
3. **Municipality, State, Federal, or other public agency:** By either a principal executive officer or ranking elected official (the chief executive officer of the agency or a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

Reports

All reports required by the permit and other information requested by the Director or authorized representative of the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Director.
2. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity, such as the

¹ When the NPDES General Permit or other Federal regulations have a required standard, the Federal requirement is highlighted by *bold-face italics*.

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position of manager, operator, superintendent, or 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.)

Changes to authorization: If an authorization as submitted in the NOI is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new notice of intent satisfying the requirements of the NOI must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

Certification: Any person signing documents under these requirements 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 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."

5.2.5 Failure to Notify

Operators who fail to notify the EPA Director of their intent to be covered under the General Permit and discharge pollutants to waters of the United States without a NPDES permit are in violation of the Clean Water Act. Violations may result in fines or imprisonment. Failure to comply with the Clean Water Act may result in fines of not less than \$2,500 per day and not more than \$25,000 per day of violation or by imprisonment of not more than one year, or both. Penalties for submitting false information include a fine of not more than \$10,000 or imprisonment of not more than two years for the first offense. After a first conviction, a fine of not more than \$20,000 per day of violation or imprisonment of not more than four years may result.

5.2.6 Contents of the Notice of Intent

EPA included a NOI form within the NPDES General Permit (Appendix B). This form *must* be used and includes the information listed below:

1. The applicant's name, address, telephone number, and ownership status as federal, state, private, public, or other entity (see section 2.2 for applicant listing).
2. The name, mailing address (if applicable), or location of the center of the site for which the notification is submitted. The location can be identified by either

quarter section, section, township and range (to the nearest quarter section) or latitude and longitude to the nearest 15 seconds.

3. The name of the receiving waters or—if the discharge is through a municipal separate storm sewer—the name of the municipal operator of the storm sewer and the ultimate receiving waters (see Table 5.5, page 5-18).
4. Indicate if there is existing quantitative data describing known concentration of pollutants in stormwater discharges from the site; no submittal of the data is needed. Normally, no data exists for a construction site.
5. In the General Permit issued on September 9, 1992, construction sites are not required to submit monitoring data, therefore, a "1" should be placed in the box which refers to monitoring data.
6. The type of facility should be indicated as "CO" for all construction activities.
7. Project start date and the estimated completion date for the entire development.
8. An estimate of the number of acres of disturbed soil on the site.
9. Indicate with a "Y" or "N" if the SWPPP for the site is in compliance with approved state and local sediment and erosion plans, permits, or stormwater management plans. If no local plans exist, enter a "Y" to avoid having the NOI rejected.
10. The NOI must be signed in accordance with the signatory requirements of the General Permit for Construction Activities.
11. The copy of the NOI submitted to ADEQ shall include the well registration number if stormwater associated with industrial activity, including areas disturbed by construction activity, is discharged to a dry well or an injection well.

5.3 Stormwater Pollution Prevention Plans

A SWPPP *must* be prepared, retained on-site, and implemented by the operator of each facility seeking to obtain coverage for stormwater discharge under the NPDES General Permit for Arizona.

The purpose of a SWPPP is to:

1. Identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges from the project site; and
2. Describe and indicate the practices that will be implemented to minimize and control erosion, sediment discharge and other pollutants in the project's stormwater discharge.

The intent of the SWPPP is to show the methods of compliance with the terms and conditions of the General Permit for Arizona by providing a *practical* description and *simple* site plan for the temporary site controls to be used during construction. The permanent controls, as found in the approved construction plans, should be shown schematically on the SWPPP.

The SWPPP should provide a simple narrative and/or plan that *minimizes* erosion and sedimentation during construction from an average storm event which is a rainfall event of 0.22 to 0.66 inches within a 24-hour period in the Phoenix area of Maricopa County. The SWPPP should also provide operation and good housekeeping measures which *eliminate* contamination of storm runoff by any chemicals and materials used during the construction process (Figure 5.1, page 5-2, outlines the SWPPP process).

5.3.1 Legal Requirements

For construction activities starting after October 1, 1992, the SWPPP is to be prepared *before* the NOI is submitted to EPA and other local agencies.

A copy of the completed SWPPP is to be kept on-site at the construction project. Copies of the plan should be available for review if requested by EPA, the county, or municipal stormwater system agency in which the project is located.

The SWPPP is intended to be a *dynamic* plan which will be *changed, modified, and updated as site and construction conditions change*. The permittee is required to amend their SWPPP whenever there is a change in design, construction, operation, or maintenance which has a significant effect on the potential for discharge of pollutants, or if the SWPPP proves to be ineffective.

If the plan is found to be deficient in meeting one or more of the minimum permit requirements of the EPA and the local stormwater agency, the permittee will be notified by EPA. The permittee then has seven days after such notification to provide the EPA and the local stormwater agencies written certification that the requested changes have been made.

5.3.2 Content of the SWPPP for Construction

The SWPPP for construction activities *may* be in either narrative or plan form; the level of detail provided will vary with the intensity, size, and type of the construction project. The SWPPP may include, by reference, detailed construction plans and specifications for the construction work. These detailed plans are not necessary for the SWPPP; however, the EPA guidelines for SWPPP, include information in these five categories:

- » Site description identifying the construction activities and any potential source(s) of stormwater pollution.
- » Description of the plan and implementation methods for control measures to minimize pollution of stormwater.
- » Description of procedures for inspecting and maintaining on-site erosion controls.
- » Description of sources of allowed non-stormwater discharges.
- » Statement of compliance with approved state and local plans regarding sedimentation, erosion, and stormwater management.

The following sections provide guidelines for preparing the specific information required for the various portions of the SWPPP and selection of control measures to reduce stormwater pollution. Exhibit 5.1 (page 5-19) provides a sample SWPPP format. This format covers the five categories of *required* information. Additionally, the BMP fact sheets in this manual contain information on implementation, design and construction details, inspection, and maintenance for each specific BMP. The SWPPP should include the BMP fact sheets in lieu of detailed plans.

5.3.3 General Guidelines for the SWPPP

The SWPPP describes the erosion potential on a construction project and explains and illustrates the measures which are to be taken to control those potential problems. The plan has a written narrative and an illustrative site plan. The SWPPP should be an independent document which concisely provides the erosion, sedimentation, and pollution control measures to be utilized. An example of typical items to be considered in preparing a SWPPP are listed in Table 5.2 (page 5-11).

Site Description: Much of the site description can be written in a narrative format which explains the erosion and sediment control decisions made for a particular project and the justification for those decisions. The site description contains concise information concerning existing site conditions, construction schedules, and other pertinent items which are not contained in a typical site plan.

The site description is also important to the construction superintendent and inspector who are responsible for seeing that the plan is implemented properly. It provides them with a single report which describes where and when the various erosion and sediment control practices should be installed.

Stormwater Pollution Prevention Plans

Description of Controls: The description of controls is a simple illustration of the project site, key physical features and the location of erosion and sediment control measures and all construction operation measures, such as entrance drives and construction yards. Simplified details and drawings may also be included or referenced where standard specifications exist, such as the BMPs in this manual. Detailed drawings of construction plans may be referenced.

Who is Responsible for Preparing a Plan? The operator is the responsible party. The owner may designate by contract someone as the operator (i.e., an engineer, architect, contractor, etc.) to prepare the plan. The NOI and SWPPP must be prepared by the operator and the NOI submitted 48-hours before construction begins. The NOI and SWPPP shall be kept on-site with other permits and plans.

Other On-Site Activities: Other activities that occur on a construction site—such as temporary asphalt batch plants and concrete plants—will be required to obtain a General Permit for Stormwater Discharges Associated with Industrial Activity. Requirements for this permit (as published in the *Federal Register*, Wednesday, September 9, 1992) should be used.

Table 5.2
Sample Stormwater Pollution Prevention Plan Checklist
 (Reference 26)

1.	A site description, including:
	<input type="checkbox"/> The nature of the activity.
	<input type="checkbox"/> Intended sequence of major construction activities.
	<input type="checkbox"/> The total area of the site.
	<input type="checkbox"/> The area of the site that is expected to undergo excavation.
	<input type="checkbox"/> The runoff coefficient of the site after construction is complete (See Table 5.3, page 5-12).
	<input type="checkbox"/> Existing soil or stormwater data.
	<input type="checkbox"/> A site map with:
	<input type="checkbox"/> Drainage patterns.
	<input type="checkbox"/> Approximate slopes after major grading.
	<input type="checkbox"/> Area of soil disturbance.
	<input type="checkbox"/> Outline of areas which won't be disturbed.
	<input type="checkbox"/> Location of major structural and non-structural controls.
	<input type="checkbox"/> Areas where stabilization practices are expected to occur.
	<input type="checkbox"/> Surface waters.
	<input type="checkbox"/> Stormwater discharge locations.
	<input type="checkbox"/> The name of the receiving waters (See insert—Major Watershed Boundaries in Maricopa County— at the back of this manual).
2.	A description of controls:
	2.1 Erosion and sediment controls, including:
	<input type="checkbox"/> Stabilization practices for all areas disturbed by construction.
	<input type="checkbox"/> Structural practices for all drainage/discharge locations.
	2.2 Stormwater management controls, including:
	<input type="checkbox"/> Measures to control pollutants occurring in stormwater discharges after construction activities are complete.
	<input type="checkbox"/> Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel.
	2.3 Other controls including:
	<input type="checkbox"/> Waste disposal practices which prevent discharge of solid materials to Waters of the U.S.
	<input type="checkbox"/> Measures to minimize offsite tracking of sediments by construction vehicles.
	<input type="checkbox"/> Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations.
	2.4 <input type="checkbox"/> Description of the timing during the construction when measures will be implemented.
3.	<input type="checkbox"/> Are State or local requirements incorporated into the plans?
4.	<input type="checkbox"/> Are maintenance procedures for control measures identified in the plan?
5.	<input type="checkbox"/> Identification of allowable non-stormwater discharges and pollution prevention measures.
6.	<input type="checkbox"/> Contractor certification.
7.	<input type="checkbox"/> Plan certification.

Table 5.3
Flood Control District of Maricopa County
Runoff Coefficients (C) Range of Values by Land Use and Return Period
 (Reference 19)

Land Use	Return Period			
	2-10 Year	25 Year	50 Year	100 Year
Streets and Roads				
Paved Roads	0.75 – 0.85	0.83 – 0.94	0.90 – 0.95	0.94 – 0.95
Gravel Roadways & Shoulders	0.60 – 0.70	0.66 – 0.77	0.72 – 0.84	0.75 – 0.88
Industrial Areas				
Heavy	0.70 – 0.80	0.77 – 0.88	0.84 – 0.95	0.88 – 0.95
Light	0.60 – 0.70	0.66 – 0.77	0.72 – 0.84	0.75 – 0.88
Business Areas				
Downtown	0.75 – 0.85	0.83 – 0.94	0.90 – 0.95	0.94 – 0.95
Neighborhood	0.55 – 0.65	0.61 – 0.72	0.66 – 0.78	0.69 – 0.81
Residential Areas				
Lawns – Flat	0.10 – 0.25	0.11 – 0.28	0.12 – 0.30	0.13 – 0.31
– Steep	0.25 – 0.40	0.28 – 0.44	0.30 – 0.48	0.31 – 0.50
Suburban	0.30 – 0.40	0.33 – 0.44	0.36 – 0.48	0.38 – 0.50
Single Family	0.45 – 0.55	0.50 – 0.61	0.54 – 0.66	0.56 – 0.69
Multi-Unit	0.50 – 0.60	0.55 – 0.66	0.60 – 0.72	0.63 – 0.75
Apartments	0.60 – 0.70	0.66 – 0.77	0.72 – 0.84	0.75 – 0.88
Parks/Cemetaries	0.10 – 0.25	0.11 – 0.28	0.12 – 0.30	0.13 – 0.31
Playgrounds	0.40 – 0.50	0.44 – 0.55	0.48 – 0.60	0.50 – 0.63
Agricultural Areas	0.10 – 0.20	0.11 – 0.22	0.12 – 0.24	0.13 – 0.25
Bare Ground	0.20 – 0.30	0.22 – 0.33	0.24 – 0.36	0.25 – 0.38
Undeveloped Desert	0.30 – 0.40	0.33 – 0.44	0.36 – 0.48	0.38 – 0.50
Mountain Terrain (Slopes > 10%)	0.60 – 0.80	0.66 – 0.88	0.72 – 0.95	0.75 – 0.95

Note: Values of C for 25, 50 and 100 Year were derived using frequency adjustment factors of 1.10, 1.20, and 1.25, respectively, with an upper limit of 0.95 for C for the 2-10 Year values.

The runoff coefficient should be estimated for post-construction activities. The design storm should also be referenced.

5.3.4 Plans for Erosion and Sediment Control During Construction

When the layout of the site has been decided upon, a plan to control erosion and sedimentation from the disturbed areas may be formulated. The site planner may use the best management practices (BMPs) described in this manual as a guide. These BMPs establish a minimum level of control for typical site conditions impacting construction projects. The site planner should determine which of the management practices are applicable to the site and select practices which can be used to satisfy the goal of preventing stormwater pollution.

The following general procedure is recommended for erosion and sediment control planning:

- A. **Determine limits of clearing and grading:** Decide exactly which areas must be disturbed in order to accommodate the proposed construction. Pay special attention to critical areas, avoiding disturbance whenever possible.
- B. **Divide the site into drainage areas:** Determine how runoff will travel over the site. Consider how erosion and sedimentation can be controlled in each small drainage area before looking at the entire site. Remember, it is easier to control erosion than to contend with sediment after it has been carried downstream.
- C. **Select erosion and sediment control practices:** Erosion and sediment control practices can be divided into three broad categories: stabilization controls, structural controls, and management measures. BMPs include design of stabilization and structural practices. Management measures are construction management techniques which, if properly utilized, can minimize the need for physical controls and possibly reduce costs.
 1. **Stabilization Practices:** The first line of defense is to prevent erosion by protecting the soil surface from raindrop impact and overland flow. Preserving the existing ground cover provides passive use of native vegetation to protect the site soil until final improvements are to be constructed. Additionally, native vegetation as a perimeter buffer or buffer adjacent to washes provides passive methods to control silt. Where land disturbance is necessary, temporary seeding, or mulching can be used on areas which will be exposed for long periods of time.

Erosion and sediment control plans must contain provisions for stabilization of disturbed areas which will remain permanently exposed and will not be subsequently paved, built upon, or landscaped. Selections of permanent vegetation or other stabilization requirements should include the following considerations:

- a. establishment requirements
- b. adaptability to site conditions
- c. aesthetics
- d. maintenance requirements

The regulations *require* stabilization measures be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. There is an exemption for arid and semi-arid areas (average annual rainfall of less than 10 inches, and between 10 and 20 inches, respectively), which states that when stabilization measures are precluded by seasonal arid conditions, stabilization measures *shall be initiated as soon as practicable*.

2. **Structural Controls:** Structural practices are generally more costly than vegetative controls. However, they are usually necessary since not all disturbed areas can be protected with vegetation in arid and semi-arid regions. Structural controls are often used as a second or third line of defense to capture sediment before it leaves the site during construction. Structural controls may also be part of the final construction improvement plan so that detention basin sites may be utilized as sediment traps during construction.

The regulations *require* that for common drainage locations serving an area with 10 or more disturbed acres at one time, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided, where attainable, until final stabilization of the site. For drainage locations serving less than 10 acres, sediment basins and/or sediment traps should be used. Where a sediment basin or trap is not attainable, at a minimum, silt fences—or equivalent sediment controls—are *required* for all sideslopes and downslope boundaries of the construction area.

It is very important that structural practices be selected, designed, and constructed according to the standards and specifications contained in this manual and meet local drainage and construction standards. Improper use or inadequate installation can create problems which are greater than the structure was designed to solve.

3. **Stormwater Management:** The regulations *require* that permanent pollution controls that are to be installed during the construction process be described. The NPDES General Permit for Construction Sites only addresses the installation of stormwater management measures, and not the ultimate *operation and maintenance* of such structures after the construction activities have been completed and the site has undergone final stabilization. Permanent practices include: stormwater detention structures (including wet ponds); retention structures; flow attenuation by vegetative swales; and any combination of methods.
4. **Other Controls:** The regulations *require* a description of other control methods, including housekeeping items such as waste disposal, off-site vehicle tracking of sediments, dust control methods, vehicle cleaning and maintenance locations, and the material storage locations.

5. **Management Measures:** Good construction management is as important as physical practices for erosion and sediment control, and there is generally little or no cost involved. Following are some management considerations which can be employed.
 - a. Sequence construction so that no area remains exposed for unnecessarily long periods of time.
 - b. Temporary stabilization should be done immediately after grading.
 - c. When possible, avoid grading activities during July, August, and September since these months have the highest potential for erosive rainfall.
 - d. On large projects, stage the construction—if possible—so that one area can be stabilized before another is disturbed.
 - e. Develop and carry out a regular maintenance schedule for the erosion and sediment control practices.
 - f. Physically mark off limits of land disturbance on the site with tape, signs, or other methods so the workers can see areas to be protected.
 - g. Make sure that all workers understand the major provisions of the SWPPP. Subcontractors that are not disturbing more than five acres of land individually should sign an affidavit certifying that they have read, understood, and will comply with the SWPPP for the site. Those subcontractors that are disturbing more than five acres of land should submit an NOI as a co-permittee with the general contractor.
 - h. Implementation of the erosion and sediment control and oversight of the SWPPP should be designated to one individual (preferably the job superintendent or foreperson).
6. **Compliance:** The SWPPP *must* comply with state or local erosion control ordinances.

Prepare the Plan: All of the necessary planning work has been done during the site planning and design process. The final step consists of consolidating the pertinent information and developing it into a specific erosion and sediment control plan for the project.

The *requirement* for a NPDES Construction Permit and SWPPP has been designated by the EPA solely on the size of the disturbed area for project construction (i.e. five acres or larger). Because the level of construction activities may vary greatly for projects of the same size, the detail that is necessary for a SWPPP will depend on the type and nature of the construction.

5.3.5 Control of Non-Stormwater Pollution

Of primary importance during construction will be the proper storage, handling, use, and disposal of all chemicals and materials. While construction specifications and documents may provide some guidance in the application of good housekeeping for the contractor to follow, EPA *requires* the operator to be responsible and in compliance of the NPDES regulations prohibiting the discharge of non-stormwater

Stormwater Pollution Prevention Plans

discharge and the operator is responsible for compliance with any or all environmental regulations for the type of chemicals, materials, and waste that results from the construction activities.

Sources of non-stormwater—as listed in Table 3.4 (page 3-7)—are allowable but must be addressed in the SWPPP. The plan *shall* identify and ensure the implementation of appropriate pollution prevention measures for the non-stormwater components of the discharge.

Stormwater runoff from a construction site can pick up and transport construction waste including various chemicals, wash waters, and solids. Potential pollutants from a construction site include pesticides, herbicides, oil, gasolines, degreasers, concrete products, paints, sealers, and fertilizers, as well as wood, paper, and other solid debris. Good construction operation practices must be used to handle, store, and dispose of these potential pollutants to prevent their transport by stormwater runoff. Education of construction site supervisors and employees on the need and purpose of local, state, and federal regulations of construction materials and chemicals is also a part of best management practices for construction site housekeeping activities. Table 5.4 provides a listing of recommended construction activities, BMPs, and pollutants to be addressed in the SWPPP.

5.3.6 Inspection and Maintenance

The General Permit *requires* the permittee to inspect the site and maintain all structural BMPs in good working order. In arid and semi-arid regions inspections are *required* monthly and after a rainfall amount equal to or greater than 0.5 inches in a 24-hour period. The on-site and off-site areas *should be* inspected for sediment, erosion, proper storage of materials, and spills. (Exhibits 5.3 and 5.4, pages 5-26 and 5-27, contain sample inspection forms and inspection checklists.)

As a result of the inspection, the SWPPP shall be revised and changes implemented within seven days of the inspection.

A report summarizing the scope of the inspection, names and qualifications for personnel making the inspection, the dates of the inspection, major observations relating to the implementation of the SWPPP, and actions taken, *shall* be made and retained as part of the SWPPP. Where a report does not identify any incidents of non-compliance, the report *shall* contain a certification that the facility is in compliance with the SWPPP and NPDES General Permit for Construction Activities. The report must be signed by a duly authorized representative as described in Section 5.2.3, page 5-5.

Table 5.4
Construction Activities and BMPs for Construction Site Operations

Activity	Best Management Practice (BMP)	Pollutants Addressed
Clearing or grading land	<ul style="list-style-type: none"> » Control <i>runoff</i> and <i>dust</i> during construction and install sediment controls per SWPPP. » Clean and maintain sediment basins. » Proper disposal of debris. » Inspection and maintenance. 	Sediment, nutrients, other pollutants attached to the sediment.
Handling fresh concrete or other cement-related mortars	<ul style="list-style-type: none"> » Never wash fresh concrete mortar into a storm drain or stream. » Use designated wash-out areas. » When building concrete aggregate driveways, wash fines to the side, to straw bales, or to a sediment basin. 	Toxic and acidic pollutants, sediments.
Painting, sanding, plastering, applying drywall, paper, or tile, or other activities using paints, solvents, or adhesives	<ul style="list-style-type: none"> » Keep residues such as paint chips from entering storm drain. » Keep paints, solvents, and other chemicals and their waste containers and soiled rags covered from the rain. » Prepare for and clean up spills. » Minimize wastes and properly dispose of all wastes. » Fix any oil leaks in equipment. 	Toxics, including metals, oils and greases
All activities producing or handling wastes, such as batteries and solvents	<ul style="list-style-type: none"> » Minimize wastes and properly dispose of all wastes. » Ensure all workers know proper procedures. » Provide secure storage site/construction yard. » Erect barriers or isolate area to prevent contact with stormwater runoff. 	Toxic pollutants, including metals
Adjacent to a stream	<ul style="list-style-type: none"> » Preserve the stream corridor and take steps to maintain the stream channel and vegetation. 	Sediment.
General contracting and construction management	<ul style="list-style-type: none"> » Make sure all applicable BMPs are followed. » Ensure all local, state, and federal permits are in place and followed. 	All.
Training new employees	<ul style="list-style-type: none"> » Include training about water quality BMPs. » Ensure all employees understand the project SWPPP. 	Potentially all.

5.3.7 Contractor Requirements

The SWPPP *must* clearly identify the contractor and subcontractors that will implement the plan. All contractors and subcontractors identified in the plan must sign a copy of the certification statement, which includes the name and title of the person providing the signature; the name, address, and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made. The certification then becomes part of the SWPPP.

The certification statement shall read as follows:

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification."

5.3.8 Notice of Termination

The operator of the facility may submit a Notice of Termination (NOT) after the construction site has been finally stabilized and all stormwater discharges from the construction activity is eliminated. A NOT should also be submitted when the construction site changes operators or the subcontractor has completed the work and has stabilized that portion of the construction site for which the subcontractor had direct responsibility.

The information required on the NOT includes information similar to the NOI. The NOT should include the NPDES permit number that was assigned to the construction site by the EPA after the submittal of the NOI. The NOT also *requires* a certification (as stated on the NOT form in Appendix B) that the operator is no longer authorized to discharge stormwater from the construction site. The certification also states that the NOT does not release an operator from liability for any violation of the permit or the Clean Water Act.

The NOT shall be submitted to the EPA, ADEQ, and the local municipality having jurisdiction (a sample NOT is included in Appendix B).

5.3.9 Retention of Records

The permittee *shall* retain copies of the SWPPP and all reports required by the permit, and records of all data used to complete the NOI for a period of at least three years from the date that the site is finally stabilized.

**Exhibit 5.1
Stormwater Pollution Prevention Plan NPDES General Permit for Construction**

Site Description

A. General Information

Project Name: _____ **Project Location:** _____
 City/County/State: _____
 Township/Range/Section: _____
 Location map attached: Yes No

Owner name and address: _____ **Operator name and address:** _____

Description (purpose and types of soil disturbance activities): _____

B. Hydrologic Information

Project size (acres): _____ Area to be graded (acres): _____
 Existing project runoff coefficient: _____ Developed project runoff coefficient: _____
 Soils report: Yes No
 if yes, prepared by: _____

Receiving waters in Maricopa County, Arizona (see insert in back pocket of this binder)
 Agua Fria River Cave Creek Centennial Wash Gila River
 Hassayampa River Indian Bend Wash New River Salt River
 Santa Cruz River Skunk Creek Verde River
 Flood control structure (name): _____
 Other (describe): _____

C. Type of Construction

Residential Single Family Multi-family Commercial
 Roadways Utilities Industrial
 Other (specify): _____

On-site construction activities

Grading acres: _____ cu. yd: _____ Blasting
 Roadways linear feet: _____ Sewer, Water, Utilities
 Drainage Structures (describe): _____

Off-site construction activities (may require separate permit)

Grading acres: _____ cu. yd: _____ Blasting
 Roadways linear feet: _____ Sewer, Water, Utilities
 Drainage Structures (describe): _____

Stormwater Pollution Prevention Plans

Exhibit 5.1 (continued)
Stormwater Pollution Prevention Plan NPDES General Permit for Construction

D. Sequence of Major Activities (to the nearest month)

Start date: _____

End date: _____

Sequencing schedule:

___ See attached schedule

E. Site Map (see Exhibit 5.2, page 5-24)

Controls

A. Erosion and Sediment Controls

Stabilization practices:

Structural practices:

Stormwater management:

B. Other controls (waste disposal, offsite tracking, etc.)

C. Maintenance/Inspection procedures (including non-stormwater discharges)

D. Housekeeping (spill prevention)

Other Concerns

(attach additional sheets if needed)

State and local requirements have been incorporated into the plan: ___ Yes ___ No

Maintenance procedures for control measures have been identified into the plan: ___ Yes ___ No

Allowable non-stormwater discharges and pollution prevention measures have been identified (see Table 3.4, page 3-7): ___ Yes ___ No

Contractor certification received: ___ Yes ___ No

Plan certification received: ___ Yes ___ No

Exhibit 5.1 (continued)
Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Pollution Prevention Plan Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signed: _____
 Name
 Position Title
 Company

Date: _____

Contractor's Certification:

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signature	Company Name, Address and Phone	Responsibility
_____ Name of General Contractor Date:		
_____ Name of Subcontractor Date:		
_____ Name of Subcontractor Date:		

PROJECT BMP SELECTION

THE BMP'S TO BE USED AS TEMPORARY (TEMP.) OR PERMANENT (PERM.) CONTROLS FOR THE PROJECT SWPPP.
 CHECK EACH APPLICABLE BMP.

EXHIBIT 5.1 (continued)

CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL / DIVERSION							SWPPP	
			SLOPE PROTECTION			SEDIMENT TRAPPING		DRAINAGEWAY AND STREAM PROTECTION		TEMP.	PERM.
			A	B	C	D	E	F	G		
PLANNING	SCHEDULING CONSIDERATIONS		●	●	●	●	●				
	CONSTRUCTION PHASING		●	●		●	●				
	PRESERVATION OF WASHES					●	●	●			
	OPEN SPACE BUFFERS					●	●	●			
VEGETATIVE CONTROLS -LIMIT EXPOSED AREA	TREES, SHRUBS, VINES, AND GROUND COVERS			●			●	●			
	MULCHING			●			●				
	EROSION CONTROL MATTINGS			●			●				
	PROTECTION OF TREES AND VEGETATION IN CONSTR. AREAS		●			●		●			
REDUCE AREA OF EXPOSURE -RUNOFF VOLUME REDUCTION/DIVERSION -PREVENT LOSS OF SEDIMENTS BY VEHICLES AND WIND	TEMP. DIVERSION DIKES		●	●							
	TEMP. DRAINAGE SWALE		●	●							
	PIPE SLOPE DRAINS			●							
	STABILIZED CONSTRUCTION ENTRANCE				●		●				
	CONSTRUCTION ROAD STABILIZATION		●				●				
	DUST CONTROL				●		●				

PROJECT BMP SELECTION

EXHIBIT 5.1 (continued)

THE BMP'S TO BE USED AS TEMPORARY (TEMP.) OR PERMANENT (PERM.) CONTROLS FOR THE PROJECT SWPPP. CHECK EACH APPLICABLE BMP.

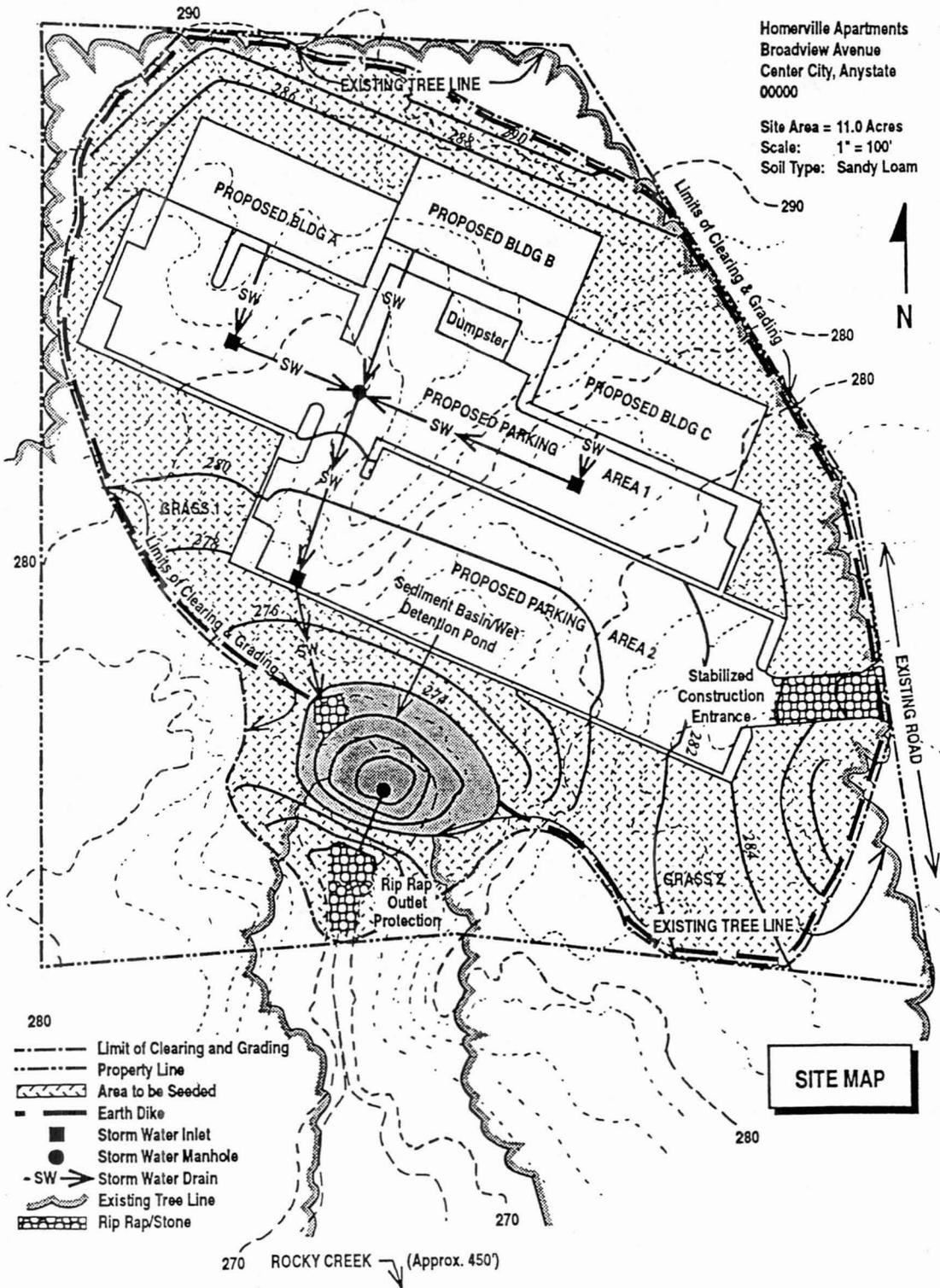
CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL / DIVERSION							SWPPP		
			SLOPE PROTECTION		SEDIMENT TRAPPING		DRAINAGEWAY AND STREAM PROTECTION		NON-SEDIMENT POLLUTION CONTROL		TEMP.	PERM.
			A	B	C	D	E	F	G			
RUNOFF VELOCITY REDUCTION	CHECK DAMS				●	●						
	ROCK OUTLET PROTECTION			●		●	●					
	SURFACE ROUGHENING			●		●	●					
SEDIMENT TRAPPING	STRAW BALE BARRIER		●		●							
	SILT FENCE		●		●							
	STORM DRAIN INLET PROTECTION				●							
	TEMPORARY SEDIMENT TRAP				●							
	TEMPORARY SEDIMENT BASIN				●							
	SAND BAG BARRIER (BERM)		●		●							
	GRAVEL FILTER BERM		●		●							
GOOD HOUSEKEEPING PRACTICES	EQUIPMENT MAINTENANCE PROCEDURES									●		
	SOLID WASTE MANAGEMENT									●		
	DESIGNATED WASHDOWN AREAS									●		
	PROTECTED CHEMICAL STORAGE AREAS									●		
	TEMPORARY ACCESS WATERWAY CROSSING						●			●		
	SPILL CONTAINMENT PLAN						●			●		

Stormwater Pollution Prevention Plan NPDES General Permit for Construction Exhibit 5.1 (continued)

**Exhibit 5.2
Site Map Requirements**

- » Project title
- » Project location or address
- » Total site area
- » Scale
- » North arrow
- » Existing and proposed roads
- » Drainage patterns after major grading
- » Approximate slopes after major grading
- » Outline property boundary
- » Location of all proposed structures and impervious areas
- » Outline of the area of soil disturbance
- » Outline of areas which will not be disturbed
- » Location of major structural and non-structural controls
- » Areas where stabilization practices are expected to occur
- » Surface waters (such as washes and ponds)
- » Stormwater discharge locations

Exhibit 5.2 (continued)
 Sample Site Map
 (Reference 26)



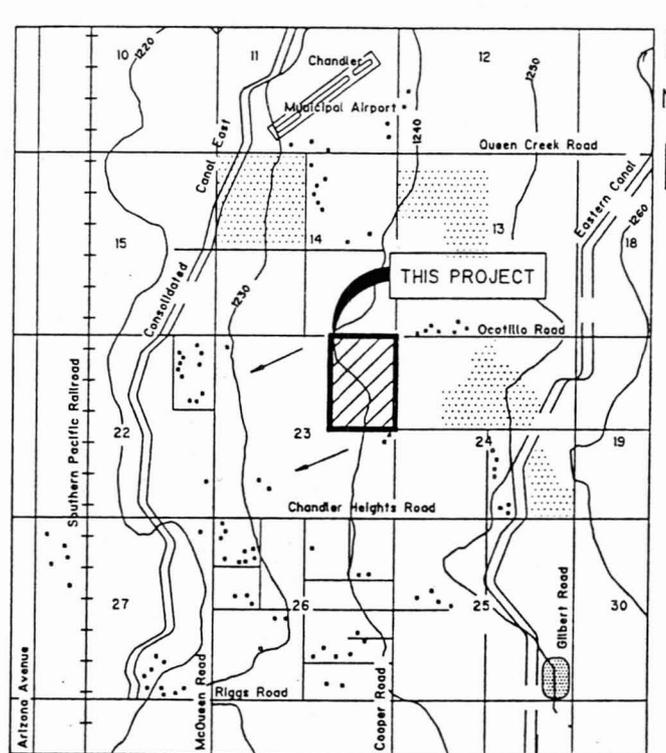
Stormwater Pollution Prevention Plans

Exhibit 5.3 Location Map Requirements

Provide a topographic map or maps of the area extending at least to one mile beyond the property boundaries of the facility which clearly show the following:

- » The legal boundaries of the facility, by Township, Range, and Section, to the nearest Quarter Section.
- » The location of each of the existing and proposed inflow and discharge structures.
- » Street names, jurisdictional boundaries, and jurisdiction names.

On each map, include the map scale, a meridian arrow showing north, and latitude and longitude at the nearest whole second. On all maps with rivers, show the direction of the flow. Use a 7-1/2 minute series map published by the U.S. Geological Survey. If a 7-1/2 minute series map has not been published for your facility site, then you may use a 15 minute series map from the U.S. Geological Survey. If neither a 7-1/2 nor 15 minute series map has been published for your facility site, use a plat map or other appropriate map, including all the requested information; in this case, briefly describe land uses in the map area (e.g., residential, commercial).



LOCATION MAP 47°30'

1 1/2 0 1 MILE

SCALE

Project Name: OCOTILLO HEIGHTS PLAZA

Receiving Waters: SALT RIVER

Jurisdiction: CHANDLER

Location: OCOTILLO ROAD & CHANDLER HEIGHTS ROAD

Map: USGS 7.5' QUAD MAPS, GILA BUTTE & CHANDLER

Township Range Section: T 2 S, R 5 E, NE1/4 SECTION 23

Stormwater Pollution Prevention Plans

Exhibit 5.5
NPDES Site Construction Permittee
Inspection Checklist

Project: _____

Monthly inspection Rainfall event inspection Rainfall: _____ inches

Inspected by: _____ Date: _____

Qualifications: _____

Yes	No	Does Not Apply	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are all operational storm sewer inlets protected from sediment inflow?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do any structural practices require repair or clean-out to maintain adequate function? If yes, indicate which ones: _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are construction on-site traffic routes, parking, and storage of equipment and supplies restricted to areas specifically designated for those uses?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are locations of temporary soil stock piles or construction materials in approved areas?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding, or mulching?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there any evidence that sediment is leaving the site?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there any evidence of erosion or cut or fill slopes?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there any evidence of sediment, debris, or mud on public roads at intersections with site access roads?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the Stormwater Prevention Plan require revisions? If yes, explain: _____

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 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.

Signature: _____ Date: _____



6

Best Management Practices

Best Management Practices (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 pollution of stormwater. 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 will be generated by owners and contractors once the NPDES program is fully in place.

6.1 Selection Factors

Selection of the most appropriate combination of BMPs for a specific construction site should be based upon a careful review of the characteristics of the site that affect its potential for erosion and the erosion factors within the contractor's control. These controllable factors are:

- » Construction scheduling
- » Limiting exposed areas
- » Runoff velocity reduction
- » Sediment trapping
- » Good housekeeping

For each of the five controllable factors there are many tactics available for effectively reducing the volume and velocity of stormwater runoff, the amount of the site exposed to runoff and the potential for non-sediment pollution. BMPs are organized on the matrix shown in Figure 6.1 according to these five controllable factors. Each BMP is also cross-referenced to the type(s) of controls which the individual BMPs provide. Many of the BMPs achieve control in more than one category which should be taken into account when selecting BMPs for maximum effectiveness. The type of controls are:

Selection Factors

CONTROL FACTOR	BMP TITLE	SYMBOL	SELECTION FACTORS						
			A	B	C	D	E	F	G
PLANNING	SCHEDULING CONSIDERATIONS		●	●	●	●	●		
	CONSTRUCTION PHASING		●	●		●	●		
	PRESERVATION OF WASHES					●	●	●	
	OPEN SPACE BUFFERS					●	●	●	
VEGETATIVE CONTROLS -LIMIT EXPOSED AREA	TREES, SHRUBS, VINES, AND GROUND COVERS			●			●	●	
	MULCHING			●			●		
	EROSION CONTROL MATTINGS			●			●		
	PROTECTION OF TREES AND VEGETATION IN CONSTR. AREAS		●			●		●	
REDUCE AREA OF EXPOSURE -RUNOFF VOLUME REDUCTION/DIVERSION -PREVENT LOSS OF SEDIMENTS BY VEHICLES AND WIND	TEMP. DIVERSION DICES		●	●					
	TEMP. DRAINAGE SWALE		●	●					
	PIPE SLOPE DRAINS			●					
	STABILIZED CONSTRUCTION ENTRANCE				●		●		
	CONSTRUCTION ROAD STABILIZATION		●				●		
	DUST CONTROL				●		●		
RUNOFF VELOCITY REDUCTION	CHECK DAMS				●	●			
	ROCK OUTLET PROTECTION			●		●	●		
	SURFACE ROUGHENING			●		●	●		
SEDIMENT TRAPPING	STRAW BALE BARRIER		●		●				
	SILT FENCE		●		●				
	STORM DRAIN INLET PROTECTION				●				
	TEMPORARY SEDIMENT TRAP				●				
	TEMPORARY SEDIMENT BASIN				●				
	SAND BAG BARRIER (BERM)		●		●				
	GRAVEL FILTER BERM		●		●				
GOOD HOUSEKEEPING PRACTICES	EQUIPMENT MAINTENANCE PROCEDURES								●
	SOLID WASTE MANAGEMENT								●
	DESIGNATED WASHDOWN AREAS								●
	PROTECTED CHEMICAL STORAGE AREAS								●
	TEMPORARY ACCESS WATERWAY CROSSING					●			●
	SPILL CONTAINMENT PLAN					●			●

Figure 6.1
Selection Matrix for Construction Site BMPs

- » Perimeter control/diversion
- » Slope protection
- » Sediment trapping
- » Drainageway and stream protection
- » Temporary stabilization
- » Permanent stabilization
- » Non-sediment pollution control

6.2 Selection Process

The site designer should select the control tactics which are best suited to the site, then select from suggested BMPs based upon consideration of cost, material availability, topography, location, and duration of exposure. 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.

6.2.1 Step 1: Construction Scheduling

The first step in selecting BMPs is to compare the project schedule with on-site management measures that can limit the exposure of the project site to erosion and sedimentation. The management measures to be examined all have a similar goal, which is to minimize the amount of site subject 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 wet summer months of July, August, and September and the 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. For example, stormwater detention basins could be built early in a large project and used as sedimentation basins during the rest of the construction period.

6.2.2 Step 2: Limiting Exposed Area

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 off-site runoff may involve

Selection Process

vegetative and structural controls as well as on-site management options. To effectively determine appropriate volume control measures, the designer should review a map of the project site with sufficient topographic detail so that existing and proposed drainage patterns can be identified and existing and proposed permanent stormwater control structures located. On this map identify the following:

- » Locations where stormwater enters and exits the site. Include both sheet and channel flow for the existing and final grading contours.
- » Locate permanent stormwater collection, drainage and control structures.
- » Identify locations subject to high rates of erosion, areas of steep slopes, and unlined channels. Long slopes over 100' in length are considered as areas of moderate to high erosion potential.
- » Categorize slopes as:

Low Erosion Potential	0-5%
Moderate Erosion Potential	5-10%
High Erosion Potential	Over 10%
- » Identify those areas where existing vegetation will not be disturbed by construction activity, and establish clearing limits.
- » Identify the boundaries between drainage basins if your site has more than 1 drainage outlet, and then calculate the approximate area of each drainage basins.

With this information, consider the following methods for reducing the volume of runoff affecting your construction site:

Runoff Volume Reduction:

1. Divert upslope water from entering the unvegetated areas of the construction site by constructing dikes, and swales.
2. Divert or intercept stormwater before it reaches long and/or steep slopes. Use temporary dikes, swales, pipe slope drains.
3. Release captured stormwater at a slow and controlled rate to prevent damage to downstream drainageways and structures.

Vegetative Controls:

1. Increase the soil's ability to absorb moisture through vegetative means, surface roughening, and mulching.
2. Stage grading so the native vegetation provides a buffer to slow and disperse runoff.

6.2.3 Step 3: Runoff Velocity Reduction

The third step involves selecting BMPs to reduce the velocity of runoff across denuded areas, steep slopes, and drainage channels. Structural practices to be considered are listed under the "Runoff Velocity Reduction" portion of Figure 6.1 (page 6-2). Appropriate applications of these BMPs should include:

1. Limit length of slopes to 50 feet. Construct mid-slope diversion (swales) on longer slopes to intercept runoff.
2. Build check dams or other energy dissipation structures in unlined drainage channels to slow runoff velocity and encourage settlement of sediments.
3. Roughen slopes to increase the absorption of rainfall and slow runoff.
4. Limit slopes to 3:1, where practical.
5. Provide for spreading of concentrated stormwater flows into overland sheet flow.
6. Intercept runoff before it reaches steep slopes using diversion dikes, swales, or other barriers.
7. Protect slopes with mulches, matting, or other types of temporary or permanent soil stabilization.
8. Provide velocity reducing structures or riprap linings at stormwater outfalls.

6.2.4 Step 4: Sediment Trapping

Once measures have been taken to limit exposure, limit runoff volume, and velocity, the last step in controlling erosion and sedimentation is to separate as much sediment from the stormwater as possible before the water leaves the project site. The appropriate controls for doing this all work on the same principle in that the velocity of sediment laden runoff is slowed by temporary barriers or basins which pond the stormwater to allow sediments to settle out. Appropriate strategies for implementing sediment trapping controls include:

1. Direct sediment-laden stormwater to temporary sediment traps.
2. Direct off-site stormwater away from denuded areas and away from temporary sediment traps.
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. Do not allow the discharge from one basin to enter the inlet of another basin.
4. When permanent stormwater detention basins are to be constructed, convert these basins to temporary use as a sediment trap or basin.

Selection Process

5. Construction sites with relatively flat slopes that produce sheet flow runoff are appropriate for temporary sediment barriers such as:
 - » Silt fences.
 - » Straw bale barriers.
 - » Sand bag barriers.
 - » Gravel filter berms.
6. Protect municipal storm drainage structures from sediment clogging by providing inlet protection for area drains and curb inlets.

6.2.5 Step 5: Good Housekeeping

The fifth step in selecting practices to control stormwater pollution deals with preventing contamination of stormwater by materials other than sediment. The BMP Matrix provides several methods for preventing non-sediment stormwater pollution by construction materials, equipment, and wastes. Not all of these practices will apply to every construction site, the suitability of a BMP depends upon how the operator conducts his or her activities. For example, the BMP on Equipment Maintenance Procedures may or may not apply to a given project if maintenance work is done off-site. The SWPPP designer should consider all of the suggested Housekeeping Control Practices and select those which are appropriate for the project. For a particular project, the contractor may develop other BMPs which would better meet the specific site needs.

After the SWPPP designer has reviewed the five controllable factors and selected appropriate BMPs, the final stage of the process is to review the site map. All BMPs should be located with all major structural and non-structural controls, and areas of permanent or temporary stabilization shown.

The BMP fact sheets in this manual provide design, construction, inspection, and maintenance standards for temporary controls. In using these BMPs, the designer should be aware that these standards are temporary measures and are not for permanent drainage improvements.

- » Flow diversions should *not* adversely impact off-site properties. The historic flow patterns should be maintained.
- » These BMPs are for control of the average rainfall event of 0.22 to 0.66 inches in the Phoenix area.
- » For permanent measures the designer is referred to the local stormwater jurisdiction for information and standards.

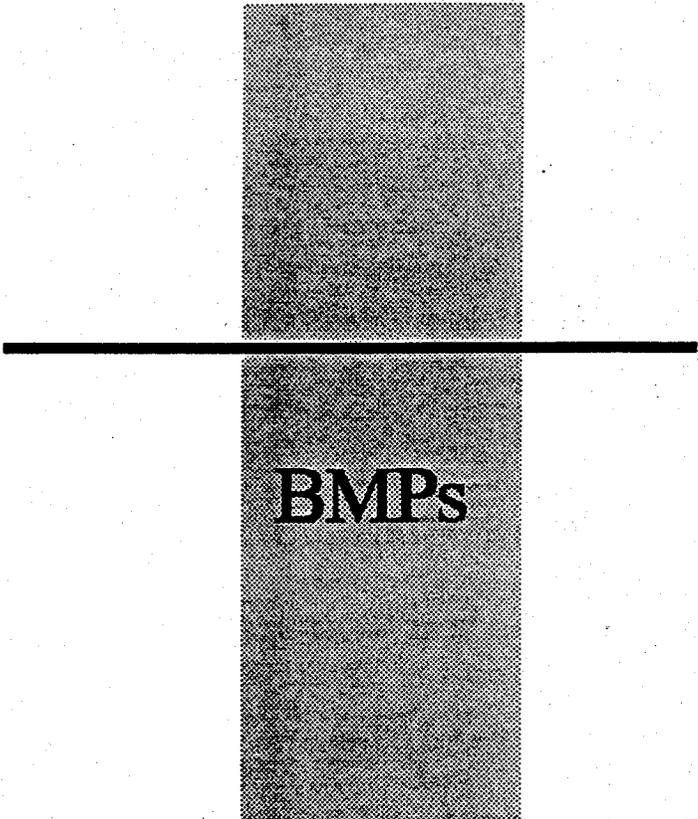


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BMPs

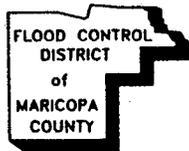
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Spill Containment Plan	BMP-107

II

CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL / DIVERSION						
			A	B	C	D	E	F	G
PLANNING	SCHEDULING CONSIDERATIONS		●	●	●	●	●	●	●
	CONSTRUCTION PHASING		●	●		●	●		
	PRESERVATION OF WASHES					●	●	●	
	OPEN SPACE BUFFERS		●	●			●	●	
	VEGETATIVE BUFFER ZONES						●		
VEGETATIVE CONTROLS -LIMIT EXPOSED AREA	TREES, SHRUBS, VINES, AND GROUND COVERS			●			●	●	
	MULCHING			●			●		
	EROSION CONTROL MATTINGS			●			●		
	PROTECTION OF TREES AND VEGETATION IN CONSTR. AREAS		●			●		●	

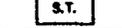
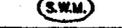
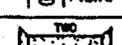


III

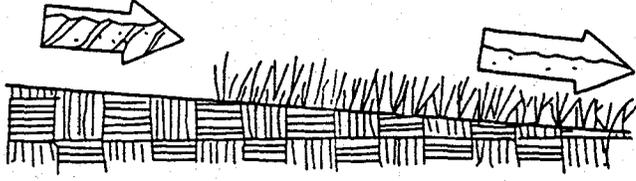
CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL/ DIVERSION											
			SLOPE PROTECTION		SEDIMENT TRAPPING		DRAINAGEWAY AND STREAM PROTECTION		TEMPORARY STABILIZATION		PERMANENT STABILIZATION		NON SEDIMENT POLLUTION CONTROL	
			A	B	C	D	E	F	G					
REDUCE AREA OF EXPOSURE -RUNOFF VOLUME REDUCTION/ DIVERSION -PREVENT LOSS OF SEDIMENTS BY VEHICLES AND WIND	TEMP. DIVERSION DIKES		●	●										
	TEMP. DRAINAGE SWALE		●	●										
	PIPE SLOPE DRAINS			●										
	STABILIZED CONSTRUCTION ENTRANCE				●			●			●			
	CONSTRUCTION ROAD STABILIZATION		●					●						
	DUST CONTROL				●			●						
RUNOFF VELOCITY REDUCTION	CHECK DAMS				●	●								
	ROCK OUTLET PROTECTION			●		●	●							
	SURFACE ROUGHENING			●		●	●							



VI

CONTROL FACTOR	BMP TITLE	SYMBOL	PERIMETER CONTROL / SLOPE PROTECTION SEDIMENT TRAPPING DRAINAGEWAY AND STREAM PROTECTION TEMPORARY STABILIZATION PERMANENT STABILIZATION NON SEDIMENT POLLUTION CONTROL							
			A	B	C	D	E	F	G	
SEDIMENT TRAPPING	STRAW BALE BARRIER		●		●					
	SILT FENCE		●		●					
	STORM DRAIN INLET PROTECTION				●					
	TEMPORARY SEDIMENT TRAP				●					
	TEMPORARY SEDIMENT BASIN				●					
	SAND BAG BARRIER (BERM)		●		●					
	GRAVEL FILTER BERM		●		●					
GOOD HOUSEKEEPING PRACTICES	EQUIPMENT MAINTENANCE PROCEDURES									●
	SOLID WASTE MANAGEMENT									●
	DESIGNATED WASHDOWN AREAS									●
	PROTECTED CHEMICAL AND MATERIALS STORAGE AREAS									●
	TEMPORARY ACCESS WATERWAY CROSSING					●				●
	SPILL CONTAINMENT PLAN									●



<p style="text-align: center;">SYMBOL</p> <p style="text-align: center;">  </p>	<p style="text-align: center;">TREES, SHRUBS, VINES AND GROUND COVERS</p>	 <p style="text-align: right;">1 of 6</p>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION * PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 	
<p><u>DEFINITION</u></p> <p>Trees, shrubs, vines, and ground covers can provide superior, low-maintenance, and long-term erosion protection. They are particularly useful for site aesthetics.</p> <p><u>PURPOSE</u></p> <p>Preserving and protecting trees can often result in a more stable and aesthetically pleasing development. Trees stabilize the soil and help prevent erosion, decrease stormwater runoff, moderate temperature, provide buffers and screens, filter pollutants from the air, supply oxygen, provide habitat for wildlife, and increase property values.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <ol style="list-style-type: none"> 1. On steep or rocky slopes, where mowing is not feasible. 2. Where ornamentals are desirable for landscaping purposes. 3. Where woody plants are desirable for soil conservation or to establish wildlife habitats. <p>Because many types of woody plants and ground covers are available, and because site conditions and land use vary so widely, this practice consists of a set of general guidelines for growing trees, shrubs, vines, and ground covers on disturbed land. Much of the information provided in this practice regarding trees also applies to shrubs. A shrub is a woody plant less than 15 feet tall, usually with several trunks rising from a common base.</p>		

SYMBOL	TREES, SHRUBS, VINES AND GROUND COVERS	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 2 of 6
		

In addition to stabilizing disturbed soil, vegetation can:

1. Provide attractive cover that does not need mowing.
2. Define traffic and pedestrian areas.

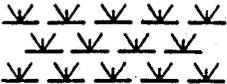
Low-growing plants that sprawl, trail, spread, or send out runners can come in many leaf types, colors, and growth habits. Some are suitable only as a part of a maintained landscaping and some can stabilize large areas with little care.

LIMITATIONS

Construction activities are likely to injure or kill trees unless adequate protective measures are taken. Direct contact by equipment is the most obvious problem, but damage is also caused by root stress from filling, excavating, or compacting too close to trees.

PLANNING CONSIDERATIONS

1. On cut-and-fill slopes adjacent to paved areas of shopping centers, schools, industrial parks, or other non-residential projects: woody plants and ground cover can be used on these slopes to control erosion. They will also help to control foot traffic.
2. Trees, shrubs, vines, or ground covers may be planted in residential areas, along rights-of-way, or easements to reduce maintenance and improve appearance.
3. The Arizona Department of Water Resources has an approved plant list for Maricopa County of low water use plants (See Appendix C).

SYMBOL	TREES, SHRUBS, VINES AND GROUND COVERS	 <small>FLOOD CONTROL DISTRICT OF MANDAN COUNTY</small>
		

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:

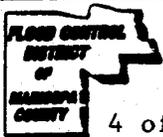
Time of Year - Late fall through winter (November to February) is the preferred time for planting trees.

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.

SYMBOL	TREES, SHRUBS, VINES AND GROUND COVERS	 4 of 6
		

SHRUBS:

Follow the general procedure for tree planting when planting shrubs.

VINES AND GROUND COVERS:

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.

PLANTING - The following steps will help insure good plant growth:

1. Arrange the plantings on the contour.
2. Dig the holes 1/3 larger than the plant root ball.
3. Plant at the same level that the plants grow.
4. Use good topsoil or soil mixture with a lot of organics.
5. Fill hole 1/3 to 1/2 full, shake plants to settle soil among roots, then water.
6. Leave saucer-shaped depression around the plant to hold water.
7. Water thoroughly and regularly.
8. Space plants according to plant type and coverage desired.

SYMBOL	TREES, SHRUBS, VINES AND GROUND COVERS	
		

DESIGN & SIZING CRITERIA

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 vast 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 in Appendix C.

MAINTENANCE REQUIREMENTS

Specific maintenance requirements may be listed on landscape plans and specifications. General requirements include:

TREES:

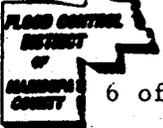
Young trees should receive an inch of water each week for the first two years after planting. Transplanted trees should be fertilized on an annual basis.

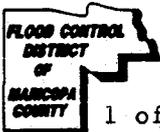
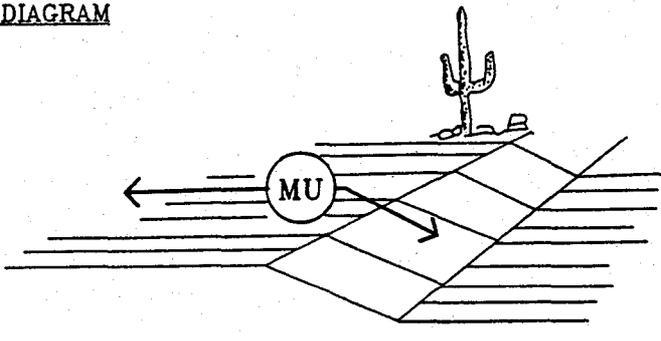
SHRUBS:

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.
Reference (10,23)

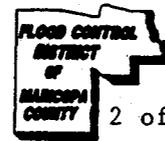
SYMBOL	TREES, SHRUBS, VINES AND GROUND COVERS	 6 of 6
▽▽▽▽▽ ▽▽▽▽▽ ▽▽▽▽▽		

<p style="text-align: center;">SYMBOL</p> 	<p style="text-align: center;">MULCHING</p> <div style="text-align: right;">  <p>1 of 6</p> </div>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>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.</p> <p><u>PURPOSE</u></p> <p>The purposes of using mulch are: (a) prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow and (b) to foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <ol style="list-style-type: none"> 1. Areas which have been permanently seeded should be mulched immediately following seeding. 2. Areas which cannot be seeded because of the season, but will be seeded at a later date should be mulched to provide some protection to the soil surface. An organic mulch (not wood fiber alone) shall be used, and the area then seeded as soon as feasible in spring. 3. Mulch should be used together with plantings of trees, shrubs, or certain ground covers which do not provide adequate soil stabilization by themselves. 4. Mulch should be used in conjunction with temporary seeding operations when climatic conditions allow or temporary irrigation is provided. 	

SYMBOL



MULCHING



2 of 6

LIMITATIONS

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 mulches more appropriate for arid regions include gravels and decomposed granite.

PLANNING CONSIDERATIONS

Mulches are applied to the soil surface to conserve a desirable soil property or to promote plant growth. A surface mulch is one of the most effective means of controlling runoff on disturbed land.

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.

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 are less effective mulches when used alone. These materials are useful to bind organic mulches together or to stabilize flat areas such as roadways. Decomposed granite, gravels and bark are effective as ground cover in landscaped areas.

A variety of nets and mats have been developed for erosion control in recent years, and these are also 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 Matting, BMP.

The choice of materials for mulching will be based on the type of soil to be protected, site conditions, landscape requirements, and economics.

SYMBOL	MULCHING	 3 of 6
		

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

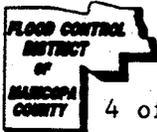
Compliance with the requirements of Subsection 106.05 of the 1990 ADOT Standard Specifications for Road and Bridge Construction is recommended.

WOOD FIBER MULCH: Wood fiber mulch shall consist of a specially prepared wood fiber processed to contain no growth or germination inhibiting factors. The mulch shall 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: Straw mulch shall conform to the requirements of Subsection 805 - 2.03 of ADOT's Standard Specifications and shall be from the current season's crop. A letter of certification from the supplier shall be required to show that the straw was baled less than 12 months from the delivery date.

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

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

SYMBOL	MULCHING	 4 of 6
		

PREPARATION/METHODS AND EQUIPMENT

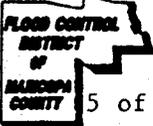
The equipment and methods used to distribute mulching materials shall be such as to provide an even and uniform application of mulch and/or other materials at the specified rate. The mulch can be spread by hand or by mulch-blowing equipment.

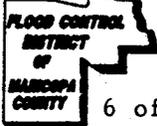
APPLYING MULCH: Mulch shall be immediately affixed by either crimping or tacking. The Engineer shall determine which areas are not conducive to anchoring by crimping and will direct the contractor to anchor such mulch by tacking.

Within 24 hours after each area is planted, straw mulch shall be uniformly applied at the rate of approximately 2-1/2 tons per acre for crimped areas and 1-3/4 tons per acre for tacked areas.

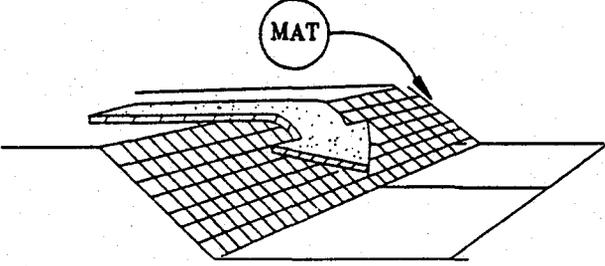
ANCHORAGE BY CRIMPING: Mulch shall be anchored into the soil with a heavy disc with flat, serrated discs at least 1/4 inch thick having dull edges and spaced no more than nine inches apart. Mulch shall be anchored to a depth of at least two inches and shall not be covered with an excessive amount of soil. Anchoring operations shall be across the slopes where practical with no more than two passes of the anchoring equipment. Immediately following the crimping operation the crimped area shall be tacked as specified under Anchorage by Tacking.

ANCHORING BY TACKING: Mulch shall be anchored by tacking using either emulsified asphalt uniformly applied at the rate of approximately 500 gallons per acre or a slurry consisting of a minimum of 150 pounds of binder, 400 pounds of wood fiber mulch, and 700 gallons of water per acre.

SYMBOL	MULCHING	 FLOOD CONTROL DISTRICT OF MANDAN COUNTY 5 of 6
	<p><u>MAINTENANCE REQUIREMENTS</u></p> <p>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, along steep slopes or areas of higher velocity flows, then a geotextile mat or net is recommended.</p> <p>Reference (10, 23)</p>	

SYMBOL	MULCHING	
		 6 of 6

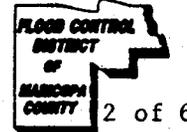
NOTES:

SYMBOL	EROSION CONTROL MATTINGS	
	 1 of 6	
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 	
<p><u>DEFINITION</u></p> <p>Installing natural or synthetic mattings on steep slopes and/or prepared vegetative seed beds.</p> <p><u>PURPOSE</u></p> <p>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.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>In channels where designed flow exceed 3 fps; on steep slopes; when planting is likely to be slow; and on stream banks where flow is likely to wash out new vegetative plantings.</p> <p><u>LIMITATIONS</u></p> <p>Properly installed nettings provide excellent erosion control but do so at relatively high cost. Typically netting is used in areas of concentrated channel flow and steep slopes.</p> <p><u>PLANNING CONSIDERATIONS</u></p> <p>Matting strengths and uses vary; the manufacturer specifications should be followed. In most cases the matting alone is not acceptable for flow velocities greater than 6 fps. The matting provides additional protection for flow and for revegetation.</p>		

SYMBOL



EROSION CONTROL MATTINGS



DESIGN & SIZING CRITERIA

Jute Mat - shall be cloth of a uniform plain weave of undyed and unbleached single jute yarn and weighing an average of 1.2 pounds per linear yard of cloth with a tolerance of plus or minus five (5) percent, with approximately 78 warp ends per width of cloth and 41 weft ends per linear yard of cloth. The yarn shall be of a loosely twisted construction having an average twist of not less than 1.6 turns per inch and shall not vary in thickness by more than ½ its normal diameter.

Straw Mat - shall be a machine produced mat consisting of 70% ($\pm 3\%$) agricultural straw and 30% ($\pm 3\%$) coconut fiber. The blanket shall be of consistent thickness with the straw and coconut fiber evenly distributed. The blanket shall 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 with a polypropylene netting with an approximate ½" x ½" mesh. The blanket shall be sewn together with cotton thread.

Excelsior Mat - shall be wood excelsior, 48 inches in width plus or minus one inch and weighing 0.8 pound per square yard plus or minus ten percent. The excelsior material shall be covered with a netting to facilitate handling and to increase strength.

Glass Fiber Matting - of bonded textile glass fibers with an average fiber diameter of eight to twelve microns, two to four inch strands of fiber bonded with phenol formaldehyde resin. Mat shall be roll type, water permeable, minimum thickness ¼ inch, maximum thickness ½ inch, density not less than three pounds per cubic foot.

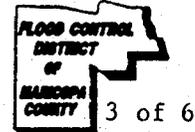
Other Mulch Nettings - such as paper, plastic, cotton or fiber glass matting shall be installed according to the manufacturer's recommendations.

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

SYMBOL



EROSION CONTROL MATTINGS



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 1½ 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 ½ 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. Matting blanket or strips should be used on steep, highly erodible sites. The stops are placed in narrow trenches six to twelve inches deep across the channel and left flush with the soil surface. They are to cover the full cross section of designed flow.

Laying and Securing Matting:

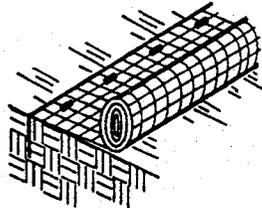
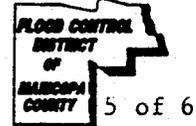
Before laying the matting, all erosion stops should be installed and the friable seed bed made free of clods, rocks, and roots. Most matting comes with manufacturer's recommendations for installation. The matting should be unrolled starting at the upper end of the channel, allowing a four-inch overlap 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.

SYMBOL	EROSION CONTROL MATTINGS	
	 4 of 6	
<p>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.</p> <p>Mechanical or manual laydown equipment shall be capable of handling full rolls of fabric, and laying the fabric smoothly, without wrinkles or folds. The equipment shall be in accordance with the fabric manufacturer's recommendations or as approved by the Engineer.</p> <p>The surface upon which the separation fabric will be placed shall be compacted and finished according to the manufacturer's recommendations.</p> <p>○ Final Check:</p> <ul style="list-style-type: none"> - 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. <p><u>MAINTENANCE REQUIREMENTS</u></p> <p>Inspect monthly and after each significant rainfall. Re-anchor loosened nettings and replace lost net and staples as required.</p> <p>Reference (1,2)</p>		

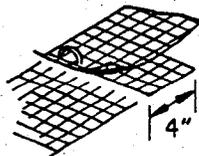
SYMBOL



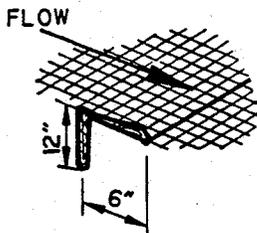
EROSION CONTROL MATTINGS



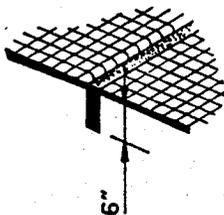
ANCHOR SLOT: BURY THE UP-CHANNEL END OF THE NET IN A 12" DEEP TRENCH. TAMP THE SOIL FIRMLY. STAPLE AT 12" INTERVALS ACROSS THE NET.



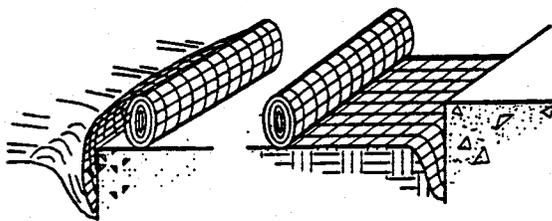
OVERLAP: OVERLAP EDGES OF THE STRIPS AT LEAST 4". STAPLE EVERY 12" DOWN THE CENTER OF THE STRIP.



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.



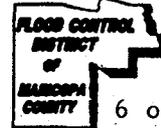
ANCHORING ENDS AT STRUCTURES: PLACE THE END OF THE NET IN A 12" SLOT ON THE UP-CHANNEL SIDE OF THE STRUCTURE. FILL THE TRENCH AND TAMP FIRMLY. ROLL THE NET UP THE CHANNEL. PLACE STAPLES AT 12" INTERVALS ALONG THE ANCHOR END OF THE NET.

INSTALLATION OF NETTING AND MATTING

SYMBOL

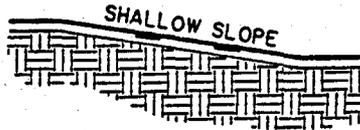


EROSION CONTROL MATTINGS

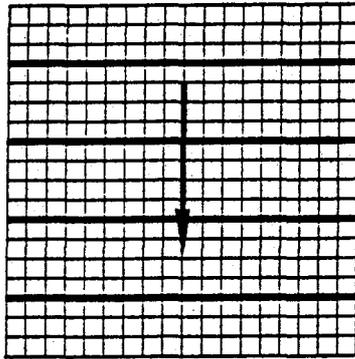


6 of 6

ON SHALLOW SLOPES, STRIPS OF NETTING MAY BE APPLIED ACROSS THE SLOPE.



SECTION

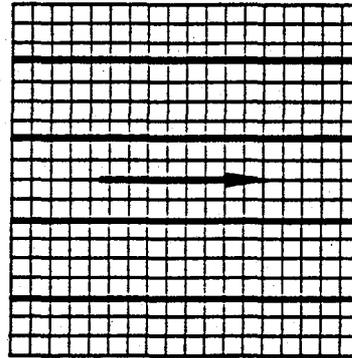


(SHALLOW SLOPES)
PLAN

ON STEEP SLOPES, APPLY STRIPS OF NETTING PARALLEL TO THE DIRECTION OF FLOW AND ANCHOR SECURELY.

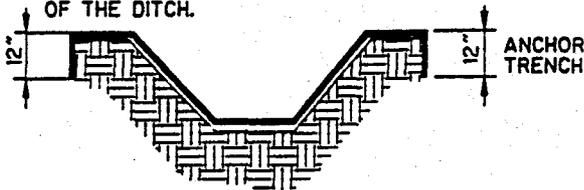


SECTION



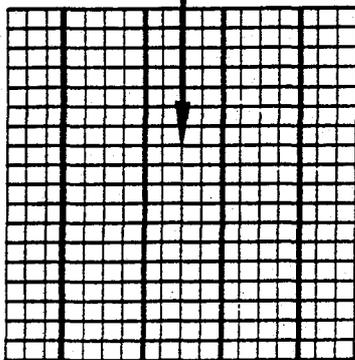
(STEEP SLOPE)
PLAN

IN DITCHES, APPLY NETTING PARALLEL TO THE DIRECTION OF FLOW. USE CHECK SLOTS EVERY 15 FEET. DO NOT JOIN STRIPS IN THE CENTER OF THE DITCH.

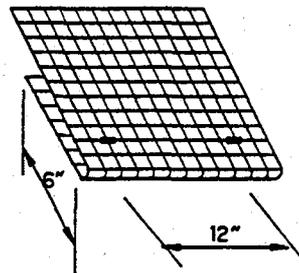


SECTION

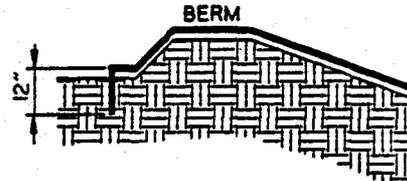
FLOW



(DITCH)
PLAN

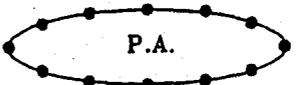
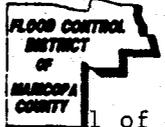
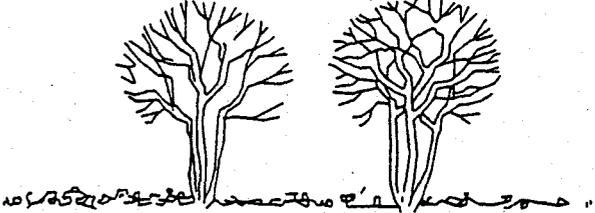


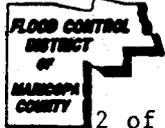
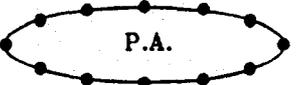
BRING NETTING DOWN TO A LEVEL BEFORE TERMINATING THE INSTALLATION. TURN THE END UNDER 6" AND STAPLE AT 12" INTERVALS.



WHERE THERE IS A BERM AT THE TOP OF THE SLOPE, BRING THE MATTING OVER THE BERM AND ANCHOR IT BEHIND THE BERM WITH A 12" ANCHOR TRENCH.

ORIENTATION OF NETTING AND MATTING

<p style="text-align: center;">SYMBOL</p> 	<p style="text-align: center;">PROTECTION OF TREES/NATURAL AREA IN CONSTRUCTION AREAS</p>  <p style="text-align: right;">1 of 4</p>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> * PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING * DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION * PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>Protection of desirable trees from mechanical and other injury while the land is being developed.</p> <p><u>PURPOSE</u></p> <p>To employ the necessary protective measures to insure the survival of desirable trees for shade, beautification, and vegetative cover.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Criteria for deciding upon the trees to remain on site:</p> <ul style="list-style-type: none"> - Aesthetic values: Foliage, crown characteristics, texture. - Freedom from disease and rot. - Life span of trees: Some are considered short-lived trees. - Environmental values: Habitat; screening; and buffers. - Space needed: For future growth and relationship to structures, utilities, driveways and streets. <p><u>EFFECTIVENESS:</u></p> <p>Mature trees have extensive root systems that help to hold soil in place thus reducing erosion.</p> <p><u>ADVANTAGES:</u></p> <p>Saving existing mature trees on site beautifies the area and saves money by limiting the number of new trees required to be planted.</p>	

SYMBOL	PROTECTION OF TREES/NATURAL AREA IN CONSTRUCTION AREAS	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 P.A.		

LIMITATIONS

Tree protection can be implemented on most construction projects where trees are present. For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.

PLANNING CONSIDERATIONS

Methods for protecting existing trees:

- 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).

DESIGN & SIZING CRITERIA

Protecting existing trees with "Tree Wells." The work under this item shall consist of the materials required to construct tree wells as necessary based upon long term protection requirements and as shown on landscape plans (see attached Tree Well Detail).

Rock Mulch

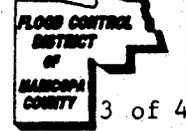
Rock mulch shall be in accordance with the applicable requirements of Subsections 803-30.3 of the ADOT Standard Specifications and shall meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
3 inch	75-100
2 inch	25-75
1.5 inch	0-25

SYMBOL



**PROTECTION OF TREES/NATURAL
AREA IN CONSTRUCTION AREAS**



Wall Construction Rocks

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

<u>Sieve Size</u>	<u>Percent Passing</u>
12 inch	75-100
8 inch	25-75
6 inch	0-25

Mortar shall consist of one part portland cement and two parts fine aggregate by volume. Portland cement and water shall conform to the applicable requirements of Section 1006 of ADOT specifications. Hydrated lime shall 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 shall be treated as an additive and not a replacement for cement.

Construction of Tree Wells shall 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.

MAINTENANCE REQUIREMENTS

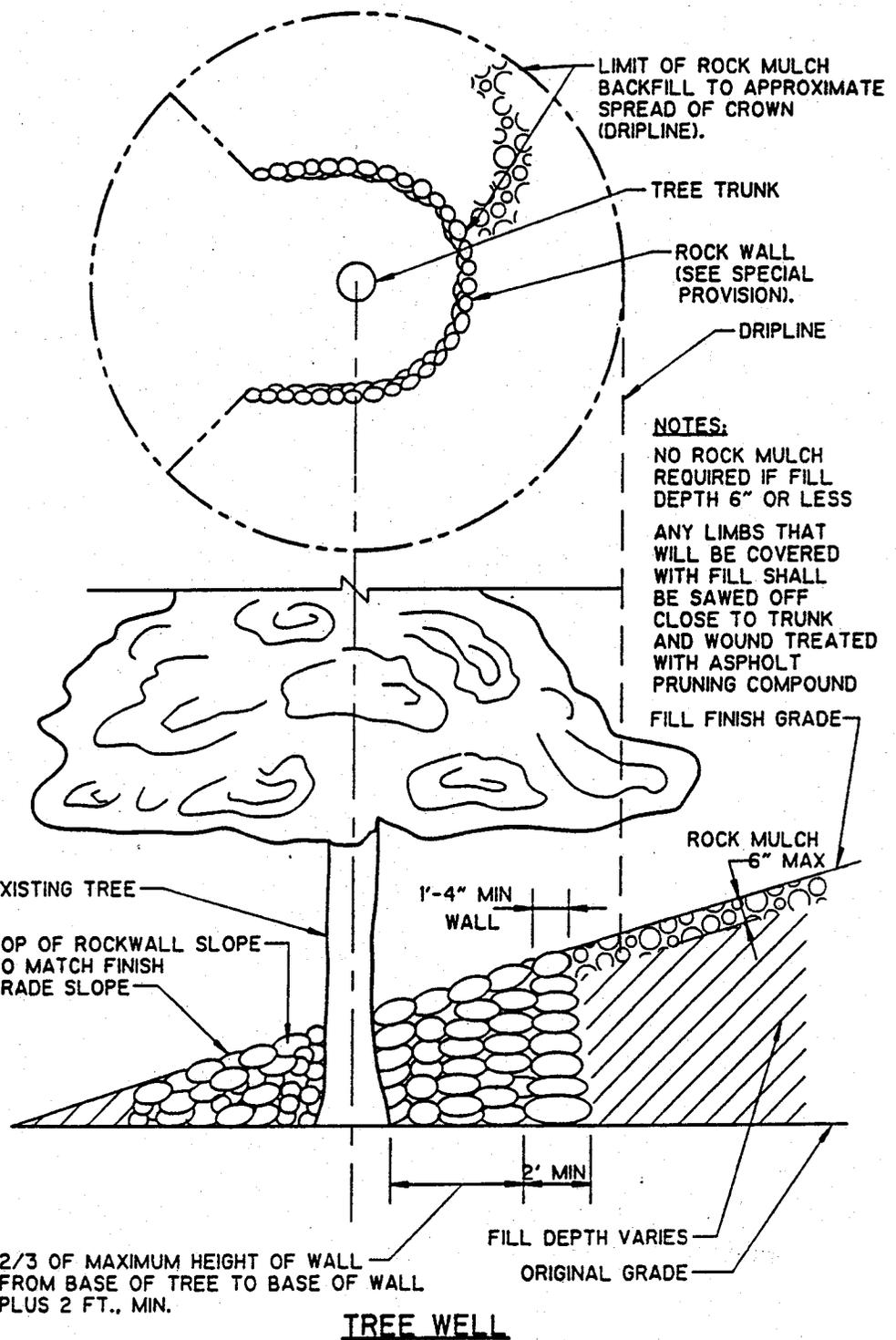
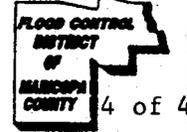
Maintenance requirements are low. During construction the limits of grading or disturbance should be clearly marked at all times. Irrigation or maintenance of native trees or vegetation should conform to specifications on the Landscape Plan.

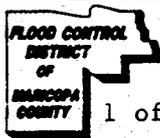
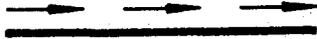
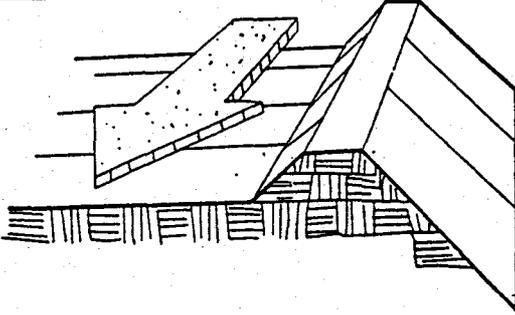
Reference (10, 23)

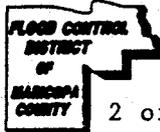
SYMBOL



PROTECTION OF TREES/NATURAL AREA IN CONSTRUCTION AREAS



SYMBOL	TEMPORARY DIVERSION DIKE		 1 of 4
D.D. 			
DIAGRAM 	CONDITIONS WHERE PRACTICE APPLIES <ul style="list-style-type: none"> * PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 		
<u>DEFINITION</u>			
<p>A temporary berm or ridge of compacted soil, located in such a manner as to channel water to a desired location.</p>			
<u>PURPOSE</u>			
<p>The purpose of an earth dike is to direct runoff to a sediment trapping device or stabilized outlet, to reduce the potential for erosion. Earth dikes can also be used for diverting clean water away and sheet flows away from disturbed areas and unprotected slopes.</p>			
<u>APPROPRIATE APPLICATIONS</u>			
<p>Earth dikes are often constructed upstream of disturbed areas and around construction sites. The dikes should remain in place until the disturbed areas are permanently stabilized. The dikes must be on-site and maintain the inflow and outflow conditions at the site to the historic drainage pattern.</p>			
<u>LIMITATIONS</u>			
<p>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 shall be in compliance with local municipality's or Flood Control District of Maricopa County's hydraulic design standards.</p>			
<ul style="list-style-type: none"> • Often times earth dikes create more disturbed area on site and become barriers to construction equipment. • Earth dikes must be stabilized immediately which adds cost and maintenance concerns. • Diverted stormwater flow may cause flood damage to adjacent areas. 			

SYMBOL	TEMPORARY DIVERSION DIKE	
D.D. 		

PLANNING CONSIDERATIONS

An earth dike itself does not control erosion or remove sediment from runoff, rather it directs runoff to an erosion control device such as a sediment trap or directs runoff away from an erodible area. Temporary diversion dikes should not adversely impact adjacent properties and must conform to local floodplain management regulations.

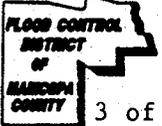
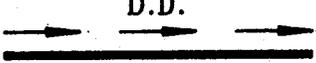
◆ Advantages:

- Earth dikes can handle flows from large drainage areas and are easy to install.
- Also, once stabilized, earth dikes require little maintenance.
- Uses on-site materials.

DESIGN & SIZING CRITERIA

Temporary Diversion Dikes

1. All dikes shall be compacted by earth-moving equipment.
2. All dikes shall have positive drainage to an outlet.
3. Top width may be wider and side slopes may be flatter if desired to facilitate crossing by construction traffic.
4. Location should be adjusted as needed to utilize a stabilized safe outlet.
5. Earth dikes shall have an outlet that functions with a minimum of erosion. Runoff shall 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.

SYMBOL	TEMPORARY DIVERSION DIKE	
D.D. 		

6. Temporary stabilization, when necessary, shall be as scheduled below:

FLOW CHANNEL STABILIZATION

<u>TYPE OF TREATMENT</u>	<u>CHANNEL GRADE</u>	<u>ROCK (D50) STABILIZATION</u>
1	0.5-1.0%	4" Rock
2	1.1-2.0%	6" Rock
3	2.1-4.0%	8" Rock
4	4.1-5%	Rip-Rap 8-12"

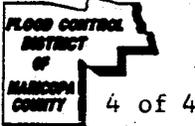
- A. Stone or recycled concrete equivalent, in a layer at least 8 inches in thickness and be pressed into the soil with construction equipment.
- B. Rip-Rap to be in a layer at least two times the D50 and pressed into the soil.
- C. Approved equivalents can be substituted for any of the above materials.

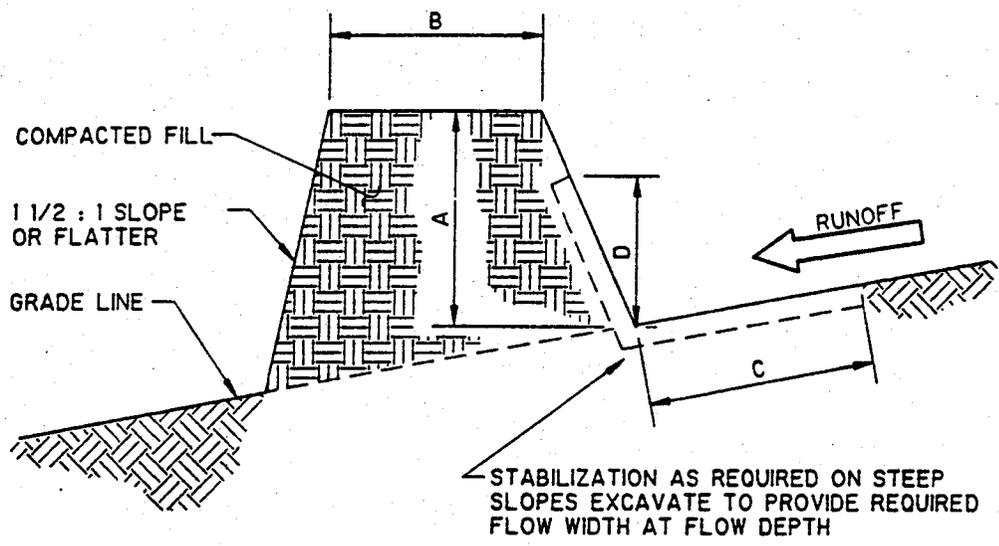
7. Filter cloth may be used for dikes in use for long periods.

MAINTENANCE REQUIREMENTS

Inspection and required maintenance must be provided after each rain event.

References (1,10,11,23)

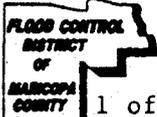
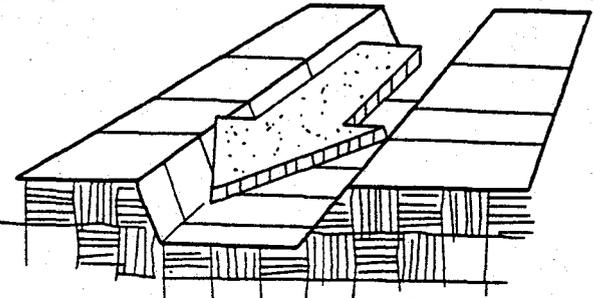
SYMBOL	TEMPORARY DIVERSION DIKE	
D.D.		

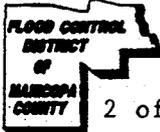
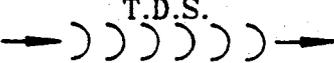


REQUIREMENTS BASED ON UPSTREAM DRAINAGE AREA

	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"

TEMPORARY DIVERSION DIKE

SYMBOL	TEMPORARY DRAINAGE SWALE		 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 1 of 4
T.D.S. 			
<u>DIAGRAM</u> 	<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> * PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 		
<p><u>DEFINITION</u></p> <p>A temporary 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.</p> <p><u>PURPOSE</u></p> <p>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 stabilized outlet, sediment trapping device or stabilized outlet.</p> <p><u>APPROPRIATE APPLICATION</u></p> <p>Drainage swales are placed to divert upland flows away from a disturbed area or exposed slope and to direct on-site sediment-laden water to a trapping device. The temporary drainage swales must be on-site and maintain the historic drainage patterns for inflow and outflow from the site.</p> <p><u>LIMITATIONS</u></p> <p>Temporary drainage swales or any diversion of runoff should not adversely impact upstream or downstream properties and must conform to local floodplain management regulations.</p> <ul style="list-style-type: none"> • 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. 			

SYMBOL	TEMPORARY DRAINAGE SWALE	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 2 of 4
T.D.S. 		

PLANNING CONSIDERATIONS

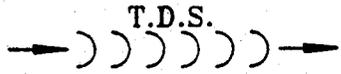
Drainage swales will effectively convey runoff and avoid erosion only if the proper type of geometry and lining is used. Care should be taken to assure that runoff leaving the swale is at non-erosive velocities.

- Drainage swales can transport large volumes of concentrated flows with little maintenance once established.

DESIGN & SIZING CRITERIA

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

1. All temporary swales shall have uninterrupted positive grade to an outlet.
2. Diverted runoff from a disturbed area shall be conveyed to a sediment trapping device.
3. Diverted runoff from an undisturbed area shall outlet directly into an undisturbed stabilized area at non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.
5. The swale shall 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 shall be compacted by earth moving equipment.
7. All earth removed and not needed on construction shall be placed so that it will not interfere with the functioning of the swale.

SYMBOL	TEMPORARY DRAINAGE SWALE	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
T.D.S. 		3 of 4

8. Stabilization shall be as per the chart below:

FLOW STABILIZATION

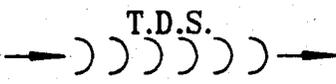
<u>TYPE OF TREATMENT</u>	<u>CHANNEL GRADE</u>	<u>D50 A (5 AC or Less)</u>	<u>D50 B (5AC-10AC)</u>
1	0.5-1.0%	4" Rock	4" Rock
2	1.1-2.0%	6" Rock	6" Rock
3	2-3%	8" Rock	Rip-Rap 6-12"
4	3.1-5%	8-12" Rip-Rap	Engineered

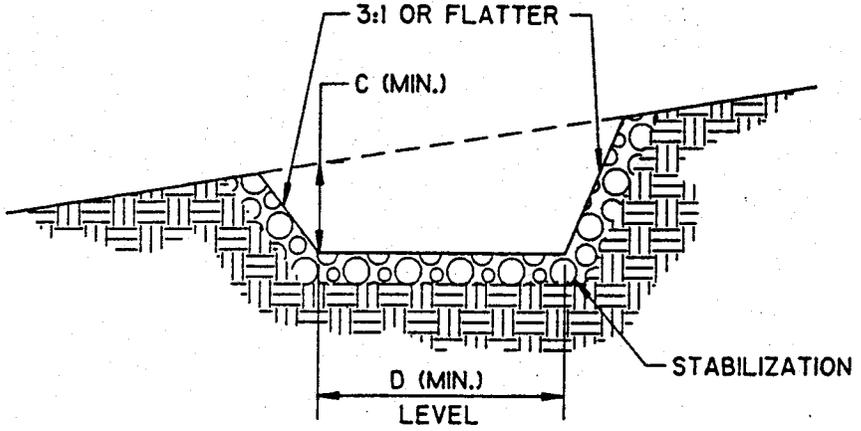
MAINTENANCE

Periodic inspection and required maintenance must be provided after each rain event.

These temporary drainage swales are intended to fill with sediment during large storm events, and will require maintenance.

References (1,14)

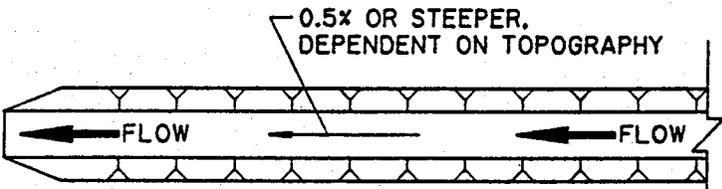
SYMBOL	TEMPORARY DRAINAGE SWALE	 FLOOD CONTROL DISTRICT OF HANCOCK COUNTY 4 of 4
T.D.S. 		



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

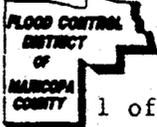
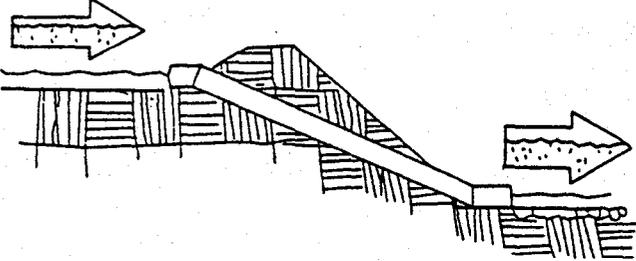
CROSS SECTION

OUTLET AS REQUIRED
SEE ITEM 8
UNDER DESIGN CRITERIA

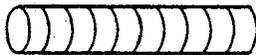


PLAN

TEMPORARY DRAINAGE SWALE

<p style="text-align: center;">SYMBOL</p> <p style="text-align: center;">P.S.D.</p> 	<p style="text-align: center;">PIPE SLOPE DRAIN</p> <div style="text-align: right;">  <p>1 of 6</p> </div>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>A temporary pipe drain placed from the top of a slope to the bottom of a slope.</p> <p><u>PURPOSE</u></p> <p>The purpose of the structure is to convey concentrated runoff down slopes without causing erosion.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Pipe slope drains are used where concentrated flow of surface runoff must be conveyed down a slope in order to prevent erosion. Typically used in conjunction with top of slope diversion dikes or swales. May also be used as an emergency spillway for a sediment basin.</p> <p><u>LIMITATIONS</u></p> <p>Maximum drainage area per pipe slope drain is 5 acres. For large areas use a paved chute, rock lined channel, or additional pipes.</p> <ul style="list-style-type: none"> • During large storms, pipe slope drains may become clogged or overcharged, forcing water around the pipe and causing extreme slope erosion. • Also, dissipation of high flow velocities at the pipe outlet is required to avoid downstream erosion. • Failure of this type of temporary structure can result in flooding and severe erosion. 	

SYMBOL	PIPE SLOPE DRAIN	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
P.S.D.		



PLANNING CONSIDERATIONS

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

- Pipe slope drains allow no chance of 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 & SIZING CRITERIA

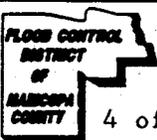
The capacity for temporary drains shall be sufficient to handle a 10-year, 24-hour peak flow. This may be computed using the Rational Method described in Maricopa County Flood Control District's "Hydrologic Design Manual". Higher flows must be safely stored or routed to prevent any off-site concentration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

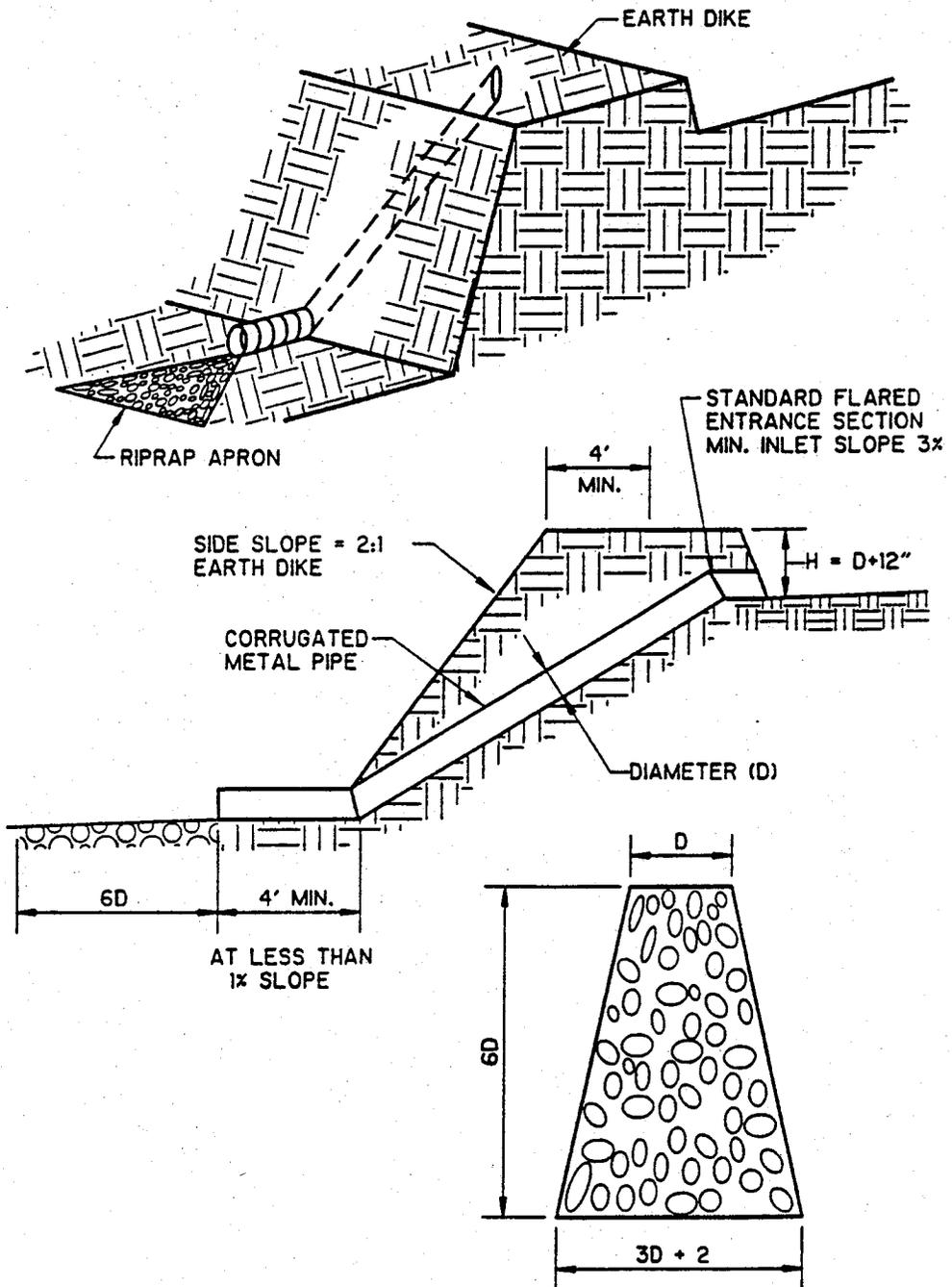
Temporary pipe slope drains shall not be sized smaller than as shown in the following table:

<u>MINIMUM PIPE DIAMETER</u>	<u>MAXIMUM UPSTREAM DRAINAGE AREA (ACRES)</u>
12"	0.5
18"	1.5
21"	2.5
24"	3.5
30"	5.0

The entrance shall 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 shall be at least 3 percent. The soil around and under the pipe and entrance section shall be thoroughly compacted. The flared inlet section shall be securely connected to the slope drain and have watertight connecting bands.

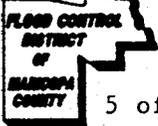
SYMBOL	PIPE SLOPE DRAIN	
P.S.D. 	3 of 6	
<p>Slope drain sections shall be securely fastened together and have gasketted watertight fittings, and be securely anchored into the soil.</p> <p>Interceptor dikes shall be used to direct runoff into a slope drain. The height of the dike shall be at least 1 foot higher at all points than the top of the inlet pipe.</p> <p>The area below the outlet must be stabilized with a riprap apron per attached construction drawings.</p> <p>If the pipe slope drain is conveying sediment-laden water, direct all flows into the sediment trapping facility.</p> <p><u>MAINTENANCE REQUIREMENTS</u></p> <p>Check inlet and outlet points regularly, and especially after heavy storms. The inlet should be free of undercutting, and no water should be going around the point of entry. If there are problems, 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.</p> <p>References (1,14)</p>		

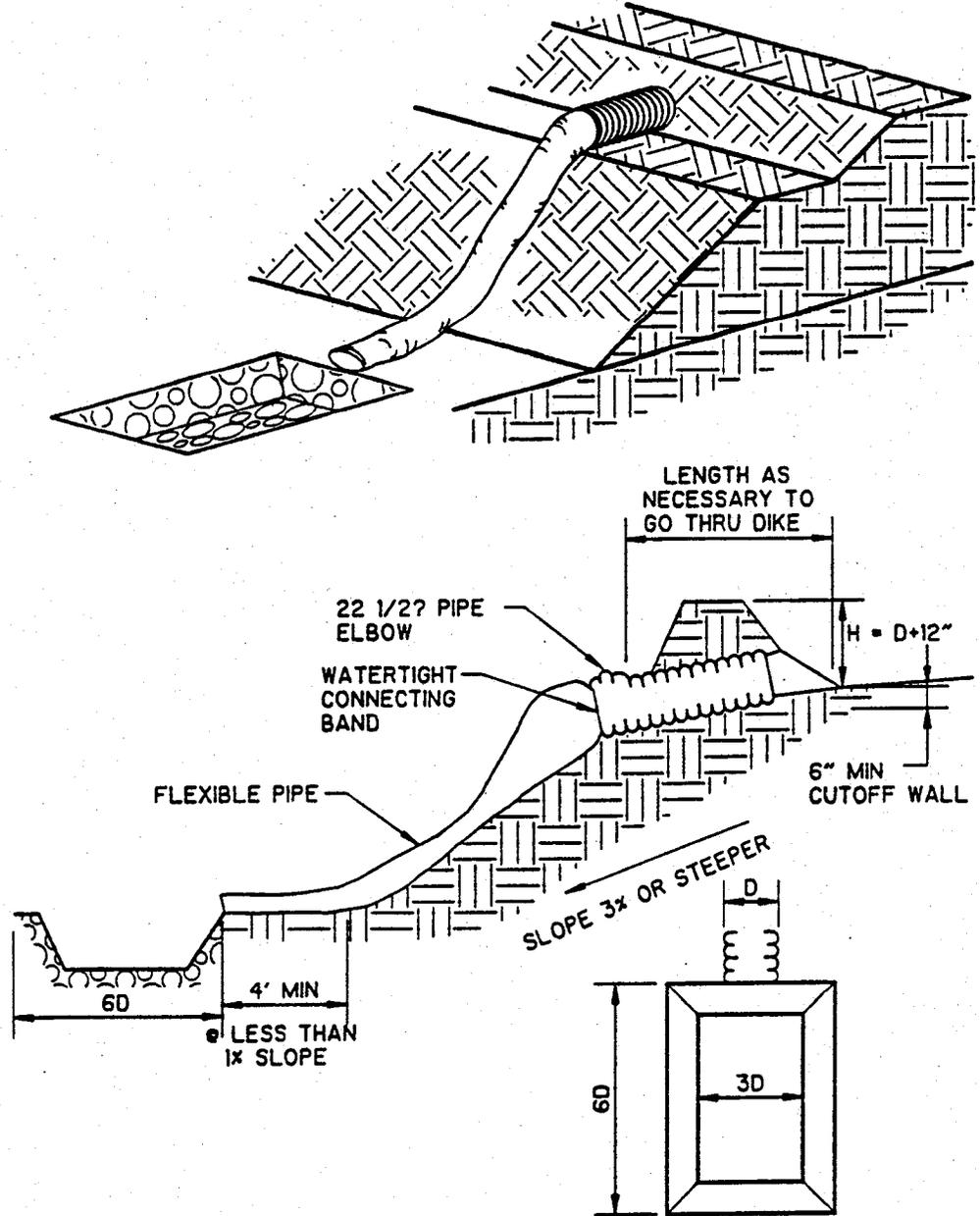
SYMBOL	PIPE SLOPE DRAIN	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 4 of 6
P.S.D. 		



RIPRAP SHALL CONSIST OF 6" DIAMETER STONE PLACED AS SHOWN AND SHALL BE MINIMUM OF 12" IN THICKNESS.

PIPE SLOPE DRAIN (RIGID)

SYMBOL	PIPE SLOPE DRAIN	 5 of 6
P.S.D.		



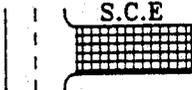
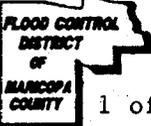
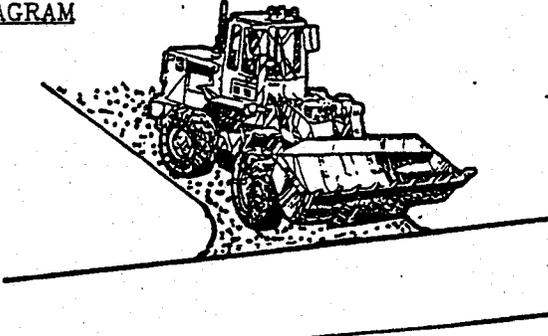
RIPRAP SHALL CONSIST OF 6" DIA STONE PLACED AS SHOWN. DEPTH OF APRON SHALL EQUAL THE PIPE DIA AND RIPRAP SHALL BE A MINIMUM OF 12" IN THICKNESS.

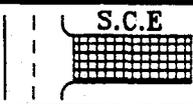
RIPRAP APRON PLAN

PIPE SLOPE DRAIN (FLEXIBLE)

SYMBOL	PIPE SLOPE DRAIN	 6 of 6
P.S.D. 		

NOTES:

<p>SYMBOL</p> 	<p>STABILIZED CONSTRUCTION ENTRANCE</p>	 <p>1 of 4</p>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS * NON-SEDIMENT POLLUTION CONTROL 	
<p><u>DEFINITION</u></p> <p>A stabilized pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk or parking area.</p> <p><u>PURPOSE</u></p> <p>The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets. Reducing trackout of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>A stabilized construction entrance should be used at all points of construction ingress and egress. NPDES permits require that appropriate measures be implemented to prevent trackout of sediments onto paved roadways.</p> <p><u>LIMITATIONS</u></p> <p>The stabilized construction entrance plan should be reviewed as part of the project traffic control plan.</p> <ul style="list-style-type: none"> • Construct on level ground. • Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff. 		

SYMBOL	STABILIZED CONSTRUCTION ENTRANCE	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 2 of 4
 S.C.E.		

PLANNING CONSIDERATIONS

Stabilized construction entrances are not very effective in removing sediment from equipment leaving a construction site. Efficiency is greatly increased, though when a washing rack is included as part of a stabilized construction entrance. Build on level ground.

◆ Advantages:

- Does remove some sediment from equipment and serves to channel construction traffic in and out of the site.

DESIGN & SIZING CONSIDERATIONS

The aggregate for stabilized construction entrance aprons shall be 1 to 3 inches in size, washed, well-graded gravel or crushed rock. The apron dimensions recommended are 30 ft. x 50 ft. and 6 inches deep.

- Entrance must be properly graded to prevent runoff from leaving the construction site.
- When wash areas are provided, washing shall be done on an area stabilized with crushed stone which drains into a properly constructed sediment trap or basin (pond).

MAINTENANCE REQUIREMENTS

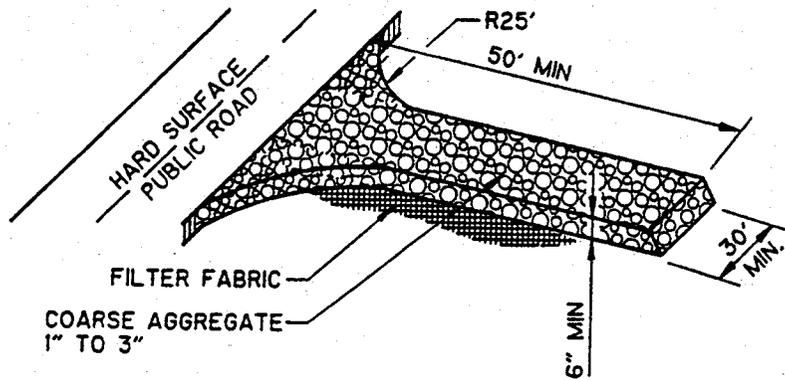
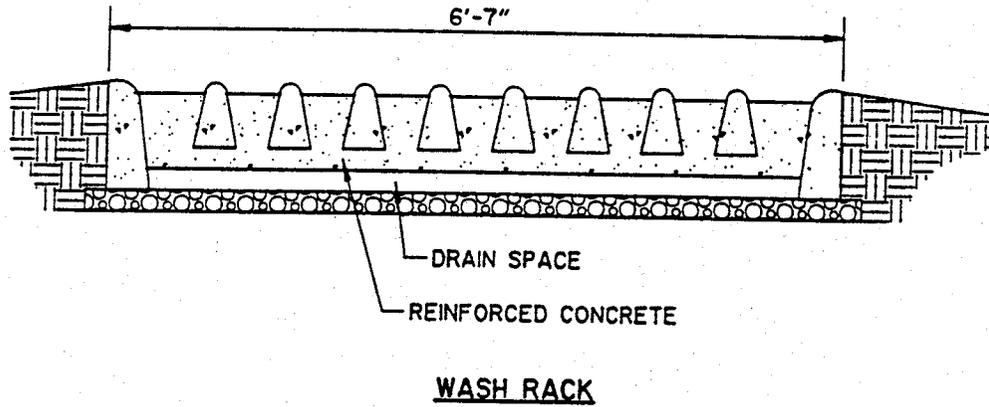
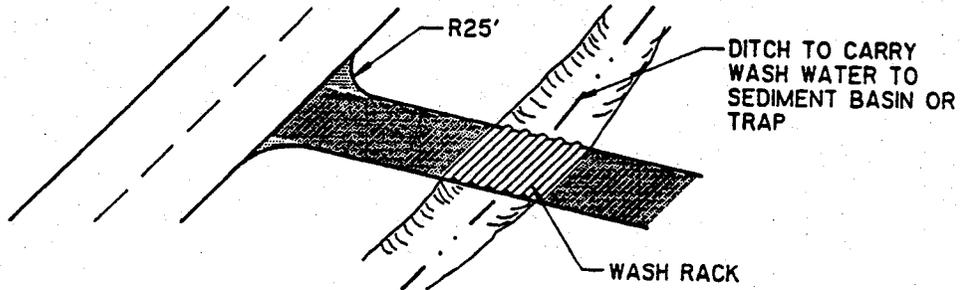
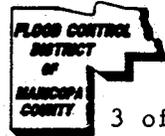
- Inspect monthly and after each rainfall.
- Replace gravel mat when surface voids are no longer visible. Periodic top dressing with additional stone will be required.
- All sediments deposited on paved roadways must be removed within 24 hours.
- Remove gravel and filter fabric upon completion of construction.

References (1,2)

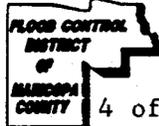
SYMBOL

S.C.E

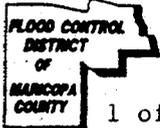
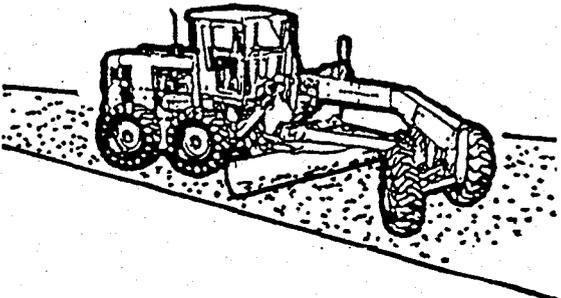
STABILIZED CONSTRUCTION ENTRANCE



STABILIZED CONSTRUCTION ENTRANCE

SYMBOL	STABILIZED CONSTRUCTION ENTRANCE	 FLOOD CONTROL DISTRICT OF HARFORD COUNTY 4 of 4
 S.C.E		

NOTES:

<p style="text-align: center;">SYMBOL</p> 	<p style="text-align: center;">CONSTRUCTION ROAD STABILIZATION</p> <div style="text-align: right;">  <p>1 of 2</p> </div>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> * PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>The temporary stabilization of access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes with gravel or by chemical stabilization immediately after grading.</p> <p><u>PURPOSE</u></p> <p>To reduce erosion of temporary road beds by construction traffic.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <ul style="list-style-type: none"> • Wherever parking areas are constructed, whether permanent or 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. <p><u>LIMITATIONS</u></p> <p>Measures on temporary roads must be cheap to install and also to remove. Application of aggregate or chemical stabilization to construction roads may need to be made more than once during a construction period.</p> <p>All unpaved construction roads will generate airborne dust. The contractor shall control dust in compliance with the requirements of the Maricopa County Air Quality Division, refer to Dust Control BMP for strategies to control dust including the use of chemical stabilization methods.</p>	

SYMBOL	CONSTRUCTION ROAD STABILIZATION	
		

PLANNING CONSIDERATIONS

Roads graded for construction vehicles are especially susceptible to erosion. The exposed soil surface is continually disturbed resulting in erosion, dust problems, and transport runoff waters along their surfaces. During wet weather, the roads may generate significant quantities of sediment that may be transported off-site in surface runoff or on the wheels of construction vehicles.

Permanent roads and parking areas should be paved as soon as possible after grading. As an alternative where construction will be phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems.

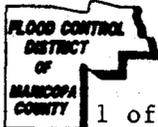
DESIGN & SIZING CRITERIA

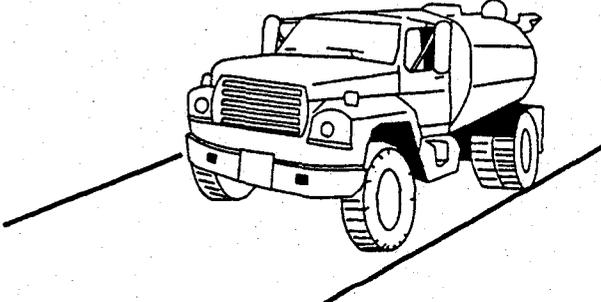
A 6-inch course of 2 to 4-inch crushed rock, gravel base, or crushed surfacing base course shall be applied immediately after grading or the completion of utility installation within the right-of-way. A 4-inch course of aggregate base course may be used in lieu of the crushed rock. Chemical stabilization may also be used upon compacted native sub-grade. Acceptable chemical stabilization methods are listed in the Dust Control BMP fact sheet. These chemical controls should be applied per the manufacturers directions.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible. 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 shall be protected to prevent sediment-laden water entering the drain sewer system (see Storm Drain Inlet Protection BMP).

MAINTENANCE REQUIREMENTS

Inspect stabilized areas regularly, especially after large storm events. Add rock or gravel if necessary to stabilize any erosion. Reference (10,14)

SYMBOL	DUST CONTROL	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 1 of 4
		

<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
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DEFINITION

A comprehensive plan to limit off-site sedimentation by controlling the sites potential for producing air borne fugitive dust and track-out of sediments.

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 also limit quantity of sediments in stormwater.

APPROPRIATE APPLICATIONS

Primary sources of dust from development and construction activities are:

- 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 requirements of the air pollution control permit. Refer to Appendix D for additional information on dust control in Maricopa County. The Division of Air Pollution Control's approach to reduce air pollution from construction sites will be to require:

SYMBOL	DUST CONTROL	 2 of 4
		

- 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.

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.

The following Table, Dust Control Application provides guidance on the appropriate best management practices recommended for typical field operations and conditions

There are many products available as dust palliatives for chemically stabilizing gravel roadways and stockpiles. The types of chemicals available and recommendations for their use are tabulated in the chart of Commonly Used Dust Palliatives.

MAINTENANCE REQUIREMENTS

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



SYMBOL

TABLE: DUST CONTROL APPLICATORS

FIELD CONDITION	PERMANENT VEGETATION	MULCHING	WET SUPPRESSION (WATERING)	CHEMICAL DUST SUPPRESSION	GRAVEL OR ASPHALT SURFACING	SAND FENCES	TEMPORARY GRAVEL CONSTRUCTION ENTRANCES\ EQUIPMENT WASH DOWN	HAUL TRUCK COVERS	MINIMIZE EXTENT OF AREA DISTURBED
DISTURBED AREAS NOT SUBJECT TO TRAFFIC	X	X	X	X	X				
DISTURBED AREAS SUBJECT TO TRAFFIC			X	X	X				X
MATERIAL STOCK PILE STABILIZATION			X	X		X			
DEMOLITION			X				X	X	
CLEARING/ EXCAVATION			X	X					X
TRUCK TRAFFIC ON UNPAVED ROADS			X	X	X			X	
MUD/DIRT CARRYOUT					X		X		

DUST CONTROL



FLOR CONTROL DISTRICT OF ALLEGHENY COUNTY
3 OF 4

BMP-45

BMP-46

COMMONLY USED CHEMICAL DUST PALLIATIVES

	SALTS	LIGNOSULFONATES	BITUMENS
	DELIQUESCENT AND HYDROSCOPIC CHEMICALS	ORGANIC NON-BITUMINOUS BINDERS	PETROLEUM BASED PRODUCTS ¹
CHEMICAL TYPES	<ul style="list-style-type: none"> • Calcium Chloride² • Magnesium Chloride • Natural Brines 	<ul style="list-style-type: none"> • Calcium Lignosulfonate • Sodium Lignosulfonate • Ammonium Lignosulfonate 	<ul style="list-style-type: none"> • Bunker Oil • Asphalt Primer • Emulsified Asphalt
LIMITATIONS	<p>Can lose effectiveness in dry periods with low humidity. Leaches from road in heavy rain.</p> <p>Not recommended for gravel road surfaces with low fines. Recommended 10-20% fines.</p>	<p>Not affected by dry weather and low humidity. Leached from road in heavy rain if not sufficiently cured.</p> <p>Best performance on gravel roads with high surface fines (10-30%) and dense compact surface with no loose gravel.</p>	<p>Generally effective regardless of climatic conditions may pothole in wet weather.</p> <p>Best performance on gravel roads with 5-10% fines.</p>
COMMENTS	<p>Calcium Chloride is popular. May become slippery when wet on gravel surfaces with high fines.</p>	<p>Ineffective on gravel surfaces low in fines. May become slippery when wet on gravel surfaces with high fines content.</p>	<p>Creates a hardened crust.</p>

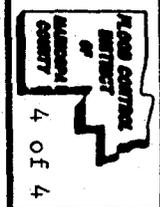
¹Motor oils and oil treatments are not recommended due to adverse effects on plant life and groundwater.

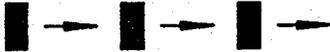
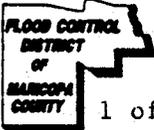
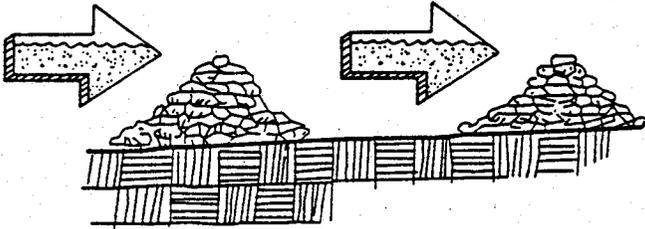
²Not recommended due to adverse effects on plant life.



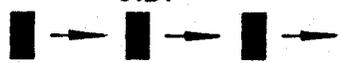
SYMBOL

DUST CONTROL



<p style="text-align: center;">SYMBOL</p> <p style="text-align: center;">C.D.</p> 	<p style="text-align: center;">CHECK DAMS</p> <div style="text-align: right;">  <p>1 of 4</p> </div>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING * DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>Small temporary dams constructed across a swale or drainage ditch.</p> <p><u>PURPOSE</u></p> <p>Check dams reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch, and slow water velocity to allow sediment capture.</p> <p><u>APPROPRIATE APPLICATION</u></p> <p>Check dams are used to reduce the velocity of channel flow in smaller channels and temporary swales. This practice is limited to use in small open channels which drain 10 acres or less.</p> <p><u>LIMITATIONS</u></p> <p>Check dams should not be used in live streams. Do not install in channels which have already been lined or vegetated.</p> <p><u>PLANNING CONSIDERATIONS</u></p> <p>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.</p>	

SYMBOL	CHECK DAMS	
C.D.		



◆ Advantages:

- Check dams reduce the need for more stringent erosion control practices in the swale due to the decreased velocity and energy of runoff.

DESIGN & SIZING CRITERIA

Check dams can be constructed of either rock or logs. Provide a deep sump immediately upstream.

The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

Rock check dams shall be constructed of appropriately sized rock of D50 equal to 8"-12" minimum. The rock must be placed by hand or mechanical placement (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges. The rock used must be large enough to stay in place given the expected design flow through the channel.

Log check dams shall be constructed of 4 to 6-inch diameter logs. The logs shall be embedded into the soil at least 18 inches.

In the case of grass-lined ditches and swales, check dams shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.

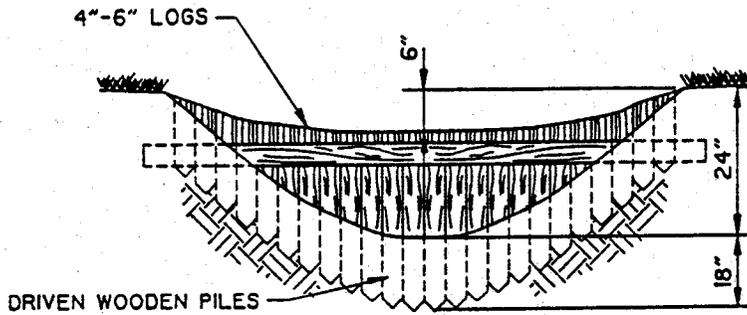
MAINTENANCE REQUIREMENTS

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches on half the sump depth.

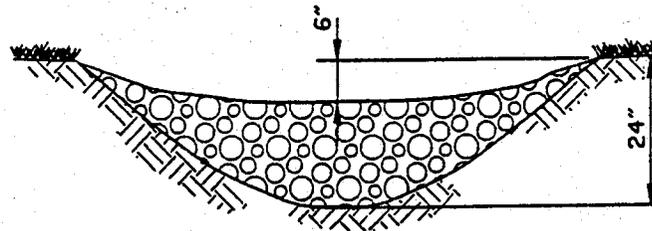
Reference (1,14)

SYMBOL

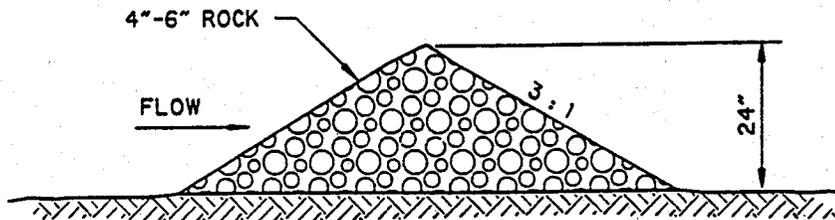
CHECK DAMS



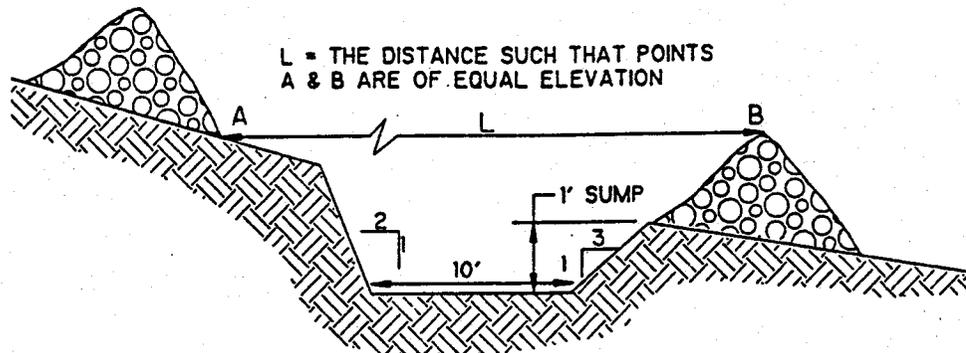
LOG CHECK DAM



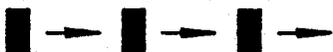
ROCK CHECK DAM



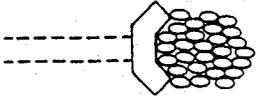
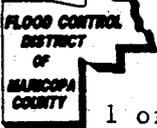
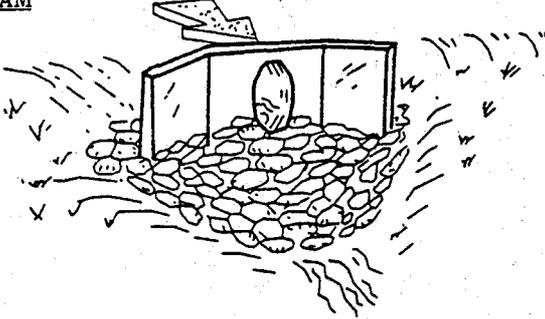
ROCK CHECK DAM CROSS-SECTION

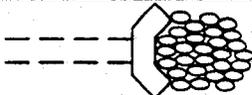


SPACING BETWEEN CHECK DAMS

SYMBOL	CHECK DAMS	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
C.D. 		

NOTES:

<p style="text-align: center;">SYMBOL</p> 	<h2>ROCK OUTLET PROTECTION</h2>	 <p>1 of 4</p>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING * DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 	
<p><u>DEFINITION</u></p> <p>A section of rock protection placed at the outlet end of culverts, conduits or channels. Grouted riprap and concrete rubble are also used for pipe outlet stabilization.</p> <p><u>PURPOSE</u></p> <p>The purpose of the rock outlet protection is to reduce the velocity, and energy of water, such that the flow will not erode the receiving downstream reach.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>This practice applies where discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the next downstream reach.</p> <p>Rock outlet protection is usually less expensive and easier to install than concrete aprons or energy dissipators. It also serves to trap sediment and reduce flow velocities. Rock size should be increased for high velocity flows.</p> <p><u>LIMITATIONS</u></p> <p>Rock outlet protection may need continual maintenance because large storms often wash away the stone and leave the area susceptible to erosion. Grouted or wire-tied rock riprap can minimize maintenance requirements.</p>		

SYMBOL	ROCK OUTLET PROTECTION	 FLOOD CONTROL DISTRICT OF HANCOCK COUNTY 2 of 4
		

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.

DESIGN & SIZING CRITERIA

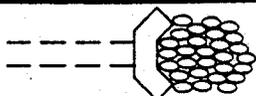
General recommendations for rock size and length of outlet protection mat shown in the rock outlet protection figure. Best results are obtained when sound, durable, angular rock is used.

MAINTENANCE

Inspect monthly and after each rainfall. Replace rocks as needed.

Reference (2,11,14)

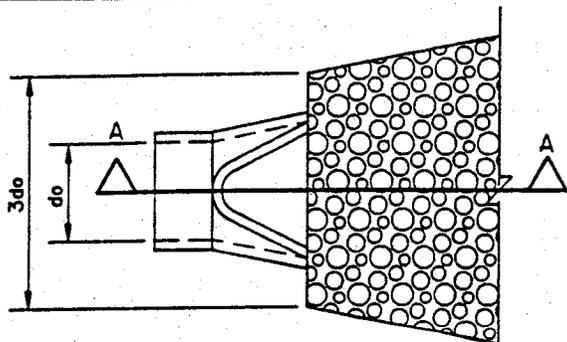
SYMBOL



ROCK OUTLET PROTECTION

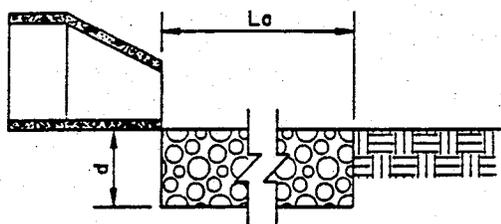


3 of 4



L_a = LENGTH OF APRON
 d_o = INSIDE PIPE DIAMETER

PLAN



SECTION A-A

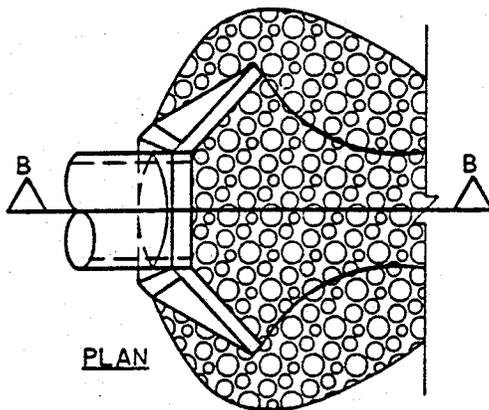
PIPE OUTLET TO FLAT AREA
 WITH NO DEFINED CHANNEL

NOTES

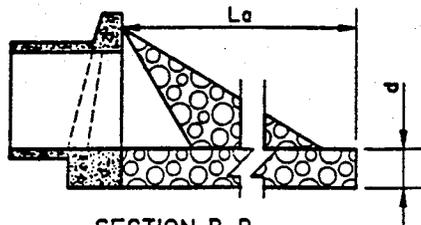
1. APRON LINING MAY BE RIPRAP, GROUDED RIPRAP, OR CONCRETE.
2. WHERE AS TECHNICAL DESIGN PROCEDURES EXIST FOR DETERMINING L_a , FCDML RECOMMENDS USE OF THE FOLLOWING TABLE FOR TEMPORARY ROCK OUTLET PROTECTION.

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

3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6 INCHES.



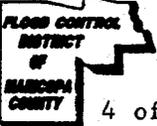
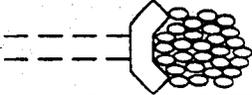
PLAN

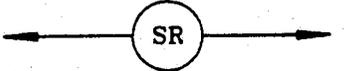
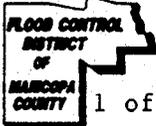
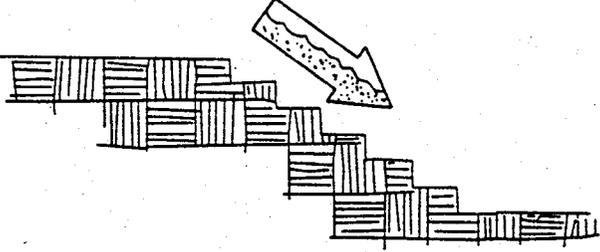


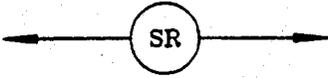
SECTION B-B

PIPE OUTLET TO WELL-DEFINED CHANNEL

PIPE OUTLET CONDITIONS

SYMBOL	ROCK OUTLET PROTECTION	
	4 of 4	
<p>NOTES:</p>		

<p style="text-align: center;">SYMBOL</p> <div style="text-align: center;">  </div>	<p style="text-align: center;">SURFACE ROUGHENING</p> <div style="text-align: right;">  <p>1 of 4</p> </div>
<p><u>DIAGRAM</u></p> <div style="text-align: center;">  </div>	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL * SLOPE PROTECTION — SEDIMENT TRAPPING * DRAINAGEWAY & STREAM PROTECTION * TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>Provision of a rough soil surface with horizontal depressions created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.</p> <p><u>PURPOSE</u></p> <p>To aid in establishment of vegetative cover, reduce runoff velocity, and increase infiltration, and provide for sediment trapping.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>All non-vegetated, erodible slopes steeper than 3:1, and greater than 5 vertical feet, require surface roughening, either stair-step grading, grooving, furrowing, or tracking if they are to be stabilized with vegetation.</p> <p>Surface roughening provides erosion protection on bare soil while vegetative cover is being established by slowing the runoff and allowing infiltration.</p> <p>It is an inexpensive and simple erosion control measure for roadway cut slopes.</p>	

SYMBOL	SURFACE ROUGHENING	
		

LIMITATIONS

While this is a cheap and simple method of erosion control, it is of limited effectiveness in anything more than a moderate storm

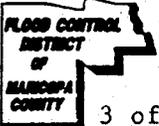
PLANNING CONSIDERATIONS

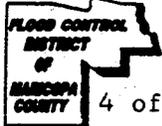
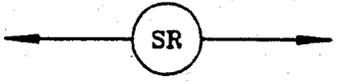
Graded areas with smooth, hard surfaces give a false impression of "finished grading" and a job well done. It is difficult to establish vegetation on such surfaces due to reduced water infiltration and the potential for erosion. Rough slope surfaces with uneven soil and rocks left in place may appear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

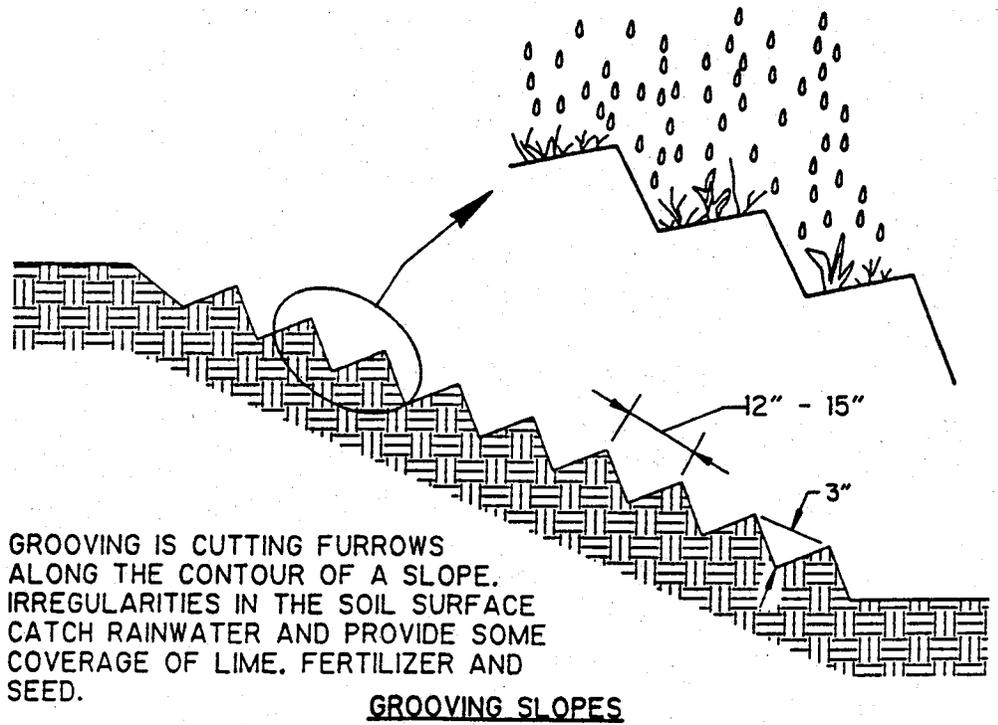
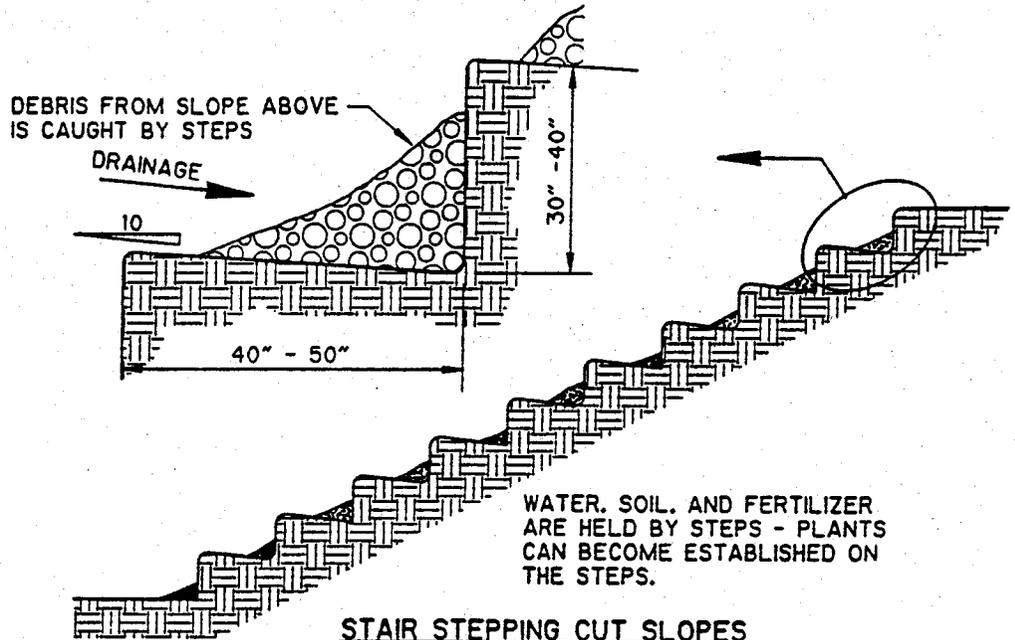
Rough, loose soil surfaces give lime, fertilizer, and seed some natural coverage. Niches in the surface provide microclimates which generally provide a cooler and more favorable moisture level than hard flat surfaces; this aids seed germination.

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.

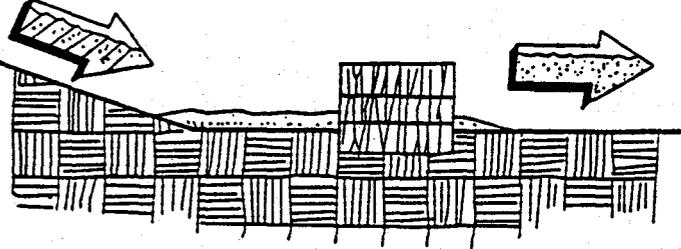
1. Disturbed areas which will not require mowing may be stair-step graded, grooved, or left rough after filling.
2. Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material which sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment.

SYMBOL	SURFACE ROUGHENING	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 3 of 4
		
<p>3. Areas which will be mowed (these areas should have slopes less than 3:1) may have small furrows left by discing, harrowing, raking, or seed-planting machinery operated on the contour.</p> <p>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.</p> <p><u>DESIGN & SIZING CRITERIA</u></p> <p>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.</p> <p>Graded areas steeper than 2:1 should be stair-stepped with benches as shown in the attached figure. The stair-stepping will help vegetation become established and also trap soil eroded from the slopes above.</p> <p><u>MAINTENANCE REQUIREMENTS</u></p> <p>Areas which are to be re-vegetated in this manner should be seeded as quickly as possible.</p> <p>Regular inspections should be made of the area.</p> <p>Reference (14)</p>		

SYMBOL	SURFACE ROUGHENING	 FLOOD CONTROL DISTRICT OF HARBISON COUNTY 4 of 4
		



STAIR-STEPPING CUT SLOPES AND GROOVING SLOPES

SYMBOL	STRAW BALE BARRIERS		
S.B.B. 			1 of 4
<u>DIAGRAM</u> 	<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> * PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 		
<u>DEFINITION</u> <p>A temporary barrier of straw bales or similar material used to intercept sediment laden runoff from small drainage areas of disturbed soil.</p> <u>PURPOSE</u> <p>The purpose of a straw bale dike is to reduce runoff velocity and cause deposition of the transported sediment load.</p> <u>APPROPRIATE APPLICATIONS</u> <p>The straw bale dike is used 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, below disturbed areas subject to sheet flow of runoff to intercept and detain sediment.</p> <u>LIMITATIONS</u> <ul style="list-style-type: none"> • Straw bale dikes are not to be used for extended periods of time because they tend to rot and fall apart. • Suitable only for sheet flow on slopes of 2% or flatter. • Not appropriate for large drainage areas, limit to one acre or less. • Straw bales lose their effectiveness rapidly due to rotting, thus constant maintenance is required. • Not recommended for concentrated flow, channel flow, and live streams. • Bale bindings of jute or cotton not recommended. 			

SYMBOL

STRAW BALE BARRIERS



S.B.B.



PLANNING CONSIDERATIONS

When installed and maintained properly, straw bale dikes remove approximately 67% of the sediment transported in construction site runoff. This optimum efficiency can only be achieved through careful maintenance with special attention to replacing rotted or broken bales. Barrier should be constructed on a level contour to prevent concentration of flow against a small portion of the barrier.

DESIGN & SIZING CRITERIA

1. Bales shall be placed on the contour and in a row with ends tightly abutting the adjacent bales.
2. Maximize ponding by locating barrier away from the toe-of-slopes. This also provides access for maintenance.
3. Each bale shall be embedded in the soil a minimum of four inches and placed so the bindings are horizontal. Bindings placed on soil will soon disintegrate and cause the barrier to fail.
4. Bales shall be securely anchored in place by either two stakes or re-bars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together. Stakes shall be driven flush with the bale.
5. Bales shall be removed when they have served their usefulness so as not to block or impede storm flow or drainage.

MAINTENANCE REQUIREMENTS

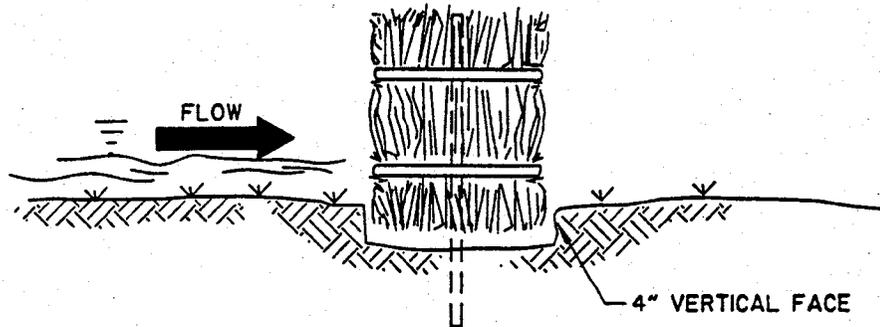
Inspect monthly and after each rain event. Remove and properly dispose of detained sediments when silt depth reaches 6".

References (1,2,4,14)

SYMBOL

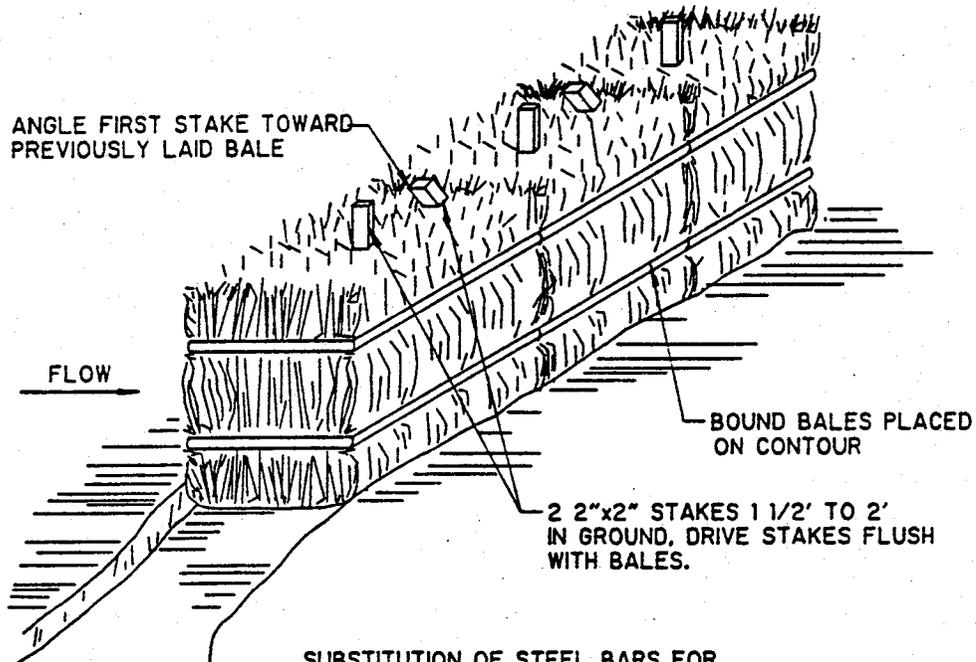
STRAW BALE BARRIERS

S.B.B.
■ ■ ■ ■ ■ ■



- PROMOTES ON SITE SEDIMENTATION BY CREATING A TEMPORARY POND.

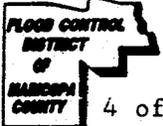
BEDDING DETAIL



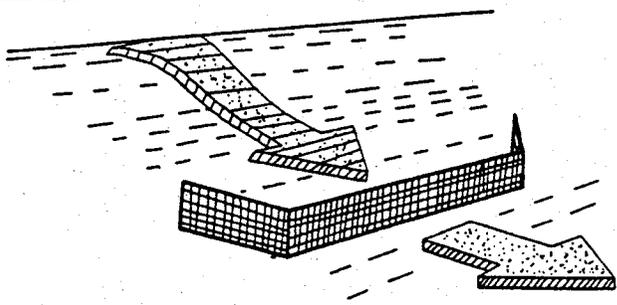
SUBSTITUTION OF STEEL BARS FOR WOODEN STAKES IS NOT RECOMMENDED DUE TO POTENTIAL FOR DAMAGING CONSTRUCTION EQUIPMENT

ANCHORING DETAIL

STRAW BALE BARRIERS

SYMBOL	STRAW BALE BARRIERS	 FLOOD CONTROL DISTRICT OF HARRISON COUNTY 4 of 4
S.B.B. ■ ■ ■ ■ ■ ■		

NOTES:

SYMBOL	SILT FENCE 
 S.F.	
<u>DIAGRAM</u> 	<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> * PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts, entrenched, and, depending upon the strength of the fabric used, with wire fence for support.</p> <p><u>PURPOSE</u></p> <ol style="list-style-type: none"> 1. To intercept and detain <u>small amounts</u> of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site. 2. To decrease the velocity of sheet flows and low-to-moderate level channel flows. <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Filter fences must be provided just upstream of the point(s) of discharge of runoff from a site, before the flow becomes concentrated. They may also be used:</p> <ol style="list-style-type: none"> 1. Below disturbed areas where runoff may occur in the form of sheet and rill erosion; wherever runoff has the potential to impact downstream resources. 2. Perpendicular to minor swales or ditch lines for up to one acre contributing drainage areas. <p>Not intended for use in detaining concentrated flows.</p> <p>Synthetic fabric filter fences are only applicable for sheet or overland flows and not the volumes of water in concentrated flows.</p>	

SYMBOL	SILT FENCE	
S.F. 		

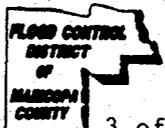
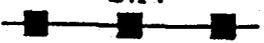
LIMITATIONS

- Filter fences will create a temporary sedimentation pond on the upstream side of the fence which may cause temporary flooding. Fences not constructed on a level contour will be overtopped by concentrated flow resulting in failure of the filter fence.
- Filter fences are not practical where large flows of water are involved, hence the need to restrict their use to drainage areas of one acre or less, and flow rates of less than 0.5 cfs.
- Problems may arise from incorrect selection of pore size and/or improper installation.
- Do not allow water depth to exceed 1.5 feet at any point.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.

PLANNING CONSIDERATIONS

Laboratory work at the Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. 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.

- 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.

SYMBOL	SILT FENCE	 <small>FLOOD CONTROL DISTRICT OF MADISON COUNTY</small>
 S.F.		

DESIGN & SIZING CRITERIA

- 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, 1:1.
- Maximum sheet or overland flow path length to the fence \leq 100 feet.
- No concentrated flows greater than 0.5 cfs.

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 shall 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. The following criteria is recommended for selection of the equivalent opening size:

1. If 50 percent or less of the soil, by weight, will pass the U.S. standard sieve No. 200, select the EOS to retain 85 percent of the soil. The EOS should not be finer than EOS 70.
2. For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 [0.0083 in. (0.21 mm.)] except where direct discharge to a stream, lake, or wetland will occur, then the EOS shall be no larger than Standard Sieve No. 100.

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U.S. Standard Sieve No. 100 [0.0059 in. (0.15 mm.)]. If 85 percent or more of a soil, by weight, passes through the openings in a No. 200 sieve [0.0029 in. (0.074 mm.)], filter fabric shall not be used. Most of the particles in such a soil would not be retained if the EOS was too large, and they would clog the fabric quickly if the EOS was small enough to capture the soil.

SYMBOL	SILT FENCE	
S.F.		

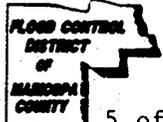


Selection of fabric tensile strength and bursting strength characteristics shall be supported with wire mesh in and as recommended by the fabric manufacturer. Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable life at a temperature range of 0° F. to 120° F.

◆ Typical Installation:

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

- a. Posts shall be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 30 inches.
- b. A trench shall be excavated approximately 8 inches wide and 12 inches deep along the line of posts and upslope from the barrier.
- c. When standard strength filter fabric is used, a wire mesh support fence shall 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 shall extend into the trench a minimum of 4 inches.
- d. The standard strength filter fabric shall be stapled or wired to the fence, and 20 inches of the fabric shall 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.
- e. The use of joints should be avoided. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6 inch overlap and both ends securely fastened to the post.
- f. The trench shall be backfilled with 3/4-inch minimum diameter washed gravel or compacted native material.

SYMBOL	SILT FENCE	
 S.F.		

MAINTENANCE REQUIREMENTS

Inspect monthly during dry periods and immediately after each rainfall. Repair as necessary. Sediment must be removed when it reaches approximately one third the height of the fence, especially if heavy rains are expected.

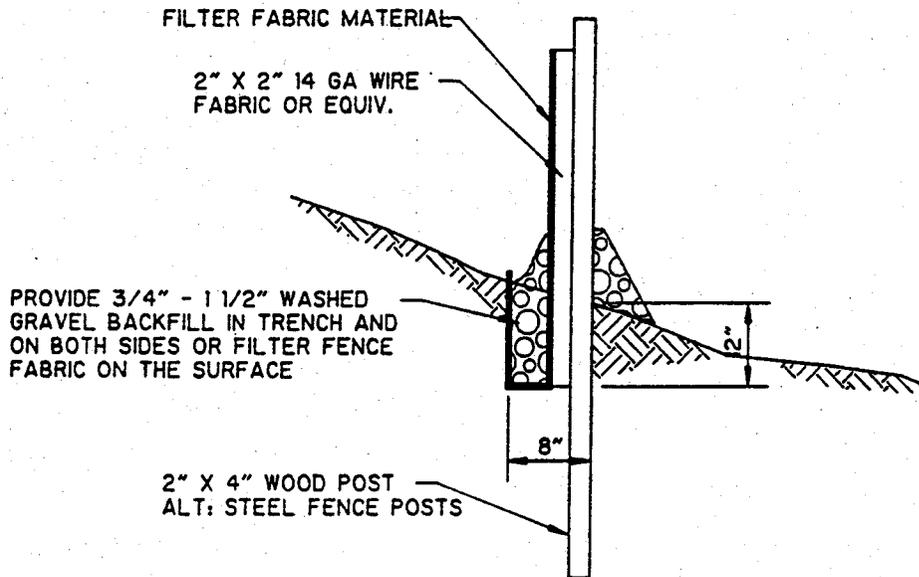
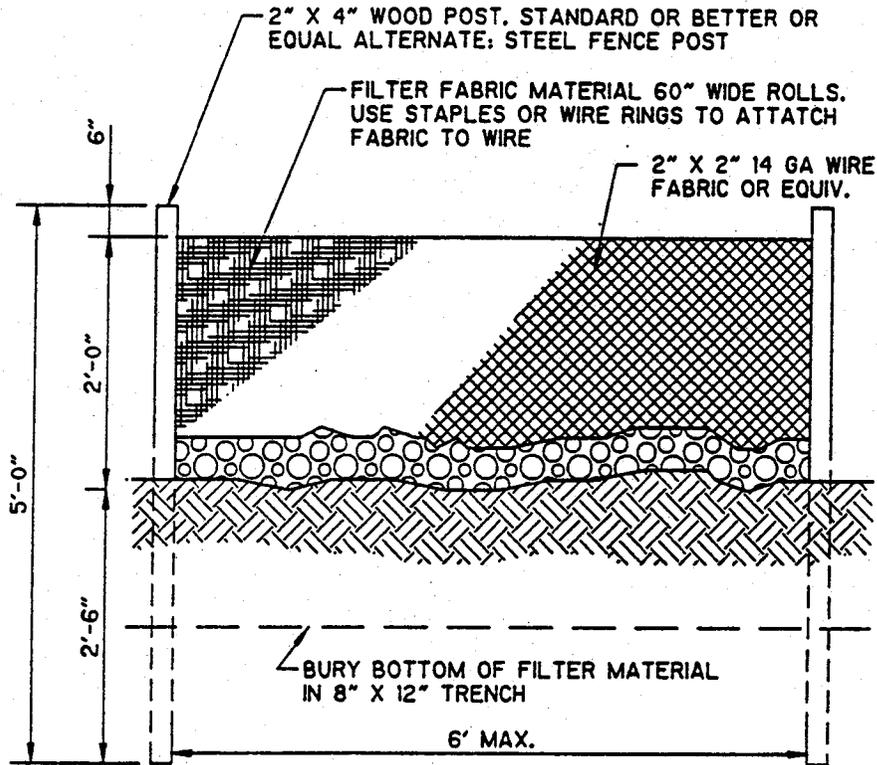
Filter fences should not be removed until the upslope area has been permanently stabilized.

References (1,2,14)

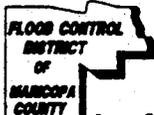
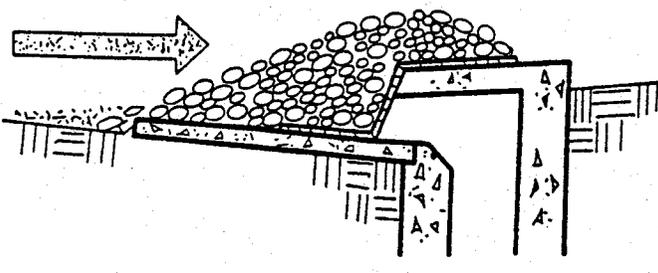
SYMBOL

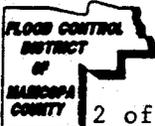
SILT FENCE

S.F.



SILT FENCE

<p style="text-align: center;">SYMBOL</p>  <p style="text-align: center;">I.P.</p>	<p style="text-align: center;">STORM DRAIN INLET PROTECTION</p> <div style="text-align: right;">  <p>FLOOD CONTROL DISTRICT OF MARICOPA COUNTY</p> </div> <p style="text-align: right;">1 of 6</p>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING * DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>A sediment filter or an excavated impounding area around a storm drain, drop inlet, or curb inlet.</p> <p><u>PURPOSE</u></p> <p>To prevent sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. Different types of structures are applicable to different conditions:</p> <ol style="list-style-type: none"> a. <u>Filter Fabric Fence</u> - Applicable where the inlet drains a relatively small (less than 1 acre) flat area (less than 5 percent slope). Do not place fabric under grate as the collected sediment may fall into the drain when the fabric is retrieved. b. <u>Excavated Drop Inlet Sediment Trap</u> - Protection against sediment entering a storm drain inlet can be provided by excavating an area in the approach to the drain. The drainage area for a drain protected in this manner is one acre. Provide weep holes to drain the shallow pool. <p>◆ Advantages:</p> <ul style="list-style-type: none"> • Inlet protection prevents sediment from entering the storm drain system and clogging it. 	

SYMBOL	STORM DRAIN INLET PROTECTION	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 I.P.		

LIMITATIONS

- 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 acre or less. For larger drainage areas, smaller sediment catchment areas are recommended.

PLANNING CONSIDERATIONS

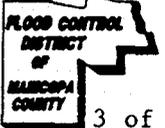
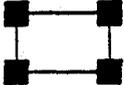
Where storm sewers are made operational before their drainage area is stabilized, or where construction is adjacent to an existing storm sewer, large amounts of sediment may enter the storm sewer system. In cases of extreme sediment loading, the storm sewer itself may clog and lose a major portion of 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.

DESIGN & SIZING CRITERIA

Grates and spaces of all inlets should be secured to prevent seepage of sediment-laden water. All inlet protection measures should include sediment sumps of 1 to 2 feet in depth and with 2:1 side slopes. Installation procedure for filter fabric fence:

- a. 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. The stakes must be at least 3 feet long.

SYMBOL	STORM DRAIN INLET PROTECTION	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 I.P.		

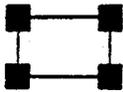
- b. Excavate a trench approximately 8 inches wide and 12 inches deep around the outside perimeter of the stakes.
- c. Staple the filter fabric (for materials and specifications, see Silt Fence BMP) to wooden stakes so that 32 inches of the fabric extends out and can be formed into the trench. Use heavy-duty wire staples at least 1/2 inch in length.
- d. Backfill the trench with 3/4 inch or less washed gravel all the way around.

MAINTENANCE REQUIREMENTS

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 one-half the height of the fence. If a sump is used, sediment should be removed when it fills approximately one-half the depth of the hole.

References (1,3,11,14,23

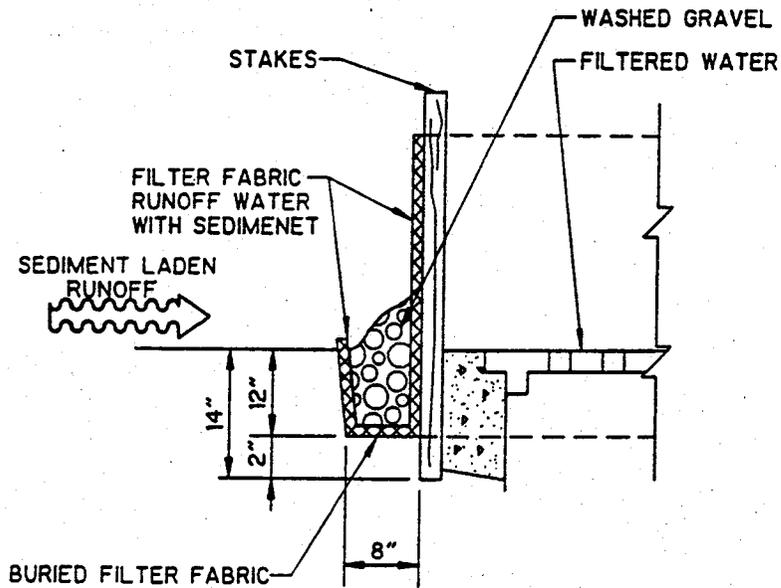
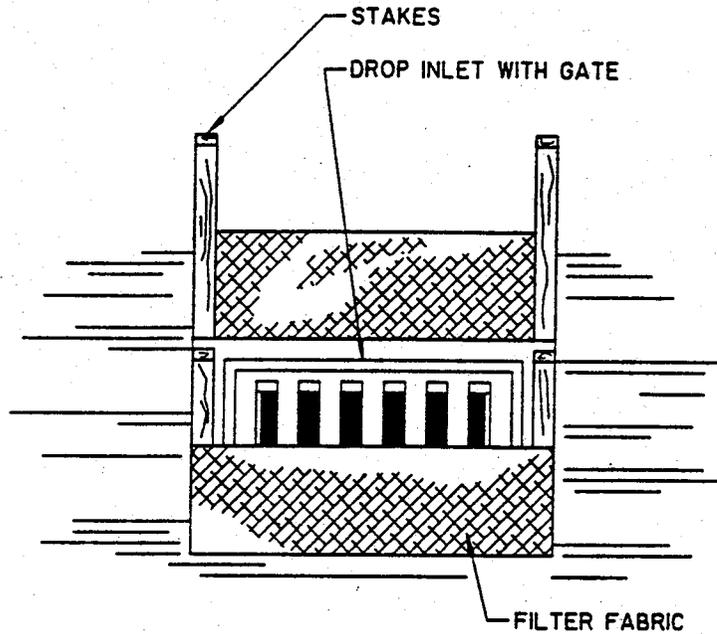
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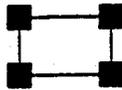
STORM DRAIN INLET PROTECTION

FLOOD CONTROL
DISTRICT
OF
MARICOPA
COUNTY 4 of 6



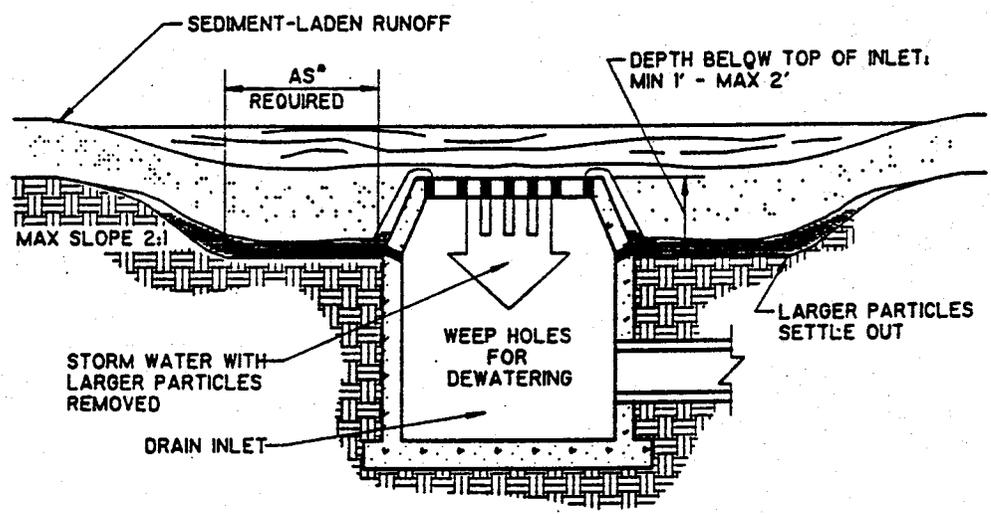
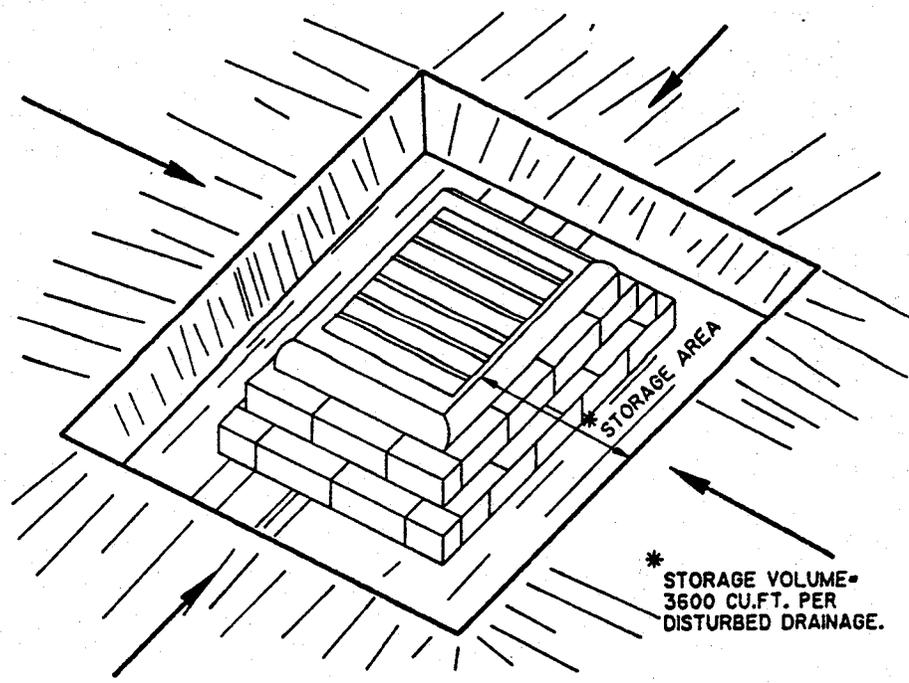
FILTER FABRIC FENCE DROP INLET FILTER

SYMBOL



I.P.

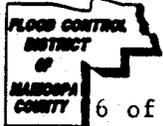
STORM DRAIN INLET PROTECTION



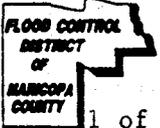
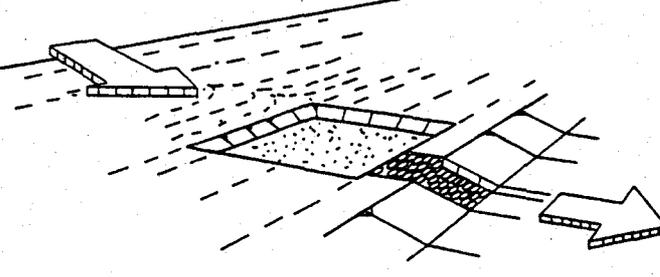
SPECIFIC APPLICATION

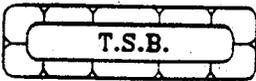
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPABILITY AND EASE OF MAINTENANCE ARE DESIRABLE.

EXCAVATED DROP INLET SEDIMENT TRAP

SYMBOL	STORM DRAIN INLET PROTECTION	 FLOOD CONTROL DISTRICT OF HARBISON COUNTY
 I.P.		6 of 6

NOTES:

SYMBOL	TEMPORARY SEDIMENT TRAP		 1 of 6
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">S.T.</div>			
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 		
<p><u>DEFINITION</u></p> <p>A small temporary ponding area, with a gravel outlet, formed by excavation and/or by constructing an earthen embankment.</p> <p><u>PURPOSE</u></p> <p>To collect and store sediment from sites cleared and/or graded during construction. It is intended for use on relatively small building areas, with no unusual drainage features, and projected quick build-out time. It should help in reducing silt-laden runoff. The trap is a <u>temporary</u> 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.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Proposed building sites where the tributary drainage area is less than <u>10 acres</u>. Typically installed in a drainageway and/or point of discharge from a disturbed area.</p> <p><u>LIMITATIONS</u></p> <ol style="list-style-type: none"> 1. Serves only limited areas. 2. Sediment traps are only practically effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first. 			

SYMBOL	TEMPORARY SEDIMENT BASIN	 <small>2 of 6</small>
 <small>T.S.B.</small>		

PLANNING CONSIDERATIONS

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 10 acres, refer to Sediment Ponds, or subdivide the catchment area into smaller drainage basins.

Sediment must be removed from the trap after each rainfall event. Plans shall detail how this sediment is to be disposed of, such as by use in fill areas on-site, or removal to an approved off-site dump. Sediment traps, along with other perimeter controls, shall 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 or service public roads or utilities. Also, sediment traps and ponds are attractive to children and can be dangerous. The following recommendations should be implemented to reduce risks.

1. Install continuous fencing around the sediment trap or pond. Consult local ordinances regarding requirements for maintaining health and safety.
2. Restrict basin side slopes to 3:1 or flatter.

DESIGN & SIZING CRITERIA

The sediment trap may be formed completely by excavation or by construction of a compacted embankment. It shall have a 1.5 foot deep sump for sediment storage. The outlet shall 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. In Maricopa County the recommended sediment trap size is 3600 cubic feet per acre of disturbed upstream drainage area for drainage areas of 10 acres or less. This roughly equates to a trap volume necessary to pond the precipitation from a 1 inch rain event.

SYMBOL	TEMPORARY SEDIMENT TRAP	 FLOOD CONTROL DISTRICT OF HANCOCK COUNTY
S.T.		

After determining the necessary volume, size the trap by adding an additional 1½ feet for sediment accumulation to the volume computed.

- To complete the design of the temporary sediment trap:
 - a. Calculate required trap volume
Required Volume = 3600 cubic feet per acre
 - b. A 3:1 or flatter aspect ratio between the trap length and width of the trap is desirable. Length is defined as the average distance from the inlet to the outlet of the trap.
 - c. Determine the bottom and top surface area of the sediment storage volume to be provided using 1 feet in depth for sediment storage, 2 feet settling depth and 3:1 side slopes from the bottom of the trap. Note the trap bottom should be level.
 - d. Determine the total trap dimensions by adding the depth required for the 2-year, 24-hour design storm above the surface of the sediment storage volume, while not exceeding 3:1 side slopes (see attached figure).
Required Depth = 3½ feet (2 feet settling depth and 1½ feet sediment storage)

MAINTENANCE REQUIREMENTS

The key to having a functional sediment trap is continual monitoring and regular maintenance. The size of the trap is less important to its effectiveness than is regular sediment removal. Sediment should be removed from the trap when it reaches approximately one foot in depth (assuming a 1.5 foot sediment accumulation depth. Regular monthly inspections should be done and additional inspections made after each large runoff-producing storm.

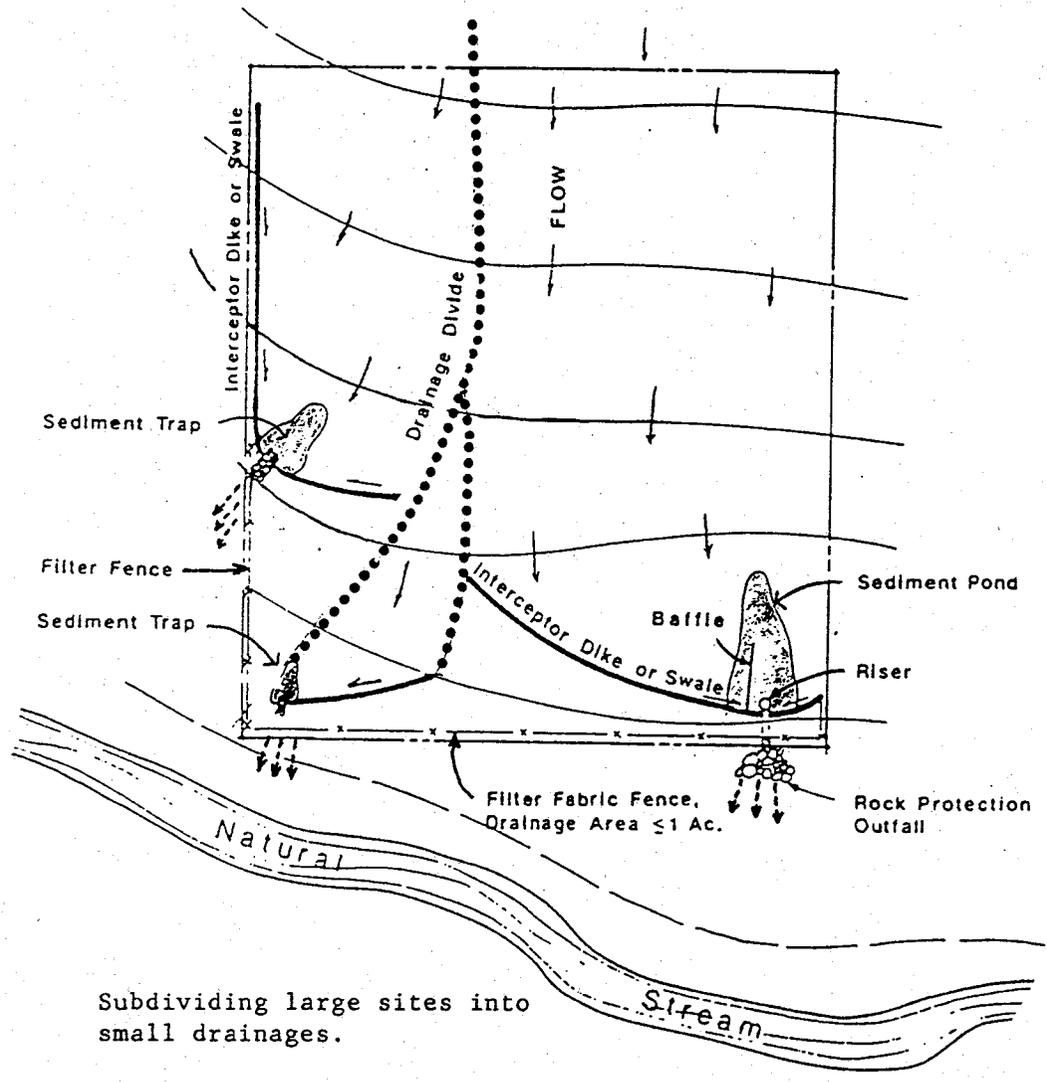
References (1,2,14)

SYMBOL

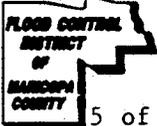
TEMPORARY SEDIMENT TRAP

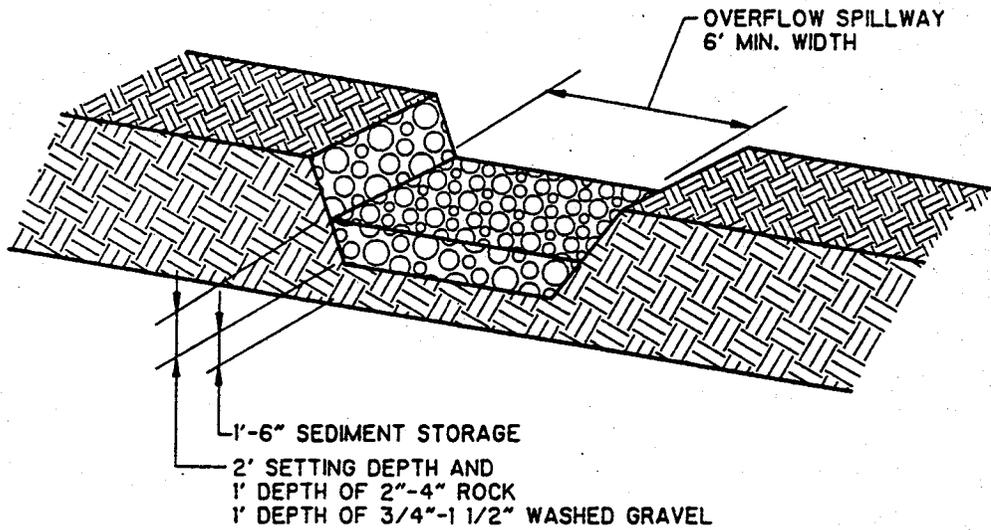
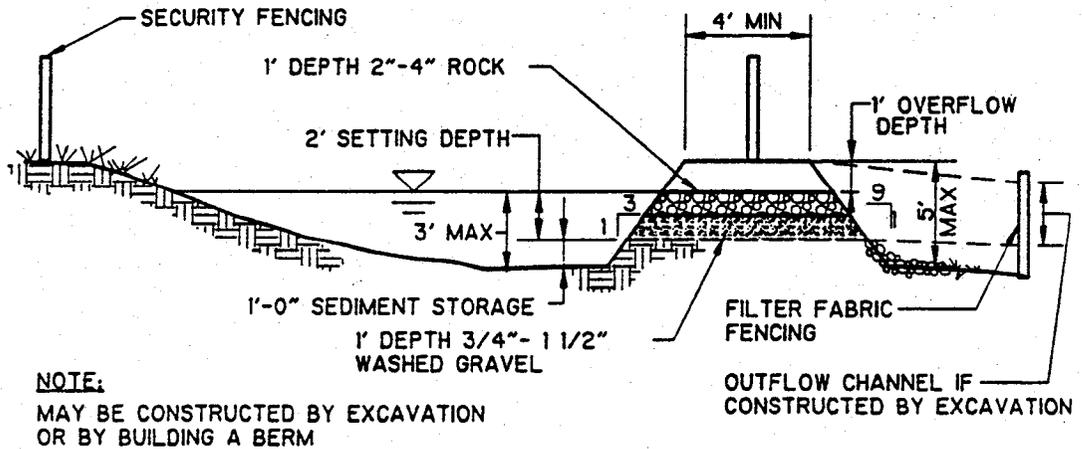
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 4 of 6

S.T.



Subdividing large sites into small drainages.

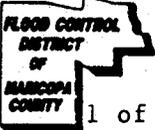
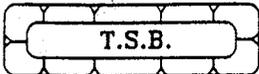
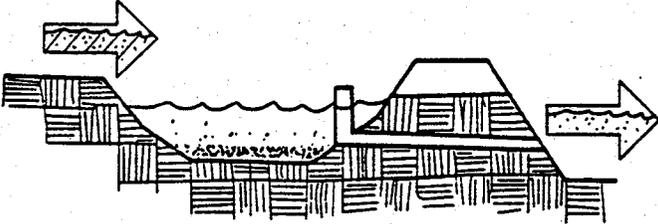
SYMBOL	TEMPORARY SEDIMENT TRAP	 FLOOD CONTROL DISTRICT OF HARBORSIDE COUNTY
S.T.		



TEMPORARY SEDIMENT TRAP

SYMBOL	TEMPORARY SEDIMENT TRAP	 6 of 6
S.T.		

NOTES:

SYMBOL	TEMPORARY SEDIMENT BASIN		 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 T.S.B.			1 of 6
<u>DIAGRAM</u> 	<u>CONDITIONS WHERE PRACTICE APPLIES</u> — PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL		
<u>DEFINITION</u> A temporary basin with a controlled storm water release structure formed by constructing an embankment of compacted soil across a drainageway, or other suitable locations. <u>PURPOSE</u> 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 prevent damaging erosion on the site which results in 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. <u>APPROPRIATE APPLICATIONS</u> Sedimentation basins are suitable for nearly all types of construction projects. Basins should be located at the stormwater outlet from the site. A typical application would include temporary dikes (berms) and/or channel to divert runoff to the basin inlet. Many development projects in Maricopa County will be required by local ordinances to provide a storm water detention basin which may be easily adapted to service as a sedimentation pond.			

SYMBOL



TEMPORARY SEDIMENT BASIN



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 shall be shown on the SWPPP.

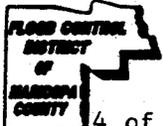
- Generally temporary sedimentation basins are for disturbed upstream drainage areas of 10 acres or more.
- Because of additional detention time, sediment ponds may be capable of trapping smaller sediment particles than traps. However, they are most effective when used in conjunction with other BMPs such as seeding or mulching.
- Ponds may become an "attractive nuisance" and care must be taken to adhere to all safety practices.
- Sediment ponds 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 emphasizing the need to control erosion to the maximum extent first.

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.

SYMBOL	TEMPORARY SEDIMENT BASIN
	
<p>◆ Location</p> <ul style="list-style-type: none"> 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 <u>before</u> it enters the stream. The basin should <u>not</u> be located where its failure would result in the loss of life or interruption of the use or service of public utilities or roads. <p><u>DESIGN & SIZING CRITERIA</u></p> <p>The sediment basin may be formed by partial excavation and/or by construction of a compacted embankment. It may have one or more inflow points carrying polluted runoff. Baffles to spread the flow throughout the basin should be included. A securely anchored riser pipe is the principal discharge mechanism along with an emergency overflow spillway. The riser pipe shall 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 attached Figure. Outlet protection is provided to reduce erosion at the pipe outlet.</p> <ul style="list-style-type: none"> The sediment pond volume is the sum of the sediment storage (1 foot in depth) <u>plus</u> a settling volume of 2 to 4 feet in depth. The total volume is 3,600 cubic feet per acre of upstream disturbed soil for a sediment basin. 	

SYMBOL	TEMPORARY SEDIMENT BASIN	
		

Computing the settling zone volume: The settling zone volume may be approximated by assuming a 2 foot depth above the sediment storage volume and extending the 3:1 side slopes as necessary, or by computing the precise volume as outlined below. The maximum settling zone depth shall be 4 feet.

Pond surface area:

The settling zone volume is determined by the pond surface area which is computed using the following equation: $(SA) = 1.2Q_{10} / V_{SED}$

Where Q_{10} is the design inflow based on the peak discharge from a 10-year, 24-hour duration design storm event from the tributary drainage area as computed using the methods described in Flood Control District of Maricopa County's Hydrologic Design Manual. Provide a minimum of 3600 cubic feet total volume per acre of drainage.

The settling velocity of the design soil particle which is medium silt (0.02 mm) has a settling velocity (V_{SED}) of 0.00096 ft/sec. As a rule it will not be necessary to use a particle size of less than 0.02 mm for a temporary sediment basin. Note that in choosing V_{SED} of 0.00096 ft/sec the surface area equates to a surface area (SA) of 1250 sq. ft. per cfs of inflow (Reference 1).

Settling depth (SD) should not be less than 2 feet and is also governed by the sediment storage volume surface area and relationship to the basin length (L). The basin length is defined as the average distance from the inlet to the outlet of the pond.

The ratio of L/SD should be less than 200.
The settling volume is therefore the surface area (SA) times (SD), required settling depth.

SYMBOL

TEMPORARY SEDIMENT BASIN



To complete the design of the sediment pond:

Total sediment pond volume and dimension are determined as outlined below:

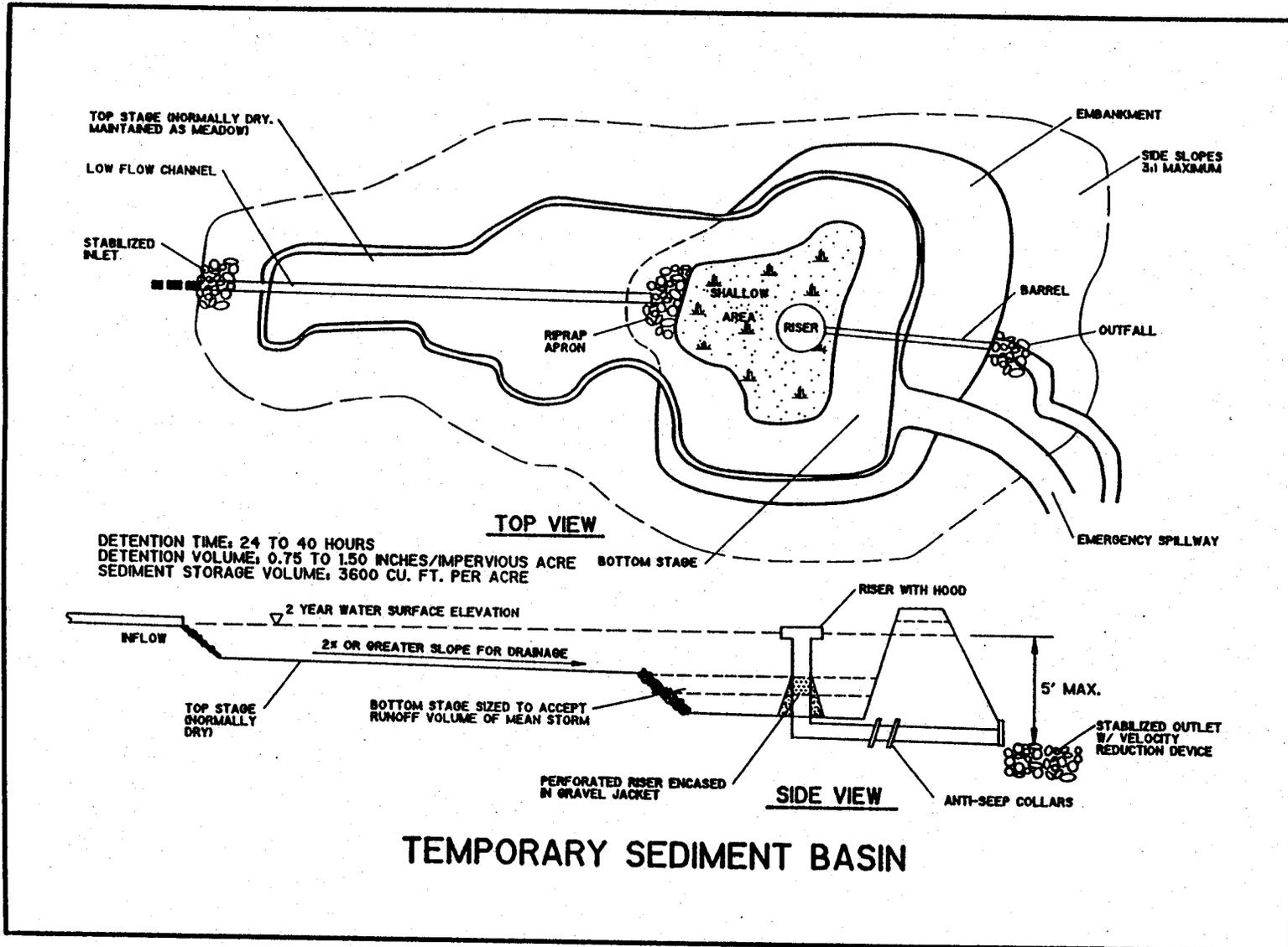
- a. The details shown in the attached figure may be useful in designing the sediment pond.
- b. Determine pond geometry for the sediment storage volume calculated above using 3 feet in depth and 3:1 side slopes from the bottom of the basin. Note, the basin bottom is level.
- c. Extend the pond side slopes (at 3:1 max.) as necessary to obtain the settling zone volume at 2 foot depth minimum or as determined above.
- d. 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.
- e. Provide an emergency spillway with a crest elevation 1 foot above the top of the riser pipe.
- f. Provide baffles to prevent short-circuiting. A 6:1 aspect ratio between the basin length and width of the pond is desirable.

MAINTENANCE REQUIREMENTS

Inspections should be made regularly, especially after each storm event of 0.5 inches or more. Sediment should be removed when it fills one half of the pond's total sediment storage area. The effectiveness of a sediment pond is based less on its size than on regular sediment removal.

Reference (1,11,14)

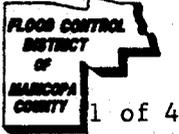
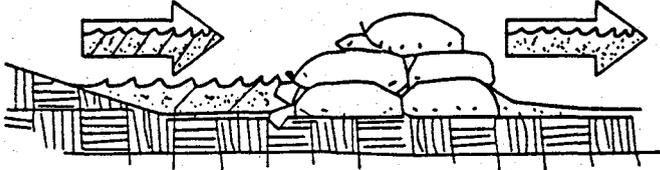
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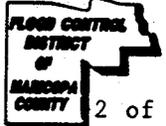


SYMBOL
T.S.B.

TEMPORARY SEDIMENT BASIN

PLANS CENTER
DISTRICT
HARRISON COUNTY
6 OF 6

SYMBOL	SANDBAG BERM		
S.B.B. 			
<u>DIAGRAM</u> 		<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> * PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 	
<u>DEFINITION</u> <p>A temporary berm constructed of stacked sandbags installed across a channel or right of way in a developing.</p> <u>PURPOSE</u> <p>The purpose of a sandbag berm is to intercept sediment-laden water from disturbed areas.</p> <u>APPROPRIATE APPLICATIONS</u> <p>Sandbag berms may be used during construction activities in stream beds and utility construction in channels, temporary channel crossing for construction equipment, etc. Sandbag berms may also be installed parallel to roadway construction. Sandbag berms may also be used to create temporary sediment traps, retention basins and in place of straw bales or silt fences. Examples of applications include:</p> <ul style="list-style-type: none"> • Check dams across stream channels. • Barrier for utility trenches or other construction in a stream channel. • Temporary channel crossing. • Barrier on a slope in place of straw bales or silt fences. • Direct or divert flow. • Create temporary sediment basin or retention basin. • Near the toe of slopes. • At construction perimeter. 			

SYMBOL	SANDBAG BERM	
S.B.B. 		

◆ Advantages:

- Provides a semi-permeable barrier in potentially wet areas.
- More permanent than silt fences or straw bales.
- Allows for easy relocation on site to meet changing needs during construction.

LIMITATIONS

Use should be restricted to construction of low berms 18 inches or less.

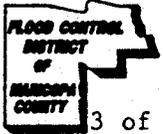
PLANNING CONSIDERATIONS

Sandbag berms are appropriate to use when construction of check dams or sumps in a stream is undesirable. The sandbag berms can provide the same function as a check dam without disturbing the stream or vegetation. The sandbag berm will also allow a small sediment retention area to be created prior to construction of final detention basins.

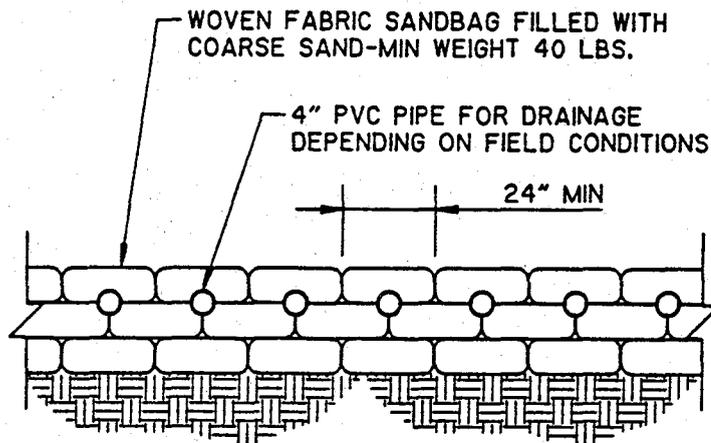
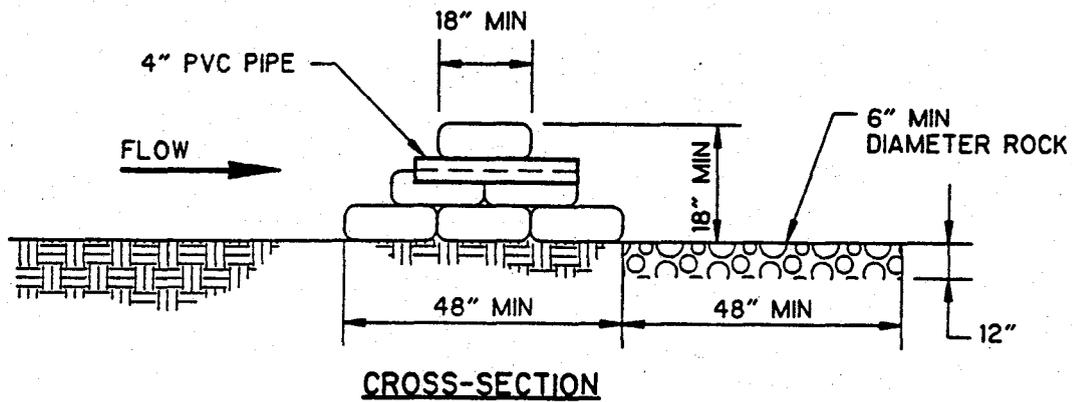
DESIGN & SIZING CRITERIA

For installation of a sandbag berm, the following criteria shall be observed.

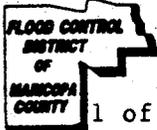
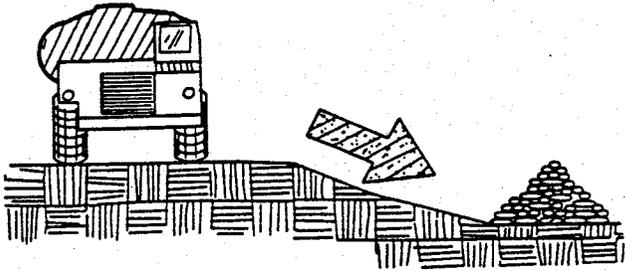
- Drainage Area - Less than 10 acres.
- Height of Berm - 24 inches maximum height, measured from the top of the existing ground at the upslope toe to the top of berm.
- Width of Berm - 48 inches minimum width measured at the bottom of the berm; 18 inches at the top.
- Sandbag Size - Length 24 to 30 inches, width 16 to 18 inches and thickness six (6) to eight (8) inches. Weight 90 to 125 pounds.
- Sandbag Material - Polypropylene, polyethylene or polyamide woven fabric, minimum unit weight four ounces per square yard, mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70 percent.
- Grade of Sand - Coarse sand, gravel.
- Runoff water shall flow over the tops of the sandbags or through four (4) inch pipes embedded below the top layer of bags.

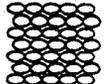
SYMBOL	SANDBAG BERM
S.B.B. 	 3 of 4
<p><u>MAINTENANCE REQUIREMENTS</u></p> <ul style="list-style-type: none"><li>• The sandbag berm shall be inspected after each rain. The sandbags shall be reshaped or replaced as needed during inspection. Additional inspections shall be made daily by the responsible party.<li>• When silt depth reaches 6", remove and properly dispose of accumulated sediments. <p>Reference (2)</p>	

SYMBOL	SANDBAG BERM	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 4 of 4
S.B.B. 		



SANDBAG BERM

SYMBOL	GRAVEL FILTER BERM		 1 of 4
G.F.B. 			
<u>DIAGRAM</u> 		<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> * PERIMETER CONTROL — SLOPE PROTECTION * SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS — NON-SEDIMENT POLLUTION CONTROL 	
<u>DEFINITION</u> <p>A temporary berm constructed of open graded rock installed at the toe of a slope, or the perimeter of a developing or disturbed area.</p> <u>PURPOSE</u> <p>To intercept and detain sediment laden water from an unprotected area, detain the sediment and release the water in sheet flow.</p> <u>APPROPRIATE APPLICATIONS</u> <p>Where a temporary measure is needed to retain sediments such as:</p> <ul style="list-style-type: none"> • 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. <p>◆ Advantages:</p> <ul style="list-style-type: none"> • May be less costly than other temporary barriers. • Relatively efficient at Sediment Removal. <p>◆ Disadvantages:</p> <ul style="list-style-type: none"> • Removal of temporary gravel berms may be difficult. 			

SYMBOL	GRAVEL FILTER BERM	
G.F.B. 		

LIMITATIONS

- Maximum drainage area, 5 acres.
- Not recommended to be built on landscaped areas due to the difficulty of clean up.

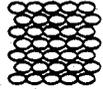
PLANNING CONSIDERATIONS

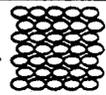
- Construct along a level contour for intercepting sheet flow.
- Provide an undisturbed or stabilized outlet suitable for sheet flow.
- Allow ample room for sediment removal equipment between the berm and toe-of-slope.
- Installation in stream beds requires large rock, staking of woven wire sheathing,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

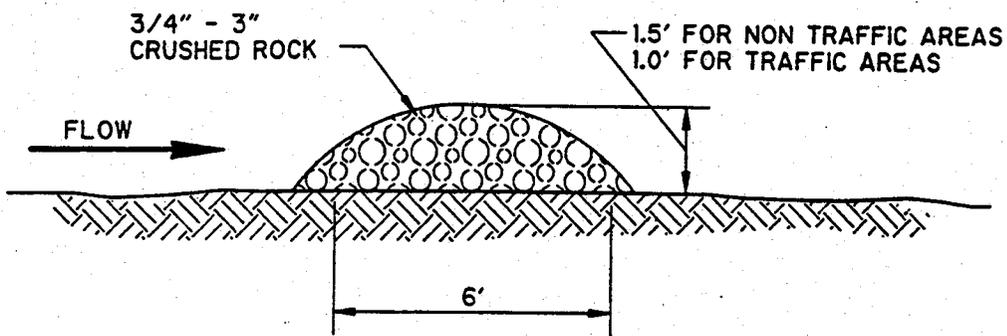
DESIGN & SIZING CRITERIA

In Non-Traffic Areas:

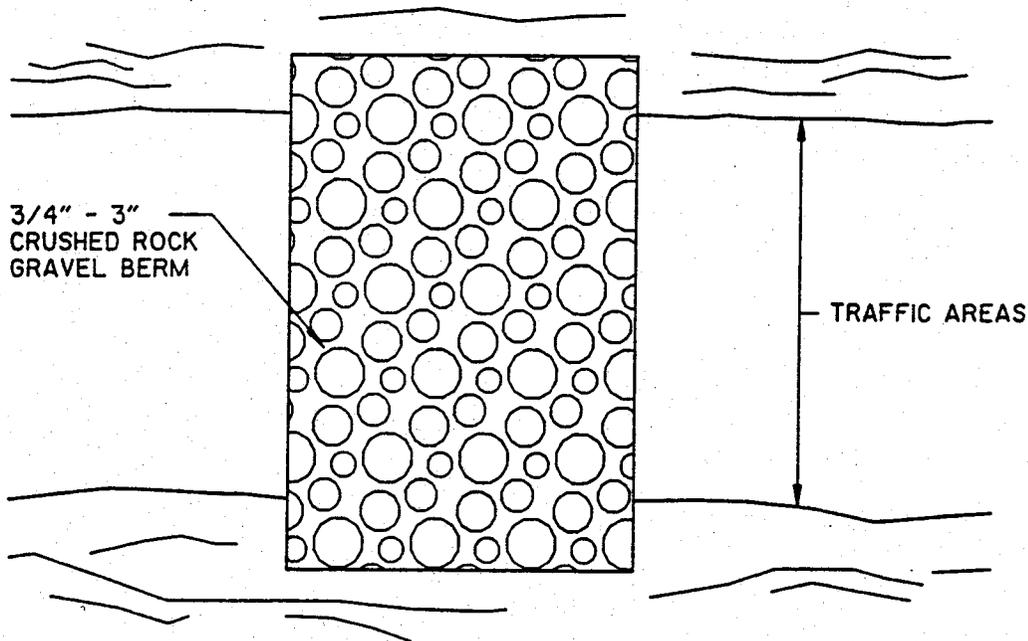
- Maximum flow through rate per square foot of berm = 60 gpm
- Height = 18 inches minimum
- Top width = 24 inches minimum
- Side slopes = 2:1 or flatter
- Woven wire sheathing (poultry netting) is recommended in areas of concentrated flow, wire to be 1 inch diameter hexagonal mesh, galvanized 20 gauge.
- Build on a level contour.
- Rock: 3/4 inch to 3 inches open graded for sheet flow and 3 to 5 inches open graded for concentrated flow.

SYMBOL	GRAVEL FILTER BERM	
G.F.B. 	 3 of 4	
<p>In Construction Traffic Areas:</p> <ul style="list-style-type: none"> • Height = 12 inches maximum • Provide multiple berms in series, as shown. <ul style="list-style-type: none"> -every 300 feet on slopes less than 5 percent -every 200 feet on slopes 5 to 10 percent -every 100 feet on slopes greater than 10 percent. <p><u>MAINTENANCE REQUIREMENTS</u></p> <ul style="list-style-type: none"> • 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 <p>References (2)</p>		

SYMBOL	GRAVEL FILTER BERM	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 4 of 4
G.F.B. 		

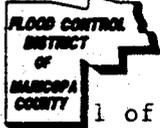


SECTION



PLAN

GRAVEL FILTER BERM

SYMBOL	EQUIPMENT MAINTENANCE PROCEDURES		
			1 of 2
<u>DIAGRAM</u>	<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS * — NON-SEDIMENT POLLUTION CONTROL 		
<p><u>DEFINITION</u></p> <p>Establish a program of equipment maintenance procedures which will reduce contamination of on-site soils.</p> <p><u>PURPOSE</u></p> <p>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.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Applicable for large construction sites where heavy equipment and truck storage and maintenance yards are located on-site.</p> <p><u>LIMITATIONS</u></p> <p>Comply with local codes and ordinances regarding on-site equipment maintenance and disposal of fluids and consumables.</p>			

SYMBOL

E.M.P.

EQUIPMENT MAINTENANCE PROCEDURES



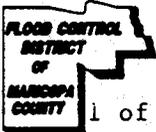
PLANNING CONSIDERATIONS

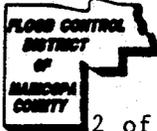
1. Properly dispose of or recycle used oils, hydraulic fluids, and gear lubricants. Do not dump fuels and lubricants into pits or on the ground. Never place used oil in a dumpster or pour down a storm drain.
2. Properly dispose of or recycle used batteries.
3. Do not bury used tires.
4. Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing in dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.
5. Repair leaks of hydraulic fluids, oils, and other fluids as soon as possible.
6. Use steam or high pressure water instead of thinners and solvents to wash down heavy equipment. Locate the wash down area in a contained area, and dispose of wash water and detergents to the sanitary sewer system only after grit is removed.
7. Provide spill containment dikes around stored oil and chemical drums.

MAINTENANCE REQUIREMENTS

1. Maintain waste oil containers in leak proof condition.
2. Clean equipment radiators to maximize cooling efficiency and prevent boil overs.
3. Inspect equipment for damaged hoses and leaky gaskets daily. Repair or replace as needed.

Reference (14)

SYMBOL	SOLID WASTE MANAGEMENT		 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 1 of 2
			1 of 2
<u>DIAGRAM</u>	<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS * — NON-SEDIMENT POLLUTION CONTROL 		
<u>DEFINITION</u> <p>The routine collection and regular disposal of accumulated solid waste generated at the construction site.</p> <u>PURPOSE</u> <p>Solid waste is one of the major pollutants caused by construction. Construction debris is solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures, and the installation of structures. Other waste products include wood and paper from packaging and building materials, scrap metals, sanitary wastes, rubber, plastic and glass pieces, masonry products, and others. Domestic waste products include food containers such as beverage cans, coffee cups, lunch-wrapping paper and plastic wrappers.</p> <u>APPROPRIATE APPLICATIONS</u> <p>Proper solid waste management is applicable to all construction activities. Care should be taken to ensure that toxic wastes and construction chemicals are not disposed of in dumpster designated for clean construction debris or domestic waste.</p>			

SYMBOL	SOLID WASTE MANAGEMENT 
	

PLANNING CONSIDERATIONS

The major control mechanism for these pollutants is to provide adequate disposal facilities. Collected solid waste should be removed and disposed of at authorized disposal areas on a regular basis. Sanitary facilities must be convenient and well maintained to avoid indiscriminate soiling of adjacent areas.

A contingency plan should be developed in case toxic or hazardous materials are found on-site.

DESIGN & SIZING CRITERIA

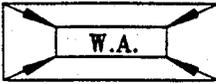
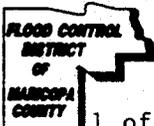
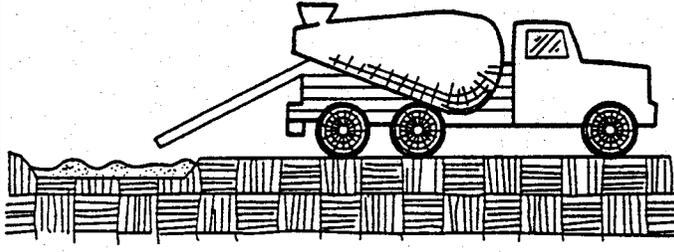
Solid Waste Management Plan must consider volume of construction debris based upon area to be graded, materials to be removed and materials generated during construction. The Solid Waste Management Plan must also consider the number of employees on site. Disposal for all construction debris and all domestic garbage must be coordinated with the local jurisdiction and disposed of in an appropriate solid waste management facility permitted for the type of waste materials.

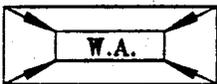
MAINTENANCE REQUIREMENTS

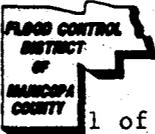
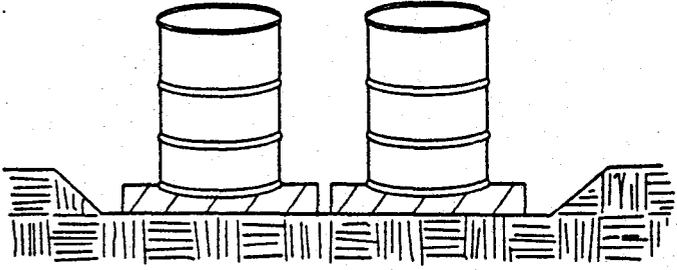
Collection of on site trash should be done on a regular basis. Trash container and dumpsters should be maintained on an as needed basis. Where possible provide cover for dumpsters and waste containers to prevent the entry of rainwater, and loss of contents by high winds.

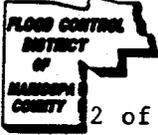
Have a contingency plan in place should hazardous or toxic materials be discovered.

Reference (14)

<p style="text-align: center;">SYMBOL</p> 	<p style="text-align: center;">DESIGNATED WASHOUT AREA</p>  <p style="text-align: right;">1 of 2</p>
<p><u>DIAGRAM</u></p> 	<p><u>CONDITIONS WHERE PRACTICE APPLIES</u></p> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS * NON-SEDIMENT POLLUTION CONTROL
<p><u>DEFINITION</u></p> <p>A temporary pit or bermed area for washout of concrete trucks, tools, mortar mixers, etc.</p> <p><u>PURPOSE</u></p> <p>Improper washout of concrete trucks, tools, etc. may allow fresh concrete or cement laden mortar to enter a storm drainage system.</p> <p><u>APPROPRIATE APPLICATIONS</u></p> <p>Effective when vehicles, tools, and mixers can be moved to the pit location. Where this is not practical, temporary ponds may be constructed to allow for settling and hardening of cement and aggregates. Washout area/pits are appropriate for minor amounts of wash water which result from cleaning of aggregate materials or concrete trucks, tools, etc.</p> <p><u>PLANNING CONSIDERATIONS</u></p> <ol style="list-style-type: none"> 1. Wash out into a slurry pit which will later be backfilled. Do this only with the approval of the property owner. 2. Wash out into a temporary pit where the concrete wash can harden, be broken up, and then properly disposed of off-site. 	

SYMBOL	DESIGNATED WASHOUT AREA		
			2 of 2
<p><u>DESIGN & SIZING CRITERIA</u></p> <ol style="list-style-type: none"> 1. Locate wash out pits away from storm drains, open ditches, or stormwater receiving waters. 2. DO NOT wash out concrete trucks into storm drains, sanitary sewers, street gutters, or stormwater channels. <p><u>MAINTENANCE REQUIREMENTS</u></p> <p>Properly dispose of hardened concrete products on a routine basis to prevent the buildup of waste materials to an unmanageable size and to maintain percolation of water.</p> <p>Reference (14)</p>			

SYMBOL	PROTECTED CHEMICAL AND MATERIALS STORAGE AREA	
 P.S.A.	 1 of 2	
<u>DIAGRAM</u> 	<u>CONDITIONS WHERE PRACTICE APPLIES</u> <ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS * NON-SEDIMENT POLLUTION CONTROL 	
<u>DEFINITION</u> <p>Provide covered storage areas for construction materials. Create a spill proof perimeter around the storage area.</p> <p><u>PURPOSE:</u></p> <p>Rain can wash pollutants from improperly stored materials into local drainage systems. By properly covering and storing chemicals, materials, and waste containers so that they are protected from rainwater, non-sediment pollution of stormwater can be reduced.</p> <p><u>APPROPRIATE APPLICATIONS:</u></p> <p>Locate chemical storage areas away from low areas, drainageways and stream banks.</p> <p><u>PLANNING CONSIDERATIONS:</u></p> <p>The best method for controlling chemical pollution is to provide adequate controls at the points of storage and use. The following recommendations are intended to prevent the contamination of on-site sediments.</p> <ol style="list-style-type: none"> 1. Store chemical drums on an angle so that the top of the drum will shed rainwater. This will prevent contamination of the contents of the drum as well as reduce corrosion of the bottom of the drum. 2. Do not store chemicals, drums and bagged materials directly on the ground. Where possible, cover stockpiled materials. 3. Provide spill containment dikes around chemical and fuel storage tanks. Line with plastic film to prevent soil contamination. 		

SYMBOL	PROTECTED CHEMICAL AND MATERIALS STORAGE AREA	 2 of 2
 P.S.A.		

4. Wash up waters from water-based paints may go into a sanitary sewer.
5. Dispose of oil-based paints, solvents, thinners, and mineral spirits through a licensed waste management firm.
6. Follow the recommendations of the manufacturer to dispose of construction chemicals such as curing compounds, form releases, etc.
7. Try to keep chemical products in their original containers, and keep them well labeled. Use proper devices to transfer chemicals from one container to another.
8. Follow manufacturers instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.

DESIGN AND SIZING CRITERIA:

The contractor should contact the local Fire Marshall to review the site materials, chemicals and proposed storage area to determine specific requirements. See Flammable and Combustible Liquid Code, NFPA30.

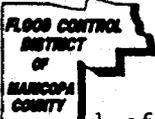
MAINTENANCE REQUIREMENTS:

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:

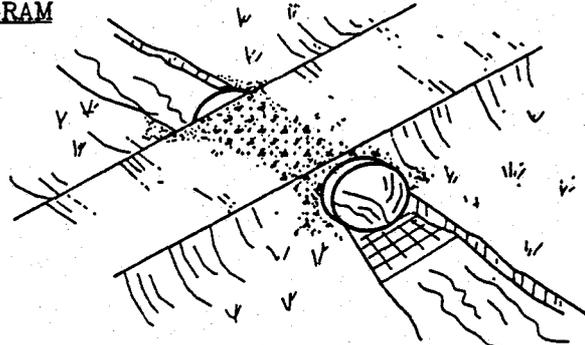
- Report spill to the National Response Center, 1-800-424-8802, within 24 hours.
- Revise SWPPP to show corrective actions.
- Notify local EPA Region IX office within 14 days.

Reference (14,23)

SYMBOL	TEMPORARY ACCESS WATERWAY CROSSING	 1 of 4
TWC		



DIAGRAM



CONDITIONS WHERE PRACTICE APPLIES

- PERIMETER CONTROL
- SLOPE PROTECTION
- SEDIMENT TRAPPING
- * DRAINAGEWAY & STREAM PROTECTION
- TEMPORARY STABILIZATION
- PERMANENT STABILIZATION & EXPOSURE LIMITS
- * NON-SEDIMENT POLLUTION CONTROL

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.

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

◆ Effectiveness:

- **Temporary Access Culvert:** A temporary access culvert may be effective in controlling erosion.
- **Temporary Access Ford:** A temporary access ford offers very little sediment and erosion control and is really only effective in ephemeral stream channel.

◆ Advantages:

- **Temporary Access Culvert:** A temporary culvert is easily constructed and allows for heavy equipment loading.
- **Temporary Access Ford:** A temporary ford is the least expensive waterway crossing and allows for maximum load limits. It also offers very low maintenance.

SYMBOL	TEMPORARY ACCESS WATERWAY CROSSING	
		

LIMITATIONS

- **Temporary Access Culvert:** Temporary culverts need maintenance often and can cause erosion if the culvert becomes clogged.
- **Temporary Access Ford:** A temporary ford offers little erosion control.

NOTE:Special care must be taken for all these practices when crossing an environmentally sensitive streams. Oils or other potentially hazardous materials shall not be used for surface treatments.

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

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 contractor should consider the time of year, construction schedule, and construction requirements. For crossing intermittently flowing streams a shallow access ford or culvert is recommended.

DESIGN & SIZING CRITERIA

Temporary culvert shall be sized and installed per the requirements of the Maricopa County Flood Control District or local municipal stormwater agency.

MAINTENANCE REQUIREMENTS

Inspect monthly and after each significant rainfall.

- Replace lost aggregates to restore access.
- Clean silt deposits from culverts.
- Inspect for erosion, undercutting and settlement.

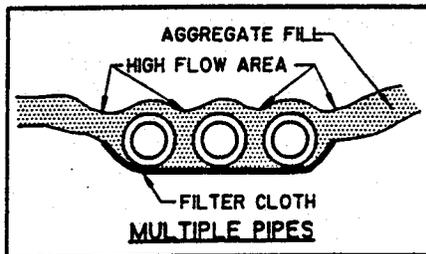
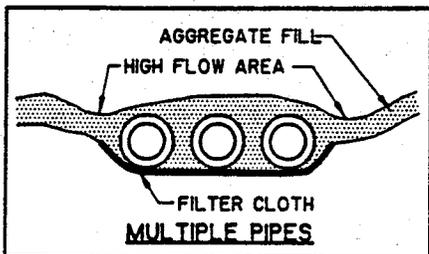
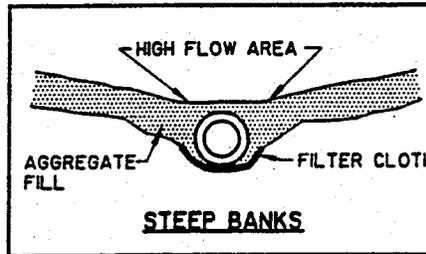
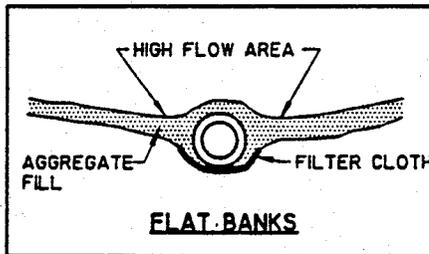
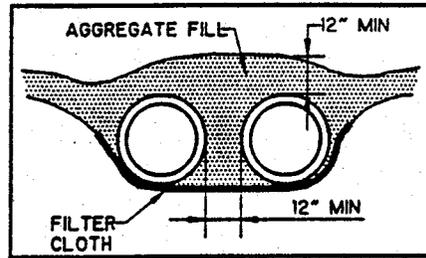
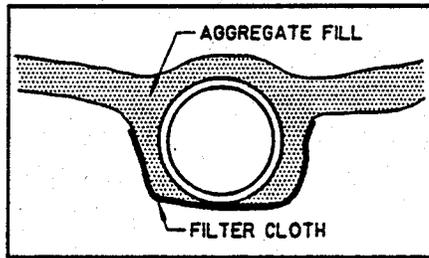
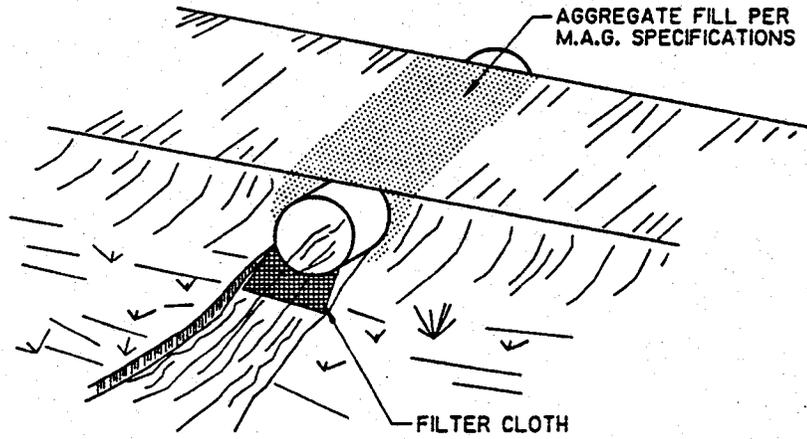
Reference (1)

SYMBOL

TWC



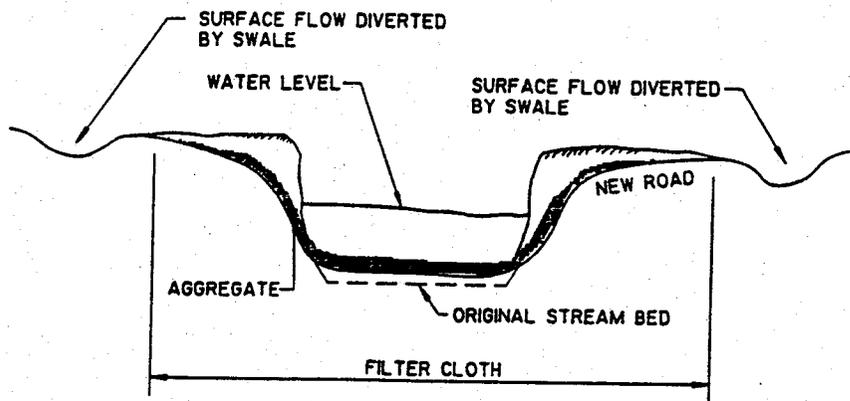
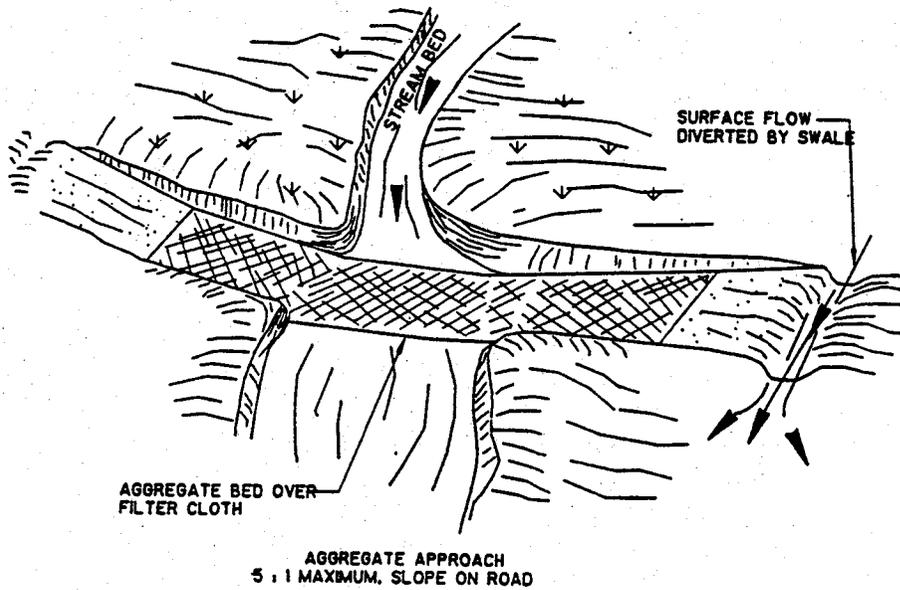
TEMPORARY ACCESS WATERWAY CROSSING



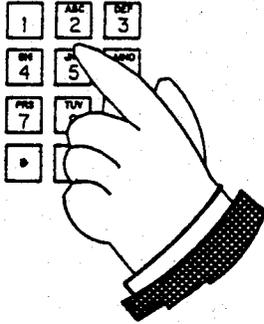
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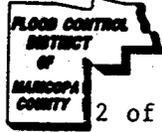
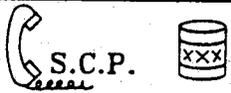
SYMBOL
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**TEMPORARY ACCESS
WATERWAY CROSSING**



TEMPORARY ACCESS FORD

SYMBOL		SPILL CONTAINMENT PLAN		 1 of 2
 S.C.P.				
DIAGRAM		CONDITIONS WHERE PRACTICE APPLIES		
		<ul style="list-style-type: none"> — PERIMETER CONTROL — SLOPE PROTECTION — SEDIMENT TRAPPING — DRAINAGEWAY & STREAM PROTECTION — TEMPORARY STABILIZATION — PERMANENT STABILIZATION & EXPOSURE LIMITS * NON-SEDIMENT POLLUTION CONTROL 		
<u>DEFINITION</u>				
<p>An emergency plan to contain spills of dangerous, hazardous, or toxic wastes which mitigates environmental damage and provides prompt notice to proper authorities.</p>				
<u>PURPOSE</u>				
<p>The Spill Prevention Plan should include measures to limit the scope of the spill and minimize environmental damage.</p>				
<u>APPROPRIATE APPLICATIONS</u>				
<p>This practice is applicable to all construction sites. Those sites located near natural watercourses, canals, and reservoirs are at highest risk of an uncontained spill contaminating surface waters.</p>				
<u>LIMITATIONS</u>				
<p>This plan deals with emergency spill response. Proper storage, use, and disposal of dangerous, hazardous, and toxic wastes should be observed at all times to minimize the potential for a spill.</p>				

SYMBOL	SPILL CONTAINMENT PLAN	 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY 2 of 2
 S.C.P.		

PLANNING CONSIDERATIONS

The construction site management team should develop the spill prevention plan and ensure that the plan is communicated to all field personnel.

All spills regardless of size and/or type of spill should be reported to the proper agencies.

- ◆ In Maricopa County contact:
 - The local Fire Department
 - A.D.E.Q. Emergency Response Hotline: 257-2330, or (A.D.E.Q. Office Phone #): 392-4064
- ◆ If a hazardous material spill could reach surface water, the contractor must also contact the "National Response Center" at 1-800-424-8802 (24 hr.).

DESIGN & SIZING CRITERIA

Identify the types of hazardous materials which may be used on the project and develop a strategy to stop leaks at the source of the spill. Develop a strategy to contain the materials already spilled using available materials and equipment.

Contact local Fire Marshall to review the accuracy and adequacy of your spill containment plan. Request Fire Marshall to review on-site storage areas to determine specific requirements and appropriate containment techniques.

MAINTENANCE REQUIREMENTS

- Comply with suggestions and requirements set by local Fire Department.
- Update spill containment plan during the course of construction as changes occur in the types of chemicals being stored.
- If a spill occurs follow proper procedure as required in the Spill Containment Plan. Dispose of materials per agency or manufacturer's instruction.





SWPPPs

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1. Sample SWPPP for Construction Activity

from EPA Document "Storm Water Management for Construction Activities
(Reference 26)

HOMERVILLE APARTMENTS CONSTRUCTION POLLUTION PREVENTION PLAN

SITE DESCRIPTION			
Project Name and Location: (Latitude, Longitude, or Address)	Homerville Apartments 21 Broadview Avenue Center City, ANY STATE 00000	Owner Name and Address:	Quality Associates 11 Main Street Center City, ANY STATE 00000
Description: (Purpose and Types of Soil Disturbing Activities)	<p>This project will consist of three low-rise, attached apartment buildings with adjacent parking facilities.</p> <p>Soil disturbing activities will include: clearing and grubbing; installing a stabilized construction entrance, perimeter, and other erosion and sediment controls; grading; excavation for the sedimentation pond, storm sewer, utilities, and building foundations; construction of curb and gutter, road, and parking areas; and preparation for final planting and seeding.</p>		
Runoff Coefficient:	The final coefficient of runoff for the site will be $c = 0.5$.		
Site Area:	The site is approximately 11.0 acres of which 9.8 acres will be disturbed by construction activities.		
Sequence of Major Activities			
The order of activities will be as follows:			
<ol style="list-style-type: none"> 1. Install stabilized construction entrance 2. Clear and grub for earth dike and sediment basin 3. Install earth dike 4. Construct sedimentation basin 5. Continue clearing and grading 6. Pile topsoil 7. Stabilize denuded areas and stockpiles within 14 days of last construction activity in that area 8. Install utilities, storm sewer, curb and gutter 	<ol style="list-style-type: none"> 9. Apply stone to parking area and road 10. Construct apartment buildings 11. Complete grading and install permanent seeding and plantings 12. Complete final paving 13. Remove accumulated sediment from basin. 14. When all construction activity is complete and the site is stabilized, remove earth dike and reseed any areas disturbed by their removal. 		
Name of Receiving Waters:	The entire site will drain into Rocky Creek which is approximately one hundred yards from the site.		
CONTROLS			
Erosion and Sediment Controls			
Stabilization Practices			
<p>Temporary Stabilization - Top soil stock piles and disturbed portions of the site where construction activity temporarily ceases for at least 21 days will be stabilized with temporary seed and mulch no later than 14 days from the last construction activity in that area. The temporary seed shall be Rye (grain) applied at the rate of 120 pounds per acre. Prior to seeding, 2,000 pounds of ground agricultural limestone and 1,000 pounds of 10-10-10 fertilizer shall be applied to each acre to be stabilized. After seeding, each area shall be mulched with 4,000 pounds per acre of straw. The straw mulch is to be tacked into place by a disk with blades set nearly straight. Areas of the site which are to be paved will be temporarily stabilized by applying geotextile and stone sub-base until bituminous pavement can be applied.</p>			
<p>Permanent Stabilization - Disturbed portions of the site where construction activities permanently ceases shall be stabilized with permanent seed no later than 14 days after the last construction activity. The permanent seed mix shall consist of 80 lbs/acre tall fescue, and 40 lbs/acre kobe lespedeza. Prior to seeding, 4,000 pounds of ground agricultural limestone and 2,000 pounds of 10-10-10 fertilizer shall be applied to each acre to be stabilized. After seeding, each area shall be mulched with 4,000 pounds per acre of straw. The straw mulch is to be tacked into place by a disk with blades set nearly straight.</p>			

CONTROLS (Continued)

Structural Practices

Earth Dike - will be constructed along the uphill perimeter (north) of the site. A portion of the dike will divert runoff around the construction site. The remaining portion of the dike will collect runoff from the disturbed area and direct the runoff to the sediment basin.

Sediment Basin - will be constructed at the common drainage location on the south side of the construction site. The basin will be formed by constructing an embankment across an existing gully and excavating a storage pond with a volume of 36,000 cubic feet (0.82 acre feet). The basin will drain through a corrugated metal riser and outlet pipe to a rip rap outlet apron. Once construction activities are nearly complete, the accumulated sediment will be removed from the basin.

Storm Water Management

Storm water drainage will be provided by curb and gutter, storm sewer and catch basin, for the developed areas. The areas which are not developed will be graded at less than 0.5:1 and have permanent seeding or plantings. Two acres of the site will remain untouched and in its natural state. When construction is complete the entire site will drain to a wet detention basin. The wet detention basin will be in the location of the temporary sediment basin. When upslope areas are stabilized, the accumulated sediment will be removed from the sediment basin, and the areas on the sides of the basin will be planted with vegetation. The wet detention pond is designed with a permanent pool volume of 0.82 (acre-feet). This is equivalent to one inch of runoff for the entire drainage area. It is expected that this wet detention pond design will result in an 80 percent removal of total suspended solids from the site's storm water runoff. The pond has been designed by a professional engineer to keep peak flow rates from the two and ten year/24 hour storms at their pre-development rates. The outlet of the detention basin will be stabilized by a riprap apron.

OTHER CONTROLS

Waste Disposal:

Waste Materials

All waste materials will be collected and stored in a securely lidded metal dumpster rented from the ADF Waste Management Company, which is a licensed solid waste management company in Center City. The dumpster will meet all local Center City and any State solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied a minimum of twice per week or more often if necessary, and the trash will be hauled to the Center City Dump. No construction waste materials will be buried onsite. All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted in the office trailer and Mr. Doe, the individual who manages the day-to-day site operations, will be responsible for seeing that these procedures are followed.

Hazardous Waste

All hazardous waste materials will be disposed of in the manner specified by local or State regulation or by the manufacturer. Site personnel will be instructed in these practices and Mr. Doe, the individual who manages day-to-day site operations, will be responsible for seeing that these practices are followed.

Sanitary Waste

All sanitary waste will be collected from the portable units a minimum of three times per week by the TIDEE Company, a licensed Center City sanitary waste management contractor, as required by local regulation.

Offsite Vehicle Tracking:

A stabilized construction entrance has been provided to help reduce vehicle tracking of sediments. The paved street adjacent to the site entrance will be swept daily to remove any excess mud, dirt or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin.

TIMING OF CONTROLS/MEASURES

As indicated in the Sequence of Major Activities, the earth dike, stabilized construction entrance and sediment basin will be constructed prior to clearing or grading of any other portions of the site. Areas where construction activity temporarily ceases for more than 21 days will be stabilized with a temporary seed and mulch within 14 days of the last disturbance. Once construction activity ceases permanently in an area, that area will be stabilized with permanent seed and mulch. After the entire site is stabilized, the accumulated sediment will be removed from the trap and the earth dike will be removed.

CERTIFICATION OF COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

The storm water pollution prevention plan reflects Center City requirements for storm water management and erosion and sediment control, as established in Center City ordinance 5-188. To ensure compliance, this plan was prepared in accordance with the Center City Storm Water Management, Erosion and Sediment Control Handbook, published by the Center City Department of Planning, Storm Water Management Section. There are no other applicable State or Federal requirements for sediment and erosion site plans (or permits), or storm water management site plans (or permits).

MAINTENANCE/INSPECTION PROCEDURES

Erosion and Sediment Control Inspection and Maintenance Practices

These are the inspection and maintenance practices that will be used to maintain erosion and sediment controls.

- Less than one half of the site will be denuded at one time.
- All control measures will be inspected at least once each week and following any storm event of 0.5 inches or greater.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of report.
- Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.
- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- The sediment basin will be inspected for depth of sediment, and built up sediment will be removed when it reaches 10 percent of the design capacity or at the end of the job.
- Diversion dike will be inspected and any breaches promptly repaired.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
- A maintenance inspection report will be made after each inspection. A copy of the report form to be completed by the inspector is attached.
- Mr. Doe, site superintendent, will select three individuals who will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance report.
- Personnel selected for inspection and maintenance responsibilities will receive training from Mr. Doe. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.

MAINTENANCE/INSPECTION PROCEDURES (Continued)

Non-Storm Water Discharges

It is expected that the following non-storm water discharges will occur from the site during the construction period:

- Water from water line flushings.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- Uncontaminated groundwater (from dewatering excavation).

All non-storm water discharges will be directed to the sediment basin prior to discharge.

INVENTORY FOR POLLUTION PREVENTION PLAN

The materials or substances listed below are expected to be present onsite during construction:

- Concrete
- Detergents
- Paints (enamel and latex)
- Metal Studs
- Concrete
- Tar
- Fertilizers
- Petroleum Based Products
- Cleaning Solvents
- Wood
- Masonry Block
- Roofing Shingles.

SPILL PREVENTION

Material Management Practices

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff.

Good Housekeeping:

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough product required to do the job
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label
- Substances will not be mixed with one another unless recommended by the manufacturer
- Whenever possible, all of a product will be used up before disposing of the container
- Manufacturers' recommendations for proper use and disposal will be followed
- The site superintendent will inspect daily to ensure proper use and disposal of materials onsite.

Hazardous Products:

These practices are used to reduce the risks associated with hazardous materials.

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data will be retained; they contain important product information
- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

SPILL PREVENTION (Continued)

Product Specific Practices

The following product specific practices will be followed onsite:

Petroleum Products:

All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

Fertilizers:

Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paints:

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to manufacturers' instructions or State and local regulations.

Concrete Trucks:

Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site.

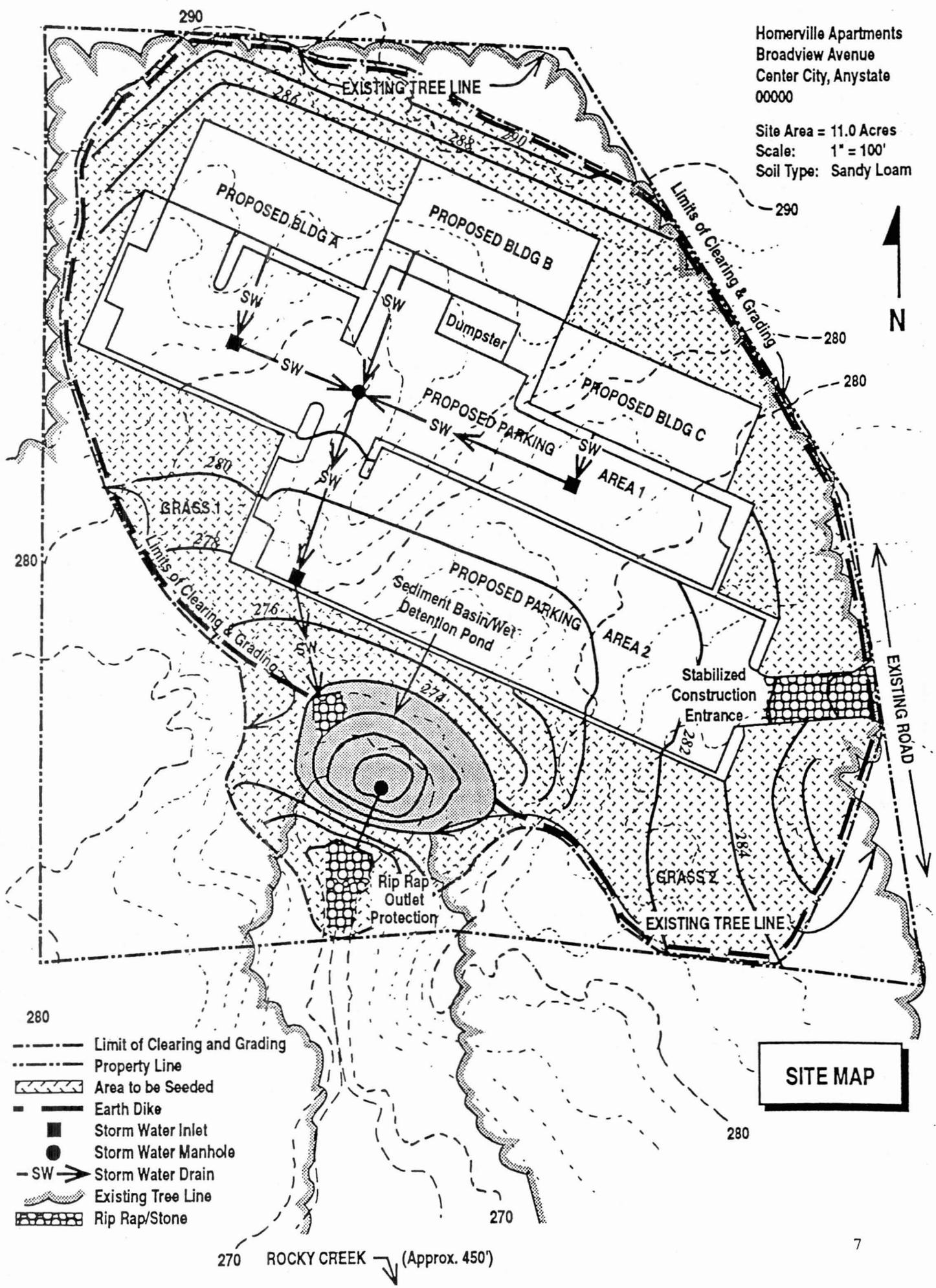
Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- Mr. Doe, the site superintendent responsible for the day-to-day site operations, will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the office trailer onsite.

Homerville Apartments
 Broadview Avenue
 Center City, Anystate
 00000

Site Area = 11.0 Acres
 Scale: 1" = 100'
 Soil Type: Sandy Loam



SITE MAP

- 280
- Limit of Clearing and Grading
- Property Line
- ▨ Area to be Seeded
- Earth Dike
- Storm Water Inlet
- Storm Water Manhole
- SW → Storm Water Drain
- ~ Existing Tree Line
- ▨ Rip Rap/Stone

270 ROCKY CREEK (Approx. 450')

POLLUTION PREVENTION PLAN 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 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.

Signed: _____

John R. Quality,
President
Quality Associates

Date: _____

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

Signature	For	Responsible for
_____ Joseph Contractor, President Date: _____	Center City Const., Inc. 21 Elm Street Center City, Any State 00000 (123) 399-8765	General Contractor
_____ John Planter Vice President of Construction Date: _____	Green Grass, Inc. 4233 Center Road Outerville, Any State 00001 (123) 823-5678	Temporary and Permanent Stabilization
_____ Jim Kay, President Date: _____	Dirt Movers, Inc. 523 Lincoln Ave. Outerville, Any State 00001 (123) 823-8921	Stabilized Construction Entrance, Earth Dikes, Sediment Basin

HOMERVILLE APARTMENTS

STORM WATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT FORM

TO BE COMPLETED EVERY 7 DAYS AND WITHIN 24 HOURS OF
A RAINFALL EVENT OF 0.5 INCHES OR MORE

INSPECTOR: _____ DATE: _____

INSPECTOR'S QUALIFICATIONS:

DAYS SINCE LAST RAINFALL: _____ AMOUNT OF LAST RAINFALL _____ INCHES

STABILIZATION MEASURES

AREA	DATE SINCE LAST DISTURBED	DATE OF NEXT DISTURBANCE	STABILIZED? (YES/NO)	STABILIZED WITH	CONDITION
BLDG. A					
BLDG. B					
BLDG. C					
PRKNG. 1					
PRKNG. 2					
GRASS 1					
GRASS 2					

STABILIZATION REQUIRED:

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

HOMERVILLE APARTMENTS
STORM WATER POLLUTION PREVENTION PLAN
INSPECTION AND MAINTENANCE REPORT FORM
STRUCTURAL CONTROLS

DATE: _____

EARTH DIKE:

FROM	TO	IS DIKE STABILIZED?	IS THERE EVIDENCE OF WASHOUT OR OVER-TOPPING?
BUILDING B	STABILIZED CONSTRUCTION ENTRANCE		
STABILIZED CONSTRUCTION ENTRANCE	SEDIMENT BASIN		
BUILDING B	SEDIMENT BASIN		

MAINTENANCE REQUIRED FOR EARTH DIKE:

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

HOMERVILLE APARTMENTS

STORM WATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT FORM

SEDIMENT BASIN:

DEPTH OF SEDIMENT IN BASIN	CONDITION OF BASIN SIDE SLOPES	ANY EVIDENCE OF OVERTOPPING OF THE EMBANKMENT?	CONDITION OF OUTFALL FROM SEDIMENT BASIN

MAINTENANCE REQUIRED FOR SEDIMENT BASIN:

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

OTHER CONTROLS

STABILIZED CONSTRUCTION ENTRANCE:

DOES MUCH SEDIMENT GET TRACKED ON TO ROAD?	IS THE GRAVEL CLEAN OR IS IT FILLED WITH SEDIMENT?	DOES ALL TRAFFIC USE THE STABILIZED ENTRANCE TO LEAVE THE SITE?	IS THE CULVERT BENEATH THE ENTRANCE WORKING?

MAINTENANCE REQUIRED FOR STABILIZED CONSTRUCTION ENTRANCE:

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

HOMERVILLE APARTMENTS
STORM WATER POLLUTION PREVENTION PLAN
INSPECTION AND MAINTENANCE REPORT FORM

CHANGES REQUIRED TO THE POLLUTION PREVENTION PLAN:

REASONS FOR CHANGES:

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.

SIGNATURE: _____ **DATE:** _____

2. Sample SWPPP for Small Projects

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Site Description			
A. General Information			
Project Name: <u>Joe Hay's Stable and Corral</u>			
Project Location:			
address: <u>8000 West Bell Road</u>			
City/County/State: <u>Glendale, Maricopa County, Arizona</u>			
Township/Range/Section: <u>T4N, R1E, Sect. 25 SE 1/4</u>			
Location map attached: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Owner name and address:	Operator name and address:		
<u>Joe Hay</u>	<u>same as owner</u>		
<u>8000 West Bell Road</u>			
<u>Glendale, Arizona 85308</u>			
Description (purpose and types of soil disturbance activities):			
<i>Construction of horse corral, stables, and access driveway.</i>			
<i>Soil disturbing activities include: clearing and grubbing, grading, installing fences, and seeding.</i>			
B. Hydrologic Information			
Project size (acres): <u>10</u>	Area to be graded (acres): <u>5</u>		
Existing project runoff coefficient: <u>.35</u>	Developed project runoff coefficient: <u>.35</u>		
Soils report: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
if yes, prepared by: _____			
Receiving waters in Maricopa County, Arizona			
<input type="checkbox"/> Agua Fria River	<input type="checkbox"/> Cave Creek	<input type="checkbox"/> Centennial Wash	
<input type="checkbox"/> Gila River	<input type="checkbox"/> Hassayampa River	<input type="checkbox"/> Indian Bend Wash	
<input checked="" type="checkbox"/> New River	<input type="checkbox"/> Salt River	<input type="checkbox"/> Santa Cruz River	
<input type="checkbox"/> Skunk Creek	<input type="checkbox"/> Verde River		
Flood control structures (name): _____			
Other (describe): _____			
C. Type of Construction			
<input type="checkbox"/> Residential	<input type="checkbox"/> Single Family	<input type="checkbox"/> Multi-family	
<input type="checkbox"/> Commercial	<input type="checkbox"/> Roadways	<input type="checkbox"/> Utilities	<input type="checkbox"/> Industrial
<input checked="" type="checkbox"/> Other (describe): _____			

2. Sample SWPPP for Small Projects (continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Site Description (continued)

On-site construction activities:

Grading acres: 5 cu.yd. _____ Blasting
 Roadways linear feet: 700 _____ Sewer, Water, Utilities
 Drainage Structures (describe): _____

Off-site construction activities (may require a separate permit): N/A

Grading acres: _____ cu.yd. _____ Blasting
 Roadways linear feet: _____ Sewer, Water, Utilities
 Drainage Structures (describe): _____

D. Sequence of Major Activities (to the nearest month)

Start date: November 1, 1992 End date: February, 1993

Sequencing Schedule:

*Nov., 1992: clear brush (existing trees and major shrubs will remain).
 Nov. - Dec., 1992: Stables, fence and driveway will be constructed.
 Jan., 1993: Corral and staging areas will be seeded with native grasses.*

E. Site Map (see attached map)

Controls

A. Erosion and Sediment Controls

Stabilization practices:

Temporary controls:

If needed, straw mulch tacked with an emulsifier will be placed on graded areas to prevent erosion.

Dust control will be achieved by applying a fine spray of water at rates sufficient to settle the dust but not to cause runoff.

Permanent controls:

The corral and staging areas will be seeded with native grasses.

Structural practices:

Perimeter dike: *shall be placed on the east and south sides of the property.*

Stormwater management:

It is not anticipated that there will be any allowable non-stormwater discharges.

2. Sample SWPPP for Small Projects

(continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

B. Other controls (waste disposal, offsite tracking, etc.)

Waste disposal: Trash will be stored in authorized storage containers and collected twice a week by the City of Glendale.

Offsite tracking: There will be limited traffic to the graded area. If dirt enters onto the roadway, then it will be swept that day.

Air Quality: In lieu of obtaining a County burn permit we have opted to take the brush to the city landfill to be chipped for mulch.

C. Maintenance/Inspection procedures (including non-stormwater discharges)

Maintenance: The perimeter dike shall be maintained per the attached BMP fact sheet.

Inspections: The site shall be inspected monthly and within 24 hours after a rainfall event in excess of 0.5 inches within a 24 hour period.

D. Housekeeping (spill prevention)

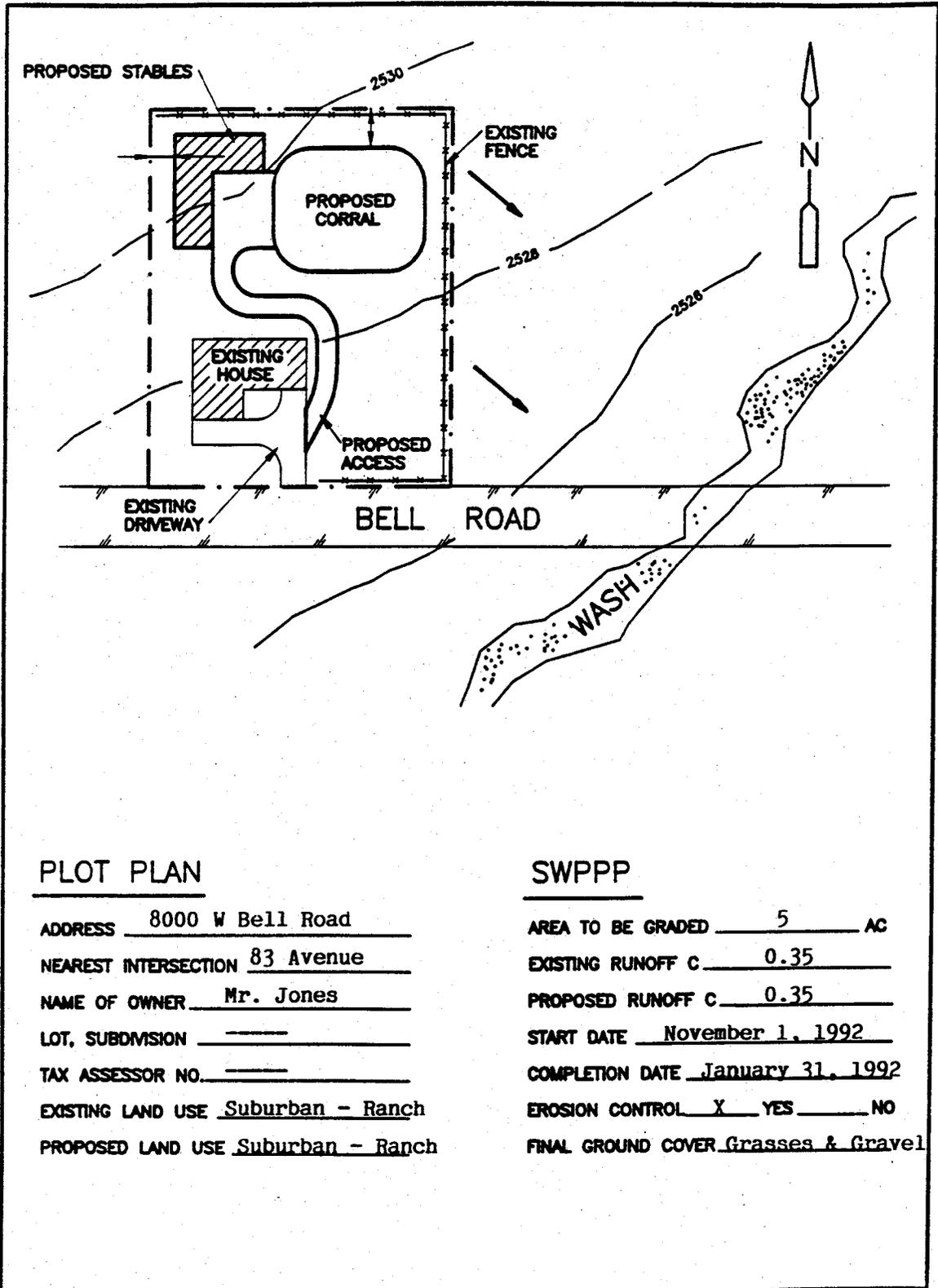
No vehicle maintenance shall be performed onsite.

All materials stored onsite will be stored in a neat, orderly manner and in their original containers.

All manufacturer's recommendations for spill prevention, clean-up, and disposal shall be followed.

Other Concerns

State and local requirements have been incorporated into the plan:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Maintenance procedures for control measures have been identified into the plan:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Allowable non-stormwater discharges and pollution prevention measures have been identified:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Contractor certification received:	<input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No
Plan certification received:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

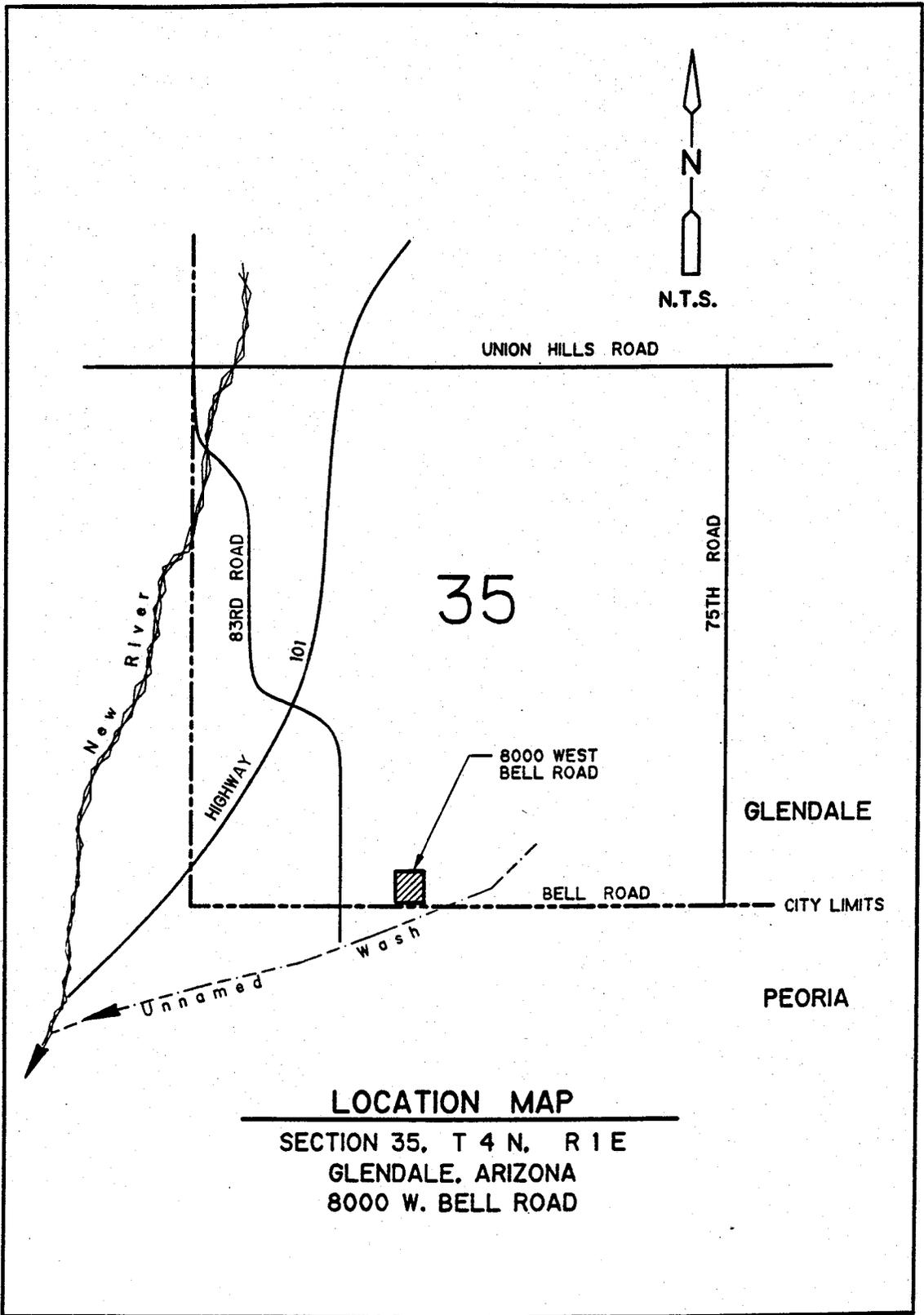


PLOT PLAN

ADDRESS 8000 W Bell Road
 NEAREST INTERSECTION 83 Avenue
 NAME OF OWNER Mr. Jones
 LOT, SUBDIVISION _____
 TAX ASSESSOR NO. _____
 EXISTING LAND USE Suburban - Ranch
 PROPOSED LAND USE Suburban - Ranch

SWPPP

AREA TO BE GRADED 5 AC
 EXISTING RUNOFF C. 0.35
 PROPOSED RUNOFF C. 0.35
 START DATE November 1, 1992
 COMPLETION DATE January 31, 1992
 EROSION CONTROL X YES _____ NO
 FINAL GROUND COVER Grasses & Gravel



LOCATION MAP

SECTION 35, T 4 N, R 1 E
 GLENDALE, ARIZONA
 8000 W. BELL ROAD

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Pollution Prevention Plan Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signed: _____
 Name
 Position Title
 Company

Date: _____

Contractor's Certification:

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signature	Company Name, Address and Phone	Responsibility
_____ Name of General Contractor Date:		
_____ Name of Subcontractor Date:		
_____ Name of Subcontractor Date:		

2. Sample SWPPP for Small Projects

(continued)

Other attachments should include:

- * BMP Fact Sheet for a temporary diversion dike.
- * Copy of completed Notice of Intent (NOI) form.
- * Certification form.
- * Grading permit.
- * Copy of any other permits that are related to construction and pollution prevention.

3. Sample SWPPP for a Phase Development

**Stormwater Pollution Prevention Plan
NPDES General Permit for Construction**

Site Description		
A. General Information		
Project Name: <u>Plainsview Residential Community</u>		
Project Location:		
address: <u>100 N. Plainsview Street</u>		
City/County/State: <u>Chandler, Maricopa County, Arizona</u>		
Township/Range/Section: <u>T2N, R5E, Sect. 23 SE 1/4</u>		
Location map attached: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Owner name and address: <u>Plainsview Development Co.</u> <u>1111 East Oak Ave.</u> <u>Chandler, Arizona 85224</u> <hr/>	Operator name and address: <u>Plainsview Construction Co.</u> <u>1113 East Oak Ave.</u> <u>Chandler, Arizona 85224</u> <hr/>	
Description (purpose and types of soil disturbance activities):		
<i>This project is a single family residential community. Soil disturbing activities include: clearing and grubbing, installing a stabilized construction entrance; construction of all erosion control structures; grading; excavation for temporary sediment traps and basins, storm sewer, utilities, and building foundations; construction of curb and gutters and roads; and preparation for final landscaping.</i>		
B. Hydrologic Information		
Project size (acres): <u>346: I - 156: II - 190</u> Area to be graded (acres): <u>293: I - 132: II - 161</u>		
Existing project runoff coefficient: <u>.35</u> Developed project runoff coefficient: <u>.50</u>		
Soils report: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
if yes, prepared by: <u>ABC Engineers</u>		
Receiving waters in Maricopa County, Arizona		
<input type="checkbox"/> Agua Fria River	<input type="checkbox"/> Cave Creek	<input type="checkbox"/> Centennial Wash
<input type="checkbox"/> Gila River	<input type="checkbox"/> Hassayampa River	<input type="checkbox"/> Indian Bend Wash
<input type="checkbox"/> New River	<input checked="" type="checkbox"/> Salt River	<input type="checkbox"/> Santa Cruz River
<input type="checkbox"/> Skunk Creek	<input type="checkbox"/> Verde River	
Flood control structures (name): _____		
Other (describe): _____		
C. Type of Construction		
<input checked="" type="checkbox"/> Residential	<input checked="" type="checkbox"/> Single Family	<input type="checkbox"/> Multi-family
<input type="checkbox"/> Commercial	<input checked="" type="checkbox"/> Roadways	<input checked="" type="checkbox"/> Utilities
<input type="checkbox"/> Other (describe): _____		<input type="checkbox"/> Industrial

3. Sample SWPPP for Phase Development

(continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Site Description (continued)

On-site construction activities:

Grading acres: 293 cu.yd. _____ Blasting
 Roadways linear feet: 3000 _____ Sewer, Water, Utilities
 Drainage Structures (describe): Natural wash area, storm sewer system, detention basin
(see approved Drainage Plans #123)

Off-site construction activities (may require a separate permit):

Grading acres: _____ cu.yd. _____ Blasting
 Roadways linear feet: 5280 _____ Sewer, Water, Utilities
 Drainage Structures (describe): Minor roadway culvert crossings.

D. Sequence of Major Activities (to the nearest month)

Start date: March 1, 1993 End date: January, 1995

Sequencing Schedule:

1. Install BMP construction access control entrance.
2. Clear and grub areas for roads, temporary sediment basins and detention basin.
3. Install detention basin (sediment basin) and temporary sediment traps.
4. Construct all other BMPs including equipment washdown and storage areas.
5. Install utilities; storm sewer, curb and gutter.
6. Develop pads on individual lots.
7. Construct buildings.
8. Complete final grading and paving for each lot.
9. Finalize landscaping for each lot.
10. Remove accumulated sediment in basin once all lots are complete.
11. Finalize landscaping in retention area.

E. Site Map (see attached map)

Controls

A. Erosion and Sediment Controls (see project BMP selection matrix and BMP fact sheets)

Stabilization practices:

Temporary controls:

Open space buffers will be kept throughout the project.

Dust control will be achieved by applying a fine spray of water at rates sufficient to settle the dust but not to cause runoff.

Permanent controls:

Landscaping will be used in all open areas and community property.

Structural practices:

Temporary: diversion dike; check dams; straw bale barrier; sediment traps, sediment basin; storm sewer protection.

Permanent: sediment basin (detention basin)

3. Sample SWPPP for a Phase Development

(continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Stormwater management:

This project will incorporate numerous management BMPs to help prevent future pollution from leaving the site. These include: detention basin, storm sewer system, landscaped slopes, outlet protection, and preservation of the natural wash.

B. Other controls (waste disposal, offsite tracking, etc.)

Waste disposal: All solid waste shall be stored in a securely lidded metal dumpster. The dumpster shall meet all State and Local waste management regulations. The dumpster will be emptied a minimum of twice per week or as often as necessary. The City Waste Company, a licensed solid waste management company in Chandler, will transport the material to the City Landfill in covered vehicles. No construction materials will be buried onsite.

Hazardous Waste: All hazardous waste shall be disposed of in the manner as specified by the manufacturer and State and Local regulations.

Sanitary Waste: All sanitary wastes will be collected from the portable units as needed by the Port-a-Potty Company, a licensed Sanitary waste management contract in the City of Chandler, as required by local regulations.

Designated Washout area: A washout area shall be constructed for the temporary collection of excess concrete and non-stormwater discharges from vehicle washing. The concrete will be taken to the City Landfill within 1 week of disposing into the washout area.

Offsite tracking: A stabilized construction entrance will be constructed to reduce vehicle tracking of sediments onto public rights-of-ways. The paved street adjacent to the site entrance will be swept daily to remove excess dirt.

Dust Control: A dust control plan has been approved by the Maricopa County Air Quality Department (See attached plan).

C. Maintenance/Inspection procedures (including non-stormwater discharges)

Maintenance: All structural BMPs will follow the specification listed in the BMP Fact Sheets per FCDMC's Erosion Control Manual.

Inspections: Inspection will be made monthly and within 24 hours after a rainfall event of 0.5 inches or greater (with a maximum duration of 24 hours) We do not anticipate any non-stormwater discharges. All non-stormwater flows shall be directed toward the washdown area or sediment basin. The SWPPP will be revised as site conditions and project warrants.

3. Sample SWPPP for a Phase Development (continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

D. Housekeeping (spill prevention)

Inventory: An inventory of substances to be used onsite included: Petroleum products, concrete, lumber, asphalt, paints, house construction materials, fertilizers, and pesticides.

Spill prevention: A spill prevention and material storage plan has been reviewed and approved by the Fire Marshall. Any release of a material in excess of a reportable quantity will be reported per federal regulations. All materials stored onsite will be stored in a neat, orderly manner and in the original containers. All manufacturer's recommendations for spill prevention, clean-up, and disposal shall be followed.

Good housekeeping: The contractor is responsible for following the good housekeeping requirements specified within the construction contract which are incorporated by reference to this SWPPP.

Other Concerns

State and local requirements have been incorporated into the plan:	<u> X </u> Yes <u> </u> No
Maintenance procedures for control measures have been identified into the plan:	<u> X </u> Yes <u> </u> No
Allowable non-stormwater discharges and pollution prevention measures have been identified:	<u> X </u> Yes <u> </u> No
Contractor certification received:	<u> X </u> Yes <u> </u> No
Plan certification received:	<u> X </u> Yes <u> </u> No

PLAINSVIEW RESIDENTIAL COMMUNITY

PROJECT BMP SELECTION

THE BMP'S TO BE USED AS TEMPORARY (TEMP.) OR PERMANENT (PERM.) CONTROLS FOR THE PROJECT SWPPP.
CHECK EACH APPLICABLE BMP.

CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL / SLOPE PROTECTION / SEDIMENT TRAPPING / DRAINAGEWAY AND STREAM PROTECTION / TEMPORARY STABILIZATION / PERMANENT STABILIZATION / NON-SEDIMENT POLLUTION CONTROL							SWPPP		
			A	B	C	D	E	F	G	TEMP.	PERM.	
PLANNING	SCHEDULING CONSIDERATIONS		●	●	●	●	●					
	CONSTRUCTION PHASING		●	●		●	●					
	PRESERVATION OF WASHES					●	●	●				
	OPEN SPACE BUFFERS					●	●	●				
VEGETATIVE CONTROLS -LIMIT EXPOSED AREA	TREES, SHRUBS, VINES, AND GROUND COVERS			●			●	●				
	MULCHING			●			●					
	EROSION CONTROL MATTINGS			●			●					
	PROTECTION OF TREES AND VEGETATION IN CONSTR. AREAS		●			●		●				
REDUCE AREA OF EXPOSURE -RUNOFF VOLUME REDUCTION/DIVERSION -PREVENT LOSS OF SEDIMENTS BY VEHICLES AND WIND	TEMP. DIVERSION DIKES		●	●								
	TEMP. DRAINAGE SWALE		●	●								
	PIPE SLOPE DRAINS			●								
	STABILIZED CONSTRUCTION ENTRANCE				●		●					
	CONSTRUCTION ROAD STABILIZATION		●				●					
	DUST CONTROL				●		●					

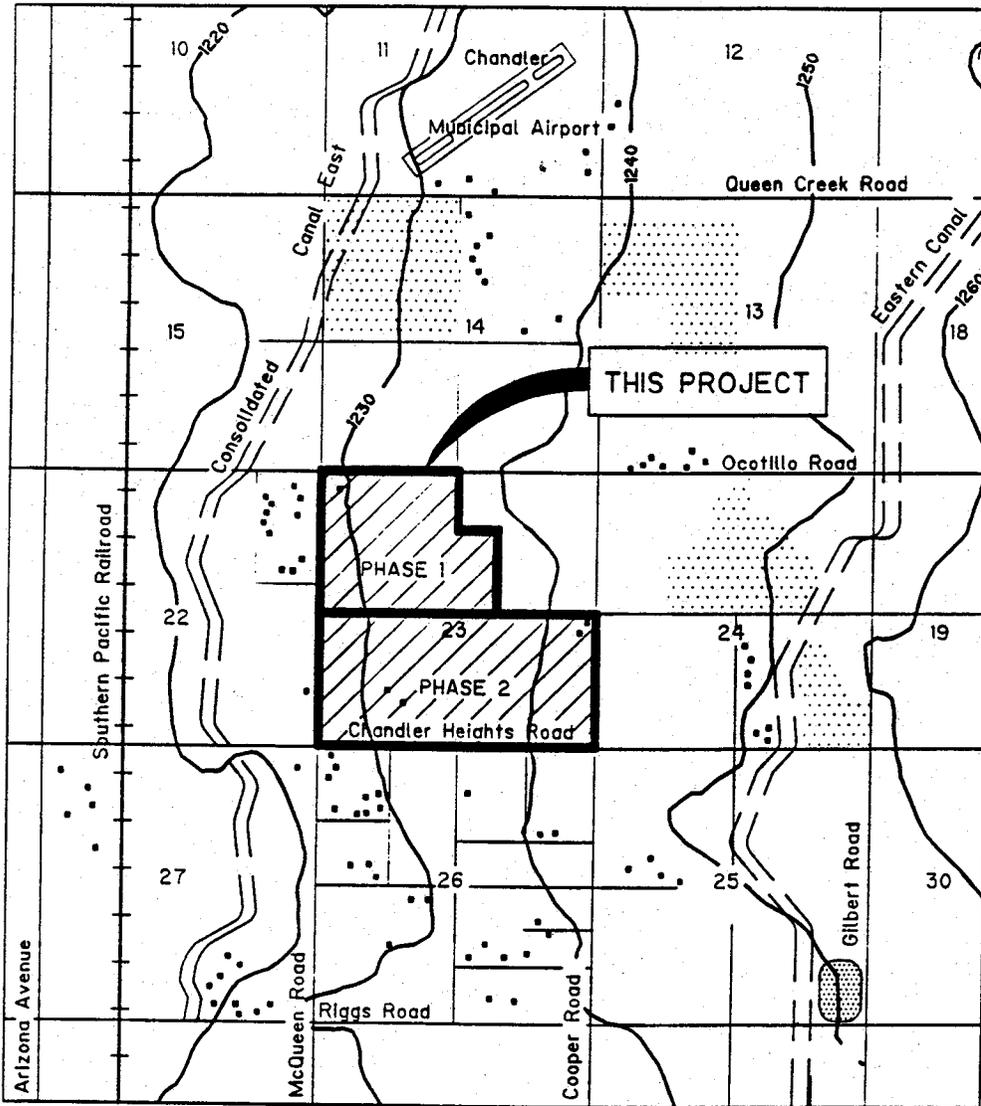
PLAINSVIEW CONTINUED

PROJECT BMP SELECTION

THE BMP'S TO BE USED AS TEMPORARY (TEMP.) OR PERMANENT (PERM.) CONTROLS FOR THE PROJECT SWPPP.
CHECK EACH APPLICABLE BMP.

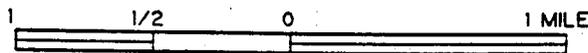
CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL / SLOPE PROTECTION / SEDIMENT TRAPPING / DRAINAGEWAY AND STREAM PROTECTION / TEMPORARY STABILIZATION / PERMANENT STABILIZATION / NON-SEDIMENT POLLUTION CONTROL							SWPPP			
			A	B	C	D	E	F	G	TEMP.	PERM.		
RUNOFF VELOCITY REDUCTION	CHECK DAMS				●	●							
	ROCK OUTLET PROTECTION			●		●	●						
	SURFACE ROUGHENING			●		●	●						
SEDIMENT TRAPPING	STRAW BALE BARRIER		●		●								
	SILT FENCE		●		●								
	STORM DRAIN INLET PROTECTION				●								
	TEMPORARY SEDIMENT TRAP				●								
	TEMPORARY SEDIMENT BASIN				●								
	SAND BAG BARRIER (BERM)		●		●								
	GRAVEL FILTER BERM		●		●								
GOOD HOUSEKEEPING PRACTICES	EQUIPMENT MAINTENANCE PROCEDURES									●			
	SOLID WASTE MANAGEMENT									●			
	DESIGNATED WASHDOWN AREAS									●			
	PROTECTED CHEMICAL STORAGE AREAS									●			
	TEMPORARY ACCESS WATERWAY CROSSING					●				●			
	SPILL CONTAINMENT PLAN					●				●			

SAMPLE SWPPP



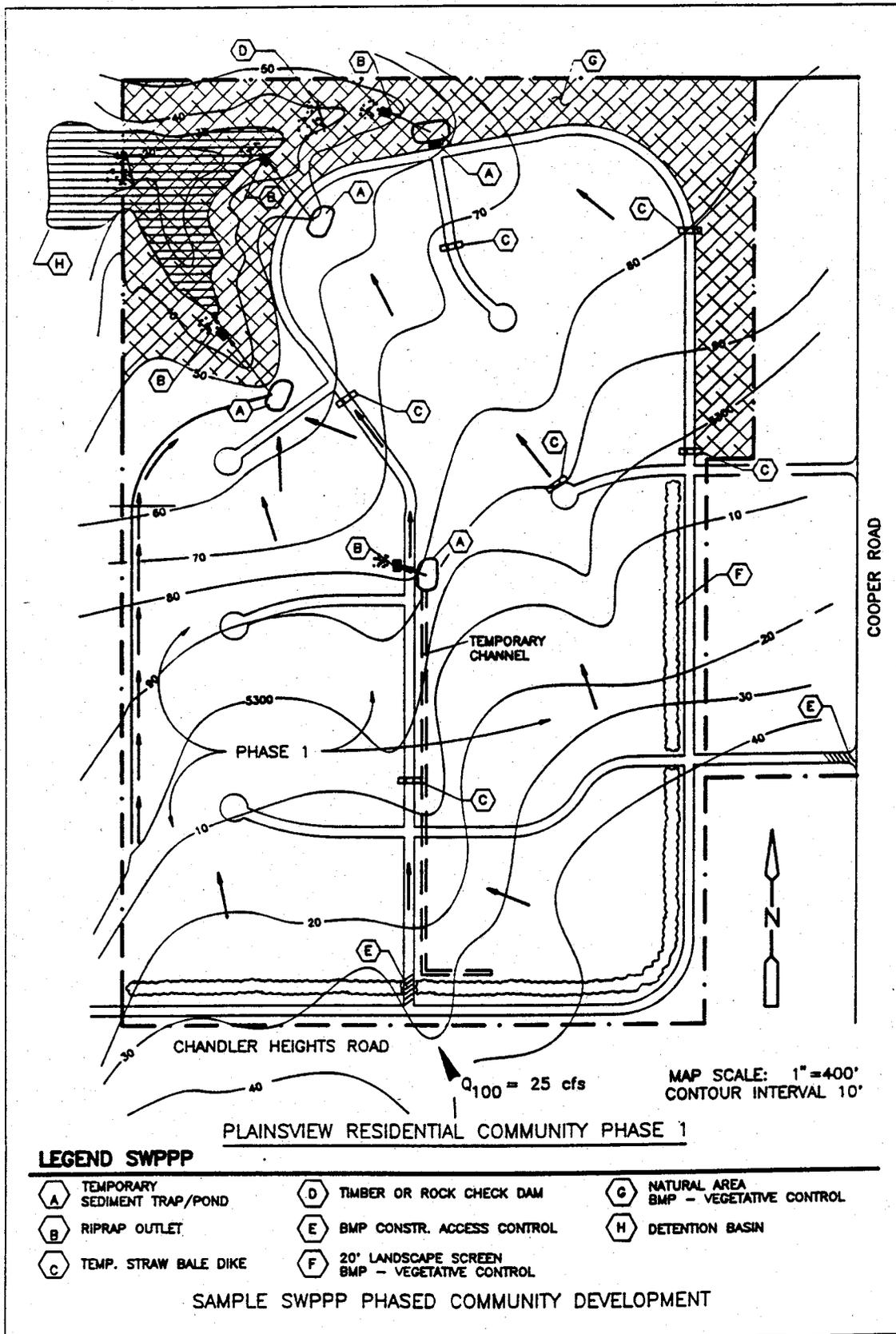
LOCATION MAP

47'30"



SCALE

Project Name: PLAINSVIEW RESIDENTIAL COMMUNITY
 Receiving Waters: SALT RIVER
 Jurisdiction: CHANDLER
 Location: OCOTILLO ROAD & CHANDLER HEIGHTS ROAD
 Map: USGS 7.5' QUAD MAPS: GILA BUTTE & CHANDLER
 Township Range Section: T 2 S, R 5 E, NW1/4 AND NE1/4 SECTION 23



Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Pollution Prevention Plan Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signed: _____
 Name
 Position Title
 Company

Date: _____

Contractor's Certification:

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signature	Company Name, Address and Phone	Responsibility
_____ Name of General Contractor Date:		
_____ Name of Subcontractor Date:		
_____ Name of Subcontractor Date:		

3. Sample SWPPP for a Phase Development (continued)

Other attachments should include:

- * BMP fact sheets for:
 - Temporary: Diversion dike;
Stabilized construction entrance;
Dust control;
Check dam;
Straw bale barriers;
Sediment trap;
Sediment basin;
Equipment maintenance procedures;
Solid waste management;
Washout area;
Spill containment plan
 - Permanent: Trees, shrubs, vines, and ground covers
Mulching
Sediment basin (same as temporary sediment basin)
- * Drainage plans
- * Dust control plan
- * Copy of Notice of Intent (NOI)
- * Contractor certification sheet
- * Grading permit
- * Copy of any other permit relating to construction and pollution prevention.

4. Sample SWPPP for Commercial Site

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Site Description			
A. General Information			
Project Name: <u>Ocotillo Heights Plaza</u>			
Project Location:			
address: <u>600 W. Guadalupe Rd.</u>			
City/County/State: <u>Mesa, Maricopa County, Arizona</u>			
Township/Range/Section: <u>T1N, R5E, Sect. 4 SE 1/4</u>			
Location map attached: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Owner name and address: <u>John Developer</u> <u>Desert Developing Company</u> <u>200 N. Country Club</u> <u>Mesa, Arizona 85201</u>	Operator name and address: <u>Joe Contractor</u> <u>Saguaro Construction Co.</u> <u>1200 E. BROADWAY RD.</u> <u>Mesa, Arizona 85204</u>		
Description (purpose and types of soil disturbance activities): <i>This project is a commercial shopping center. Soil disturbing activities include: clearing and grubbing, installing a stabilized construction entrance; construction of all erosion control structures; grading; excavation for temporary sediment basin, storm sewer system, utilities, and building foundations; construction of curb and gutters, roads and parking areas; and preparation for final landscaping.</i>			
B. Hydrologic Information			
Project size (acres): <u>12</u> Area to be graded (acres): <u>11</u>			
Existing project runoff coefficient: <u>.35</u> Developed project runoff coefficient: <u>.85</u>			
Soils report: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
if yes, prepared by: <u>Smith Engineers</u>			
Receiving waters in Maricopa County, Arizona			
<input type="checkbox"/> Agua Fria River	<input type="checkbox"/> Cave Creek	<input type="checkbox"/> Centennial Wash	
<input checked="" type="checkbox"/> Gila River	<input type="checkbox"/> Hassayampa River	<input type="checkbox"/> Indian Bend Wash	
<input type="checkbox"/> New River	<input type="checkbox"/> Salt River	<input type="checkbox"/> Santa Cruz River	
<input type="checkbox"/> Skunk Creek	<input type="checkbox"/> Verde River		
Flood control structures (name): _____			
Other (describe): _____			
C. Type of Construction			
<input type="checkbox"/> Residential	<input type="checkbox"/> Single Family	<input type="checkbox"/> Multi-family	<input type="checkbox"/> Industrial
<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Roadways	<input checked="" type="checkbox"/> Utilities	
<input type="checkbox"/> Other (describe): _____			

4. Sample SWPPP for Commercial Site

(continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Site Description (continued)

On-site construction activities:

Grading acres: 11.5 cu.yd. 4000 Blasting
 Roadways linear feet: _____ Sewer, Water, Utilities
 Drainage Structures (describe): retention basin

Off-site construction activities (may require a separate permit): *none*

Grading acres: _____ cu.yd. _____ Blasting
 Roadways linear feet: _____ Sewer, Water, Utilities
 Drainage Structures (describe): _____

D. Sequence of Major Activities (to the nearest month)

Start date: January, 1993 End date: January, 1995

Sequencing Schedule:

1. Install BMP stabilized construction access control entrance.
2. Clear and grub areas for temporary sediment basins and drainage swale.
3. Install temporary sediment basin and drainage swale.
4. Continue clearing and grading.
5. Install utilities; storm drains, and curb and gutter.
6. Install storm drain inlet protection.
7. Construct buildings.
8. Complete final grading and paving of the parking lot area.
9. Remove accumulated sediments from basin.
10. Finalize landscaping in retention area.

E. Site Map (see attached map)

Controls

A. Erosion and Sediment Controls (see project BMP selection matrix and BMP fact sheets)

Stabilization practices:

Temporary controls:

Stabilized construction entrance.

Dust control will be achieved by applying a fine spray of water at rates sufficient to settle the dust but not to cause runoff.

Permanent controls:

Landscaping in retention area.

Structural practices:

Temporary: *drainage swale; storm drain inlet protection; sediment basin.*

Permanent: *sediment basin (retention basin); rock outlet protection.*

4. Sample SWPPP for Commercial Site

(continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Stormwater management:

The stormwater will be provided by overland flow to a retention basin where landscaping will help prevent future pollution from leaving the site.

B. Other controls (waste disposal, offsite tracking, etc.)

Waste disposal: All solid waste shall be stored in a securely lidded metal dumpster. The dumpster shall meet all State and Local waste management regulations. The dumpster will be emptied a minimum of twice per week or as often as necessary. The Desert Waste Company, a licensed solid waste management company in Mesa will transport the material to the City Landfill in covered vehicles. No construction materials will be buried onsite.

Hazardous Waste: All hazardous waste shall be disposed of in the manner as specified by the manufacturer and State and Local regulations.

Sanitary Waste: All sanitary wastes will be collected from the portable units as needed by the Port-a-Potty Company, a licensed Sanitary waste management contract in the City of Mesa, as required by local regulations.

Designated Washout area: A washout area shall be constructed for the temporary collection of excess concrete and non-stormwater discharges from vehicle washing. The concrete will be taken to the City Landfill within 1 week of placing in the washout area.

Offsite tracking: A stabilized construction entrance will be constructed to reduce vehicle tracking of sediments onto public rights-of-ways. The paved street adjacent to the site entrance will be swept daily to remove excess dirt.

Dust Control: A dust control plan has been approved by the Maricopa County Air Quality Department (See attached plan).

C. Maintenance/Inspection procedures (including non-stormwater discharges)

Maintenance: All structural BMPs will follow the specification listed in the BMP Fact Sheets per FCDMC's Erosion Control Manual.

Inspections: Inspection will be made monthly and within 24 hours after a rainfall event of 0.5 inches or greater (with a maximum duration of 24 hours) We do not anticipate any non-stormwater discharges. All non-stormwater flows shall be directed toward the washout area or sediment basin. The SWPPP will be revised as site conditions and project warrants.

4. Sample SWPPP for Commercial Site

(continued)

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

D. Housekeeping (spill prevention)

Inventory: An inventory of substances to be used onsite included: Petroleum products, concrete, lumber, asphalt, paints, building construction materials, fertilizers, and pesticides.

Spill prevention: A spill prevention and material storage plan has been reviewed and approved by the Fire Marshall. Any release of a material in excess of a reportable quantity will be reported per federal regulations. All materials stored onsite will be stored in a neat, orderly manner and in the original containers. All manufacturer's recommendations for spill prevention, clean-up, and disposal shall be followed.

Good housekeeping: The contractor is responsible for following the good housekeeping requirements specified within the construction contract which are incorporated by reference to this SWPPP.

Other Concerns

State and local requirements have been incorporated into the plan:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Maintenance procedures for control measures have been identified into the plan:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Allowable non-stormwater discharges and pollution prevention measures have been identified:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Contractor certification received:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Plan certification received:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

PROJECT BMP SELECTION

Ocotillo Heights

THE BMP'S TO BE USED AS TEMPORARY (TEMP.) OR PERMANENT (PERM.) CONTROLS FOR THE PROJECT SWPPP.
CHECK EACH APPLICABLE BMP.

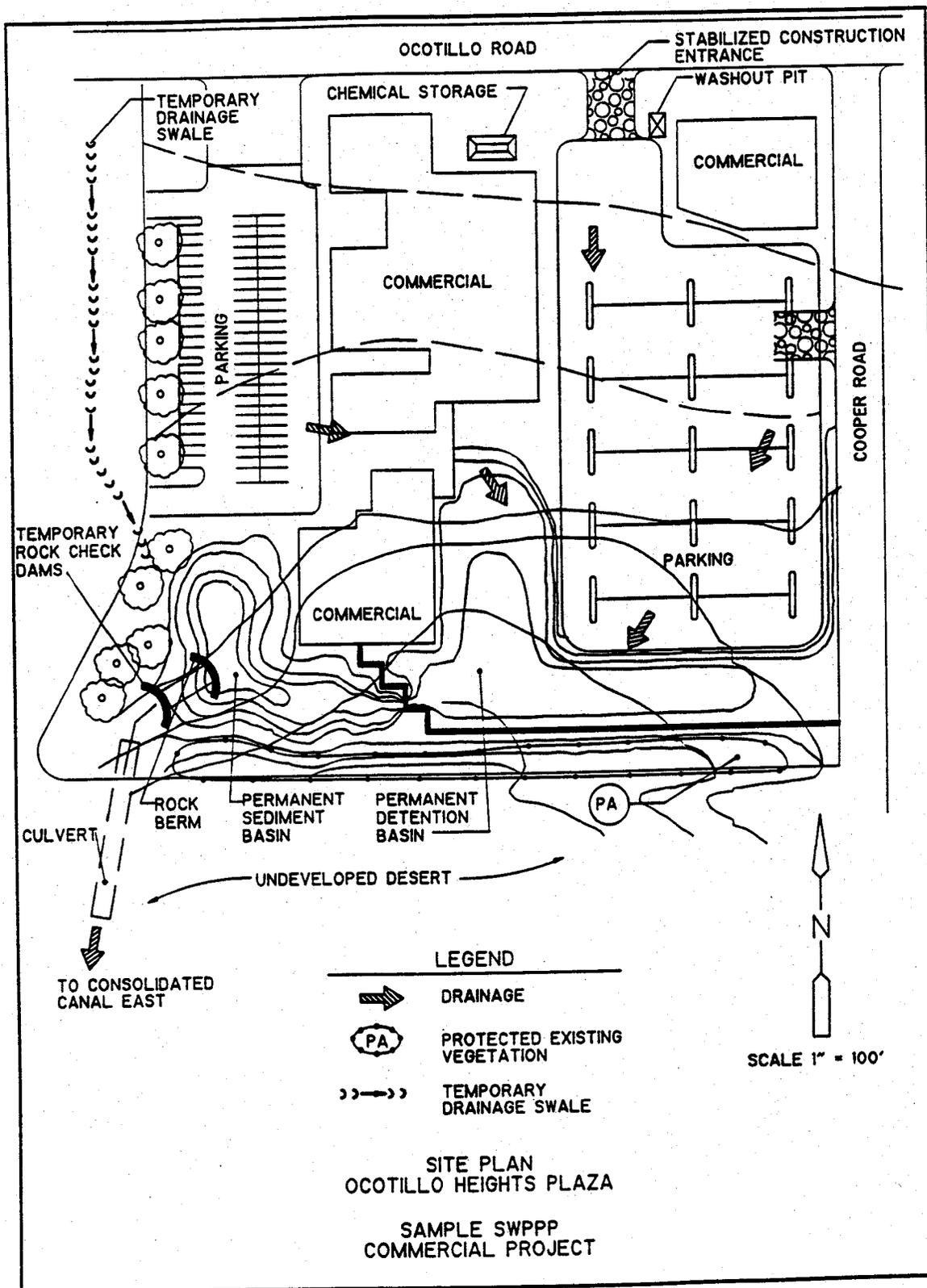
CONTROL FACTOR	BMP TITLE	SYMBOL	PERMETER CONTROL / DIVERSION							SWPPP	
			SLOPE PROTECTION		SEDIMENT TRAPPING		DRAINAGE AND STREAM PROTECTION		TEMP.	PERM.	
			A	B	C	D	E	F			G
PLANNING	SCHEDULING CONSIDERATIONS		●	●	●	●	●			✓	
	CONSTRUCTION PHASING		●	●		●				✓	
	PRESERVATION OF WASHES					●					
	OPEN SPACE BUFFERS		●			●					
VEGETATIVE CONTROLS -LIMIT EXPOSED AREA	TREES, SHRUBS, VINES, AND GROUND COVERS			●			●	●			✓
	MULCHING			●			●				
	EROSION CONTROL MATTINGS			●			●				
	PROTECTION OF TREES AND VEGETATION IN CONSTR. AREAS		●			●		●			
REDUCE AREA OF EXPOSURE -RUNOFF VOLUME REDUCTION/ DIVERSION -PREVENT LOSS OF SEDIMENTS BY VEHICLES AND WIND	TEMP. DIVERSION DIKES		●	●							
	TEMP. DRAINAGE SWALE		●	●						✓	
	PIPE SLOPE DRAINS		●	●							
	STABILIZED CONSTRUCTION ENTRANCE		●		●		●		●	✓	
	CONSTRUCTION ROAD STABILIZATION		●				●				
	DUST CONTROL		●		●		●		●	✓	

Ocotillo Heights

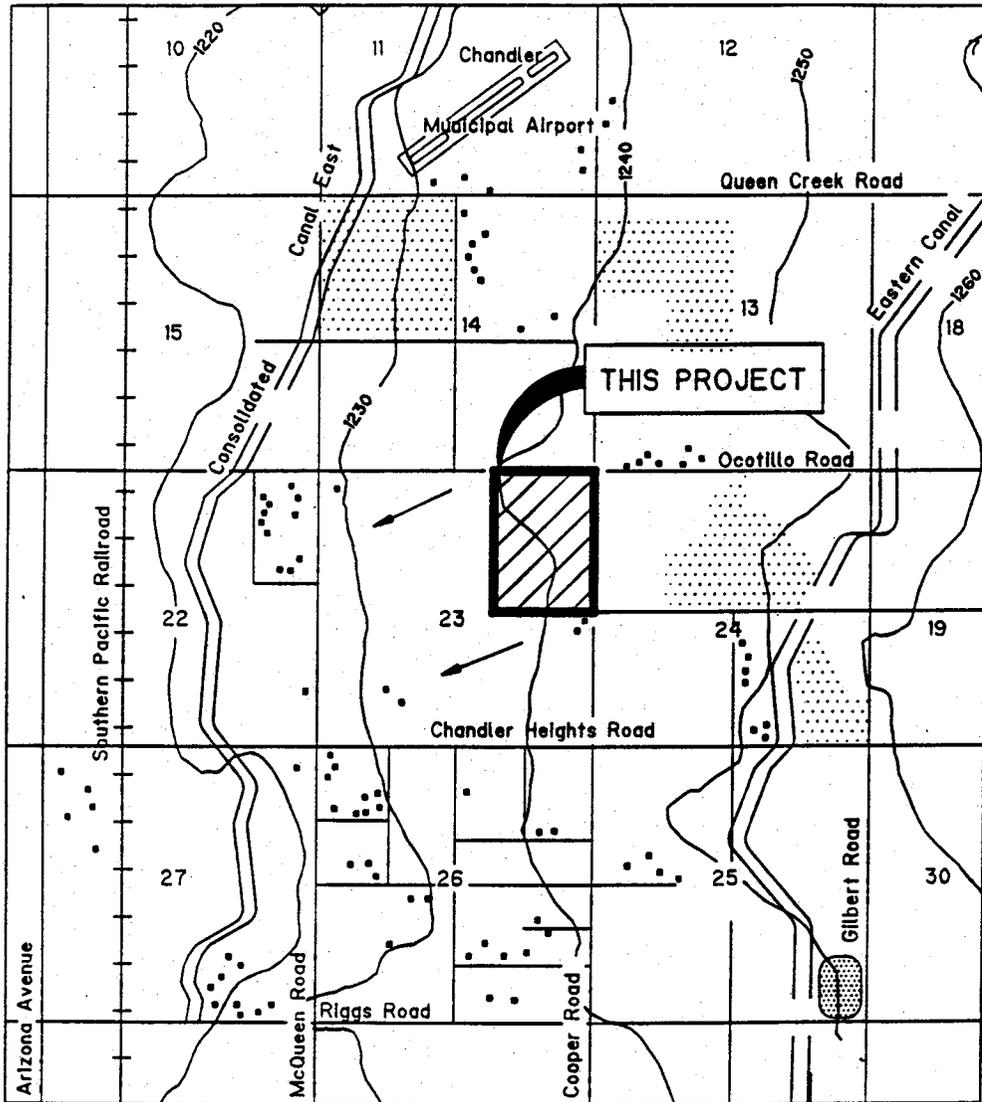
PROJECT BMP SELECTION

THE BMP'S TO BE USED AS TEMPORARY (TEMP.) OR PERMANENT (PERM.) CONTROLS FOR THE PROJECT SWPPP.
CHECK EACH APPLICABLE BMP.

CONTROL FACTOR	BMP TITLE	SYMBOL	PERIMETER CONTROL / SLOPE PROTECTION / SEDIMENT TRAPPING / DRAINAGEWAY AND STREAM PROTECTION / TEMPORARY STABILIZATION / PERMANENT STABILIZATION / NON-SEDIMENT POLLUTION CONTROL							SWPPP	
			A	B	C	D	E	F	G	TEMP.	PERM.
RUNOFF VELOCITY REDUCTION	CHECK DAMS				●		●				
	ROCK OUTLET PROTECTION			●		●	●	●			✓
	SURFACE ROUGHENING			●			●				
SEDIMENT TRAPPING	STRAW BALE BARRIER		●		●						
	SILT FENCE		●		●						
	STORM DRAIN INLET PROTECTION				●	●				✓	
	TEMPORARY SEDIMENT TRAP				●	●					
	TEMPORARY SEDIMENT BASIN				●	●				✓	✓
	SAND BAG BARRIER (BERM)		●		●						
	GRAVEL FILTER BERM		●		●		●				
GOOD HOUSEKEEPING PRACTICES	EQUIPMENT MAINTENANCE PROCEDURES								●		
	SOLID WASTE MANAGEMENT								●	✓	
	DESIGNATED WASHDOWN AREAS								●	✓	
	PROTECTED CHEMICAL STORAGE AREAS								●	✓	
	TEMPORARY ACCESS WATERWAY CROSSING					●			●		
	SPILL CONTAINMENT PLAN					●			●	✓	

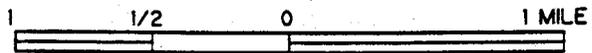


SITE PLAN
 OCOTILLO HEIGHTS PLAZA
 SAMPLE SWPPP
 COMMERCIAL PROJECT



LOCATION MAP

47'30"



SCALE

Project Name: OCOTILLO HEIGHTS PLAZA
 Receiving Waters: SALT RIVER
 Jurisdiction: CHANDLER
 Location: OCOTILLO ROAD & CHANDLER HEIGHTS ROAD
 Map: USGS 7.5' QUAD MAPS: GILA BUTTE & CHANDLER
 Township Range Section: T 2 S. R 5 E. NE1/4 SECTION 23

Stormwater Pollution Prevention Plan NPDES General Permit for Construction

Pollution Prevention Plan Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signed: _____
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Contractor's Certification:

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Signature	Company Name, Address and Phone	Responsibility
_____ Name of General Contractor Date:		
_____ Name of Subcontractor Date:		
_____ Name of Subcontractor Date:		

4. Sample SWPPP for Commercial Site (continued)

Other attachments should include:

- * BMP fact sheets for:
 - Temporary: Drainage swale;
Stabilized construction entrance;
Dust control;
Storm drain inlet protection;
Sediment basin;
Equipment maintenance procedures;
Solid waste management;
Washout area;
Protected chemical storage area;
Spill containment plan.
 - Permanent: Trees, shrubs, vines, and ground covers
Rock outlet protection;
Sediment basin (same as temporary sediment basin)
- * Drainage plans
- * Dust control plan
- * Copy of Notice of Intent (NOI)
- * Contractor certification sheet
- * Grading permit
- * Copy of any other permit relating to construction and pollution prevention.

5. SWPPP Strategy for Public Projects

Public improvements in Maricopa County are generally constructed using MAG Specifications or ADOT Specifications for construction management and oversight. With the NPDES General Permit, public works contracts and specifications may be amended to provide the contractor with specific responsibilities and the guidance to perform these duties. A general approach for specifications is outlined below.

Contract Documents: The construction contract documents should clearly defined the role and responsibilities of the Owner, Contractor, Sub-contractor, Construction Manager, and all other parties for preparation, implementation, inspection, and maintenance of the SWPPP and all other compliance documentation as necessary under the NPDES General Permit. The public agency as the owner, or the owner's designated representative, will prepare the contract, specifying the various responsibilities of all parties involved in a construction project. The owner should review the NPDES General Permit to ensure that all necessary compliance requirements will be met.

The key components of the NPDES General Permit which should be addressed are:

Notice of Intent (NOI).

Stormwater Pollution Prevention Plan (SWPPP).

preparation.

implementation.

review and approval.

revisions.

Best Management Practices (BMPs), where not covered by other documents such as this manual.

Inspection.

Maintenance.

Spills with Reportable Quantities.

Notice of Termination (NOT).

Record Keeping

Permitting Costs: Establishing a cost or an allowance to pay the costs of implementing the SWPPP prior to receiving contractor bids may help ensure contractor's willingness to implement and maintain erosion and sedimentation control measures. It also will place competing contractor's on a level playing field to prevent last minute cost cutting measures from reducing the scope.

Construction Scheduling: Draft information from the EPA indicates that the beginning of construction will be defined as the first construction activity that occurs as a result of the project no matter how minor. For most public projects this first activity will be utility relocations which are often done by the utility companies separately from the project construction contract. Therefore, an NOI should be submitted prior to any construction activities taking place within the project limits as a result of the project.

The Notice of Termination (NOT) should be submitted after the project is deemed complete by the owner. This may be immediately after final inspections and approvals, or the contract may specify a length of time under which the contractor is responsible for maintaining landscaping or other improvements.

A construction schedule outlining the basic construction sequence, the owner's requirements, and the NPDES General Permit components should be done as early as possible in the project planning and design.

Specifications: The contract specifications can provided many of the details for the SWPPP preparation, implementation, maintenance, and inspection requirements. Using the *MAG Uniform Specifications for Public Works Construction* the following items should be considered in addition to the contract definition of roles and responsibilities.

Part 100 General Conditions; Sureties or other bonding capacity to provide for completion, inspection, and maintenance of the BMPs per the NPDES General Permit requirements.

Part 200 Earthwork: Clarification of stabilization requirements, guidelines, and BMPs to be used on the specific project.

Part 300 Streets and Related Work: Requirements for storm sewer inlet protection, street sweeping, BMPs for storm sewers and other drainage structures should be defined.

Part 400 Right-of-way and Traffic Control: This general section covers several key items including:

Providing safe driving conditions. Implementation of any BMP must not compromise traffic safety.

General work within the right-of-way including parkway grading should address appropriate locations for implementing BMPs. Also some of the BMPs are more appropriate for private development of large tracks of land rather than linear public works projects. Inappropriate BMPs should be identified and their use restricted.

Landscaping requirements, maintenance, and general clean up requirements.

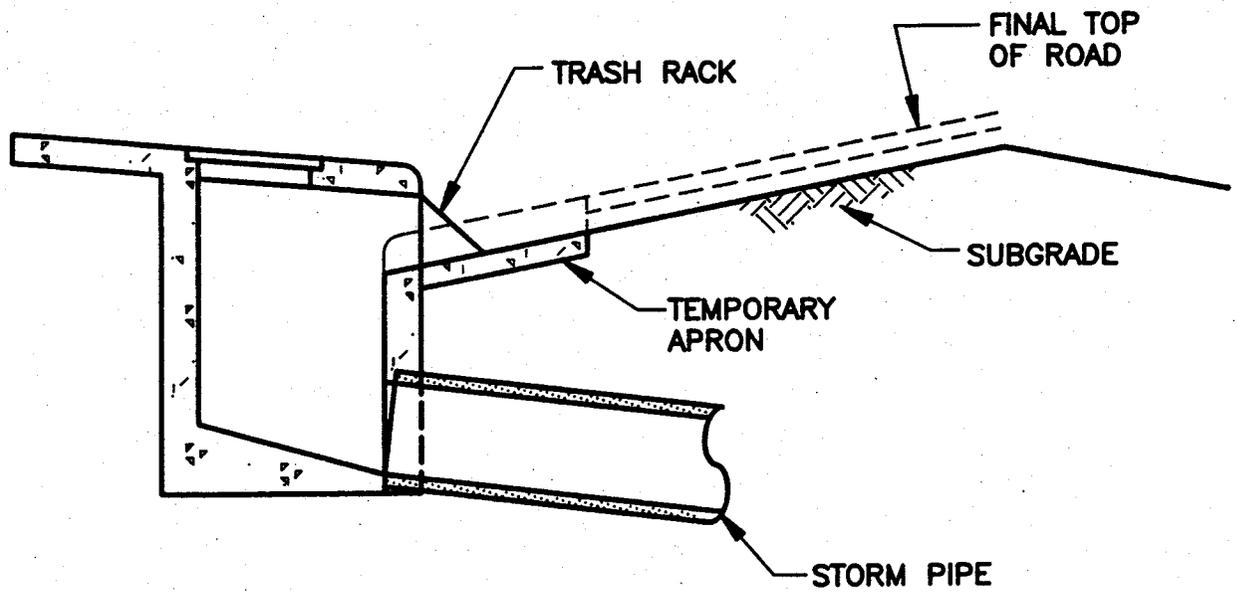
Utilities, water line flushing, or other allowable non-stormwater discharges should be defined.

Part 700 Materials: In this section the majority of the specifications for construction of BMPs and pollution control measures for storage and selection of materials will be identified. Some of the relevant items will include:

Materials within this section should be reviewed for potential pollutants. Where appropriate substitutes are available, these materials should be identified.

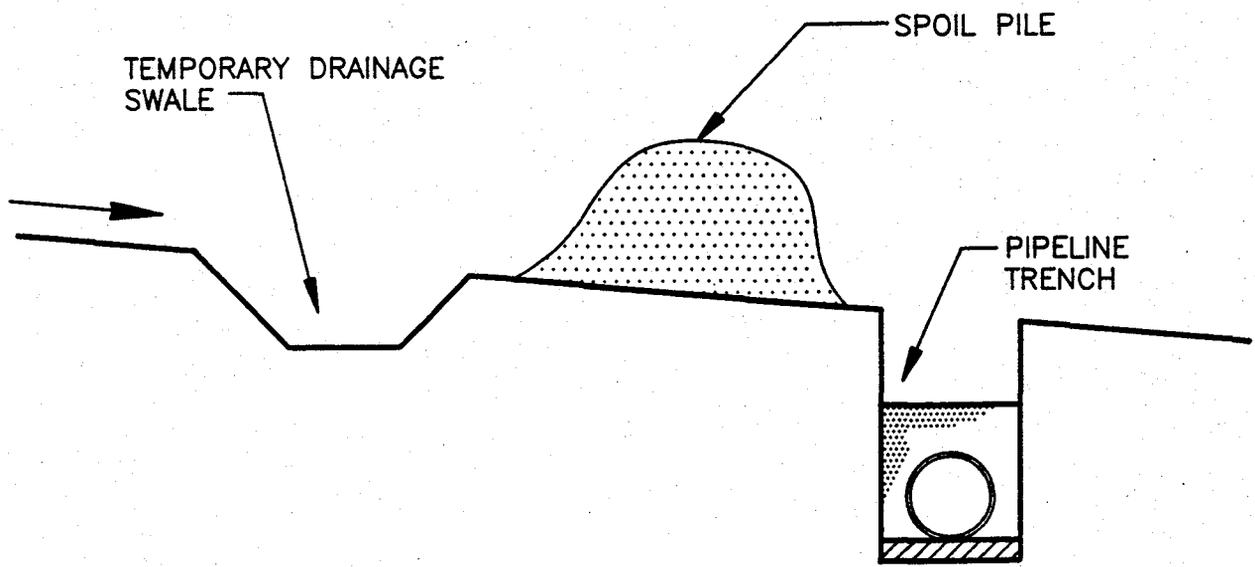
Dust palliatives and other dust control measures should be identified.

Acceptable BMPs and guidance in the implementation of the BMPs should be included within this section either as reference to other specifications or as standards developed by the engineer for the project. Some BMPs may also be shown as standard details on the construction drawings.



STORM DRAIN INLET
TEMPORARY CONSTRUCTION DRAIN
FOR
HIGHWAY PROJECTS

NOT TO SCALE



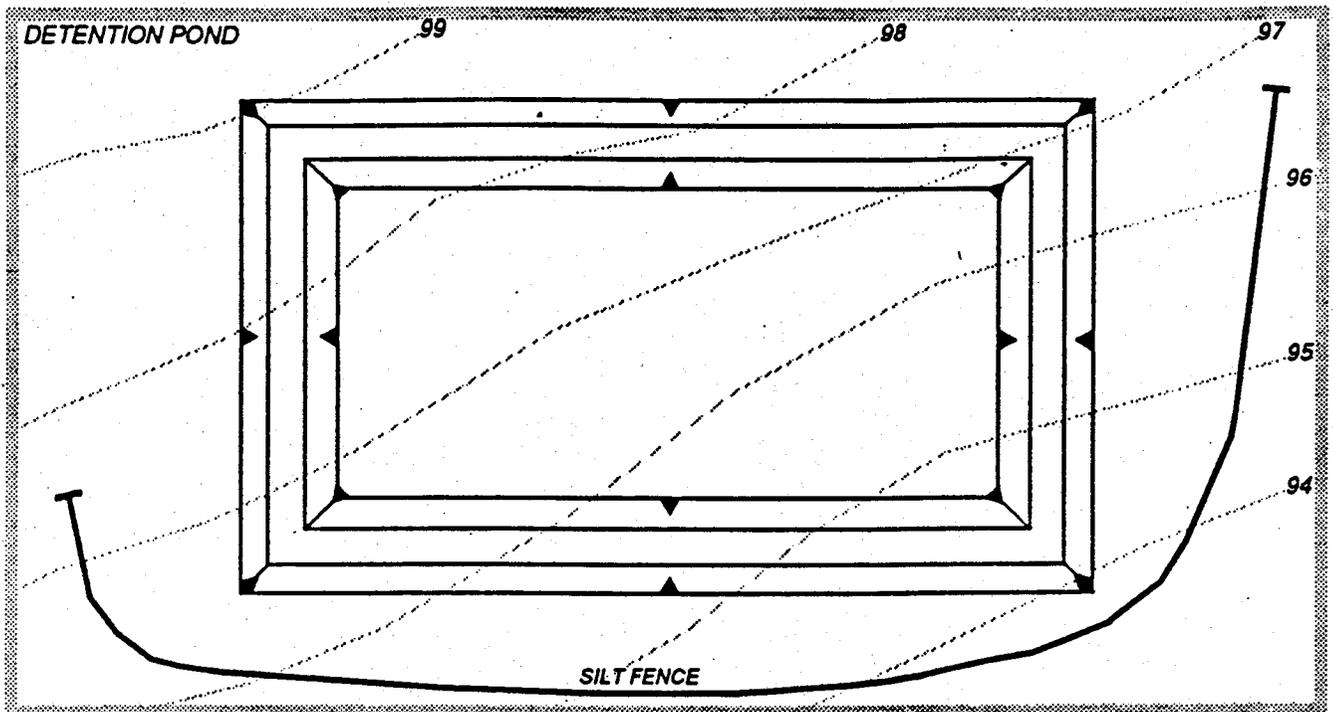
**TEMPORARY DRAINAGE AND EROSION PROTECTION
TYPICAL PIPELINE CONSTRUCTION DETAIL**

NOT TO SCALE

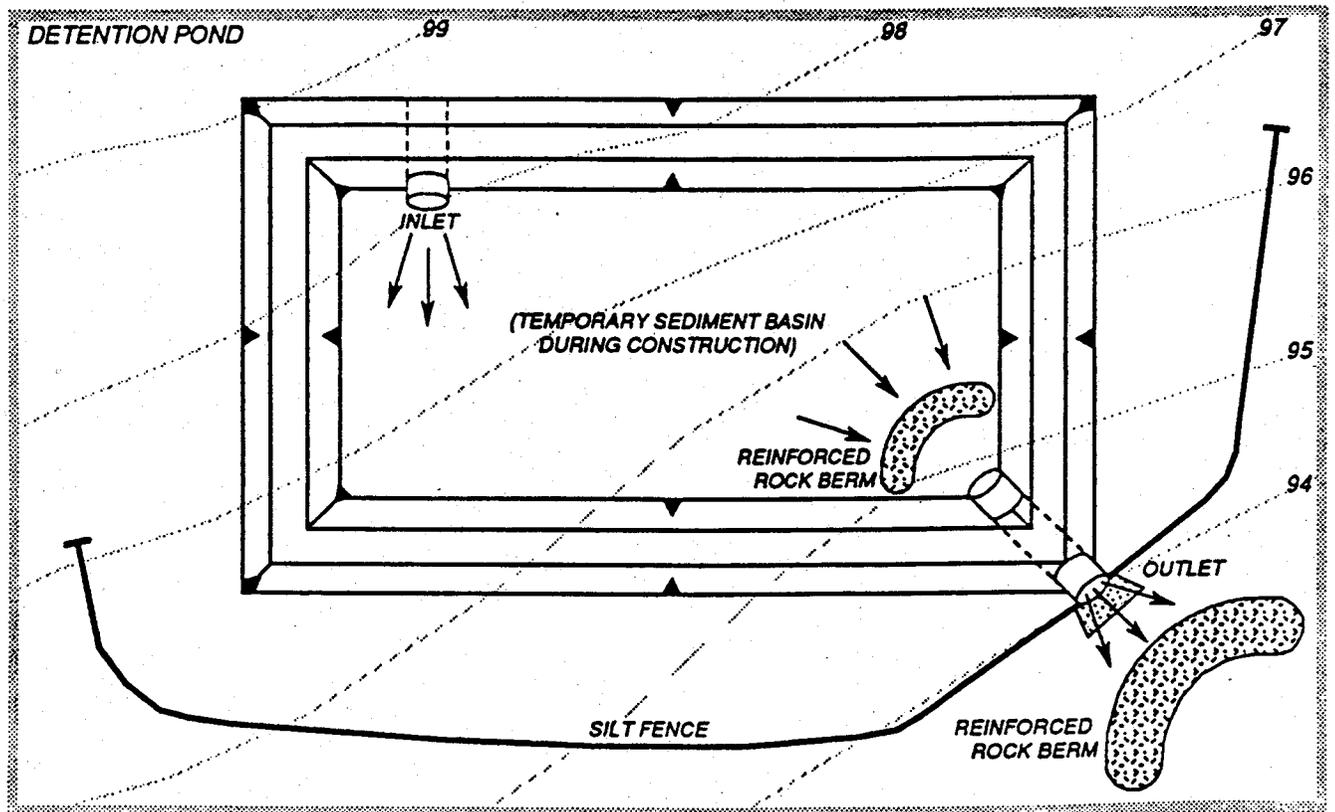
PROT.DWG

TEMPORARY ESC TWO-PHASE DESIGN - DETENTION POND CONSTRUCTION

Phase One - *Perimeter* controls for clearing and earth work



Phase Two - *Interior* controls after rough cut and fill





Appendix A

Definitions

(Reference 21)

Definition

Backfill:	Earth refilling a trench or an excavation.
Baseline General Permit:	A permit applicable to a number of classes or categories of discharge.
Berm:	An earthen mound used to direct the flow of runoff around or through a structure.
Best Management Practice BMPs:	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.
Buffer Strip or Zone:	Strip of erosion-resistant vegetation between a waterway and an area of more intensive land use.
CERCLA:	Comprehensive Environmental Responsibility Compensation and Liabilities Act.
Clean Water Act (CWA):	(33 U.S.C. 1251 et seq.) requirement of the NPDES program are defined under Sections 307, 402, 318 and 405 of the CWA.
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.
Conveyance:	Any channel or pipe for directing the flow of water.
Culvert:	A covered channel or a large-diameter pipe that directs water flow below the ground level.
Denuded:	Land stripped of vegetation such as grass, or land that has been worn down due to impacts from the elements or humans.
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.
Drip Guard:	A device used to prevent drips of fuel, or corrosive or reactive chemicals from contacting other materials or areas.

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.
Excavation:	The process of removing earth, stone, or other materials.
Fertilizer:	Materials such as 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).
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.
Hazardous Substance:	<ol style="list-style-type: none">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. Any substance named by EPA to be reported is a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted into the environment.
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.
Holding Pond:	A pond or reservoir, usually made of earth, built to store polluted runoff for a limited time.
Illicit Connection:	Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges authorized by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire-fighting activities.
Infiltration:	<ol style="list-style-type: none">1. The penetration of water through the ground surface into sub-surface 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.
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 sheetflow (i.e., not through channels). The purpose of level spreaders are to prevent concentrated erosive flows from occurring and to enhance infiltration.
Liner:	<ol style="list-style-type: none">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.
Material Storage Areas:	On site locations where raw materials, products, final products, by-products, or waste materials are stored.
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.
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.
Notice of Termination (NOT):	Form to notify authorities when a construction project is complete.
NPDES:	National Pollution Discharge Elimination Systems. (Pronounced NIP-DEEZ)
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.
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.
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 quality of a soil that enables water or air to move through it. Usually expressed in inches/hour or inches/day.
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.
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 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, or vessel or other floating craft, from which pollutants are or may be discharged.
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, then filters naturally into the soil.
Precipitation:	Any form of rain or snow.
Preventative Maintenance Program:	A schedule of inspections and testing at regular intervals intended to prevent equipment failures and deterioration.
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.
- 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.
- 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.
- Runon:** Stormwater surface flow or other surface flow which enters property other than that where it originated.
- Runoff:** That part of precipitation, snow melt, 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.
Sheet Erosion:	Erosion of thin layers of surface materials by continuous sheets of running water.
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 and Countermeasures Plan (SPCC):	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.
Storm Drain:	A slotted opening leading to an underground pipe or an open ditch for carrying surface runoff.
Stormwater:	Runoff from a storm event, snow melt runoff, and surface runoff and drainage. For the purpose of the NPDES program, stormwater is designed as storm water as used in the Clean Water Act.
Stormwater Discharge Associated with Industrial Activity:	The discharge from any conveyance which is used for collecting and conveying stormwater and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under 40 CFR Part 122. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling

equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only stormwater discharges from all areas (except access road and rail lines) that are listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste material, by-products, or industrial machinery *are exposed to stormwater*. For the purposes of this paragraph, material handling activities include the: storage loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with stormwater drained from the above described areas. Industrial facilities [including industrial facilities that are federally, state, or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)] include those facilities designed under the provision of 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to stormwater effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are excepted under category (xi) of this paragraph; (ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285) 29, 311, 32 (except 323), 33, 3441, 372; (iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11 (l) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990 and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge stormwater contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; (inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator; inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, or processing of mined materials, nor sites

where minimal activities are undertaken for the sole purpose of maintaining mining claim); (iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA; (v) Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection including those that are subject to regulation under Subtitle D of RCRA; (vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobiles junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093; (vii) Steam electric power generating facilities, including coal handling sites; (viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(viii) or (ix)-(xi) of this subsection are associated with industrial activity; (xi) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with Section 405 of the CWA; (x) Construction activity, including clearing, grading and excavation activities, except: operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale; (xi) Facilities under Standard Industrial Classification 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x));

Note:

The Transportation Act of 1991 provides an exemption from stormwater permitting requirements for certain facilities owned or operated by municipalities with a population of less than 100,000. Such municipalities must submit stormwater discharge permit applications only for airports, powerplants, and uncontrolled sanitary landfills that they own or operate, unless a permit is otherwise required by the permitting authority.

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 Water:	All water 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.
Swale:	An elongated depression in the land surface that is at least seasonally wet, is usually heavily vegetated, and is normally without flowing water. Swales direct stormwater to infiltrate into the ground surface.
Tarp:	A sheet of waterproof canvass or other materials used to cover and protect materials, equipment, or vehicles.
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.
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.
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.
Universal Soil Loss Equation (USLE):	An equation developed to estimate annual soil loss based on watershed characteristics.
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.
Water Table:	The depth or level below which the ground is saturated with water.
Waters of the United States:	As defined by 40 FRC 404; (a) 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;

-
- (b) All interstate waters, including interstate "wetlands;"
 - (c) 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:
 - (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
 - (d) All impoundments of waters otherwise defined as waters of the United States under this definition;
 - (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;
 - (f) The territorial sea; and
 - (g) 'Wetlands' adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) 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 in 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.

Waterway:	A channel for the passage or flow of water.
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.
Wind Break:	Any device design to block wind flow and intended for protection against any ill effects of wind.



Appendix B

EPA Forms

for

Construction Activities



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, Ca. 94105-3901

In Reply
Reply to: W-5-1

16 SEP 1992

To Whom It May Concern:

The purpose of this letter is to provide notice of the issuance of final general NPDES permits which authorize, with certain exceptions, storm water discharges associated with industrial activity in specified states (including Arizona), territories and Indian lands. These permits appeared in the Federal Register on September 9, 1992 (57 Fed. Reg. 41176). The 1987 Water Quality Act and NPDES regulations at 40 CFR 122.26 require NPDES permits for storm water discharges from a broad range of industrial facilities. The enclosed fact sheets provide a discussion of the coverage of the program and a summary of the general permits requirements.

If your facility discharges storm water associated with industrial activity and you wish to seek coverage under a general permit, please call the EPA storm water hotline at (703) 821-4823 or Eugene Bromley of EPA, Region 9 at (415) 744-1906 to obtain a copy of the full permit. To obtain coverage under these general permits, dischargers must submit a notice of intent (NOI) to the following address:

Storm Water Notice of Intent
P. O. Box 1215
Newington, VA 22122

The NOI form (including instructions) is enclosed. NOIs are due by October 1, 1992.

For facilities (other than construction) which discharge to the storm sewer systems operated by the cities of Phoenix, Tempe, Mesa, Tucson, or Pima County, the NOI must also be sent to the municipal operator of the affected system. The appropriate addresses follow below:

Tom Lange
Development Services Dept.
City of Phoenix
125 E. Washington Street
Phoenix, AZ 85004

Richard Grimaldi
Pima County Dept. of
Environmental Quality
130 W. Congress, 2nd Floor
Tucson, AZ 85701

Lee Quaas
Public Works Dept.
P. O. Box 5002
Tempe, AZ 85280

City of Tucson Dept.
of Transportation
Planning and Programs Div.
P. O. Box 27210
Tucson, AZ 85726-7210

Peter Knudsen
City Engineering Dept.
City of Mesa
P. O. Box 1466
Mesa, AZ 85211

For construction projects operating under approved State or local sediment and erosion plans, grading plans or storm water management plans, the NOI must be sent to the local agency approving such plans.

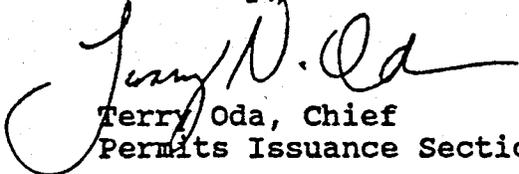
In Arizona (excluding Indian lands), NOIs must also be sent to the Arizona Department of Environmental Quality (DEQ) at the following address:

Storm Water Coordinator
Arizona DEQ
P. O. Box 600
Phoenix, AZ 85001-0600

NOIs submitted to the Arizona DEQ must also include the well registration number if any storm water associated with industrial activity is discharged to a dry well or injection well.

Should you have any questions regarding this matter, please call Eugene Bromley of the Permits Issuance Section at (415) 744-1906 or EPA's storm water hotline at (703) 821-4823.

Sincerely,


Terry Oda, Chief
Permits Issuance Section

Enclosures

Appendix C — NOI Form Instructions

See Reverse for Instructions		Form Approved. OMB No. 2040-0086 Approval expires: 8-31-96
NPDES FORM		United States Environmental Protection Agency Washington, DC 20460 Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity Under the NPDES General Permit
<p>Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a NPDES permit issued for storm water discharges associated with industrial activity in the State identified in Section II of this form. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.</p>		
I. Facility Operator Information		
Name:		Phone:
Address:		Status of Owner/Operator: <input type="checkbox"/>
City:		State: ZIP Code:
II. Facility/Site Location Information		Is the Facility Located on Indian Lands? (Y or N) <input type="checkbox"/>
Name:		
Address:		
City:		State: ZIP Code:
Latitude:		Longitude: Quarter: Section: Township: Range:
III. Site Activity Information		
MS4 Operator Name:		
Receiving Water Body:		
If You are Filing as a Co-permittee, Enter Storm Water General Permit Number:		Are There Existing Quantitative Data? (Y or N) <input type="checkbox"/> Is the Facility Required to Submit Monitoring Data? (1, 2, or 3) <input type="checkbox"/>
SIC or Designated Activity Code:	Primary: 	2nd: 3rd: 4th:
If This Facility is a Member of a Group Application, Enter Group Application Number:		
If You Have Other Existing NPDES Permits, Enter Permit Numbers:		
IV. Additional Information Required for Construction Activities Only		
Project Start Date:		Completion Date:
Estimated Area to be Disturbed (In Acres):		Is the Storm Water Pollution Prevention Plan in Compliance with State and/or Local Sediment and Erosion Plans? (Y or N) <input type="checkbox"/>
<p>V. 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 gather and evaluate 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.</p>		
Print Name:		Date:
Signature:		

**Instructions * EPA Form 3510-6
Notice of Intent (NOI) for
Storm Water Discharges Associated with Industrial Activity
To Be Covered Under the NPDES General Permit**

Who Must File A Notice of Intent (NOI) Form

Federal Law at CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. The operator on an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the NPDES Storm Water General Permit. If you have questions about whether you need a permit under the NPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a state agency, contact the Storm Water Hotline at (703) 821-4823.

Where To File NOI Form

NOI's must be sent to the following address:

Storm Water Notice of Intent
P.O. Box 1215
Newington, VA 22122

Completing the Form

You must type or print using upper-case 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 call the Storm Water Hotline at (703) 821-4823.

Section I Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility.

F = Federal
S = State

M = Public (other than federal or state)
P = Private

Section II Facility/Site Location Information

Enter the facility's or site's official or legal name and complete street address including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Indicate whether the facility is located on Indian lands.

Section III Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g., municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

Indicate whether the facility is required to submit monitoring data by entering one of the following:

- 1 = Not required to submit monitoring data;
- 2 = Required to submit monitoring data;
- 3 = Not required to submit monitoring data; submitting certification for monitoring exclusion

Those facilities that must submit monitoring data (e.g. choice 2) are: Section 313 EPCRA facilities; primary metal industries; and disposal units\incinerators BIFs; wood treatment facilities; facilities with coal pile runoff; and battery reclaimers.

List in descending order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility site identified in Section II of this application.

HZ = Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26(b)(14)(v)];

LF = Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26 (b)(14)(v)];

SE = Steam electric power generating facilities, including coal handling sites [40 CFR 122.26 (b)(14)(vii)]; or

TW = Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26 (b)(14)(ix)], or,

CO = Construction activities [40 CFR 122.26 (b)(14)(x)].

If the facility listed in Section II has participated in Part I of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other NPDES permits presently issued for the facility or sites listed in Section II, list the permit numbers. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Section IV Additional Information Required For Construction Activities Only

Construction activities must complete Section IV in addition to Section I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be distributed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, permits, or storm water management plans.

Section V Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which 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, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if 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,
or

For a municipality, a state, Federal, or other public facility: by either a
principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. 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, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

Appendix D — NOT Form Instructions

Please See Instructions Before Completing This Form		Form Approved. OMB No. 2040-0088 Approval expires: 8-31-95
NPDES FORM		United States Environmental Protection Agency Washington, DC 20460 Notice of Termination (NOT) of Coverage Under the NPDES General Permit for Storm Water Discharges Associated with Industrial 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 storm water associated with industrial activity under the NPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.		
I. Permit Information NPDES Storm Water General Permit Number: _____ Check Here if You are No Longer the Operator of the Facility: <input type="checkbox"/> Check Here if the Storm Water Discharge is Being Terminated: <input type="checkbox"/>		
II. Facility Operator Information Name: _____ Phone: _____ Address: _____ City: _____ State: _____ ZIP Code: _____		
III. Facility/Site Location Information Name: _____ Address: _____ City: _____ State: _____ ZIP Code: _____ Latitude: _____ Longitude: _____ Quarter: _____ Section: _____ Township: _____ Range: _____		
IV. Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES 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 storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES 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.		
Print Name: _____ Date: _____ Signature: _____		
Instructions for Completing Notice of Termination (NOT) Form		
Who May File a Notice of Termination (NOT) Form Permittees who are presently covered under the EPA issued National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26 (b)(14), or when they are no longer the operator of the facilities.	Where to File NOT Form Send this form to the the following address: Storm Water Notice of Termination P.O. Box 1185 Newington, VA 22122	
For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a NPDES general permit have otherwise been eliminated. 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 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.	Completing the Form Type or print, using upper-case 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, call the Storm Water Hotline at (703) 821-4823.	
PLEASE SEE REVERSE OF THIS FORM FOR FURTHER INSTRUCTIONS		

**Instructions * EPA Form 3510-7
Notice of Termination (NOT) of Coverage
Under the NPDES General Permit for
Storm Water Discharges Associated With Industrial Activity**

Section I Permit Information

Enter the existing NPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, contact the Storm Water Hotline at (703) 821-4823.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box:

If there has been a change of operator and you are no longer operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state the latitude and longitude of the facility to the nearest 15 seconds or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Section V Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which 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, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if 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, or

For a municipality, a state, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. 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, PM-223, U.S. Environmental Protection Agency, 401 M Street SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.



1984; Revised October, 1992



ARIZONA DEPARTMENT OF WATER RESOURCES
PHOENIX ACTIVE MANAGEMENT AREA
LOW WATER USING PLANT LIST

This list was compiled by the Department of Water Resources in cooperation with experts from the Desert Botanical Garden, the Arizona Department of Transportation and various nursery and landscape specialists in the Phoenix AMA. Individuals wishing to add or delete plants from the list may submit information to the Director for consideration. The Director will amend the list as appropriate.

PLANTS ARE PLACED IN THE CATEGORIES WHERE THEY ARE MOST OFTEN USED. THIS DOES NOT PRECLUDE THE USE OF ANY PLANT IN ANOTHER GROWTH FORM.

TREES

Botanical Name

Common Name

Acacia spp.

Acacia, Wattle

Brachychiton populneus

Bottle Tree

Brahea spp.

Fan Palm

Bursera spp.

Elephant Tree

Caesalpinia spp.

Bird-of-Paradise

Callistemon viminalis

Weeping Bottlebrush

Canotia holacantha

Crucifixion Thorn

Casuarina spp.

Beefwood

Botanical Name

Common Name

Celtis reticulata

Western Hackberry

Ceratonia siliqua

St. John's Bread Tree

Carob Tree

Cercidium spp.

Palo Verde

Chamaerops humilis

Mediterranean Fan Palm

Chilopsis linearis

Desert-willow

Cupressus arizonica

Arizona Cypress

Cupressus sempervirens

Italian Cypress

Botanical Name
Common Name

Dalbergia sissoo
Sissoo Tree

Eucalyptus spp.
Eucalyptus

Geijera parviflora
Australian-willow

Gleditsia triacanthos
Honey Locust

Holacantha emoryi
(*Castela emoryi*)
Crucifixion Thorn

Leucaena retusa
Golden Ball Lead Tree

Lysiloma spp.
Desert-fern

Olea europaea
Olive

Olneya tesota
Ironwood

Parkinsonia aculeata
Mexican Palo Verde,
Jerusalem Thorn

Phoenix canariensis
Canary Island Date Palm

Phoenix dactylifera
Date Palm

Pinus canariensis
Canary Island Pine

Botanical Name
Common Name

Pinus eldarica
Afghan Pine

Pinus halepensis
Aleppo Pine

Pinus pinea
Italian Stone Pine

Pinus roxburghii
Chir Pine

Pistacia spp.
Pistachio

Pithecellobium spp.
Ebony

Pittosporum phillyraeoides
Willow Pittosporum

Prosopis spp.
Mesquite

Quercus spp.
Oak

Rhus lancea
African Sumac

Schinus molle
California Pepper Tree

Schinus terebinthifolius
Brazilian Pepper Tree

Sophora secundiflora
Texas Mountain-laurel,
Mescal Bean

Botanical Name
Common Name

Tamarix aphylla
Athel Tree

Tipuana tipu
Tipu Tree

Ulmus parvifolia
cv. 'Sempervirens'
Evergreen Elm

Ungnadia speciosa
Mexican-buckeye

Botanical Name
Common Name

Vitex agnus-castus
Chaste Tree

Washingtonia spp.
Desert Fan Palm

Xylosma congestum
Xylosma

Ziziphus jujuba
Chinese Jujube

SHRUBS

Botanical Name
Common Name

Acacia spp.
Acacia, Wattle

Aloysia spp.
Beebrush

Ambrosia ambrosioides
Canyon Ragweed

Ambrosia deltoidea
Triangleleaf Bur-sage

Ambrosia dumosa
White Bur-sage

Anisacanthus spp.
Desert Honeysuckle

Artemisia spp.
Sagebrush

Asclepias linaria
Pine-leaf Milkweed

Asclepias subulata
Desert Milkweed

Atriplex spp.
Saltbush

Baccharis spp.
Desert Broom

Berberis haematocarpa
Red Barberry

Botanical Name
Common Name

Buddleia marrubifolia
Woolly Butterfly Bush

Caesalpinia spp.
Bird-of-Paradise

Calliandra californica
Baja Red Fairy Duster

Calliandra eriophylla
Fairy Duster

Calliandra peninsularis
Baja Red Fairy Duster

Callistemon citrinus
Lemon Bottlebrush

Callistemon phoeniceus
Salt Resistant Bottlebrush

Callistemon viminalis cv. 'Captain Cook'
Dwarf Bottlebrush

Calothamnus spp.
Net Bush

Cassia spp.
Cassia

Celtis pallida
Desert Hackberry

Chrysothamnus nauseosus
Rabbit Brush

Botanical Name
Common Name

Cistus spp.
Rockrose

Convolvulus cneorum
Bush Morning Glory,
Silverbush

Cordia boissieri
Anacahuita

Cordia parvifolia
Little Leaf Cordia

Dalea spp.
Smoketree, Indigo Bush

Dodonaea viscosa
Hopbush

Encelia spp.
Brittlebush

Ephedra spp.
Mormon-tea

Eremophila glabra
Emu Bush

Ericameria laricifolia
Turpentine Bush

Ericameria linearifolia
Turpentine Bush

Eriogonum spp.
Buckwheat

Botanical Name
Common Name

Erythrina flabelliformis
Southwest Coralbean

Euphorbia antisyphilitica
Wax Plant, Candelilla

Euphorbia rigida
Euphorbia

Forestiera neomexicana
Desert Olive

Genista hispanica
Spanish Broom

Gutierrezia microcephala
Snakeweed

Hyptis emoryi
Desert-lavender

Jasminum mesnyi
Primrose Jasmine

Jatropha spp.
Limberbush

Juniperus chinensis varieties
Juniper

Justicia spp.
Mexican Honeysuckle,
Chuparosa

Krameria parvifolia
Ratany

Botanical Name
Common Name

Lantana camara
Bush Lantana

Larrea tridentata
Creosote Bush

Leucophyllum spp.
Texas Sage, Texas Ranger

Lycium spp.
Wolfberry

Maytenus phyllanthoides
Mangle Dulce

Melaleuca spp.
Australian Myrtle

Mimosa biuncifera
Wait-a-Minute Bush

Mimosa dysocarpa
Velvet Pod Mimosa

Myrtus communis
True Myrtle, Roman Myrtle

Myrtus communis cv. 'Boetica'
Twisted Myrtle

Myrtus communis cv. 'Compacta'
Dwarf Myrtle

Nandina domestica
Heavenly-bamboo

Botanical Name
Common Name

Nerium oleander varieties
Oleander

Plumbago scandens
Plumbago

Punica granatum varieties
Pomegranate

Pyracantha spp.
Pyracantha, Fire-thorn

Rhus choriophylla
Mearns Sumac

Rhus microphylla
Desert Sumac

Rhus ovata
Sugarbush

Rhus trilobata
Skunkbush

Rhus virens
Evergreen Sumac

Rosmarinus officinalis
Bush Rosemary

Ruellia californica
Ruellia

Ruellia peninsularis
Ruellia

Botanical Name
Common Name

Salvia spp.
Sage

Simmondsia chinensis
Jojoba

Sophora arizonica
Arizona Sophora

Sophora formosa
Sophora

Tecoma stans
Yellowbells

Tecomaria capensis
Cape Honeysuckle

Teucrium fruticans
Bush Germander

Thamnosma montana
Turpentine Broom

Botanical Name
Common Name

Thevetia peruviana
Yellow Oleander

Trixis californica
Trixis

Vauquelinia spp.
Rosewood

Viguiera deltoidea
Golden Eye

Viguiera tomentosa
Golden Eye

Ziziphus obtusifolia
Greythorn

GROUNDCOVERS

Botanical Name
Common Name

Acacia spp.
Acacia

Asparagus densiflorus
cv. 'Sprengeri'
Sprenger Asparagus

Atriplex spp.
Saltbush

Baccharis spp.
Desert Broom,
Coyote Bush

Carpobrotus edulis
Ice Plant,
Hottentot-fig

Cephalophyllum spp.
Ice Plant

Clianthus formosus
Sturt's Desert Pea

Convolvulus mauritanicus
Ground Morning Glory

Dalea spp.
Indigo Bush

Drosanthemum speciosum
Ice Plant, Dewflower

Gazania spp.
Gazania

Botanical Name
Common Name

Lantana montevidensis
Trailing Lantana

Malephora crocea
Ice Plant

Myoporum parvifolium
Myoporum

Oenothera berlandieri
Mexican Evening Primrose

Oenothera stubbei
Saltillo Primrose

Pentzia incana
Karoo Bush

Rosmarinus officinalis cv. 'Prostratus'
Prostrate Rosemary

Salvia chamaedryoides
Blue Sage

Salvia farinacea
Mealy Cup Sage

Santolina chamaecyparissus
Lavender Cotton

Santolina virens
Green Santolina

Sesuvium verrucosum
Sea Purslane

Botanical Name
Common Name

Verbena bipinnatifida
Verbena

Verbena peruviana
Peruvian Verbena

Verbena tenera
Moss Verbena

Botanical Name
Common Name

Verbena rigida
Sandpaper Verbena

Wedelia trilobata
Yellow Dot

SUCCULENTS

Botanical Name
Common Name

Botanical Name
Common Name

Agave spp.
Century Plant, Agave

Fouquieria spp.
Ocotillo

Aloe spp.
Aloe

Hesperaloe spp.
Hesperaloe

Cactaceae
Cactus Family

Nolina spp.
Bear-grass

Dasyliirion spp.
Desert Spoon

Yucca spp.
Yucca

ANNUAL WILDFLOWERS

Botanical Name
Common Name

Abronia villosa
Sand-verbena

Argemone pleiacantha
Prickly-poppy

Camissonia brevipes
Yellow Cups

Camissonia cardiophylla
Heart-leaved Primrose

Catharanthus roseus
Madagascar Periwinkle

Centaurea rothrockii
Basket Flower

Cirsium neomexicanum
Thistle

Clarkia amoena
Farewell-to-Spring

Collinsia heterophylla
Chinese-houses

Coreopsis bigelovii
Desert Coreopsis

Cosmos spp.
Cosmos

Dimorphotheca spp.
African Daisy

Botanical Name
Common Name

Eriastrum diffusum
Prickly Stars

Eriophyllum lanosum
Woolly Daisy

Eriophyllum wallacei
Woolly Daisy

Eschscholzia californica
California Poppy

Eschscholzia mexicana
Mexican Gold Poppy

Euphorbia heterophylla
Painted Spurge

Gaillardia pulchella
Fire Wheel, Blanket Flower

Geraea canescens
Desert Sunflower

Gilia leptantha
Showy Blue Gilia

Gomphrena globosa
Globe Amaranth

Helianthus annuus
Wild Sunflower

Helichrysum bracteatum
Everlasting Daisy

Botanical Name
Common Name

Helipterum spp.
Helipterum

Ipomoea cristulata
Morning Glory

Ipomoea leptotoma
Morning Glory

Kallstroemia grandiflora
Arizona poppy

Lasthenia chrysostoma
(*Baeria chrysostoma*)
Goldfield

Layia platyglossa
Tidy Tips

Lesquerella gordonii
Yellow Blanket

Linaria spp.
Toadflax

Linum grandiflorum cv. 'Rubrum'
Red Flax

Lupinus arizonicus
Arizona Lupine

Lupinus densiflorus
Lupine

Lupinus sparsiflorus
Desert Lupine

Botanical Name
Common Name

Lupinus succulentus
Arroyo Lupine

Machaeranthera canescens
(*Aster bigelovii*)
Blue Aster

Machaeranthera tanacetifolia
(*Aster*)
Purple Aster, Tahoka Daisy

Matricaria grandiflora
Pineapple Weed

Matthiola longipetala cv. 'Bicornis'
Evening Scented Stock

Mentzelia spp.
Blazing Star

Mimulus bigelovii
Bigelow's Monkeyflower

Mohavea confertiflora
Ghost Flower

Monarda austromontana
Bee Balm

Monoptilon bellioides
Belly Flower

Nama demissum
Purple Mat

Nama hispidum
Purple Mat

Botanical Name
Common Name

Nemophila maculata
Five Spot

Nemophila menziesii
Baby Blue Eyes

Oenothera deltoides
Birdcage Evening Primrose

Oenothera primiveris
Evening Primrose

Orthocarpus purpurascens
Owl's Clover

Papaver rhoeas
Shirley Poppy

Pectis papposa
Chinch Weed

Perityle emoryi
Rock Daisy

Phacelia spp.
Scorpion Weed

Plantago spp.
Indian-wheat

Botanical Name
Common Name

Platystemon californicus
Cream Cups

Proboscidea parviflora
Devil's Claw

Rafinesquia neomexicana
Desert-chicory

Salvia columbariae
Chia

Sisymbrium ambiguum
Purple Rocket

Tithonia rotundifolia
Mexican Sunflower

Ursinia spp.
Ursinia

Verbesina encelioides
Golden Crown Beard

Viguiera annua
Golden Eye

PERENNIAL WILDFLOWERS

Botanical Name
Common Name

Allionia incarnata
Trailing Windmills

Anigozanthos spp.
Kangaroo-paw

Anisodonteia hypomandrum
African Mallow

Arctotis spp.
African Daisy

Argemone munita
Prickly Poppy

Argemone platyceras
Prickly Poppy

Bahia absinthifolia
Bahia

Baileya multiradiata
Desert Marigold

Castilleja chromosa
Indian Paintbrush

Castilleja lanata
Indian Paintbrush

Datura inoxia
Sacred Datura, Jimsonweed

Delphinium amabile
Larkspur

Botanical Name
Common Name

Delphinium scaposum
Barestem Larkspur

Dichelostemma pulchellum
Bluedicks

Dyssodia acerosa
Dyssodia

Dyssodia pentachaeta
Dyssodia

Erigeron divergens
Spreading Fleabane

Evolvulus arizonicus
Arizona Blue Eyes

Hesperocallis undulata
Ajo Lily

Ipomopsis longiflora
Pale Blue Trumpets

Justicia sonora
Sonoran Justicia

Linum lewisii
Blue Flax

Lotus rigidus
Desert Rock Pea

Machaeranthera gracilis
Yellow Aster

Botanical Name
Common Name

Machaeranthera tortifolia
Mohave Aster

Melampodium leucanthum
Blackfoot Daisy

Mirabilis multiflora
Desert Four O'Clock

Oenothera caespitosa
Tufted Evening Primrose

Penstemon spp.
Penstemon

Proboscidea altheaefolia
Devil's Claw

Psilostrophe cooperi
Paperflower

Ratibida columnaris
Mexican Hat, Coneflower

Botanical Name
Common Name

Romneya coulteri
Matilija Poppy

Senna covesii (Cassia covesii)
Desert Senna

Sphaeralcea spp.
Globe-mallow

Stachys coccinea
Red Mint, Betony

Tagetes spp.
Mount Lemmon Marigold, Licorice
Marigold

Verbena gooddingii
Goodding Verbena

Zinnia acerosa
Desert Zinnia

Zinnia grandiflora
Rocky Mountain Zinnia

GRASSES

Botanical Name
Common Name

Aristida purpurea
Purple Three-awn

Bouteloua aristidoides
Six weeks Grama

Bouteloua curtipendula
Side Oats Grama

Bouteloua gracilis
Blue Grama

Erioneuron pulchellum
Fluffgrass

Hilaria rigida
Big Galleta

Muhlenbergia dumosa
Giant Muhly

Botanical Name
Common Name

Sporobolus cryptandrus
Sand Dropseed

Muhlenbergia porteri
Bush Muhly

Muhlenbergia rigens
Deer Grass

Pennisetum setaceum cv. 'Cupreum'
Purple Fountain Grass

Schismus barbatus
Mediterranean Grass

Setaria macrostachya
Plains Bristlegrass

Trichachne californica
Cotton-top

VINES

Botanical Name
Common Name

Antigonon leptopus
Coral Vine, Queens Wreath

Bougainvillea spp.
Bougainvillea

Callaeum macroptera
(*Mascagnia macroptera*)
Yellow Orchid Vine

Campsis radicans
Common Trumpet Creeper

Cissus trifoliata
Grape Ivy

Clematis drummondii
Virgin's Bower

Hardenbergia comptoniana
Wild Wisteria

Kennedia nigricans
Black Yellow Vine

Botanical Name
Common Name

Macfadyena unguis - cati
Cat's Claw

Maurandya antirrhiniflora
Snapdragon Vine

Maurandya wislizeni
Snapdragon Vine

Merremia aurea
Yuca

Podranea ricasoliana
Pink Trumpet Vine

Rhynchosia texana
Rosary Bead Vine

Rosa banksiae
Lady Bank's Rose

Solanum jasminooides
Potato Vine

LWUPL.lst
9/1992



Appendix D
Dust Control

Dust Control

Introduction

"Recent Environmental Protection Agency (EPA) regulations mandate limits on the concentration of PM-10, particles 10 microns and smaller, in the air. EPA has determined that particles in this size range are capable of being taken into the respiratory system and present the greatest health risk (Reference 1)."

Apart from the health risks, airborne dust has also been identified as having negative impacts on:

- Safety
- Vegetation
- Water Resources
- Aesthetics

On a nationwide basis EPA has determined the principal contributors of particulate pollution to be:

- #1 Vehicular traffic on unpaved roads
- #2 Construction activities
- #3 Wide erosion
- #4 Paved roads
- #5 Wild Fires
- #6 Agricultural tilling
- #7 Mineral extraction

Regulations/Agencies

EPA has designated Maricopa County as a non-attainment area in meeting the requirements of the Clean Air Act. This means that local air quality does not meet standards regarding airborne particulate matter (PM-10).

The consequences of the "non-attainment" designation may carry serious federal penalties including the withholding of Federal Highway Funds.

In an effort to comply with the Clean Air Act, the Maricopa Association of Governments (MAG) prepared a multi-faceted plan to reduce airborne particulate matter. This plan, the "MAG 1991 particulate plan for PM-10 for the Maricopa County Area," was subsequently adopted by the Maricopa County Board of Supervisors. The plan commits the County to implement a variety of measures to control the generation of fugitive dust from the contributing sources listed above. Part of this plan calls for a county-wide program to control fugitive dust from construction activities.

The program will be administered by the Maricopa County Division of Air Pollution Control Compliance Section.

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Phoenix, AZ 85034
(602) 506-6700

The overall approach of the Air Pollution Control Division is to:

- Require earthmoving activities to be permitted.
- Require permittees to implement reasonably available control measures (RACMs) to limit dust from construction activities, and prevent track-out of sediments onto paved roads.
- Require contractors to develop a Dust Control Plan for their construction activities.
- Require contractors to document their dust control activities and maintain these records for agency review.

Contractors should contact the Air Pollution Control Division to obtain a copy of the program requirements. For the benefit of those who are preparing SWPPPs for the NPDES program, a comprehensive listing of RACMs is included in this appendix. Some of these RACMs are identical to the Best Management Practices (BMPs) suggested for stormwater pollution control, and may be implemented to satisfy the requirements of both programs.

The "MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area", provides the following information on RACMs (Reference 2).

SECTION 401 OF THE MAG 1991 PARTICULATE PLAN FOR PM-10
FOR THE MARICOPA COUNTY AREA

THE FOLLOWING COMPREHENSIVE LIST IS INCLUDED AS A GUIDE TO THE USER AND REGULATOR. ITS PURPOSE IS TO PROVIDE A MENU OF RACMs WHICH MAY BE USED TO EFFECTIVELY ACCOMPLISH THE CONTROL OF DUST FROM OPEN FUGITIVE DUST SOURCES. ALTHOUGH COMPREHENSIVE IT IS NOT EXHAUSTIVE, FURTHERMORE, MANY OF THE RACMs LISTED ARE COMPLEMENTARY AND SHOULD BE USED IN COMBINATION FOR DUST CONTROL. PLEASE BE ADVISED THAT ANY SINGLE RACM MEASURE USED ALONE WILL PROBABLY NOT BE SUFFICIENT TO EFFECT PROPER DUST CONTROL. A VALID DUST CONTROL PROGRAM OR PLAN WILL USUALLY PROVIDE FOR THE USE OF A NUMBER OF THESE RACMs IN COMBINATION OF SUCCESSION IN ORDER TO BE EFFECTIVE.

1. PAVE, VEGETATE, OR CHEMICALLY OR PHYSICALLY STABILIZE ACCESS POINTS WHERE UNPAVED TRAFFIC SURFACES ADJOIN PAVED ROADS.
2. DESIGN AND IMPLEMENT EFFECTIVE DUST CONTROL PLANS FOR CONSTRUCTION, DEMOLITION OR LAND CLEARING, PROJECTS OR ACTIVITIES.
3. COVER THE MATERIAL LOADS ON HAUL TRUCKS.
4. REROUTE TRAFFIC AND/OR PROVIDE FOR RAPID CLEAN UP OF TEMPORARY SOURCES OF DUST ON PAVED ROADS.
5. PAVE, CHEMICALLY OR PHYSICALLY STABILIZE UNPAVED HAUL ROADS, ACCESS ROADS AND PARKING STORAGE AND STAGING AREAS.
6. REDUCE TRAFFIC AND VEHICLE SPEEDS ON UNPAVED ROADS.
7. LIMIT THE USE OF RECREATIONAL, ALL TERRAIN OFF-ROAD VEHICLES ON OPEN LANDS.
8. CURB, PAVE OR CHEMICALLY OR PHYSICALLY STABILIZE SHOULDERS OF PAVED ROADS.
9. PAVE OR CHEMICALLY STABILIZE UNPAVED ROADS.
10. PAVE OR CHEMICALLY OR PHYSICALLY STABILIZE UNPAVED ROADS.
11. PAVE, VEGETATE OR CHEMICALLY OR PHYSICALLY STABILIZE UNPAVED PARKING OR STAGING AREAS.
12. IMPLEMENT EFFECTIVE DUST CONTROL PLANS AND MEASURES FOR BULK MATERIAL STORAGE STOCK PILES INCLUDING BUT NOT LIMITED TO ADEQUATELY DESIGNED AND CONSTRUCTED WIND SCREENING, PHYSICALLY COVERING OR ENCLOSING, ESTABLISHING VEGETATIVE GROUND COVER, WATERING AND CHEMICAL STABILIZATION.

13. MAKE EFFECTIVE WORK PRACTICE AND OR STRUCTURAL PROVISIONS TO PREVENT WIND AND WATER EROSION OF SEDIMENTS ONTO PAVED ROADS.
14. REVEGETATION, CHEMICAL OR PHYSICAL STABILIZATION OR OTHER EFFECTIVE, APPROVED ABATEMENT MEASURES FOR WIND ERODIBLE SOILS INCLUDING LANDS SUBJECT TO WATER MINING, AND ABANDONED FARMS, CONSTRUCTION OR OTHER DISTURBED SOIL SURFACES OR REAL PROPERTIES.
15. THE USE OF WATER OR OTHER SOLUTIONS CONTAINING CHEMICAL DUST PALLIATIVE, SUPPRESSANTS OR CHEMICAL STABILIZERS TO CONTROL FUGITIVE DUST EMANATING FROM DUST SOURCES.
16. THE APPLICATION OF ASPHALT, OIL, WATER, SOLUTIONS, CHEMICAL DUST SUPPRESSANTS, PALLIATIVE OR STABILIZERS, CEMENTS, CEMENTIOUS LIQUIDS ON DIRT ROADS, VACANT LOTS, MATERIAL STOCK PILES, DISTURBED SOIL SURFACES, URBAN OR SUBURBAN OPEN AREAS OR OTHER SURFACES OR SOURCES WHICH MAY GIVE RISE TO FUGITIVE DUST.
17. THE PLANTING AND MAINTENANCE OF VEGETATIVE GROUND COVER.
18. THE EFFECTIVE USE OF HOODS, DUST COLLECTORS, COVERS, ENCLOSURES, SPRAY BARS OR OTHER FUGITIVE DUST CONTAINMENT METHODS, MEASURES, TECHNIQUES, AND/OR TECHNOLOGIES.
19. MATERIAL TRACK OUT AND CARRY OUT CONTROLS SUCH AS GRAVEL OR PAVEMENT APRONS PRIOR TO PAVED ROADWAY ENTRY OR GRAVEL OR PAVED "GRIZZLY" RAMPS OR WASH DOWN PADS AT PAVED ROADWAY ENTRY.
20. THE DAILY REMOVAL OF DIRT, EARTH, SOIL, SAND, SILT, MUD SEDIMENTS OR OTHER MATERIALS CAPABLE OF GIVING RISE TO FUGITIVE DUST THAT HAS BEEN TRACKED OUT, CARRIED OUT OR TRANSPORTED ONTO PAVED STREETS BY TRUCKING, OR EARTHMOVING AND MATERIAL TRANSPORT EQUIPMENT.
21. COVERING THE MATERIAL LOADS OF OPEN BODIED HAUL TRUCKS AND REPAIRING BEDS, TAILGATES, ETC. SO THAT SPILLAGE MAY NOT OCCUR.
22. RESTRICTING, LIMITING OR PROPERLY PHASING THE ACCESS OF MOTORS VEHICLES ON REAL PROPERTY AREAS.
23. OTHER MEANS, MEASURES, TECHNIQUES, METHODS AND TECHNOLOGIES OR COMBINATIONS THEREOF LIKELY TO BE SUCCESSFUL IN EFFECTIVELY CONTROLLING FUGITIVE DUST EMISSIONS FROM OPEN FUGITIVE DUST SOURCES AS SPECIFICALLY APPROVED OR STIPULATED BY THE CONTROL OFFICER.

Dust Control References

1. "Consumers Guide to Dust Control Technologies", June 1989 Prepared for:

Arizona Department of Environmental Quality -
Office of Air Quality

Prepared by:

John P. Zanlewski, Anna K. Bennett,
Center for Advanced Research in Transportation
College of Engineering and Applied Science
Arizona State University
Tempe, Arizona 85287-6306

2. MAG 1991 Particulate Plan for PM-10 for the Maricopa County Area, Section 401.



Federal Register

Wednesday
September 9, 1992

Construction
Permit Language

Part II

Environmental Protection Agency

**Final NPDES General Permits For Storm
Water Discharges From Construction
Sites; Permit Language**

**Appendix B—NPDES General Permits
for Storm Water Discharges From
Construction Activities That Are
Classified as "Associated With
Industrial Activity"**

**Authorization to Discharge Under the
National Pollutant Discharge Elimination
System**

[Permit No. *NHR10000IF*]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", for Indian Tribes located in the State of New Hampshire, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Ronald Manfredonia,

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities with stormwater discharges, for Indian Tribes located in the State of New Hampshire.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. MER10000IF]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", for Indian Tribes located in the State of New Hampshire, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Ronald Manfredonia,

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities with stormwater discharges, for Indian Tribes located in the State of Maine.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. MAR10000 IF]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", for Indian Tribes located in the State of Massachusetts, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Ronald Manfredonia,

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities with stormwater discharges, for Indian Tribes located in the State of Massachusetts.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. MER100000 IF]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the State of Maine, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Ronald Manfredonia,

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Maine.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. NHR10000]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the State of New Hampshire, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Ronald Manfredonia,

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of New Hampshire.

Authorization To Discharge Under the National Pollutant Discharge Elimination System

[NPDES Permit Number PRR100000]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq, the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity," located in the Commonwealth of Puerto Rico are authorized to

discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kevin Bricke.

*Acting Director, Water Management Division,
U.S. Environmental Protection Agency,
Region II.*

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the Commonwealth of Puerto Rico.
Region IV

Authorization To Discharge Under the National Pollutant Discharge Elimination System

[General Permit Number MSR10000F]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 *et seq.*, the "Act") except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity," located on Indian land in Mississippi belonging to the Mississippi Band of Choctaw Indians are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued: August 28, 1992.

Robert F. McGhee.

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located within the general permit area.

Region IV

[General Permit Number FLR10001F]

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 *et seq.*, the "Act") except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on Indian land in Florida belonging to the Miccosukee Indian Tribe of Florida are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued: August 28, 1992.

Robert F. McGhee.

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located within the general permit area.

Region IV

[General Permit Number FLR10000F]

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 *et seq.*, the "Act") except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on Indian land in Florida belonging to the Seminole Tribe of Florida are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued: August 28, 1992.

Robert F. McGhee.

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located within the general permit area.

[General Permit Number NCR10000F]

Region IV

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 *et seq.*, the "Act") except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on Indian land in North Carolina belonging to the Eastern Band of Cherokee Indians in the State of North Carolina are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued: August 28, 1992.

Robert F. McGhee.

Acting Director, Water Management Division.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located within the general permit area.

[Permit No. T X R100000]

Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of stormwater discharges from construction activities that are classified as "associated with industrial activity", located in the State of Texas, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 27th day of August, 1992.

Myron O. Knudson, P.E.,

Water Management Director, Region VI.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Texas.

[Permit No. O K R100000]

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the State of Oklahoma, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 27th day of August, 1992.

Myron O. Knudson,

Water Management Director, Region VI.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Oklahoma.

[Permit No. NMR100000]

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the State of New Mexico, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 27th day of August, 1992.

Myron O. Knudson,

Water Management Director, Region VI.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of New Mexico.

[Permit No. LAR100000]

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the State of Louisiana, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 27th day of August, 1992.

Myron O. Knudson,

Water Management Director, Region VI.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Louisiana.

[Permit No. WYR10000F]

Authorization to Discharge Under the National Pollutant Discharge Elimination System

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the Wind River Indian Reservation in the State of Wyoming, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kerrigan Clough,

Acting Regional Administrator.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the States of Wyoming.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. UTR10000F]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the following Indian Reservations in Utah (except for the portions of the Navajo Reservation and Goshute Reservation located in Utah)

Northern Shoshoni Reservation;
 Paiute Reservations—several very small reservations located in the southwest quarter of Utah;
 Skull Valley Reservation; and Uintah & Ouray Reservation.

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kerrigan Clough,

Acting Regional Administrator.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Utah.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. SDR100000]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the entire State of South Dakota including the Indian reservations noted below (with the exception of the portion of the Standing Rock Reservation located in South Dakota), and the portion of the Lake

Traverse Reservation located in North Dakota

Cheyenne River Reservation; Crow Creek Reservation;

Flandreau Reservation; Lake Traverse Reservation—Also known as the Sisseton Reservation. Includes the entire Reservation, which is located in North Dakota and South Dakota;

Lower Brule Reservation;

Pine Ridge Reservation—Includes only the portion of the Reservation located in South Dakota; Rosebud Reservation; and, Yankton Reservation.

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kerrigan Clough,

Acting Regional Administrator.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of South Dakota and the portion of the Lake Traverse Reservation located in the State of North Dakota.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. NDR10000F]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", in all the Indian Reservations located in the State of North Dakota including the following (with the exception of the portion of the Lake Traverse Reservation, also known as the Sisseton Reservation, located in North Dakota)

Fort Totten Reservation—Also known as Devils Lake Reservation;
 Fort Berthold Reservation;

Standing Rock Reservation—Includes the entire Reservation, which is located in both North Dakota and South Dakota; and, Turtle Mountain Reservation.

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kerrigan Clough,

Acting Regional Administrator.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of North Dakota and the portion of the Standing Rock Reservation located in the State of South Dakota.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. MTR10000F]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", in all Indian Reservations in Montana including the following Reservations:

Blackfeet Reservation;
 Crow Reservation;
 Flathead Reservation;
 Fort Belknap Reservation;
 Fort Peck Reservation;
 Northern Cheyenne Reservation; and, Rocky Boys Reservation.

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm

water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kerrigan Clough,

Acting Regional Administrator.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Montana.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. COR10000F]

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity" in applicable federal facilities located in the State of Colorado, and in the following Indian Reservations

Southern Ute Reservation; and, Ute Mountain Reservation—Includes the entire Reservation, which is located in Colorado and New Mexico

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight September 9, 1997.

Signed and issued this 28th day of August, 1992.

Kerrigan Clough,

Acting Regional Administrator.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Colorado and the portion of the Ute Mountain Reservation located in the State of New Mexico.

Storm Water General Permit for Construction Activities

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. AZR1000IF]

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on

Indian Lands in the State of Arizona,

Including Navajo Territory in the States of New Mexico and Utah

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight September 9, 1997.

Signed and issued this 28th day of August, 1992.

Daniel W. McGovern,

Regional Administrator, Region 9.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located on the Indian lands specified above.

Authorization To Discharge Under the National Pollutant Discharge Elimination System

[Permit No. AZR100000]

In compliance with the provisions of the Clean Water Act, as amended, (U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the

State of Arizona (Excluding Indian Lands)

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Daniel W. McGovern,

Regional Administrator, Region 9.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of Arizona (excluding Indian lands).

Authorization To Discharge Under the National Pollutant Discharge Elimination System

[Permit No. NVR1000IF]

In compliance with the provisions of the Clean Water Act, as amended, (U.S.C. 1251 et seq.; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on

Indian Lands in the State of Nevada,

Including Goshute Territory in the State of Utah, and the Duck Valley Reservation in Nevada and Idaho

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Daniel W. McGovern,

Regional Administrator, Region 9.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located on the Indian lands specified above.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. CAR1000IF]

In compliance with the provisions of the Clean Water Act, as amended, (U.S.C. . . . 1251 *et seq.*; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on Indian Lands in the State of California are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Daniel W. McGovern,

Regional Administrator, Region 9.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located on Indian lands in the State of California.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. MWR100000]

In compliance with the provisions of the Clean Water Act, as amended, (U.S.C. . . . 1251 *et seq.*; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on Midway Island or Wake Island

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August, 1992.

Daniel W. McGovern,

Regional Administrator, Region 9.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located on Midway Island or Wake Island.

Authorization To Discharge Under the National Pollutant Discharge Elimination System

[Permit No. JAR100000]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 *et seq.*; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located on Johnston Atoll

are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by this permit must submit a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this 28th day of August 1992.

Daniel W. McGovern,

Regional Administrator, Region 9.

This signature is for the permit conditions in Parts I through IX and for any additional

conditions in Part X which apply to facilities located on Johnston Atoll.

Authorization To Discharge Under the National Pollutant Discharge Elimination System for Storm Water Discharges From Construction Activities That Are Classified as Associated With Industrial Activity

[General Permit No.: ID-R-10-000F]

In compliance with the provisions of the Clean Water Act, (33 U.S.C. 1251 *et seq.*), as amended by the Water Quality Act of 1987, Pub. L. 100-4, the "Act".

Owners and operators engaged in discharging storm water from construction activities that are classified as "associated with industrial activity" which are located on Indian lands in the State of Idaho, except for those sites identified in Part I hereof, are authorized to discharge to waters of the United States, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

A copy of this general permit must be kept at the site where the discharges occur.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed this 27th day of August 1992.

Harold E. Geren,

Acting Director, Water Division, Region 10, U.S. Environmental Protection Agency.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to activities located on Indian lands in the State of Idaho.

Authorization to Discharge Under the National Pollutant Discharge Elimination System for Storm Water Discharges From Construction Activities That Are Classified as Associated With Industrial Activity

[General Permit No.: AK-R-10-000F]

In compliance with the provisions of the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act".

Owners and operators engaged in discharging storm water from construction activities that are classified as "associated with industrial activity" which are located on Indian lands in the State of Alaska, except for those sites identified in Part I hereof, are authorized to discharge to waters of the United States, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

A copy of this general permit must be kept at the site where the discharges occur.

This permit shall become effective September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, on September 9, 1997.

Signed this 27 day of August 1992.

Harold E. Geren,

Acting Director, Water Division, Region 10, U.S. Environmental Protection Agency.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to activities located on Indian lands in the State of Alaska.

Authorization to Discharge Under the National Pollutant Discharge Elimination System for Storm Water Discharges From Construction Activities That Are Classified as Associated With Industrial Activity

[General Permit No.: WA-R-10-001F]

In compliance with the provisions of the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act".

Owners and operators engaged in discharging storm water from construction activities that are classified as "associated with industrial activity" which are located on Indian lands in the State of Washington, except for those sites identified in Part I hereof, are authorized to discharge to waters of the United States, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

A copy of this general permit must be kept at the site where the discharges occur.

This permit shall become effective September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, on September 9, 1997.

Signed this 27 day of August 1992.

Harold E. Geren,

Acting Director, Water Division, Region 10, U.S. Environmental Protection Agency.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to activities located on Indian lands in the State of Washington.

Authorization to Discharge Under the National Pollutant Discharge Elimination System for Storm Water Discharges from Construction Activities That Are Classified as Associated with Industrial Activity

[General Permit No.: WA-R-10-000F]

In compliance with the provisions of the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act".

Owners and operators of federal facilities in the State of Washington engaged in discharging storm water from construction activities that are classified as "associated with industrial activity", except for those sites identified in Part I hereof and except those sites located on Indian lands within the State of Washington, are authorized to discharge to waters of the State of Washington and waters of the United States adjacent to State waters, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

A copy of this general permit must be kept at the site where the discharges occur.

This permit shall become effective September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, on September 9, 1997.

Signed this 27th day of August 1992.

Harold E. Geren,

Acting Director, Water Division, Region 10, U.S. Environmental Protection Agency.

This signature is for the permit conditions in Parts I through IX and any additional conditions in Part X which apply to federal facilities in the State of Washington.

Authorization to Discharge Under the National Pollutant Discharge Elimination System for Storm Water Discharges from Construction Activities That Are Classified as Associated with Industrial Activity

[General Permit No.: ID-R-10-0000]

In compliance with the provisions of the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act".

Owners and operators engaged in discharging storm water from construction activities that are classified as "associated with industrial activity", except for those sites identified in Part I hereof and except those sites located on Indian lands within the State of Idaho, are authorized to discharge to waters of the State of Idaho and waters of the United States adjacent to State waters, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

A copy of this general permit must be kept at the site where the discharges occur.

This permit shall become effective September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, on September 9, 1997.

Signed this 27th day of August 1992.

Harold E. Geren,

Acting Director, Water Division, Region 10, U.S. Environmental Protection Agency.

This signature is for the permit conditions in Parts I through IX and any additional conditions in Part X which apply to federal facilities in the State of Idaho.

Authorization to Discharge Under the National Pollutant Discharge Elimination System for Storm Water Discharges From Construction Activities That Are Classified as Associated With Industrial Activity

[General Permit No.: AK-R-10-0000]

In compliance with the provisions of the Clean Water Act, 33 U.S.C. 1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, the "Act".

Owners and operators engaged in discharging storm water associated with construction activities that are classified as associated with industrial activities, except those sites identified in Part I hereof and except those sites located on Indian lands within the State of Alaska and waters of the United States adjacent to State waters, in accordance with effluent limitations, monitoring requirements, and other conditions set forth herein.

A copy of this general permit must be kept at the site where discharges occur.

This permit shall become effective September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, on September 9, 1997.

Signed this 27 day of August 1992.

Harold E. Geren,

Acting Director, Water Division, Region 10, U.S. Environmental Protection Agency.

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to activities located in the State of Alaska.

Authorization to Discharge Under the National Pollutant Discharge Elimination System

[Permit No. _____ R100000 or _____ R10000F (for only Indian lands and/or Fed. fac)]

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 *et seq.*; the Act), except as provided in Part I.B.3 of this permit, operators of storm water discharges from construction activities that are classified as "associated with industrial activity", located in the State(s) of _____, are authorized to discharge in accordance with the conditions and requirements set forth herein.

Operators of storm water discharges from construction activities within the general permit area who intend to be authorized by these permits must submit

a Notice of Intent in accordance with Part II of this permit. Operators of storm water discharges associated with industrial activity who fail to submit a Notice of Intent in accordance with Part II of this permit are not authorized under this general permit.

This permit shall become effective on September 9, 1992.

This permit and the authorization to discharge shall expire at midnight, September 9, 1997.

Signed and issued this ____ day of _____, 1992.

(Signature of Water Management Director or Regional Administrator)

This signature is for the permit conditions in Parts I through IX and for any additional conditions in Part X which apply to facilities located in the State of _____.

NPDES General Permits for Storm Water Discharges From Construction Activities That are Classified as "Associated With Industrial Activity"

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Preface

The Clean Water Act (CWA) provides that storm water discharges associated with industrial activity from a point source (including discharges through a municipal separate storm sewer system) to waters of the United States are unlawful, unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. The terms "storm water discharge associated with industrial activity", "point source" and "waters of the United States" are critical to determining whether a facility is subject to this requirement. Complete definitions of these terms are found in the definition section (Part IX) of this permit.

The United States Environmental Protection Agency (EPA) has established the Storm Water Hotline at (703) 821-4823 to assist the Regional Offices in distributing notice of intent forms and storm water pollution prevention plan guidance, and to provide information pertaining to the storm water regulations.

Part I. Coverage Under This Permit

A. Permit Area

The permit covers all areas of:
Region I—for the States of Maine and New Hampshire; for Indian lands located in Massachusetts, New Hampshire, and Maine.

Region II—for the Commonwealth of Puerto Rico.

Region IV—for Indian lands located in Florida (two tribes), Mississippi, and North Carolina.

Region VI—for the States of Louisiana, New Mexico, Oklahoma, and Texas; and for Indian lands located in Louisiana, New Mexico (except Navajo lands and Ute Mountain Reservation lands), Oklahoma, and Texas.

Region VIII—for the State of South Dakota; for Indian lands located in

Colorado (including the Ute Mountain Reservation in Colorado), Montana, North Dakota, Utah (except Goshute Reservation and Navajo Reservation lands), and Wyoming; for Federal facilities in Colorado; and for the Ute Mountain Reservation New Mexico.

Region IX—for the State of Arizona; for the Territories of Johnston Atoll, and Midway and Wake Island; and for Indian lands located in California, and Nevada; and for the Goshute Reservation in Utah and Nevada, the Navajo Reservation in Utah, New Mexico, and Arizona, the Duck Valley Reservation in Nevada and Idaho.

Region X—for the State of Alaska, and Idaho; for Indian lands located in Alaska, Idaho (except Duck Valley Reservation lands), and Washington; and for Federal facilities in Washington.

B. Eligibility

1. This permit may authorize all discharges of storm water associated with industrial activity from construction sites, (those sites or common plans of development or sale that will result in the disturbance of five or more acres total land area ¹), (henceforth referred to as storm water discharges from construction activities) occurring after the effective date of this permit (including discharges occurring after the effective date of this permit where the construction activity was initiated before the effective date of this permit), except for discharges identified under paragraph I.B.3.

2. This permit may only authorize a storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:

A. the industrial source other than construction is located on the same site as the construction activity;

b. storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and

c. storm water discharges associated with industrial activity from the areas of the site where industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different NPDES general permit or

¹ On June 4, 1992, the United States Court of Appeals for the Ninth Circuit remanded the exemption for construction sites of less than five acres to the EPA for further rulemaking. (Nos. 90-70671 and 91-70200).

individual permit authorizing such discharges.

3. Limitations on Coverage

The following storm water discharges from construction sites are not authorized by this permit:

a. storm water discharges associated with industrial activity that originate from the site after construction activities have been completed and the site has undergone final stabilization.

b. discharges that are mixed with sources of non-storm water other than discharges which are identified in Part III.A of this permit and which are in compliance with Part IV.D.5 (non-storm water discharges) of this permit.

c. storm water discharges associated with industrial activity that are subject to an existing NPDES individual or general permit or which are issued a permit in accordance with paragraph V.L (requiring an individual permit or an alternative general permit) of this permit. Such discharges may be authorized under this permit after an existing permit expires provided the existing permit did not establish numeric limitations for such discharges;

d. storm water discharges from construction sites that the Director (EPA) has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard; and

e. storm water discharges from construction sites if the discharges may adversely affect a listed or proposed to be listed endangered or threatened species or its critical habitat.

C. Authorization

1. A discharger must submit a Notice of Intent (NOI) in accordance with the requirements of Part II of this permit, using a NOI form provided by the Director (or a photocopy thereof), in order for storm water discharges from construction sites to be authorized to discharge under this general permit.²

2. Where a new operator is selected after the submittal of an NOI under Part II, a new Notice of Intent (NOI) must be submitted by the operator in accordance with Part II, using a NOI form provided by the Director (or a photocopy thereof).

3. Unless notified by the Director to the contrary, dischargers who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction sites under the terms and conditions of this permit 2 days after the date that the NOI is postmarked. The Director may deny

² A copy of the approved NOI form is provided in Appendix C of this notice.

coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information (see Part V.L of this permit).

Part II. Notice of Intent Requirements

A. Deadlines for Notification

1. Except as provided in paragraphs II.A.2, II.A.3, and II.A.4, individuals who intend to obtain coverage for storm water discharges from a construction site (where disturbances associated with the construction project commence before October 1, 1992), under this general permit shall submit a Notice of Intent (NOI) in accordance with the requirements of this Part on or before October 1, 1992;

2. Individuals who intend to obtain coverage under this general permit for storm water discharges from a construction site where disturbances associated with the construction project commence after October 1, 1992, shall submit a Notice of Intent (NOI) in accordance with the requirements of this Part at least 2 days prior to the commencement of construction activities (e.g. the initial disturbance of soils associated with clearing, grading, excavation activities, or other construction activities);

3. For storm water discharges from construction sites where the operator changes, (including projects where an operator is selected after a NOI has been submitted under Parts II.A.1 or II.A.2) a NOI in accordance with the requirements of this Part shall be submitted at least 2 days prior to when the operator commences work at the site; and

4. EPA will accept an NOI in accordance with the requirements of this part after the dates provided in Parts II.A.1, 2 or 3 of this permit. In such instances, EPA may bring appropriate enforcement actions.

B. Contents of Notice of Intent

The Notice(s) of Intent shall be signed in accordance with Part VI.G of this permit by all of the entities identified in Part II.B.2 and shall include the following information:

1. The mailing address of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location of the approximate center of the site must be described in terms of the latitude and longitude to the nearest 15 seconds, or the section, township and range to the nearest quarter section;

2. The name, address and telephone number of the operator(s) with day to

day operational control that have been identified at the time of the NOI submittal, and operator status as a Federal, State, private, public or other entity. Where multiple operators have been selected at the time of the initial NOI submittal, NOIs must be attached and submitted in the same envelope.

When an additional operator submits an NOI for a site with a preexisting NPDES permit, the NOI for the additional operator must indicate the number for the preexisting NPDES permit;

3. The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer, the name of the municipal operator of the storm sewer and the ultimate receiving water(s);

4. The permit number of any NPDES permit(s) for any discharge(s) (including any storm water discharges or any non-storm water discharges) from the site;

5. An indication of whether the operator has existing quantitative data which describes the concentration of pollutants in storm water discharges (existing data should not be included as part of the NOI); and

6. An estimate of project start date and completion dates, estimates of the number of acres of the site on which soil will be disturbed, and a certification that a storm water pollution prevention plan has been prepared for the site in accordance with Part IV of this permit, and such plan provides compliance with approved State and/or local sediment and erosion plans or permits and/or storm water management plans or permits in accordance with Part IV.D.2.d of this permit. (A copy of the plans or permits should not be included with the NOI submission).

C. Where to Submit

1. Facilities which discharge storm water associated with industrial activity must use a NOI form provided by the Director (or photocopy thereof). The form in the Federal Register notice in which this permit was published may be photocopied and used. Forms are also available by calling (703) 821-4823. NOIs must be signed in accordance with Part VI.G of this permit. NOIs are to be submitted to the Director of the NPDES program in care of the following address: Storm Water Notice of Intent, PO Box 1215, Newington, VA 22122.

2. A copy of the NOI or other indication that storm water discharges from the site are covered under an NPDES permit, and a brief description of the project shall be posted at the construction site in a prominent place for public viewing (such as alongside a building permit).

D. Additional Notification

Facilities which are operating under approved State or local sediment and erosion plans, grading plans, or storm water management plans shall submit signed copies of the Notice of Intent to the State or local agency approving such plans in accordance with the deadlines in Part II.A of this permit (or sooner where required by State or local rules), in addition to submitting the Notice of Intent to EPA in accordance with paragraph II.C.

E. Renotification

Upon issuance of a new general permit, the permittee is required to notify the Director of his intent to be covered by the new general permit.

Part III. Special Conditions, Management Practices, and Other Non-Numeric Limitations**A. Prohibition on Non-Storm Water Discharges**

1. Except as provided in paragraph I.B.2 and III.A.2, all discharges covered by this permit shall be composed entirely of storm water.

2. a. Except as provided in paragraph III.A.2.(b), discharges of material other than storm water must be in compliance with a NPDES permit (other than this permit) issued for the discharge.

b. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharge is in compliance with paragraph IV.D.5: discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles or control dust in accordance with Part IV.D.2.c.(2); potable water sources including waterline flushings; irrigation drainage; routine external building washdown which does not use detergents; pavement washwaters 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; air conditioning condensate; springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Releases in Excess of Reportable Quantities

1. The discharge of hazardous substances or oil in the storm water discharge(s) from a facility shall be prevented or minimized in accordance with the applicable storm water pollution prevention plan for the facility. This permit does not relieve the permittee of the reporting requirements

of 40 CFR part 117 and 40 CFR part 302. Where a release containing a hazardous substance in an amount equal to or in excess of a reporting quantity established under either 40 CFR 117 or 40 CFR 302, occurs during a 24-hour period:

a. The permittee is required to notify the National Response Center (NRC) (800-424-8802; in the Washington, DC metropolitan area 202-426-2675) in accordance with the requirements of 40 CFR 117 and 40 CFR 302 as soon as he or she has knowledge of the discharge;

b. The permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and steps to be taken in accordance with Part III.B.3 of this permit to the appropriate EPA Regional office at the address provided in Part V.C (addresses) of this permit; and

c. The storm water pollution prevention plan required under Part IV of this permit must be modified 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, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

2. *Spills.* This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

Part IV. Storm Water Pollution Prevention Plans

A storm water pollution prevention plan shall be developed for each construction site covered by this permit. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site. In addition, the plan shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges associated with industrial activity at the construction site and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

A. Deadlines for Plan Preparation and Compliance

The plan shall:

1. Be completed (including certifications required under Part IV.E) prior to the submittal of an NOI to be covered under this permit and updated as appropriate;

2. For construction activities that have begun on or before October 1, 1992, except for sediment basins required under Part IV.D.2.a(2) (structural practices) of this permit, the plan shall provide for compliance with the terms and schedule of the plan beginning on October 1, 1992. The plan shall provide for compliance with sediment basins required under Part IV.D.2.a(a) of this permit by no later than December 1, 1992;

3. For construction activities that have begun after October 1, 1992, the plan shall provide for compliance with the terms and schedule of the plan beginning with the initiation of construction activities.

B. Signature and Plan Review

1. The plan shall be signed in accordance with Part VI.G, and be retained on-site at the facility which generates the storm water discharge in accordance with Part V (retention of records) of this permit.

2. The permittee shall make plans available upon request to the Director; a State or local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system.

3. The Director, or authorized representative, may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this part. Such notification shall identify those provisions of the permit which are not being met by the plan, and identify which provisions of the plan requires modifications in order to meet the minimum requirements of this part. Within 7 days of such notification from the Director, (or as otherwise provided by the Director), or authorized representative, the permittee shall make the required changes to the plan and shall submit to the Director a written certification that the requested changes have been made.

C. Keeping Plans Current

The permittee shall amend the plan whenever there is a change in design,

construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the plan or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.2 of this permit, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. In addition, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the storm water pollution prevention plan (see Part IV.E). Amendments to the plan may be reviewed by EPA in the same manner as Part IV.B above.

D. Contents of Plan

The storm water pollution prevention plan shall include the following items:

1. *Site description.* Each plan shall provide a description of pollutant sources and other information as indicated:

- a. A description of the nature of the construction activity;
- b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. grubbing, excavation, grading);
- c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities;
- d. An estimate of the runoff coefficient of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;
- e. A site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, an outline of areas which not be disturbed, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands), and locations where storm water is discharged to a surface water; and
- f. The name of the receiving water(s), and areal extent of wetland acreage at the site.

2. *Controls.* Each plan shall include a description of appropriate controls and measures that will be implemented at the construction site. The plan will clearly describe for each major activity identified in Part IV.D.1.b appropriate control measures and the timing during the construction process that the

measures will be implemented. (For example, perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site. Perimeter controls will be actively maintained until final stabilization of those portions of the site upward of the perimeter control. Temporary perimeter controls will be removed after final stabilization). The description and implementation of controls shall address the following minimum components:

a. *Erosion and sediment controls—(1) stabilization practices.* A description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. A record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be included in the plan. Except as provided in paragraphs IV.D.2.(a).(1).(a), (b), and (c) below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

(a). Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

(b). Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of site by the 14th day after construction activity temporarily ceased.

(c). In arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches), where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is

precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

(2). *Structural practices.* A description of structural practices to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural practices should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA.

(a) For common drainage locations that serve an area with 10 or more disturbed acres at one time, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. The 3,600 cubic feet of storage area per acre drained does not apply to flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent controls is not attainable, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, or equivalent sediment controls are required for all sideslope and downslope boundaries of the construction area.

(b) For drainage locations serving less than 10 acres, sediment basins and/or sediment traps should be used. At a minimum, silt fences or equivalent sediment controls are required for all sideslope and downslope boundaries of the construction area unless a sediment basin providing storage for 3,600 cubic feet of storage per acre drained is provided.

b. *Storm water management.* A description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA. This permit only addresses

the installation of storm water management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed and the site has undergone final stabilization. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with industrial activity have been eliminated from the site.

(1). Such practices may include: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The pollution prevention plan shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.

(2). Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel for the purpose of providing a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

c. Other controls—(1) waste disposal. No solid materials, including building materials, shall be discharged to waters of the United States, except as authorized by a Section 404 permit.

(2) Off-site vehicle tracking of sediments and the generation of dust shall be minimized.

(3) The plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.

d. Approved State or local plans. (1) Permittees which discharge storm water associated with industrial activity from construction activities must include in their storm water pollution prevention plan procedures and requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by State or local officials. Permittees shall provide a certification in their storm water pollution prevention plan that their storm water pollution prevention plan reflects requirements applicable to protecting surface water resources in sediment and erosion site plans or site permits, or storm water management

site plans or site permits approved by State or local officials. Permittees shall comply with any such requirements during the term of the permit. This provision does not apply to provisions of master plans, comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit that is issued for the construction site.

(2) Storm water pollution prevention plans must be amended to reflect any change applicable to protecting surface water resources in sediment and erosion site plans or site permits; or storm water management site plans or site permits approved by State or local officials for which the permittee receives written notice. Where the permittee receives such written notice of a change, the permittee shall provide a recertification in the storm water pollution plan that the storm water pollution prevention plan has been modified to address such changes.

(3) Dischargers seeking alternative permit requirements shall submit an individual permit application in accordance with Part V.I.L of the permit at the address indicated in Part V.C of this permit for the appropriate Regional Office, along with a description of why requirements in approved State or local plans or permits, or changes to such plans or permits, should not be applicable as a condition of an NPDES permit.

3. Maintenance. A description of procedures to ensure the timely maintenance of vegetation, erosion and sediment control measures and other protective measures identified in the site plan in good and effective operating condition.

4. Inspections. Qualified personnel (provided by the discharger) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater. Where sites have been finally stabilized, or during seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches) such inspection shall be conducted at least once every month.

a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures

identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

b. Based on the results of the inspection, the site description identified in the plan in accordance with paragraph IV.D.1 of this permit and pollution prevention measures identified in the plan in accordance with paragraph IV.D.2 of this permit shall be revised as appropriate, but in no case later than 7 calendar days following the inspection. Such modifications shall provide for timely implementation of any changes to the plan within 7 calendar days following the inspection.

c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph IV.D.4.b of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the site is finally stabilized. Such reports shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part VI.G of this permit.

5. Non-Storm Water Discharges. Except for flows from fire fighting activities, sources of non-storm water listed in Part III.A.2 of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

E. Contractors

1. The storm water pollution prevention plan must clearly identify for each measure identified in the plan, the contractor(s) and/or subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the plan must sign a copy of the certification statement in Part IV.E.2

of this permit in accordance with Part VI.G of this permit. All certifications must be included in the storm water pollution prevention plan.

2. *Certification Statement.* All contractors and subcontractors identified in a storm water pollution prevention plan in accordance with Part IV.E.1 of this permit shall sign a copy of the following certification statement before conducting any professional service identified in the storm water pollution prevention plan:

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

The certification must include the name and title of the person providing the signature in accordance with Part VI.G of this permit; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

Part V. Retention of Records

A. The permittee shall retain copies of storm water pollution prevention plans and all reports required by this permit, and records of all data used to complete the Notice of Intent to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Director at any time.

B. The permittee shall retain a copy of the storm water pollution prevention required by this permit at the construction site from the date of project initiation to the date of final stabilization.

C. *Addresses.* Except for the submittal of NOIs (see Part II.C of this permit), all written correspondence concerning discharges in any State, Indian land or from any Federal Facility covered under this permit and directed to the U.S. Environmental Protection Agency, including the submittal of individual permit applications, shall be sent to the address of the appropriate Regional Office listed below:

1. CT, MA, ME, NH, RI, VT

United States EPA, Region I, Water Management Division (WCP-2109), Storm Water Staff, John F. Kennedy Federal Building, Room 2209, Boston, MA 02203.

2. NJ, NY, PR, VI

United States EPA, Region II, Water Management Division (2WM-WPC),

Storm Water Staff, 26 Federal Plaza, New York, NY 10278.

3. DE, DC, MD, PA, VA, WV

United States EPA, Region III, Water Management Division (3WM55), Storm Water Staff, 841 Chestnut Building, Philadelphia, PA 19107.

4. AL, FL, GA, KY, MS, NC, SC, TN

United States EPA, Region IV, Water Management Division (FPB-3), Storm Water Staff, 345 Courtland Street, N.E., Atlanta, GA 30365.

5. IL, IN, MI, MN, OH, WI

United States EPA, Region V; Water Quality Branch (5WQP), Storm Water Staff, 77 West Jackson Boulevard, Chicago, IL 60604.

6. AR, LA, NM (Except See Region IX for Navajo Lands, and See Region VIII for Ute Mountain Reservation Lands), OK, TX

United States EPA, Region VI, Water Management Division (6W-EA), Storm Water Staff, First Interstate Bank Tower at Fountain Place, 1445 Ross Avenue, 12th Floor, Suite 1200, Dallas, TX 75202.

7. IA, KS, MO, NE

United States EPA, Region VII, Water Management Division, Compliance Branch, Storm Water Staff, 726 Minnesota Avenue, Kansas City, MO 66101.

8. CO, MT, ND, SD, WY, UT (Except See Region IX for Goshute Reservation and Navajo Reservation Lands)

United States EPA, Region VIII, Water Management Division, NPDES Branch (8WM-C), Storm Water Staff, 999 18th Street, Denver, CO 80202-2466.

Note—For Montana Indian Lands, please use the following address: United States EPA, Region VIII, Montana Operations Office, Federal Office Building, Drawer 10096, 301 South Park, Helena, MT 59620-0026.

9. AZ, CA, HI, NV, Guam, American Samoa, the Goshute Reservation in UT and NV, the Navajo Reservation in UT, NM, and AZ, the Duck Valley Reservation in NV and ID

United States EPA, Region IX, Water Management Division (W-5-1), Storm Water Staff, 75 Hawthorne Street, San Francisco, CA 94105.

10. AK, ID (Except See Region IX for Duck Valley Reservation Lands), OR, WA

United States EPA, Region X, Water Management Division (WD-134), Storm Water Staff, 1200 Sixth Street, Seattle WA 98101.

Part VI. Standard Permit Conditions

A. Duty to Comply

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

a. Criminal

(1). *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 a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

(2). *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.

(3). *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 is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than \$250,000, or by imprisonment for not more than 15 years, or both.

(4). *False Statement* The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than 2 years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or by both. (See Section 309.c.4 of the Clean Water Act).

b. *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 \$25,000 per day for each violation.

c. 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:

(1). *Class I penalty* Not to exceed \$10,000 per violation nor shall the maximum amount exceed \$25,000.

(2). *Class II penalty* Not to exceed \$10,000 per day for each day during which the violation continues nor shall the maximum amount exceed \$125,000.

B. Continuation of the Expired General Permit

This permit expires on October 1, 1997. However, an expired general permit continues in force and effect until a new general permit is issued. Permittees must submit a new NOI in accordance with the requirements of Part II of this permit, using a NOI form provided by the Director (or photocopy thereof) between August 1, 1997 and September 29, 1997 to remain covered under the continued permit after October 1, 1997. Facilities that had not obtained coverage under the permit by October 1, 1997 cannot become authorized to discharge under the continued permit.

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee 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.

D. Duty to Mitigate

The permittee 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.

E. Duty to Provide Information

The permittee shall furnish to the Director; an authorized representative of the Director; a State or local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, any information which is requested to

determine compliance with this permit or other information.

F. Other Information

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Director, he or she shall promptly submit such facts or information.

G. Signatory Requirements

All Notices of Intent, storm water pollution prevention plans, reports, certifications or information either submitted to the Director or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed as follows:

1. All Notices of Intent shall be signed as follows:

a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) 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 (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25,000,000 (in second-quarter 1980 dollars) if 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 includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. All reports required by the permit and other information requested by the Director or authorized representative of the Director shall be signed by a person described above 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 above and submitted to the Director.

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 company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

c. Changes to authorization. If an authorization under paragraph II.B.3. is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new notice of intent satisfying the requirements of paragraph II.B must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification. Any person signing documents under paragraph VI.G 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 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.

H. Penalties for Falsification of Reports

Section 309(c)(4) of the Clean Water Act provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or by both.

I. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA or section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

J. Property Rights

The issuance of this permit does not convey any property rights of any sort,

nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

K. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

L. Requiring an Individual Permit or an Alternative General Permit

1. The Director may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Director to take action under this paragraph. Where the Director requires a discharger authorized to discharge under this permit to apply for an individual NPDES permit, the Director shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of issuance or denial of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the appropriate Regional Office indicated in Part V.C of this permit. The Director may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual NPDES permit application as required by the Director under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified by the Director for application submittal.

2. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Director at the address for the appropriate Regional Office indicated in part V.C of this permit. The request may be granted by issuance of any individual permit or an alternative general if the

reasons cited by the permittee are adequate to support the request.

3. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to an owner or operator otherwise subject to this permit, or the owner or operator is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Director.

M. State/Environmental Laws

1. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by section 510 of the Act.

2. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

N. Proper Operation and Maintenance

The permittee 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 permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

O. Inspection and Entry

The permittee shall allow the Director or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through a municipal separate storm sewer, an authorized representative of the municipal operator or the separate storm sewer receiving the discharge, upon the presentation of credentials and

other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

P. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VII. Reopener Clause

A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the discharger may be required to obtain individual permit or an alternative general permit in accordance with Part I.C of this permit or the permit may be modified to include different limitations and/or requirements.

B. Permit modification or revocation will be conducted according to 40 CFR 122.62, 122.63, 122.64 and 124.5.

Part VIII. Termination of Coverage

A. Notice of Termination

Where a site has been finally stabilized and all storm water discharges from construction activities that are authorized by this permit are eliminated, or where the operator of all storm water discharges at a facility changes, the operator of the facility may submit a Notice of Termination that is signed in accordance with Part VI.G of this permit. The Notice of Termination shall include the following information:

1. The mailing address of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location of the approximate center of the site must be described in terms of the latitude and longitude to the nearest 15 seconds, or the section, township and range to the nearest quarter section;

2. The name, address and telephone number of the operator addressed by the Notice of Termination;

3. The NPDES permit number for the storm water discharge identified by the Notice of Termination;

4. An indication of whether the storm water discharges associated with industrial activity have been eliminated or the operator of the discharges has changed; and

5. The following certification signed in accordance with Part VI.G (signature requirements) of this permit:

I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by an NPDES 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 storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES 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.

For the purposes of this certification, elimination of storm water discharges associated with industrial activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated.

B. Addresses

All Notices of Termination are to be sent, using the form provided by the Director (or a photocopy thereof),³ to the following address: Storm Water Notice of Termination, PO Box 1185, Newington, VA 22122.

Part IX. Definitions

Best Management Practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Commencement of Construction—The initial disturbance of soils associated

with clearing, grading, or excavating activities or other construction activities.

CWA means the Clean Water Act or the Federal Water Pollution Control Act.

Dedicated portable asphalt plant—A portable asphalt plant that is located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR 443.

Dedicated portable concrete plant—A portable concrete plant that is located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

Director means the Regional Administrator of the Environmental Protection Agency or an authorized representative.

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 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR part 122); or (ii) located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in appendices H and I of 40 CFR part 122); or (iii) owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

NOI means notice of intent to be covered by this permit (see Part II of this permit).

NOT means notice of termination (see Part VIII of this permit).

Point Source means 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 discharges. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm Water Associated with Industrial Activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in paragraphs (i) through (x) of this definition, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in paragraph (xi) of this definition, the term includes only storm water discharges from all areas (except access roads and rail lines) listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste

³ A copy of the approved NOT form is provided in Appendix D of this notice.

product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi) of this definition) include those facilities designated under 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this definition);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 311, 32 (except 323), 33, 3441, 373;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45 and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale;

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (i)-(x)).⁴

Waters of the United States means:

(a) 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;

(b) All interstate waters, including interstate "wetlands";

(c) All other waters such as interstate 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:

(1) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(3) Which are used or could be used for industrial purposes by industries in interstate commerce;

(d) All impoundments of waters otherwise defined as waters of the United States under this definition;

(e) Tributaries of waters identified in paragraphs (a) through (d) of this definition;

(f) The territorial sea; and

(g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.

Part X. State Specific Conditions

The provisions of this Part provide modifications or additions to the applicable conditions of Parts I through IX of this permit to reflect specific additional conditions identified as part of the State section 401 certification process. The additional revisions and requirements listed below are set forth in connection with particular State, Indian lands and Federal facilities and only apply to the States, Indian lands and Federal facilities specifically referenced.

Region II

A. *Puerto Rico*. Puerto Rico 401 certification special permit conditions revise the permit as follows:

1. Part I.A of the permit is revised to read as follows:

Part I. Coverage Under This Permit

A. *Permit Area*. The permit covers all areas administered by EPA Region 2 in the Commonwealth of Puerto Rico.

2. Part III of the permit are revised to read as follows:

⁴ On June 4, 1992, the United States Court of Appeals for the Ninth Circuit remanded the exclusion for manufacturing facilities in category (xi) which do not have materials or activities exposed to storm water to the EPA for further rulemaking. (Nos. 90-70671 and 91-70200).

Part III. Special Conditions, Management Practices, Commonwealth Special Conditions, and Narrative Effluent Limitations.

C. Commonwealth Special Conditions

1. Prior to the construction of any treatment system of waters compose entirely of storm water, the permittee shall obtain the approval of the engineering report, plans and specifications from the Environment Quality Board (EQB) of Puerto Rico.

2. The permittee shall submit to EQB with copy to the Regional Office the following information regarding its storm water discharge(s) associated with industrial activity: The number of storm water discharges associated with industrial activity covered by this permit and a drawing indicating the drainage area of each storm water outfalls:

a. For construction activities that have begun on or before October 1, 1992, the permittee is required to submit the information listed above no later than November 15, 1992.

b. For construction activities that have begun after October 1, 1992, the permittee is required to submit the information listed above within forty five (45) days of submission of the NOI.

D. Narrative Effluent Limitations

1. All discharges covered by this Permit shall be free of oil sheen at all times.

2. The storm water discharges associated with industrial activity from construction activities covered by this permit will not cause violation to the applicable water quality standards.

3. Part IV of the permit is revised to read as follows:

Part IV. Storm Water Pollution Prevention Plans

A. Deadlines for Plan Preparation and Compliance

The plan shall: 1. Be completed prior to the submittal of an NOI to be covered under this permit and updated as appropriate;

2. For construction activities that have begun on or before October 1, 1992, the plan shall provide for compliance with the terms and schedule of the plan beginning on October 1, 1992. On or before November 1, 1992, the permittee shall submit to EQB with copy to the Regional Office, a certification stating that the Plan has been developed and implemented in accordance with the requirements established in this permit.

The certification should be signed by the person who fulfills the signatory requirements in accordance with Part VI.G of this permit.

3. For construction activities that have begun after October 1, 1992, the plan shall provide for compliance with the terms and schedule of the plan beginning with the initiation of construction activities. Within thirty (30) days of submission of the NOI, the permittee shall submit to EQB with copy to the Regional Office, a certification stating that the Plan has been developed and implemented in accordance with the requirements established in this permit. This certification should be signed by the person who fulfills the signatory requirements in accordance with Part VI.G of this permit.

C. Keeping Plans Current. The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the plan or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.2 of this permit, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the plan may be reviewed by EPA in the same manner as Part IV.B above. If events have occurred which require the modification of the Plan, the engineer who performs the corresponding revision must submit to EQB with copy to the Regional Office, a certification stating the modifications performed to the plan. As soon as the modifications performed to the Plan are implemented, the person who fulfills the signatory requirements in accordance with Part VI.G of this permit shall submit to EQB with copy to the Regional Office, a certification stating that the modifications of the Plan have been implemented.

D. Contents of Plan

2. Controls.

d. Approved State or Local Plans

(4) Compliance with the Plan requirements does not relieve the permittee of his responsibility to comply with the provisions of the Sediment and

Erosion Control Plan (Plan CEST, as referred to in Spanish) required by EQB.

4. Part VI.N of the permit is revised to read as follows:

Part VI. Standard Permit Conditions

N. Proper Operation and Maintenance. The permittee 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 permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit. Also, proper operation and maintenance includes, but is not limited to, the effective performance based on designed facility removals, adequate funding, effective management, qualified operator staffing, adequate training, adequate laboratory and process controls including appropriate quality assurance procedures.

Region VIII

B. Colorado (Federal facilities and Indian lands). There are no special conditions pursuant to Colorado 401 certification in this permit for storm water discharges associated with industrial activity from construction activities located on Indian lands in Colorado. Colorado 401 certification special permit conditions for storm water discharges associated with industrial activity from construction activities from Federal facilities is revised as follows:

1. Part I.A of the permit is revised to read as follows:

Part I. Coverage Under This Permit

A. Permit Area. The permit covers all Federal Facilities and Indian Lands administered by EPA Region 8 in the State of Colorado.

2. Part III of the permit is revised to read as follows:

Part III. Special Conditions

A. Prohibition on non-storm water discharges.

2.

b. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharge is in compliance with paragraph IV.D.5: Discharges from fire fighting activities: fire hydrant flushings; waters used to wash vehicles or control dust in accordance with Part IV.D.2.c.(2); potable water sources including waterline flushings; irrigation drainage; routine external building washdown which does not use detergents or other compounds; pavement washwaters 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; air conditioning condensate that has not been contaminated by industrial activity and no chemicals have been added to it; naturally occurring springs which have not been altered by the industrial activity; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Releases in Excess of Reportable Quantities

1.

b. The permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and steps to be taken in accordance with paragraph III.B.3 of this permit to the appropriate EPA Regional Office at the address provided in Part V.C (addresses) of this permit and to the Colorado Water Quality Control Division at the following address: Colorado Department of Health, Water Quality Control Division, 4300 Cherry Creek Drive South, Denver, Colorado 80222-1530, Attention: Permits and Enforcement.

3. Part IV.B.2 of the permit is revised to read as follows:

Part IV. Storm Water Pollution Prevention Plans

B. Signature and Plan Review

2. The permittee shall make plans available upon request to the Director,

or authorized representative, or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the operator of the municipal system. Federal Facilities located on non-Indian lands in Colorado shall make plans available upon request to the Colorado Water Quality Control Division.

4. Part VII.A of the permit is revised to read as follows:

Part VII. Reopener Clause

A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the discharger may be required to obtain individual permit or an alternative general permit in accordance with Part I.C of this permit or the permit may be modified to include different limitations and/or requirements. If EPA develops new regulations which specifically impact storm water permit requirements or there is a change in statute which imposes additional requirements, this permit may be reopened and modified (following administrative procedures) to include the appropriate requirements.

Region IX

C. *Arizona.* Arizona 401 certification special permit conditions revise the permit as follows:

1. Part I.A of the permit is revised to read as follows:

Part I. Coverage Under This Permit

A. *Permit Area.* The permit covers all areas administered by EPA Region 9 in the State of Arizona, excluding all Indian lands.

2. Part II of the permit is revised to read as follows:

Part II. Notice of Intent Requirements

F. *Special NOI Requirements for the State of Arizona.* NOIs shall also be submitted to the State of Arizona Department of Environmental Quality at the following address: Storm Water Coordinator, Arizona Department of Environmental Quality P.O. Box 600, Phoenix, Arizona 85001-0600.

NOIs submitted to the State of Arizona shall include the well registration number if storm water associated with industrial activity is

discharged to a dry well or an injection well.

3. Part III of the permit is revised to read as follows:

Part III. Special Conditions

C. *Compliance with Water Quality Standards of the State of Arizona.* Discharges authorized by this permit shall not cause or contribute to a violation of any applicable water quality standards of the State of Arizona (A.G. Rule No. R92-006).

4. Part VIII of the permit is revised to read as follows:

Part VIII. Termination of Coverage

C. *Special NOT Requirement for the State of Arizona.* NOTs shall also be submitted to the State of Arizona Department of Environmental Quality at the following address:

Storm Water Coordinator, Arizona Department of Environmental Quality, P.O. Box 600, Phoenix, Arizona 85001-0600.

5. The following definition has been added to Part IX of the permit:

Part IX. Definitions

Significant sources of non-storm water includes, but is not limited to: Discharges which could cause or contribute to violations of water quality standards of the State of Arizona, and discharges which could include releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and 40 CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).

Region X

D. *Alaska.* Alaska 401 certification special permit conditions revise the permit as follows:

1. Part I.A of the permit is revised to read as follows:

Part I. Coverage Under This Permit

A. *Permit Area.* The permit covers all areas administered by EPA Region 10 in the State of Alaska.

2. Part II.C of the permit is revised to read as follows:

Part II. Notice of Intent Requirements

C. *Where to Submit.*

3. A copy of initial Notice of Intent (NOI), any NOI for the continuation of the general permit, and any Notice of Termination shall be submitted to the appropriate State regional office, attention Storm Water Coordinator, as follows:

Alaska Department of Environmental Conservation, Northern Regional Office, 1001 Noble Street, suite 350, Fairbanks, Alaska 99701, (907) 452-1714, Fax: 451-2187.

Alaska Department of Environmental Conservation, Southeastern Regional Office, 410 W. Willoughby, suite 105, Juneau, Alaska 99801, (907) 465-5350, Fax: 465-5362.

Alaska Department of Environmental Conservation, Southcentral Regional Office, 3601 "C" Street, suite 1334, Anchorage, Alaska 99503, (907) 563-6529, Fax: 562-4026.

Alaska Department of Environmental Conservation, Pipeline Corridor Regional Office, 411 W. 4th Ave., suite 2C, Anchorage, Alaska 99502, (907) 278-8594, Fax: 272-0690.

4. With the NOI to the State, a brief description of the activities to be covered shall be submitted. This shall be on a single sheet and shall describe the area to be disturbed to the nearest acre, the primary pollutants expected from the activities and the type of treatment to be provided.

3. Part III.B.1.b is revised to read as follows:

Part III. Special Conditions, Management Practices, and Other Non-Numeric Limitations

B. Releases in excess of Reportable Quantities.

1.

b. The permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and steps to be taken in accordance with Part III.B.3 of this permit to the appropriate EPA Regional Office at the address provided in Part V.C (addresses) of this permit and to the

appropriate State regional office (see section II.C for addresses);

4. Part IV.D.4 of the permit is revised to read as follows:

Part IV. Storm Water Pollution Prevention Plans

D. Contents of Plan.

4. *Inspections.* Qualified personnel (provided by the discharger) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater. Where sites have been finally stabilized, or during seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches) such inspection shall be conducted at least once every month. Monthly inspections shall be conducted for areas finally until a Notice of Termination (NOT) has been submitted for the area.

E. Idaho. Idaho 401 certification special permit conditions revise the permit as follows:

1. Part I.A of the permit is revised to read as follows:

Part I. Coverage Under This Permit

A. Permit Area. The permit covers all areas administered by EPA Region 10 in the State of Idaho.

2. Part III of the permit is revised to read as follows:

Part III. Special Conditions

C. All storm water shall be treated and disposed of in such a manner that the ground water standards of Idaho are not violated. Such standards are specified in Section 1.02299 of the "Idaho Water Quality Standards and Wastewater Treatment Requirements."

F. Washington (Federal facilities and Indian lands). Washington 401 certification special permit conditions revise the permit as follows:

1. Part I.A of the permit is revised to read as follows:

Part I. Coverage Under This Permit

A. Permit Area. The permit covers all Federal Facilities administered by EPA Region 10 in the State of Washington.

2. Part III of the permit is revised to read as follows:

Part III. Special Conditions

C. Washington State Standards

1. This permit does not authorize the violation of ground water standards (Chapter 173-200 WAC), surface water standards (Chapter 173-201 WAC), or sediment management standards (Chapter 173-204 WAC) of the State of Washington. The point of compliance with surface water standards shall be determined after consideration of the assignment of a dilution zone as allowed under Chapter 173-201 WAC. The point of compliance with ground water standards shall be determined by applying the provisions of Chapter 173-200 WAC. The point of compliance with sediment management standards shall be determined in accordance with Chapter 173-204 WAC.

2. Diversion of storm water discharges to ground water from existing discharges to surface water shall not be authorized by this permit if this causes a violation or the potential for violation of ground water standards (Chapter 173-200 WAC). Such discharges below the surface of the ground are also regulated by the Underground Injection Control Program (Chapter 173-218 WAC).

3. Washington Department of Ecology (WDOE) is currently developing a "Storm Water Pollution Prevention Plan" which will require facilities to assess the potential of their storm water discharges to violate the Washington State surface water, ground water, or sediment management standards. Those discharges with a high potential to violate standards will be required to develop and implement a monitoring program.

Upon issuance of the "Storm Water Pollution Prevention Plan" by WDOE, EPA may reopen this permit to require facilities to assess their storm water discharges and to require additional monitoring.

BILLING CODE 6560-50-M

Instructions - EPA Form 3510-6
Notice Of Intent (NOI) For Storm Water Discharges Associated With Industrial Activity
To Be Covered Under The NPDES General Permit

Who Must File A Notice Of Intent (NOI) Form

Federal law at 40 CFR Part 122 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the NPDES Storm Water General Permit. If you have questions about whether you need a permit under the NPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a state agency, contact the Storm Water Hotline at (703) 821-4823.

Where To File NOI Form

NOIs must be sent to the following address:

Storm Water Notice of Intent
 PO Box 1215
 Newington, VA 22122

Completing The Form

You must type or print, using upper-case 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, call the Storm Water Hotline at (703) 821-4823.

Section I Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same as the name of the facility. The responsible party is the legal entity that controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Enter the appropriate letter to indicate the legal status of the operator of the facility.

F = Federal M = Public (other than federal or state)
 S = State P = Private

Section II Facility/Site Location Information

Enter the facility's or site's official or legal name and complete street address, including city, state, and ZIP code. If the facility or site lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Indicate whether the facility is located on Indian lands.

Section III Site Activity Information

If the storm water discharges to a municipal separate storm sewer system (MS4), enter the name of the operator of the MS4 (e.g., municipality name, county name) and the receiving water of the discharge from the MS4. (A MS4 is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body which is designed or used for collecting or conveying storm water.)

If the facility discharges storm water directly to receiving water(s), enter the name of the receiving water.

If you are filing as a co-permittee and a storm water general permit number has been issued, enter that number in the space provided.

Indicate whether or not the owner or operator of the facility has existing quantitative data that represent the characteristics and concentration of pollutants in storm water discharges.

Indicate whether the facility is required to submit monitoring data by entering one of the following:

- 1 = Not required to submit monitoring data;
- 2 = Required to submit monitoring data;
- 3 = Not required to submit monitoring data; submitting certification for monitoring exclusion

Those facilities that must submit monitoring data (e.g., choice 2) are: Section 313 EPCRA facilities; primary metal industries; land disposal units/incinerators/SIFs; wood treatment facilities; facilities with coal pile runoff; and, battery reclaimers.

List, in descending order of significance, up to four 4-digit standard industrial classification (SIC) codes that best describe the principal products or services provided at the facility or site identified in Section II of this application.

For industrial activities defined in 40 CFR 122.26(b)(14)(i)-(xi) that do not have SIC codes that accurately describe the principal products produced or services provided, the following 2-character codes are to be used:

- HZ = Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA [40 CFR 122.26 (b)(14)(iv)];
- LF = Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under subtitle D of RCRA [40 CFR 122.26 (b)(14)(v)];
- SE = Steam electric power generating facilities, including coal handling sites [40 CFR 122.26 (b)(14)(vi)];
- TW = Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage [40 CFR 122.26 (b)(14)(ix)]; or,
- CO = Construction activities [40 CFR 122.26 (b)(14)(x)].

If the facility listed in Section II has participated in Part 1 of an approved storm water group application and a group number has been assigned, enter the group application number in the space provided.

If there are other NPDES permits presently issued for the facility or site listed in Section II, list the permit numbers. If an application for the facility has been submitted but no permit number has been assigned, enter the application number.

Section IV Additional Information Required for Construction Activities Only

Construction activities must complete Section IV in addition to Sections I through III. Only construction activities need to complete Section IV.

Enter the project start date and the estimated completion date for the entire development plan.

Provide an estimate of the total number of acres of the site on which soil will be disturbed (round to the nearest acre).

Indicate whether the storm water pollution prevention plan for the site is in compliance with approved state and/or local sediment and erosion plans, permits, or storm water management plans.

Section V Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which 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, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if 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; or

For a municipality, state, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. 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, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

Appendix D — NOT Form Instructions

Please See Instructions Before Completing This Form		Form Approved. OMB No. 2040-0088 Approval expires: 8-31-95
NPDES FORM		United States Environmental Protection Agency Washington, DC 20460 Notice of Termination (NOT) of Coverage Under the NPDES General Permit for Storm Water Discharges Associated with Industrial 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 storm water associated with industrial activity under the NPDES program. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.		
I. Permit Information NPDES Storm Water General Permit Number: <input style="width: 150px;" type="text"/> Check Here if You are No Longer the Operator of the Facility: <input type="checkbox"/> Check Here if the Storm Water Discharge is Being Terminated: <input type="checkbox"/>		
II. Facility Operator Information Name: <input style="width: 600px;" type="text"/> Phone: <input style="width: 100px;" type="text"/> Address: <input style="width: 600px;" type="text"/> City: <input style="width: 200px;" type="text"/> State: <input style="width: 50px;" type="text"/> ZIP Code: <input style="width: 100px;" type="text"/>		
III. Facility/Site Location Information Name: <input style="width: 500px;" type="text"/> Address: <input style="width: 500px;" type="text"/> City: <input style="width: 200px;" type="text"/> State: <input style="width: 50px;" type="text"/> ZIP Code: <input style="width: 100px;" type="text"/> Latitude: <input style="width: 80px;" type="text"/> Longitude: <input style="width: 80px;" type="text"/> Quarter: <input style="width: 50px;" type="text"/> Section: <input style="width: 50px;" type="text"/> Township: <input style="width: 80px;" type="text"/> Range: <input style="width: 50px;" type="text"/>		
IV. Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a NPDES 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 storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES 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.		
Print Name: <input style="width: 500px;" type="text"/> Date: <input style="width: 100px;" type="text"/> Signature: _____		
Instructions for Completing Notice of Termination (NOT) Form		
Who May File a Notice of Termination (NOT) Form Permittees who are presently covered under the EPA issued National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26 (b)(14), or when they are no longer the operator of the facilities. For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a NPDES general permit have otherwise been eliminated. 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 70% of the cover for unpeaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.	Where to File NOT Form Send this form to the the following address: Storm Water Notice of Termination P.O. Box 1185 Newington, VA 22122 Completing the Form Type or print, using upper-case 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, call the Storm Water Hotline at (703) 821-4823.	
PLEASE SEE REVERSE OF THIS FORM FOR FURTHER INSTRUCTIONS		

Instructions - EPA Form 3510-7
Notice of Termination (NOT) of Coverage Under The NPDES General Permit
for Storm Water Discharges Associated With Industrial Activity

Section I Permit Information

Enter the existing NPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, contact the Storm Water Hotline at (703) 821-4823.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box:

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II Facility Operator Information

Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III Facility/Site Location Information

Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quarter, section, township, and range (to the nearest quarter section) of the approximate center of the site.

[FR Doc. 92-21385 Filed 9-8-92; 8:45 am]

BILLING CODE 6560-50-C

Section IV Certification

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

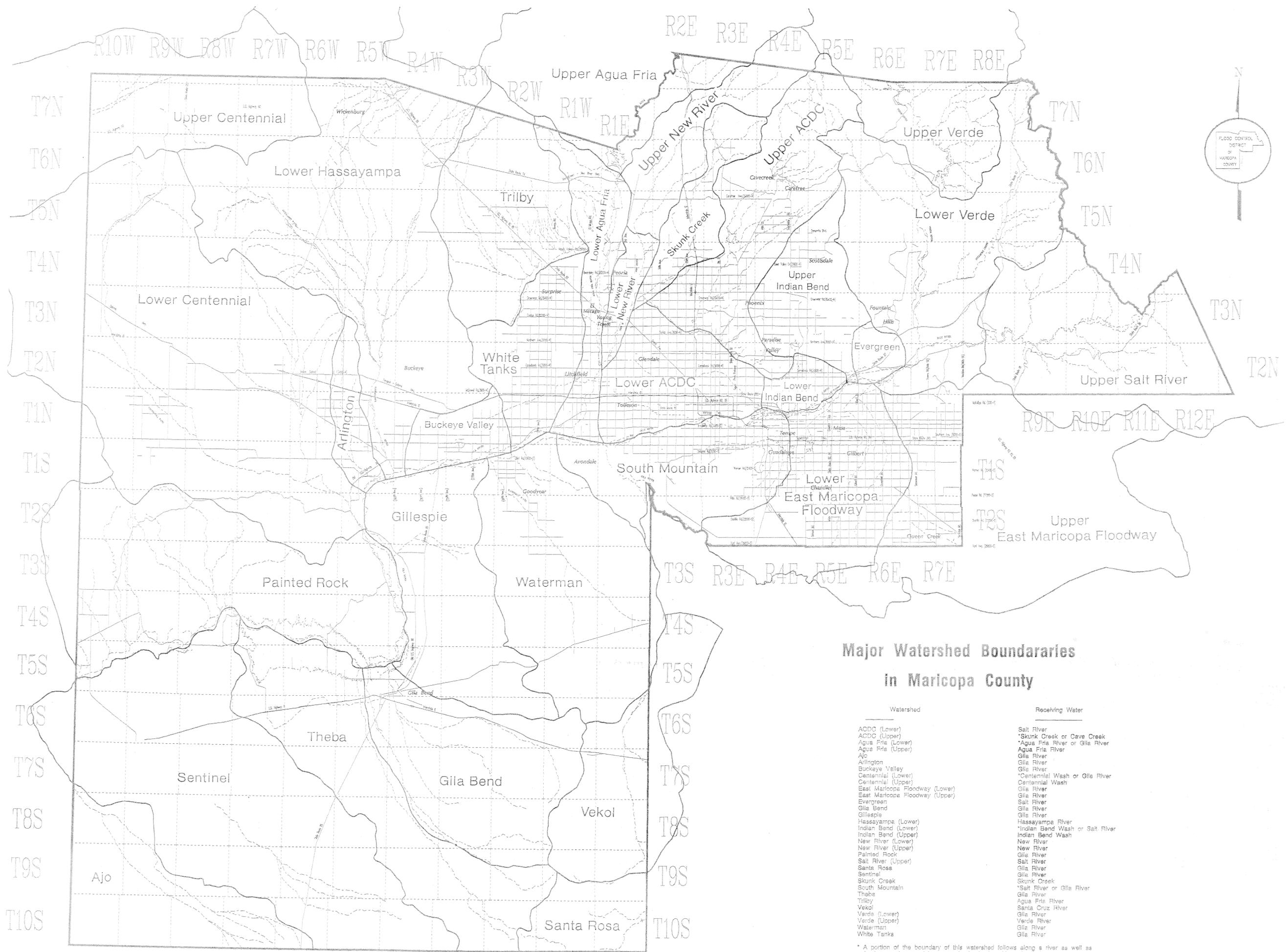
For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if 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; or

For a municipality, State, Federal, or other public facility: by either a principal executive officer or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. 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, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.



**Major Watershed Boundaries
in Maricopa County**

Watershed	Receiving Water
ACDC (Lower)	Salt River
ACDC (Upper)	*Skunk Creek or Cave Creek
Agua Fria (Lower)	*Agua Fria River or Gila River
Agua Fria (Upper)	Agua Fria River
Ajo	Gila River
Arlington	Gila River
Buckeye Valley	Gila River
Centennial (Lower)	*Centennial Wash or Gila River
Centennial (Upper)	Centennial Wash
East Maricopa Floodway (Lower)	Gila River
East Maricopa Floodway (Upper)	Salt River
Evergreen	Gila River
Gila Bend	Gila River
Gillespie	Gila River
Hassayampa (Lower)	Hassayampa River
Indian Bend (Lower)	*Indian Bend Wash or Salt River
Indian Bend (Upper)	Indian Bend Wash
New River (Lower)	New River
New River (Upper)	New River
Painted Rock	Gila River
Salt River (Upper)	Salt River
Santa Rosa	Gila River
Sentinel	Gila River
Skunk Creek	Skunk Creek
South Mountain	*Salt River or Gila River
Theba	Gila River
Trilby	Agua Fria River
Vekol	Santa Cruz River
Verde (Lower)	Gila River
Verde (Upper)	Verde River
Waterman	Gila River
White Tanks	Gila River

* A portion of the boundary of this watershed follows along a river as well as having another receiving water in the basin. More detailed analysis is needed to determine the receiving waters for a specific site.

R10W R9W R8W R7W R6W R5W R4W R3W R2W R1W R1E