City of Palm Springs
Animal Care Facility
Project No. CP. 07-24

Volume III

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

B. FUGITIVE DUST CONTROL PLAN (PM-10)

BID SET

Bid Set
January 18, 2010

PREVAILING WAGE JOB

STORM WATER POLLUTION PREVENTION PLAN
(SWPPP)

For

Palm Springs Animal Care Facility
APN 680-020-010

Paving, grading, underground utilities and building construction

Located in the City of Palm Springs
Riverside County, CA
Colorado River Basin Region 7

Prepared For:
CITY OF PALM SPRINGS
3500 E. Taquitz Canyon Way
Palm Springs, CA 92262
760 323-8245

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December 18, 2009

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TRAINING

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CERTIFICATION

Owner's 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.

Owner Signature _____ Date _____

Print Name _____

Owner: City of Palm Springs
3500 E. Taquitz Canyon Way
Palm Springs, CA 92262
760 323-8245

Note: Signatory requirements are defined in Section C.9 of the GENERAL PERMIT 99-08 Located in Appendix A - Regulatory.

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CONTRACTOR SWPPP CERTIFICATION

Project Name: **Palm Springs Animal Care Facility APN 680-020-010**

Project Number: **case No. 3.3369-MAJ**

"I certify under a penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel 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, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Contractor Signature	Date
Contractor Name	Telephone Number

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PREFACE

The Federal Water Pollution Act (also referred to as the Clean Water Act) of 1972 was amended to prohibit discharge from any source unless it was in conformance with the National Pollutant Discharge Elimination System (NPDES). CWA Amendments in 1987 added Section 402, which lays out the framework for regulating municipal and industrial storm water discharges.

United States Environmental Protection Agency (USEPA) published final regulations regarding storm water permit application requirements for specified categories of industries on November 16, 1990. These regulations provide that discharges of storm water to the waters of the United States from Construction Sites of 5 Acres or more of soil disturbance are prohibited from discharging unless it is in compliance with the NPDES Permit. Effective March 10, 2003 Phase II will be in affect; reducing the Construction Site to 1 acre.

California is a delegated NPDES State with General Permitting Authority. The State has issued two General Permits for Storm Water Discharges; one for industrial facilities and one for construction sites.

The State Water Resources Control Board (SWRCB), Order No. 99-08 DWQ, National Pollutant Discharge Elimination System (NPDES), GENERAL PERMIT No. CAS000002. Waste Discharge Requirements (WDRS), for Discharges of Storm Water Runoff Associated with Construction Activity is the State's permit and commonly referred to as THE GENERAL PERMIT.

Further information regarding this permit can be found in Appendix A - Regulatory of this report.

The Storm Water Pollution Prevention Plan shall be implemented prior to any construction or soil disturbance activity.

The intended purpose of this report is to assist the owner or the owner's representative in complying with the GENERAL PERMIT 99-08 "Section A: Storm Water Pollution Prevention Plan". All others sections of the GENERAL PERMIT pertain to other parties which are responsible for addressing the Findings 1-15, Orders A-D, and Sections B & C.

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Amendments & Revisions

Any revisions and amendments to any part of this SWPPP shall be noted below as indicated in accordance with applicable sections of THE GENERAL PERMIT. All amendments to the SWPPP are required to be signed by persons meeting signatory requirements per Section C.9 of the GENERAL PERMIT.

Revision # & Description	Prepared BY/Date	Approved By/Date Print Name & Initial
1.		

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I. INTRODUCTION

A. Purpose of Permit

THE GENERAL PERMIT contains 3 parts titled

- State Water Resources Control Boards Findings 1-15
- Orders describing (A) Discharge Prohibitions, (B) Receiving Water Limitations, (C) Special Provisions for Construction Activity, Regional Water Quality Control Board (RWQCB), (D) Regional Water Quality Control Board (RWQCB) Authorities; and
- Section A Storm Water Pollution Prevention Plan, Section B, Monitoring Program and Reporting Requirements and Section C: Standard Provisions for Construction Activity. The entire permit is included in Appendix A - Regulatory.

THE GENERAL PERMIT requires that the Owner develops and implements a SWPPP and a Monitoring Program Plan, which incorporates Structural and Non-Structural Best Management Practices. Non-Structural BMPs are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices that reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges. Structural BMPs are devices constructed in place, for permanent or temporary use. BMPs include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, waste disposal, and drainage from raw material storage.

BMP implementation must take into account changing weather conditions and construction activities, and various combinations of BMPs may be used over the life of the project to maintain compliance with The GENERAL PERMIT. The GENERAL PERMIT gives the owner the discretion to determine the most economical, effective, and possibly innovative BMPs to achieve the performance-based goals of the GENERAL PERMIT.

B. "Section A: Storm Water Pollution Prevention Plan"

The objectives of the SWPPP are outlined in The GENERAL PERMIT Section A.1.a – A.1.f:
This report includes guidelines to achieve these objectives.

C. Notice of Intent

The Notice of Intent to comply with the terms of the GENERAL PERMIT to Discharge Storm Water Associated the State Water ed with Construction Activity (Water Quality Order No. 99-08-DWQ) has been filed with Resources Control Board. A copy of this document is provided in Appendix A - Regulatory along with a copy of the Receipt of Notice of Intent as provided by the State Water Resources Control Board. The Receipt indicates the Waste Discharge identification number (WDID) for this property.

Also included in Appendix A - Regulatory is a copy of the New Owner Information and Change of Information (COI) Form for the General Construction Permit (Attachment 4). This form is used to terminate coverage under this NOI for a portion of the project when:

Ownership of a portion of this project has been transferred; or
A phase within this multi-phase project has been completed.

See Special Provisions for Construction Activity in Orders section Paragraph C.7, of the GENERAL PERMIT for additional information concerning this form.

D. Notice of Termination

A copy of the Notice of Termination of coverage under the NPDES GENERAL PERMIT CAS000002 for Discharges of Storm Water Associated with Construction Activity has been included in Appendix A Regulatory. The Owner shall complete this form and submit it to the Regional Water Quality Control Board Director, once construction is completed as defined by:

The Instructions for Completing Notice of Termination for Construction Activity (also attached in Appendix A - Regulatory); and

See Special Provisions for Construction Activity in Orders section Paragraph C.7, of the GENERAL PERMIT for additional information concerning this form.

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II. PROJECT INFORMATION

A. Project Description

The Project Site which; includes APN 680-020-010 encompasses 5.5 acres. The project is surrounded by similar commercial/light industrial land use and is situated between Velle and Williams Road just south of Mesquite Avenue.

This project proposes a 22,000 square foot animal care facility which will contain; indoor and outdoor animal enclosures; exam rooms; waiting rooms; customer service areas and associated offices for facility operations. Parking areas are located along adjacent Vella Road and to the south side of the building.

The site was previously vacant.

B. Storm Water Patterns

The proposed project includes three drainage areas with three points of discharge. The first area, approximately 1.30 acres, will drain via sheet flow and storm drain improvements to a proposed retention / infiltration basin located within the site along the site westerly property line. The second area, approximately 1.70 acres, will drain via sheet flow, bio-swale, and storm drain to the existing Riverside County Flood Control storm drain located in Vella Road. The third area, approximately 0.12 acres, will consist of parking bays directly adjacent to Vella Road. This area will be conveyed along Vella Road and will subsequently intercepted by existing Riverside County Flood Control storm drain improvements located therein.

C. Site Descriptive Maps and Plans

The following maps and plans provide additional descriptive detail that is also required by the GENERAL PERMIT, and are provided in Appendix B - Reference Plans of this report:

<u>Location & Vicinity Maps</u>
The Location Map shows the approximate location of the Project in relation to the City.

<u>Erosion and Sediment Control Plan</u>
This Plan shows the layout for the proposed site improvements and contains the required information concerning sediment control practices and best management practices necessary to complete all construction activities with minimal effect on storm water runoff.

<u>SWPPP Site Map/PM10</u>
This map shows possible locations for anticipated contractors activities BMPs and probable Sampling locations, where applicable. Contractor shall update map per GENERAL PERMIT requirements.

D. Construction Site Soil Characteristics

Per the Geotechnical Report titled "New Palm Springs Animal Shelter", prepared by Southern California Soil & Testing, Inc., dated August 5, 2008.

"Materials encountered in the borings consisted of fill and alluvium. The fill comprised of loose tp medium dense silty sand that extends to depths of about 1 to 5 feet below the existing ground surface. The alluvium consists of medium dense to dense silty sand that extends to the maximum depth explored, 25 feet. Groundwater was not encountered in our borings."

Runoff Coefficient		Approx. % Impervious Cover	
Existing	Developed	Existing	Developed
0.3	0.80	0	85

E. Construction Schedule

Construction will be completed in several minor phases as designated at the Construction Site.

In addition to this section, the Construction Manager should supplement this section with actual construction schedules that are available for review on the job-site at all times as required by the GENERAL PERMIT.

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III. STORM WATER POLLUTION PREVENTION PLAN

A. Objectives (Section A.1)

The 2 major objectives of the GENERAL PERMIT are:

(1) To help identify the sources of sediment and other pollutants that affect the quality of storm water discharges,
and
(2) describe and ensure the implementation of Best Management Practices (BMPs) to reduce or eliminate sediment and other pollutants in storm water as well as non-storm water discharges.
Additionally, the GENERAL PERMIT requires further measures listed below:
(3) Develop and implement an approved monitoring and reporting program, to include: pre-, during- & post- construction monitoring to identify and quantify pollutants in storm water runoff from the site. This should include sampling and laboratory testing during the rainy season (October 1st to May 31st)(see section 5 for compliance).

Develop and implement an approved Post-Construction Management Program, to include: identification of long-term funding mechanism, operation and maintenance of any structural or programmatic controls in the Post-Construction Management Program.
It is the intentions of this SWPPP to comply with the water quality standards set forth by the U.S. Environmental Protection Agency (EPA) and, as such, to comply with California's water quality standards set forth in the GENERAL PERMIT. Where conflicts arise in applications of BMPs, or any other criteria, the more stringent application shall apply.
This SWPPP specifies the implementation of Best Management Practices ("BMPs"), as appropriate, to control the discharge of pollutants to surface waters within the project area. The owner and the discharger is required to implement the provisions contained within this SWPPP and they must comply with the standard provisions, monitoring and reporting requirements specified in the GENERAL PERMIT. A copy of the GENERAL PERMIT is included as a part of this SWPPP in Appendix. A copy of this SWPPP shall be kept on site at all times during construction, commencing with the initial construction activity and ending with the termination of coverage specified under the GENERAL PERMIT.

B. Implementation Schedule (Section A.2)

All BMPs as discussed herein and as shown on the Erosion and Sediment Control Plan, will be implemented in a proactive manner during all seasons while construction is occurring, as appropriate to protect water quality during the life of the project.

All BMPs for the site shall be implemented on a year-round basis, not just during the part of the year when there is a high probability of precipitation. BMPs will be implemented in a proactive manner during all seasons while construction is occurring, as appropriate to protect storm water quality during the life of the project. During the traditional Southern California rainy season (October 31 to May 31), an effective combination of erosion and sediment control BMPs will be implemented on all disturbed areas. At a minimum during the non-rainy season, the discharger is responsible for ensuring that adequate sediment control materials are available to control sediment discharges at the downgrade perimeter and operational inlets in the event of a predicted storm.

CONSTRUCTION BMP IMPLEMENTATION SCHEDULE

ACTIVITY	CASQA#	Description	Specification
Site clearing, grubbing and Rough Grading	WE1	Dust Control	Dust control shall be done by watering when wind erosion may occur.
	TC1	Stabilized Construction Entrance	Construction entrances shall be installed in order to minimize tracking of sediment and shall be maintained in achieve effectiveness. Street shall be kept clean by sweeping in to minimize additional tracking.
	SE8	Sand Bag Barrier	Sand Bag Barriers at perimeter of the site shall be installed prior to Rough Grading. Per ESCP.
	WM5	Solid Waste Management	Designate waste collection areas and containers as well as arrange regular disposals to prevent or reduce the discharge of solid waste to storm water.
	WM9	Sanitary/Septic Waste Management	Do not place portable toilets in or near temporary swales which could be directed to offsite run-off
	CA40	Employee/ Subcontractor Training	Contractor/Owner shall incorporate regular meeting to discuss the best Management Practices utilized at the job site.
Underground Utilities	EC1	Scheduling	Trenching should be scheduled in manageable segments to insure that they can be properly covered or completed in time for any rain event.
Curb & gutter installation, Street Paving	SE6	Gravel Bag Berm	See SE10.
	SE10	Storm Drain Inlet Protection	Inlet protection shall installed prior to any discharge to the storm drain system. SE6 has been utilized for this BMP.
	NS3	Paving Operations	All discharge points to storm drain shall be completely blocked off.
	NS8	Vehicle and Equipment Cleaning	Vehicles and equipments shall be cleaned using offsite facilities or washed in designated, contained areas only.

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	NS9	Vehicle and Equipment Fueling	Use offsite facilities or designated areas only for vehicle and equipment fueling and enclose stored fuel.
	WM1	Material Delivery and Storage	Storage area can earthen berms, perimeter ditch, and/on any other type of secondary containment, or cover to avoid contact stormwater. One of these items must be used upon storage materials. Suggested location located on the ESCP or SWPPP Site Map in the SWPPP
	WM4	Spill Prevention	Reference Fact Sheet in Appendix A-Regulations Contractor must contact one of the following Companies: Asbury Environmental @ 800 974-4495 or a company with same type of service.
	WM5	Solid Waste Management	See WM5 above.
	WM6	Hazardous Waste Management	Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal and training of employees.
	WM8	Concrete Waste Management	Concrete handlers will utilize concrete wash out areas as provided by contractor or handing will be performed off-site.
	WM9	Sanitary/Septic Waste Management	See WM9 above.
	CA40	Employee/ Subcontractor Training	Training must thorough and on-going and shall incorporated in the standard operating procedures as part of company policy see SWPPP for more a more detailed
Precise Grading, Project Landscaping, Irrigation System Installation and House Construction	WE1	Dust Control	See WE1 above.
	SE8	Sand Bag Barrier	Sand Bag Barriers along street curbs shall installed and maintained until completion of street parkway landscaping at which the individual lot landscaping will commence Per ESCP. Appendix B-Reference

	CA3	Structure Construction and Painting	Proper disposal of all building materials must be implemented, for example washout area for painting materials shall be connected to sewer, tarps under for stucco equipment and materials, old paint cans shall be dried and disposed of properly. See CA3 in Appendix D-BMPs For Contractors Activities for more information.
	WM1	Material Delivery and Storage	Storage area can earthen berms, perimeter ditch, and/on any other type of secondary containment, or cover to avoid contact with storm water. One of these items must be used upon storage materials.
	WM2	Material Use	Do not overuse materials in a manner that will cause a discharge of excess material in the storm drain and/or temporary drainage swales. See WM1 for more information regarding this BMP
	WM9	Sanitary/Septic Waste Management	See WM9 above.

Erosion and Sediment Control Plan (ESCP)

Contractor shall reference BMP Fact sheets located in Appendix D-BMPs For Contractor Activities & Appendix E-BMPs Erosion and Sediment Control for further information

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Special attention should be given to larger areas of soil disturbance; if at all possible the contractor should make the area as small as possible in order to implement erosion control as a first resort and sediment control as a last resort.

In addition to the above the contractor shall implement a schedule for all BMP maintenance and implementation, which will be most effective for the current site conditions. These schedules should be noted on the Amendments & Revision section of this report and added to Appendix D - Contractor Activity BMPs & Appendix E - Erosion Control BMPs.

C. Availability (Section A.3)

The SWPPP shall remain on the construction site while site is under construction. All reporting, training and progress and all amendments shall be kept in the SWPPP. Refer to Section A of the permit in Appendix A - Regulatory

D. Required Changes (Section A.4)

Revisions to the SWPPP shall be made when any changes in the field conditions may affect the discharge of pollutants to ground water, surface water or Municipal Separate Storm Sewer System (MS4).

E. Source Identification (Section A.5)

This section of the permit have been addressed as follows:

Section A.5.a. (1): This information can be found with the Vicinity/Location Map, Existing Hydrology Maps, Proposed Hydrology, Maps in Appendix B - Reference Plans.

Section A.5.a. (2): This information is located within the Erosion and Sediment Control Plan in Appendix B-Reference Plans.

Section A.5.a. (2). (a)-(b): This information is located within the Existing and Proposed Hydrology Maps in Appendix B-Reference Plans.

Section A.5.a.(2). c): This information is located within the Erosion and Sediment Control Plan in Appendix B-Reference Plans.

Section A.5.b. (1): This information has been included on the Erosion and Sediment Control Plan in Appendix B-Reference Plans.
Contractor shall revise his SWPPP Site Map or Erosion and Sediment Control Plan Progress Maps to include any grading activities that occur during the construction activities after Grading permit issuance.

Section A.5.b. (2)-(3): In order to eliminate repetition this information will be included in Section III.I of this report.

Section A.5.b. (4): Their are no known existing features at the site due to past use that may contribute to storm water.

Section A.5.b. (5)-(6): This information will be included in the SWPPP Site Map located in Appendix B-Reference Plans and the BMPs in Appendix D - Contractor Activity BMPs - Contractor Activity BMPs

Section A.5.b. (7)-(8): In order to eliminate repetition this information will be included on the SWPPP Site Map located in Appendix B – Reference Plans

Section A.5.c. (1): Pre-Construction control practices on this project are not applicable to this site.

Section A.5.c/(2):
This section discusses activities or materials that could result in either the discharge of pollutants in the storm water runoff from the site, or in non-storm water discharges, and discusses the appropriate BMPs to be implemented to protect against those discharges.

The BMPs discussed in this section are intended to provide a flexible approach to maintain compliance with permit requirements. As it is impossible to anticipate all potential environmental issues that could arise on a daily basis during the course of the project, this BMP program has been tailored to provide effective options to the Owner and its representatives who have responsibility for overseeing workplace safety and environmental compliance. If an item in the workplace is in need of attention or correction, persons responsible for SWPPP implementation have been instructed to take all appropriate steps to address the situation in a prompt and effective manner.

For similar reasons, contractors should regard the following BMPs primarily as the framework governing their obligation to protect water quality. Contractors should use their best judgment in deciding the appropriate action to be taken, guided by the GENERAL PERMIT and the Owner's overriding goal of reducing or eliminating pollutant discharges to receiving waters. Inventory of possible pollutants is listed in the Best Management Practices contained in Appendices D & E.

The following is a list of Activities, which may occur at the construction site.
The list that follows generally presents the activities taking place on the site during the construction phase, which have the potential to contribute sediment and other pollutants to either storm water or non-storm water discharges:

- Excavation
- Construction of erosion control measures (e.g., desilting basins, down drains, storm drain system, sand bag dikes, and slope protection)
- Utility installation (including gas, electric, domestic water, reclaimed water, cable, storm drain, telephone and related communication lines, and sanitary sewer)
- Fire hydrant and water main testing and flushing (including potable water supply pipeline disinfection, flushing, and maintenance)
- Hydrostatic testing of pipelines
- Concrete waste management
- Sandblast grit management
- Paving (asphalt and concrete)
- Street sweeping and cleaning
- Landscaping (including irrigation system construction)
- Construction of structures (residential and retail)
- Vehicle and construction equipment storage, cleaning, maintenance, fueling, and stored fuel management
- Solid and hazardous waste management (including disposal)
- Material delivery and storage

- Painting
- Portable sanitary and septic waste management.

The following is a list of Materials, which may be located at the construction site. The list that follows represents, generally, construction materials other than sediment, equipment, and vehicles, which have a potential to contribute to the discharge of pollutants to either storm water or non-storm water discharges. Where applicable, general classes of materials are meant to include the specific. The following is a list of materials and equipment:

- Asphalt paving materials and solvents
- Concrete and concrete slurry
- Curing compounds
- Petroleum products
- Natural earthen materials (including sand, gravel, and topsoil)
- Masonry products
- Packaging materials
- Paints and solvents
- Plaster and other products (included with concrete products)
- Roofing materials
- Steel products
- Construction debris (including scrap flooring, carpeting metals, rubber, plastic, glass, wood, and masonry)
- Portable toilet waste
- Equipment parts and fluids (including hydraulic fluid and batteries)
- Domestic wastes, food containers, and cigarettes

Equipment/Vehicles

- Earth moving equipment (including bulldozers, scrapers, and compactors)
- Water trucks
- Asphalt paving equipment (including paving machines, rollers, and tac trucks)
- Concrete trucks
- Street cleaning trucks (including sweepers)
- Delivery and materials trucks
- Cranes
- Welding equipment
- Personal vehicles
- Street striping equipment.

See Appendix D - Contractor Activity BMPs - Contractor Activity BMPs

See sections III.F & III.I. for further discussion on BMP selection.

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Section A.5.c. (3)-(4):

Soil information for the site required by the GENERAL PERMIT is included in Section II.D.

Site Acreage and other project information is included on the Notice of Intent located in Appendix A - Regulatory.

Section A.5.c. (5): The Construction schedule is as follow:
Due to scheduling changes, the Contract will supplement this section with the construction schedule utilized at the job site. Refer to Section III.B for BMP Implementation Table.

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Section A.5.c. (6)

If the parties are not listed at time of publication of the SWPPP, the owner/contractor must designate the responsible parties below.

Persons Responsible for BMP Inspection, Maintenance, and Repair:

	Name	Phone Numbers
Pre-storm		
During Storm		
Post-storm		
Routine		

Persons Responsible for Permit Compliance and Implementation:

Name	Phone Number

Persons Responsible for Annual Evaluation and Certification

Name	Phone Number

Note: The Annual Certifications must be submitted to the RWQCB by July 1.

Persons Responsible for Elimination of Unauthorized Discharges:

Name	Phone Number

Persons Responsible for Non-Storm Water Management:

Name	Phone Number

F. Erosion Control (Section A.6)

Refer to Erosion and Sediment Control Plan in Appendix A - Regulatory. The language of this section of the permit has been added to the Erosion and Sediment Control Plan in the GENERAL PERMIT Notes.

BMPs for Pollutants Related to Storm Water (Erosion Control)

The following table lists specific Erosion and Control BMPs that are to be performed by the contractor to reduce the likelihood of on-site erosion and to reduce the likelihood of introducing sediments to the storm drain system. The BMPs are provided in a "fact sheet" format and are taken from the California Storm Water Best Management Practice Handbook for Construction Activity. Copies of the BMP fact sheets listed in the table are attached in Appendix E - Erosion Control BMPs.

Erosion Control BMPs (to be determined upon final design and grading)

BMPs which may be incorporated

BMP	BMP Number
Scheduling	EC1
Wind Erosion	WE1

G. Stabilization (Section A.7)

Refer to Erosion and Sediment Control Plan in Appendix B-Reference Plans. The language of this section of the permit has been added to the Erosion and Sediment Control Plan in the GENERAL PERMIT Notes.

H. Sediment Control (Section A.8)

Refer to Erosion and Sediment Control Plan in Appendix A - Regulatory. The language of this section of the permit has been added to the Erosion and Sediment Control Plan in the GENERAL PERMIT Notes.

BMPs for Pollutants Related to Storm Water (Sediment Control)

The following table (Table 2) lists specific Erosion and Sediment Control BMPs that are to be performed by the contractor to reduce the likelihood of on-site erosion and to reduce the likelihood of introducing sediments to the storm drain system. The BMPs are provided in a "fact sheet" format and are taken from the California Storm Water Best Management Practice Handbook for Construction Activity January 2003 edition. Copies of the BMP fact sheets listed in the table are attached in Appendix E - Erosion Control BMPs.

Sediment Control BMPs

BMPs that may be incorporated

BMP	BMP Number
Street Sweeping and Vacuuming	SE7
Sandbag Barrier	SE8
Storm Drain Inlet Protection	SE10
Stabilized Construction Entrance	TC1

I. Non-Storm Water Management (Section A.9)

The BMPs discussed in this section are intended to provide a flexible approach to maintain compliance with permit requirements. As it is impossible to anticipate all potential environmental issues that could arise on a daily basis during the course of the project, this BMP program has been tailored to provide effective options to the Owner and its representatives who have responsibility for overseeing workplace safety and environmental compliance. If an item in the workplace is in need of attention or correction, persons responsible for SWPPP implementation have been instructed to take all appropriate steps to address the situation in a prompt and effective manner.

BMPs for Pollutants Related to Contractor Activities (Non-storm Water)

The following table lists specific contractor activities that are likely to occur on the project site and the applicable Best Management Practices (BMPs) that are to be followed by the contractor to reduce the likelihood of introducing non-storm water related pollutants to the storm drain system. Most of the BMPs are provided in a "fact sheet" format and are taken from the California Storm Water Best Management Practice Handbook for Construction Activity. Copies of the applicable BMPs and fact sheets listed in the table are attached in Appendix D - Contractor Activity BMPs - Contractor Activity BMPs.

Contractor Activity BMPs

Contractor Activity	Applicable BMP
Material Delivery and Storage	WM1
Material Use	WM2
Stockpile Management	WM3
Spill Prevention and Control	WM4
Solid Waste Management	WM5
Hazardous Waste Management	WM6
Concrete Waste Management	WM8
Sanitary Waste Management	WM9
Water Conservation Practices	NS1
Paving	NS3
Illicit Connection/Discharge Prevention	NS6
Potable Water/Irrigation	NS7
Vehicle and Equipment Cleaning	NS8
Vehicle and Equipment Fueling	NS9
Vehicle and Equipment Maintenance	NS10
Concrete Curing	NS12
Concrete Finishing	NS13

J. Post Construction Storm Water Management (Section A.10)

Post Construction BMPs

The following will address post construction BMPs Structural and Non-Structural that will be implemented on a permanent basis to minimize pollutant discharges, including sediment, and provide water quality benefits for the community after construction has been completed.

The following BMPs shall be implemented where applicable to this project:

All Structural Post Construction BMPs shall be maintained and operated by the property owner.

(8-2010 Bid Set (Not for Construction)

STRUCTURAL BMP TABLE

APPROPRIATE STRUCTURAL BMPs		RESIDENTIAL	INDUSTRIAL	RETAIL/OFFICE CENTER	RESTAURANTS WAREHOUSE GROCERY	FUEL DISPENSING	VEHICLE REPAIR MAINTENANCE
Control of Impervious Runoff	(S1)	X	X	X	X	X	
Common Area Efficient Irrigation	(S2)	X	X	X	X	X	X
Common Area Run-Off – Minimizing Landscape	(S3	X	X	X	X	X	X
Community Car Wash Racks	(S4)	X					
Wash Water Controls for Food Preparation Areas	(S				X		
Trash Container (Dumpster) Areas	(S6)	X	X	X	X	X	X
Self-Contained Areas for Washing/Steam Cleaning/Repair/Mat. Processing	(S7)		X				X
Outdoor Storage	(S8)		X				
Motor Fuel Concrete Dispensing Area	(S9)					X	
Motor Fuel Dispensing Area Canopy	(S10)					X	
Energy Dissipators	(S11)	X	X	X			
Catch Basin Stenciling	(S12)	X	X	X			
Diversion of Loading Dock Drainage	(S13)				X		
Inlet Trash Racks	(S14)	X	X	X			

Highlighted items are BMPs applicable to this type of project per County of Riverside DAMP Supplement A - New Development Guidelines Dated April, 1996

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NON-STRUCTURAL BMP TABLE

APPROPRIATE NON-STRUCTURAL BMPs		RESIDENTIAL	INDUSTRIAL	RETAIL/OFFICE CENTER	RESTAURANTS WAREHOUSE GROCERY	FUEL DISPENSING	VEHICLE REPAIR MAINTENANCE
Homeowner/Tenant Education	(N1)	X	X	X			
Activity Restrictions	(N2)	X	X	X	X	X	X
Common Area Landscape Management	(N3)	X	X	X			
Catch Basin Inspection	(N4)	X	X	X	X	X	X
Common Area Litter Control	(N5)		X			X	X
Private Street/Lot Sweeping	(N6)		X			X	
Underground Storage Tank Compliance	(N7)		X			X	X
Spill Contingency Plan	(N8)		X			X	
Haz-Mat Disclosure Compliance	(N9)					X	
Uniform Fire Code Implementation	(N10)		X			X	X
Title 22 CCR Compliance	(N11)	X	X	X	X	X	X
Housekeeping of Loading Docks	(N12)		X	X	X	X	X
Employee Training	(N13)		X		X		
BMP Maintenance	(N14)	X	X	X	X	X	X
Private Street/Lot Sweeping	(N15)	X	X	X			
Commercial Vehicle Washing	(N16)		X				X

Highlighted items are BMPs applicable to this type of project per County of Riverside DAMP Supplement A - New Development Guidelines Dated April, 1996

Bid Set Not for Construction

POST CONSTRUCTION BMP
MAINTENANCE RESPONSIBILITY/FREQUENCY TABLE

Please refer to WQMP as prepared by MDS Consulting December 15, 2009

18-2010 Bid Set (Not for Construction)

K. Maintenance, Inspection and Repair (Section A.11)

Inspections shall be conducted by a qualified personnel before and after storm events and once after each 24-hour period during extended storm events. Further discussion on this topic will be addressed in Section IV of this report. Permit language has also be added to the GENERAL PERMIT Notes on the Erosion and Sediment Control Plan in Appendix A - Regulatory.

L. Training (Section A.12)

Individuals responsible for SWPPP preparation and compliance shall be documented in Appendix I-Training and Meeting Documentation.

The owner and/or the discharger shall be responsible for training their personnel and, if necessary, the contractors working on the site regarding: revisions, and implementation of the SWPPP, BMP design, installation, and maintenance; and inspecting, monitoring and reporting.
Contractors shall be responsible for training their personnel as well as their subcontractors on SWPPP implementation, BMP installation and maintenance, and inspection, monitoring and reporting.
Specific training documents regarding the project pertaining to training for all persons responsible for preparation, implementation, amendments, revisions, installation and repairs of BMPs for this SWPPP shall be documented. Training forms are provided in Appendix I-Training and Meeting Documentation.
Training documentation shall include both formal and informal training. Where appropriate, the training documents shall state the date of the meeting, the names of the participants, and the materials discussed.

RWQCB suggests contractor or site superintendent implement SWPPP training into a portion of the regularly scheduled safety meetings.

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M. List of Contractors/Subcontractors (Section A.13)

Including responsible parties under contract (i.e., contractor or sub-contractor) to the owner and responsible for SWPPP implementation and permit compliance.

Contractor (Name & Address)	Contact Person	Phone Numbers	Areas of Responsibility	Emergency Contact Numbers

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N. Other Plans (Section A.14)

All reference plans will be included in Appendix B-Reference Plans.

O. Public Access (Section A.15)

Permit Language has been included on the cover sheet of this SWPPP.

P. Preparer Certification (Section A.16)

All certifications will be included in this report following the Table of Contents. Certifications for the same can be found within the NOI located in Appendix A - Regulatory.

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IV. MONITORING PROGRAM/REPORTING REQUIREMENTS (Section B)

Property owners and contractor should consult Section B of the SWRCB GENERAL PERMIT 99-08 for Monitoring Program and Reporting requirements in order to be in full compliance with the GENERAL PERMIT.

A. Required Changes (Section B.1)

Changes may be required to be submitted to the RWQCB.

B. Implementation (Section B.2)

Implementation of the SWPPP begins at the commencement of construction activity.

C. Site Inspections (Section B.3)

At the onset of construction, BMPs will be inspected on a regular basis (weekly at a minimum). The site shall also be inspected when there is a 30 percent chance of rain in the 5-day forecast and after storm events. Inspection shall be performed before and after storm events and once each 24-hour period during extended storm events to identify BMP effectiveness and implement repairs or design changes as soon as feasible depending upon field conditions. Points of discharge from the site shall also be inspected to check for signs of pollutant discharge. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible after the conclusion of each storm depending upon worker safety.

D. Compliance Certification (Section B.4)

The discharger will annually inspect the site and certify that the construction activity onsite is in compliance with the State General Construction Activity Permit CAS000002 and the SWPPP. Annual compliance certification shall be based upon a review of the site inspection reports completed since the last annual compliance certification. Annual compliance certifications shall be completed by July 1 of each year.

E. Noncompliance Reporting (Section B.5)

During the annual inspection, a Site Inspection Report shall be prepared and kept with a copy of this SWPPP on site, along with either a Certificate of Compliance or Notice of Non-Compliance. These forms are located in Appendix C – Reporting Documents of this SWPPP. Notices of Non-Compliance shall be submitted to the Regional Water Quality Control Board within 30-calendar days of identification of noncompliance. Notices of Compliance and Non-Compliance are located in Appendix C – Reporting Documents.

F. Monitoring Records (Sections B.6)

All monitoring record shall be kept in Appendix C of this SWPPP.

A SWPPP Inspection Report, located in Appendix C - Reporting Documents, will be completed before, during (extended events) and after storm events. Control measures and facilities requiring repair will be noted and reported to the construction site manager with a SWPPP Corrective Action Report, located in Appendix C - Reporting Documents. On the SWPPP Corrective Action Report the inspector will note the control measure or facility requiring corrective action, the recommended action, and a scheduled completion date.

Sampling Procedure, Location and Rationale

Due to the complexity of the construction activities, the contractor shall determine the actual locations for sampling and shall sample when activities visually indicate a possible discharge of a pollutant as indicated in Resolution 2001-046, Section A.5.b (8) located in Appendix A - Regulatory.
Sampling Procedures are included in Appendix C - Reporting Documents.

Monitoring Program for Sedimentation/Siltation

Section A.1.e of the GENERAL PERMIT requires monitoring for discharges from construction activity which discharge directly into water bodies listed on Attachment 3 of the GENERAL PERMIT (Clear Water Act Section 303(d) water bodies listed for sedimentation/siltation). The site does not discharge directly into one of these water bodies; therefore, no specific sampling and analysis program for sediment/siltation or turbidity will be implemented for the site.

Monitoring Program for Pollutants Not Visually Detectable in Storm Water

Non-visible pollutants consist of those pollutants that are not visibly detectable in runoff from the site, and that may cause or contribute to exceedances of water quality objectives if discharged. Such pollutants may include, but are not limited to *soil amendments (such as lime and gypsum), pesticides, herbicides, solvents, detergents, petroleum products, and historic contaminants which have not adhered to soil (such as metals, VOC's).* Monitoring for these non-visible pollutants will be conducted as described below in accordance with Sections A.5.b.8 and A.8 of the GENERAL PERMIT.[1]

Non-visible pollutant monitoring will proceed according to the following steps:

1. Is there a non-visible pollutant present that may be discharged from the site in storm water runoff? If yes, then proceed to item 2.
2. Is the non-visible pollutant stored in a watertight condition (i.e., in a water-tight container in a building or under a water-tight roof)? If no, then proceed to item 3.
3. Does routine, pre-storm, during-storm, or post-storm visual monitoring reveal that there has been or there is currently occurring a spill or leak, or a breach or malfunction of a BMP that could result in the discharge of a non-visible pollutant in storm water from the site? If yes, then proceed to item 4.
4. After containing the spill, leak, breach, or malfunction, do you still suspect that there is currently, has been, or could be, a discharge (i.e., transport off the site) in storm water of a non-visible pollutant? If yes, then proceed to item 5.
5. Conduct non-visible pollutant monitoring according to the following steps:
   - A. Parameters: For all samples, analyze the sample for indicator parameter(s) relevant to the particular pollutant for which the non-visible pollutant monitoring is being conducted.
   - B. Type of testing: Determine whether field-testing or laboratory testing will be employed.
     - i. Field Testing: Contact the person(s) responsible for conducting field-testing. All field-testing will be conducted following the manufacturer's instructions on the testing device for the analysis of both the contaminated and uncontaminated samples, in addition to the steps described below.
     - ii. Laboratory Testing: Contact the person(s) at the chosen laboratory responsible for conducting testing. All laboratory testing will follow the protocol for collecting and transporting samples used by the applicable laboratory, in addition to the steps described below.
   - C. Timing: Collect all samples within the first two hours of discharge from rain events that occur during daylight hours and which generates runoff.
   - D. Location: Determine the proper sampling location.
     - i. Collect all samples at a point before the storm water runoff from the site mixes with storm water flowing in the receiving water or public storm drain.
     - ii. Collect samples at the relevant location based on the following:
       - a) Identify the discharge point(s) and the potential testing locations on the relevant catchments, sub-watershed, or sub-basin map prepared for the project.

[1] These sections were added to the General Permit on April 26, 2001, and are included in Appendix I.

b) Because the site has multiple discharge locations, samples should be collected from the discharge location accepting flows from the area where the spill, leak, or BMP malfunction or breach occurred if possible, or, alternatively, from a catch basin inlet accepting flow from the area where the spill, leak, or BMP malfunction or breach occurred.
c) All discharge locations sampled must be safely accessible.

E. Uncontaminated sample Collect and analyze an uncontaminated sample. Select a location on the site either upstream or otherwise away from the area sampled that does not accept storm water flows from the area where the spill, leak, or BMP malfunction or breach occurred.

F. Reporting: Prepare a non-visible pollutant monitoring report for each sampling event and append the form to the SWPPP. (Form is included in Appendix C - Reporting Documents.) Determine if you need to make any reports to the Regional Water Quality Control Board under Section 6 of the SWPPP. Keep all analytical data with the SWPPP until such time as a Notice of Termination is submitted and approved.

For all non-visible pollutant monitoring, personnel trained in the collection of field or laboratory samples shall collect the contaminated and uncontaminated samples. Appropriate personnel shall be available to collect samples on regular working days, as well as on weekends and holidays, should the need arise. Training of personnel to collect the samples will include training regarding sample collection methods, operation of field analysis devices or laboratory collection and transport protocols, and appropriate indicator parameters to be analyzed for the non-visible pollutants sampled

Contractor shall consult Resolution 2001-046, Section B.7 & B.8 for Program Requirements.

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V. LIST OF RESPONSIBLE PARTIES

If the parties are not listed at time of publication of the SWPPP, the owner must designate the responsible parties below.

A. Persons Responsible for BMP Inspection, Maintenance, and Repair:

	Name	Phone Numbers
Pre-storm		
During Storm		
Post-storm		
Routine		

B. Persons Responsible for SWPPP Compliance and Implementation:

Name	Phone Number

C. Persons Responsible for Elimination of Unauthorized Discharges:

Name	Phone Number

D. Persons Responsible for Non-Storm Water Management:

Name	Phone Number

E. List of Contractors

Including responsible parties under contract (i.e., contractor or sub-contractor) to the owner and responsible for SWPPP implementation.

Contractor	Contact Person	Phone Numbers	Areas of Responsibility	Emergency Contact Numbers

Proposed Set for Construction

APPENDIX A - REGULATORY

1-18-2010 Bid Set (Not for Construction)

NPDES

DESERT TASK FORCE

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE RIVERSIDE COUNTY MUNICIPAL STORMWATER PERMIT
FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

ORDER NO. 01-077 (NPDES NO. CAS617002)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD –
COLORADO RIVER BASIN REGION

MARK ONLY ONE ITEM 1. ☒ New Construction 2. ☐ Reconstruction 3. ☐ Change of Information for WDID#

I. OWNER

Name	Contact Person		
City of Palm Springs			
Mailing Address	Title		
3200 E. Tahquitz Canyon Way			
City	State	Zip	Phone
Palm Springs	CA	92262	(760) 323-8245

II. CONTRACTOR INFORMATION

Name	Contact Person		
Same as Owner			
Local Mailing Address	Title		
City	State	Zip	Phone
			( ) –

III. SITE INFORMATION

A. Project Title	Site Address		
Palm Springs Animal Care Facility	APN 680-020-010		
	State	Zip	Phone
n Springs			( ) –

B. Construction commencement date: (Month / Day / Year)	C. Projected construction completion date: (Month / Day / Year)
01/2010	06/2011

D. Type of Work: ☐ Utility ☐ Flood Control ☐ Transportation ☒ Other (Specify)

Description of Work: City Maintenance Yard and Associated Buildings

E. Total size of site: 5.5 Acres

IV. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. ☒ Indirectly to waters of the U.S. ☐ N/A
2. ☒ Storm Water Conveyance system - Enter owner's name: Coachella Valley Water District
3. ☐ Directly to waters of U.S. (e.g., river, lake, creek, stream, bay, ocean, etc.)

V. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (mark one)

- ☐ A SWPPP has been prepared for this facility and is available for review
- ☒ A SWPPP will be prepared and ready for review by (date): 12/2009

B. MONITORING PROGRAM (MP) (mark one) ☒ N/A

- ☐ A MP has been prepared for this facility and is available for review
- ☒ A MP will be prepared and ready for review by (date): 12/2009

VI. VICINITY MAP (must show site location in relation to nearest waterbodies, named streets, intersections, etc.)

Have you included a vicinity map with this submittal? ☒ YES ☐ NO

The distance between the project site and its nearest waterbody is approximately 0.1 mile

VII. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and 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 or imprisonment. In addition, I certify that Section D.5 of Order No. 01-077, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan, will be complied with."

Printed Name: _____ **Title:** _____

Signature: _____ **Date:** _____

79432

FACT SHEET
FOR
WATER QUALITY ORDER 99-08-DWQ

STATE WATER RESOURCES CONTROL BOARD (SWRCB)
1001 I STREET, SACRAMENTO, CALIFORNIA 95814

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES ASSOCIATED WITH
CONSTRUCTION ACTIVITY (GENERAL PERMIT): Sampling and Analysis

Contents

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- 1.2 Background
  - 1.2.1 Water Quality Standards or Objectives
  - 1.2.2 Non-Visible Pollutant Sampling
  - 1.2.3 Sediment-Impaired Water Bodies
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- 2.13 Retention of Data

3.0 Sampling Program for Sedimentation/Siltation
- 3.1 What the Permit Says About Sampling

3.2 Deciding When to Sample
3.3 Deciding What Constituent(s) Require Sampling
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A Water Quality Objectives for Suspended Materials, Setteable Materials, Sediment and Turbidity

1.0 Introduction

This document is an amendment to the Fact Sheet to the State Water Resources Control Board's (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated With Construction Activity (CGP). This Permit was modified in 2001 by Resolution No. 2001-046, "*Modification of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated With Construction Activity (CGP)*". The modifications to the CGP require that a sampling and analysis strategy and sampling schedule for certain discharges from construction activity be developed and kept with the project's Storm Water Pollution Prevention Plan (SWPPP). The sampling and analysis requirements are found in Section B, paragraphs 7 and 8, of the CGP. Paragraph 7 concerns monitoring for sedimentation/siltation or turbidity and Paragraph 8 concerns monitoring for pollutants that are not visually detectable in storm water. Where required, a sampling and analysis strategy and sampling schedule must be developed regardless of the time of the year that construction occurs.

This document only addresses the modifications and is intended to facilitate the proper implementation of the sampling and analysis requirements. It provides information on when sampling and analysis is required, how to perform sampling and analysis, what conclusions may be drawn from the sampling and analysis results, and it explains the rationale for the required sampling.

SWRCB staff developed this document with consideration of comments from interested persons, including the California Stormwater Quality Association, the Building Industry Legal Defense Foundation, the California Building Industry Association, the San Francisco BayKeeper, the Santa Monica BayKeeper, the San Diego BayKeeper, and the Orange County CoastKeeper. It is based on the CGP, two orders issued by the Sacramento Superior Court in response to a challenge to the CGP, Clean Water Act provisions, regulations, guidance documents and permits issued by the federal Environmental Protection Agency, and other documents submitted by interested persons. A full record has been compiled and is available for inspection or copying upon request. A draft guidance document was circulated for public comment and a hearing was held prior to issuance of this final guidance document.

Although sampling and analysis will be required at many construction sites, it will not be required at all construction sites. It is the responsibility of dischargers to evaluate the construction project and, where required, to develop a site-specific sampling and analysis strategy in compliance with the CGP requirements. For further guidance please contact your local Regional Water Quality Control Board (RWQCB).

The sampling and analysis requirements supplement, but do not replace, the visual monitoring program required by Section B of the CGP. All construction projects must continue the visual monitoring program including inspections before predicted rain events, during extended rain events, and following rain events that produce runoff.

This document provides guidance on complying with the sampling and analysis requirements of the CGP. It does not in any way change these requirements or guarantee compliance with the CGP. The permit has many other requirements such as development of a SWPPP,

implementation of Best Management Practices (BMP) programs, and visual monitoring that are not addressed in this document.

1.1 Organization

Section 1: general information and background on the sampling and requirements.

Section 2: non-visible pollutant sampling and analysis.

Section 3: sediment, silt and turbidity sampling and analysis.

Section 4: sampling and analysis procedures.

Section 5: definitions.

Section 6: contact list and additional sources of information.

Section 7: general explanation of and rationale for the sampling and analysis requirements; citations to other documents that form the basis for the SWRCB's conclusions.

1.2 Background

The SWRCB adopted the CGP on August 19, 1999. The CGP is an NPDES permit that implements section 402(p)(2)(B) of the federal Clean Water Act. The San Francisco BayKeeper, Santa Monica BayKeeper, San Diego BayKeeper, and Orange County CoastKeeper filed a petition for writ of mandate challenging numerous aspects of the CGP in the Superior Court, County of Sacramento.

On September 15, 2000, the Court issued a judgment and writ of mandate that upheld most provisions of the CGP, but directed the SWRCB to modify the provisions of the CGP to require permittees to implement specific sampling and analytical procedures to determine whether BMPs implemented on a construction site are:

(1) preventing further impairment by sediment in storm waters discharged directly into waters listed as impaired (Clean Water Act Section 303(d) List [303(d) List]) for sediment, silt, or turbidity; and

(2) preventing other pollutants that are known or should be known by permittees to occur on construction sites and that can not be visually observed or detected in storm water discharges, from causing or contributing to exceedances of water quality objectives.

The monitoring, sampling and analysis provisions in the CGP were modified pursuant to the court order and issued as Resolution No. 2001-046, adopted by the SWRCB on April 26, 2001.

On December 27, 2001, the Court issued an Order Enforcing Writ of Mandate. In that order, the Court acknowledged that the permit had been modified, but required further actions by the SWRCB. Issuance of this fact sheet amendment is intended to respond to the Court's further instructions. In general, the Court expressed concern that certain aspects of the modifications might be ambiguous and might result in misinterpretation by dischargers. This amendment is

intended to avoid such potential ambiguities and misinterpretations and to help explain the requirements and provide suggestions for compliance.

1.2.1 Water Quality Standards or Objectives

The Receiving Water Limitations in the CGP require the SWPPP be designed and implemented so that storm water discharges and authorized non-storm water discharges do not cause or contribute to an exceedance of any applicable water quality standard. (CGP, Receiving Water Limitation B.2.) The modifications to the monitoring program require sampling and analysis procedures to help determine whether BMPs installed and maintained in accordance with the SWPPP are preventing pollutants in discharges from the construction site from causing or contributing to exceedance of water quality standards. In making these determinations, it is necessary to understand what are the applicable water quality standards.

Water quality standards consist of the designation of beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. (40 CFR §131.3(i)) When adopted by the SWRCB or a RWQCB, the criteria are termed "water quality objectives." (Water Code §13241; the terms are used interchangeably here.) If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff).

In California, water quality standards are published in the Basin Plans adopted by each RWQCB, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan. One way to determine the applicable standards for the receiving water for your runoff is to contact staff from the appropriate RWQCB. (See the contact list in Section 6 of this guidance.)

The SWRCB intends in the future to augment its internet site to further facilitate access to water quality standards. In the interim, dischargers can determine the applicable water quality standards by contacting RWQCB staff or from one of the following sources. The actual plans that contain the water quality standards can be viewed at the site of the appropriate RWQCB for Basin Plans (http://www.waterboards.ca.gov/regions.html), the SWRCB site for statewide plans (http://www.waterboards.ca.gov/plnspols/index.html), or the US Environmental Protection Agency (USEPA) regulations for the NTR and CTR (40 CFR Title 131). Basin Plans and statewide plans are also available by mail from the appropriate RWQCB or the SWRCB. The USEPA regulations are available at http://www.epa.gov/. Additional information concerning Water Quality Standards can be accessed through http://www.waterboards.ca.gov/stormwtr/gen_const.html

1.2.2 Non-Visible Pollutant Sampling

The monitoring requirements in the CGP require sampling and analysis for pollutants that are not visually detectable in storm water discharges, which are or should be known to occur on the construction site, and which could cause or contribute to an exceedance of water quality objectives. As is explained below, the situations where non-visible pollutants may occur in runoff from a construction site are limited. Where such non-visible pollutants are known or

should be known to be present and have the potential to contact runoff and to contribute to an exceedence of a water quality objective, sampling and analysis is required.

A variety of materials are used in construction or are present on construction sites. Examples of such materials include soil stabilizers, paint, and fluids from vehicles. Any of these materials can end up in the storm water runoff and contain pollutants that pose a threat to water quality. Some of these potential pollutants will leave a visible trace. For example, sediment turns water brown and oil and grease leave a sheen. Other pollutants will discolor the runoff or leave a residue or film. For pollutants that are visible in runoff, the CGP requires the discharger to perform visual monitoring of the site and does not require sampling and analysis. The sampling and analysis requirements only apply to pollutants that do not leave a visible trace or are not associated with a visible tracer. Examples of such potential non-visible pollutants include increased pH, pesticides, and nutrients such as nitrogen or phosphorus.

The presence or use of a material on the construction site does not always mean that dischargers must sample for it in runoff. The CGP requires sampling and analysis when non-visible pollutants could "cause or contribute to an exceedance of water quality objectives in the receiving water." The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore do not need to be sampled for in runoff. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site. Manage any potential pollutants on the site in such a way that the exposure of the pollutant to rainfall or storm water is minimized or eliminated.

Elimination of exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer's instructions at a time when they are unlikely to be washed away. Other materials can be exposed when storage, waste disposal or application are not done in a manner protective of water quality or through accidental spillage. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed to pollutants. In cases where construction materials may be exposed to storm water but the storm water is contained, and is not allowed to run off the site, then sampling only needs to occur when inspections show the containment failed or is breached and there is potential for exposure or discharge.

Many common good housekeeping BMPs already limit exposure to most materials. Improving these practices to prevent exposure is a better approach to preventing pollution of runoff and will limit the amount of sampling and analysis. Improved BMPs may be less costly than an ongoing sampling and analysis program.

The first step in managing potential pollutants at a construction site is the implementation of well thought out BMP programs that are designed to minimize the mobilization of pollutants such as sediment and to minimize the exposure of storm water to pollutants. The next important step is an aggressive program of inspections both on a regular basis and before and after storms. The inspection program must also be accompanied by an equally aggressive BMP maintenance

program. The receiving water is protected when appropriate BMPs are implemented, inspected and maintained. The role of sampling is to support the visual inspection of the site when necessary.

1.2.3 Sediment-Impaired Water Bodies

Certain lakes, streams, rivers, creeks and other bodies of water in California have been determined by the SWRCB to be impaired by one or more pollutants. (This listing is required by Clean Water Act section 303(d).) One of the pollutants that can trigger a listing is sediment, termed variously as sedimentation, siltation, sediment, or turbidity. The water bodies listed for sediment in California are included in Attachment 3 to the CGP. Additional discharges of sediment to a sediment-impaired water body-could contribute to the exceedance of a water quality standard for that pollutant. Following listing of impaired waters, RWQCBs adopt total maximum daily loads (TMDLs) that may include waste load allocations for the impairing pollutant. Effluent limitations in NPDES permits must be consistent with the assumptions and requirements of waste load allocations (40 CFR section 122.44(d)(1)(vii)(B)), and adoption of TMDLs could result in specific requirements in the CGP or an individual or watershed-wide construction permit. Pending completion of TMDLs for sediment-impaired waters, it is necessary to ensure that sediment discharges from construction sites do not cause or contribute to exceedances of water quality. To that end, the modifications require sampling and analysis of discharges from construction activity that directly enters a water body listed in Attachment 3 to the CGP as impaired for sediment. This requirement is generally only applicable to a handful of construction projects each year.

To obtain the latest list of 303(d) water bodies, visit the SWRCB's Web site at http://www.waterboards.ca.gov/.

1.3 Purpose of Sampling and Analysis

The primary method of determining compliance with the CGP is visual inspections. The permit requires regular inspections as well as pre-storm and post-storm inspections to determine if there are areas where storm water can be or has been exposed to pollutants. It is possible to see if there is erosion and movement of soil, or if construction materials, chemicals and waste are exposed. This is the best way to determine if the site is in compliance. In some cases, verification of this compliance through sampling and analysis is appropriate. The purpose of the sampling and analysis requirements is to support the visual observation program and to provide information that can be used to help determine whether the BMPs employed on a construction site are effective in preventing construction site pollutants from causing or contributing to exceedances of water quality objectives in the receiving waters. The modifications to the CGP contain two categories of sampling and analysis requirements, which are illustrated in Figures 1-1 and 1.2.1-4:

Monitoring for non-visible pollutants at any site where the relevant triggering conditions occur. This monitoring is required at any site where there is exposure and where a discharge can cause or contribute to exceedence of a water quality objective, not just those that discharge to water bodies that are listed for a particular pollutant; and

Monitoring for sediment in storm water discharged directly to water bodies listed as impaired for sediment/siltation, sediment, or turbidity on the SWRCB's 303(d) list of water bodies.

The sampling and analysis results are not conclusive proof of compliance or non compliance with the permit. Specifically, Receiving Water Limitations in the CGP provide that the SWPPP must be designed and implemented so that storm water discharges shall not cause or contribute to exceedance of any applicable water quality standards. These provisions also require implementation of corrective measures, and revision of the SWPPP and monitoring requirements if storm water discharges do cause or contribute to an exceedance of an applicable water quality standard. USEPA has pointed out the difficulties and limitations of using sampling in storm water permits as a measure of compliance. (57 Fed. Reg. 11394, 11402) While sampling and analysis, as required by the CGP, may be a useful tool in pointing to areas of concern, it is of limited use in the storm water context and must be used as a diagnostic tool rather than as conclusive evidence of compliance or non-compliance with the CGP.

Determine if You Must Perform Sampling and Analysis for Sediment, Silt, or Turbidity

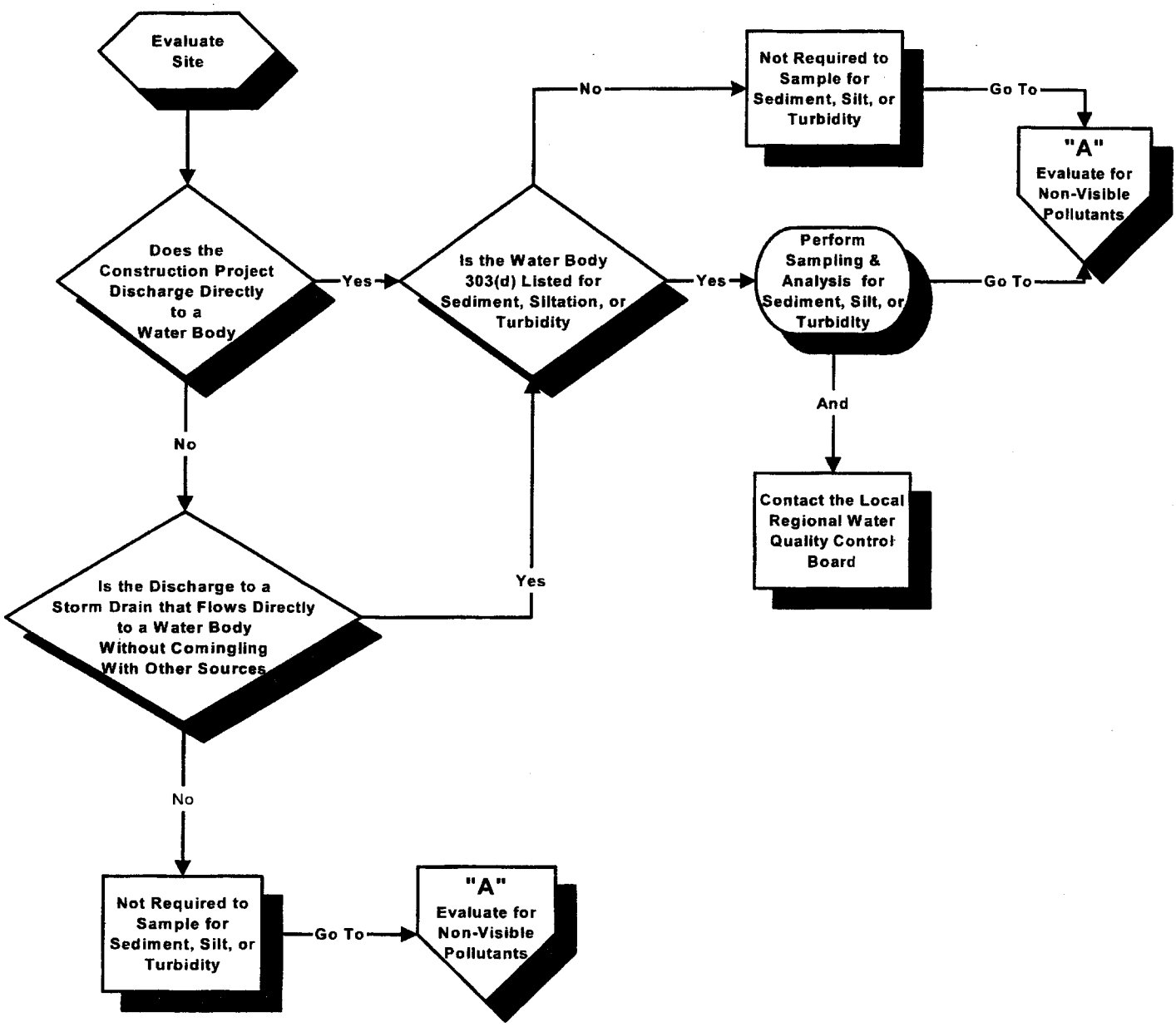


Figure 1.1

Evaluate Site for Non-Visible Pollutants and Determine if You Must Perform Sampling & Analysis for Non-Visible Pollutants

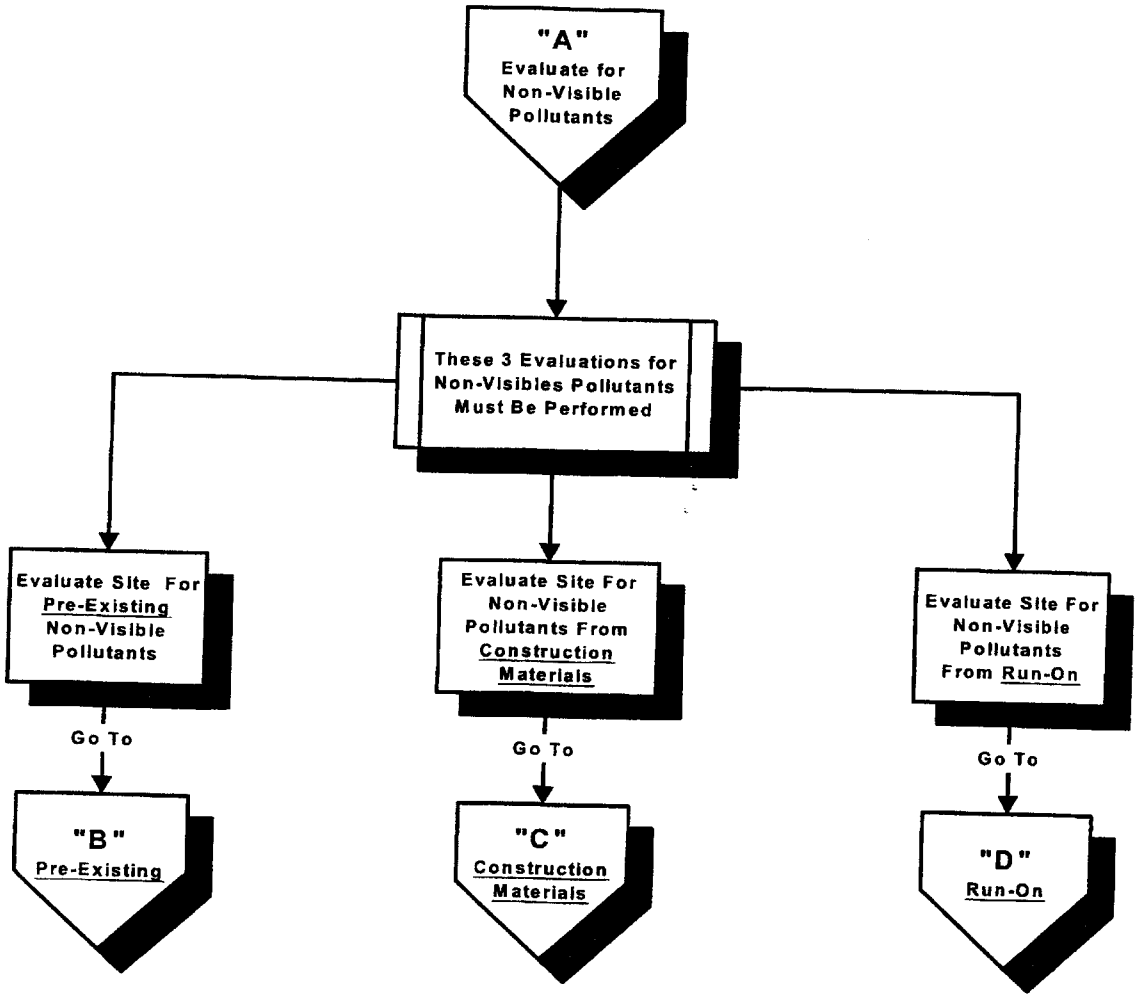


Figure 1.2

Determine If You Must Perform Sampling and Analysis (S&A) for Pre-Existing Non-Visible Pollutants

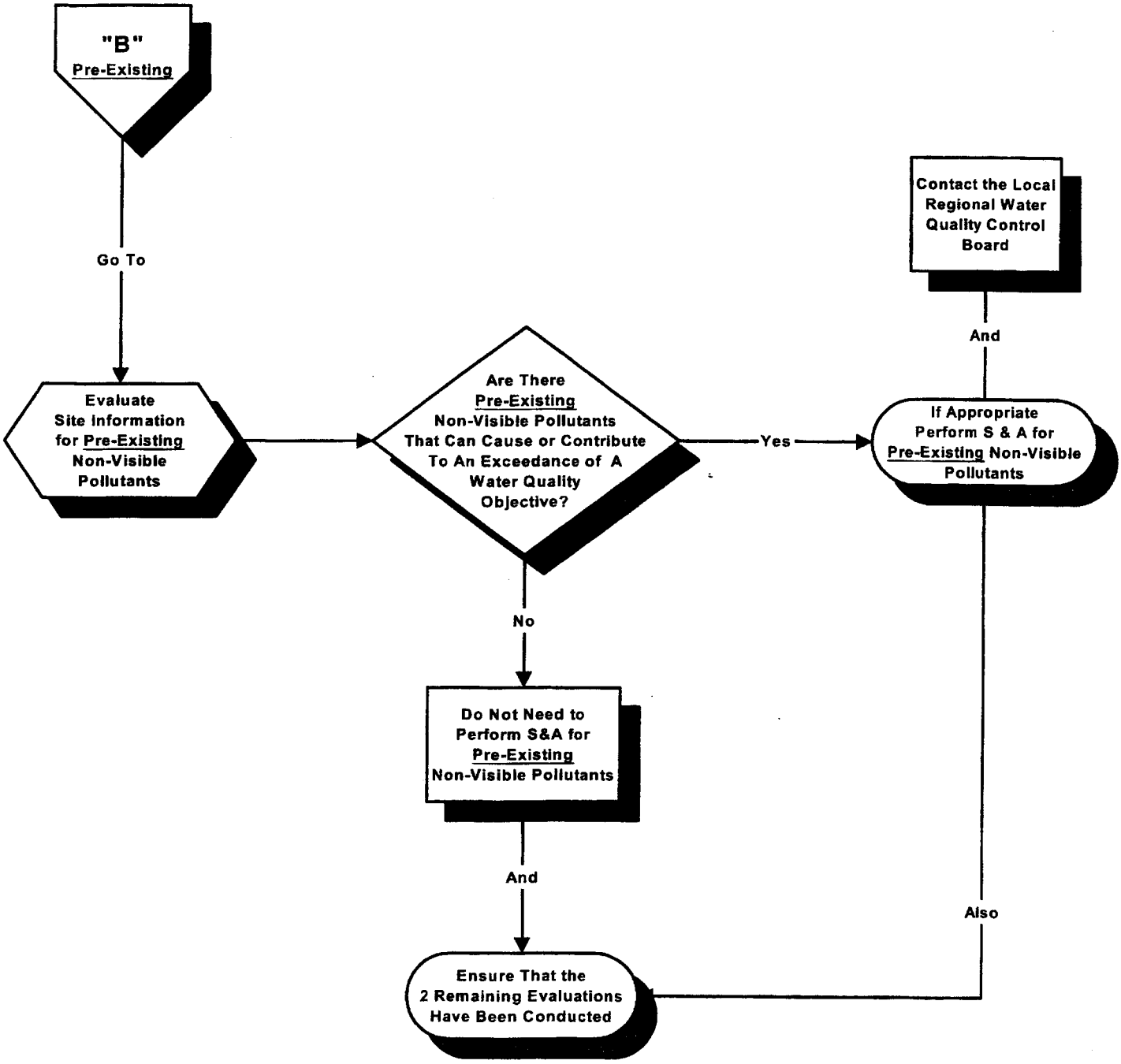


Figure 1.2.1

Determine If You Must Perform Sampling and Analysis (S&A) for Non-Visible Pollutants From Construction Material

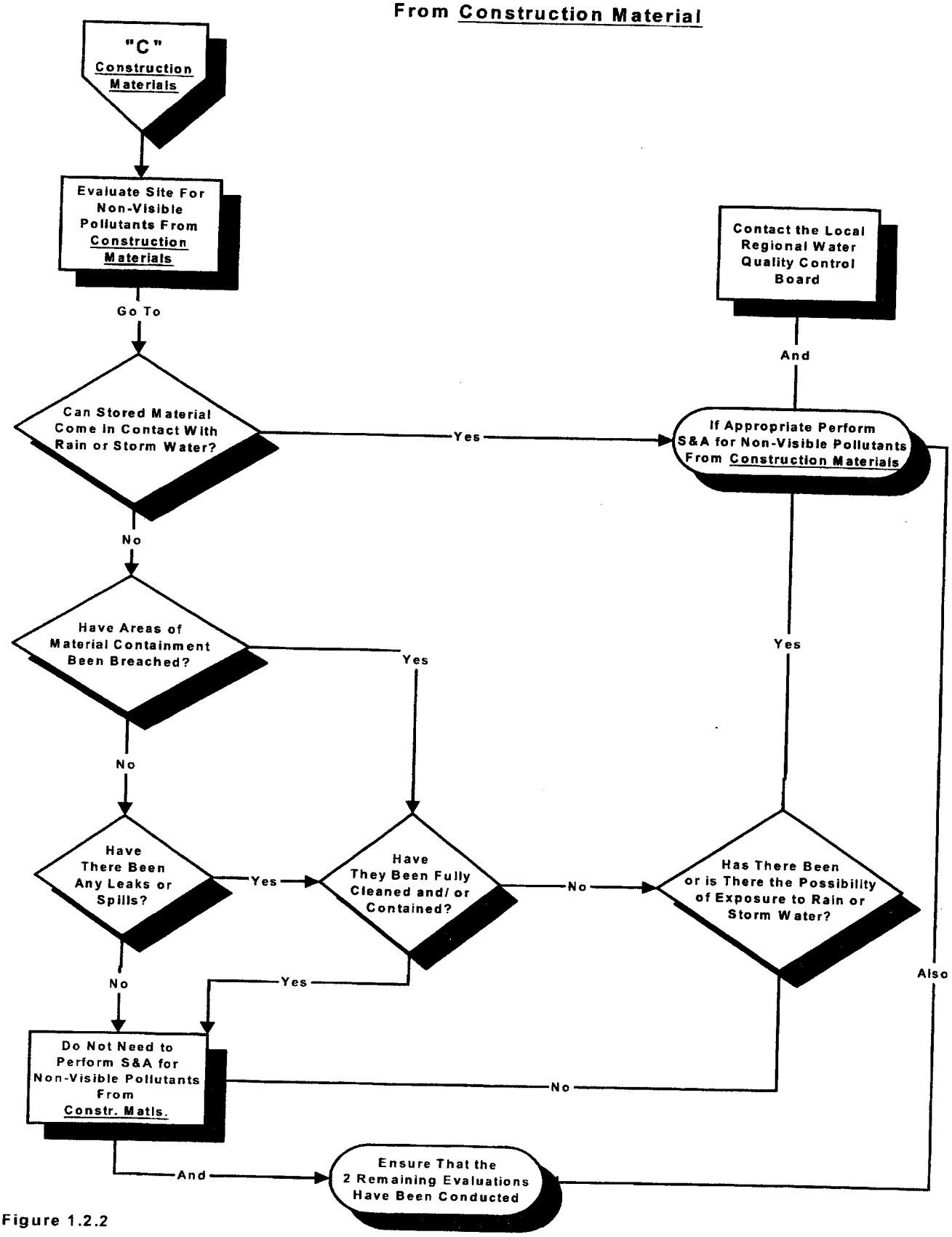


Figure 1.2.2

Determine If You Must Perform Sampling and Analysis (S&A) for Non-Visible Pollutants From Run-On

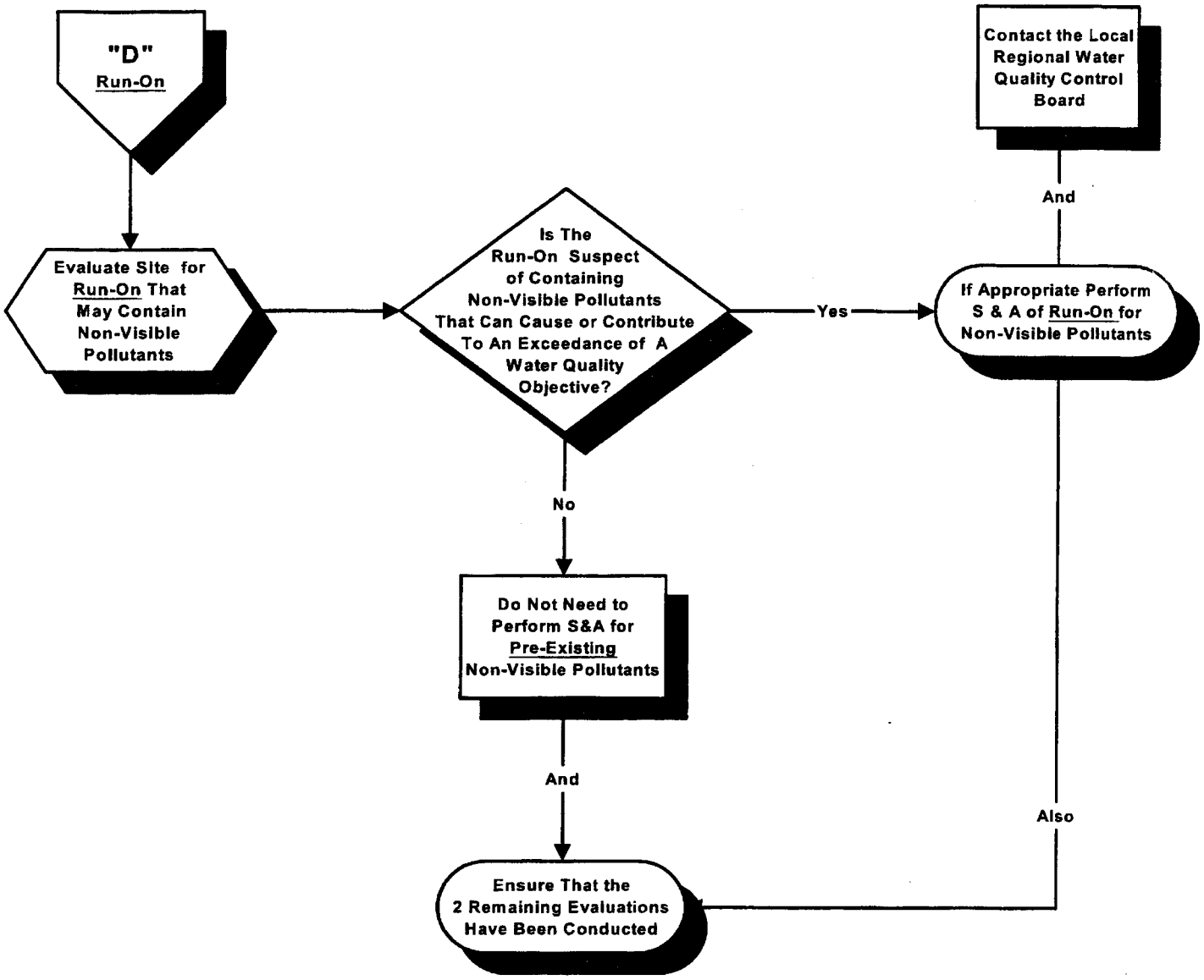


Figure 1.2.3

2.0 Sampling Program for Pollutants Not Visually Detectable in Storm Water

The CGP requires sampling and analysis for pollutants not visually detectable in runoff, but which could cause or contribute to an exceedance of water quality objectives in the receiving water. Sample for a constituent if there is reason to expect that it may be in the discharge, regardless of whether or not it is causing or contributing to an exceedence of a water quality objective. First attempt to eliminate the exposure of construction materials to prevent pollution of storm water and thus to limit the requirement for sampling and analysis. Many construction materials, including soil amendments, fertilizers, pesticides, and even things like fencing and wood products, are intended for use outdoors. For such materials, minimize pollutant discharge through implementation of appropriate BMPs. If exposure to these products can contribute pollutants to the runoff at levels that could cause or contribute to exceedance of a water quality objective, then sampling is still required, even if they are used correctly.

2.1 What the Permit Says about Sampling

The CGP requires that a sampling and analysis program be developed and conducted for pollutants which:

- Are not visually detectable in storm water discharges,
- Are known or should be known to occur on the construction site, and
- Could cause or contribute to an exceedance of water quality objectives in the receiving water.

Include all pollutants identified in this way in this sampling and analysis strategy and identify them in the SWPPP (as required by Sections A. 5. b. and A. 5. c. of the CGP). The CGP states that the SWPPP must identify a strategy for conducting the sampling and analysis, including the frequency and location(s) at which sampling will be conducted.

Sample for pollutants that would not be visible in runoff if:

- Visual inspections (required before, during and after storm events) indicate that there has been a breach, malfunction, leakage or spill from a BMP that could result in the discharge of pollutants in storm water and the pollutants would not be visually detectable; or
- Storm water comes into contact with soil amendments, other exposed materials, or other on site sources of pollution.

2.2 Deciding When to Sample

Conduct proper inspections throughout the duration of the project to make sure that appropriately selected BMPs have been implemented, are being maintained, and are effective. Sample if non-visible pollutants that are known or should be known to occur on the construction site "could cause or contribute to an exceedance of water quality objectives in the receiving water." As discussed in this document, there are numerous receiving water standards found in different documents, including narrative water quality objectives in basin plans. For that reason,

and because of the difficulties associated with linking a discharge from a construction site to exceedance of water quality standards in the receiving waters, conduct sampling and analysis whenever the above conditions are met.

If a determination is made that sampling is needed, collect storm water runoff samples regardless of the time of year, status of the construction site, or day of the week. Collect samples during the first two hours of runoff (during daylight hours). Storm water inspections and sample collections are required even during non-working days (including weekends and holidays).

2.3 Deciding What Constituents to Sample for: What are Pollutants Which are "Known or Should be Known " to Occur on a Construction Site?

Pollutants can be considered to be known or should be known to occur on the construction site if they are currently in use or are present as a result of previous land uses. This includes materials that:

- are being used in the construction activities
- are stored on the construction site
- were spilled during construction operations and not cleaned up
- were stored (or used) in a manner that presented the potential for a release of the materials during past land use activities
- were spilled during previous land use activities and not cleaned up
- were applied to the soil as part of past land use activities.

Construction material inventories and the project SWPPP should provide adequate information on materials currently in use or proposed for use on the construction site.

Develop a list of potential pollutants based on a review of potential sources identified in your SWPPP (required by CGP sections A.5.b. and A.5.c.), which will include construction related materials, soil amendments, soil treatments, and historic contamination. Review existing environmental and real estate documentation to determine the potential for pollutants to be present on the construction site as a result of past land use activities. Good sources of information on previously existing pollution and past land uses include Environmental Assessments, Initial Studies, Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act, and Phase 1 Assessments prepared for property transfers. In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.

Identify from this list those pollutants that would not be visible in storm water discharges. These are the constituents that you will likely have to sample for in runoff if the materials are

exposed to storm water. Consult with your analytical laboratory or water quality chemist to determine if there are field tests or indicator parameters that can be used.

2.4 Deciding Where to Sample

Sample at all discharge locations that drain the areas from which the pollutants may have entered the runoff and at locations that have not come in contact with the pollutants (reference sampling). This allows a comparison of reference samples with the sample(s) collected from storm water suspected of containing construction-related pollutants. The collection of this sample is important in the interpretation of the potentially contaminated sample because it provides information on the characteristics of the storm water without the exposure. For example, if storm water were to come in contact with hydrated lime products, the indicator parameter for pollution would be an elevated pH. The storm water could also be polluted with other materials or minerals, but the elevated pH will provide information necessary for the discharger to make further determinations as to the cause. In this case, a sample of storm water from the same storm event that did *not* come in contact with the hydrated lime would provide an understanding of what the pH of the uncontaminated storm water was in relation to the polluted storm water.

A more accurate background sample would have also contacted the soil and vegetation of the area, further isolating the lime as the source of the elevated pH. This gives the discharger the necessary information to take immediate steps to detain the polluted storm water or to minimize or eliminate the exposure. Describe the sampling procedure, location and rationale for obtaining the reference sample of storm water in the SWPPP.

Identify sampling locations that provide information on both the runoff quality that is affected by material storage, historic contamination or other exposed potential pollutants, and the background runoff quality (i.e., reference sample). Material storage may be confined to a small area of the project while historic contamination or exposed materials, such as soil amendments, may be widespread throughout the construction site. For this reason, the sampling locations identified for these two types of potential pollutants may be different.

- Collect samples at locations identified in your SWPPP and in areas identified by visual observations/inspections where there has been a BMP failure or breach and which can be safely accessed.

- Collect samples from a location that is not affected by material storage activities or by runoff as a background or reference location.

- For a widespread potential pollutant, select sampling locations at the perimeter of your site, where storm water is unaffected by your activities and compare this to areas that are affected by your activities on the site. Describe the sampling procedure, the location, and the rationale for selecting these locations in the SWPPP.

If the "reference sample" is taken from on-site and it turns out to be carrying a high level of pollutants this should trigger an evaluation of this drainage area. Are there previously

undetected sources of pollutants? It may turn out that additional BMPs may be necessary on this portion of the site or that the discharge must be managed or contained.

If the "reference sample" is taken from off site and it turns out to be carrying a high level of pollutants take a sample on site to determine if the same pollutants are on site and must be managed.

2.5 Types of Test Methods?

The CGP requires sampling of non-visible pollutants that "could cause or contribute to an exceedance of water quality objectives in the receiving waters". Unlike sediment, for which there are a limited number of applicable water quality objectives, the applicable water quality standards for "non-visible" pollutants will depend on the material and its chemical makeup. This guidance document contains information on what pollutants may occur on construction sites and which water quality standards may be associated with those pollutants. The best assurance of complying with the receiving water limitations is to prevent or reduce runoff of all polluting substances from construction sites through implementation of effective BMPs.

The sampling and analysis language recognizes that sampling and laboratory analysis, in and of itself, does not protect water quality. Rather, field identification and detection of the source of pollution, followed by timely action is ultimately what will protect the receiving waters. Because of the short-term nature of construction, and the use of different materials during the construction period, laboratory sampling will not generally provide the information needed in an adequate time frame. It is preferable to use field-sampling techniques that can provide immediate information and allow a timely solution.

For this reason, the sampling and analysis language for non-visible pollutants contemplates field sampling using indicator parameters. The correct indicator parameter can provide a quick and immediate indication of contamination of storm water to known materials stored or used on a construction site. Field test kits and devices have been commercially available for decades and widely used for water quality applications. As an example, test strips to evaluate for ammonia, phosphate, chlorine, copper, iron, nitrate, nitrite, and low and high range pH are readily commercially available. Manufacturers and distributors provide technical support as well as training to their customers.

2.6 Deciding How Often to Sample

Determine the frequency of sampling for non-visible pollutants based on the exposure of pollutant sources. Sample runoff when BMPs do not effectively prevent or reduce exposure of a non-visible pollutant source to storm water. Sample runoff when inspections identify a BMP failure, which exposed pollutants to storm water. If spills are thoroughly cleaned up and the contaminated material is isolated, eliminating exposure to storm water runoff, sampling is not required. For instances when the potential for previously existing pollution is identified, perform laboratory screening analysis during the first one or two storm events of the season to determine if the potential pollutant is running off the construction site. If construction activity will disturb or mobilize such potential pollutant sources, take samples to determine if the pollutants are being mobilized by the construction activity.

2.7 Identification of Pollutant Sources

Information about various construction pollutant sources can be viewed by following the instructions posted on the swrcb.ca.gov web site. In addition, various discharger groups have also produced information that may be useful for determining pollutants sources and sampling parameters for runoff from construction activity. These include a "Pollutant Testing Guidance Table" that lists construction materials, describes whether they would be visible in runoff, and lists pollutant indicators, which will be available on the swrcb.ca.gov/stormwtr/gen_const.html web site

2.8 Examples of When Sampling and Analysis for Non-Visible Pollutants Is Not Required

Sampling and analysis is not required under the following conditions. However, a contingency sampling strategy should be prepared in the event of an accidental discharge.

- Where construction takes place entirely during a period of time when there are no rainfall events. Timing construction to occur outside of the rainy season is the most effective BMP.
- Where a construction project is "self-contained", meaning that the project generates no runoff or any potential discharges containing pollutants, including no potential for tracking sediment off-site from vehicle tires, and no potential for discharging products of wind erosion.
- Where construction materials and compounds are kept or used so that they are not in contact with storm water (e.g., in water-tight containers, under a water-tight roof, inside a building, etc.).
- Where for specific pollutants, the BMPs implemented at the construction site fully contain the exposed pollutants (e.g., bermed concrete washout area).
- For building, landscaping and BMP materials that are in their final constructed or in-place form or are designed for exposure (e.g., fence materials, support structures and equipment that will remain exposed at the completion of the project, etc.).
- Where pollutants may have been spilled or released on site, but have been properly cleaned-up and storm water exposure has been eliminated prior to a storm event.
- For stockpiles of construction materials for which both cover and/or containment BMPs have been properly implemented to protect them from run-on and from contributing pollutants to storm water .

2.9 Examples of When Sampling and Analysis Is Required

Sampling and analysis is required when non-visible pollutants have the potential to contact storm water and run off the construction site into a storm drainage system or water body at levels that may cause or contribute to exceedance of water quality standards. Some examples of this situation are:

- Where construction materials and compounds are stored or applied such that they may come in contact with storm water runoff.

- For construction projects that utilize soil amendments or soil treatments that can come in contact with storm water runoff. (If you have independent test data available that demonstrates that the soil amendments cannot result in concentration levels in storm water discharges that will cause or contribute to exceedance of applicable water quality standards, sampling and analysis may not be required. Contact the appropriate RWQCB to determine acceptable concentration(s) of the material(s) in question.)

- When a leak or spill occurs that is not fully contained and cleaned prior to a storm event.

- When a leak or spill occurs, during a storm event, and it cannot immediately be isolated and/or cleaned-up, and the possibility of an off-site discharge exists.

- When, during regular inspections, it is discovered that cover and containment BMPs have been compromised and storm water comes in contact with materials resulting in runoff discharging into a storm drain system or water body.

- When material storage BMPs have been compromised, breached, or have failed.

2.10 Do I Sample Storm Water Flows Diverted Around My Project for Non-Visible Pollutants?

Dischargers may be faced with a situation where the disturbed area of their construction site is adjacent to a large area that historically has drained across their site. This happens most frequently in foothill situations where schools or commercial development is undertaken alongside an existing roadway, adjacent to a large undisturbed area. In such a situation, calculate the anticipated volume of the flow in order to size a diversion structure to divert the (usually) clean storm water around or though the site. (CGP section A.5.b.1.) It is unwise to allow a large volume of water to wash across a disturbed area. Not only would the run-on cause erosion and remove the soil from the project, but also the discharge would be turbid and violate the Permit requirements. To the extent that the discharger does allow run-on of polluted water to flow across the site, and contaminants in the run-on are not visible, the sampling and analysis requirements apply. Additionally, the CGP (section A. 5. b.) requires that the RWQCB be contacted in the above situation.

The requirement to divert run-on does not authorize the creation of a new point source of pollutants, however. If the run-on contains pollutants from pre-existing pollution in the watershed, the discharger is responsible to determine this before planning the diversion. Should a discharger divert contaminated water around the site and allow it to enter surface waters, this permit does not authorize such discharge and the discharger should be aware that a separate NPDES permit may be required. (See, *Committee to Save Mokelumne River v. East Bay Municipal Utility District* (9th Cir. 1993) 13 F.3d 305, 309.) If you are planning on diverting flows from entering your site and you suspect that they contain pollutants, contact your local RWQCB for advice.

2.11 Deciding How to Sample

- Only personnel trained in water quality sampling procedures should collect storm water samples.
- Determine sampling methods and locations in advance of the runoff event in order to provide sufficient time to gather the supplies and equipment necessary to sample and plan for safe access by the sampling personnel.
- General guidance for sampling procedures is provided in Section 4 of this document.

2.12 How to Use Your Sampling Data

2.12.1 How to Analyze Your Data

Initiate corrective action where non-visible pollutant sample test results indicate presence of pollutants in the construction site storm water runoff. This can be determined by comparing your construction site's storm water test results with the background sample. BMPs must be used to control offsite discharge of any pollutant (e.g., pesticides) that is not naturally occurring, regardless of background levels of that pollutant.

Where your site's storm water test concentrations for naturally occurring substances are considerably above (or, in the case of pH, considerably above or below) the background concentrations, or where other pollutants are found, evaluate the BMPs to determine the cause. Initiate corrective action by repairing, replacing or suplementing the BMPs on your site. Conduct additional sampling during the next runoff event after corrective actions are implemented to demonstrate and document that the problems have been corrected.

This permit does not contain benchmarks. However, method of data analysis for naturally occurring substances employs a similar concept: determining whether the results are "considerably above" the background levels. The term "considerably above" is based upon guidance contained in USEPA's Multi-Sector General Permit, which does use benchmarks. These benchmarks are not numeric storm water effluent limits, are not related or necessarily protective of any specific receiving water, and exceedances of these benchmarks are not automatically considered permit violations. When sample results exceed one or more of the benchmarks, the USEPA recommends dischargers reevaluate the effectiveness of their BMPs and develop, when appropriate, additional BMPs. The use of such benchmark values is a scientifically valid indicator of the presence of pollutants associated with construction activity in the runoff. Since the non-visual pollutants that may occur on construction sites may be similar in type and cause to those on industrial sites, it is valid to use USEPA's approach here. Where a parameter in a sample is being evaluated, and a benchmark is available, the benchmark may be used for comparison purposes. (USEPA does not require any sampling and analysis in its construction permits, and therefore does not have benchmarks for construction activities.)

2.12.2 Coordinating Visual Observations with Sampling Results

If visual inspection of storm water BMPs used to contain or otherwise manage (i.e., filter or treat) non-visible pollutants at a construction site indicates that a BMP has failed or been compromised, then field monitoring of any impacted storm water from the site for non-visible pollutants is required. Of course, immediately repair or replace any BMP that has been visually inspected and found breached or compromised. If feasible, contain the polluted discharge and prevent it from being discharged off site. After taking steps to correct the failed BMP, conduct field monitoring in the vicinity of the BMP to verify that pollutants are no longer in the storm water.

The intent of conducting field monitoring for non-visible pollutants is to obtain an immediate indication if storm water that is discharging from a site has been polluted. An immediate indication of a polluted discharge requires an immediate response in the form of backtracking from the point of discharge to find the source and take appropriate measures to prevent a recurrence of a polluted discharge.

2.12.3 What To Do If The Data Show a Potential Problem

If your data shows a problem, follow the reporting requirements as shown in the CGP Receiving Water Limitations. In addition, take the following steps as soon as possible:

- Identify the source
- Repair or replace any BMP that has failed
- Maintain any BMP that is not functioning properly due to lack of maintenance
- Evaluate whether additional or alternative BMPs should be implemented

If sampling and analysis during subsequent storm events shows that there is still a problem, then repeat the steps above until the analytical results of "upstream" and "downstream" samples are relatively comparable.

Where your site's storm water results show test concentrations considerably above (or below) background concentrations, evaluate the BMPs to determine what is causing the difference. Possible solutions may include repairing the existing BMPs, evaluating alternative BMPs that could be implemented, and/or implementing additional BMPs (cover and/or containment) which further limit or eliminate contact between storm water and non-visible pollutant sources at your site. Where contact cannot be reduced or eliminated, retain storm water that has come in contact with the non-visible pollutant source on-site and do not allow it to discharge to the storm drainage system or to a water body. Contact your RWQCB to determine whether it is permissible to discharge the retained storm water. Conduct additional sampling during the next runoff event after corrective actions are implemented to demonstrate and document that the problems have been corrected.

2.13 Retention of Data

Keep results of field measurements and laboratory analyses with the SWPPP, which is required to be kept on the project site until the Notice of Termination (NOT) is filed and approved by the

appropriate RWQCB. Keep field training logs, Chain-Of-Custody (COC) forms and other documentation relating to sampling and analysis with the project's SWPPP. Records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated or after project completion.

3.0 Sampling Program for Sedimentation/Siltation

3.1 What the Permit Says About Sampling

Soils, sediments, and fine (suspended) particles that result from grading and earthwork activities and soil erosion from disturbed, un-stabilized land areas are potentially significant sources of storm water pollution at construction sites. The CGP requires construction sites to develop, implement and maintain an effective combination of erosion control and sediment control BMPs to prevent soils, sediments, debris and solids fine enough to remain suspended from leaving the construction site and moving into receiving waters at levels above preconstruction levels.

The CGP requires that a visual survey of the site be done before, during and after a storm. If the visual survey indicates either the potential for a discharge of sediment laden water or that sediment is being discharged, steps must be taken to repair or augment the BMPs to prevent the discharge as soon as possible. Discharge of sediment above predevelopment levels is not allowed.

The CGP requires sampling and analysis for sediment/silt or turbidity when the construction site runoff discharges directly into a water body that is impaired by sedimentation/siltation, sediment, or turbidity (that is, the water body is on the 303(d) list for one or more of these pollutants.) A key point is that the discharge of storm water runoff must directly enter the impaired water body or impaired segment of a water body. Construction site runoff that flows through a tributary or storm drainage system and is commingled with other sources of flow, is not considered a direct discharge even if the flow eventually enters an impaired water body. (See the definition of direct discharge in Section 5 for further details.)

The CGP requires that the SWPPP identify a strategy for conducting the sampling and analysis, including the frequency at which sampling will be conducted. The SWPPP must also describe:

- the location(s) of direct discharges from construction activities to a water body listed on the SWRCB's 303(d) list for sedimentation/siltation, sediment and/or turbidity;
- the designated sampling location(s) in the listed water body representing the prevailing conditions up-stream of the discharge; and
- the designated sampling location(s) in the listed water body representing the prevailing conditions down-stream of the discharge.
- the sampling design which describes the sampling devices used; the sample size; the number of samples to be taken at each location, the laboratory protocol employed; and, if applicable, the statistical test used to determine if the upstream/downstream samples differ to a statistically significant degree.

3.2 Deciding When to Sample

- Dischargers must perform sampling if the storm water runoff directly discharges from the construction site to a 303(d) listed water body.
- Dischargers must collect samples during the first two hours of discharge (runoff) from storm events which result in a direct discharge to any 303(d) listed water body. But samples need only be collected during daylight hours (sunrise to sunset).
- Dischargers must collect samples regardless of the time of year, status of the construction site, or day of the week. Samples should be taken during the first two hours of a storm event. Storm water inspections and sample collections are required even during non-working days (including weekends and holidays). Samples must be taken from the same storm event for comparison, concentrations are not comparable across storm events.
- Dischargers do not need to perform upstream/downstream sample collection for more than four (4) rain events per month.

3.3. Deciding What Constituent(s) Require Sampling

- If the water body is listed as impaired for sedimentation or siltation, analyze samples for Setteable Solids (mL/L) and Total Suspended Solids (mg/L) according to USEPA 160.2 and USEPA 160.5, respectively. Samples may be analyzed for suspended sediment concentration (SSC) according to ASTM D3977-97 instead of or in addition to Total Suspended Solids and Setteable Solids.
- If the water body is listed as impaired for turbidity, analyze samples for turbidity per USEPA 180.1 or analyze in the field using a correctly calibrated turbidity meter.
- It is very important that consistent sampling and analysis methods are used for all sampling locations.

Table 3-1 shows general sample handling and laboratory requirements for sediment sampling.

Table 3-1
LABORATORY REQUIREMENTS[1] FOR STORM WATER MONITORING OF SEDIMENT, SILTATION AND/OR TURBIDITY

Parameters	Analytical Method	Target **Method Detection** Limit	Minimum Sample Volume [2]	Container	Preservative	Holding Time
Total Suspended Solids (TSS) [2]	EPA 160.2	1 mg/L	100 mL	500 mL polypropylene	Store in ice or refrigerator at 4°C (39.2°F)	7 days
Setteable Solids (SS)	EPA 160.5	0.1 mL/L/hour	1 liter	1 liter mL polypropylene	Store in ice or refrigerator at 4°C (39.2°F)	48 hours
Suspended Sediment Concentration (SSC) [3]	ASTM D 3977-97	Contact Laboratory	200 mL	Contact Laboratory	Store in ice or refrigerator at 4°C (39.2°F)	7 days
Turbidity	EPA 180.1	1 NTU	100 mL	500 mL polypropylene or glass	Store in ice or refrigerator at 4°C (39.2°F), Dark	48 hours

1 The data in this table is a summary of recommended laboratory requirements. For specific USEPA regulatory requirements, consult the sampling and analysis requirements found in 40 CFR 136.

2 Minimum sample volume recommended. Specific volume requirements will vary by laboratory; please check with your laboratory when setting up bottle orders.

3 Use either TSS or SSC, or both, for suspended solids analysis. Upstream and downstream samples should be analyzed by the same method.

3.4 Deciding Where to Sample

In-stream sampling is required, both upstream and downstream of the discharge. The CGP does not require that the effluent be sampled. However, effluent sampling is recommended. Take both upstream and downstream samples within the actual flow of the waterbody. Collect samples at the following locations:

- Sample the 303(d) listed water body upstream of the construction site discharge in a location representative of the sediment load present in the water body before it is impacted by discharge from the construction site.
- Sample the 303(d) listed water body at a point immediately downstream of the last point of discharge from the construction site.

Additionally, for the purpose of interpreting the results of the samples collected from the 303(d) listed water body, collect and analyze samples of the actual discharge from the construction site (effluent sample) prior to it being commingled in the receiving water. This sample can be used to verify whether the source of the sediment in-stream is emanating from the construction discharge. Remember that samples should only be collected from safely accessible locations.

In general, sample away from the bank in or near the main current. Avoid collecting samples directly from ponded, sluggish, or stagnant water. Be careful when collecting water upstream or downstream of confluences or point sources to minimize problems caused by backwater effects or poorly mixed flows. Note that samples collected directly downstream from a bridge can be contaminated from the bridge structure or runoff from the road surface.

Choose the upstream location in water that appears to represent the nature of the flow in the stream.

Downstream samples should represent the receiving water mixed with flow from the construction site. For instance if the flow from the site can be observed by either a color or a flow difference, collect the downstream sample from within the affected water.

3.5 What Are the Applicable Water Quality Standards

The CGP requires sampling of runoff from construction sites that discharge directly to 303(d) listed water bodies to demonstrate that discharges do not contribute to the impairment of the receiving water. Each of the listed waters is subject to water quality objectives in a RWQCB Basin Plan for sediments and solids or for turbidity. The applicable water quality objectives for each RWQCB are listed in Appendix A to this guidance document.

3.6 Deciding How to Sample

- Only personnel trained in water quality sampling procedures should collect storm water samples.

- Determine sampling methods and locations in advance of the runoff event in order to provide sufficient time to gather the supplies and equipment necessary to sample and plan for safe access by the sampling crew(s) and document them in the SWPPP.
- General guidance for sampling procedures is provided in Section 4 of this document.

3.7 How to Use Your Data

3.7.1 How to Analyze Your Data

While it is desirable for sediment concentrations from a site to be as low as possible, the amount that a site can contribute is determined by a TMDL analysis and in the absence of an implemented TMDL, the instream concentrations below the point of discharge cannot be significantly different from the upstream concentrations.

In order to allow for meaningful analysis of the data, it is necessary to establish a statistical framework for it. When sampling a body of water, it is unlikely that two samples, even taken next to each other, will have the same concentration of a pollutant. This is referred to as variability. Concentrations will vary from sample to sample, but the difference between them may not be meaningful. In order to obtain a statistically meaningful set of samples, it is necessary to determine how many samples will be necessary, the greater the variability between samples, the larger the number of samples (N) will be required. This may require that the water body be sampled before the start of construction to determine the variability. Collect sufficient numbers of samples (N) during each storm event monitored to represent the prevailing conditions of both locations (upstream and downstream). Depending upon which statistical test is used, and the variability between the samples, N will usually be more than a single sample. When comparing samples from a single storm event, a range of readings will be obtained. Almost all samples from that source will fall into that range. The likely range of readings can be expressed through the use of a statistical confidence interval for the parameter being sampled. Confidence intervals are expressed as probabilities, such as 95% confidence or 97% confidence. The size of a confidence interval will be determined by the variability in the samples from the single source and the number of samples collected.

Once the sampling is completed and results returned from the laboratory, compare the concentration of the appropriate parameter (see Section 2.3 Deciding What Constituents to Sample for)) derived from the upstream samples to the concentration of the same parameter from the downstream samples (from the same storm event). It is expected that every sample will be different. (This would be true even if there were not construction activities, in light of the variability of stream conditions, explained above.) Rather, compare the samples to see if there is a statistically significant difference between the central tendency (arithmetic mean, geometric mean, median, etc.) of the upstream samples and the downstream samples.

Estimate the magnitude of the difference in the central tendency between the upstream and downstream concentration values. The null hypothesis to be tested is: The difference between the downstream central tendency and the upstream central tendency is less than or equal to zero. The minimum acceptable confidence interval shall be 90%. Using the data, calculate a one-sided lower confidence limit (LCL) on the difference in central tendencies. If the numeric value of zero

is contained within the confidence interval (LCL), then you cannot reject the null hypothesis, and you would conclude that no impairment has occurred. If, however, the data indicates that the downstream central tendencies are significantly higher than the upstream, you cannot accept the null hypothesis. In this case there is the presumption that the discharges are contributing to the existing impairment.

If you did take samples of the effluent, and those samples are not consistent with the conclusion that the discharge is contributing to the existing impairment, take steps to determine what other source(s) is causing the increase in the downstream sampling. If you can show that there is a different source than your discharge, you should contact the appropriate RWQCB.

The hypothesis, sampling methodology, confidence interval, and statistical tests and assumptions must be defensible to the RWQCB. Since construction sites that discharge *directly* into impaired water bodies are not common in California, the local RWQCB will likely ask to review the SWPPP and the sampling and analysis strategy prior to construction activity.

3.7.2 Sources of sediment, silt and turbidity in a construction discharge

Conditions or areas on a site that may be causing sediment, silt, and/or turbidity in your storm water runoff may include:

- Exposed soil areas with inadequate erosion control measures
- Active grading areas
- Poorly stabilized slopes
- Lack of perimeter sediment controls
- Areas of concentrated flow on unprotected soils
- Poorly maintained erosion and sediment control measures
- Unprotected soil stockpiles
- Failure of an erosion or sediment control measure
- Unprotected Clayey soils

3.7.3 What To Do If Your Data Shows a Statistically Significant Increase Downstream of the Discharge

The CGP requires that BMPs be implemented on the construction site to prevent a net increase of sediment load in storm water discharges relative to pre-construction levels. Although the upstream reference (background) sample may not be representative of pre-construction levels at your site, it will provide a basis for comparison with the sample taken downstream of the construction site.

If the statistical tests of the upstream and downstream samples indicate an increase in silt, sediment and/or turbidity, follow the reporting requirements as shown in the Receiving Water Limitations of the CGP. If you have collected samples of the discharge from your site, use these results to help identify if it is your project that is discharging sediment into the receiving water. It is recommended that the following steps be taken as soon as possible.

- Identify the source of the silt, sediment or turbidity
- Review effectiveness of existing erosion control BMPs. The sediment may be coming from locations at the construction site where existing erosion control BMPs have been reduced in effectiveness. These BMPs should be evaluated to determine whether they are in need of maintenance.
- Review effectiveness of existing sediment control BMPs. The sediment may be coming from locations at the construction site where existing sediment control BMPs have been reduced in effectiveness. These BMPs should be evaluated to determine whether they are in need of maintenance.
- Look for evidence that there are too few sediment and erosion control BMPs. In inspecting the site, sources of sediment that either do not have BMPs or for which the BMPs appear to be insufficient in number or type may be identified.
- Repair or replace any BMP that has failed or is in need of maintenance
- Evaluate whether additional or alternative BMPs should be implemented to provide an effective combination of erosion and sediment control measures on the site. Do not rely solely on perimeter sediment controls, particularly where there are fine-grained soils (such as silts or clays) on the site. Implement erosion controls (source controls) that keep the soil in place, even on temporary slopes and rough graded areas, wherever possible and as necessary to prevent sediment from leaving the site.

If sampling and analysis during subsequent storm events shows that there is still a statistically significant difference, then repeat the steps above until the analytical results of the upstream concentration samples are within the confidence interval.

3.8 Retention of Data

Keep results of field measurements and laboratory analyses with the SWPPP, which is required to be kept on the project site until the NOT is filed and approved by the appropriate RWQCB. Keep training logs, Chain-Of-Custody (COC) forms and other documentation relating to sampling and analysis with the project's SWPPP. All records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated or after project completion.

4.0 Sampling Procedures

The collection and handling of storm water runoff samples requires care to ensure the integrity and validity of the samples. A Chain of Custody (COC) form, must follow the sample from the

collection through the analysis process. Additional documentation to track other information of interest, e.g. field conditions, or required field measurements may also be used. This type of information is recorded on a field tracking form.

Collect all samples with care to ensure that the sample is representative of the runoff being tested, use the correct type of container, preserve samples in accordance with the test method's specifications, and store at the appropriate temperature until delivered to an analytical laboratory. Some types of samples have very short holding times and must be analyzed before this holding time is exceeded. Sample handling requirements and documentation form the basis of your sampling quality assurance program.

Before starting any sampling program, contact the analytical laboratory that you plan to use to analyze your samples. Make sure to select a laboratory that will provide you with the support that you need, such as, properly cleaned and preserved sampling containers and COC forms. Some laboratories can assist in identifying courier services available to transport samples to the laboratory, or may be able to provide sampling service for you. Work out all of these details in advance of sample collection. Consult the analytical laboratory on what additional samples will be required for quality assurance and quality control purposes.

Both field and/or analytical analysis methods can be used to meet the Permit requirements. Field techniques have the advantage of providing immediate results, however, there are only a limited number of analyses that can be done in the field. Analytical laboratories can analyze for a wide range of parameters, but the data may take several weeks or longer to get back.

Some constituents (e.g. pH) can be evaluated in the field with special equipment. Field samples must be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Field equipment must be used by trained staff and the equipment must be calibrated and maintained according to the manufacturer's specifications.

Laboratory analyses should be conducted by a laboratory that is currently accredited by the California Department of Health Services Environmental Laboratory Accreditation Program (ELAP). Analyses must be conducted in accordance with 40 CFR Part 136.

You may refer to the California Department of Transportation (Caltrans) *Guidance Manual: Stormwater Monitoring Protocols (Second Edition), July 2000* to assist you in developing a sampling and analysis program. This document may be downloaded from the Caltrans Website, at

http://www.dot.ca.gov/hq/construc/stormwater/SamplingGuidanceManual.pdf

Figure 4-1 is an outline for a typical comprehensive storm water sampling and analysis plan. As some laboratories may have specific requirements for sample collection and handling, specific information or requirements on your samples should be checked with your laboratory.

1 PROJECT OVERVIEW/DESCRIPTION
- 1.1 Description of why the project is being conducted
- 1.2 Description of who is conducting the project
- 1.3 General scope of monitoring activities
- 1.4 Project organization/roles and responsibilities

2 MONITORING SITES
- 2.1 Site location (map)
- 2.2 Written driving directions
- 2.3 Site access instructions (gates, locks, keys, combinations)
- 2.4 Notification procedures

3 ANALYTICAL CONSTITUENTS
- 3.1 List of constituents for sampling and analysis (including sample collection methods, container type, volume required, preservation and laboratory performing analysis)

4 DATA QUALITY OBJECTIVES (DQOs)
- 4.1 Analytical reporting limits
- 4.2 Analytical precision, accuracy and completeness

5 FIELD EQUIPMENT MAINTENANCE
- 5.1 Equipment calibration
- 5.2 Equipment maintenance
- 5.3 Equipment cleaning (bottles/lids/tubing)

6 MONITORING PREPARATION AND LOGISTICS
- 6.1 Weather tracking
- 6.2 Storm selection criteria
- 6.3 Storm action levels
- 6.4 Communications/notification procedures
- 6.5 Sample bottle order
- 6.6 Sample bottle labeling
- 6.7 Field equipment preparation

7 SAMPLE COLLECTION, PRESERVATION AND DELIVERY
- 7.1 Sample collection methods
- 7.2 Field measurement methods
- 7.3 Field equipment list
- 7.4 Sample containers, preservation and handling
- 7.5 QA/QC sample collection methods
- 7.6 Sample labeling (site names, codes, etc.)
- 7.7 Composite sample splitting
- 7.8 Forms and procedures for documenting sample collection and field measurements
- 7.9 Laboratory communication procedures
- 7.10 Sample shipping/delivery, chain-of-custody

8 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)
- 8.1 Field procedures for QA/QC sample collection

9 LABORATORY SAMPLE PREPARATION AND ANALYTICAL METHODS
- 9.1 Laboratory sample preparation procedures
- 9.2 Analytical constituent table (including analytical methods, holding times and reporting limits)

10 DATA MANAGEMENT AND REPORTING PROCEDURES
- 10.1 Analytical data validation
- 10.2 Electronic data transfer
- 10.3 Filing of electronic and hard copy data
- 10.4 Reports

APPENDICES
- A Clean Sampling Techniques
- B Health and Safety Plan

Figure 4-1 Outline for a Typical Storm Water Sampling and Analysis Plan

5.0 Definitions

Chain of Custody (COC) Form

The COC Form is a form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Direct Discharge

Direct discharge means storm water runoff that flows from a construction site directly into a 303(d) water body listed for sedimentation, siltation, or turbidity. Storm water runoff from the construction site is considered a direct discharge to a 303(d) listed water body unless it first flows through:

1) A municipal separate storm sewer system (MS4) that has been formally accepted by and is under control and operation of a municipal entity;

2) A separate storm water conveyance system where there is co-mingling of site storm water with off-site sources; or

3) A tributary or segment of a water body that is not listed on the 303d list before reaching the 303d listed water body or segment.

Discharger

The discharger is the person or entity subject to the CGP.

Electrical Conductivity (EC)

EC is a measure of the ability of water to carry an electric current. This ability depends on the presence of ions, their concentration, valence, mobility and temperature. EC measurements can give an estimate of the variations in the dissolved mineral content of storm water in relation to receiving waters.

Field Measurements

Field measurements refers to water quality testing performed in the field with portable field-testing kits or meters.

Field Tracking Form (FTF)

The FTF is a form that serves as a guide to sampling crews to obtain sampling information and to prescribe and document sample collection information in the field. The FTF usually contains sample identifiers, sampling locations, requested analyses, Quality Control (QC) sample identifiers, special instructions, and field notes.

Holding Time

Holding time is specified by the analytical method and is the elapsed time between the time the sample is collected and the time the analysis must be initiated.

pH

The pH is universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Reference Sample
A sample taken from an undisturbed part of the construction site or from an undisturbed site immediately upstream from a construction site. The reference sample is used for comparison with samples taken from the active construction site. It is the same set of samples that is referred to as an uncontaminated sample in the Permit.

Sampling and Analysis Plan
A document that describes how the samples will be collected and under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment
Sediment is solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation/Siltation
Sedimentation/siltation is the process of sediment/silt deposition.

Setteable Solids
The setteable solids (SS) test measures the solid material that can be settled within a water column during a specified time frame. This typically is tested by placing a water sample into an Imhoff settling cone and allowing the solids to settle by gravity. Results are reported either as a volume (mL/L) or a weight (mg/L).

Silt
Silt are soil particles between 0.05mm and 0.002mm in size. (For the purposes of its use here, it also includes clay, which is categorized by a particle size less than 0.002mm.)

Soil Amendment
Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water. Certain soil amendments may not be visible in site runoff. Soil amendments likely to fall in this category include lime, cementitious binders, chlorides, emulsions, polymers, soil stabilizers, and tackifiers applied as a stand-alone treatment (i.e., without mulch). Even some of these products may bind with the soil, and thus be visible. In contrast, plant fibers (such as straw or hay), wood and recycled paper fibers (such as mulches and matrices), bark or wood chips, green waste or composted organic materials, and biodegradable or synthetic blanket fibers are soil amendments that are likely to be visible in storm water runoff.

Suspended Sediment Concentration (SSC)

The suspended sediment concentration (SSC) test measures the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)

Suspended solids in a water sample include inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The total suspended solids test (TSS) test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Turbidity

Cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The scattering of light increases with a greater suspended load. Turbidity is commonly measured in Nephelometric Turbidity Units (NTU).

6.0 Sources of Further Assistance

Regional Water Quality Control Boards

Regional Water Quality Control Board	Address	Contact Name E-mail	Telephone/Fax
NORTH COAST REGION	5550 Skylane Blvd., Suite A Santa Rosa, CA 95403	John Short shorj@rb1.swrcb.ca.gov	(707) 576-2065 FAX: (707) 523-0135
SAN FRANCISCO BAY REGION	1515 Clay St., Suite 1400 Oakland, CA 94612	Mark Johnson stu36@rb2.swrcb.ca.gov	(510) 622-2493 FAX: (510) 622-2460
CENTRAL COAST REGION	895 Aerovista Place., Suite 101 San Luis Obispo, CA 93401	Jennifer Bitting jbitting@rb3.swrcb.ca.gov	(805) 549-3334 FAX: (805) 543-0397
LOS ANGELES REGION	320 W. 4th St., Suite 200 Los Angeles, CA 90013	Ejigu Soloman (Ventura County) esoloman@rb4.swrcb.ca.gov	213) 576-6727 FAX: (213) 576-6686
CENTRAL VALLEY REGION Sacramento Office	11020 Sun Center Drive, #200 Rancho Cordova, CA 95670	Sue McConnell mcconns@rb5s.swrcb.ca.gov George Day DayG@rb5s.swrcb.ca.gov Dannas Berchtold BerchtD@rb5s.swrcb.ca.gov Rich Muhl MuhlR@rb5s.swrcb.ca.gov	(916) 464-4798 FAX: (916) 464-4681 (916) 464-6404 FAX: (916) 464-4681 (916) 464-468[illegible] FAX: (916) 46[illegible]01 (916) 464-4749 FAX: (916) 464-4681
CENTRAL VALLEY REGION Fresno Branch Office	E. Street Fresno, CA 93706	Brian Erlandsen ErlandsenB@rb5f.swrcb.ca.gov	(559) 445-6046 FAX: (559) 445-5910
CENTRAL VALLEY REGION Redding Branch Office	415 Knollcrest Dr. Redding, CA 96002	Carole Crowe crowec@rb5r.swrcb.ca.gov	(530) 224-4849 FAX: (530) 224-4857
LAHONTAN REGION South Lake Tahoe Office	2501 Lake Tahoe Blvd. South Lake Tahoe, CA 96150	Jason Churchill Jchurchill@rb6s.swrcb.ca.gov	(530) 542-5571 FAX: (530) 544-2271
LAHONTAN REGION Victorville Office	15428 Civic Dr., Suite 100 Victorville, CA 92392	Doug Feay Dfeay@rb6v.swrcb.ca.gov Ted Saari Tsaari@rb6v.swrcb.ca.gov	(760) 241-7353 FAX: (760) 241-7308 (760) 241-7407

Regional Water Quality Control Board	Address	Contact Name E-mail	Telephone/Fax
COLORADO RIVER BASIN REGION	73-720 Fred Waring Dr., Suite 100 Palm Desert, CA 92260	Abdi Haile haila@rb7.swrcb.ca.gov Rosalyn Fleming flemr@rb7.swrcb.ca.gov	(760) 776-8939 FAX: (760) 341-6820 (760) 776-8939 FAX: (760) 341-6820
SANTA ANA REGION	3737 Main St., Suite 500 Riverside, CA 92501-3339	Michael Roth (Riverside County) mroth@rb8.swrcb.ca.gov Aaron Buck (Orange County) abuck@rb8.swrcb.ca.gov Muhammad Bashir (San Bernardino County) mbashir@rb8.swrcb.ca.gov	(909) 320-2027 FAX: (909) 781-6288 (909) 782-4469 FAX: (909) 781-6288 (909) 320-6396 FAX: (909) 781-6288
SAN DIEGO REGION	9174 SkyPark Court, Suite 100 San Diego, CA 92123	Benjamin Tobler Toblb@rb9.swrcb.ca.gov Eric Becker Becke@rb9.swrcb.ca.gov Ben Neill Neilb@rb9.swrcb.ca.gov	(858) 467-3272 (858) 492-1785 (858) 467-2983 FAX: (858) 571-6972

State Water Resources Control Board
Division of Water Quality
Storm Water Permit Section
P.O. Box 1977
Sacramento, CA 95812-1977
Construction Inquiry Line: (916) 341-5537
Web Site: http://www.waterboards.ca.gov/
e-mail: stormwater@waterboards.ca.gov

How to Obtain a List of State Certified Laboratories
http://www.dhs.ca.gov/ps/ls/elap/html/lablist_county.htm

Other Useful Web Sites

California Stormwater Quality Association http://www.casqa.org/

California Department of Transportation
Environmental Program http://www.dot.ca.gov/hq/env/index.htm

Storm Water Management Program http://www.dot.ca.gov/hq/env/stormwater/

7.0 Explanation of Sampling and Analysis Requirements

The sampling and analysis provisions were added to the CGP in response to the writ of mandate issued in *San Francisco BayKeeper v. California State Water Resources Control Board* (Sacramento County Superior Court, No. 99CS01929). The SWRCB has now been directed to provide explanation and direction for dischargers subject to the sampling and analysis requirements. One issue that is at the heart of this direction is that the SWRCB must explain how dischargers should interpret the results of the required sampling and analysis in deciding whether they are in compliance with the permit's receiving water limitations requirements. In essence, can the sampling and analysis results be used to provide a reliable answer to the question whether the discharge is causing or contributing to exceedance of water quality standards? As is explained below, the answer is a qualified "yes," in that the results must by used in concert with other information and in accordance with a logical process exercising best professional judgment. The results from the sampling and analysis will provide information regarding whether or not the BMPs are effective, and may provide some evidence of causing or contributing to exceedance of water quality standards. But the sampling and analysis requirements in a storm water permit are ultimately a diagnostic tool, and are not a guaranteed method of determining compliance with the receiving water limitations.

7.1 Requirement for Compliance With Water Quality Standards

The SWRCB is well aware of the requirement that it must issue industrial storm water permits, including the CGP, with requirements that require "strict compliance" with water quality standards. (CWA §402(p)(3)(A).) It is also aware that USEPA has concluded that in general it is not appropriate or legally required to include numeric, water quality-based effluent limitations in storm water permits. (40 CFR 122.44(k)(2).) In addition, we note that USEPA does not require sampling and analysis in industrial storm water permits (40 CFR §122.44(i)(4)) and it has elected not to include any sampling or analysis requirements in its own recently issued general construction permit. (See, http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.) USEPA has explained the limitations of sampling and analysis in industrial storm water permits. (See, 57 Fed. Reg. 11394 et seq. (1992).)

USEPA has addressed the relationship between BMPs and water quality standards, and has determined that almost all storm water discharges can be adequately controlled to meet water quality standards through BMPs. (NPDES Storm Water Program Questions and Answers, 1/21/04.) USEPA states that to evaluate effectiveness, NPDES permits may at the discretion of the permitting authority require visual inspections, evaluation of environmental indicators or measurable goals, effluent monitoring, or in-stream monitoring. (*Id.*) USEPA has made clear, both in its regulations and its guidance documents, that monitoring requirements are not necessary to enforce compliance with water quality standards. (In fact, neither EPA nor any state we are aware of has chosen to include monitoring requirements equivalent to, or more robust than, those already in place in the CGP.) Certainly, there is no legal requirement that the permitting authority must "prove" that a specific monitoring result is conclusive evidence of exceedance of a water quality standard. USEPA has conducted studies and modeling showing that existing permit programs as of 2003 were already capable of controlling approximately 80-90% of sediment runoff from construction sides, and that more stringent rules would remove

only 1% more. (USEPA Withdrawal of Proposed Effluent Limitation Guideline for Construction Industry, Volume 69, Federal Register 22472 et seq., April 26, 2004.) In conducting its state equivalency analysis, USEPA evaluated all states' programs, including California's, and determined that these were adequate and that further requirements were not mandated for compliance with federal law.

In USEPA's analysis of monitoring for construction (EPA-821-R-02-007), it concludes that planning monitoring for storm water is not possible because the flows are highly variable and temporarily stochastic. USEPA also notes that several of the criteria that could be used have special measurement problems because they are based on trapping efficiency, which is very difficult to measure. The most commonly used measurements, such as TSS, also have problems because to measure average or peak TSS it is necessary to measure TSS in the effluent over the duration of the outflow hydrograph as well as the flow rate. This requires that multiple samples be taken and that the samples be centered around the peak discharge. This is time consuming and difficult since the timing of an event and the timing of the peak discharge are not known beforehand. The average concentration is a weighted concentration, using flow rate as a weighting function.

USEPA also conducted an extensive evaluation of the literature to identify pollutants present in storm water discharges from construction sites. They found that while the literature contains extensive information on pollutants present in storm water discharges from urban areas, there were little data available on pollutants present in storm water discharges from construction sites during the active construction phase, other than for sediment, TSS and turbidity. USEPA was not able to identify sufficient data in the literature to warrant development of controls specific to pollutants other than sediment, TSS and turbidity in storm water discharges from construction sites. Some literature suggests that pollutants adhere to sediment, so that regulating TSS should also act as a control for other pollutants.

USEPA also evaluated the inclusion of organics, pesticides, and bacteria as potential pollutants of concern, but the literature indicated that control of these pollutants through conventional storm water management strategies is potentially much more difficult, and that there are little data linking their presence in storm water discharges directly with new land development activities. Source control (implementation of BMPs) may factor greatly into controlling these pollutant sources.

Permit compliance is based on the degree of control that can be achieved using various levels of pollution control technology (BMPs), a visual inspection requirement, coupled with parameter sampling in the instances where exposure has been determined. A storm water sample for non-visible pollutants indicating contamination is not conclusive proof of either a receiving water violation or of compliance with the Permit. But, it should give the discharger enough information to eliminate the source, detain the discharge, improve the BMPs, or take whatever action is necessary to abate the problem.

In the case of a direct discharge of sediment to a water body listed as impaired by sediment, sampling downstream of the discharge that shows a statistically significant increase in sediment over the upstream monitoring is strong evidence that the discharge from the construction site is causing or contributing to the impairment. We have suggested, however, that dischargers who

conduct such sampling should also sample the effluent. They may use the results of such sampling to overcome this presumption should the effluent sampling not be consistent with the downstream results. The case of a direct discharge of sediment to a water body impaired by sediment is a far simpler case than discharges that are indirect, that contain pollutants for which there may be assimilative capacity, or that contain pollutants that may be diluted in the receiving water. In those cases there is no simple way to conclude from sampling and analysis whether an applicable water quality standard is impacted by the storm water discharge. Instead, the data are most useful in alerting the discharger to the need to review BMPs and source control and should trigger a visual inspection.

The final determination as to whether discharges are in compliance with water quality standards will be made by RWQCBs through enforcement and other compliance activities. The sampling and analysis results are relevant, as is visual inspection and evaluation of BMPs. This method of assessment is known as "best professional judgment" and is consistent with USEPA's approach to regulating storm water discharges. This is the appropriate and lawful method of regulation pending adoption of effluent limitation guidelines by USEPA. (CWA §301.) USEPAproposed such guidelines for construction sites, but decided against adopting effluent limitation guidelines for storm water discharges associated with construction activity. (Effluent Guidelines Construction and Development Fact Sheet: Final Action – Selection of Non-Regulatory Option; EPA 821-F-04-001; March 2004; final action is at Volume 69, Federal Register 22472 et seq., April 26, 2004.) In taking this Final Action, USEPA concluded that the current system that allows states to develop their own programs is adequate and will result in "significant improvements in water quality and in the control of discharges of construction site stormwater runoff." In conducting its investigation of existing programs, USEPA found that every state already has regulations and programs in place that incorporate most of the provisions that USEPA considered in its most stringent proposal. USEPA further states that the following components of a construction program are: (1) Require preparation of a SWPPP; (2) Require site inspections by dischargers on a regular basis; (3) Require a combination of erosion and sediment controls; and (3) Require stabilization of soils after construction. USEPA decided that the existing programs (which do not require monitoring) are adequate and that any further regulatory requirements imposed by USEPA would be too costly and "would provide only marginal environmental improvements over regulations already in place." USEPA further concluded that additional controls would make housing unaffordable. Even when USEPA initially proposed adopting an effluent limitation guideline, it rejected even considering any monitoring requirements. In discussing the option of requiring monitoring in construction permits, USEPA listed several concerns, including that a national monitoring requirement would be impractical and that monitoring receiving waters at most construction sites is infeasible. (Effluent Limitation Guidelines and New Source Performance Standards for the Construction and Development Category: Proposed Rule, 67 Federal Register 42644, 42658-9 (6/24/02).) USEPA concluded that: "All of these factors would add significant expense to the construction process, with little or no added assurance in the effectiveness of control measures or expected environmental benefits." (*Id.*)

7.2 Background Contamination

The Court asked the SWRCB to explain the need for background (reference) sampling for non-visual pollutants. In essence, the Court question is why is it relevant whether the construction activity "increased" the level of pollutants in the runoff if pre-existing pollutants in runoff could also be of concern. There are several responses to this question. First, the CGP is intended to be a permit for storm water discharges associated with construction activity. (CWA §402(p); construction that disturbs greater than one acre is considered an industrial activity (40 CFR §122.26(b)(14)(x) and (15).) At this time, Congress has determined that it is not appropriate to regulate storm water runoff in general, and that only specified types of storm water discharges are subject to permitting. In fact, even at industrial sites, only the portions of the site that are used for industrial activities are subject to permitting. (40 CFR §122.26(b)(14).) Second, the focus of the CGP is on BMPs, and assuring that they are effective in preventing pollutants associated with construction activity from entering receiving waters. Where there are pollutants entering receiving waters, the required action is, through the iterative process in the Receiving Water Limitations, to evaluate and improve BMPs. Eliminating the source of contamination is the most direct and desirable approach to regulating construction runoff.

Regardless of whether a construction site owner *could* be held liable for historical contaminants running off the site, the purpose of the "reference" sample is clear: the permit does not contain numeric effluent limitations and is based on the BMP approach.[1] The two samples compare whether the BMPs that have been installed to prevent the non-visible pollutants associated with construction activity from entering receiving waters are effective. If "control samples" were not taken, the use of sampling to help determine permit compliance would be thwarted. If BMPs, including good housekeeping (source control) BMPs, are properly installed and maintained, they will effectively control the transportation of most pollutants. The background sampling will verify this fact. It is noted that the permit does require identification of historical pollutants, including pollutants that are the result of past usage. (CGP section A.5.b.3.) Sampling for these pollutants is required if the construction activity (e.g., disturbance of soil impacted by prior use) result in the mobilization and runoff of these pollutants.

The Court stated that USEPA documents indicate that reference sample collection and comparison may be unsuitable for persistent bio-accumulative pollutants. (The court cited USEPA's Water Quality Guidance for the Great Lakes System: Supplementary Information Document (GLSID), at p. 63.) A California Court of Appeal recently had occasion to discuss the appropriate regulation of persistent bio-accumulative pollutants in NPDES permits. In *Communities for a Better Environment v. SWRCB* (2003) 109 Cal. App. 4th 1089 (hrg. denied), the court upheld a permit for a refinery that did not include final numeric effluent limitations for dioxins, which are bio-accumulative pollutants. The court upheld an approach relying on BMPs and a watershed approach to dealing with persistent bio-accumulative pollutants through other methods, such as a TMDL. The GLSID adopted by USEPA describes a watershed approach to controlling and eliminating persistent pollutants, which will include adoption of TMDLs. (See, GLSID at p. 247) It is not limited to adoption of NPDES permits, and does not even address

[1] The Court has upheld this approach. See, Ruling on Submitted Matter, *San Francisco BayKeeper v. California SWRCB*, p. 5-6.

construction storm water permits in the region. The reference on page 63 concerns the appropriate approaches for TMDLs, not for construction storm water permits. USEPA concludes in the GLSID that the TMDL process is the appropriate means of effectively addressing persistent bio-accumulative pollutants.

Pollutants such as the Persistent Bio-accumulative and Toxic chemicals (PBT) currently being addressed under USEPA's PBT initiative [2] are not closely associated with modern day construction activity. The listed pesticides could possibly be found, however, as historic pollutants in the soil if the construction site had been used for agriculture prior to the 1970s (the 1990s in the case of toxaphene). Information about PBTs can be found through http://www.waterboards.ca.gov/stormwtr/gen_const.html Persistent bio-accumulative pollutants are strongly associated with soils and soil particles, so an aggressive erosion and sediment control program combined with visual inspections is the most understandable and cost-effective approach to controlling the discharge of such pollutants from construction activity.

If the area that the construction site is located in has prior contamination from PBTs, such issues should be dealt with on a watershed-based approach, such as a TMDL for the particular pollutant. The Construction CGP is not intended to address such issues. On the other hand, the permit does require all dischargers to control soil erosion and the movement of products of erosion off the site via the storm water discharge. Mobilization of pesticide residue by construction activity may trigger sampling and analysis requirements.

7.3 Parameters to Sample for to Determine the Presence of Non-Visible Pollutants in Runoff

It has been suggested that construction dischargers should consult the CTR, and then design a sampling strategy to sample their discharge for all non-visible CTR pollutants based on the numerical values provided. The CTR pollutants and numerical limits, however, have limited relevance to construction activity or storm water pollution from construction sites. The CTR pollutants currently known to be used and commonly found on construction sites can be found through http://www.waterboards.ca.gov/stormwtr/gen_const.html.

Of greater concern for construction discharges are the pollutants found in materials used in large quantities throughout California and exposed throughout the rainy season such as cement, fly-ash, and other recycled materials or by-products of combustion. (But many of these materials may be visible in runoff, affecting color for example.) The water quality standards for these materials will depend on their composition. Some of the more common storm water pollutants from construction activity such as glyphosate (herbicides), diazinon and chlopyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants) are not CTR pollutants. The use of diazinon and chlopyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if applications come into contact with storm water.

Other more common storm water contamination problems resulting from construction activity such as high pH values from cement and gypsum, high pH and TSS from wash waters and

[2] http://www.epa.gov/opptintr/pbt/aboutpbt.htm

chemical and fecal contamination from portable toilets are also not CTR pollutants. Some of these constituents do have numeric water quality objectives in individual Basin Plans, but many do not and are subject to narrative water quality standards such as not causing toxicity. This Fact Sheet provides direction on how to ascertain the applicable water quality standards for the receiving water. Of more use will be information the SWRCB will distribute upon completion of a contract with the University of California, which will list the most common pollutants, describe which construction materials they are associated with, and suggest parameters for sampling. At this time, dischargers are encouraged to discuss these issues with RWQCB staff and their own knowledgeable representative or Storm Water Quality Professionals..

7.4 The Watershed Approach to Storm Water Permitting

USEPA has endorsed a watershed approach to storm water permitting that focuses on BMPs in lieu of numeric effluent limitations and visual inspection and indicator monitoring in lieu of sampling for individual pollutant parameters. (Questions and Answers Regarding Implementation of an Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, 61 Fed. Reg. 57424 (11/6/96)). In a memorandum dated November 22, 2002, USEPA issued guidance on the interaction between storm water permits and TMDLs. The memorandum explains that, even in the case where a TMDL has been finalized and a wasteload allocation established for storm water discharges, the inclusion of numeric effluent limitations will be "rare." The memorandum therefore discusses monitoring requirements in BMP-based permits. It states that the monitoring should assess the effectiveness of the BMPs (i.e., appropriate monitoring is visual inspection) and *if monitoring for storm water is required,* it should be consistent with the state's watershed approach.

7.5 References and Record for this Guidance Document

In preparing this guidance document, the SWRCB has relied upon numerous background materials including federal statutes, regulations and guidance materials. These materials include Clean Water Act sections 303(d) and 402(p) and federal regulations implementing section 402(p) including 40 CFR sections 122.26, 122.44, 122.48, and Part 131. The SWRCB has also relied several guidance documents from USEPA. These include the preambles to the various storm water regulatory actions: 55 Fed. Reg. 47990 et seq. (11/16/90), 57 Fed. Reg. 11394 et seq. (4/2/92), and 64 Fed. Reg. 68722 et seq. The SWRCB has relied on the Porter-Cologne Water Quality Control Act (Water Code section 13000 et seq.), and implementing state regulations at Title 23, California Code of Regulations. The SWRCB has also relied on relevant court decisions, including: *Communities for a Better Environment v. SWRCB* (2003) 109 Cal. App. 4th 1089 (hrg. denied) (Water Boards have broad discretion in adopting effluent limitations for impaired waters). The SWRCB has also reviewed the recently-adopted USEPA general construction permit, published at http://cfpub.epa.gov/npdes/stormwater/cgp.cfm. and USEPA's decision not to adopt effluent limitations guidelines for storm water discharges from construction activities (Volume 69, Federal Register 22472 et seq., April 26, 2004) The SWRCB has also reviewed the USEPA multi-sector general permit for industrial activities (65 Fed. Reg. 64746 et seq. (10/30/00) and a general construction permit issued by USEPA Region IV (65 Fed. Reg 25122 et seq. (4/28/00). The record also contains submittals received by the SWRCB from

interested persons including the Keepers organizations, the Building Industry Legal Defense Foundation and the California Building Industry Association.

APPENDIX A
WATER QUALITY OBJECTIVES FOR SUSPENDED MATERIALS, SETTEABLE MATERIALS, SEDIMENT AND TURBIDITY

Below is a compilation of the water quality objectives for suspended materials, setteable material, sediment and turbidity as of August 2003 for each of the Regional Water Quality Control Boards. The water quality objectives are found in chapter 3 (unless otherwise noted) of the RWQCB's Basin Water Quality Control Plan (Basin Plan). Some of the weblinks go directly to Chapter 3 and others will go to the Basin Plan.

North Coast Regional Water Quality Control Board - Region 1

http://www.waterboards.ca.gov/rwqcb1/down/032202basin-plan.pdf

Suspended Material
Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Setteable Material
Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity
Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

San Francisco Bay Regional Water Quality Control Board - Region 2

http://www.waterboards.ca.gov/rwqcb2/Basin Plan/chap_3_bp.pdf

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life.

Setteable Material
Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses.

Suspended Material
Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU.

Central Coast Regional Water Quality Control Board - Region 3

http://www.waterboards.ca.gov/rwqcb3/BasinPlan/BP_text%5Cchapter_3%5CChapter3.htm

Suspended Material
Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Setteable Material
Waters shall not contain setteable material in concentrations that result in deposition of material that causes nuisance or adversely affects beneficial uses.

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Increase in Turbidity attributable to controllable factors shall not exceed the following limits:

1. Where natural turbidity is between 0 and 50 Jackson Turbidity Units (JTU), increases shall not exceed 20 percent.
2. Where natural turbidity is between 50 and 100 JTU, increases shall not exceed 10 JTU
3. Where natural turbidity is greater than 100 JTU, increases shall not exceed 10 percent.

Allowable zones of dilution within which higher concentrations will be tolerated will be defined for each discharge in discharge permits.

Los Angeles Regional Water Quality Control Board - Region 4

http://www.waterboards.ca.gov/rwqcb4/html/meetings/tmdl/Basin_plan/el_doc/BP3 Water Quality Objectives.pdf

Solid, Suspended, or Setteable Materials
Waters shall not contain suspended or setteable material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable factors shall not exceed the following limits:

Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%.

Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.

Allowable zones of initial dilution within which higher concentrations will be tolerated may be defined for each discharge in specific Waste Discharge Requirements.

Central Valley Regional Water Quality Control Board - Region 5

Sacramento River and San Joaquin River Basins

http://www.waterboards.ca.gov/rwqcb5/available_documents/basin_plans/bsnplnab.pdf

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Setteable Material
Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

Suspended Material
Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.

Exceptions to the above limits will be considered when a dredging operation can cause an increase in turbidity. In those cases, an allowable zone of dilution within which turbidity in excess of the limits may be tolerated will be defined for the operation and prescribed in a discharge permit.

For Folsom Lake (50) and American River (Folsom Dam to Sacramento River) (51), except for periods of storm runoff, the turbidity shall be less than or equal 10 NTUs. To the extent of any conflict with the general turbidity objective, the more stringent applies.

For Delta waters, the general objectives for turbidity apply subject to the following: except for periods of storm runoff, the turbidity of Delta waters shall not exceed 50 NTUs in the waters of the Central Delta and 150 NTUs in other Delta waters. Exceptions to the Delta specific objectives will be considered when a dredging operation can cause an increase in turbidity. In this case, an allowable zone of dilution within which turbidity in excess of limits can be tolerated will be defined for the operation and prescribed in a discharge permit.

Tulare Lake Basin

http://www.waterboards.ca.gov/rwqcb5/available_documents/basin_plans/bsnpln5c.pdf

Sediment
The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Setteable Material
Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

Suspended Material
Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

In determining compliance with the above limits, the Regional Water Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.

Lahontan Regional Water Quality Control Board - Region 6

http://www.waterboards.ca.gov/rwqcb6/BPlan/Bplantxt.pdf

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

Setteable Materials
Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of setteable materials shall not be raised by more that 0.1 milliliter per liter.

Suspended Materials
Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

Colorado River Basin Regional Water Quality Control Board - Region 7

http://www.waterboards.ca.gov/rwqcb7/documents/RB7Plan.pdf

Suspended Solids and Setteable Solids
Discharges of wastes or wastewater shall not contain suspended or setteable solids in concentrations which increase the turbidity of receiving waters, unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in turbidity does not adversely affect beneficial uses.

Sediment
The suspended sediment load and suspended sediment discharge rate to surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Santa Ana River Regional Water Quality Control Board - Region 8

http://www.waterboards.ca.gov/~rwqcb8/pdf/R8BPlan.pdf

(See Chapter 4)

Solids, Suspended and Setteable
Enclosed bays and estuaries shall not contain suspended or setteable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.

Turbidity
Increases in turbidity which result from controllable water quality factors shall comply with the following:

Natural Turbidity	Maximum Increase
0-50 NTU	20%
50-100 NTU	10 NTU
Greater than 100 NTU	10%

All enclosed bay and estuaries of the region shall be free of changes in turbidity which adversely affect beneficial uses

San Diego Regional Water Quality Control Board - Region 9

http://www.waterboards.ca.gov/rwqcb9/programs/Chapter 3 Water Quality Objectives.pdf

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Suspended and Setteable Solids
Water shall not contain suspended and setteable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.

Turbidity
Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Inland surface water shall not contain turbidity in excess of the numerical objectives described in Table 3-2. (This is reference to the Basin Plan; this table can be found via the weblink to the Region 9 Basin Plan).

Ground waters shall not contain turbidity in excess of the numerical objectives described in Table 3-3. (This is reference to the Basin Plan; this table can be found via the weblink to the Region 9 Basin Plan.)

The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed areas and dredging projects conducted in conformance with waste discharge requirements of the RWQCB. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

Natural Turbidity	Maximum Increase
0- 50 NTU	20% over natural turbidity level
50 - 100 NTU	10 NTU
Greater than 100 NTU	10% over natural turbidity level

In addition, within San Diego Bay, the transparency of bay waters, insofar as it may be influenced by any controllable factor, either directly or through induced conditions, shall not be less that 8 feet in more than

20 percent of the readings in any zone, as measured by standard Secchi disk. Wherever the waster is less than 10 feet deep, the Secchi disk reading shall not be less than 80 percent of the depth in more than 20 percent of the readings in any zone.

STATE WATER RESOURCES CONTROL BOARD (SWRCB)
ORDER NO. 99 - 08 - DWQ
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT NO. CAS000002

WASTE DISCHARGE REQUIREMENTS (WDRS) FOR DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH CONSTRUCTION ACTIVITY

The State Water Resources Control Board finds that:

1. Federal regulations for controlling pollutants in storm water runoff discharges were promulgated by the U.S. Environmental Protection Agency (USEPA) on November 16, 1990 (40 Code of Federal Regulations (CFR) Parts 122, 123, and 124). The regulations require discharges of storm water to surface waters associated with construction activity including clearing, grading, and excavation activities (except operations that result in disturbance of less than five acres of total land area and which are not part of a larger common plan of development or sale) to obtain an NPDES permit and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate storm water pollution.

   On December 8, 1999 federal regulations promulgated by USEPA (40CFR Parts 9, 122, 123, and 124) expanded the NPDES storm water program to include storm water discharges from municipal separate storm sewer systems (MS4s) and construction sites that were smaller than those previously included in the program. Federal regulation 40 CFR § 122.26(b)(15) defines small construction activity as including clearing, grading, and excavating that result in land disturbance of equal to or greater than one acre or less than five acres or is part of a larger common plan of development or sale. Permit applications for small construction activities are due by March 10, 2003.

2. This General Permit regulates pollutants in discharges of storm water associated with construction activity (storm water discharges) to surface waters, except from those areas on Tribal Lands; Lake Tahoe Hydrologic Unit; construction projects which disturb less than one acre, unless part of a larger common plan of development or sale; and storm water discharges which are determined ineligible for coverage under this General Permit by the California Regional Water Quality Control Boards (RWQCBs). Attachment 1 contains addresses and telephone numbers of each RWQCB office.

3. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to separate storm sewer systems or other watercourses within their jurisdiction, as allowed by State and Federal law.

4. To obtain authorization for proposed storm water discharges to surface waters, pursuant to this General Permit, the landowner (discharger) must submit a Notice of Intent (NOI) with a vicinity map and the appropriate fee to the SWRCB prior to commencement of construction activities. In addition, coverage under this General Permit shall not occur until the applicant develops a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the requirements of Section A of this permit for the project. For proposed construction activity conducted on easements or on nearby property by agreement or permission, or by an owner or lessee of a mineral estate (oil, gas, geothermal, aggregate, precious metals, and/or industrial minerals) entitled to conduct the activities, the entity responsible for the construction activity must submit the NOI and filing fee and shall be responsible for development of the SWPPP.

5. If an individual NPDES Permit is issued to a discharger otherwise subject to this General Permit or if an alternative General Permit is subsequently adopted which covers storm water discharges regulated by this General Permit, the applicability of this General Permit to such discharges is automatically terminated on the effective date of the individual permit or the date of approval for coverage under the subsequent General Permit.

6. This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with section 13389 of the California Water Code.

7. The SWRCB adopted the California Ocean Plan, and the RWQCBs have adopted and the SWRCB has approved Water Quality Control Plans (Basin Plans). Dischargers regulated by this General Permit must comply with the water quality standards in these Basin Plans and subsequent amendments thereto.

8. The SWRCB finds storm water discharges associated with construction activity to be a potential significant sources of pollutants. Furthermore, the SWRCB finds that storm water discharges associated with construction activities have the reasonable potential to cause or contribute to an excursion above water quality standards for sediment in the water bodies listed in Attachment 3 to this permit.

9. It is not feasible at this time to establish numeric effluent limitations for pollutants in storm water discharges from construction activities. Instead, the provisions of this General Permit require implementation of Best Management Practices (BMPs) to control and abate the discharge of pollutants in storm water discharges.

10. Discharges of non-storm water may be necessary for the completion of certain construction projects. Such discharges include, but are not limited to: irrigation of vegetative erosion control measures, pipe flushing and testing, street cleaning, and dewatering. Such discharges are authorized by this General Permit as long as they (a) do comply with Section A.9 of this General Permit, (b) do not cause or contribute to violation of any water quality standard, (c) do not violate any other provision of this

General Permit, (d) do not require a non-storm water permit as issued by some RWQCBs, and (e) are not prohibited by a Basin Plan. If a non-storm water discharge is subject to a separate permit adopted by a RWQCB, the discharge must additionally be authorized by the RWQCB permit.

11. Following adoption of this General Permit, the RWQCBs shall enforce the provisions herein including the monitoring and reporting requirements.

12. Following public notice in accordance with State and Federal laws and regulations, the SWRCB in a public meeting on June 8, 1998, heard and considered all comments. The SWRCB has prepared written responses to all significant comments.

13. This Order is an NPDES permit in compliance with section 402 of the Clean Water Act (CWA) and shall take effect upon adoption by the SWRCB provided the Regional Administrator of the USEPA has no objection. If the USEPA Regional Administrator objects to its issuance, the General Permit shall not become effective until such objection is withdrawn.

14. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA section 404 and does not constitute a waiver of water quality certification under CWA section 401.

15 The Monitoring Program and Reporting Requirements are modified in compliance with a judgment in the case of San Francisco BayKeeper, et al. v. State Water Resources Control Board. The modifications include sampling and analysis requirements for direct discharges of sediment to waters impaired due to sediment and for pollutants that are not visually detectable in runoff that may cause or contribute to an exceedance of water quality objectives.

16 Storm water discharges associated with industrial activity that are owned or operated by municipalities serving populations less than 100,000 people are no longer exempt from the need to apply for or obtain a storm water discharge permit. A temporary exemption, which was later extended by USEPA, was provided under section 1068(c) of the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991. Federal regulation 40 CFR § 122.26(e)(1)(ii) requires the above municipalities to submit permit application by March 10, 2003.

17 This permit may be reopened and modified to include different monitoring requirements for small construction activity than for construction activity over five (5) acres.

IT IS HEREBY ORDERED that all dischargers who file an NOI indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

A. DISCHARGE PROHIBITIONS:

1. Authorization pursuant to this General Permit does not constitute an exemption to applicable discharge prohibitions prescribed in Basin Plans, as implemented by the nine RWQCBs.

2. Discharges of material other than storm water which are not otherwise authorized by an NPDES permit to a separate storm sewer system (MS4) or waters of the nation are prohibited, except as allowed in Special Provisions for Construction Activity, C.3.

3. Storm water discharges shall not cause or threaten to cause pollution, contamination, or nuisance.

4. Storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of a reportable quantity listed in 40 CFR Part 117 and/or 40 CFR Part 302.

B. RECEIVING WATER LIMITATIONS:

1. Storm water discharges and authorized nonstorm water discharges to any surface or ground water shall not adversely impact human health or the environment.

2. The SWPPP developed for the construction activity covered by this General Permit shall be designed and implemented such that storm water discharges and authorized nonstorm water discharges shall not cause or contribute to an exceedance of any applicable water quality standards contained in a Statewide Water Quality Control Plan and/or the applicable RWQCB's Basin Plan.

3. Should it be determined by the discharger, SWRCB, or RWQCB that storm water discharges and/or authorized nonstorm water discharges are causing or contributing to an exceedance of an applicable water quality standard, the discharger shall:

   a. Implement corrective measures immediately following discovery that water quality standards were exceeded, followed by notification to the RWQCB by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. This notification shall be followed by a report within 14-calender days to the appropriate RWQCB, unless otherwise directed by the RWQCB, describing (1) the nature and cause of the water quality standard exceedance; (2) the BMPs currently being implemented; (3) any additional BMPs which will be implemented to

prevent or reduce pollutants that are causing or contributing to the exceedance of water quality standards; and (4) any maintenance or repair of BMPs. This report shall include an implementation schedule for corrective actions and shall describe the actions taken to reduce the pollutants causing or contributing to the exceedance.

b. The discharger shall revise its SWPPP and monitoring program immediately after the report to the RWQCB to incorporate the additional BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring needed.

c. Nothing in this section shall prevent the appropriate RWQCB from enforcing any provisions of this General Permit while the discharger prepares and implements the above report.

C. SPECIAL PROVISIONS FOR CONSTRUCTION ACTIVITY:

1. All dischargers shall file an NOI and pay the appropriate fee for construction activities conducted at each site as required by Attachment 2: Notice of Intent--General Instructions.

2. All dischargers shall develop and implement a SWPPP in accordance with Section A: Storm Water Pollution Prevention Plan. The discharger shall implement controls to reduce pollutants in storm water discharges from their construction sites to the BAT/BCT performance standard.

3. Discharges of non-storm water are authorized only where they do not cause or contribute to a violation of any water quality standard and are controlled through implementation of appropriate BMPs for elimination or reduction of pollutants. Implementation of appropriate BMPs is a condition for authorization of non-storm water discharges. Non-storm water discharges and the BMPs appropriate for their control must be described in the SWPPP. Wherever feasible, alternatives which do not result in discharge of nonstorm water shall be implemented in accordance with Section A.9. of the SWPPP requirements.

4. All dischargers shall develop and implement a monitoring program and reporting plan in accordance with Section B: Monitoring Program and Reporting Requirements.

5. All dischargers shall comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to separate storm sewer systems or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs developed to comply with NPDES permits issued by the RWQCBs to local agencies.

6. All dischargers shall comply with the standard provisions and reporting requirements contained in Section C: Standard Provisions.

7. The discharger may terminate coverage for a portion of the project under this General Permit when ownership of a portion of this project has been transferred or when a phase within this multi-phase project has been completed. When ownership has transferred, the discharger must submit to its RWQCB a Change of Information Form (COI) Attachment 4 with revised site map and the name, address and telephone number of the new owner(s). Upon transfer of title, the discharger should notify the new owner(s) of the need to obtain coverage under this General Permit. The new owner must comply with provisions of Sections A. 2. (c) and
B. 2. (b) of this General Permit. To terminate coverage for a portion of the project when a phase has been completed, the discharger must submit to its RWQCB a COI with a revised map that identifies the newly delineated site.

8. The discharger may terminate coverage under this General Permit for a complete project by submitting to its RWQCB a Notice of Termination Form (NOT), and the post-construction BMPs plan according to Section A.10 of this General Permit. Note that a construction project is considered complete only when all portions of the site have been transferred to a new owner; or the following conditions have been met:

   a. There is no potential for construction related storm water pollution,

   b. All elements of the SWPPP have been completed,

   c. Construction materials and waste have been disposed of properly,

   d. The site is in compliance with all local storm water management requirements, and

   e. A post-construction storm water management plan is in place as described in the site's SWPPP.

9. This General Permit expires five years from the date of adoption.

D. REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) AUTHORITIES:

1. RWQCBs shall:

   a. Implement the provisions of this General Permit. Implementation of this General Permit may include, but is not limited to requesting the submittal of SWPPPS, reviewing SWPPPs, reviewing monitoring reports, conducting compliance inspections, and taking enforcement actions.

   b. Issue permits as they deem appropriate to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a RWQCB, the affected dischargers shall no longer be regulated by this General Permit.

2. RWQCBs may require, on a case-by-case basis, the inclusion of an analysis of potential downstream impacts on receiving waterways due to the permitted construction.

3. RWQCBs may provide information to dischargers on the development and implementation of SWPPPs and monitoring programs and may require revisions to SWPPPs and monitoring programs.

4. RWQCBs may require dischargers to retain records for more than three years.

5. RWQCBs may require additional monitoring and reporting program requirements including sampling and analysis of discharges to water bodies listed in Attachment 3 to this permit. Additional requirements imposed by the RWQCB should be consistent with the overall monitoring effort in the receiving waters.

6. RWQCBs may issue individual NPDES permits for those construction activities found to be ineligible for coverage under this permit.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on August 19, 1999.

AYE: James M. Stubchaer
Mary Jane Forster
John W. Brown
Arthur G. Baggett, Jr.

NO: None

ABSENT: None

ABSTAIN: None

/s/

Maureen Marché
Administrative Assistant to the Board

SECTION A: STORM WATER POLLUTION PREVENTION PLAN

1. Objectives

A Storm Water Pollution Prevention Plan (SWPPP) shall be developed and implemented to address the specific circumstances for each construction site covered by this General Permit. The SWPPP shall be certified in accordance with the signatory requirements of section C, Standard Provision for Construction Activities (9). The SWPPP shall be developed and amended or revised, when necessary, to meet the following objectives:

a. Identify all pollutant sources including sources of sediment that may affect the quality of storm water discharges associated with construction activity (storm water discharges) from the construction site, and

b. Identify non-storm water discharges, and

c. Identify, construct, implement in accordance with a time schedule, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in storm water discharges and authorized nonstorm water discharges from the construction site during construction, and

d. Develop a maintenance schedule for BMPs installed during construction designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).

e. Identify a sampling and analysis strategy and sampling schedule for discharges from construction activity which discharge directly into water bodies listed on Attachment 3. (Clean Water Act Section 303(d) [303(d)] Water Bodies listed for Sedimentation).

f. For all construction activity, identify a sampling and analysis strategy and sampling schedule for discharges that have been discovered through visual monitoring to be potentially contaminated by pollutants not visually detectable in the runoff.

2. Implementation Schedule

a. For construction activity commencing on or after adoption of this General Permit, the SWPPP shall be developed prior to the start of soil-disturbing activity in accordance with this Section and shall be implemented concurrently with commencement of soil-disturbing activities.

b. Existing permittees engaging in construction activities covered under the terms of the previous General Construction Permit SWPPP (WQ Order No.92-08-DWQ) shall continue to implement their existing SWPPP and shall implement any

necessary revisions to their SWPPP in accordance with this Section of the General Permit in a timely manner, but in no case more than 90-calender days from the date of adoption of this General Permit.

c. For ongoing construction activity involving a change of ownership of property, the new owner shall review the existing SWPPP and amend if necessary, or develop a new SWPPP within 45-calender days.

d. Existing permittees shall revise their SWPPP in accordance with the sampling and analysis modifications prior to August 1, 2001. For ongoing construction activity involving a change of ownership the new owner shall review the existing SWPPP and amend the sampling and analysis strategy, if required, within 45 days. For construction activity commencing after the date of adoption, the SWPPP shall be developed in accordance with the modification language adopted.

3. Availability

The SWPPP shall remain on the construction site while the site is under construction during working hours, commencing with the initial construction activity and ending with termination of coverage under the General Permit.

4. Required Changes

a. The discharger shall amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of pollutants to surface waters, ground waters, or a municipal separate storm sewer system (MS4). The SWPPP shall also be amended if the discharger violates any condition of this General Permit or has not achieved the general objective of reducing or eliminating pollutants in storm water discharges. If the RWQCB determines that the discharger is in violation of this General Permit, the SWPPP shall be amended and implemented in a timely manner, but in no case more than 14-calendar days after notification by the RWQCB. All amendments should be dated and directly attached to the SWPPP.

b. The RWQCB or local agency with the concurrence of the RWQCB may require the discharger to amend the SWPPP.

5. Source Identification

The SWPPP shall include: (a) project information and (b) pollutant source identification combined with an itemization of those BMPs specifically chosen to control the pollutants listed.

a. Project Information

(1) The SWPPP shall include a vicinity map locating the project site with respect to easily identifiable major roadways, geographic features, or landmarks. At a minimum, the map must show the construction site perimeter, the geographic features surrounding the site, and the general topography.

(2) The SWPPP shall include a site map(s) which shows the construction project in detail, including the existing and planned paved areas and buildings.

(a) At a minimum, the map must show the construction site perimeter; existing and proposed buildings, lots, roadways, storm water collection and discharge points; general topography both before and after construction; and the anticipated discharge location(s) where the storm water from the construction site discharges to a municipal storm sewer system or other water body.

(b) The drainage patterns across the project area must clearly be shown on the map, and the map must extend as far outside the site perimeter as necessary to illustrate the relevant drainage areas. Where relevant drainage areas are too large to depict on the map, map notes or inserts illustrating the upstream drainage areas are sufficient.

(c) Temporary on-site drainages to carry concentrated flow shall be selected to comply with local ordinances, to control erosion, to return flows to their natural drainage courses, and to prevent damage to downstream properties.

3. Information presented in the SWPPP may be represented either by narrative or by graphics. Where possible, narrative descriptions should be plan notes. Narrative descriptions which do not lend themselves to plan notes can be contained in a separate document which must be referenced on the plan.

b. Pollutant Source and BMP Identification

The SWPPP shall include a description of potential sources which are likely to add pollutants to storm water discharges or which may result in nonstorm water discharges from the construction site. Discharges originating from off-site which flow across or through areas disturbed by construction that may contain pollutants should be reported to the RWQCB.

The SWPPP shall:

(1) Show drainage patterns and slopes anticipated after major grading activities are completed. Runoff from off-site areas should be prevented from flowing through areas that have been disturbed by construction unless appropriate conveyance systems are in place. The amount of anticipated storm water run-on must be considered to determine the appropriateness of the BMPs chosen. Show all calculations for anticipated storm water run-on, and describe all BMPs implemented to divert off-site drainage described in section A. 5 a. (2) (c) around or through the construction project.

(2) Show the drainage patterns into each on-site storm water inlet point or receiving water. Show or describe the BMPs that will protect operational storm water inlets or receiving waters from contaminated discharges other than sediment discharges, such as, but not limited to: storm water with elevated pH levels from contact with soil amendments such as lime or gypsum; slurry from sawcutting of concrete or asphalt ;washing of exposed aggregate concrete; concrete rinse water; building washing operations; equipment washing operations; minor street washing associated with street delineation; and/or sealing and paving activities occurring during rains.

(3) Show existing site features that, as a result of known past usage, may contribute pollutants to storm water, (e.g., toxic materials that are known to have been treated, stored, disposed, spilled, or leaked onto the construction site). Show or describe the BMPs implemented to minimize the exposure of storm water to contaminated soil or toxic materials.

(4) Show areas designated for the (a) storage of soil or waste, (b) vehicle storage and service areas, (c) construction material loading, unloading, and access areas, (d) equipment storage, cleaning, and maintenance areas.

(5) Describe the BMPs for control of discharges from waste handling and disposal areas and methods of on-site storage and disposal of construction materials and construction waste. Describe the BMPs designed to minimize or eliminate the exposure of storm water to construction materials, equipment, vehicles, waste storage areas, or service areas. The BMPs described shall be in compliance with Federal, State, and local laws, regulations, and ordinances.

(6) Describe all post-construction BMPs for the project, and show the location of each BMP on the map. (Post-construction BMPs consist of permanent features designed to minimize pollutant discharges, including sediment, from the site after construction has been completed.) Also, describe the agency or parties to be the responsible party for long-term maintenance of these BMPs.

(7) Show the locations of direct discharge from the construction site into a Section 303(d) list water body. Show the designated sampling locations in the receiving waters, which represent the prevailing conditions of the water bodies upstream of the construction site discharge and immediately downstream from the last point of discharge.

(8) Show the locations designated for sampling the discharge from areas identified in Section A. 5. b. (2), (3), and (4) and Section A. 5. c. (1) and (2). Samples shall be taken should visual monitoring indicate that there has been a breach, malfunction, leakage, or spill from a BMP which could result in the discharge in storm water of pollutants that would not be visually detectable, or if storm water comes into contact with soil amendments or other exposed materials or contamination and is allowed to be discharged. Describe the sampling procedure, location, and rationale for obtaining the uncontaminated sample of storm water.

c. Additional Information

(1) The SWPPP shall include a narrative description of pollutant sources and BMPs that cannot be adequately communicated or identified on the site map. In addition, a narrative description of preconstruction control practices (if any) to reduce sediment and other pollutants in storm water discharges shall be included.

(2) The SWPPP shall include an inventory of all materials used and activities performed during construction that have the potential to contribute to the discharge of pollutants other than sediment in storm water. Describe the BMPs selected and the basis for their selection to eliminate or reduce these pollutants in the storm water discharges.

(3) The SWPPP shall include the following information regarding the construction site surface area: the size (in acres or square feet), the runoff coefficient before and after construction, and the percentage that is impervious (e.g., paved, roofed, etc.) before and after construction.

(4) The SWPPP shall include a copy of the NOI, and the Waste Discharge Identification (WDID) number. Should a WDID number not be received from the SWRCB at the time construction commences, the discharger shall include proof of mailing of the NOI, e.g., certified mail receipt, copy of check, express mail receipt, etc.

(5) The SWPPP shall include a construction activity schedule which describes all major activities such as mass grading, paving, lot or parcel

improvements at the site and the proposed time frame to conduct those activities.

(6) The SWPPP shall list the name and telephone number of the qualified person(s) who have been assigned responsibility for prestorm, poststorm, and storm event BMP inspections; and the qualified person(s) assigned responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

6. Erosion Control

Erosion control, also referred to as "soil stabilization" is the most effective way to retain soil and sediment on the construction site. The most efficient way to address erosion control is to preserve existing vegetation where feasible, to limit disturbance, and to stabilize and revegetate disturbed areas as soon as possible after grading or construction. Particular attention must be paid to large mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great. Mass graded construction sites may be exposed for several years while the project is being built out. Thus, there is potential for significant sediment discharge from the site to surface waters.

At a minimum, the discharger/operator must implement an effective combination of erosion and sediment control on all disturbed areas during the rainy season. These disturbed areas include rough graded roadways, slopes, and building pads. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single-most important factor in reducing erosion at construction sites. The discharger shall consider measures such as: covering with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, permanent seeding, and a variety of other measures.

The SWPPP shall include a description of the erosion control practices, including a time schedule, to be implemented during construction to minimize erosion on disturbed areas of a construction site. The discharger must consider the full range of erosion control BMPs. The discharger must consider any additional site-specific and seasonal conditions when selecting and implementing appropriate BMPs. The above listed erosion control measures are examples of what should be considered and are not exclusive of new or innovative approaches currently available or being developed.

a. The SWPPP shall include:

(1) An outline of the areas of vegetative soil cover or native vegetation onsite which will remain undisturbed during the construction project.

(2) An outline of all areas of soil disturbance including cut or fill areas which will be stabilized during the rainy season by temporary or permanent erosion control measures, such as seeding, mulch, or blankets, etc.

(3) An outline of the areas of soil disturbance, cut, or fill which will be left exposed during any part of the rainy season, representing areas of potential soil erosion where sediment control BMPs are required to be used during construction.

(4) A proposed schedule for the implementation of erosion control measures.

b. The SWPPP shall include a description of the BMPs and control practices to be used for both temporary and permanent erosion control measures.

c. The SWPPP shall include a description of the BMPs to reduce wind erosion at all times, with particular attention paid to stock-piled materials.

7. Stabilization

(1) All disturbed areas of the construction site must be stabilized. Final stabilization for the purposes of submitting a NOT is satisfied when:

-All soil disturbing activities are completed AND EITHER OF THE TWO FOLLOWING CRITERIA ARE MET:

-A uniform vegetative cover with 70 percent coverage has been established OR:

-equivalent stabilization measures have been employed. These measures include the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

(2) Where background native vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: If the native vegetation covers 50 percent of the ground surface, 70 percent of 50 percent (.70 X .50=.35) would require 35 percent total uniform surface coverage.

8. <u>Sediment Control</u>

The SWPPP shall include a description or illustration of BMPs which will be implemented to prevent a net increase of sediment load in storm water discharge relative to preconstruction levels. Sediment control BMPs are required at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during the rainy season. Sediment control practices may include filtration devices and barriers (such as fiber rolls, silt fence, straw bale barriers, and gravel inlet filters) and/or settling devices (such as sediment traps or basins). Effective filtration devices, barriers, and settling devices shall be selected, installed and maintained properly. A proposed schedule for deployment of sediment control BMPs shall be included in the SWPPP. These are the most basic measures to prevent sediment from leaving the project site and moving into receiving waters. Limited exemptions may be authorized by the RWQCB when work on active areas precludes the use of sediment control BMPs temporarily. Under these conditions, the SWPPP must describe a plan to establish perimeter controls prior to the onset of rain.

During the nonrainy season, the discharger is responsible for ensuring that adequate sediment control materials are available to control sediment discharges at the downgrade perimeter and operational inlets in the event of a predicted storm. The discharger shall consider a full range of sediment controls, in addition to the controls listed above, such as straw bale dikes, earth dikes, brush barriers, drainage swales, check dams, subsurface drain, sandbag dikes, fiber rolls, or other controls. At a minimum, the discharger/operator must implement an effective combination of erosion and sediment control on all disturbed areas during the rainy season.

If the discharger chooses to rely on sediment basins for treatment purposes, sediment basins shall, at a minimum, be designed and maintained as follows:

Option 1: Pursuant to local ordinance for sediment basin design and maintenance, provided that the design efficiency is as protective or more protective of water quality than Option 3.

OR

Option 2: Sediment basin(s), as measured from the bottom of the basin to the principal outlet, shall have at least a capacity equivalent to 3,600 cubic feet of storage per acre draining into the sediment basin. The length of the basin shall be more than twice the width of the basin. The length is determined by measuring the distance between the inlet and the outlet; and the depth must not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency.

OR

Option 3: Sediment basin(s) shall be designed using the standard equation:

$$As=1.2Q/Vs$$

Where: As is the minimum surface area for trapping soil particles of a certain size; Vs is the settling velocity of the design particle size chosen; and Q=C x I x A where Q is the discharge rate measured in cubic feet per second; C is the runoff coefficient; I is the precipitation intensity for the 10-year, 6-hour rain event and A is the area draining into the sediment basin in acres. The design particle size shall be the smallest soil grain size determined by wet sieve analysis, or the fine silt sized (0.01mm) particle, and the Vs used shall be 100 percent of the calculated settling velocity.

The length is determined by measuring the distance between the inlet and the outlet; the length shall be more than twice the dimension as the width; the depth shall not be less than three feet nor greater than five feet for safety reasons and for maximum efficiency (two feet of storage, two feet of capacity). The basin(s) shall be located on the site where it can be maintained on a year-round basis and shall be maintained on a schedule to retain the two feet of capacity;

OR

Option 4: The use of an equivalent surface area design or equation, provided that the design efficiency is as protective or more protective of water quality than Option 3.

A sediment basin shall have a means for dewatering within 7-calendar days following a storm event. Sediment basins may be fenced if safety (worker or public) is a concern.

The outflow from a sediment basin that discharges into a natural drainage shall be provided with outlet protection to prevent erosion and scour of the embankment and channel.

The discharger must consider any additional site-specific and seasonal conditions when selecting and designing sediment control BMPs. The above listed sediment control measures are examples of what should be considered and are not exclusive of new or innovative approaches currently available or being developed.

The SWPPP shall include a description of the BMPs to reduce the tracking of sediment onto public or private roads at all times. These public and private roads shall be inspected and cleaned as necessary. Road cleaning BMPs shall be discussed in the SWPPP and will not rely on the washing of accumulated sediment or silt into the storm drain system.

9. Non-Storm Water Management

Describe all non-storm water discharges to receiving waters that are proposed for the construction project. Non-storm water discharges should be eliminated or reduced to the extent feasible. Include the locations of such discharges and descriptions of all BMPs designed for the control of pollutants in such discharges. Onetime discharges shall be monitored during the time that such discharges are occurring. A qualified person should be assigned the responsibility for ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems (consistent with BAT/BCT), and the name and contact number of that person should be included in the SWPPP document.

Discharging sediment-laden water which will cause or contribute to an exceedance of the applicable RWQCB's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain without filtration or equivalent treatment is prohibited.

10. Post-Construction Storm Water Management

The SWPPP shall include descriptions of the BMPs to reduce pollutants in storm water discharges after all construction phases have been completed at the site (Post-Construction BMPs). Post-Construction BMPs include the minimization of land disturbance, the minimization of impervious surfaces, treatment of storm water runoff using infiltration, detention/retention, biofilter BMPs, use of efficient irrigation systems, ensuring that interior drains are not connected to a storm sewer system, and appropriately designed and constructed energy dissipation devices. These must be consistent with all local post-construction storm water management requirements, policies, and guidelines. The discharger must consider site-specific and seasonal conditions when designing the control practices. Operation and maintenance of control practices after construction is completed shall be addressed, including short-and long-term funding sources and the responsible party.

11. Maintenance, Inspection, and Repair

The SWPPP shall include a discussion of the program to inspect and maintain all BMPs as identified in the site plan or other narrative documents throughout the entire duration of the project. A qualified person will be assigned the responsibility to conduct inspections. The name and telephone number of that person shall be listed in the SWPPP document. Inspections will be performed before and after storm events and once each 24-hour period during extended storm events to identify BMP effectiveness and implement repairs or design changes as soon as feasible depending upon field conditions. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible after the conclusion of each storm depending upon worker safety.

For each inspection required above, the discharger shall complete an inspection checklist. At a minimum, an inspection checklist shall include:

a. Inspection date.

b. Weather information: best estimate of beginning of storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall (inches).

c. A description of any inadequate BMPs.

d. If it is possible to safely access during inclement weather, list observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list result of visual inspection at relevant outfall, discharge point, or downstream location and projected required maintenance activities.

e. Corrective actions required, including any changes to SWPPP necessary and implementation dates.

f. Inspectors name, title, and signature.

The dischargers shall prepare their inspection checklists using the inspection checklist form provided by the SWRCB or RWQCB or on forms that contain the equivalent information.

12. Training

Individuals responsible for SWPPP preparation, implementation, and permit compliance shall be appropriately trained, and the SWPPP shall document all training. This includes those personnel responsible for installation, inspection, maintenance, and repair of BMPs. Those responsible for overseeing, revising, and amending the SWPPP shall also document their training. Training should be both formal and informal, occur on an ongoing basis when it is appropriate and convenient, and should include training/workshops offered by the SWRCB, RWQCB, or other locally recognized agencies or professional organizations.

13. List of Contractors/Subcontractors

The SWPPP shall include a list of names of all contractors, (or subcontractors) and individuals responsible for implementation of the SWPPP. This list should include telephone numbers and addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers should also be included.

14. Other Plans

This SWPPP may incorporate by reference the appropriate elements of other plans required by local, State, or Federal agencies. A copy of any requirements incorporated by reference shall be kept at the construction site.

15. Public Access

The SWPPP shall be provided, upon request, to the RWQCB. The SWPPP is considered a report that shall be available to the public by the RWQCB under section 308(b) of the Clean Water Act.

16. Preparer Certification

The SWPPP and each amendment shall be signed by the landowner (discharger) or his representative and include the date of initial preparation and the date of each amendment.

SECTION B: MONITORING PROGRAM AND REPORTING REQUIREMENTS

1. Required Changes

The RWQCB may require the discharger to conduct additional site inspections, to submit reports and certifications, or perform sampling and analysis.

2. Implementation

a. The requirements of this Section shall be implemented at the time of commencement of construction activity (see also Section A. 2. Implementation Schedule). The discharger is responsible for implementing these requirements until construction activity is complete and the site is stabilized.

b. For ongoing construction activity involving a change in ownership of property covered by this General Permit, the new owner must complete a NOI and implement the requirements of this Section concurrent with the change of ownership. For changes of information, the owner must follow instructions in C. 7. Special Provisions for Construction Activity of the General Permit.

3. Site Inspections

Qualified personnel shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. The name(s) and contact number(s) of the assigned inspection personnel shall be listed in the SWPPP. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that the BMPs have functioned adequately. During extended storm events, inspections shall be required each 24-hour period. Best Management Practices (BMPs) shall be evaluated for adequacy and proper implementation and whether additional BMPs are required in accordance with the terms of the General Permit (see language in Section A. 11. Maintenance, Inspection, and Repair). Implementation of nonstorm water discharge BMPs shall be verified and their

effectiveness evaluated. One time discharges of non-storm water shall be inspected when such discharges occur.

4. Compliance Certification

Each discharger or qualified assigned personnel listed by name and contact number in the SWPPP must certify annually that construction activities are in compliance with the requirements of this General Permit and the SWPPP. This Certification shall be based upon the site inspections required in Item 3 of this Section. The certification must be completed by July 1 of each year.

5. Noncompliance Reporting

Dischargers who cannot certify compliance, in accordance with Item 4 of this Section and/or who have had other instances of noncompliance excluding exceedances of water quality standards as defined in section B. 3. Receiving Water Limitations Language, shall notify the appropriate RWQCB within 30 days. Corrective measures should be implemented immediately following discovery that water quality standards were exceeded. The notifications shall identify the noncompliance event, including an initial assessment of any impact caused by the event; describe the actions necessary to achieve compliance; and include a time schedule subject to the modifications by the RWQCB indicating when compliance will be achieved. Noncompliance notifications must be submitted within 30-calendar days of identification of noncompliance.

6. Monitoring Records

Records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated. With the exception of noncompliance reporting, dischargers are not required to submit these records.

7. Monitoring Program for Sedimentation/Siltation

Dischargers of storm water associated with construction activity that directly enters a water body listed in Attachment 3 shall conduct a sampling and analysis program for the pollutants (sedimentation/siltation or turbidity) causing the impairment. The discharger shall monitor for the applicable parameter. If the water body is listed for sedimentation or siltation, samples should be analyzed for Settleable Solids (ml/l) and Total Suspended Solids (mg/l). Alternatively or in addition, samples may be analyzed for suspended sediment concentration according to ASTM D3977-97. If the water body is listed for turbidity, samples should be analyzed for turbidity (NTU). Discharges that flow through tributaries that are not listed in Attachment 3 or that flow into Municipal Separate Storm Sewer Systems (MS4) are not subject to these sampling and analysis requirements. The sampling and analysis parameters and procedures must be designed to determine whether the BMPs installed and maintained prevent discharges of sediment from contributing to impairment in receiving waters.

Samples shall be collected during the first two hours of discharge from rain events which result in a direct discharge to any water body listed in Attachment 3. Samples shall be collected during daylight hours (sunrise to sunset). Dischargers need not collect more than four (4) samples per month. All samples shall be taken in the receiving waters and shall be representative of the prevailing conditions of the water bodies. Samples shall be collected from safely accessible locations upstream of the construction site discharge and immediately downstream from the last point of discharge.

For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification. All field and/or laboratory analytical data shall be kept in the SWPPP document, which is to remain at the construction site at all times until a Notice of Termination has been submitted and approved.

8. Monitoring Program for Pollutants Not Visually Detectable in Storm Water

A sampling and analysis program shall be developed and conducted for pollutants which are not visually detectable in storm water discharges, which are or should be known to occur on the construction site, and which could cause or contribute to an exceedance of water quality objectives in the receiving water. Pollutants that should be considered for inclusion in this sampling and analysis program are those identified in Sections A.5.b. and A.5.c.

Construction materials and compounds that are not stored in water-tight containers under a water-tight roof or inside a building are examples of materials for which the discharger may have to implement sampling and analysis procedures. The goal of the sampling and analysis is to determine whether the BMPs employed and maintained on site are effective in preventing the potential pollutants from coming in contact with storm water and causing or contributing to an exceedance of water quality objectives in the receiving waters. Examples of construction sites that may require sampling and analysis include: sites that are known to have contaminants spilled or spread on the ground; sites where construction practices include the application of soil amendments, such as gypsum, which can increase the pH of the runoff; or sites having uncovered stockpiles of material exposed to storm water. Visual observations before, during, and after storm events may trigger the requirement to collect samples. Any breach, malfunction, leakage, or spill observed which could result in the discharge of pollutants to surface waters that *would* not be visually detectable in storm water shall trigger the collection of a sample of discharge. Samples shall be collected at all discharge locations which drain the areas identified by the visual observations and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples. A sufficiently large sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site

(uncontaminated sample) shall be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

The uncontaminated sample shall be compared to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and TDS.

For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification. All field and/or analytical data shall be kept in the SWPPP document, which is to remain at the construction site at all times until a *Notice of* Termination has been submitted and approved.

SECTION C: STANDARD PROVISIONS FOR CONSTRUCTION ACTIVITY

1. Duty to Comply

The discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

2. General Permit Actions

This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a discharger 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 General Permit.

4. Duty to Mitigate

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of Storm Water Pollution Prevention Plans (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

6. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

7. Duty to Provide Information

The discharger shall furnish the RWQCB, State Water Resources Control Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records required to be kept by this General Permit.

8. Inspection and Entry

The discharger shall allow the RWQCB, SWRCB, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

9. Signatory Requirements

a. All Notice of Intents (NOIs), Notice of Terminations (NOTs), SWPPPs, certifications, and reports prepared in accordance with this Order submitted to the SWRCB shall be signed as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) 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 (b) the manager of the construction activity if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer, ranking elected official, or duly authorized representative. The principal executive officer of a Federal agency includes the chief executive officer of the agency or the senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of USEPA).

b. All SWPPPs, reports, certifications, or other information required by the General Permit and/or requested by the RWQCB, SWRCB, USEPA, or the local storm water management agency shall be signed by a person described above or by a duly authorized representative. A person is a duly authorized representative if:

(1) The authorization is made in writing by a person described above and retained as part of the SWPPP; or

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the construction 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. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization must be attached to the SWPPP prior to submittal of any reports, information, or certifications to be signed by the authorized representative.

10. Certification

Any person signing documents under Section C, Provision 9 above, 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 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, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Anticipated Noncompliance

The discharger will give advance notice to the RWQCB and local storm water management agency of any planned changes in the construction activity which may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA 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 General 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 two years or by both.

13. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

14. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

15. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

16. Penalties for Violations of Permit Conditions

a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $27,500 per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties which in some cases are greater than those under the CWA.

17. Availability

A copy of this General Permit shall be maintained at the construction site during construction activity and be available to operating personnel.

18. Transfers

This General Permit is not transferable. A new owner of an ongoing construction activity must submit a NOI in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An owner who sells property covered

by this General Permit shall inform the new owner of the duty to file a NOI and shall provide the new owner with a copy of this General Permit.

19. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

Attachment 1

SWRCB AND RWQCB CONTACT LIST

Division of Water Quality
P.O. Box 1977
Sacramento, CA 95812-1977
(916) 341-5537 FAX: (916) 341-5543
Web Page: http://www.waterboards.ca.gov/stormwtr/index.html
Email: stormwater@waterboards.ca.gov

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

NORTH COAST REGION (1)
5550 Skylane Blvd, Ste. A
Santa Rose, CA 95403
(707) 576-2220 FAX: (707)523-0135
http://www.waterboards.ca.gov/rwqcb1

SAN FRANCISCO BAY REGION (2)
1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300 FAX: (510) 622-2640
http://www.waterboards.ca.gov/rwqcb2

CENTRAL COAST REGION (3)
895 Aerovista Place, Ste 101
San Luis Obispo, CA 93401
(805) 549-3147 FAX: (805) 543-0397
http://www.waterboards.ca.gov/rwqcb3

LOS ANGELES REGION (4)
320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-6600 FAX: (213) 576-6640
http://www.waterboards.ca.gov/rwqcb4

CENTRAL VALLEY REGION (5S)
11020 Sun Center Dr., #200
Rancho Cordova, CA 95670-6114
(916) 464-3291 FAX: (916) 464-4645
http:www.waterboards.ca.gov/rwqcb5

FRESNO BRANCH OFFICE (5F)
1685 E St.
Fresno, CA 93706
(559) 445-5116 FAX: (559) 445-5910
http://www.waterboards.ca.gov/rwqcb5

REDDING BRANCH OFFICE (5R)
415 Knollcrest Drive, Ste. 100
Redding, CA 96002
(530) 224-4845 FAX: (530) 224-4857
http://www.waterboards.ca.gov/rwqcb5

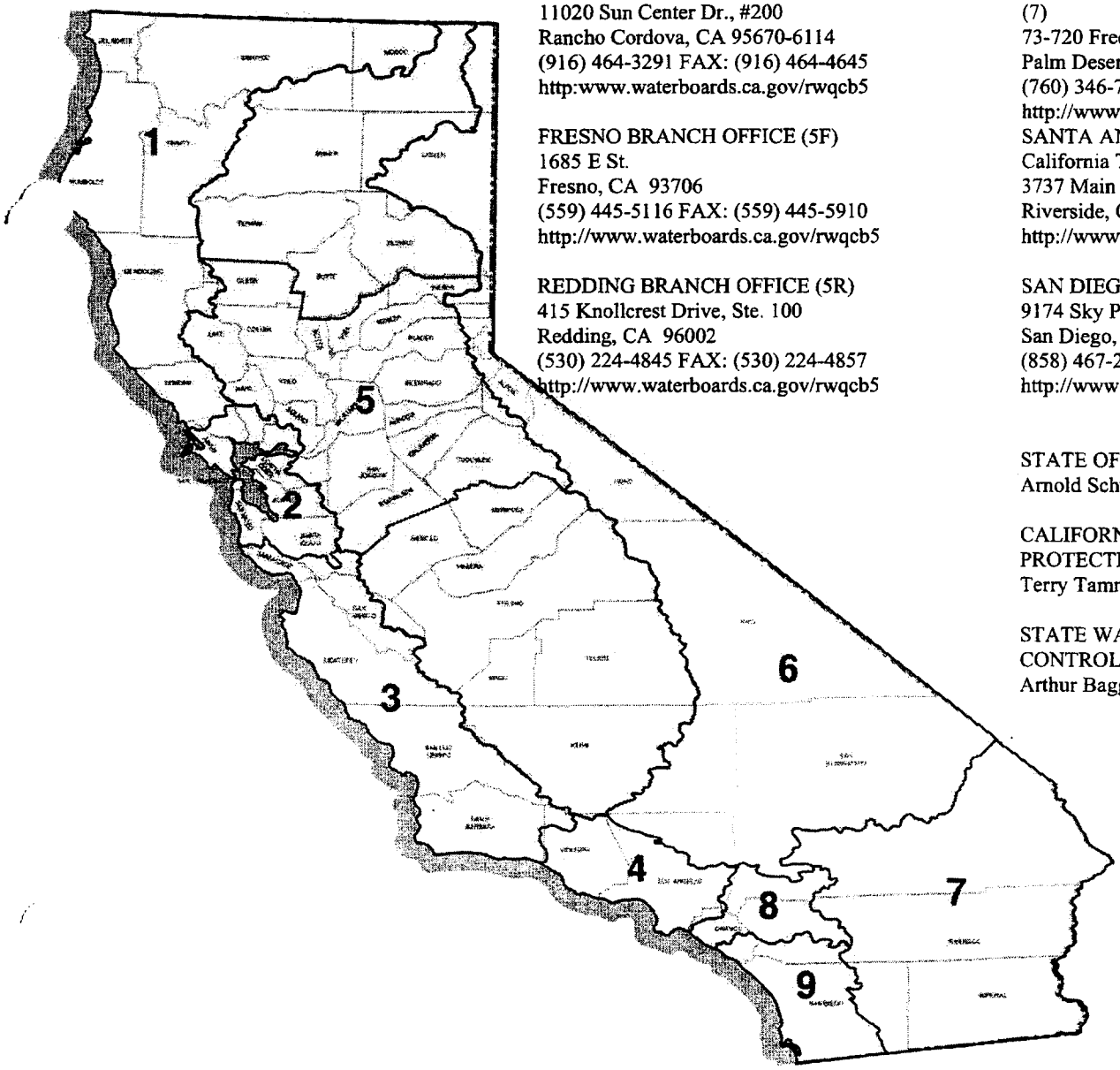
LAHONTAN REGION (6 SLT)
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530) 542-5400 FAX: (530) 544-2271
http://www.waterboards.ca.gov/rwqcb6

VICTORVILLE OFFICE (6V)
15428 Civic Drive, Ste. 100
Victorville, CA 92392-2383
(760) 241-6583 FAX: (760) 241-7308
http://www.waterboards.ca.gov/rwqcb6

COLORADO RIVER BASIN REGION (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491 FAX: (760) 341-6820
http://www.waterboards.ca.gov/rwqcb7

SANTA ANA REGION (8)
California Tower
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
http://www.waterboards.ca.gov/rwqcb8

SAN DIEGO REGION (9)
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340
(858) 467-2952 FAX: (858) 571-6972
http://www.waterboards.ca.gov/rwqcb9



STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
Terry Tamminen, Secretary

STATE WATER RESOURCES CONTROL BOARD
Arthur Baggett Jr., Chairman

ATTACHMENT 3

303d Listed Water Bodies for Sedimentation

REGION	WATER BODY NAME	CODE	POLLUTANT
1	MATTOLE RIVER	1100	Sedimentation/Siltation
1	TRINITY RIVER, SOUTH FORK	1100	Sedimentation/Siltation
1	REDWOOD CREEK	1100	Sedimentation/Siltation
1	MAD RIVER	1100	Sedimentation/Siltation
1	ELK RIVER	1100	Sedimentation/Siltation
1	EEL RIVER, SOUTH FORK	1100	Sedimentation/Siltation
1	EEL RIVER, NORTH FORK	1100	Sedimentation/Siltation
1	TRINITY RIVER	1100	Sedimentation/Siltation
1	EEL RIVER, MIDDLE FORK	1100	Sedimentation/Siltation
1	MAD RIVER	2500	Turbidity
1	TEN MILE RIVER	1100	Sedimentation/Siltation
1	NOYO RIVER	1100	Sedimentation/Siltation
1	BIG RIVER	1100	Sedimentation/Siltation
1	ALBION RIVER	1100	Sedimentation/Siltation
1	NAVARRO RIVER	1100	Sedimentation/Siltation
1	GARCIA RIVER	1100	Sedimentation/Siltation
1	GUALALA RIVER	1100	Sedimentation/Siltation
1	RUSSIAN RIVER	1100	Sedimentation/Siltation
1	TOMKI CREEK	1100	Sedimentation/Siltation
1	VAN DUZEN RIVER	1100	Sedimentation/Siltation
1	EEL RIVER DELTA	1100	Sedimentation/Siltation
1	EEL RIVER, MIDDLE MAIN FORK	1100	Sedimentation/Siltation
1	ESTERO AMERICANO	1100	Sedimentation/Siltation
1	NAVARRO RIVER DELTA	1100	Sedimentation/Siltation
1	EEL RIVER, UPPER MAIN FORK	1100	Sedimentation/Siltation
1	FRESHWATER CREEK	1100	Sedimentation/Siltation
1	SCOTT RIVER	1100	Sedimentation/Siltation
2	TOMALES BAY	1100	Sedimentation/Siltation
2	NAPA RIVER	1100	Sedimentation/Siltation
2	SONOMA CREEK	1100	Sedimentation/Siltation
2	PETALUMA RIVER	1100	Sedimentation/Siltation
2	LAGUNITAS CREEK	1100	Sedimentation/Siltation
2	WALKER CREEK	1100	Sedimentation/Siltation
2	SAN GREGORIO CREEK	1100	Sedimentation/Siltation

2	SAN FRANCISQUITO CREEK	1100	Sedimentation/Siltation
2	PESCADERO CREEK (REG 2)	1100	Sedimentation/Siltation
2	BUTANO CREEK	1100	Sedimentation/Siltatior
3	MORRO BAY	1100	Sedimentation/Siltation
3	SAN LORENZO RIVER ESTUARY	1100	Sedimentation/Siltation
3	SHINGLE MILL CREEK	1100	Sedimentation/Siltation
3	MOSS LANDING HARBOR	1100	Sedimentation/Siltation
3	WATSONVILLE SLOUGH	1100	Sedimentation/Siltation
3	SAN LORENZO RIVER	1100	Sedimentation/Siltation
3	ELKHORN SLOUGH	1100	Sedimentation/Siltation
3	SALINAS RIVER LAGOON (NORTH)	1100	Sedimentation/Siltation
3	GOLETA SLOUGH/ESTUARY	1100	Sedimentation/Siltation
3	CARPINTERIA MARSH (EL ESTERO MARSH)	1100	Sedimentation/Siltation
3	LOMPICO CREEK	1100	Sedimentation/Siltation
3	MORO COJO SLOUGH	1100	Sedimentation/Siltation
3	VALENCIA CREEK	1100	Sedimentation/Siltation
3	PAJARO RIVER	1100	Sedimentation/Siltation
3	RIDER GULCH CREEK	1100	Sedimentation/Siltation
3	LLAGAS CREEK	1100	Sedimentation/Siltation
3	SAN BENITO RIVER	1100	Sedimentation/Siltation
3	SALINAS RIVER	1100	Sedimentation/Siltation
3	CHORRO CREEK	1100	Sedimentation/Siltation
3	LOS OSOS CREEK	1100	Sedimentation/Siltation
3	SANTA YNEZ RIVER	1100	Sedimentation/Siltation
3	SAN ANTONIO CREEK (SANTA BARBARA COUNTY)	1100	Sedimentation/Siltation
3	CARBONERA CREEK	1100	Sedimentation/Siltation
3	SOQUEL LAGOON	1100	Sedimentation/Siltation
3	APTOS CREEK	1100	Sedimentation/Siltation
4	MUGU LAGOON	1100	Sedimentation/Siltation
5	HUMBUG CREEK	1100	Sedimentation/Siltation
5	PANOCHE CREEK	1100	Sedimentation/Siltation
5	FALL RIVER (PIT)	1100	Sedimentation/Siltation
6	BEAR CREEK (R6)	1100	Sedimentation/Siltation
6	MILL CREEK (3)	1100	Sedimentation/Siltation
6	HORSESHOE LAKE (2)	1100	Sedimentation/Siltation
6	BRIDGEPORT RES	1100	Sedimentation/Siltation
6	TOPAZ LAKE	1100	Sedimentation/Siltation
6	LAKE TAHOE	1100	Sedimentation/Siltation

6	PINE CREEK (2)	1100	Sedimentation/Siltation
6	TRUCKEE RIVER	1100	Sedimentation/Siltation
6	CLEARWATER CREEK	1100	Sedimentation/Siltation
6	GRAY CREEK (R6)	1100	Sedimentation/Siltation
6	WARD CREEK	1100	Sedimentation/Siltation
6	BLACKWOOD CREEK	1100	Sedimentation/Siltation
6	GOODALE CREEK	1100	Sedimentation/Siltation
6	EAST WALKER RIVER	1100	Sedimentation/Siltation
6	HEAVENLY VALLEY CREEK	1100	Sedimentation/Siltation
6	WOLF CREEK (1)	1100	Sedimentation/Siltation
6	WEST WALKER RIVER	1100	Sedimentation/Siltation
6	HOT SPRINGS CANYON CREEK	1100	Sedimentation/Siltation
6	BRONCO CREEK	1100	Sedimentation/Siltation
6	SQUAW CREEK	1100	Sedimentation/Siltation
7	IMPERIAL VALLEY DRAINS	1100	Sedimentation/Siltation
7	NEW RIVER (R7)	1100	Sedimentation/Siltation
7	ALAMO RIVER	1100	Sedimentation/Siltation
8	SAN DIEGO CREEK, REACH 1	1100	Sedimentation/Siltation
8	RATHBONE (RATHBUN) CREEK	1100	Sedimentation/Siltation
8	SAN DIEGO CREEK, REACH 2	1100	Sedimentation/Siltation
8	UPPER NEWPORT BAY ECOLOGICAL RESERVE	1100	Sedimentation/Siltation
8	BIG BEAR LAKE	1100	Sedimentation/Siltation
8	ELSINORE, LAKE	1100	Sedimentation/Siltation
9	SAN ELIJO LAGOON	1100	Sedimentation/Siltation
9	LOS PENASQUITOS LAGOON	1100	Sedimentation/Siltation
9	AGUA HEDIONDA LAGOON	1100	Sedimentation/Siltation
9	BUENA VISTA LAGOON	1100	Sedimentation/Siltation

Attachment

NEW OWNER INFORMATION AND CHANGE OF INFORMATION (COI) FORM FOR THE GENERAL CONSTRUCTION PERMIT NO. CAS000002

Owners Name: _____ Date: _____

WDID No.: _____ Date of Last NOI Change: _____

Prepared By: _____ Signature of Preparer: _____

	Area Transferred (acres)[1] column 1	Area Remaining (acres)[2] column 2	Lot/Tract Numbers Transferred	Contact Person and Company Name of NewOwner(s)	Address(es) of the New Owner(s)	Phone # of New Owner	Is Const/Post Construction Complete? Yes/No	Date of Ownership Transfer
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

[1]Use approximate area (in acres) if no exact figure is available.

[2]Calculate running total in this column as follows:

Enter in column 2, line 1, the area from NOI minus the area in column 1.

Enter in column 2, line 2, the area in column 2, line 1, minus the area in line 2, column 1.

Enter in column 2, line 3, the area in column 2, line 2, minus the area in line 3, column 1, and so forth.

NPDES

DESERT TASK FORCE

NOTICE OF TERMINATION

OF COVERAGE UNDER THE RIVERSIDE COUNTY MUNICIPAL STORMWATER PERMIT
FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

ORDER NO. 01-077 (NPDES NO. CAS617002)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD –
COLORADO RIVER BASIN REGION

I. OWNER

Name	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone ( ) –

II. SITE INFORMATION

A. Project Title	Site Address		
City	State	Zip	Phone ( ) –
B. Contractor Name	Contact Person		
Local Mailing Address	Title		
City	State	Zip	Phone ( ) –

3ASIS OF TERMINATION

__ 1. The construction project is complete and the following conditions have been met. (Provide photograph of site to support the basis termination)

- ✓ All elements of the Storm Water Pollution Prevention Plan have been completed.
- ✓ Construction materials and waste have been disposed of properly.
- ✓ The site is in compliance with all local storm water management requirements.
- ✓ A post-construction storm water operation and management plan is in place.
- ✓ All disturbed areas have been stabilized by the following method. (Attach additional sheet if necessary)

_____

_____

__ 2. Construction activities have been suspended, either ___ temporarily or __ indefinitely and the following conditions have been met.

- ✓ All elements of the Storm Water Pollution Prevention Plan have been completed.
- ✓ Construction materials and waste have been disposed of properly.
- ✓ All disturbed areas and other areas of potential erosion are stabilized.
- ✓ The site is in compliance with all local storm water management requirements.

Date of suspension ____ / ____ / ____ Expected start up date ____ / ____ / ____

IV. CERTIFICATION

I certify under penalty of law that all storm water discharges associated with construction activity from the identified site that are authorized by Section D.5 of Board Order No. 01-077 have been eliminated or that I am no longer the owner of the site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under Board Order No. 01-077, and that discharging pollutants in storm water associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an owner of liability for any violation of Board Order No. 01-077 or the Clean Water Act.

Printed Name: _____ **Title:** _____

Signature: _____ **Date:** _____

V. REGIONAL WATER QUALITY CONTROL BOARD USE ONLY

, Notice of Termination has been reviewed and approved.

rinted Name: _____ **Title:** _____

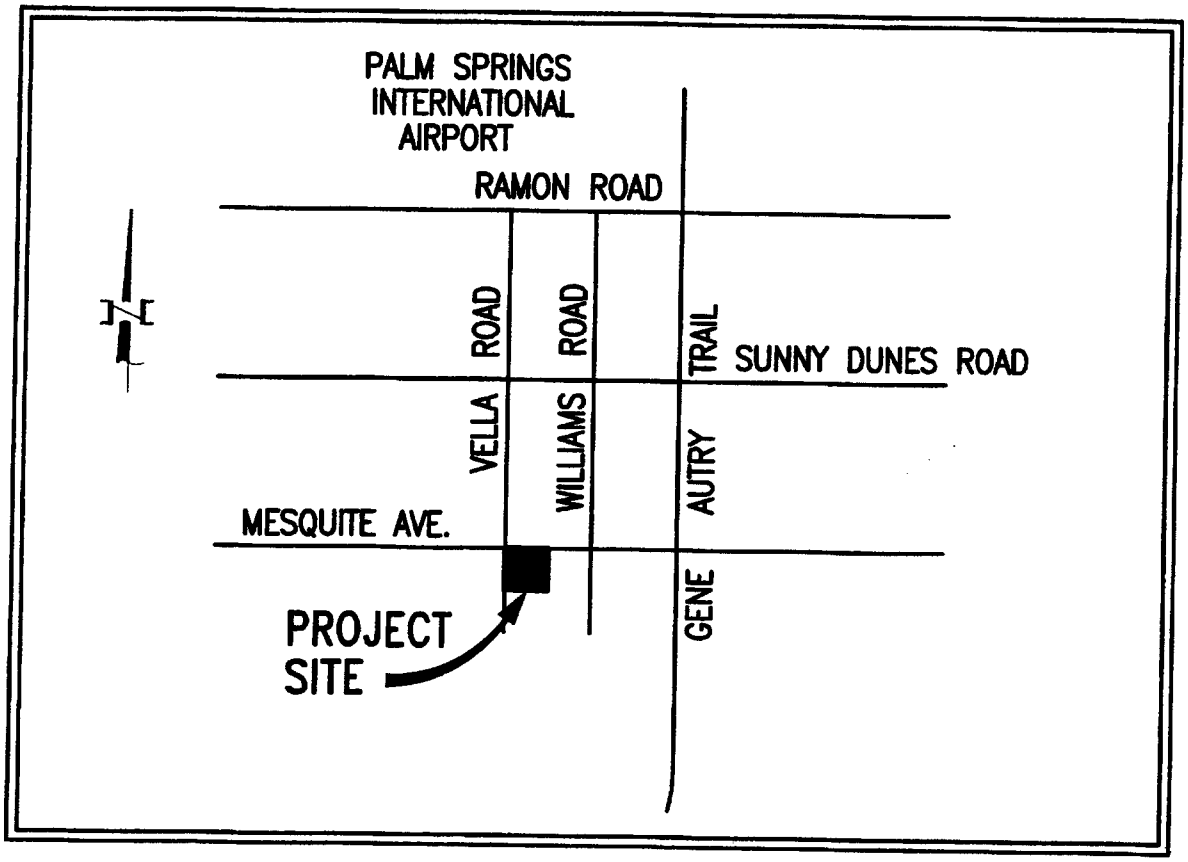
Signature: _____ **Date:** _____

79440

APPENDIX B – REFERENCE PLANS

Note: A copy of any requirements incorporated by Reference shall be kept at the construction site

1-18-2010 Bid Set (Not for Construction)



VICINITY MAP

NOT TO SCALE

CITY OF PALM SPRINGS GUIDELINES AND APPLICATION

FUGITIVE DUST CONTROL PLAN (PM-10)
Effective: October 2008

FOR PROJECTS LESS THAN 10 ACRES

The Coachella Valley dust control ordinances require submittal and approval of a Fugitive Dust Control Plan prior to:

- Issuance of grading permit. Approval of this plan does not constitute a City Engineering grading permit for project initiation.
- Issuance of a building permit for projects with 5,000 or more square feet of soil disturbance. Approval of this plan does not constitute a City Building permit for project initiation.
- Issuance of permits for projects that import or export more than 100 cubic yards of bulk material per day

Projects with more than 5,000 square feet of disturbed surfaces must post a cash deposit of $2000 per acre with the City prior to project initiation.

The person(s) completing this plan must attach a copy of the "Certificate of Completion" for Coachella Valley Fugitive Dust Control Class issued by the South Coast Air Quality Management District.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) APPLICATION

FOR PROJECTS LESS THAN 10 ACRES

Project Name: PALM SPRINGS ANIMAL CARE FACILITY

Project Address: 4575 E. MESQUITE AVE, PALM SPRINGS, CA 92262

Project Type: ☐ Single Family ☒ Commercial ☐ Subdivision ☐ Demolition

Number of: _____ Square Feet OR 3.0 Acres

↓ ↓ ↓ ↓ FOR CITY USE ONLY ↓ ↓ ↓ ↓

Based on all the provision contained in this Fugitive Dust Control Plan (PM-10), this plan is:

☐ Approved

☐ Conditionally Approved (conditions specified below)

☐ Denied (explanation attached)

SIGNATURE OF CITY REPRESENTATIVE _____ DATE _____

The following conditions have been added to the Plan by staff in order to ensure an adequate level of fugitive dust control.

(Attach additional information if necessary)

↑ ↑ ↑ ↑ FOR CITY USE ONLY ↑ ↑ ↑ ↑

I have read the above additional conditions of the Fugitive Dust Control Plan (PM-10) and I agree to implement all of the provisions at the concentrations and frequencies identified.

SIGNATURE OF OWNER _____ DATE _____

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) AGREEMENT

FOR PROJECTS LESS THAN 10 ACRES

Property Owner(s): CITY OF PALM SPRINGS
PRINT NAME(S)

Property Address: 4575 E. MESQUITE AVENUE
PALM SPRINGS, CA 92262

PROPERTY OWNER

The signature of the property owner(s) below shall act as their acknowledgement of dust control requirements and their enforceability pursuant to South Coast Air Quality Management District (SCAQMD) Rules 403 and 403.1. This document shall constitute an agreement to comply with all project conditions as identified in the approved dust control plan.

FAILURE TO CALL FOR INSPECTION PRIOR TO INITIATING ANY WORK AT THE SITE WILL RESULT IN THE ISSUANCE OF AN ADMINISTRATIVE CITATION WITH A MINIMUM FINE OF $100 PER DAY.

The property owner shall:

1. Acknowledge that dust control is required 24 hours a day, 7 days a week, throughout the period of project performance, regardless of project size or status; ground must remain in a damp condition.
2. Shall retain a copy of the approved dust control plan on-site during the duration of the project;
3. Shall ensure that each and every contractor/subcontractor and all other persons associated with the project shall be in continuous compliance with all requirements of the approved dust control plan;
4. Shall take all necessary precautions to minimize dust, even if additional measures beyond those listed in the dust control plan are necessary;
5. Shall call the City at (760) 323-8253, Ext. 8740 at least 72 hours prior to project initiation for inspection. Proper placement of the wind fence, dust control signage and on-site water source must be approved by the City inspector prior to import/export of material onto or off-site, grubbing, or grading of site;

FUGITIVE DUST CONTROL PLAN (PM-10) AGREEMENT

FOR PROJECTS LESS THAN 10 ACRES

6. Shall authorize representatives of the City to enter upon the above mentioned properly for inspection and/or abatement purposes;

7. Shall hold harmless the City and its representatives from liability for any actions related to this dust control plan or City initiated abatement activities.

PARTY RESPONSIBLE FOR ADMINISTRATIVE CITATIONS:

Name: ______________________________

Title: ______________________________

Address: ______________________________

____

Office Phone: ____________ Extension: ____________

Cell Phone: ____________ Fax Phone: ____________

Email Address: ______________________________

Property Owner: ______________________________
PRINT NAME

Signature: ______________________ Date: __________

Title: ______________________________

Company: ______________________________

◆◆◆

GRADING CONTRACTOR

I have read the conditions of the Fugitive Dust Control Plan (PM-10) and the owner has authorized the implementation of all provisions through project build out.

Contractor: ______________________________
PRINT NAME

Signature: ______________________ Date: __________

Title: ______________________________

Company: ______________________________

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS. 4/23

FUGITIVE DUST CONTROL PLAN (PM-10) INITIAL SITE INSPECTION

FOR PROJECTS LESS THAN 10 ACRES

This form is to be presented to the City Dust Control Inspector at the time of initial on-site inspection. No import/export of materials onto or off-site, grubbing, or grading are to be conducted at the site prior to inspection and approval by the City Dust Inspector

Project Name: PALM SPRINGS ANIMAL CARE FACILITY

Project Address: 4575 E. MESQUITE AVE., PALM SPRINGS, CA 92262

Contractor: _____

Title: _____

Date of Inspection: _____

Dust Control Inspector: _____

Wind Fence: _____

DUST CONTROL SIGN

Size and Lettering: _____

Location: _____

Mounting: _____

Water Source: _____

☐ Approved ☐ NOT Approved

Inspector Signature: _____

Contractor or Owner Signature: _____

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) SUBMITTAL CHECKLIST

FOR PROJECTS LESS THAN 10 ACRES

The property owner or his/her representative is responsible for complying with the South Coast Air Quality Management District's (SCAQMD) dust control (PM-10) rules which are outlined in the Coachella Valley Fugitive Dust Control Handbook. A copy of the handbook can be obtained from the SCAQMD located in Diamond Bar, California at (909) 396-2183.

The following forms and documents must be completed and submitted to the City prior to processing of the Fugitive Dust Control Plan (FDCP). Please initial each item to acknowledge that the form or document adjacent to the box has been completed and is included with the application. This checklist must be included with the FDCP application.

Initial Each Item

Included property owner and property address on Fugitive Dust Control Plan (PM-10) Agreement, pages 3 & 4. The owner signed and dated the form. If a contractor has not been chosen at the date of submittal, indicated so. The contractor's information and signature must be provided before final approval of the FDCP.

X Read and will comply with Fugitive Dust Control Plan (PM-10) requirements on pages 8 thru 10, inclusive.

X Included an 8 ½" x 11" (letter-size) site plan as required for all projects. Included all items on site plan applicable to the project. **All projects, regardless of the size, must install a wind fence.** The wind fence must be placed a minimum of 5 feet from the curb to allow for pedestrian passage if no sidewalk is present. The site plan can be combined with the required vicinity map to generate one map with all required items for both the site plan and the vicinity map. (See example on Page 11)

Completed all project information items on Page 12. Indicated NA if not applicable to the project.

X Listed dust control measures for each phase of the project on pages 13 thru 16, inclusive. If the same measures will be used for each phase, you indicated so on each page by writing same as for clearing/grubbing, mass grading, etc. Indicated NA if phasing is not applicable to the project.

Completed all items for project information for owner or owner's representative on page 17. **A 24-hour local or toll free number must be listed here and on the project dust control sign.**

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) SUBMITTAL CHECKLIST

FOR PROJECTS LESS THAN 10 ACRES

Completed all project information for General contractor on page 18. If the owner is also the general contractor, indicate so on this page by writing **"owner is also general contractor, see page 17 for required information"**. The contractor(s) information must be provided before final approval of the FDCP.

Completed all project information for sub-contractor(s) on page 19. If the owner is also the sub-contractor, indicate so on this page by writing **"owner is also sub-contractor, see page 17 for required information"**. If sub-contractor(s) have not been chosen at the date of application, indicate so. The sub-contractor(s) information must be provided before final approval of the FDCP.

X Included an 8 ½" x 11" (letter-size) map showing the vicinity of the project and clearly identifying the closest major cross streets or other landmarks and the project location. Labeled this map **"Vicinity Map"**. This map can be combined with the site plan to generate one map with all required items for both the site plan and vicinity map.

X Included an 8 ½" x 11" (letter-size) Assessor's Parcel Map (multiple pages if necessary) for the property (ies) on which the project will be occurring. Outline or highlight the affected parcels and identified location of all site entrances.

Attached a copy of the **"Certificate of Completion"** for the Coachella Valley Fugitive Dust Control Class issued by SCAQMD. The individual listed on the certificate is officially designated in the proposed Dust Control Plan as the person responsible for fugitive dust control on the site.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) REQUIREMENTS

FOR PROJECTS LESS THAN 10 ACRES

1. Notify the City of Palm Springs, Public Works and Engineering Division at (760) 323-8253, Ext. 8740 at least 72 hours prior to project initiation and after completion of construction.

2. The site shall be pre-watered for at least 72 hours prior to the physical start of clearing, grubbing or grading.

3. A complete copy of the approved Fugitive Dust Control Plan (PM-10) and all maps must be on-site prior to beginning construction activity and must be retained on-site at all times during project construction.

4. Grading plans must include a statement that incorporates the approved fugitive dust control plan into the approved grading plan. An 8 ½" x 11" (letter-size) stand alone fugitive dust control plan is required if the information is included on an approved grading plan.

5. During all grading and earthwork operations, multiple daily applications of water shall be made or soil otherwise stabilized on a regular basis to minimize the emission of visible dust across the perimeter property lines of the site. This shall include watering before and after actual working hours, 24-hours a day, 7 days a week, including holidays and weekends as necessary. Daily record keeping of dust control actions is required to be compiled and retained on-site during project duration and for three years after project completion.

6. After grading is completed and during the entire construction phase until the project is completed, multiple daily applications of water shall be made or soil otherwise stabilized to prevent dust and soil from migrating across property lines. The shall included watering before and after actual construction hours, 24-hours a day, 7 days a week, including weekends and holidays as necessary to control the mitigation of dust and soil. On days when wind is of sufficient velocity to cause surface drying and the potential for transportation of dust and soil across the property lines, a temporary sprinkler system or other mechanism approved by the Public Works and Engineering Division shall be left in operation.

7. Any operations in the Coachella Valley Blowsand Zone (defined as the corridor of land extending two miles to either side of the centerline of I-10 Freeway) shall stabilize new man-made deposits of bulk material within 24 hours of making such bulk material deposits. Stabilization procedures shall include one or more of the following:

   A. Application of water to at least 70 percent of the surface area of any bulk material deposits at least 3 times for each day that there is evidence of wind drive fugitive dust;

   B. Application of chemical stabilizers in sufficient concentrations so as to maintain a stabilized surface for a period of at least 6 months;

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) REQUIREMENTS

FOR PROJECTS LESS THAN 10 ACRES

C. Install windbreaks of such design so as to reduce maximum wind gusts to less than 25 miles per hour in the area of the bulk material deposits.

8. To minimize track-out of soil or debris, wheels, tires and other surfaces of vehicles (i.e. truck beds, mud flaps, side boards, etc.) that may collect loose material shall be inspected and washed prior to exiting onto public streets. The dust control ordinance also requires at least one of the following track-out control devices for projects **greater than five acres** or those that **import or export more than 100 cubic yards** of material per day:

   A. Gravel pad consisting of minimum one inch or larger washed gravel maintained to a depth of six inches at least 50 feet long and 30 feet wide; OR

   B. Paved surface extending at least 100 feet into the site and at least 20 feet wide; OR

   C. Wheel shaker/wheel spreading device consisting of raised dividers (rails, pipes, or grates) at least 3 inches tall at least 6 Inches apart; OR

   D. Installation and maintenance of wheel washing system

9. City streets shall be cleaned on a daily basis to remove soil, or other debris originating from the site to the satisfaction of the Public Works and Engineering Division inspector. If at anytime material (i.e. dust, mud, soil, gravel, sand, etc.) extends on the street for a cumulative distance of more than 25 feet from any site access, immediate removal is required.

10. Soil or other potential dust generation materials transported onto or from the site using public streets, shall be watered sufficiently to prevent generation of dust and then covered so as to prevent any spillage during transport. If deemed necessary, the Public Works and Engineering Division may specify additional measures.

11. Within 10 days of ceasing activity, an operator shall implement at least one of the following long-term stabilization techniques for any disturbed surface area where construction activities are not scheduled to occur for at least 30 days:

    A. Renegotiation that results in 75 percent ground coverage provided that an active watering system is in place at all times; OR

    B. Establishment of a stabilized surface through watering with physical access restriction surrounding area; OR

    C. Use chemical stabilizers to establish a stabilized surface with physical access restriction surrounding the area.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) REQUIREMENTS

FOR PROJECTS LESS THAN 10 ACRES

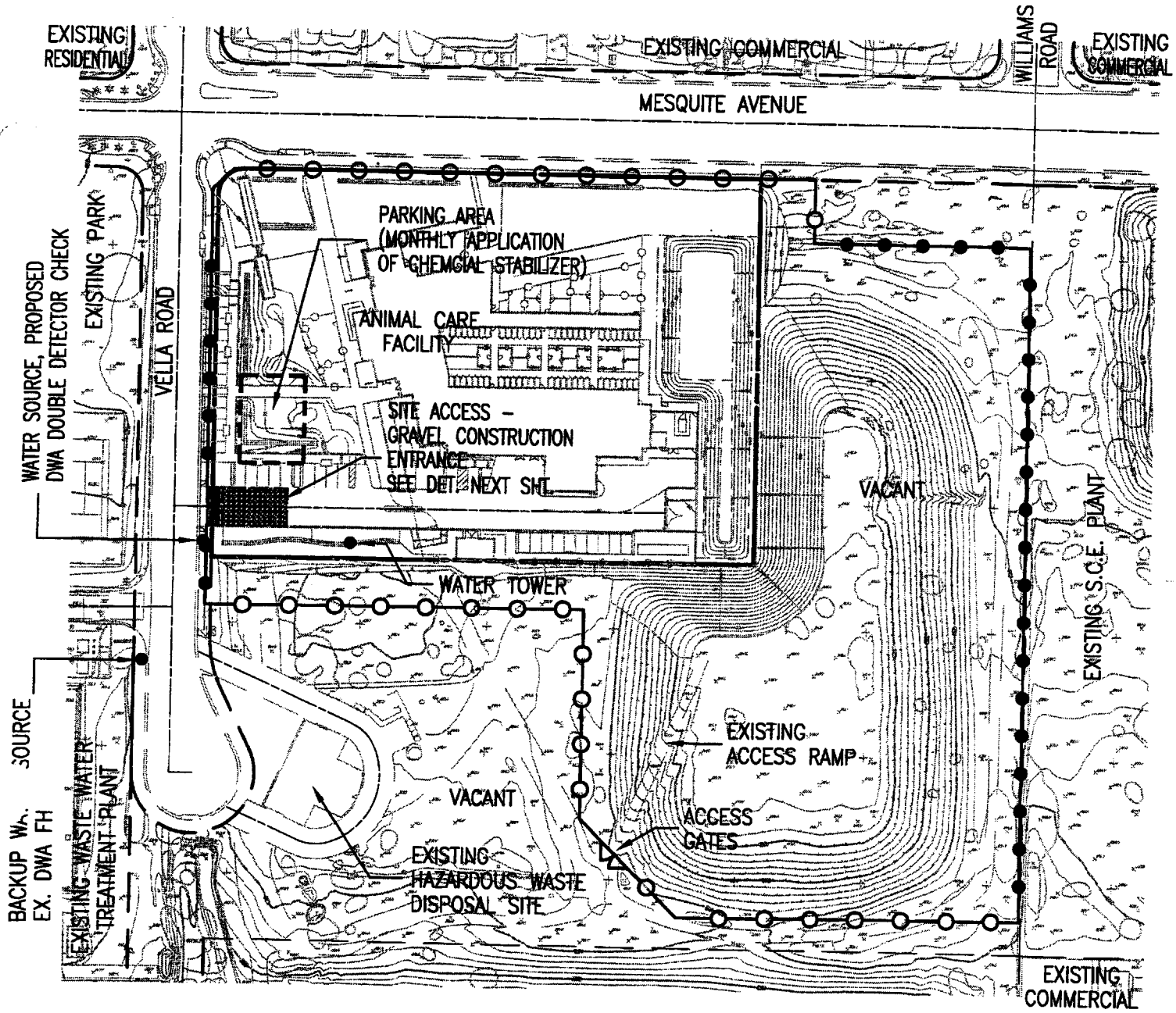
12. Failure to abide by these regulations may be cause for abatement by the Public Works and Engineering Division and any costs billed to the responsible party.

13. Appropriate signs meeting City and South Coast Air Quality Management District (SCAQMD) specifications are to be posted at the perimeter of each construction site. Generally, signage should be located on each side of the project area and within 50 feet of the project site boundary. **No clearing, grubbing, grading, or import/export of soil or other potential dust generating materials (i.e. base, gravel, sand, etc.) shall be allowed to occur at the site prior to placement of the required signs. Inspections by Public Works and Engineering Division will not be conducted unless signs are erected and lettered with the required information.** The signs shall be maintained at all times and remain in place until completion of the project. Each sign shall include the following information:

    1. Developer's Name
    2. Project Name / Tract Number
    3. Permit Number / Address
    4. Name and phone of person(s) responsible for dust control at the site. This number should be a local or toll free number manned 24-hours a day, 7 days a week.
    5. Phone number for City complaints
    6. Phone number of the South Coast Air Quality Management District complaint line: 1-800-228-7664.

14. A map showing the vicinity of the project and clearly identifying the closest major cross streets or other landmarks and the project location must be included with the Fugitive Dust Control Plan application. Lave this map **"Vicinity Map"**. Required map size is 8 ½" x 11" (letter-size).

15. An 8 ½" x 11" (letter-size) Assessor Parcel Map for the property(ies) on which the project will be occurring must be included with the Fugitive Dust Control Plan application. Outline or highlight the affected parcels. Identify location of site entrances, internal unpaved haul routes, wind fencing, areas to be chemically stabilized and other proposed and required dust control mitigations, Projects that are only installing or constructing linear features such as roads, pipelines, or other utilities that border or cross more than one Assessor's parcel do not require Assessor's Parcel Maps. However, a detailed vicinity map adequately depicting the entire project area must be provided. If the project is divided into construction phases (separate physical project areas), provide a map clearly identifying the phases.



LEGEND

PARCEL BOUNDARY

6' HIGH CHAIN LINK WIND FENCING WITH TAN FABRIC, WITH NO HOLES, CUTOUT OR RIPS ALLOWED IN FABRIC.

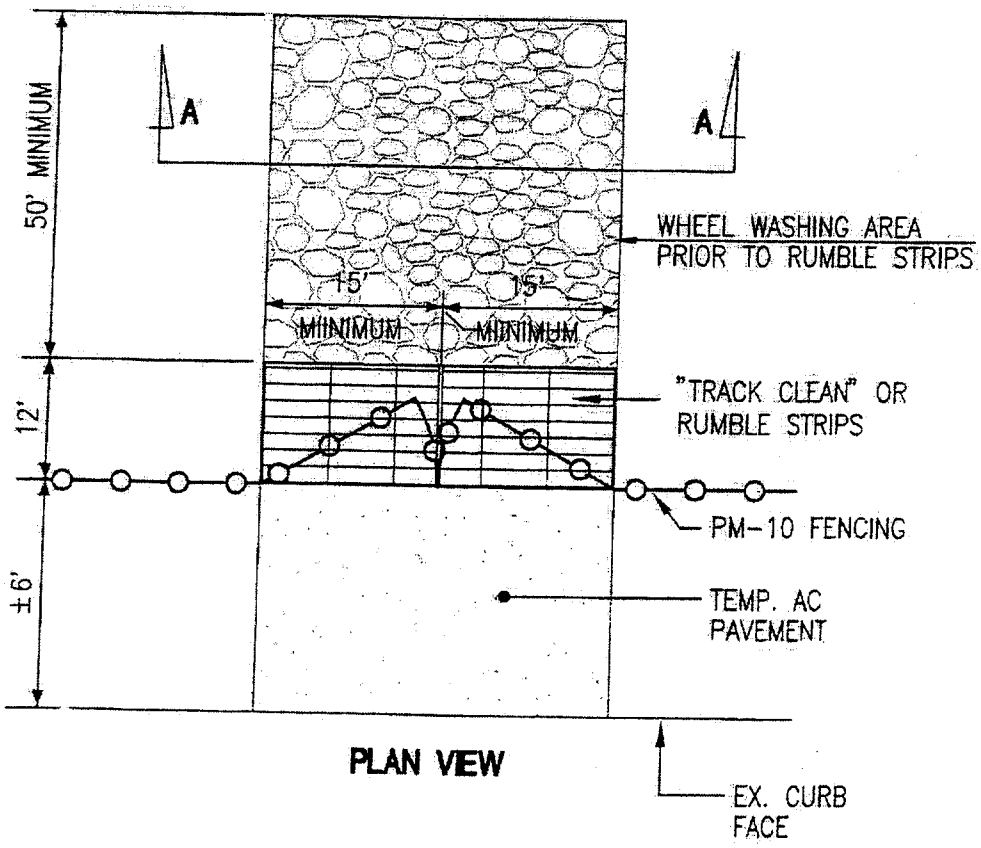
EX. 6' HIGH CHAIN LINK FENCE; TAN FABIRC TO BE INSTALLED ON EX. FENCE; FABRIC WITH NO HOLES, CUTOUT OR RIPS ALLOWED. EX. FENCE ALONG VELLA ROAD TO BE REMOVED IN ACCORDANCE WITH CONSTRUCTION SCHEDULING AND REPLACED WITH TYPICAL TEMPORARY DUST CONTROL FENCING.

SCALE 1"=120'

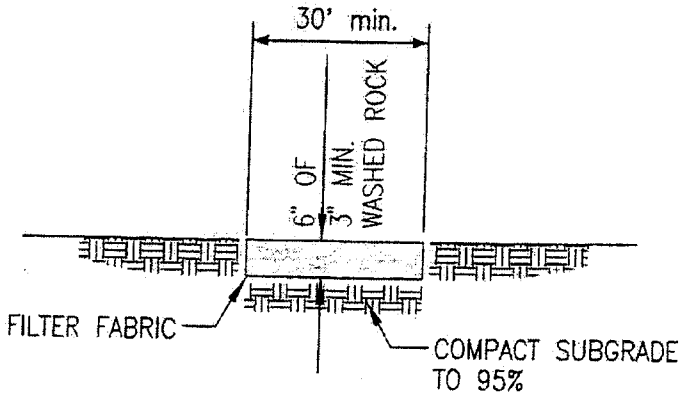
PREVAILING WIND

FUGITIVE DUST CONTROL SITE PLAN
CITY OF PALM SPRINGS ANIMAL CARE FACILITY

I:\76100\RG\PM10SITE.DWG 1-18-10



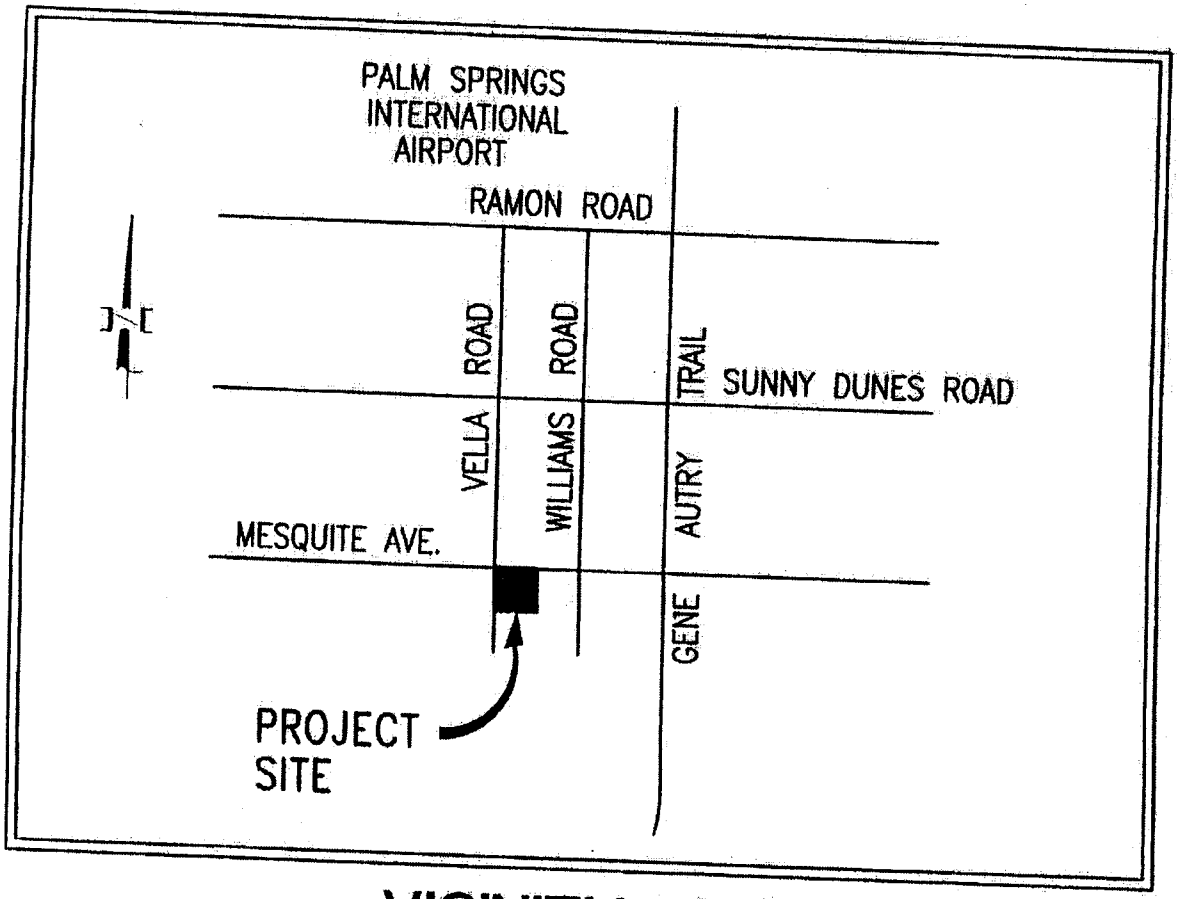
PLAN VIEW



SECTION A-A

GRAVEL CONSTRUCTION ENTRANCE

NTS



VICINITY MAP

NOT TO SCALE

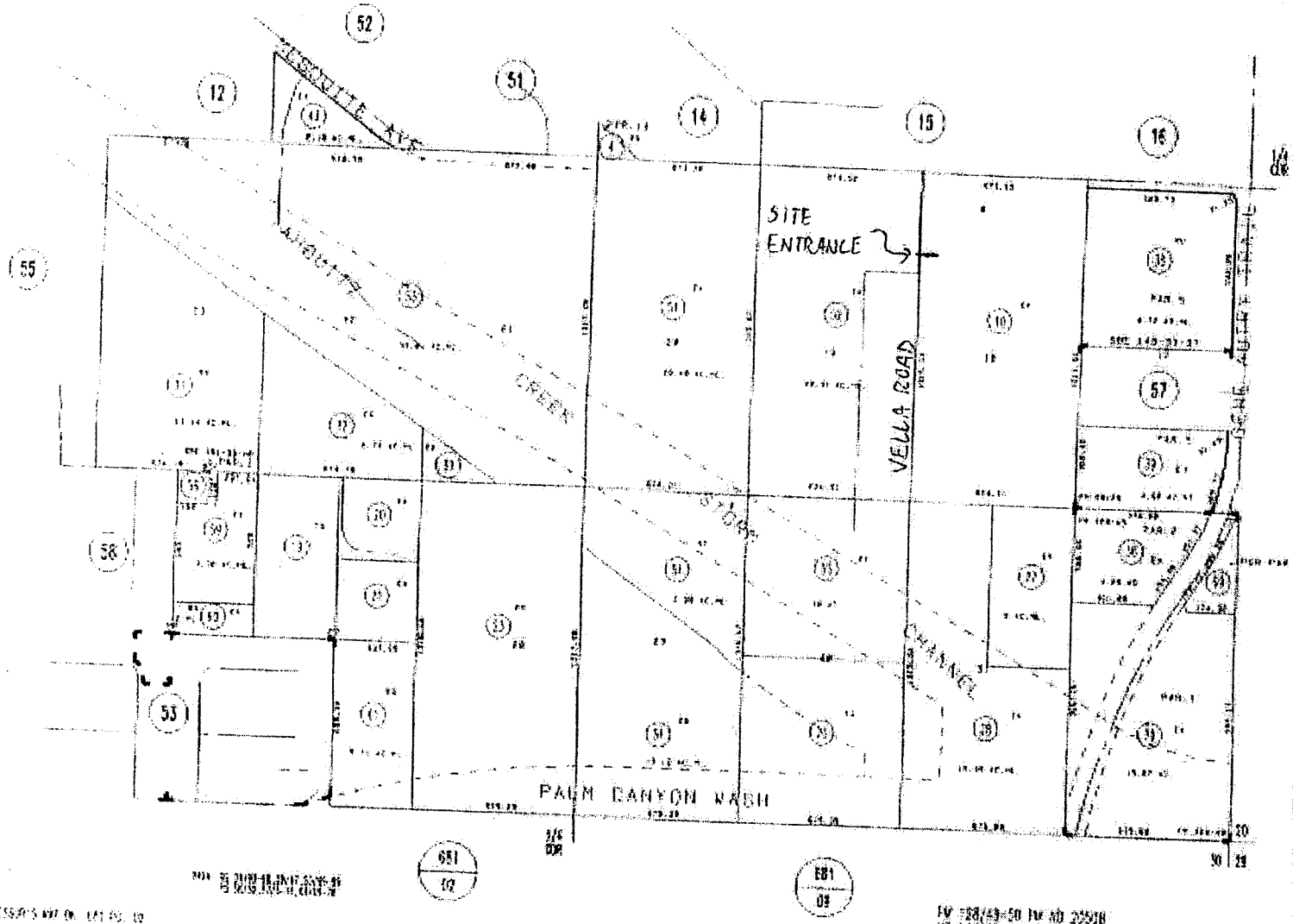
THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY. NO LIABILITY IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. ASSESSOR'S PARCEL MAY NOT COMPLY WITH LOCAL LOT SPLIT OR BUILDING SITE ORDINANCES

SEC. 19 T. 4S., R. 5E
CITY OF PALM SPRINGS

T.R.A. 011-003

680 - 02

29-21



ASSESSOR'S MAP OF LAS PAS CO
Riverside County, Calif.

FV 128/49-50 PM MD 20508
MB 147/002 S.D. PALM VALLEY COUNTRY LANDS
FV 68/25 PM MD 13852

Apr. 1999

FUGITIVE DUST CONTROL PLAN (PM-10) PROJECT INFORMATION

FOR PROJECTS LESS THAN 10 ACRES

PROJECT ACREAGE: PARCEL AREA = 3.0 AC., DISTURBED AREA 3.8 AC.
(1 acre = 43,560 s.f.)

TOTAL EARTH MOVEMENT: 18,094 MASS EXCAVATION
(Cubic Yards.)

MAXIMUM DAILY EARTH MOVEMENT: TBD BY CONTRACTOR
(Cubic Yards.)

WATER SOURCE: PROPOSED DWA DOUBLE DETECTOR CHECK LOCATED AT SW CORNER OF SIT

WATER AVAILABILITY: 1500 GPM
(Gallons/Minute)

BACK-UP WATER SOURCE: EX. DWA FIRE HYDRANT - SW CORNER OF VELLA RD. AND EX. DRIVEWAY OF WASTE WATER TREATMENT PLANT.
(If Applicable)

WATER DELIVERY EQUIPMENT

INDICATE TYPE & CAPACITY (Coverage capacity per s.f./ac. per hour)	NUMBER OF UNITS (per s.f./acres(s)	FREQUENCY/CONDITIONS OF USE (Number of times per hour, per day, etc. including Weekends and holidays)
WATER TRUCK(S)	ONE TRUCK PER 4 AC. (2,000 GAL.)	4 AC. PER HOUR, 7 DAYS A WEEK MIN. 4 WATERINGS PER DAY OR AS NEEDED
WATER PULL(S)	TBD	
WATER HOSE(S)	AS NEEDED	BUILDING PAD, FORMWORK & TRENCHWORK
WATER TOWER(S)	TBD	TBD BY CONTRACTOR; PRELIMINARY LOCATION ON SITE PLAN
IRRIGATION SYSTEM	TEMP. SYSTEM 3.0 AC.	PREWATER ENTIRE SITE TO AT LEAST 70% OPTIMUM MOISTURE CONTENT TO OVER-X DEPTH
OTHER		

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

12/23

FUGITIVE DUST CONTROL PLAN (PM-10) DUST CONTROL ACTIONS CLEARING/GRUBBING PROJECT PHASE

FOR PROJECTS LESS THAN 10 ACRES

PROJECT NAME: PALM SPRINGS ANIMAL CARE FACILITY

CONTRACTOR NAME:

ANTICIPATED START DATE: 4-1-10

ANTICIPATED COMPLETION DATE: 5-1-10

NO. OF ACRES UNDER ACTIVE CONSTRUCTION: 3.8 AC.

Detailed description of dust control actions implemented during this phase should match information provided on site plan. (Use additional pages as necessary.)

SEE NEXT PAGE

CONTRACTOR TO KEEP SITE DAMP AT ALL TIMES.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

CLEARING/GRUBBING PROJECT PHASE

GENERAL REQUIREMENTS

1. WRITTEN AND NOTARIZED PERMISSION LETTERS SHALL BE SUBMITTED TO THE PUBLIC WORKS DEPARTMENT FROM ANY ADJACENT LAND OWNERS WHOSE PROPERTY WILL BE USED IN ANY MANNER FOR CONSTRUCTION, STAGING, ACCESS, ETC., PRIOR TO ANY SUCH USAGE. THE OWNER AND AUTHORIZED DUST CONTROLLER FOR THIS PROJECT WILL BE RESPONSIBLE FOR THE DUST CONTROL ON ANY OFF-SITE DISTURBED AREAS AS WELL AS ON THIS PROJECT. A DUST CONTROL SECURITY OF $2,000 PER ACRE, OR AS OTHERWISE APPROVED BY THE CITY ENGINEER, SHALL BE POSTED FOR ALL AREAS TO BE DISTURBED BY THE PROJECT, BOTH ON-SITE AND OFF-SITE. DISTURBANCE OF SITE AREAS NOT INCLUDED IN THIS AGREEMENT SHALL BE REASON FOR THE CITY TO ASSESS ADDITIONAL CHARGES, AND POSSIBLY STOP ALL WORK AT THE SITE UNTIL THE EXTENT OF THE DISTURBANCE IS MEASURED. THEREFORE, IF IT IS SUSPECTED THAT OFF-SITE AREAS MAY BE DISTURBED DURING THE WORK, SHOW THEM ON THIS PLAN AND MAKE THE APPROPRIATE ARRANGEMENTS IN ADVANCE. (NO OFFSITE)

2. SAND FENCING, OF EITHER THE WOOD AND WIRE OR THE PLASTIC TYPE, SHALL BE INSTALLED AROUND THE PERIMETER OF THE PROJECT ON ALL SIDES THAT DO NOT HAVE EXISTING MASONRY WALLS OR SIMILAR SOLID FENCING OR HEDGES. THIS SERVES THE MULTIPLE PURPOSES OF: CATCHING SOME WINDBLOWN DUST; REDUCING WIND SPEEDS ON THE PROJECT PERIMETER, AND RESTRICTING VEHICULAR ACCESS POINTS INTO THE PROJECT. THIS RESTRICTED ACCESS HELPS REDUCE DAMAGE TO ANY "CRUST" OF STABILIZED SOIL ON THE PROJECT, AND ALLOWS PLACING OF THE EXIT WHERE "TRACK OUT" CAN BE STOPPED PER #5 BELOW.

3. PRE-WATERING SHALL COMMENCE AT LEAST THREE (3) DAYS PRIOR TO ACTUAL GRADING USING A TEMPORARY ON-SITE IRRIGATION SYSTEM. CONNECTION TO ANY EXISTING WATER SYSTEM SHALL BE DONE IN COMPLIANCE WITH WATER PURVEYOR. TEMPORARY WATER LINES SHALL BE INSTALLED WITH A MINIMAL DISTURBANCE OF ANY OFF-SITE AREAS THEY PASS THROUGH. WHEN THE GRADING BEGINS, A SPRINKLER SYSTEM SHALL BE PLACED AROUND THE PERIMETER OF THE PROJECT, WITH FREQUENT WATERING, ESPECIALLY IN THE TYPICALLY WINDY EVENINGS. PLACING THE PERIMETER SPRINKLERS ON THE SAND FENCE KEEPS THEM SAFE AND EFFECTIVE. WATERING FOR AREAS NOT COVERED BY THE SPRINKLERS SHALL BE PROVIDED BY WATER TRUCKS. (ONE TRUCK PER 8 ACRES FOR 8 HR. WORKDAYS. SEE ABOVE.)

4. ACTIVITY AREAS SUCH AS: EQUIPMENT STORAGE AREA, MATERIALS STORAGE AREA, TEMPORARY OFFICE TRAILERS, AND EMPLOYEE PARKING, SHOULD BE LOCATED IF POSSIBLE ON EXISTING PAVED SURFACES, IF TRAFFIC WOULD NOT BE AFFECTED. IN LIEU OF EXISTING PAVING, A SOIL STABILIZER THAT DOES NOT REQUIRE CONSTANT WATERING, SUCH AS A WASHED GRAVEL, OR "BIODEGRADABLE OIL" COULD BE USED FOR THE INITIAL STAGING AREA. ANY CHEMICALS USED MUST BE CLEARED WITH THE CITY AND REGIONAL WATER QUALITY CONTROL BOARD.

5. THE TIRES OF VEHICLES BEING USED ON-SITE SHOULD BE INSPECTED AND WASHED IF NECESSARY TO STOP TRACKING OF DIRT ONTO PUBLIC STREETS. IF EXTENSIVE EXPORT OR IMPORT OF DIRT IS TO BE DONE, A PAVED OR GRAVELED WHEEL WASHING AREA AT LEAST 12' WIDE BY 100' LONG SHOULD BE PROVIDED AT THE EXIT, TO FACILITATE THE INSPECTION AND CLEANING OF TIRES. "RUMBLE STRIPS" MADE FROM LUMBER, RAILROAD TRACK,OR SIMILAR MATERIALS CAN HELP REDUCE THE MUD GETTING ONTO THE CLEANING AREA. STREET SWEEPING AND WASHING IS STILL TYPICALLY REQUIRED, BUT MAY BE REDUCED BY PROPER USE OF A "WHEEL WASHING AREA" LIKE THIS. THEY ARE REQUIRED ON PROJECTS OVER 5 ACRES OR WITH OVER 5,000 CUBIC YARDS OF IMPORT OR EXPORT.

6. A STANDARD SIGN WITH THE FOLLOWING INFORMATION MUST BE POSTED ON THE SITE, AT LEAST ONE SIGN PER FRONTING STREET. THE SIGN MUST INCLUDE: THE GRADING PERMIT NUMBER, THE PROJECT NAME, MAP NUMBER IF APPROPRIATE, THE AUTHORIZED DUST CONTROLLER PHONE NUMBER(S), THE CITY PHONE NUMBER, AND THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (S.C.A.Q.M.D.) PHONE NUMBER.

7. VEHICLES TRAVELING ON DIRT AND/OR ON UNPAVED ROADS SHOULD RESTRICT THEIR SPEED TO 10 M.P.H. MAXIMUM. SIGNS TO THAT EFFECT SHOULD BE PLACED AT THE PROJECT ENTRANCE ON PROJECTS OVER 5 ACRES TO IMPROVE COMPLIANCE.

8. WHEN WIND SPEEDS EXCEED 25 MPH, BY CONTINUOUS ANEMOMETER READING, OR IN GUSTS AT LEAST TWICE WITHIN A THIRTY MINUTE PERIOD, MEASURED ON THE SITE, VEHICULAR ACTIVITY ON THE SITE SHALL CEASE, EITHER VOLUNTARILY, OR BY CITY OR A.Q.M.D. INSPECTOR NOTIFICATION, EXCEPT FOR WATER TRUCKS AND SPRINKLER-TENDING VEHICLES, IF ANY.

CLEARING/GRUBBING PROJECT PHASE

SITE SPECIFIC DETAILS:

1. PRE-WATERING METHOD: SPRINKLER SYSTEM

   WATER AVAILABILITY, INITIAL STAGE PROPOSED DWA DOUBLE DETECTOR CHECK, LOCATED EAST SIDE OF VELLA ROAD AT SW CORNER OF PROJECT SITE.
   BACK WATER SOURCE: EX. DWA FH AT SW CORNER OF INTERSECTION OF VELLA ROAD AND WASTE WATER TREATMENT PLANT DRIVEWAY.

2. OFF-SITE WORK PERMISSION NEEDED: NONE

3. ACCESS WILL BE CONTROLLED BY: GATES AT CONSTRUCTION ENTRANCE

4. INITIAL STAGING AREA: TBD BY CONTRACTOR/CITY

   EQUIPMENT STORAGE TBD BY CONTRACTOR/CITY

   TEMPORARY OFFICE TBD BY CONTRACTOR/CITY

   EMPLOYEE PARKING AS SHOWN ON SITE PLAN

5. WHEEL WASHING PROVISIONS: GRAVEL PAD AT CONSTRUCTION ENTRANCE, ALSO SEE SWPP PLAN

6. SPEED RESTRICTION SIGN LOCATION: POSTED AT CONSTRUCTION ENTRANCE

7. NUMBER OF POSTED "DUST CONTROL SIGNS" TWO (2)
   (TYP. 1 PER FRONTING ROAD OR 1 PER 600 FEET OF FRONTAGE)

8. OTHER PRELIMINARY WORK: TO REDUCE JOB-SITE TRACK-OUT, INSTALL "TRACKCLEAN" OR SIMILAR TYPE RUMBLE STRIPS BEFORE INITIATING ANY ON SITE WORK. ALSO SEE SWPPP.

FUGITIVE DUST CONTROL PLAN (PM-10) DUST CONTROL ACTIONS MASS GRADING PROJECT PHASE

FOR PROJECTS LESS THAN 10 ACRES

PROJECT NAME: PALM SPRINGS ANIMAL CARE FACILITY

CONTRACTOR NAME:

ANTICIPATED START DATE: 5-1-10

ANTICIPATED COMPLETION DATE: 6-1-10

NO. OF ACRES UNDER ACTIVE CONSTRUCTION: 3.8 AC.

Detailed description of dust control actions implemented during this phase should match information provided on site plan. (Use additional pages as necessary.)

SEE NEXT PAGE

CONTRACTOR TO KEEP SITE DAMP AT ALL TIMES.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

MASS GRADING PROJECT PHASE

GENERAL REQUIREMENTS

1. HAULING PROCEDURES:

   ALL VEHICLES GOING FROM DIRT AREAS ONTO PAVED STREETS SHALL HAVE TIRES AND WHEELS INSPECTED AND WASHED IF NECESSARY TO AVOID "TRACKING-OUT" DIRT. TRUCKS HAULING DIRT ON PAVED STREETS SHALL MAINTAIN AT LEAST A HALF FOOT "FREEBOARD" FROM RIM TO DIRT, AND COVER ALL DIRT OR DUSTY DEBRIS LOADS WITH AN APPROPRIATE TARP.

   WHEN PRACTICAL, TRUCKS AND EQUIPMENT, SHOULD SHUT OFF ENGINES RATHER THAN IDLING FOR EXTENDED PERIODS, TO MINIMIZE EXHAUST EMISSIONS AND NOISE. THIS BECOMES MORE CRITICAL AS THE SIZE AND NUMBERS OF VEHICLES INCREASES.

2. ALL STRIPPED, GRADED OR OTHERWISE DISTURBED AREAS SHALL BE STABILIZED BY SOME APPROPRIATE MEANS. AREAS ACTIVELY BEING GRADED CAN USUALLY BE STABILIZED BY APPLYING LOTS OF WATER. DISTURBED AREAS NOT ACTIVELY BEING WORKED MAY BE EFFECTIVELY TREATED WITH SOME MORE DURABLE SOIL STABILIZER, SUCH AS HYDROMULCH, TO AVOID CONSTANT WATERING. THE PREFERRED METHOD OF SITE WATERING IS BY SPRINKLER, ESPECIALLY AROUND THE PERIMETER. SPRINKLERS MUST BE SET TO RUN ON WEEKENDS AND EVENINGS WHEN WATER TRUCK DRIVERS ARE NOT AVAILABLE. A TYPICAL WATER TRUCK CAN ONLY HANDLE WELL ABOUT 4 ACRES PER HOUR.

3. IF PERIMETER BLOCK WALLS ARE TO BE BUILT THEY SHOULD BE GIVEN A HIGH PRIORITY SINCE THEY WILL HELP TO CATCH BLOWSAND AND COULD THEREBY REDUCE THE AMOUNT OF STREET SWEEPING REQUIRED.

4. DIRT STOCKPILED NEXT TO UTILITY TRENCHES SHALL BE KEPT WATERED OR OTHERWISE STABILIZED OR COVERED TO HELP COUNTERACT THEIR HIGH PROFILE EXPOSURE TO THE WIND.

5. ALL PREVIOUSLY ROUGH GRADED AREAS THAT WILL BE INACTIVE IN THIS PHASE SHOULD BE TREATED WITH A DURABLE SOIL STABILIZER OR GROUND COVER SYSTEM. IF A VEGETATED GROUND COVER IS UTILIZED IT IS ONLY NECESSARY TO GET IT INITIALLY ESTABLISHED. THE ROOT SYSTEM AND TOP STUBBLE MAY BE SUFFICIENT TO HOLD THE DUST EVEN IF WATERING IS DISCONTINUED.

SITE SPECIFIC DETAILS:

1. HAULING PROCEDURES: (AS SHOWN ABOVE UNLESS OTHERWISE DETAILED)
   IMPORT HAUL ROUTE TO BE DETERMINDED BY CITY/CONTRACTOR

2. SOIL STABILIZATION METHODS:
   ACTIVE AREA WATER SCHEDULE: (MIN. 4 TIMES PER 24 HRS.)
   ONE (1) 2,000 GALLON WATER TRUCK

   WEEKEND WATERING SCHEDULE: (MIN. 4 TIMES PER 24 HRS.)
   ONE (1) 2,000 GALLON WATER TRUCK

   INACTIVE AREA STABILIZATION METHOD(S): (ACRYLIC POLYMER, HYDROMULCH, PLANTINGS, BIODEGRADABLE "OIL", OR AS SHOWN HERE) POLYMER COATING TO BE CHECKED AFTER EACH RAIN FALL AND RE-APPLIED AS NEEDED.

3. PERIMETER BLOCK WALL SCHEDULE: NA, NONE PROPOSED

4. OTHER: INSTALL SECURITY BARRIER TO PREVENT DISTURBANCE OF NEWLY GRADED BUILDING PADS IMMEDIATELY UPON INVITATION OF THIS PHASE OF GRADING. TO REDUCE JOB-SITE TRACK-OUT, INSTALL "TRACKCLEAN" OR SIMILAR TYPE RUMBLE STRIPS BEFORE INITIATING ANY ON SITE WORK. ALSO SEE SWPPP.

FUGITIVE DUST CONTROL PLAN (PM-10) DUST CONTROL ACTIONS FINISH GRADING PROJECT PHASE

FOR PROJECTS LESS THAN 10 ACRES

PROJECT NAME: PALM SPRINGS ANIMAL CARE FACILITY

CONTRACTOR NAME:

ANTICIPATED START DATE: 6-1-10

ANTICIPATED COMPLETION DATE: 10-1-10

NO. OF ACRES UNDER ACTIVE CONSTRUCTION: 0.5 AC.

Detailed description of dust control actions implemented during this phase should match information provided on site plan. (Use additional pages as necessary.)

SEE NEXT PAGE

CONTRACTOR TO KEEP SITE DAMP AT ALL TIMES.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FINISH GRADING PROJECT PHASE

GENERAL REQUIREMENTS:

1. DIRT STOCKPILED NEXT TO UTILITY TRENCHES SHALL BE KEPT WATERED OR OTHERWISE STABILIZED OR COVERED TO HELP COUNTERACT THEIR HIGH PROFILE EXPOSURE TO THE WIND.

2. ALL PREVIOUSLY ROUGH GRADED AREAS THAT WILL BE INACTIVE IN THIS PHASE SHOULD BE TREATED WITH A DURABLE SOIL STABILIZER OR GROUND COVER SYSTEM. IF A VEGETATED GROUND COVER IS UTILIZED IT IS ONLY NECESSARY TO GET IT INITIALLY ESTABLISHED. THE ROOT SYSTEM AND TOP STUBBLE MAY BE SUFFICIENT TO HOLD THE DUST EVEN IF WATERING IS DISCONTINUED.

3. FOR TRACTS, MULTIPLE PARCELS, AND EXTENSIVE COMMERCIAL SITES, PAVED ACCESS TO THE BUILDING SITES WILL BE REQUIRED PRIOR TO FRAMING OF THE BUILDINGS. THIS CONSTRUCTION STAGE USUALLY INDICATES AN INCREASE IN THE NUMBERS OF WORKERS AND THEIR VEHICLES. ALSO, THE PAVED ACCESS IS RECOMMENDED FOR FIRE FIGHTING PURPOSES. IF PAVING IS DESIRED BEFORE ALL UTILITIES AND/OR LATERALS ARE INSTALLED, THE BASE LIFT OF ASPHALT IS SUFFICIENT FOR ACCESS. THE A.C. CAN BE "CAPPED" LATER, LEAVING A FINAL SURFACE THAT IS FREE OF UTILITY CUTS AND PATCHES.

4. AS PAVED ACCESS IS EXTENDED, THE STAGING AREA CAN BE MOVED CLOSER TO THE BUILDING SITES. THE STORAGE AND OFFICE TRAILERS, EQUIPMENT, AND EMPLOYEE PARKING CAN BE MOVED ONTO PAVED PORTIONS OF THE SITE.

SITE SPECIFIC DETAILS:

1. TRENCH STOCKPILE TREATMENT: ONE (1) 2,000 GALLON WATER TRUCK MINIMUM 4 TIMES PER 24 HRS.

2. INACTIVE AREA TREATMENT: (SEAL WITH HYDROMULCH, ACRYLIC POLYMER, PLANTINGS, ETC.) POLYMER COATING TO BE CHECKED AFTER EACH RAIN FALL AND RE-APPLIED AS NEEDED.

3. STREET PAVING SCHEDULE: AS REQUIRED

4. STAGING AREA MOVEMENT SCHEDULE: AS REQUIRED

5. OTHER: MAINTAIN SECURITY BARRIER TO PREVENT DISTURBANCE OF NEWLY GRADED BUILDING PADS. TO REDUCE JOB-SITE TRACK-OUT, MAINTAIN "TRACKCLEAN" OR SIMILAR TYPE RUMBLE STRIPS. MAINTAIN ONE (1) 2,000 GALLON WATER TRUCK FOR WATERING AS NEEDED.

FUGITIVE DUST CONTROL PLAN (PM-10) DUST CONTROL ACTIONS CONSTRUCTION PROJECT PHASE

FOR PROJECTS LESS THAN 10 ACRES

PROJECT NAME: PALM SPRINGS ANIMAL CARE FACILITY

CONTRACTOR NAME:

ANTICIPATED START DATE: 10-1-10

ANTICIPATED COMPLETION DATE: 4-1-11

NO. OF ACRES UNDER ACTIVE CONSTRUCTION: 2.7 AC.

Detailed description of dust control actions implemented during this phase should match information provided on site plan. (Use additional pages as necessary.)

SEE NEXT PAGE

CONTRACTOR TO KEEP SITE DAMP AT ALL TIMES.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

CONSTRUCTION PROJECT PHASE

GENERAL REQUIREMENTS:

1. ALL INACTIVE AREAS SHOULD HAVE BEEN STABILIZED BY THIS STAGE. IF PREVIOUSLY COVERED, THE ACTUAL BUILDING PADS MAY NOW NEED TO BE STRIPPED, SCARIFIED, AND RECOMPACTED FOR BUILDING PAD COMPACTION AND ELEVATION CERTIFICATIONS. DUST WOULD BE KEPT DOWN BY WATERING, USUALLY BY TEMPORARY SPRINKLERS.

2. TRENCHING FOR BUILDING UTILITIES, AND MISCELLANEOUS FACILITIES FORM THE BULK OF EARTHWORK AFTER THE PADS HAVE BEEN CERTIFIED. TEMPORARY SPRINKLERS MAY STILL BE USED ON THE BUILDING SITE FOR DUST CONTROL PRIOR TO THE BEGINNING OF FRAMING. TREATMENT WITH A BIODEGRADABLE "OIL" APPROVED FOR DUST CONTROL IS RECOMMENDED WHERE IT IS DIFFICULT TO WATER.

3. ESTABLISHING THE LANDSCAPE AND SPRINKLER SYSTEM AROUND THE PERIMETER OF LARGE PROJECTS SHOULD BE DONE AT THIS STAGE. PLANTINGS AROUND THE PERIMETER SERVE AS A WIND BUFFER AND COLLECTION SYSTEM FOR DUST AND SAND. IT IS GOOD TO HAVE DUST AND SAND WELL UNDER CONTROL PRIOR TO THE BUILDING PHASE FOR THE SAKE OF CERTAIN GLUING AND PAINTING PROCESSES THAT CAN BE RUINED BY BLOWSAND OR DUST.

4. DISTURBED AREAS AROUND BUILDINGS SHOULD BE WATERED BY HAND FOR DUST CONTROL UNTIL SUCH TIME THAT THE SPRINKLER SYSTEM IS FULLY FUNCTIONAL AND GROUND COVER AND/OR LANDSCAPING IS ESTABLISHED. IF WATERING IS DIFFICULT DUE TO BUILDING INTERFERENCE, CHEMICAL OR MULCH TREATMENTS ARE AVAILABLE THAT CAN STABILIZE THE SOIL WITHOUT FREQUENT WATERING.

5. CONSTRUCTION DUST SUCH AS FROM CEMENT, PLASTER, PAINT OVERSPRAY, WOOD CUTTING, GRINDING OPERATIONS, ETC., SHOULD BE MINIMIZED ALSO. A PERIMETER BARRIER OF SPRINKLERS AND PLANTINGS CAN SERVE TO CATCH SOME OF THIS POTENTIALLY HAZARDOUS MATERIAL AS WELL AS NATURAL DUST AND BLOWSAND. CONCENTRATIONS OF CONSTRUCTION DUSTS CAN RESULT FROM WASHING OF EQUIPMENT AND SHOULD BE PROPERLY DISPOSED OF BEFORE THEY CAN DRY OUT AND BLOW OR BE WASHED ACROSS PROJECT BOUNDARIES.

6. NOTE THAT SWALES SHOULD BE INSPECTED BY CITY PRIOR TO SETTING OF PERMANENT GROUND COVER OR OTHER PLANTS.

SITE SPECIFIC DETAILS:

1. BUILDING PAD WATERING:
   ONE (1) 2,000 GALLON WATER TRUCK AND/OR HANDWATERING

2. FORMWORK AND TRENCH WATERING:
   ONE (1) 2,000 GALLON WATER TRUCK AND/OR HANDWATERING

3. PERIMETER LANDSCAPE SCHEDULE:
   AS SOON AS POSSIBLE

4. OTHER: MAINTAIN SECURITY BARRIER TO PREVENT DISTURBANCE OF NEWLY GRADED BUILDING PADS. TO REDUCE JOB-SITE TRACK-OUT, MAINTAIN "TRACKCLEAN" OR SIMILAR TYPE RUMBLE STRIPS. MAINTAIN ONE (1) 2,000 GALLON WATER TRUCK FOR WATERING AS NEEDED.

FUGITIVE DUST CONTROL PLAN (PM-10) OWNER/REPRESENTATIVE INFORMATION

FOR PROJECTS LESS THAN 10 ACRES

Name: _____

Title (If applicable): _____

Company Name (If applicable): _____

Mailing Address: _____

City: _____

Zip Code: _____

Location Address: _____

Primary Phone: _____

Fax: _____

24 Hour Access/Emergency Phone: _____

Cell Phone: _____

Email Address: _____

Responsible for dust control during construction activities?

☐ Yes ☐ No

If No, explain:

_____

_____

_____

_____

Responsible for dust control during off hours?

☐ Yes ☐ No

If No, explain:

_____

_____

_____

_____

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) GENERAL CONTRACTOR INFORMATION

FOR PROJECTS LESS THAN 10 ACRES

Name: _____

Title (If applicable): _____

Company Name (If applicable): _____

Mailing Address: _____

City: _____

Zip Code: _____

Location Address: _____

Primary Phone: _____

Fax: _____

24 Hour Access/Emergency Phone: _____

Cell Phone: _____

Email Address: _____

Responsible for dust control during construction activities?

☐ Yes ☐ No

If No, explain:

_____

_____

_____

Responsible for dust control during off hours?

☐ Yes ☐ No

If No, explain:

_____

_____

_____

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) SUB-CONTRACTOR INVOLVED IN EARTH MOVEMENT AND/OR SOIL STABILIZATION

FOR PROJECTS LESS THAN 10 ACRES

Name: _____

Title (If applicable): _____

Company Name (If applicable): _____

Mailing Address: _____

City: _____

Zip Code: _____

Location Address: _____

Primary Phone: _____

Fax: _____

24 Hour Access/Emergency Phone: _____

Cell Phone: _____

Email Address: _____

Responsible for dust control during construction activities?

☐ Yes ☐ No

If No, explain:

_____

_____

_____

Responsible for dust control during off hours?

☐ Yes ☐ No

If No, explain:

_____

_____

_____

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) SIGN REQUIREMENTS

FOR PROJECTS LESS THAN 10 ACRES

REFER TO PAGE 22 FOR SIGN & LETTERING SIZE REQUIREMENTS

ALL LETTERS SHALL BE BOLD FACE TYPE

DEVELOPER'S NAME: ACME BUILDERS
TRACT #: 9999
PROJECT NAME: PALM SPRINGS TRACT
CONTRACTOR: JOHN Q BUILDER
GRADING PERMIT #: C-999
CITY (E) NUMBER: E-9999

IF YOU SEE DUST COMING FROM THIS PROJECT CALL:

ALL LETTERS SHALL BE BOLD FACE TYPE

NAME & PHONE NUMBER:
(XXX) XXX-XXXX

ALL LETTERS SHALL BE BOLD FACE TYPE

IF YOU DO NOT GET A RESPONSE WITHIN ONE HOUR PLEASE CALL:

8:00 AM - 5:00 PM MONDAY THRU FRIDAY (760) 323-8253 - CITY OF PALM SPRINGS, PUBLIC WORKS AND ENGINEERING DEPARTMENT

AFTER HOURS, WEEKENDS (760) 323-8115 - CITY OF PALM SPRINGS POLICE DEPARTMENT

OR CALL THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (AQMD) AT (800) CUT-SMOG (800) 288-7664

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) DUST CONTROL SIGNAGE REQUIREMENTS

FOR PROJECTS LESS THAN 10 ACRES

1. The sign(s) shall be constructed with materials capable of withstanding the harsh environment (e.g. strong winds, intense sunlight, and rain) of the Palm Springs area.

2. No handwritten signs will be accepted. Stenciled professionally prepared signs are required. Signs shall be constructed to the following **minimum** standards:

   a. 1 thick A/C laminated plywood board

   b. One (1) 4 x 4 post set in 2 foot deep foundation

   c. Post shall be attached to plywood with two (2) carriage bolts.

   d. The front surface of the sign should be painted in the contrasting colors of a white background with black lettering. (Other color combinations must be approved in advance by the Public Works and Engineering Division).

   e. Commercially prepared metal signs mounted on steel posts are also acceptable.

   f. Quantity and location of signs must be approved in advance by the Public Works and Engineering Division.

   g. Refer to page 22 for proper sign and letter dimensions with relation to project site acreage.

3. The sign(s) shall be installed and maintained in a condition such that members of the public can easily view, access, and read the signs(s). Additionally:

   a. The lower edge of the sign(s) shall be mounted a minimum of 6 feet and a maximum of 7 feet above the existing ground level for easy viewing.

   b. On the construction site, sign(s) should be positioned so as to be visible from all major streets on each side, or sides of the project within 50 feet of the project boundary.

   c. For construction projects that are developed in phases, the sign(s) should be relocated to the areas, which are under active construction.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) DUST CONTROL SIGNAGE REQUIREMENTS

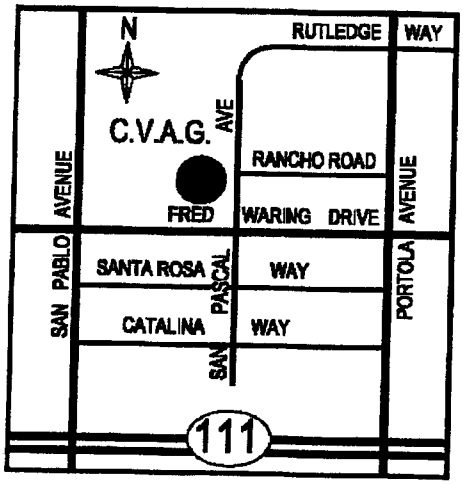
FOR PROJECTS LESS THAN 10 ACRES

SIGN AND LETTERING REQUIREMENTS (ALL DIMENSIONS IN INCHES)			
PROJECT SIZE	< 1 ACRE	1.01-9.99 ACRES	OVER 10 ACRES
SIGN SIZE	24H X 36W	36H X 48W	48H X 96W
	↓	↓	↓
PERMIT #	2	3	4
DEVELOPER'S NAME	2	3	4
PROJECT NAME/TRACT #	2	3	4
IF YOU SEE DUST COMING FROM	2	3	4
THIS PROJECT CALL:	2	3	4
NAME/PHONE NUMBER/XXX-XXXX	3	4.5	6
IF YOU DO NOT RECEIVE A RESPONSE, PLEASE CALL	1.5	2.25	3
CITY POLICE AT XXX-XXXX	1.5	2.25	3
OR CALL AQMD 800-CUT-SMOG	1.5	2.25	3

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

FUGITIVE DUST CONTROL PLAN (PM-10) AQMD DUST CONTROL CLASS INFORMATION

TO OBTAIN A FUGITIVE DUST CONTROL CERTIFICATION, YOU MUST ATTEND A THREE (3) HOUR SEMINAR AT THE COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS (C.V.A.G.) OFFICES AT:



C.V.A.G.
Conference Room 119
73-710 Fred Waring Drive
Palm Desert, CA 92260

South Coast Air Quality Management District
Regional air pollution control agency with the authority to regulate emissions, including fugitive dust.

WHO SHOULD ATTEND:

- City Managers
- Public Works Officers
- City Planners
- City Engineers
- Builders
- Large Site Landscapers
- Landfill Operators
- Developers
- Contractors

WHAT THE SEMINAR WILL COVER:

- AQMD Rule Requirements
  - Rule 403 (Fugitive Dust)
  - Rule 402 (Public Nuisance)
  - Rule 401 (Visible Emission)
- AQMD Dust Control Review Guidelines
- Dust Mitigation Plan Approval
- Offered the third Thursday of the month

RESERVATIONS REQUIRED:

- Call 1-866-861-DUST (1-866-861-3878)

  or EMAIL

  dust_control@aqmd.gov. Please leave you name, phone number and the number of attendees.

DUST CONTROL IS REQUIRED 24 HOURS A DAY – 7 DAYS A WEEK – REGARDLESS OF CONSTRUCTION STATUS.

23/23

Fugitive Dust Control Plan Application Form
(Form A - Page 1 of 4)

Please print in ink or type. Blank spaces must be completed for the application to be processed. If an item is not applicable, please enter N/A.

1. Form Preparer: Property Owner ☒ Developer ☐ Prime Contractor ☐ Other ☐*
(If Other, attach Owner Designee Form [Page 3-8])

CONTACT PERSON NAME	
COMPANY NAME	
COMPANY ADDRESS	
CITY, STATE, ZIP CODE	
TELEPHONE NUMBER	
FACSIMILE NUMBER	
24-HOUR, MANNED AFTER HOURS PHONE NUMBER	
AQMD DUST CLASS CERTIFICATE #	

2. Project Address or Location

PROJECT NAME	PALM SPRINGS ANIMAL CARE FACILITY
PROJECT ADDRESS	4575 E. MESQUITE AVENUE
CITY, STATE, ZIP CODE	PALM SPRINGS, CA 92262
NEAREST MAJOR CROSS STREETS	MESQUITE AVENUE & VELLA ROAD
PARCEL NUMBERS	APN 680-020-010 (PORTION)

Fugitive Dust Control Plan Application Form
(Form A - Page 2 of 4)

3. Project Acreage (total land to be disturbed)
(include project site and associated unpaved access roads, stockpiles, and staging areas)

PROJECT SIZE (ACRES)	3.0
WATER SOURCE (GPM)	PROPOSED FIRE HYDRANT ON MESQUITE AVE. (SOUTH SIDE)

4. Project Owner (if Fugitive Dust Control Plan preparer is not the property owner)

NAME	
COMPANY NAME (IF APPLICABLE)	CITY OF PALM SPRINGS
ADDRESS (INCLUDE CITY, STATE, & ZIP CODE)	3200 E. TAHQUITZ CANYON WAY PALM SPRINGS, CA 92262
TELEPHONE NUMBER	760-323-8253
FACSIMILE NUMBER	760-322-8325

5. The Person(s) responsible for dust control measures and to whom official notices should be sent if necessary

RESPONSIBLE PERSON	
COMPANY NAME	
ADDRESS (INCLUDE CITY, STATE, & ZIP CODE)	
TELEPHONE NUMBER	
24-HOUR, MANNED AFTER-HOURS TELEPHONE NUMBER	
FACSIMILE NUMBER	
AQMD DUST CLASS CERTIFICATE #	

Fugitive Dust Control Plan Application Form
(Form A - Page 3 of 4)

6. On-Site Superintendent/Supervisor/Foreman contact

NAME	
COMPANY NAME	
ADDRESS (INCLUDE CITY, STATE, & ZIP CODE)	
TELEPHONE NUMBER	
24-HOUR, MANNED AFTER-HOURS TELEPHONE NUMBER	
AQMD DUST CLASS CERTIFICATE #	

7. Site Mapping

Provide a map showing the vicinity of the project clearly identifying the closest major cross streets or other landmarks and the project location. Label this map "**Vicinity Map**". Required map size is 8 ½ by 11".

Provide an 8 ½ by 11" or larger **Assessor Parcel Map** for the property(s) on which the project will be occurring. Outline or highlight the affected parcels. Identify location of site entrances, internal unpaved haul routes, wind fencing, areas to be chemically stabilized and other proposed and required dust control mitigations. Projects that are only installing or constructing linear features such as roads, pipelines or other utilities that boarder or cross more than one Assessor's parcel do not require Assessor's Parcel Maps, but must provide a detailed vicinity map adequately depicting the entire project area. If the project is divided into construction phases (separate physical project areas), provide a map clearly identifying the phases.

8. Attach a Fugitive Dust Control Plan

- ✓ Projects with less than 10 acres of disturbed surfaces must complete and attach a Fugitive Dust Control Plan (Form DCP) or equivalent.
- ✓ Projects with 10 acres or more of disturbed surfaces must complete and attach a Site-Specific Fugitive Dust Control Plan. Guidance for preparation of a Site-Specific Fugitive Dust Control Plan is included later in this Chapter.

Fugitive Dust Control Plan Application Form
(Form A - Page 4 of 4)

9. Project notifications

For projects with 10 acres or more of disturbed surfaces, the dust control ordinance requires notification to the local permitting authority and to the AQMD prior to project initiation and at project completion. (Refer to Chapter 4 of this Handbook for specific requirements and forms).

10. Project Signage

Construction signage must be installed on-site prior to construction. Guidelines for construction signage are found in Chapter 5 of this Handbook.

11. Owner Agreement

The signatory on this application constitutes an agreement by the owner to be the person with authority to enforce compliance by all contractors and subcontractors of the Dust Control Ordinance, Fugitive Dust Control Plan conditions, and any supplements identified by the permitting authority. Once approved, this application is incorporated by reference and becomes apart of the approved site grading plan.

Owner Signature _____ Date _____

Printed Name _____ Title and Company _____

AQMD Coachella Valley Fugitive Dust Control Class Certificate # _____

APPENDIX C - REPORTING DOCUMENTS

Reporting documentation should be kept in this section and made shall remain at the construction site per requirements of the GENERAL PERMIT.

SAMPLING/ ANALYSIS and TESTING PROCEDURES and RECORDS

All sampling shall be in accordance with 40 CFR Part 136 and GENERAL PERMIT CAS000002, 99-08 DWQ, and Resolution 2001-046.

1-18-2010 Bid Set (Not for Construction)

SWPPP INSPECTION REPORT

Site_____
Inspector Name & Title:_____
Signature: _____ Date: _____
Current Weather Conditions: _____
Duration & Date of Last Rainfall Occurrence: _____ Amount of Rainfall

Perimeter Fencing and Sandbags
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ No damage to Fencing
- ☐ No Leaking or Damaged Sandbags
- ☐ All perimeter Fencing and Sandbags Functional

Desilting Basins
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ Spillways in Good Condition and Functional
- ☐ Embankment Intact, No Significant Erosion
- ☐ Adequate Sediment Capacity Remaining
- ☐ Outlet Drain Not Leaking Sediment

Velocity Reducers
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ No Leaking or Damaged Sandbags
- ☐ Clean, Free of Sediment and Debris

Areas with Landscaping and Ground Cover
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ Healthy, No Significant Erosion

Material Handling and Storage Areas
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ Clean, Free of Spills and Debris, No Leaking Containers
- ☐ Excess and Unneeded Materials Removed
- ☐ Materials Containing or Treated with Pollutants Properly Packaged or Covered

Equipment Storage, Cleaning and Maintenance Areas
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ Clean, Free of Spills and Debris, No Leaking Containers
- ☐ Excess and Unneeded Materials Removed
- ☐ Materials Containing or Treated with Pollutants Properly Packaged or Covered
- ☐ No Equipment or Vehicles Leaking Fluids

Points of Discharge
No. On site _____ No. Inspected _____ No. Requiring Action_____

- ☐ Signs of Pollution Discharge

SWPPP CORRECTIVE ACTION REPORT

Site:_____

Inspector Name & Title: _____

Signature: _____ Date:_____

Control Measure/Facility Requiring Attention:_____

Recommended Corrective Action: _____

Scheduled Completion Date: _____ Date Completed: _____

Control Measure/Facility Requiring Attention:_____

Recommended Corrective Action: _____

Scheduled Completion Date: _____ Date Completed: _____

Control Measure/Facility Requiring Attention:_____

Recommended Corrective Action: _____

Scheduled Completion Date: _____ Date Completed: _____

Control Measure/Facility Requiring Attention: _____

Recommended Corrective Action: _____

Scheduled Completion Date: _____ Date Completed: _____

SWPPP ANNUAL CERTIFICATION OF COMPLIANCE

CERTIFICATION: I certify that I have evaluated the storm water discharges and control practices of the _____ project site and determined the construction activity is in compliance with the State GENERAL PERMIT for Storm Water Discharges Associated with Construction Activity CAS000002, and this SWPPP. This certification is based on the visual inspection of the construction site conducted on _____, 20____. A copy of the site inspection report is on file at the Field Office.

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.

Signature: _____

Title: _____

Date: _____

Note: Certify by July 1 of each year

Signatory requirements are defined in Section C.9 of the GENERAL PERMIT 99-08

SWPPP NOTICE OF NON-COMPLIANCE

I certify that I have evaluated the storm water discharge and control practices of the following site and find that the construction site is in non-compliance with the State GENERAL PERMIT for Storm Water Discharges Associated with Construction Activity CAS000002, and this SWPPP.
This certification is based on the visual inspection of the construction site conducted on _____, 20____.

Project Site: _____

Owner: _____

Type(s) of non-compliance _____

Impact caused by the event _____

Action(s) to achieve compliance _____

The appropriate action(s) or modification(s) required to achieve compliance will be completed by _____, 20____.

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.

Signature: _____

Title: _____

Date: _____

SWQTF
Stormwater Quality Task Force
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Storm Water Sampling Guidance Document

For Compliance with California State Water Resources Control Board Resolution No. 2001-046 (NPDES General Permit For Storm Water Discharges Associated With Construction Activity)

DRAFT - July 31, 2001

Disclaimer

This preliminary draft is a work in progress by the Construction Workgroup of the California Stormwater Quality Task Force (Task Force), an advisory body of storm water dischargers. The document has not been approved by the California Stormwater Quality Task Force, State Water Resources Control Board, or any Regional Water Quality Control Board.

The purpose of this guidance document is to assist members of the Task Force and other dischargers subject to the Construction Activity Storm Water Discharge Permit (Order 99-08-DWQ, as amended by Order 2001-046) in attaining compliance with the permit.

The preliminary draft is being made available to construction dischargers to provide assistance in developing the sampling and analysis plans required by State Water Resources Control Board Order No. 2001-046. The final guidance document will be released once it is completed and approved by the California Stormwater Quality Task Force. The release of the final guidance document is expected in September 2001.

If you have comments on the guidance, please email them to the Construction Workgroup leader at mathews6@llnl.gov.

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Construction Storm Water Sampling Guidance Document

1.0 Introduction

The purpose of this document is to provide guidance to owners and operators of construction sites who are permitees under the State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated With Construction Activity (General Permit), as modified by Resolution No. 2001-046, "*Modification of Water Quality Order 99-08-DWQ State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated With Construction Activity (General Permit)*". The modifications to the General Permit require that a sampling and analysis strategy and sampling schedule for discharges from construction activity be developed and included in the project's Storm Water Pollution Prevention Plan (SWPPP). A sampling and analysis strategy and sampling schedule must be developed regardless of the time of the year that construction occurs.

This document was developed by the Construction General Permit Working Group of the California Storm Water Quality Task Force (Task Force). The Task Force was formed in 1989 to advise the State Water Resources Control Board (State Board) on storm water discharge issues. The Task Force membership is composed of storm water management and storm water quality professionals from cities, counties, special districts, industries, and consultants throughout California.

The sampling requirements and guidance provided in this document will apply to most construction projects, but it may not apply to all construction projects. For further guidance and/or direction about what must be accomplished to comply with the General Permit and Resolution 2001-46, please contact your local Regional Water Quality Control Board (RWQCB) for further guidance and assistance.

1.1 Organization of this Document

This document is organized in the following manner:

Section 1 provides the user with general information on why a sampling and analysis strategy is required.

Section 2 provides information on sediment, silt and turbidity monitoring and sampling.

Section 3 provides information on non-visible pollutant sampling, including what to sample for in construction storm water runoff.

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Section 4 provides general information on the sampling and analysis procedures, which are applicable to the types of sampling and analysis required by the General Permit.

Section 5 provides useful definitions.

Section 6 provides other sources where one can obtain more information.

1.2 Background

The General Permit was reissued by the SWRCB on August 19, 1999. The San Francisco BayKeeper, Santa Monica BayKeeper, San Diego BayKeeper, and Orange Coast Keeper filed a petition for writ of mandate challenging the General Permit in the Superior Court, County of Sacramento.

On September 15, 2000, the Court issued a judgment and writ of mandate and directed the SWRCB to modify the provisions of the General Permit to require permittees to implement specific sampling and analytical procedures to determine whether Best Management Practices (BMPs) implemented on a construction site are:

(1) preventing further impairment by sediment in storm waters discharged directly into waters listed as impaired (Clean Water Act Section 303(d) List [303(d) List]) for sediment, silt, or turbidity; and

(2) preventing other pollutants that are known or should be known by permittees to occur on construction sites and that can not be visually observed or detected in storm water discharges, from causing or contributing to exceedances of water quality objectives.

The monitoring, sampling and analysis provisions in the General Permit were modified pursuant to the court order and were issued as Resolution No. 2001- 046, adopted by the SWRCB on April 26, 2001.

1.2.1 Impaired Water Bodies

Certain lakes, streams, rivers, creeks and other bodies of water in California have been determined by Regional Water Quality Control Boards to be impaired for Sedimentation. These bodies of waters are listed on Attachment 3 of the General Permit. (Clean Water Act [CWA] Section 303(d) [303(d)] Water Bodies listed for Sedimentation). Discharges of storm water from construction sites into a 303(d) listed body of water is not prohibited as long as the type and level of pollutant(s) does not cause or contribute to a water quality exceedance.

To obtain the latest list of 303(d) water bodies, visit the State Water Resources Control Board's Web site at http://www.swrcb.ca.gov/.

1.3 Purpose of Sampling

The purpose of sampling is to determine whether the BMPs employed on a site are effective in controlling potential construction site pollutants from coming in contact with storm water, leaving the site and causing or contributing to an exceedance of water quality objectives in the receiving waters. According to the modifications to the (Resolution No. 2001-046) General Permit, there are two categories of monitoring required, as shown below. These new monitoring requirements are illustrated in Figure 1-1.

- sediment in storm water discharged directly to water bodies listed as impaired for sediment/siltation or turbidity on the SWRCB's 303(d) list water bodies; and
- non-visible pollutants.

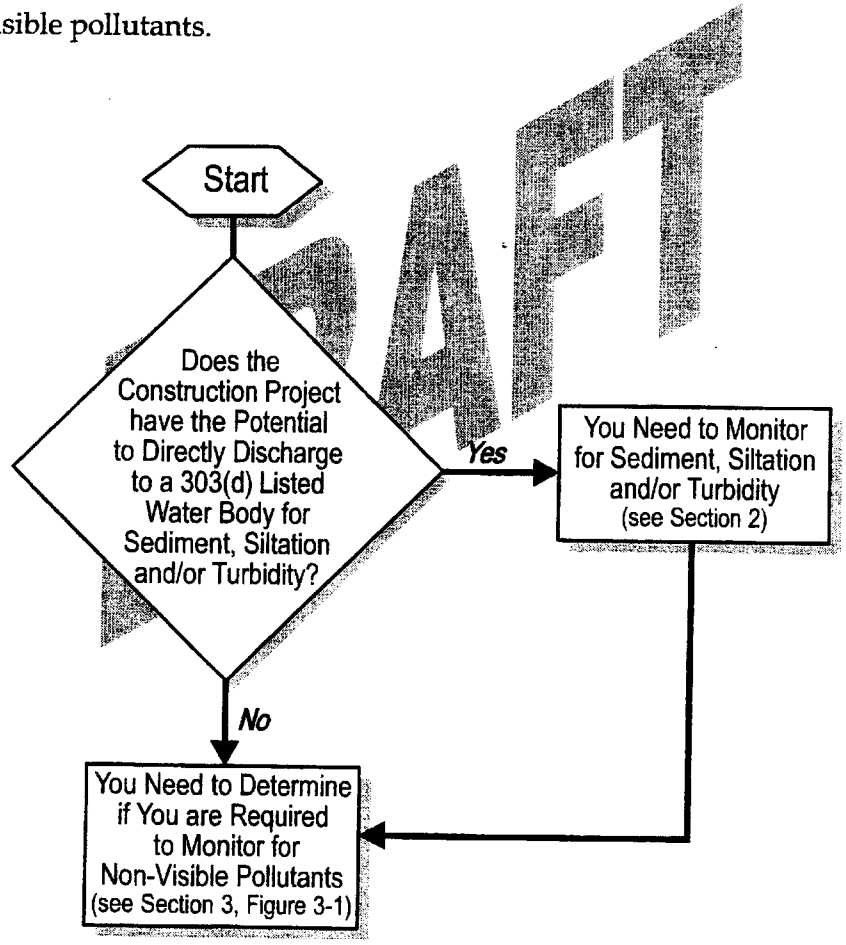

Figure 1-1
General Permit Monitoring and Analysis Requirements

2.0 Monitoring Program for Sedimentation/Siltation

2.1 What the Permit Says on Monitoring

The General Permit requires that storm water BMPs be developed, designed, installed and maintained during construction and post construction phases. The purpose of the storm water BMPs is to reduce or eliminate pollutants which are caused by, or are the result of, the construction activities from coming in contact with rainfall and storm water surface drainage and/or being discharged off-site with the construction site's storm water runoff.

Soils, sediments, and fine (suspendable) particles that result from grading and earthwork activities and soil erosion from disturbed, un-stabilized land areas are a potential significant source of storm water pollution at construction sites. The General Permit requires construction sites to develop, implement and maintain a combination of effective erosion control and sediment control BMPs to prevent soils, sediments, debris and suspendable solids from leaving the construction site and moving into receiving waters at levels above pre-construction levels.

The General Permit requires that the SWPPP identify a strategy for conducting the sampling and analysis, including the frequency at which sampling will be conducted. The SWPPP must also show:

- the location(s) of direct discharges from construction activities to a water body listed on the SWRCB's 303(d) list for sediment, silt and/or turbidity;
- the designated sampling location in the listed water body representing the prevailing conditions up-stream of the discharge; and
- the designated sampling location in the listed water body representing the prevailing conditions down-stream of the discharge.

2.2 Deciding When to Sample

- Sampling must occur when storm water runoff directly discharges from the construction site to a 303(d) listed water body. Refer to Section 2.5, Where to Sample, for guidance on sampling locations.
- Samples need only be collected during daylight hours (sunrise to sunset), during the first two hours of discharge (runoff) from storm events which result in a direct discharge to any 303(d) listed water body.
- Storm water runoff samples must be collected regardless of the time of year, status of the construction site, or day of the week. Samples should be collected during the first two hours of runoff. Storm water inspections and sample collections are required even during non-working days (including weekends and holidays).

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- Dischargers do not need to sample runoff for more than four (4) rain events per month.

2.3. Deciding What to Sample

- If the water body is listed as impaired for sedimentation or siltation, samples should be analyzed for Settleable Solids (mL/L) and Total Suspended Solids (mg/l) according to EPA 160.2. Samples may be analyzed for suspended sediment concentration (SSC) according to ASTM D3977-97 instead of or in addition to Total Suspended Solids.

- If the water body is listed as impaired for turbidity, samples should be analyzed for turbidity per EPA 180.1 or analyzed in the field using a turbidity meter.

- It is very important that consistent sampling and analysis methods are used for all samples taken at the upstream and downstream points of the 303(d) listed water body.

- Table 2-1 shows general sample handling and laboratory requirements for sediment sampling.

2.4 Deciding How to Sample

- Only personnel trained in water quality sampling procedures should collect storm water samples.

- Sampling methods and locations must be determined in advance of the runoff event in order to provide sufficient time to gather the supplies and equipment necessary to sample and plan for safe access by the sampling crew(s).

- General guidance for sampling procedures is provided in Section 4 of this document.

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Table 2-1
LABORATORY REQUIREMENTS FOR STORM WATER MONITORING OF SEDIMENT, SILTATION AND/OR TURBIDITY
Analytical Constituents, Volumes, and Holding Time Requirements

Parameters	Analytical Method	Target Reporting Limit	Minimum Sample Volume [1]	Container	Preservative	Holding Time
Total Suspended Solids (TSS) [2]	EPA 160.2	1 mg/L	100 mL	500 mL polypropylene	Store in ice or refrigerator at 4°C (39.2°F)	7 days
Settleable Solids (SS)	EPA 160.5	0.1 ml/L/hour	1 liter	500 mL polypropylene	Store in ice or refrigerator at 4°C (39.2°F)	48 hours
Suspended Sediment Concentration (SSC) [2]	ASTM D 3977-97	Contact Laboratory	200 mL	Contact Laboratory	Store in ice or refrigerator at 4°C (39.2°F)	7 days
Turbidity	EPA 180.1	1 NTU	100 mL	500 mL polypropylene or Glass	Store in ice or refrigerator at 4°C (39.2°F), Dark	48 hours

1 Minimum sample volume recommended. Specific volume requirements will vary by laboratory; please check with your laboratory when setting up bottle orders.

2 Use either TSS or SSC, or both, for suspended solids analysis. Up-gradient and down-gradient samples should be analyzed by the same method.

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2.5 Deciding Where to Sample

The General Permit requires that samples be collected at the following locations:

- Sample the 303(d) listed water body upstream of the construction site discharge
- Sample the 303(d) listed water body downstream of the construction site discharge

Additionally, for the purpose of interpreting the results of the samples collected from the 303(d) listed water body, dischargers may want to collect and analyze samples of the discharge from the construction site. Remember that samples should only be collected from safely accessible locations.

In general, sample away from the streambank in or near the main current. Collecting samples directly from ponded, sluggish, or stagnant water should be avoided. Be careful when collecting water upstream or downstream of confluences or point sources to minimize problems caused by backwater effects or poorly mixed flows. Note that samples collected directly downstream from a bridge can be contaminated from the bridge structure or runoff from the road surface.

Choose the upstream location in water that appears to represent the nature of the flow in the stream, for example, if there is a noticeable muddy plume in the center of the stream versus the outer edges, collect the sample from the center of the stream, if possible.

Downstream samples should represent the stream water mixed with flow from the construction site. For instance if the flow from the site can be observed either by a color or flow difference, collect the downstream sample from within the affected water.

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2.6 How to Use Your Data

2.6.1 Coupling Your Visual Observations with Your Analytical Data

The General Permit requires that an effective combination of erosion and sediment control measures be implemented on the site at all times during the rainy season. Site inspections and observations before, during, and after storm events should provide visual indications of whether accelerated erosion is occurring on the site and whether the eroded material is being transported off-site. Visual observations of storm water runoff that appears to be transporting silt or sediment off-site (e.g., the water is soil-colored and non-transparent) probably indicate that you have a problem on the site that will be confirmed by the analytical data.

2.6.2 What on Your Site May Be Causing Sediment, Silt and/or Turbidity

Conditions or areas on your site that may be causing sediment, silt, and/or turbidity in your storm water runoff may include:

- Exposed soil areas with inadequate erosion control measures
- Active grading areas
- Poorly stabilized slopes
- Lack of perimeter sediment controls
- Areas of concentrated flow on unprotected soils
- Poorly maintained erosion and sediment control measures
- Unprotected soil stockpiles
- Failure of an erosion or sediment control measure

2.6.3 What To Do If You Get Data That Shows a Problem

The General Permit requires that BMPs be implemented on the construction site to prevent a net increase of sediment load in storm water discharges relative to pre-construction levels. Although the upstream uncontaminated (background) sample may not be representative of pre-construction levels at your site, it will provide a basis for comparison with the sample taken downstream of the construction site.

If a comparison of the upstream and downstream samples indicates a significant increase in silt, sediment and/or turbidity, it is recommended that the following steps be taken as soon as possible:

1. Repair or replace any BMP that has failed.
2. Maintain any BMP that is not functioning properly due to lack of maintenance.
3. Evaluate whether additional or alternative BMPs should be implemented to provide an effective combination of erosion and sediment control measures on the site. Do not rely solely on perimeter sediment controls, particularly where there are fine-grained soils (such as silts or clays) on the site. Implement erosion controls (source controls) that keep the soil in place, even on temporary slopes and rough graded areas, wherever possible and as necessary to prevent sediment from leaving the site.

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4. Follow the reporting requirements as shown in section B.3 (Receiving Water Limitations) of the General Permit.

If sampling and analysis during subsequent storm events shows that there is still a problem, then repeat the steps above until the analytical results on upstream and downstream samples are relatively comparable.

2.7 Retention of Data

It is recommended that field sampling and laboratory analysis data, training logs, Chain-Of-Custody (COC) forms and other documentation relating to sampling and analysis be kept with the project's Storm Water Pollution Prevention Plan (SWPPP), which is to remain at the construction site at all times until a Notice of Termination for the project is submitted and approved by the appropriate RWQCB. The General Permit requires that records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated or after project completion.

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3.0 Monitoring Program for Pollutants Not Visually Detectable in Storm Water

3.1 What the Permit Says on Monitoring

The General Permit requires that a sampling and analysis program be developed and conducted for pollutants which:

- Are not visually detectable in storm water discharges,
- Are or should be known to occur on the construction site, and
- Could cause or contribute to an exceedance of water quality objectives in the receiving water.

Pollutants that should be considered for inclusion in this sampling and analysis program are those identified in your SWPPP (as required by Sections A.5.b. and A.5.c. of the General Permit). The General Permit states that the SWPPP needs to identify a strategy for conducting the sampling and analysis, including the frequency and location(s) at which sampling will be conducted.

Sampling for non-visibly detectable pollutants is required under the following two conditions:

- Visual inspections, currently required before, during and after storm events, indicate that there has been a breach, malfunction, leakage or spill from a BMP that could result in the discharge of pollutants in storm water and the pollutants would not be visually detectable; or
- Storm water comes into contact with soil amendments, other exposed materials, or site contamination that is allowed to be discharged off the construction site.

A sample of uncontaminated (background) storm water from the site must be collected for comparison with the sample(s) collected from storm water suspected of containing construction-related pollutants. The General Permit also states that the SWPPP needs to describe the sampling procedure, location and rationale for obtaining the uncontaminated sample of storm water.

3.2 Deciding If Sampling is Required (When to Sample)

All construction projects must ensure that proper inspections are conducted throughout the duration of the project to make sure that appropriately selected BMPs have been implemented, are being maintained, and are effective in preventing potential pollutants from coming in contact with storm water and causing or contributing to an exceedance of water quality objectives in the receiving waters.

The frequency of sampling for non-visible pollutants must be determined based on the exposure of pollutant sources. Runoff only needs to be sampled when there is

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exposure of a pollutant source to storm water that runs off the construction site. Inspections of material storage areas that identify a BMP failure, which exposes potential non-visible pollutants to storm water that runs off the construction site, trigger sampling and analysis. If spills are cleaned up and the contaminated material is isolated, eliminating exposure to storm water runoff, sampling does not need to occur. For instances when the potential for previously existing contamination is identified, it may be appropriate to conduct screening analysis during the first one or two storm events of the season to determine if the potential contaminant is running off the construction site.

3.2.1 Sampling and Analysis is Not Required

A sampling and analysis program is not required to be implemented under the following conditions. However, a contingency sampling plan is advised in the event of an incidental discharge.

- Where a construction project is "self-contained", meaning that the project contributes no runoff to other sources or areas and that any potential discharge of pollutants can be totally contained within the construction project site without discharging to a water body or storm drain system.
- Where construction materials and compounds are kept or used so that they are not in contact with storm water (e.g., in water-tight containers, under a water-tight roof, inside a building, etc.).
- Where for specific pollutants, the BMPs implemented at the construction site fully contain the exposed pollutants (e.g., bermed concrete washout area).
- For building materials that are in their final constructed form (e.g., fence materials, support structures and equipment that will remain exposed at the completion of the project, etc.).
- Where pollutants that may have been spilled or released on-site, but have been properly cleaned-up and storm water exposure has been eliminated prior to a storm event.
- For stockpiles of construction materials for which both cover and containment BMPs have been properly implemented to protect them from run-on and from contributing pollutants to storm water runoff.

3.2.2 Sampling and Analysis Is Required

Sampling is required when non-visible pollutants have the potential to contact storm water and runoff the construction site into a storm drainage system or water body. Some examples of this situation are:

- Where construction materials and compounds are stored or used such that they are in contact with storm water.

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- For construction projects that utilize soil amendments (see definition in Section 5) that are in contact with storm water runoff, unless independent test data are available that demonstrate acceptable concentration levels.

- When a leakage or spill occurs prior to a storm event and is not fully contained and cleaned.

- When a leakage or spill occurs during a storm event, and it can not immediately be isolated and/or cleaned-up, and the possibility of an off-site discharge exists..

- During regular inspections of stockpiles it is discovered that cover and containment BMPs have been compromised and storm water comes in contact with the materials, and the resulting runoff discharges into a storm drain system or water body.

- If material storage BMPs have been compromised, breached, or have failed..

If a determination has been made that sampling is needed, storm water runoff samples must be collected regardless of the time of year, status of the construction site, or day of the week. Samples should be collected during the first two hours of runoff. Storm water inspections and sample collections are required even during non-working days (including weekends and holidays).

3.2.3 Coordinating between Inspection Findings and Sampling

- A breach or malfunction in a BMP, leakage, or spill observed during regular inspections, which could result in the discharge of pollutants to a storm drain system or water body (e.g., because it was not cleaned up) and that would not be visually detectable in storm water, triggers sampling and analysis.

- If a leakage or spill is observed during inspections, and appropriate measures are taken to fully contain and clean the leakage or spill, the potential to discharge pollutants to storm water no longer exists and no sampling is required.

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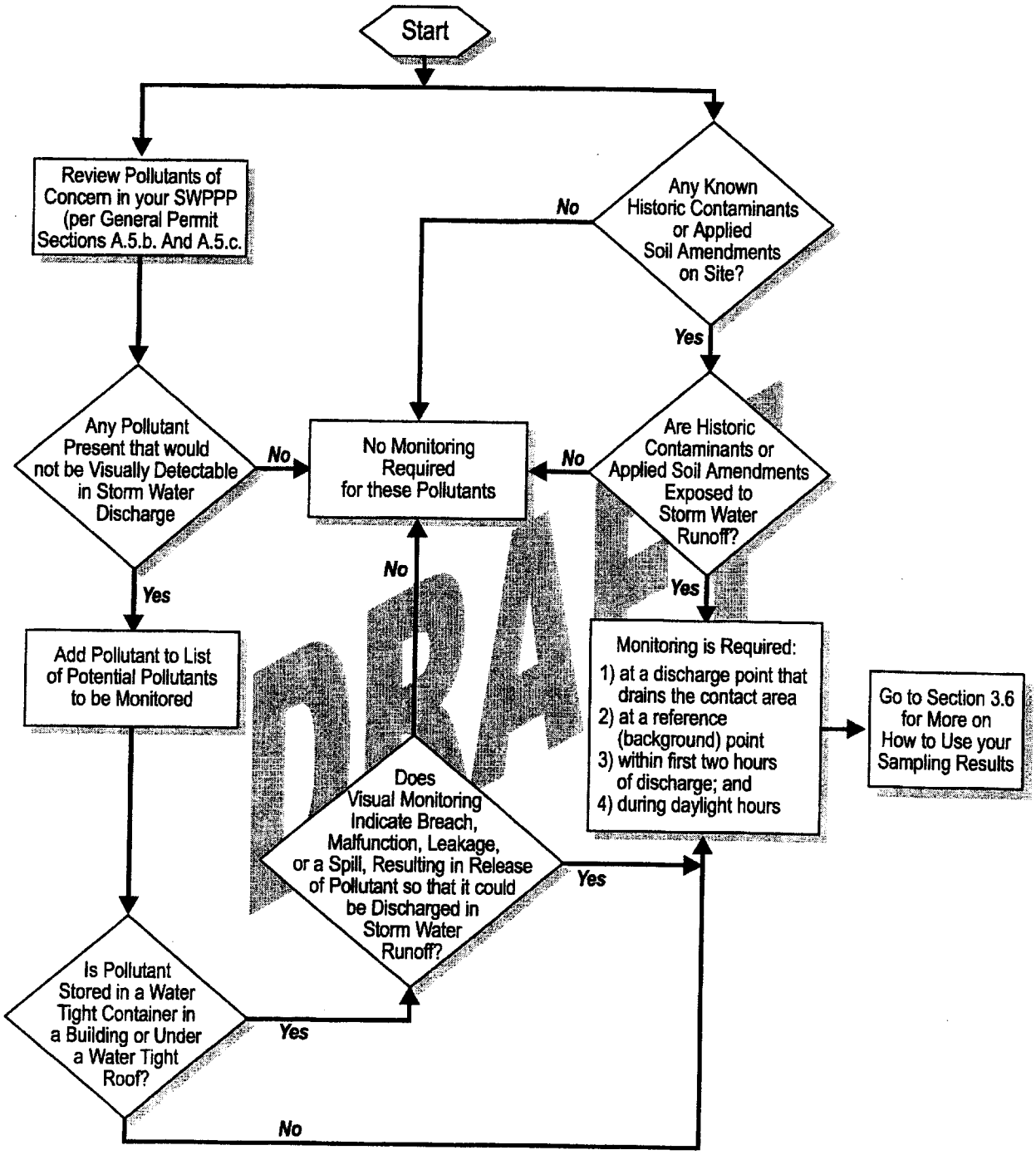

Figure 3-1
Monitoring for Non-Visually Detectable Pollutants

3.3 Deciding What to Sample

Based on your review of your potential sources from your SWPPP (required by General Permit sections A5b and A5c), which will include your construction related materials, soil amendments, and historic contaminants, develop a list of potential pollutants. Identify from this list those pollutants that are not visibly detectable. These are the constituents that you will likely have to sample for in runoff if the materials are exposed to storm water. Consult with your analytical laboratory or water quality chemist to determine if there are field tests or indicator parameters that can be used. Table 3.1 lists typical construction materials that might cause contamination of runoff if exposed to storm water.

3.4 Deciding How to Sample

- Only personnel trained in water quality sampling procedures should collect storm water samples.

- Sampling methods and locations must be determined in advance of the runoff event in order to provide sufficient time to gather the supplies and equipment necessary to sample and plan for safe access by the sampling personnel.

- General guidance for sampling procedures is provided in Section 4 of this document.

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3.5 Deciding Where to Sample

Sampling locations must be identified that provide information on both the runoff quality that is affected by material storage, historic contamination or other exposed potential pollutants, and the background runoff quality (i.e., uncontaminated sample). Material storage may be confined to a small area of the project while historic contamination or exposed materials, such as soil amendments may be widely spread through the construction site. For this reason the sampling locations identified for these two types of potential pollutants may be different.

- Samples must be collected at locations identified in your SWPPP or areas identified by visual observations/inspections where there has been a BMP failure or breach and which can be safely accessed.

- A location that is not affected by material storage activities or by runoff from material storage areas should be selected as a background or reference sampling location for collecting the uncontaminated runoff sample. For widely spread potential contaminant, you may need to select sampling locations at the perimeter of your site, where storm water enters (unaffected by your activities) and leaves (affected by your activities) the site. The SWPPP must describe the sampling procedure, location, and the rationale for selecting this location.

Table 3-1
LIST OF TYPICAL CONSTRUCTION MATERIALS
This is a preliminary table which is being refined to include field and laboratory analysis for pollutants not visually detectable.

Asphalt Work

Asphalt (conventional and rubberized)
Asphalt emulsion
Asphalt releases - Monocyclic Terpet
Asphaltic concrete is usually inert
Liquid asphalt
Sand
Gravel/pea gravel
Aluminate
Aluminum sulfate

Concrete Work

Concrete curing compound - Resin based
"Monkey blood" (a retardant compound used for concrete curing)
Arbitol or Arabitol (1,2,3,4,5 - pentanepentol)
pH from concrete sawing or freshly placed or washed off Portland cement products
Cement
Sand
Cement
Gravel/pea gravel
Diesel fuel (sprayed on wooden forms as a non-sticking compound between concrete and wood)

Cleaning

Various citrus based cleaners
Solvents
Thinners
Cleaners
Water
Detergents
Trisodium phosphate
Sodium hypochlorite

Vehicle and Equipment

Various greases and oils - For heavy equipment maintenance - Tracked types require daily lubing.
Oil and grease are a concern with any heavy equipment
Oil
Grease
Coolants
Diesel
Gasoline
Hydraulic fluid

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Table 3-1
LIST OF TYPICAL CONSTRUCTION MATERIALS
This is a preliminary table which is being refined to include field and laboratory analysis for pollutants not visually detectable.

Pipe Work

Pipe joint compound,
ABS and PVC primers
Chlorine – water line flushing disinfection

Painting

Striping Paints
Other paints
Thinners
Mineral spirits
Latex paint (propylene glycol)
Epoxy
Silicone

Landscaping etc.

Herbicides
Pesticides
Fertilizers
Mulch
Compost

Brick Work

Etching compounds
Acid wash of brick work

Soil Stabilization

Wood fiber mulch
Compost
Wood and bark chips
Straw mulch
Emulsified asphalt
Lime
Plant gums
Bonded fiber matrix
Coconut fiber
Paper mulch
Grass
Various proprietary products

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Table 3-1
LIST OF TYPICAL CONSTRUCTION MATERIALS
This is a preliminary table which is being refined to include field and laboratory analysis for pollutants not visually detectable.

Dust palliatives

Three general classes petroleum based, salts, and organic (non-petroleum)

Petroleum based (Note the CA BMP manual recommends against these because of ground water concerns and plant growth inhibition)

Bunker oil
Asphalt primer
Emulsified asphalt

Salts Note the CA BMP manual recommends against these because they plant inhibit growth)

Magnesium Chloride
Calcium chloride
Natural brines

Organic

Calcium lignosulfonate
Sodium lignosulfonate
Ammonium lignosulfonate

Wood work

Lumber treatment/preservative
Water sealants
Stains
Saw dust

Structural finishing

Plaster
Fire retardants
Epoxies
Paints (see painting)
Tar
Urethane

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3.6 How to Use Your Sampling Data

Corrective action must be initiated where non-visible pollutant sample test results indicate that the construction site's storm water discharges may cause or contribute to a water quality exceedance of the receiving water. This can be determined by comparing your construction site's storm water test results with the background sample.

Where your site's stormwater test results significantly exceed the background concentrations, you must evaluate the BMPs to determine what is causing the difference. Possible solutions may include repairing the existing BMPs, evaluating alternative BMPs that could be implemented, and/or implementing additional BMPs (cover and/or containment) which further limit or eliminate contact between storm water and non-visible pollutant sources at your site. Where contact cannot be reduced or eliminated, storm water that has come in contact with the non-visible pollutant source should be retained on-site and not allowed to be discharged. Contact your RWQCB to determine whether it is permissible to discharge the retained storm water. It is advisable to conduct additional sampling during the next runoff event after corrective actions are implemented to demonstrate and document that the problems have been corrected.

3.6.1 Coupling Your Visual Observations with Your Sampling Results

If visual inspection of storm water BMPs used to contain non-visible pollutants at a construction site indicates that a BMP has failed or been compromised then field monitoring of the storm water from the site for non-visible pollutants is required. Of course, any BMP that has been visually inspected and found breached or compromised should be immediately repaired or replaced.

The intent of conducting field monitoring for non-visible pollutants is to obtain an immediate indication if storm water that is discharging from a site has been contaminated. An immediate indication of a polluted discharge would require an immediate response in the form of back tracking from the point of discharge to verify that the failed BMP is responsible for the polluted discharge and appropriate measures be taken.

If at all feasibly possible, the contaminated discharge should be contained and prevented from being discharged off site. After taking steps to correct the failed BMP, it is advisable that field monitoring in the vicinity of the BMP be conducted to verify that pollutants are no longer in the storm water.

3.6.2 What To Do If You Get Data That Shows a Problem

If your data shows a problem, the options to correct such problems are:

- Repair or replace any BMP that has failed.
- Maintain any BMP that is not functioning properly due to lack of maintenance.
- Evaluate whether additional or alternative BMPs should be implemented.
- Follow the reporting requirements as shown in section B.3 (Receiving Water Limitations) of the General Permit.

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3.7 Retention of Data

It is recommended that field sampling and laboratory analysis data, training logs, Chain-Of-Custody (COC) forms and other documentation relating to sampling and analysis be kept with the project's Storm Water Pollution Prevention Plan (SWPPP), which is to remain at the construction site at all times until a Notice of Termination for the project is submitted and approved by the appropriate RWQCB. The General Permit requires that records of all inspections, compliance certifications, and noncompliance reporting must be retained for a period of at least three years from the date generated or after project completion.

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4.0 Sampling Procedures

The collection and handling of storm water runoff samples requires care to ensure the integrity and validity of the samples. Special documentation, a Chain Of Custody (COC) form, must follow the sample from the collection through the analysis process. Additional documentation to track other information of interest, e.g. field conditions, or required field measurements may also be used. This type of information is recorded on a field tracking form.

Every sample must be collected with care to ensure that the sample is representative of the runoff being tested, must be collected in the right kind of container, be preserved in accordance with the test method's specifications, and stored cold until delivered to an analytical laboratory. Some types of samples have very short hold times and must be analyzed before this hold time is exceeded. Sample handling requirements and documentation form the basis of your sampling quality assurance program.

Before starting any sampling program, contact the analytical laboratory that you plan to use to analyze your samples. Make sure to select a laboratory that will provide you with properly cleaned and preserved sampling containers and COC needed, and that can assist in identifying courier services available to transport samples to the laboratory, or that may be able to provide sampling service for you. All these details need to be worked out in advance of sample collection. The analytical laboratory should also be consulted on what additional samples will need to be collected for quality assurance and quality control purposes.

Both field and analytical analysis methods can be used to meet the Permit requirements. Field techniques have the advantage of providing immediate results. However, there are only a limited number of analyses that can be done in the field. Analytical laboratories can analyze for a wide range of parameters, but the data may take several weeks or longer to get back.

Some constituents (e.g. pH) can be evaluated in the field with special equipment. Field samples must be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed. Field equipment must be used by trained staff and the equipment must be calibrated and maintained according to the manufacturer's specifications.

Laboratory analyses should be conducted by an accredited by the California Department of Health Services Environmental Laboratory Accreditation Program (ELAP). . Analyses must be conducted in accordance with 40 CFR Part 136.

All field and/or laboratory analytical data must be kept in the SWPPP document, which is to remain at the construction site at all times until a Notice of Termination has been submitted and approved.

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Refer to the California Department of Transportation (Caltrans) *Guidance Manual: Stormwater Monitoring Protocols (Second Edition), July 2000* to assist you in developing a sampling and analysis program. This document may be downloaded from the Caltrans Website, at http://www.dot.ca.gov/hq/env/stormwater/special/index.htm.

Figure 4-1 is an outline for a typical storm water sampling and analysis plan. Since some laboratories may have specific requirements for sample collection and handling, specific information or requirements on your samples should be checked with your laboratory.

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1 PROJECT OVERVIEW/DESCRIPTION
- 1.1 Description of why the project is being conducted
- 1.2 Description of who in conducting the project
- 1.3 General scope of monitoring activities
- 1.4 Project organization/roles and responsibilities

2 MONITORING SITES
- 2.1 Site location (map)
- 2.2 Written driving directions
- 2.3 Site access instructions (gates, locks, keys, combinations)
- 2.4 Notification procedures

3 ANALYTICAL CONSTITUENTS
- List of constituents for sampling and analysis (including sample collection methods, container type, volume required, preservation and laboratory performing analysis)

4 DATA QUALITY OBJECTIVES (DQOs)
- 4.1 Analytical reporting limits
- 4.2 Analytical precision, accuracy and completeness

5 FIELD EQUIPMENT MAINTENANCE
- 5.1 Equipment calibration
- 5.2 Equipment maintenance
- 5.3 Equipment cleaning (bottles/lids/tubing)

6 MONITORING PREPARATION AND LOGISTICS
- 6.1 Weather tracking
- 6.2 Storm selection criteria
- 6.3 Storm action levels
- 6.4 Communications/notification procedures
- 6.5 Sample bottle order
- 6.6 Sample bottle labeling
- 6.7 Field equipment preparation

7 SAMPLE COLLECTION, PRESERVATION AND DELIVERY
- 7.1 Sample collection methods
- 7.2 Field measurement methods
- 7.3 Field equipment list
- 7.4 Sample containers, preservation and handling
- 7.5 QA/QC sample collection methods
- 7.6 Sample labeling (site names, codes, etc.)
- 7.7 Composite sample splitting
- 7.8 Forms and procedures for documenting sample collection and field measurements
- 7.9 Laboratory communication procedures
- 7.10 Sample shipping/delivery, chain-of-custody

8 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)
- Field procedures for QA/QC sample collection

9 LABORATORY SAMPLE PREPARATION AND ANALYTICAL METHODS
- 9.1 Laboratory sample preparation procedures
- 9.2 Analytical constituent table (including analytical methods, holding times and reporting limits)

10 DATA MANAGEMENT AND REPORTING PROCEDURES
- 10.1 Analytical data validation
- 10.2 Electronic data transfer
- 10.3 Filing of electronic and hard copy data
- 10.4 Reports

APPENDICES
- A Clean Sampling Techniques
- B Health and Safety Plan

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Figure 4-1
Outline for a Typical Storm Water Sampling and Analysis Plan

5.0 Definitions

Chain of Custody (COC) Form

A form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be provided by an analytical laboratory upon request.

Field Measurements

Water quality testing performed in the field with portable field-testing kits or meters.

Field Tracking Form (FTF)

A form that serves as a guide to sampling crews to obtain sampling information and to prescribe and document sample collection information in the field. The FTF contains sample identifiers, sampling locations, requested analyses, QC sample identifiers, special instructions, and field notes.

Sampling and Analysis Plan

A document which describes how the samples will be collected and under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to insure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Direct Discharge

Storm water runoff that flows from a construction site directly into a 303 (d) water body listed for sedimentation, siltation, or turbidity. If storm water runoff from the construction site reaches one of the 303(d) listed water bodies without first flowing through a municipal separate storm sewer system (MS4) that has been formally accepted by and is under control and operation of a municipal agency or district, or a separate storm water conveyance system where there is co-mingling of site storm water with off-site sources, or an unlisted tributary to the listed water body, it is considered a direct discharge to the water body and sampling is required.

Holding Time

Holding time is specified by the analytical method and is the elapsed time between the time the sample is collected and the time the analysis must be initiated.

Electrical Conductivity (EC)

Measure of the ability of water to carry an electric current. This ability depends on the presence of ions, their concentration, valence, mobility and temperature. EC

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measurements can give an estimate of the variations in the dissolved mineral content of storm water in relation to receiving waters.

pH

The pH is universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Sediment

Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation/Siltation

The process of sediment/silt deposition.

Settleable Solids

The settleable solids (SS) tests measures the solid material that can be settled within a water column during a specified time frame. This typically is tested by placing a water sample into an Imhoff settling cone and allowing the solids to settle by gravity. Results are reported either as a volume (mL/L) or a weight (mg/L).

Silt

Soil particles between 0.05mm and 0.002mm in size. (For the purposes of its use here, it also includes clay, which is categorized by a particle size less than 0.002mm.)

Soil Amendment

Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water and would be not visible in the runoff. Soil amendments include lime, cementitious binders, chlorides, emulsions, polymers, soil stabilizers, and tackifiers applied as a stand-alone treatment (i.e., without mulch). Plant fibers (such as straw or hay), wood and recycled paper fibers (such as mulches and matrices), bark or wood chips, green waste or composted organic materials, and biodegradable or synthetic blanket fibers would not be included as soil amendments in this context because they would be visible in storm water runoff.

Suspended Sediment Concentration (SSC)

The suspended sediment concentration (SSC) test measures the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L. A high suspended solids level impacts the clarity of the water which may decrease the depth to which sunlight can penetrate the water and adversely impact aquatic plant growth. It also reduces the concentration of oxygen in the water,

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potentially affecting the ability of aquatic animals and plants to survive and flourish due to oxygen deprivation.

Total Suspended Solids (TSS)

Suspended solids in a water sample include inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The total suspended solids test (TSS) test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

A high suspended solids level impacts the clarity of the water which may decrease the depth to which sunlight can penetrate the water and adversely impact aquatic plant growth. It also reduces the concentration of oxygen in the water, potentially affecting the ability of aquatic animals and plants to survive and flourish due to oxygen deprivation.

Turbidity

Cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The scattering of light increases with a greater suspended load. Turbidity is commonly measured in Nephelometric Turbidity Units (NTU).

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6.0 Sources of Further Assistance

Regional Water Quality Control Boards

Regional Water Quality Control Board	Address	Contact Name E-mail	Telephone/Fax
NORTH COAST REGION	5550 Skylane Boulevard, Suite A Santa Rosa, CA 95403	John Short shorj@rb1.swrcb.ca.gov	(707) 576-2065 FAX: (707) 523-0135
SAN FRANCISCO BAY REGION	1515 Clay Street, Suite 1400 Oakland, CA 94612	Hossain Kazomi mhk@rb2.swrcb.ca.gov	(510) 622-2369 FAX: (510) 622-2460
CENTRAL COAST REGION	81 Higuera Street, Suite 200 San Luis Obispo, CA 93401-5427	Jennifer Bitting jbitting@rb3.swrcb.ca.gov	(805) 549-3334 FAX: (805) 543-0397
LOS ANGELES REGION	320 W. 4th Street, Suite 200 Los Angeles, CA 90013	Mi Lu (Inland Los Angeles) vilu@rb4.swrcb.ca.gov	(213) 576-6728 FAX: (213) 576-6686
		Ejigu Solomon (Ventura County) esolomon@rb4.swrcb.ca.gov	213) 576-6727 FAX: (213) 576-6686
		Xavier Swamikannu (Coastal) xswami@rb4.swrcb.ca.gov	(213) 576-6654 FAX (213) 576-6686
CENTRAL VALLEY REGION **Sacramento Office**	3443 Routier Road, Suite A Sacramento, CA 95827-3098	Sue McConnell mcconns@rb5s.swrcb.ca.gov	(916) 255-3098 FAX: (916) 255-3015
CENTRAL VALLEY REGION **Fresno Branch Office**	3614 East Ashlan Avenue Fresno, CA 93726	Jarma Bennett bennettj@rb5f.swrcb.ca.gov	(559) 445-6046 FAX: (559) 445-5910
CENTRAL VALLEY REGION **Redding Branch Office**	415 Knollcrest Drive Redding, CA 96002	Carole Crowe crowec@rb5r.swrcb.ca.gov	(530) 224-4849 FAX: (530) 224-4857
LAHONTAN REGION **South Lake Tahoe Office**	2501 Lake Tahoe Boulevard South Lake Tahoe, CA 96150	Mary Fiore-Wagner fiorm@rb6s.swrcb.ca.gov	(530) 542-5245 FAX: (530) 544-2271
LAHONTAN REGION **Victorville Office**	15428 Civic Drive, Suite 100 Victorville, CA 92392	Eugene Rondash erondash@rb6v.swrcb.ca.gov	(760) 241-2434 FAX: (760) 241-7308
COLORADO RIVER BASIN REGION	73-720 Fred Waring Drive, Suite 100	Abdi Haile haila@rb7.swrcb.ca.gov	(760) 776-8939 FAX: (760) 341-6820

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Regional Water Quality Control Board	Address	Contact Name E-mail	Telephone/Fax
	Palm Desert, CA 92260	Rosalyn Fleming flemr@rb7.swrcb.ca.gov	(760) 776-8939 FAX: (760) 341-6820
SANTA ANA REGION	3737 Main Street, Suite 500 Riverside, CA 92501-3339	Michael Roth (Riverside County) mroth@rb8.swrcb.ca.gov	(909) 320-2027 FAX: (909) 781-6288
		Aaron Buck(Orange County) abuck@rb8.swrcb.ca.govmail to:	(909) 782-4469 FAX: (909) 781-6288
		Muhammad Bashir (San Bernardino County) bwhitake@rb8.swrcb.ca.gov	(909) 320-6396 FAX: (909) 781-6288
SAN DIEGO REGION	9771 Clairemont Mesa Boulevard, Suite A San Diego, CA 92124	Jane Ledford ledfj@rb9.swrcb.ca.gov	(858) 467-3272 FAX: (858) 571-6972

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State Water Resources Control Board

Division of Water Quality
Storm Water Permit Section
P.O. Box 1977
Sacramento, CA 95812-1977
Construction Inquiry Line: (916) 341-5537
Web Site: http://www.swrcb.ca.gov/
e-mail: stormwater@swrcb.ca.gov

How to Obtain a List of State Certified Laboratories

http://www.dhs.ca.gov/ps/ls/elap/html/lablist_county.htm

Other Useful Web Sites

California Stormwater Quality Task Force
http://www.stormwatertaskforce.org/

California Department of Transportation
Environmental Program http://www.dot.ca.gov/hq/env/index.htm

Storm Water Management Program http://www.dot.ca.gov/hq/env/stormwater/

APPENDIX A

General Outline of Information that should be included in your SWPPP for the Sampling and Analysis Requirements

1. Sedimentation monitoring

(In this section identify whether you need to sample for sedimentation, siltation, or turbidity. Identify at minimum elements a & b. Note that some water bodies are identified as impaired on a segment basis rather than for the whole water body. Only direct discharges into water bodies impaired for sediment, silt, or turbidity need to do this sampling. This type of monitoring may not be necessary for all projects. If you do need to conduct this monitoring your SWPPP needs to include section 2, if not move on to section 3.)

a. Site storm water discharge points

b. Receiving water

c. Review 303d list

2. Monitoring strategy for sediment

(In this section identify the sampling process, include where you will sample (at least one up and down stream location is needed) what you will sample for, and your field quality control samples. Identify how your samples will be analyzed. Field measurements may be appropriate. If you conduct field sampling, you need to follow the field meter instruction and keep it calibrated.)

a. Sample locations

   i. Location upstream of the construction site in the receiving water

   ii. Location downstream of the construction site in the receiving water

b. Analytes for Analysis

   i. Field measurements

   ii. Laboratory analyses

c. Control samples

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3. Non-visible pollutant monitoring

(In this section identify the potential sources of non-visual pollutants, your SWPPP should discuss the materials in use and the activities conducted on your site, and any past contamination of your project site. These three elements are the potential pollutant sources. Determine if these potential pollutants are non-visual and can be discharged in storm water runoff. Most projects will have to develop this sampling and analysis plan. If you don't think you can discharge pollutants, because every thing is either stored so that it doesn't contact storm water or because your site doesn't discharge runoff, you may want to develop the sampling plan as a contingency, in the event of spill or containment failure. Identify how you will use your current inspection program to trigger sampling and analysis.)

a. Source identification

   i. Pre-construction contamination

   ii. Construction activities

   iii. Construction materials

b. Connect your sampling program to you inspection program

4. Monitoring strategy for non-visual pollutants

(In this section identify the sampling process, include where you will sample, what you will sample for, when you will sample, and your field quality control samples. For sampling locations you need to collect samples of runoff that contacts the stored materials and runoff unaffected by it. The unaffected runoff can be immediately upstream or from a reference location on the site. Identify how your samples will be analyzed. Field measurements and indicator parameters may be appropriate. If you conduct field sampling, you need to follow the field meter instruction and keep it calibrated.)

a. Sample locations

   i. Location downstream from the storage or spill area

   ii. Location unaffected by the storage or spill area

b. b) Analytes for Analysis

c. c) Control samples

5. Data Evaluation

(In this section you need to identify how you will use your data. In general, If you find high levels of sediment, analytes or indicator parameters you should review your BMPs for malfunctions or potential upgrades.)

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6. Training for sampling personnel

(All personnel collecting samples should have enough training to collect samples in accordance with the regulatory requirements (40 CFR Part 136) or follow manufacturers instructions for use and calibration of field meters and instruments. You may want to subcontract sample collection to firms that specialize in water quality sampling. Identify how you have trained you staff or whether you hired trained staff.)

7. Sampling procedures

(In this section identify your sampling procedures, e.g., how you will decide when to sample; how samples will be collected; if there is a special order to sample collection; what field paper work will be completed (field tracking forms, chains of custody); how samples will be handled and transmitted to the laboratory. Other sampling procedures may be needed depending on the specifics of you site and sampling program.)

8. Sampling and analysis records

(In this section identify where you are storing records associated with sampling and analysis. Field and analytical data must be kept in the SWPPP until the Notice of Termination is filed. But you also need to keep other documents associated with the sampling program, such as calibration charts, field tracking forms chains of custody, training records of samplers, laboratory certification information. Identify where this information is kept if other than in the SWPPP.)

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APPENDIX D - CONTRACTOR ACTIVITY BMPS

1-18-2010 Bid Set (Not for Construction)

Water Conservation Practices NS-1

Objectives		
EC	Erosion Control	✓
SE	Sediment Control	✓
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	

Legend:
✓ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

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- Direct construction water runoff to areas where it can soak into the ground or be collected and reused.
- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

Costs

The cost is small to none compared to the benefits of conserving water.

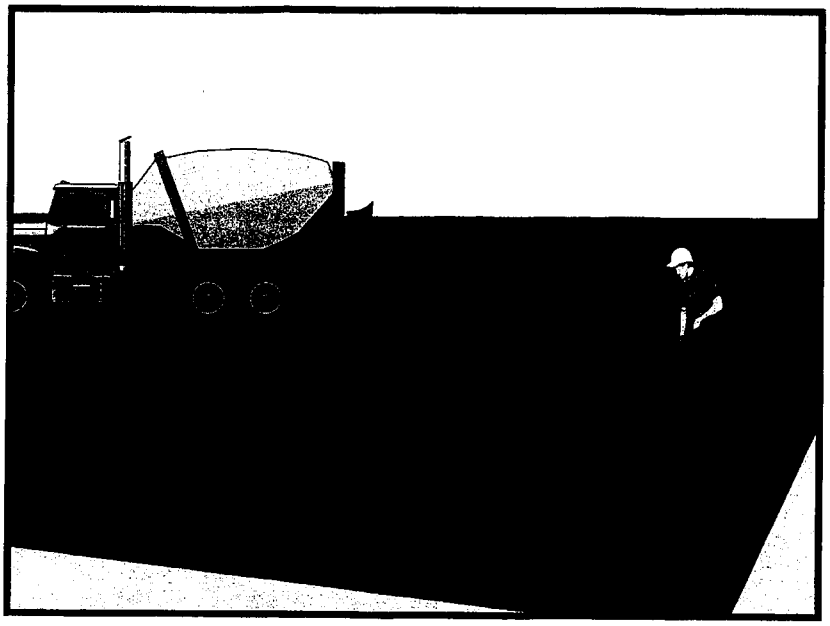
Inspection and Maintenance

- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges are occuring.
- Repair water equipment as needed to prevent unintended discharges.
  - Water trucks
  - Water reservoirs (water buffalos)
  - Irrigation systems
  - Hydrant connections

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Paving and Grinding Operations NS-3



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✔
WM	Waste Management and Materials Pollution Control	✓

Legend:
✔ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents

Sediment	✔
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	✔
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

Suitable Applications

These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Finer solids are not effectively removed by filtration systems.
- Paving opportunities may be limited during wet weather.

Implementation

General

- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is in the forecast.
- Train employees and sub-contractors in pollution prevention and reduction.
- Store materials away from drainage courses to prevent stormwater runon (see WM-1, Material Delivery and Storage).

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- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or to trap and filter sediment.
- If paving involves an onsite mixing plant, follow the stormwater permitting requirements for industrial activities.
- Stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses, These materials should be stored consistent with WM-3, Stockpile Management.
- Disposal of PCC and AC waste should be in conformance with WM-8, Concrete Waste Management.

Saw Cutting, Grinding, and Pavement Removal

- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, uncompacted or loose AC, tack coats, equipment cleaners, or unrelated paving materials:
  - AC grindings, pieces, or chunks used in embankments or shoulder backing must not be allowed to enter any storm drains or watercourses. Install silt fence until structure is stabilized or permanent controls are in place. Examples of temporary perimeter controls can be found in EC-9, Earth Dikes and Drainage Swales; SE-1, Silt Fence; or SE-5, Fiber Rolls.
  - Collect and remove all broken asphalt and recycle when practical. Old or spilled asphalt must be recycled or disposed.
  - Any AC chunks and pieces used in embankments must be placed above the water table and covered by at least 1 ft of material.
- Do not allow saw-cut slurry to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine, should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. See also WM-8, Concrete Waste Management, and WM-10, Liquid Waste Management.
- Dig out activities should not be conducted in the rain.
- Collect dig out material by mechanical or manual methods. This material may be recycled for use as shoulder backing or base material.
- If dig out material cannot be recycled, transport the material back to an approved storage site.

Asphaltic Concrete Paving

- If paving involves asphaltic cement concrete, follow these steps:

- Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks. Vacuum or sweep loose sand and gravel and properly dispose of this waste by referring to WM-5, Solid Waste Management.

- Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

Portland Cement Concrete Paving

- Do not wash sweepings from exposed aggregate concrete into a storm drain system. Collect and return to aggregate base stockpile or dispose of properly.

- Allow aggregate rinse to settle. Then, either allow rinse water to dry in a temporary pit as described in WM-8, Concrete Waste Management, or pump the water to the sanitary sewer if allowed by the local wastewater authority.

Sealing Operations

- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate must not be allowed to enter any storm drain or water courses. Apply temporary perimeter controls until structure is stabilized.

- Drainage inlet structures and manholes should be covered with filter fabric during application of seal coat, tack coat, slurry seal, and fog seal.

- Seal coat, tack coat, slurry seal, or fog seal should not be applied if rainfall is predicted to occur during the application or curing period.

Paving Equipment

- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials rather than burying. See NS-10, Vehicle and Equipment Maintenance, WM-4, Spill Prevention and Control, and WM-10, Liquid Waste Management.

- Substances used to coat asphalt transport trucks, and asphalt spreading equipment should not contain soap and should be non-foaming and non-toxic.

- Use only non-toxic substances to coat asphalt transport trucks and asphalt spreading equipment.

- Paving equipment parked onsite should be parked over plastic to prevent soil contamination.

- Clean asphalt coated equipment offsite whenever possible. When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in WM-5, Solid Waste Management. Any cleaning onsite should follow NS-8, Vehicle and Equipment Cleaning.

Thermoplastic Striping

- Thermoplastic striper and pre-heater equipment shutoff valves should be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering drain inlets, the stormwater drainage system, or watercourses.
- Pre-heaters should be filled carefully to prevent splashing or spilling of hot thermoplastic. Leave six inches of space at the top of the pre-heater container when filling thermoplastic to allow room for material to move when the vehicle is deadheaded.
- Do not pre-heat, transfer, or load thermoplastic near drain inlets or watercourses.
- Clean truck beds daily of loose debris and melted thermoplastic. When possible, recycle thermoplastic material.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near drain inlets, the stormwater drainage system, or watercourses.
- Melting tanks should be loaded with care and not filled to beyond six inches from the top to leave room for splashing when vehicle is deadheaded.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- On large-scale projects, use mechanical or manual methods to collect excess bituminous material from the roadway after removal of markers.

Costs

- All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep ample supplies of drip pans or absorbent materials onsite.
- Inspect and maintain machinery regularly to minimize leaks and drips.

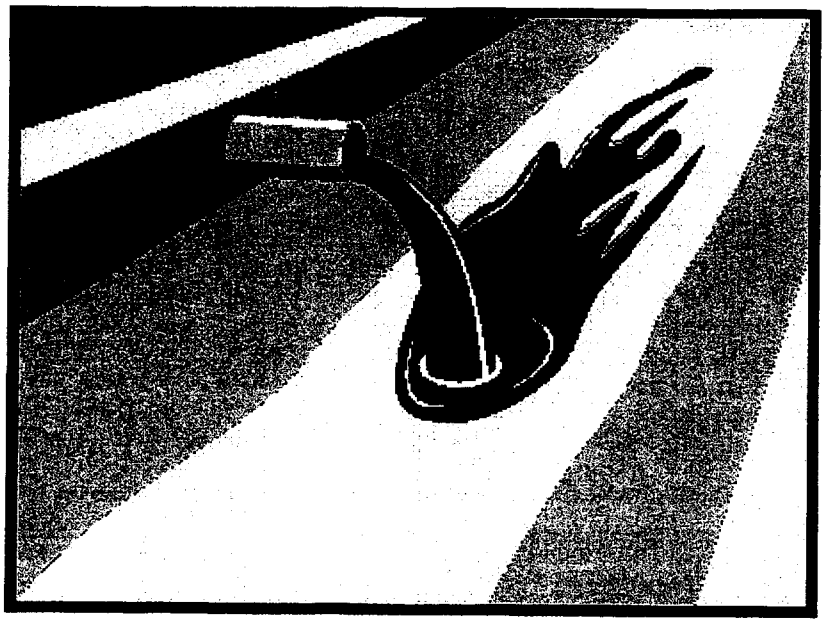
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Hot Mix Asphalt-Paving Handbook AC 150/5370-14, Appendix I, U.S. Army Corps of Engineers, July 1991.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Illicit Connection/Discharge NS-6



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Procedures and practices designed for construction contractors to recognize illicit connections or illegally dumped or discharged materials on a construction site and report incidents.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Illicit connection/discharge and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site.

Limitations

Illicit connections and illegal discharges or dumping, for the purposes of this BMP, refer to discharges and dumping caused by parties other than the contractor. If pre-existing hazardous materials or wastes are known to exist onsite, they should be identified in the SWPPP and handled as set forth in the SWPPP.

Implementation

Planning

- Review the SWPPP. Pre-existing areas of contamination should be identified and documented in the SWPPP.
- Inspect site before beginning the job for evidence of illicit connections, illegal dumping or discharges. Document any pre-existing conditions and notify the owner.

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- Inspect site regularly during project execution for evidence of illicit connections, illegal dumping or discharges.
- Observe site perimeter for evidence for potential of illicitly discharged or illegally dumped material, which may enter the job site.

Identification of Illicit Connections and Illegal Dumping or Discharges

- **General** – unlabeled and unidentifiable material should be treated as hazardous.
- **Solids** - Look for debris, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- **Liquids** - signs of illegal liquid dumping or discharge can include:
  - Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Abnormal water flow during the dry weather season
- **Urban Areas** - Evidence of illicit connections or illegal discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or illegal discharge can include:
  - Abnormal water flow during the dry weather season
  - Unusual flows in sub drain systems used for dewatering
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Excessive sediment deposits, particularly adjacent to or near active offsite construction projects
- **Rural Areas** - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
  - Abnormal water flow during the non-irrigation season
  - Non-standard junction structures
  - Broken concrete or other disturbances at or near junction structures

Reporting

Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery. For illicit connections or discharges to the storm drain system, notify the local stormwater management agency. For illegal dumping, notify the local law enforcement agency.

Cleanup and Removal

The responsibility for cleanup and removal of illicit or illegal dumping or discharges will vary by location. Contact the local stormwater management agency for further information.

Costs

Costs to look for and report illicit connections and illegal discharges and dumping are low. The best way to avoid costs associated with illicit connections and illegal discharges and dumping is to keep the project perimeters secure to prevent access to the site, to observe the site for vehicles that should not be there, and to document any waste or hazardous materials that exist onsite before taking possession of the site.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect the site regularly to check for any illegal dumping or discharge.
- Prohibit employees and subcontractors from disposing of non-job related debris or materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

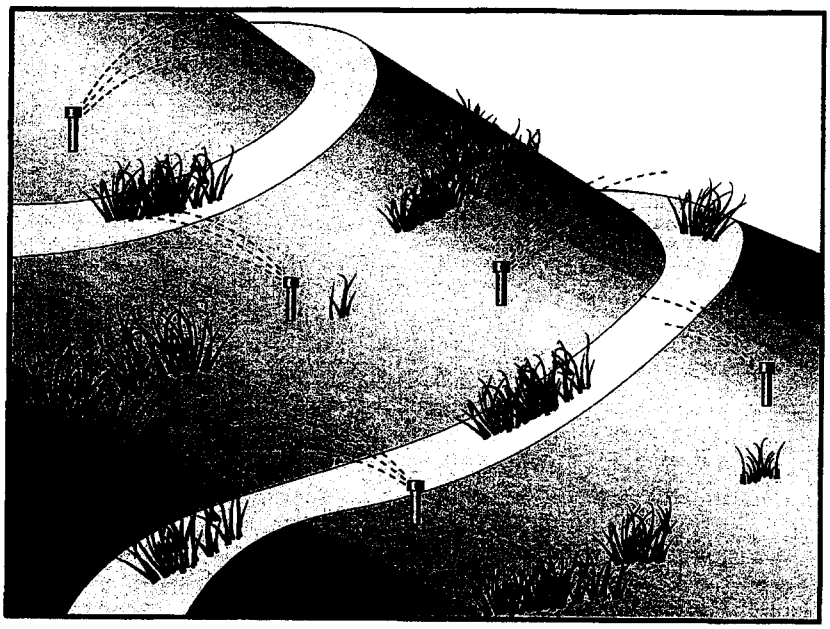
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Potable Water/Irrigation NS-7



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	
Organics	✓

Potential Alternatives

None

Description and Purpose

Potable Water/Irrigation consists of practices and procedures to manage the discharge of potential pollutants generated during discharges from irrigation water lines, landscape irrigation, lawn or garden watering, planned and unplanned discharges from potable water sources, water line flushing, and hydrant flushing.

Suitable Applications

Implement this BMP whenever potable water or irrigation water discharges occur at or enter a construction site.

Limitations

None identified.

Implementation

- Direct water from offsite sources around or through a construction site, where feasible, in a way that minimizes contact with the construction site.
- Discharges from water line flushing should be reused for landscaping purposes where feasible.
- Shut off the water source to broken lines, sprinklers, or valves as soon as possible to prevent excess water flow.
- Protect downstream stormwater drainage systems and watercourses from water pumped or bailed from trenches excavated to repair water lines.

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- Inspect irrigated areas within the construction limits for excess watering. Adjust watering times and schedules to ensure that the appropriate amount of water is being used and to minimize runoff. Consider factors such as soil structure, grade, time of year, and type of plant material in determining the proper amounts of water for a specific area.

Costs

Cost to manage potable water and irrigation are low and generally considered to be a normal part of related activities.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Repair broken water lines as soon as possible.
- Inspect irrigated areas regularly for signs of erosion and/or discharge.

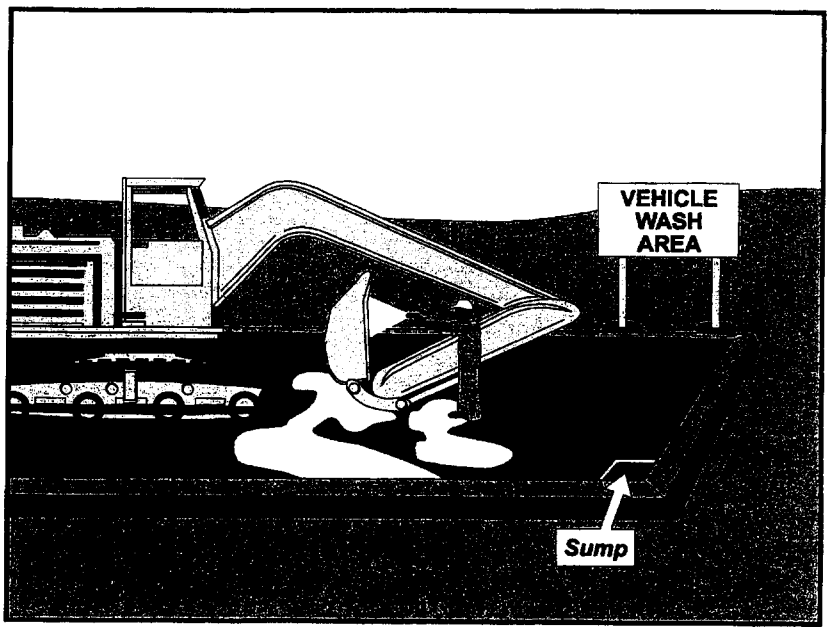
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle and Equipment Cleaning NS-8



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	

Legend:
✓ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

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- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried, and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runon and runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

Inspection and Maintenance

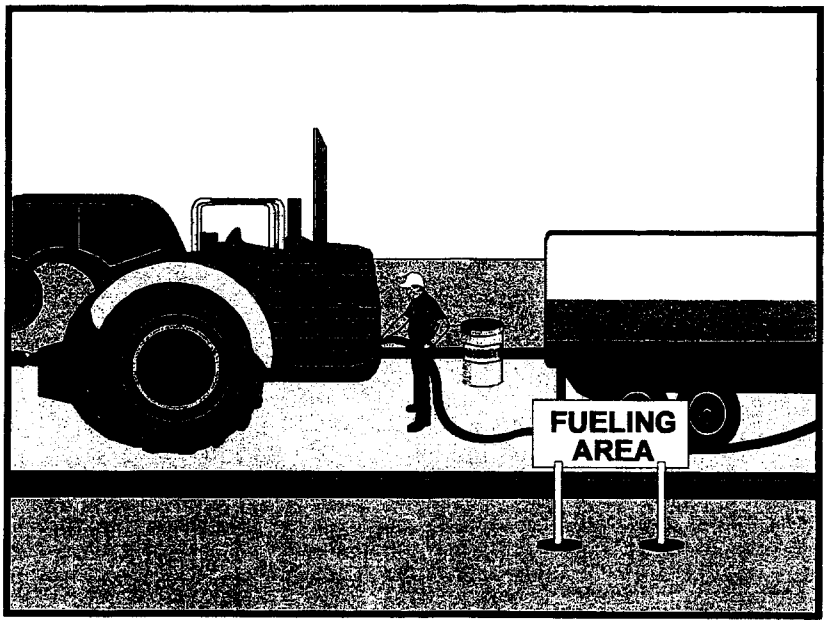
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.

Vehicle and Equipment Fueling NS-9



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	✓
Organics	

Potential Alternatives

None

Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks, and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/ Exit.

Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage "topping-off" of fuel tanks.

- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks, and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runon and runoff, and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runon, runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Costs

- All of the above measures are low cost except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.

Inspection and Maintenance

- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

References

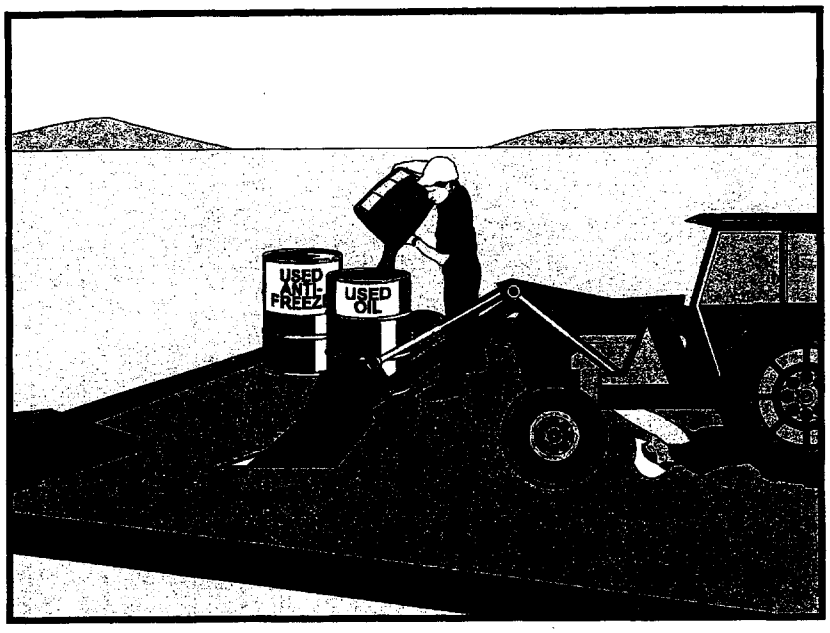
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle & Equipment Maintenance NS-10



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	

Legend:
✓ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents	
Sediment	
Nutrients	✓
Trash	✓
Metals	
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a "dry and clean site". The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8, Vehicle and Equipment Cleaning, and NS-9, Vehicle and Equipment Fueling.

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Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runon and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.
- Repair leaks of fluids and oil immediately.

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

Safer Alternative Products

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an "environmentally friendly" label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The "chlor" term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling and Disposal

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like,-trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site.

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Costs

All of the above are low cost measures. Higher costs are incurred to setup and maintain onsite maintenance areas.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

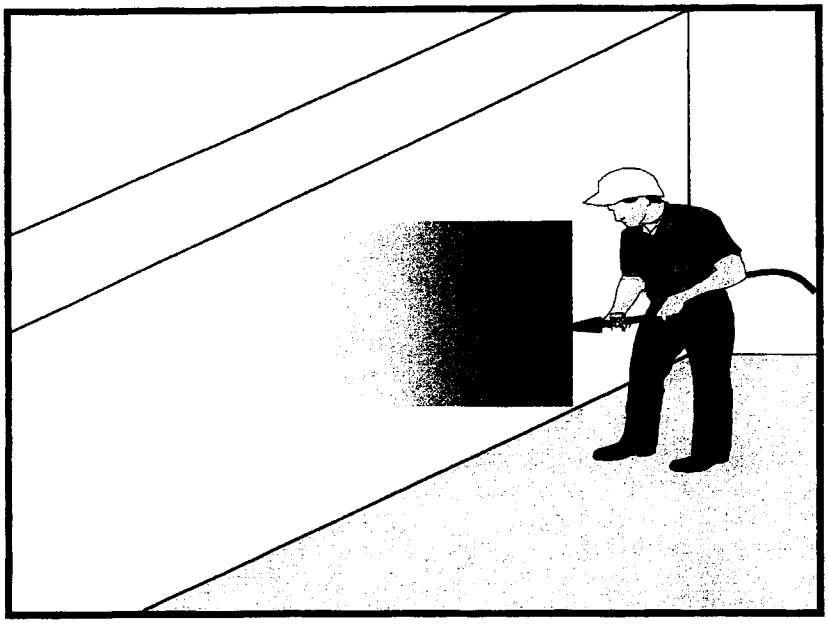
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Concrete Curing NS-12



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	✓

Legend:
✓ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	

Potential Alternatives

None

Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. Proper procedures reduce or eliminate the contamination of stormwater runoff during concrete curing.

Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.

Limitations

None identified.

Implementation

Chemical Curing

- Avoid over spray of curing compounds.
- Minimize the drift of chemical cure as much as possible by applying the curing compound close to the concrete surface. Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.
- Use proper storage and handling techniques for concrete curing compounds. Refer to WM-1, Material Delivery and Storage.

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- Protect drain inlets prior to the application of curing compounds.
- Refer to WM-4, Spill Prevention and Control.

Water Curing for Bridge Decks, Retaining Walls, and other Structures

- Direct cure water away from inlets and watercourses to collection areas for infiltration or other means of removal in accordance with all applicable permits.
- Collect cure water at the top of slopes and transport or dispose of water in a non-erodible manner. See EC-9 Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.
- Utilize wet blankets or a similar method that maintains moisture while minimizing the use and possible discharge of water.

Costs

All of the above measures are generally low cost.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds.
- Inspect cure containers and spraying equipment for leaks.

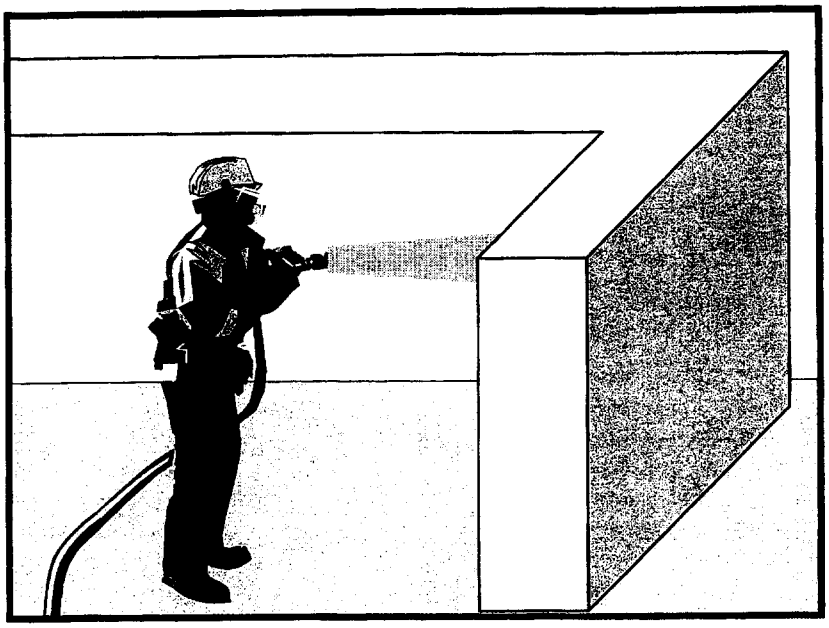
References

Blue Print for a Clean Bay-Construction-Related Industries: Best Management Practices for Stormwater Pollution Prevention; Santa Clara Valley Non Point Source Pollution Control Program, 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Concrete Finishing NS-13



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	✓
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	
Organics	✓

Potential Alternatives

None

Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.

Limitations

None identified.

Implementation

- Collect and properly dispose of water from high-pressure water blasting operations.
- Collect contaminated water from blasting operations at the top of slopes. Transport or dispose of contaminated water while using BMPs such as those for erosion control. Refer to EC-9, Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.

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- Direct water from blasting operations away from inlets and watercourses to collection areas for infiltration or other means of removal (dewatering). Refer to NS-2 De-Watering Operations.
- Protect inlets during sandblasting operations. Refer to SE-10, Storm Drain Inlet Protection.
- Refer to WM-8, Concrete Waste Management for disposal of concrete based debris.
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- When blast residue contains a potentially hazardous waste, refer to WM-6, Hazardous Waste Management.

Costs

These measures are generally of low cost.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Sweep or vacuum up debris from sandblasting at the end of each shift.
- At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

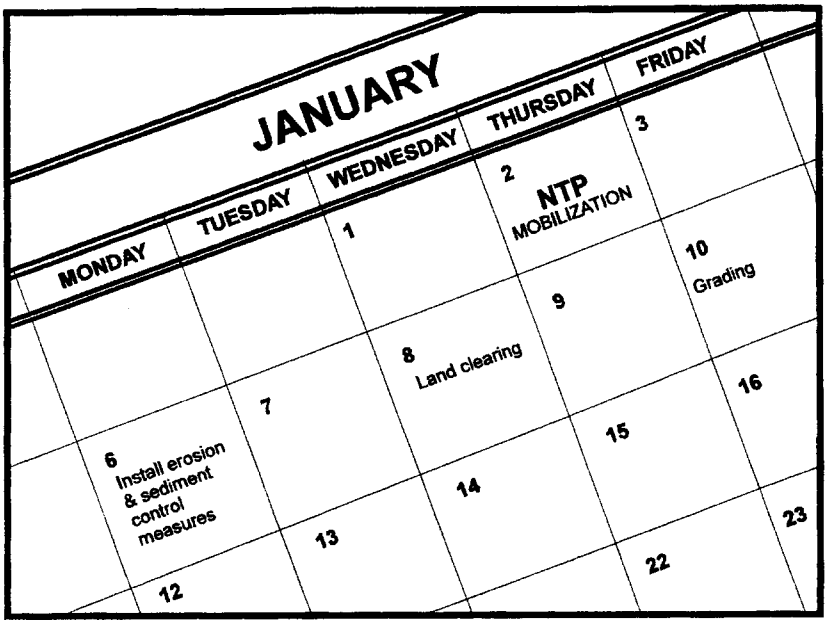
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

APPENDIX E - EROSION CONTROL BMPS

1-18-2010 Bid Set (Not for Construction)

Scheduling EC-1



Objectives

EC	Erosion Control	✔
SE	Sediment Control	✓
TC	Tracking Control	✓
WE	Wind Erosion Control	✓
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

✔ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✔
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates to soil

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disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
  - Erosion control BMPs
  - Sediment control BMPs
  - Tracking control BMPs
  - Wind erosion control BMPs
  - Non-stormwater BMPs
  - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
  - Sequence trenching activities so that most open portions are closed before new trenching begins.
  - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
  - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year round, and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.

Costs

Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost effectiveness of scheduling techniques should be compared with the other less effective erosion and sedimentation controls to achieve a cost effective balance.

Inspection and Maintenance

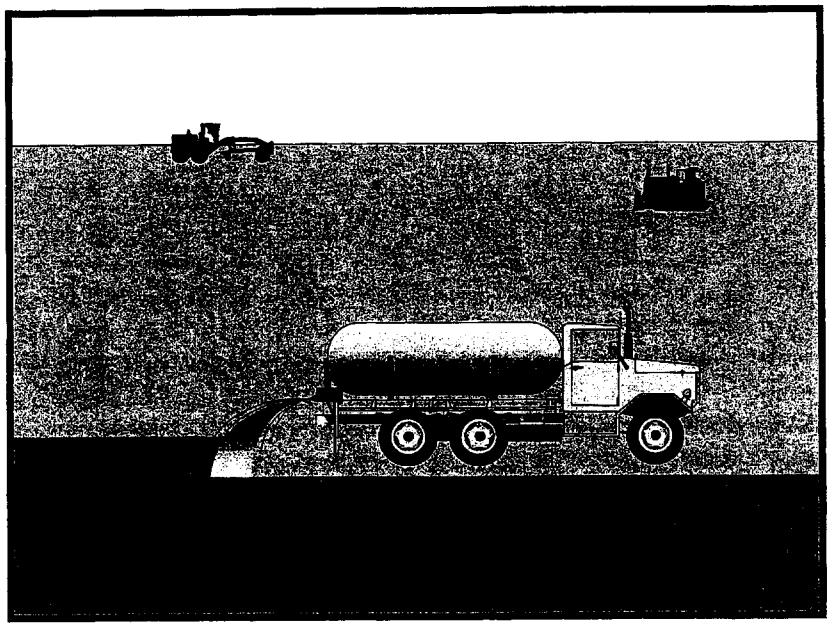
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

References

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

Wind Erosion Control WE-1



Objectives

EC	Erosion Control	
SE	Sediment Control	✓
TC	Tracking Control	
WE	Wind Erosion Control	✓
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Wind erosion or dust control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

Suitable Applications

Wind erosion control BMPs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Sediment tracking onto paved roads
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Over watering may cause erosion.

- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Effectiveness depends on soil, temperature, humidity, and wind velocity.
- Chemically treated sub grades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

Implementation

General

California's Mediterranean climate, with short wet seasons and long hot dry seasons, allows the soils to thoroughly dry out. During these dry seasons, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment.

Dust control, as a BMP, is a practice that is already in place for many construction activities. Los Angeles, the North Coast, and Sacramento, among others, have enacted dust control ordinances for construction activities that cause dust to be transported beyond the construction project property line.

Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). Approximately 90 percent of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and public health departments are in place in some regions within California.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Construction and Grading Permits: Require provisions for dust control plans.
- Opacity Emission Limits: Enforce compliance with California air pollution control laws.
- Increase Overall Enforcement Activities: Priority given to cases involving citizen complaints.
- Maintain Field Application Records: Require records of dust control measures from contractor;
- Stormwater Pollution Prevention Plan: (SWPPP): Integrate dust control measures into SWPPP.

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table shows dust control practices that can be applied to site conditions that cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time.

SITE CONDITION	DUST CONTROL PRACTICES								
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Silt Fences	Temporary Gravel Construction Entrances/Equipment Wash Down	Haul Truck Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X				X
Disturbed Areas Subject to Traffic			X	X	X		X		X
Material Stock Pile Stabilization			X	X		X			X
Demolition			X				X	X	
Clearing/ Excavation			X	X		X			X
Truck Traffic on Unpaved Roads			X	X	X		X	X	
Mud/Dirt Carry Out					X		X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (EC-1, Scheduling).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the project site.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.

- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."
- Materials applied as temporary soil stabilizers and soil binders also generally provide wind erosion control benefits.
- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for wet suppression or chemical stabilization of exposed soils.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and vehicle wash down areas.
- Stabilize inactive 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.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater.

Costs

Installation costs for water and chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Check areas protected to ensure coverage.
- Most dust control measures require frequent, often daily, or multiple times per day attention.

References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, 1992.

Caltrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

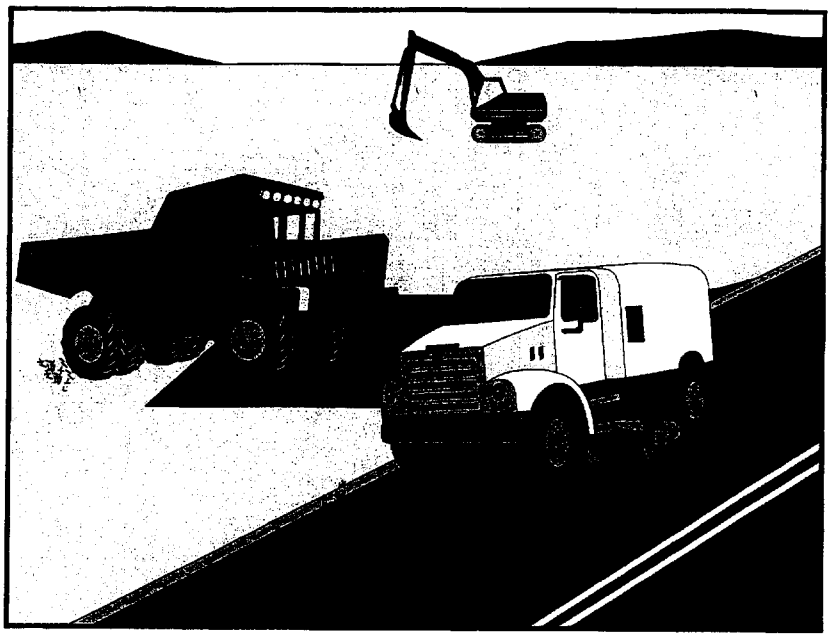
Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

APPENDIX F - SEDIMENT CONTROL BMPS

1-18-2010 Bid Set (Not for Construction)

Street Sweeping and Vacuuming SE-7



Objectives

EC	Erosion Control	
SE	Sediment Control	✓
TC	Tracking Control	✓
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	
Oil and Grease	✓
Organics	

Potential Alternatives

None

Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

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- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from $58/hour (3 yd^3 hopper) to $88/hour (9 yd^3 hopper), plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent dumping.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

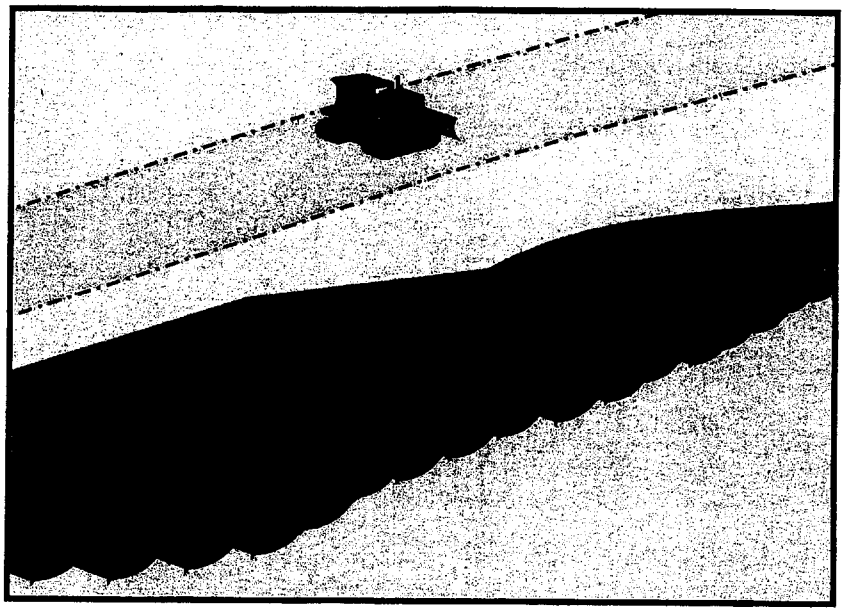
References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Labor Surcharge and Equipment Rental Rates, State of California Department of Transportation (Caltrans), April 1, 2002 – March 31, 2003.

Sandbag Barrier

SE-8



Objectives

EC	Erosion Control	✓
SE	Sediment Control	✓
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Description and Purpose

A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept sheet flows. Sandbag barriers pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

Targeted Constituents

Sediment	✓
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-9 Straw Bale Barrier

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- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

- It is necessary to limit the drainage area upstream of the barrier to 5 acres.
- Degraded sandbags may rupture when removed, spilling sand.
- Installation can be labor intensive.
- Barriers may have limited durability for long-term projects.
- When used to detain concentrated flows, maintenance requirements increase.
- Burlap should not be used for sandbags.

Implementation

General

A sandbag barrier consists of a row of sand-filled bags placed on a level contour. When appropriately placed, a sandbag barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. While the sand-filled bags are porous, the fine sand tends to quickly plug with sediment, limiting the rate of flow through the barrier. If a porous barrier is desired, consider SE-1, Silt Fence, SE-5, Fiber Rolls, SE-6, Gravel Bag Berms, or SE-9, Straw Bale Barriers. Sandbag barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets which erode rills, and ultimately gullies, into disturbed, sloped soils. Sandbag barriers are similar to ground bag berms, but less porous.

Design and Layout

- Locate sandbag barriers on a level contour.
  - Slopes between 20:1 and 2:1 (H:V): Sandbags should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the slope toe.
  - Slopes 2:1 (H:V) or steeper: Sandbags should be placed at a maximum interval of 25 ft (a closer spacing is more effective), with the first row placed near the slope toe.
- Turn the ends of the sandbag barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sandbags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 5 acres.

- Stack sandbags at least three bags high.
- Butt ends of bags tightly.
- Overlapp butt joints of row beneath with each successive row.
- Use a pyramid approach when stacking bags.
- In non-traffic areas
  - Height = 18 in. maximum
  - Top width = 24 in. minimum for three or more layer construction
  - Side slope = 2:1 or flatter
- In construction traffic areas
  - Height = 12 in. maximum
  - Top width = 24 in. minimum for three or more layer construction.
  - Side slopes = 2:1 or flatter.

Materials

- ***Sandbag Material:*** Sandbag should be woven polypropylene, polyethylene or polyamide fabric, minimum unit weight of 4 ounces/yd^2, Mullen burst strength exceeding 300 lb/in^2 in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. Use of burlap may not acceptable in some jurisdictions.
- ***Sandbag Size:*** Each sand-filled bag should have a length of 18 in., width of 12 in., thickness of 3 in., and mass of approximately 33 lbs. Bag dimensions are nominal, and may vary based on locally available materials.
- ***Fill Material:*** All sandbag fill material should be non-cohesive, Class 1 or Class 2 permeable material free from clay and deleterious material.

Costs

Sandbag barriers are more costly, but typically have a longer useful life than other barriers. Empty sandbags cost $0.25 - $0.75. Average cost of fill material is $8 per yd^3. Pre-filled sandbags are more expensive at $1.50 - $2.00 per bag.

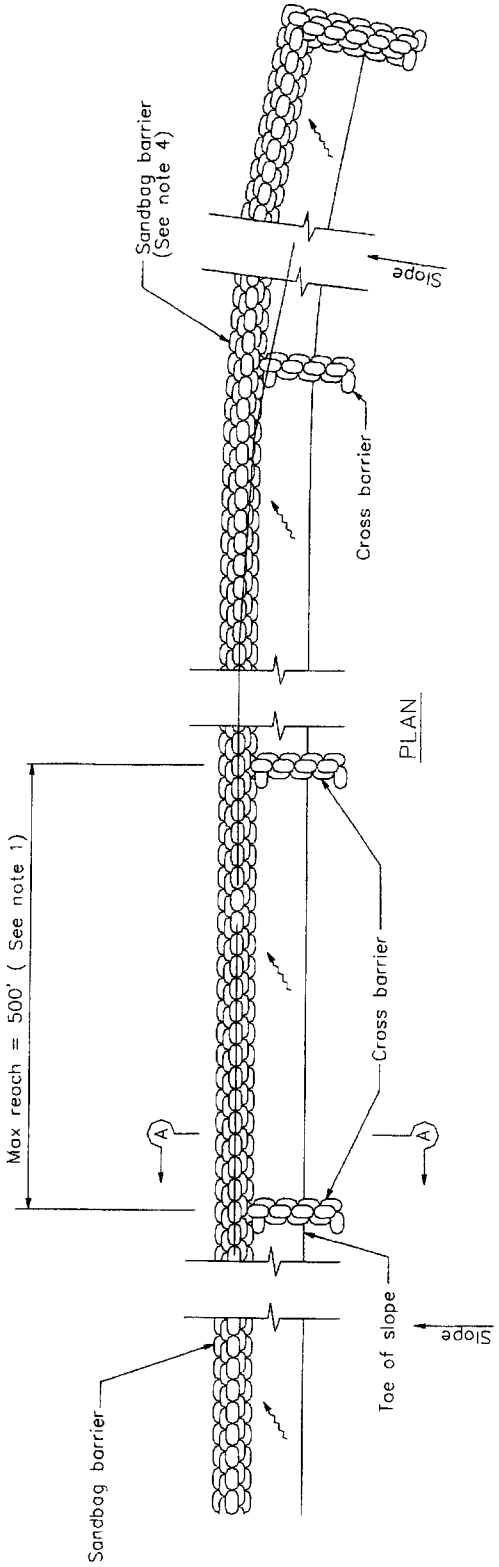
Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Sandbags exposed to sunlight will need to be replaced every two to three months due to degradation of the bags.
- Reshape or replace sandbags as needed.

- Repair washouts or other damage as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove sandbags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area.

References

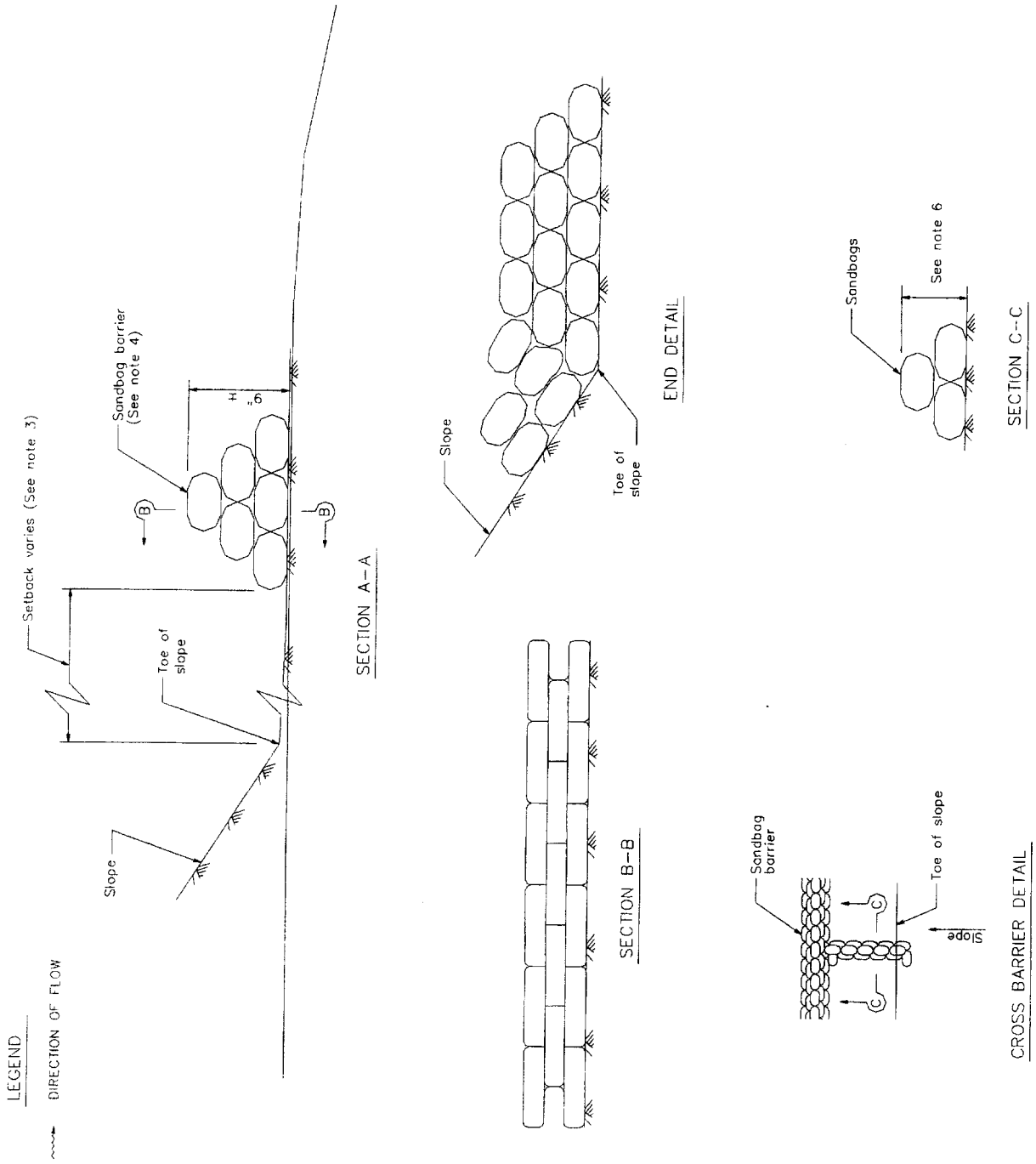
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



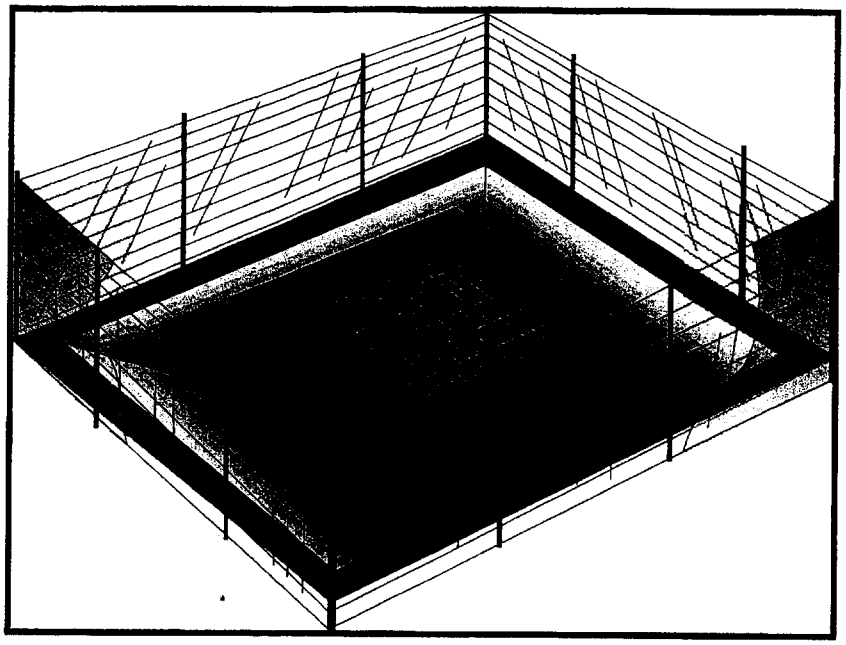
SANDBAG BARRIER

NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier. In no case shall the reach length exceed 500'.
2. Place sandbags tightly.
3. Dimension may vary to fit field condition.
4. Sandbag barrier shall be a minimum of 3 bags high.
5. The end of the barrier shall be turned up slope.
6. Cross barriers shall be a min of 1/2 and a max of 2/3 the height of the linear barrier.
7. Sandbag rows and layers shall be staggered to eliminate gaps.


LEGEND
DIRECTION OF FLOW
Setback varies (See note 3)
Sandbag barrier (See note 4)
H
6"
B
B
Toe of slope
Slope
SECTION A–A
Slope
Toe of slope
END DETAIL
SECTION B–B
Sandbags
See note 6
SECTION C–C
Sandbag barrier
C
C
Toe of slope
Slope
CROSS BARRIER DETAIL

Storm Drain Inlet Protection SE-10



Objectives

EC	Erosion Control	
SE	Sediment Control	✓
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-9 Straw Bale Barrier

Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction.

Suitable Applications

Every storm drain inlet receiving sediment-laden runoff should be protected.

Limitations

- Drainage area should not exceed 1 acre.
- Straw bales, while potentially effective, have not produced in practice satisfactory results, primarily due to improper installation.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Inlet protection usually requires other methods of temporary protection to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.
- Sediment removal may be difficult in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are

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expected, use other onsite sediment trapping techniques in conjunction with inlet protection.

- Frequent maintenance is required.
- For drainage areas larger than 1 acre, runoff should be routed to a sediment-trapping device designed for larger flows. See BMPs SE-2, Sediment Basin, and SE-3, Sediment Traps.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected, and overflow capability is needed.

Implementation

General

Large amounts of sediment may enter the storm drain system when storm drains are installed before the upslope drainage area is stabilized, or where construction is adjacent to an existing storm drain. In cases of extreme sediment loading, the storm drain 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.

Inlet control measures presented in this handbook should not be used for inlets draining more than one acre. Runoff from larger disturbed areas should be first routed through SE-2, Sediment Basin or SE-3, Sediment Trap. Different types of inlet protection are appropriate for different applications depending on site conditions and the type of inlet. Inlet protection methods not presented in this handbook should be approved by the local stormwater management agency.

Design and Layout

Identify existing and planned storm drain inlets that have the potential to receive sediment-laden surface runoff. Determine if storm drain inlet protection is needed and which method to use.

- Limit upstream drainage area to 1 acre maximum. For larger drainage areas, use SE-2, Sediment Basin, or SE-3, Sediment Trap, upstream of the inlet protection device.
- The key to successful and safe use of storm drain inlet protection devices is to know where runoff will pond or be diverted.
  - Determine the acceptable location and extent of ponding in the vicinity of the drain inlet. The acceptable location and extent of ponding will influence the type and design of the storm drain inlet protection device.
  - Determine the extent of potential runoff diversion caused by the storm drain inlet protection device. Runoff ponded by inlet protection devices may flow around the device and towards the next downstream inlet. In some cases, this is acceptable; in other cases, serious erosion or downstream property damage can be caused by these diversions. The possibility of runoff diversions will influence whether or not storm drain inlet protection is suitable; and, if suitable, the type and design of the device.
- The location and extent of ponding, and the extent of diversion, can usually be controlled through appropriate placement of the inlet protection device. In some cases, moving the

inlet protection device a short distance upstream of the actual inlet can provide more efficient sediment control, limit ponding to desired areas, and prevent or control diversions.

- Four types of inlet protection are presented below. However, it is recognized that other effective methods and proprietary devices exist and may be selected.
  - Filter Fabric Fence: Appropriate for drainage basins with less than a 5% slope, sheet flows, and flows under 0.5 cfs.
  - Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment (SE-3).
  - Gravel bag barrier: Used to create a small sediment trap upstream of inlets on sloped, paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.
  - Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.
- Select the appropriate type of inlet protection and design as referred to or as described in this fact sheet.
- Provide area around the inlet for water to pond without flooding structures and property.
- Grates and spaces around all inlets should be sealed to prevent seepage of sediment-laden water.
- Excavate sediment sumps (where needed) 1 to 2 ft with 2:1 side slopes around the inlet.

Installation

- ***DI Protection Type 1 - Filter Fabric Fence*** - The filter fabric fence (Type 1) protection is shown in the attached figure. Similar to constructing a silt fence; see BMP SE-1, Silt Fence. Do not place filter fabric underneath the inlet grate since the collected sediment may fall into the drain inlet when the fabric is removed or replaced.
  1. Excavate a trench approximately 6 in. wide and 6 in. deep along the line of the silt fence inlet protection device.
  2. Place 2 in. by 2 in. wooden stakes around the perimeter of the inlet a maximum of 3 ft apart and drive them at least 18 in. into the ground or 12 in. below the bottom of the trench. The stakes must be at least 48 in.
  3. Lay fabric along bottom of trench, up side of trench, and then up stakes. See SE-1, Silt Fence, for details. The maximum silt fence height around the inlet is 24 in.
  4. Staple the filter fabric (for materials and specifications, see SE-1, Silt Fence) to wooden stakes. Use heavy-duty wire staples at least 1 in. in length.
  5. Backfill the trench with gravel or compacted earth all the way around.
- ***DI Protection Type 2 - Excavated Drop Inlet Sediment Trap*** - The excavated drop inlet sediment trap (Type 2) is shown in the attached figures. Install filter fabric fence in

accordance with DI Protection Type 1. Size excavated trap to provide a minimum storage capacity calculated at the rate 67 yd^3/acre of drainage area.

- ***DI Protection Type 3 - Gravel bag*** - The gravel bag barrier (Type 3) is shown in the figures. Flow from a severe storm should not overtop the curb. In areas of high clay and silts, use filter fabric and gravel as additional filter media. Construct gravel bags in accordance with SE-6, Gravel Bag Berm. Gravel bags should be used due to their high permeability.

  1. Use sand bag made of geotextile fabric (not burlap) and fill with 0.75 in. rock or 0.25 in. pea gravel.
  2. Construct on gently sloping street.
  3. Leave room upstream of barrier for water to pond and sediment to settle.
  4. Place several layers of sand bags – overlapping the bags and packing them tightly together.
  5. Leave gap of one bag on the top row to serve as a spillway. Flow from a severe storm (e.g., 10 year storm) should not overtop the curb.

- ***DI Protection Type 4 – Block and Gravel Filter*** - The block and gravel filter (Type 4) is shown in the figures. Block and gravel filters are suitable for curb inlets commonly used in residential, commercial, and industrial construction.

  1. Place hardware cloth or comparable wire mesh with 0.5 in. openings over the drop inlet so that the wire extends a minimum of 1 ft beyond each side of the inlet structure. If more than one strip is necessary, overlap the strips. Place filter fabric over the wire mesh.
  2. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, so that the open ends face outward, not upward. The ends of adjacent blocks should abut. The height of the barrier can be varied, depending on design needs, by stacking combinations of blocks that are 4 in., 8 in., and 12 in. wide. The row of blocks should be at least 12 in. but no greater than 24 in. high.
  3. Place wire mesh over the outside vertical face (open end) of the concrete blocks to prevent stone from being washed through the blocks. Use hardware cloth or comparable wire mesh with 0.5 in. opening.
  4. Pile washed stone against the wire mesh to the top of the blocks. Use 0.75 to 3 in.

Costs

- Average annual cost for installation and maintenance (one year useful life) is $200 per inlet.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.

- Filter Fabric Fences. If the fabric becomes clogged, torn, or degrades, it should be replaced. Make sure the stakes are securely driven in the ground and are in good shape (i.e., not bent, cracked, or splintered, and are reasonably perpendicular to the ground). Replace damaged stakes.

- Gravel Filters. If the gravel becomes clogged with sediment, it must be carefully removed from the inlet and either cleaned or replaced. Since cleaning gravel at a construction site may be difficult, consider using the sediment-laden stone as fill material and put fresh stone around the inlet. Inspect bags for holes, gashes, and snags, and replace bags as needed. Check gravel bags for proper arrangement and displacement.

- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site ore disposed at an appropriate location.

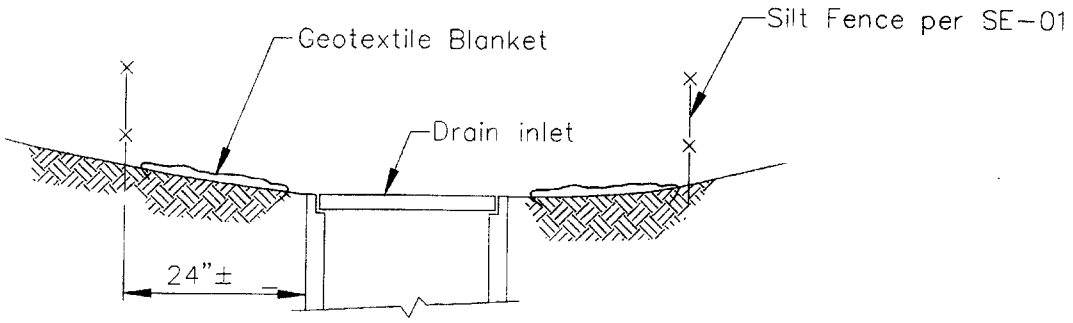
- Remove storm drain inlet protection once the drainage area is stabilized.

  - Clean and regrade area around the inlet and clean the inside of the storm drain inlet as it must be free of sediment and debris at the time of final inspection.

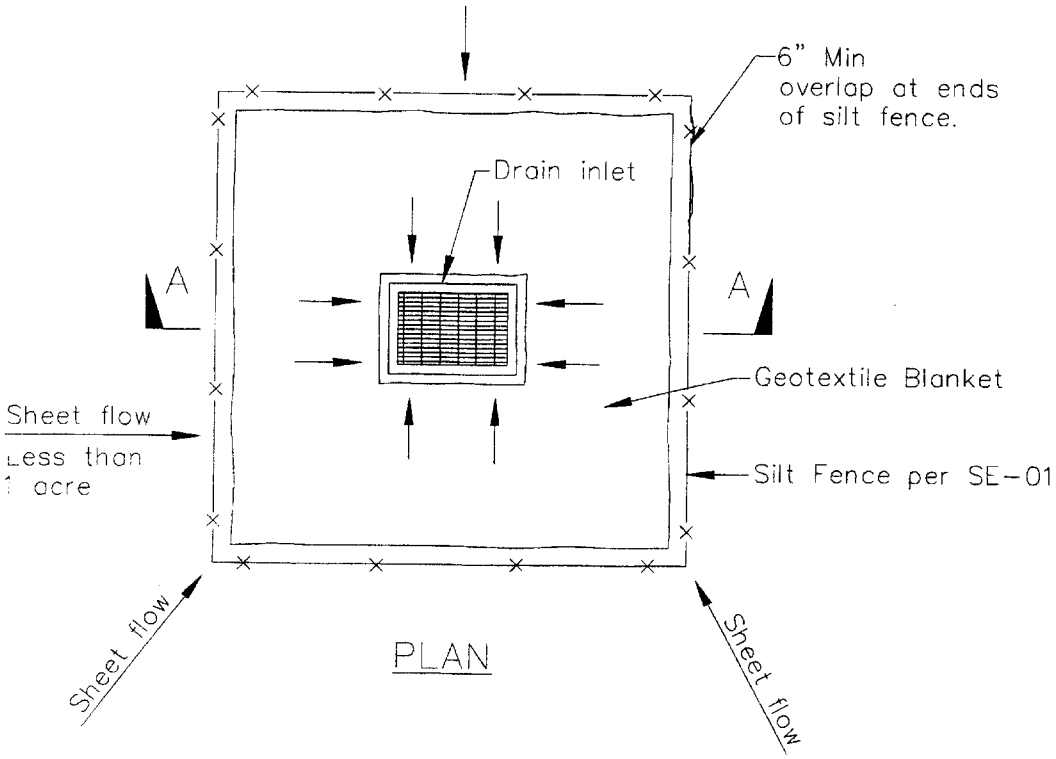
References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.



SECTION A-A

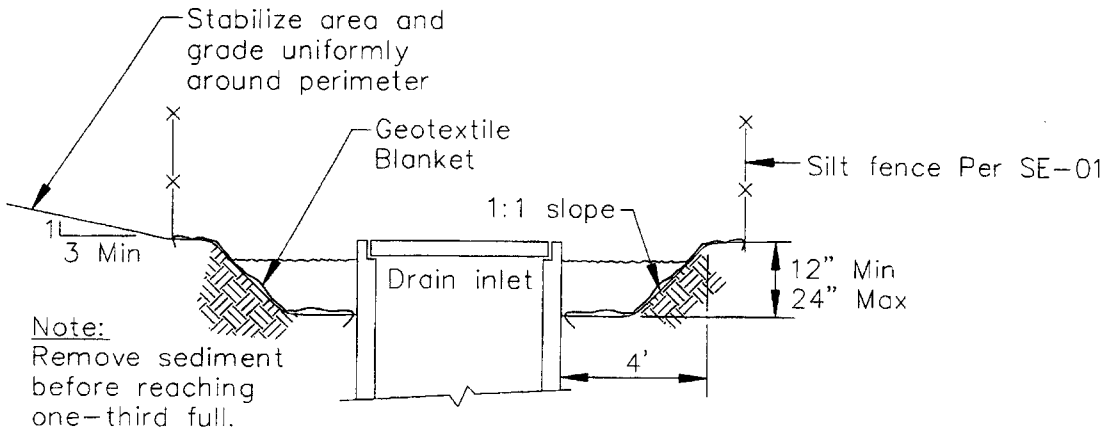


PLAN

DI PROTECTION TYPE 1
NOT TO SCALE

NOTES:

1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.



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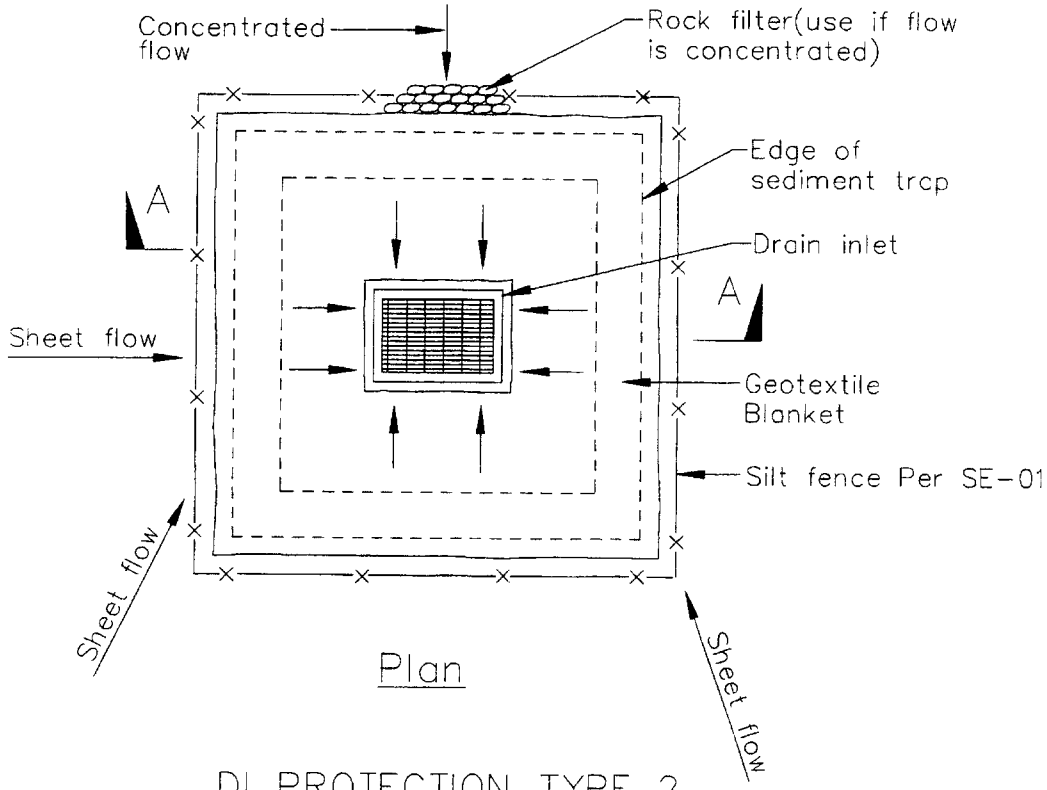
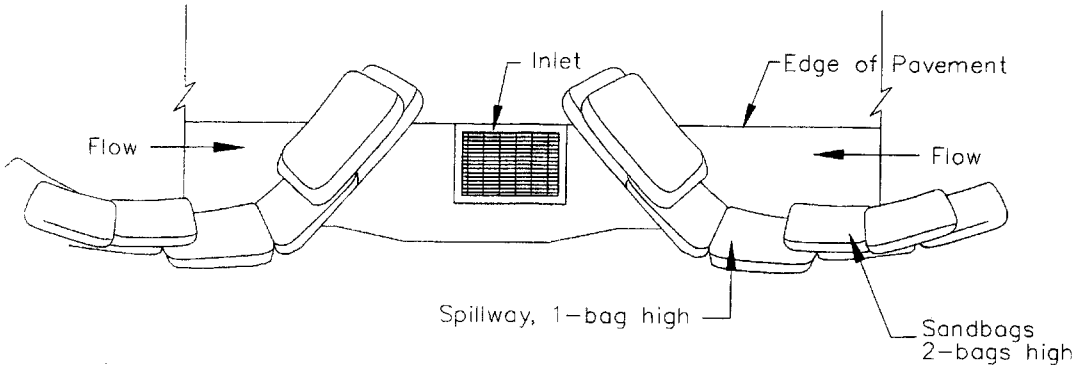


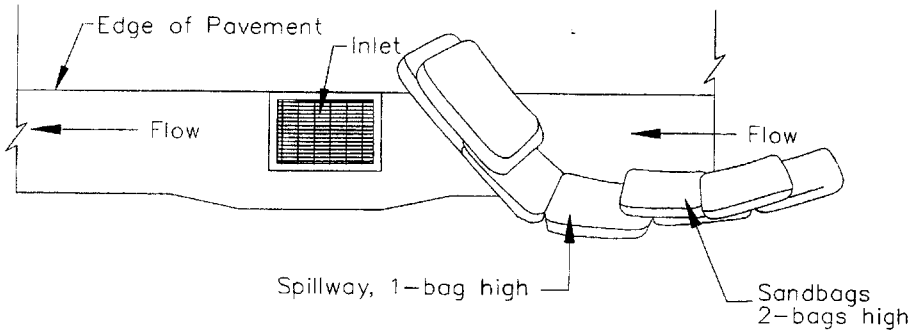
Plan

DI PROTECTION TYPE 2
NOT TO SCALE

Notes
1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.



TYPICAL PROTECTION FOR INLET ON SUMP

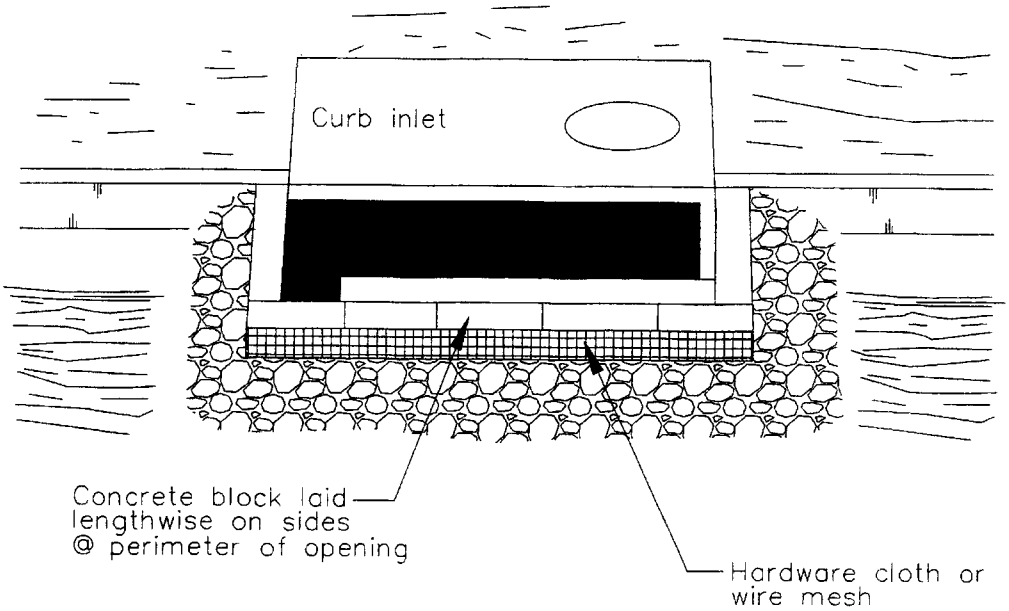


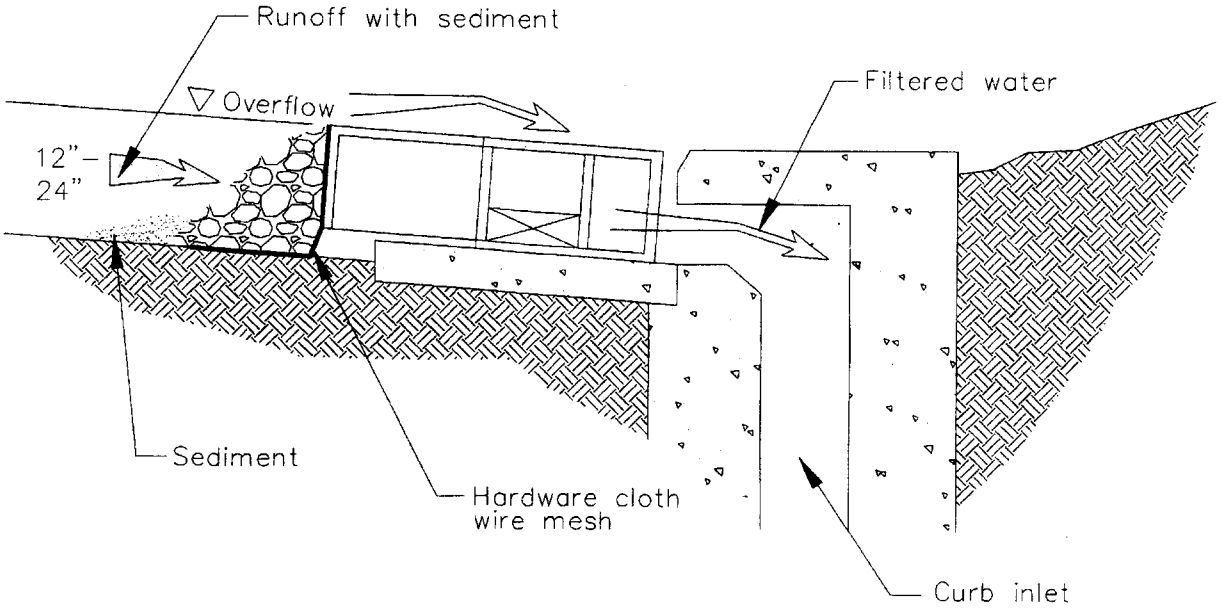
TYPICAL PROTECTION FOR INLET ON GRADE

NOTES:

1. Intended for short-term use.
2. Use to inhibit non-storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed
5. Not applicable in areas with high silts and clays without filter fabric.

DI PROTECTION TYPE 3
NOT TO SCALE

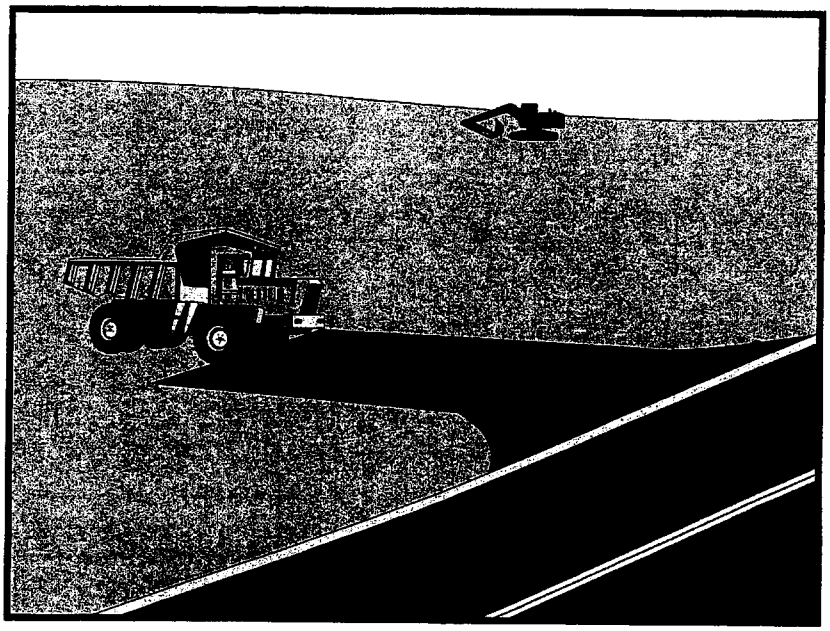




DI PROTECTION – TYPE 4

NOT TO SCALE

Stabilized Construction Entrance/Exit TC-1



Objectives

EC	Erosion Control	✓
SE	Sediment Control	✓
TC	Tracking Control	✔
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

✔ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✔
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

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

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- 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.

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Implementation

General

A stabilized construction entrance is a 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. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft minimum, and 30 ft minimum width.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.

- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from $1,200 to $4,800 each, averaging $2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from $1,200 - $6,000 each, averaging $3,600 per entrance.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

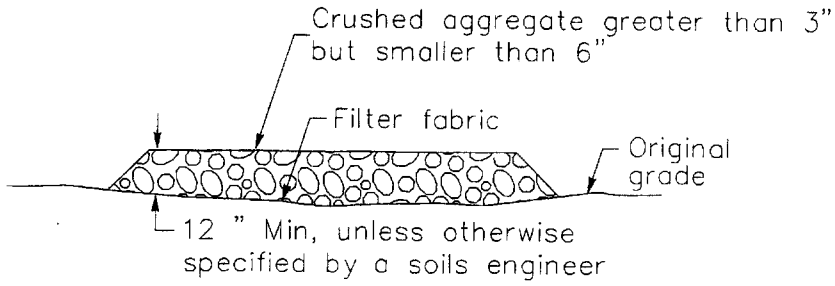
Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

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

Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



SECTION B–B
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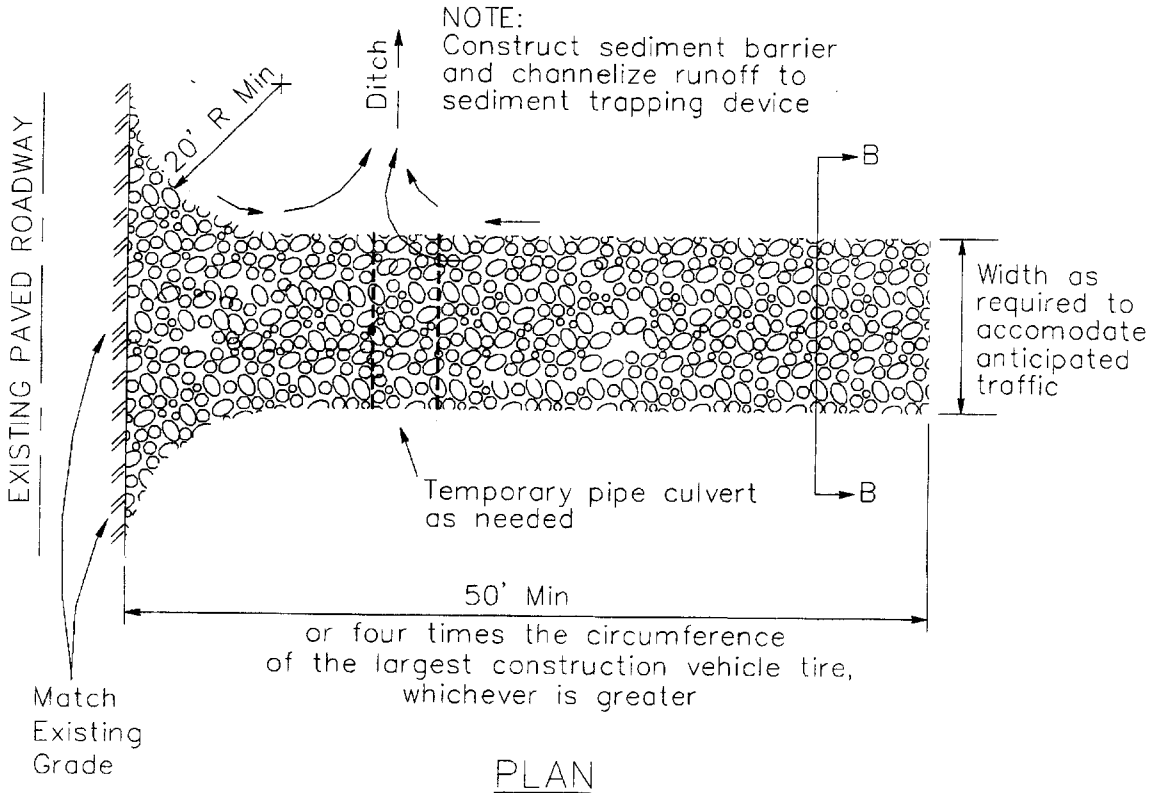

PLAN
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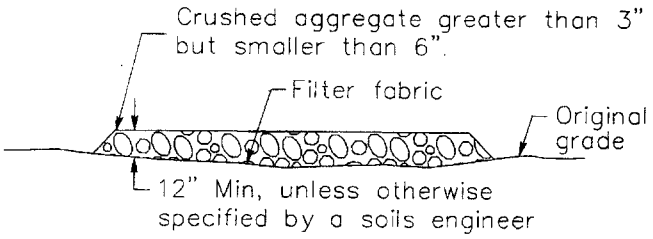
Stabilized Construction Entrance/Exit TC-1



SECTION B–B
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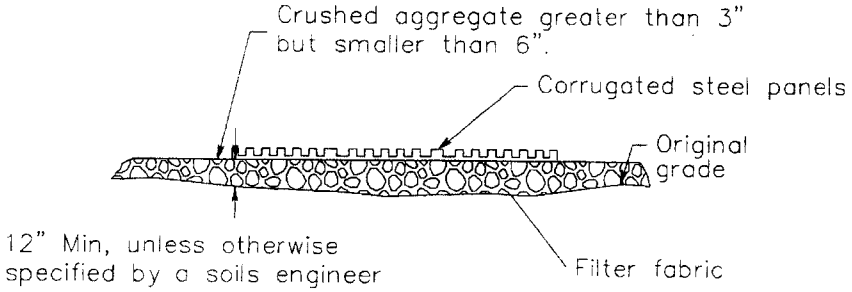

SECTION A–A
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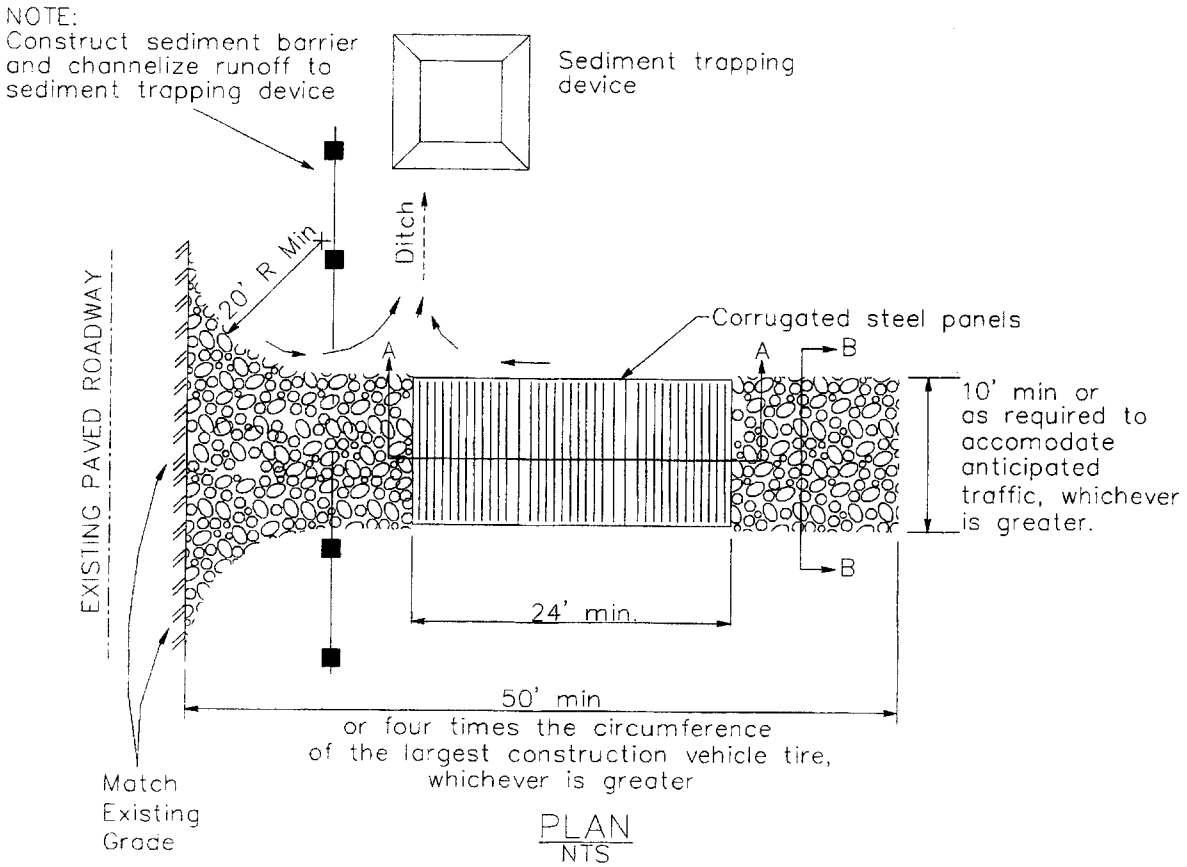

PLAN
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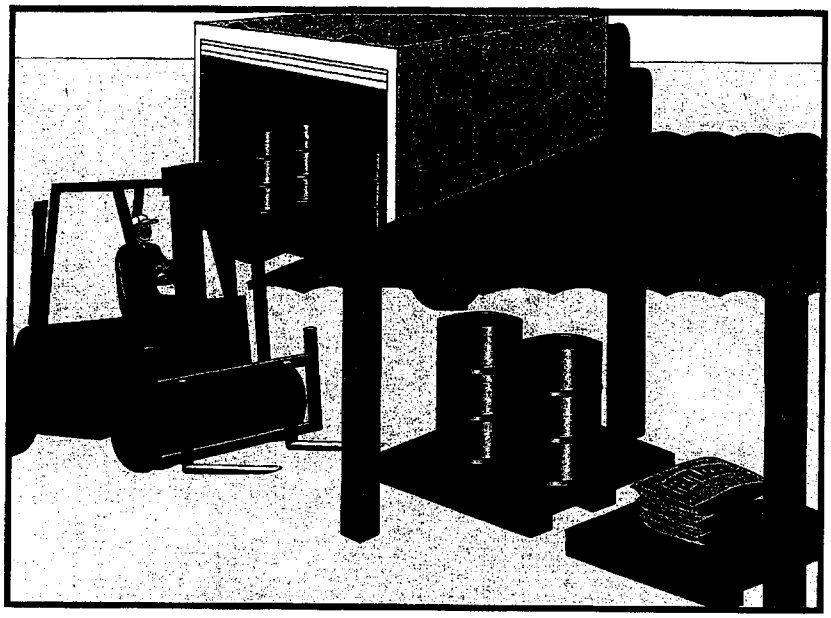
APPENDIX G - WASTE MANAGEMENT BMPS

1-18-2010 Bid Set (Not for Construction)

Material Delivery and Storage WM-1



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease
- Asphalt and concrete components

- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

Implementation

The following steps should be taken to minimize risk:

- Temporary storage area should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located near the construction entrances, away from waterways, if possible.
  - Avoid transport near drainage paths or waterways.
  - Surround with earth berms. See EC-9, Earth Dikes and Drainage Swales.
  - Place in an area which will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.
- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the rainy season, consider storing materials in a covered area. Store materials in secondary containments such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.

- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.
- Chemicals should be kept in their original labeled containers.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Throughout the rainy season, each temporary containment facility should be covered during non-working days, prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous materials.

Material Delivery Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.

Cost

- The largest cost of implementation may be in the construction of a materials storage area that is covered and provides secondary containment.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep an ample supply of spill cleanup materials near the storage area.
- Keep storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

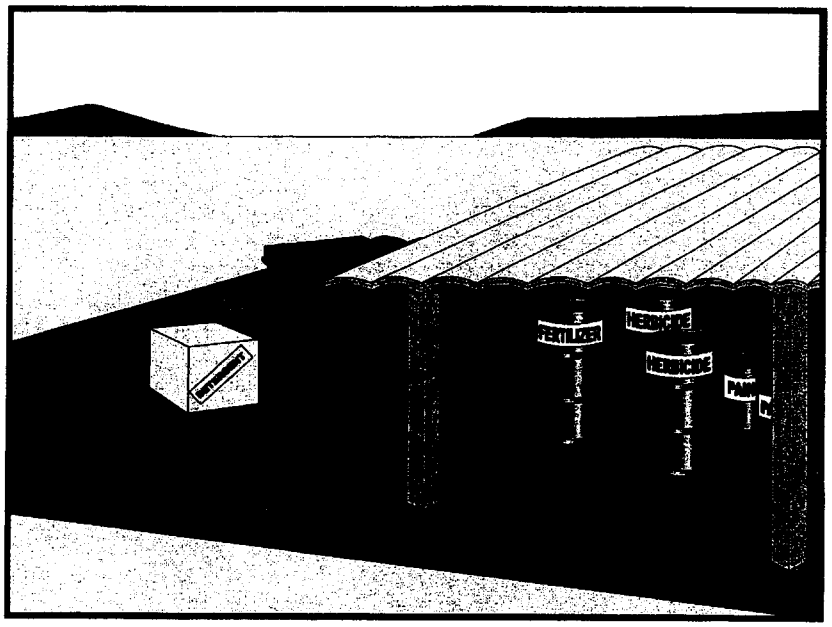
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Material Use

WM-2



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

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Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydro seeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted, or into a concrete washout pit or temporary sediment trap. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.

- Require contractors to complete the "Report of Chemical Spray Forms" when spraying herbicides and pesticides.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two–week intervals in the non-rainy season to verify continued BMP implementation.
- Maintenance of this best management practice is minimal.
- Spot check employees and subcontractors throughout the job to ensure appropriate practices are being employed.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Stockpile Management WM-3

Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Stockpile Management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other materials.

Limitations

None identified.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

- Locate stockpiles a minimum of 50 ft away from concentrated flows of stormwater, drainage courses, and inlets.
- Protect all stockpiles from stormwater runon using a temporary perimeter sediment barrier such as berms, dikes, fiber rolls, silt fences, sandbag, gravel bags, or straw bale barriers.

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- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

Soil stockpiles

- During the rainy season, soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- During the non-rainy season, soil stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- During the rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier at all times.
- During the non-rainy season, the stockpiles should be covered or protected with a temporary perimeter sediment barrier prior to the onset of precipitation.

Stockpiles of "cold mix"

- During the rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material at all times.
- During the non-rainy season, cold mix stockpiles should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Stockpiles/Storage of pressure treated wood with copper, chromium, and arsenic or ammonical, copper, zinc, and arsenate

- During the rainy season, treated wood should be covered with plastic or comparable material at all times.
- During the non-rainy season, treated wood should be covered with plastic or comparable material at all times and cold mix stockpiles should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Protection of Active Stockpiles

Active stockpiles of the identified materials should be protected further as follows:

- All stockpiles should be protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" should be placed on and covered with plastic or comparable material prior to the onset of precipitation.

Costs

All of the above are low cost measures.

Inspection and Maintenance

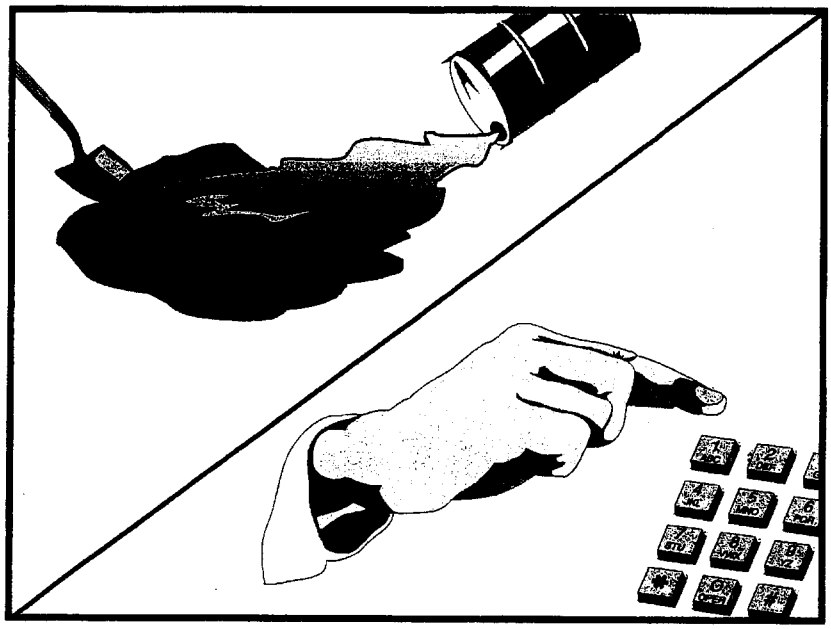
- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation

- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Spill Prevention and Control WM-4



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

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- Fuels
- Lubricants
- Other petroleum distillates

Limitations

- In some cases it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

Implementation

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.
- Do not bury or wash spills with water.

- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

Reporting

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Regularly inspect onsite vehicles and equipment for leaks and repair immediately
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur onsite, use designate areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Costs

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.

- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

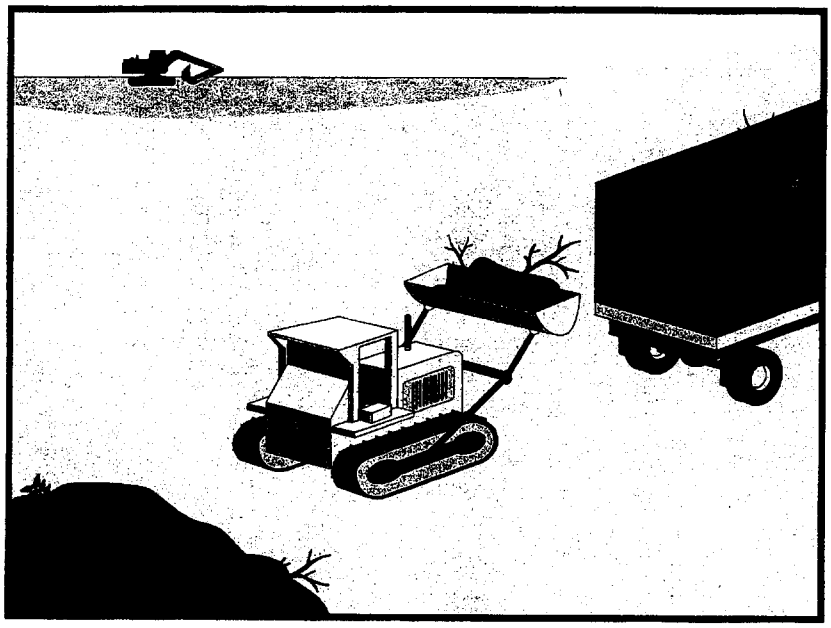
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Solid Waste Management WM-5



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:
✓ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

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- Highway planting wastes, including vegetative material, plant containers, and packaging materials

Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection, Storage, and Disposal

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runon should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.

- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

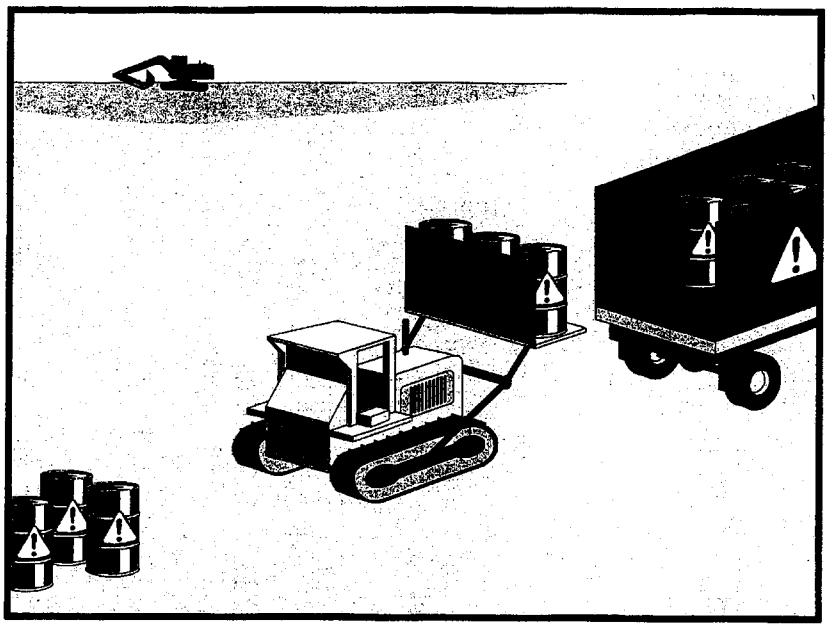
References

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Hazardous Waste Management WM-6



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Hazardous waste management practices are implemented on construction projects that generate waste from the use of:

- Petroleum Products
- Concrete Curing Compounds
- Palliatives
- Septic Wastes
- Stains
- Wood Preservatives
- Asphalt Products
- Pesticides
- Acids
- Paints
- Solvents
- Roofing Tar
- Any materials deemed a hazardous waste in California, Title 22 Division 4.5, or listed in 40 CFR Parts 110, 117, 261, or 302

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In addition, sites with existing structures may contain wastes, which must be disposed of in accordance with federal, state, and local regulations. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints
- Asbestos
- PCBs (particularly in older transformers)

Limitations

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Nothing in this BMP relieves the contractor from responsibility for compliance with federal, state, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.
- This BMP does not cover aerially deposited lead (ADL) soils. For ADL soils refer to WM-7, Contaminated Soil Management.

Implementation

The following steps will help reduce stormwater pollution from hazardous wastes:

Material Use

- Wastes should be stored in sealed containers constructed of a suitable material and should be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179.
- All hazardous waste should be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.
- Waste containers should be stored in temporary containment facilities that should comply with the following requirements:
  - Temporary containment facility should provide for a spill containment volume equal to 1.5 times the volume of all containers able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest tank within its boundary, whichever is greater.
  - Temporary containment facility should be impervious to the materials stored there for a minimum contact time of 72 hours.
  - Temporary containment facilities should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be placed into drums after each rainfall. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. Non-hazardous liquids should be sent to an approved disposal site.
  - Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.

- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Throughout the rainy season, temporary containment facilities should be covered during non-working days, and prior to rain events. Covered facilities may include use of plastic tarps for small facilities or constructed roofs with overhangs.

- Drums should not be overfilled and wastes should not be mixed.
- Unless watertight, containers of dry waste should be stored on pallets.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application. Allow time for infiltration and avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.
- Paint brushes and equipment for water and oil based paints should be cleaned within a contained area and should not be allowed to contaminate site soils, watercourses, or drainage systems. Waste paints, thinners, solvents, residues, and sludges that cannot be recycled or reused should be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths should be disposed of as solid waste.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and reuse thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.
- The following actions should be taken with respect to temporary contaminant:
  - Ensure that adequate hazardous waste storage volume is available.
  - Ensure that hazardous waste collection containers are conveniently located.
  - Designate hazardous waste storage areas onsite away from storm drains or watercourses and away from moving vehicles and equipment to prevent accidental spills.
  - Minimize production or generation of hazardous materials and hazardous waste on the job site.
  - Use containment berms in fueling and maintenance areas and where the potential for spills is high.
  - Segregate potentially hazardous waste from non-hazardous construction site debris.
  - Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.

- Clearly label all hazardous waste containers with the waste being stored and the date of accumulation.
- Place hazardous waste containers in secondary containment.
- Do not allow potentially hazardous waste materials to accumulate on the ground.
- Do not mix wastes.
- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.

Waste Recycling Disposal

- Select designated hazardous waste collection areas onsite.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes, this can cause chemical reactions, making recycling impossible and complicating disposal.
- Recycle any useful materials such as used oil or water-based paint.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g., excess oil-based paint and sludge) is collected, removed, and disposed of only at authorized disposal areas.

Disposal Procedures

- Waste should be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility utilizing properly completed Uniform Hazardous Waste Manifest forms.
- A Department of Health Services certified laboratory should sample waste to determine the appropriate disposal facility.
- Properly dispose of rainwater in secondary containment that may have mixed with hazardous waste.
- Attention is directed to "Hazardous Material", "Contaminated Material", and "Aerially Deposited Lead" of the contract documents regarding the handling and disposal of hazardous materials.

Education

- Educate employees and subcontractors on hazardous waste storage and disposal procedures.
- Educate employees and subcontractors on potential dangers to humans and the environment from hazardous wastes.
- Instruct employees and subcontractors on safety procedures for common construction site hazardous wastes.
- Instruct employees and subcontractors in identification of hazardous and solid waste.
- Hold regular meetings to discuss and reinforce hazardous waste management procedures (incorporate into regular safety meetings).
- The contractor's superintendent or representative should oversee and enforce proper hazardous waste management procedures and practices.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Hazardous waste should be regularly collected.
- A foreman or construction supervisor should monitor onsite hazardous waste storage and disposal procedures.
- Waste storage areas should be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.
- Hazardous spills should be cleaned up and reported in conformance with the applicable Material Safety Data Sheet (MSDS) and the instructions posted at the project site.

- The National Response Center, at (800) 424-8802, should be notified of spills of federal reportable quantities in conformance with the requirements in 40 CFR parts 110, 117, and 302. Also notify the Governors Office of Emergency Services Warning Center at (916) 845-8911.
- A copy of the hazardous waste manifests should be provided.

References

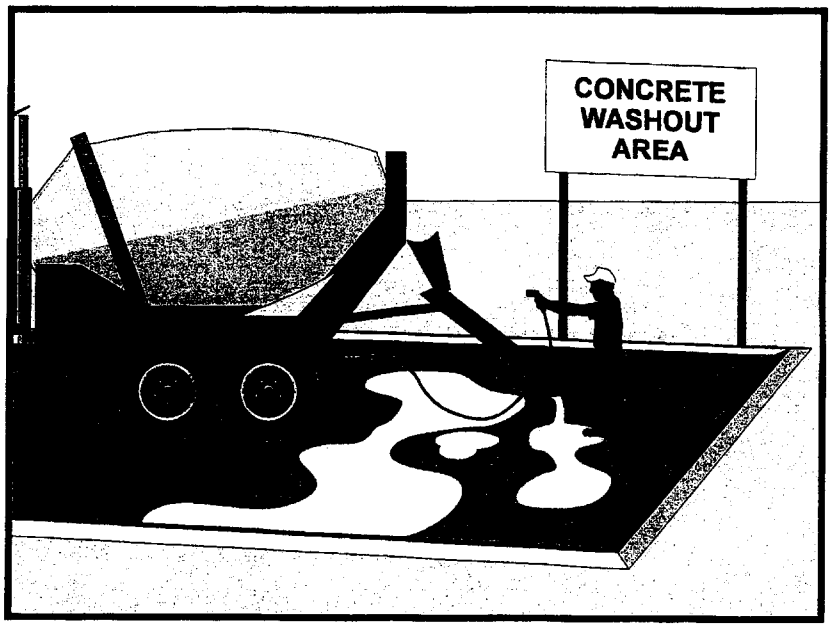
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Concrete Waste Management WM-8



Objectives

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:

✓ **Primary Objective**

✓ **Secondary Objective**

Targeted Constituents

Sediment	✓
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employee and subcontractors.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result form demolition activities
- Slurries containing portland cement concrete (PCC) or asphalt concrete (AC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition
- Concrete trucks and other concrete-coated equipment are washed onsite
- Mortar-mixing stations exist
- See also NS-8, Vehicle and Equipment Cleaning

Limitations

- Offsite washout of concrete wastes may not always be possible.

CASQA California Stormwater Quality Association

Implementation

The following steps will help reduce stormwater pollution from concrete wastes:

- Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.
- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete.
- Perform washout of concrete trucks offsite or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- For onsite washout:
  - Locate washout area at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
  - Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.
- Avoid creating runoff by draining water to a bermed or level area when washing concrete to remove fine particles and expose the aggregate.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose in the trash.

Education

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.
- Arrange for contractor's superintendent or representative to oversee and enforce concrete waste management procedures.

Concrete Slurry Wastes

- PCC and AC waste should not be allowed to enter storm drains or watercourses.
- PCC and AC waste should be collected and disposed of or placed in a temporary concrete washout facility.
- A sign should be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

- Below grade concrete washout facilities are typical. Above grade facilities are used if excavation is not practical.
- A foreman or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.
- Saw-cut PCC slurry should not be allowed to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine. Saw cutting residue should not be allowed to flow across the pavement and should not be left on the surface of the pavement. See also NS-3, Paving and Grinding Operations; and WM-10, Liquid Waste Management.
- Slurry residue should be vacuumed and disposed in a temporary pit (as described in OnSite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below) and allowed to dry. Dispose of dry slurry residue in accordance with WM-5, Solid Waste Management.

Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures

- Temporary concrete washout facilities should be located a minimum of 50 ft from storm drain inlets, open drainage facilities, and watercourses. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
- Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Temporary washout facilities should have a temporary pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
- Washout of concrete trucks should be performed in designated areas only.
- Only concrete from mixer truck chutes should be washed into concrete wash out.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per WM-5, Solid Waste Management. Dispose of hardened concrete on a regular basis.
- Temporary Concrete Washout Facility (Type Above Grade)
  - Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and

minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.

- Straw bales, wood stakes, and sandbag materials should conform to the provisions in SE-9, Straw Bale Barrier.
- Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

- Temporary Concrete Washout Facility (Type Below Grade)
  - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
  - Lath and flagging should be commercial type.
  - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

Costs

All of the above are low cost measures.

Inspection and Maintenance

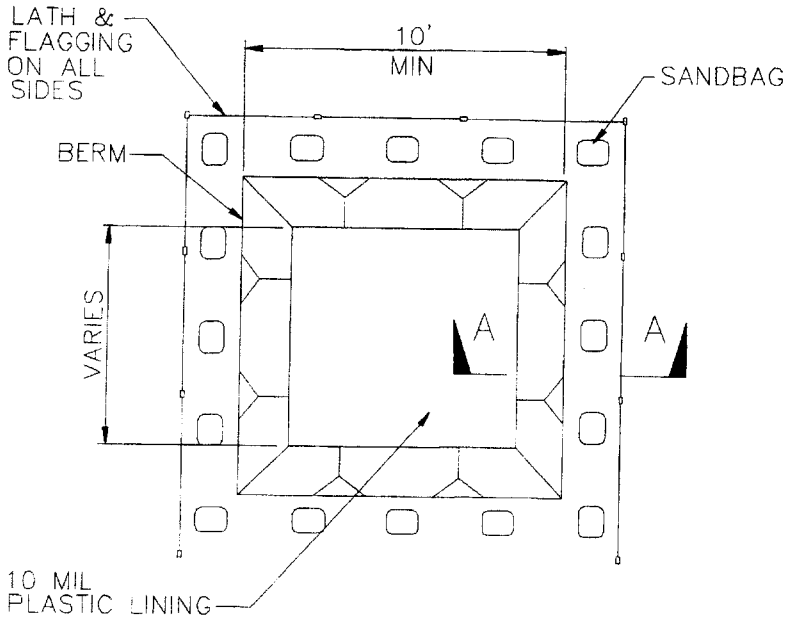
- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Temporary concrete washout facilities should be maintained to provide adequate holding capacity with a minimum freeboard of 4 in. for above grade facilities and 12 in. for below grade facilities. Maintaining temporary concrete washout facilities should include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials should be removed and disposed of.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.

References

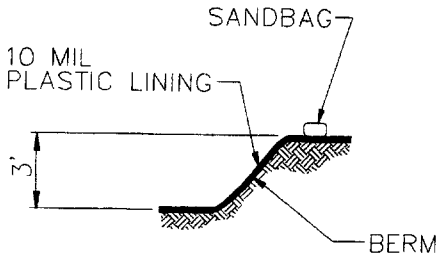
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

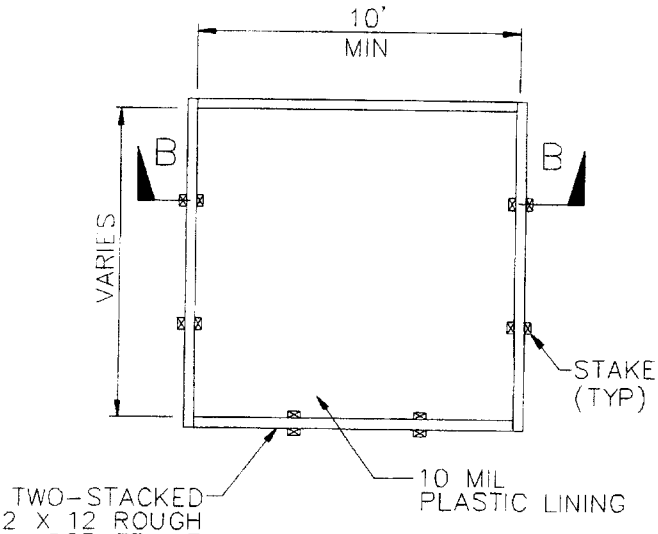
Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



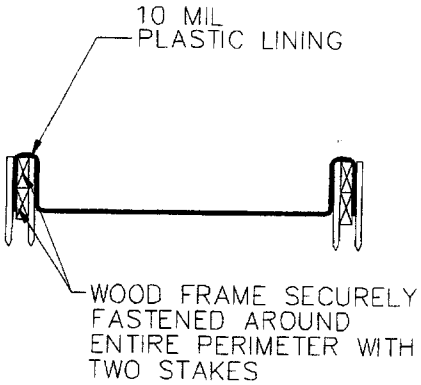
PLAN
NOT TO SCALE
TYPE "BELOW GRADE"



SECTION A–A
NOT TO SCALE



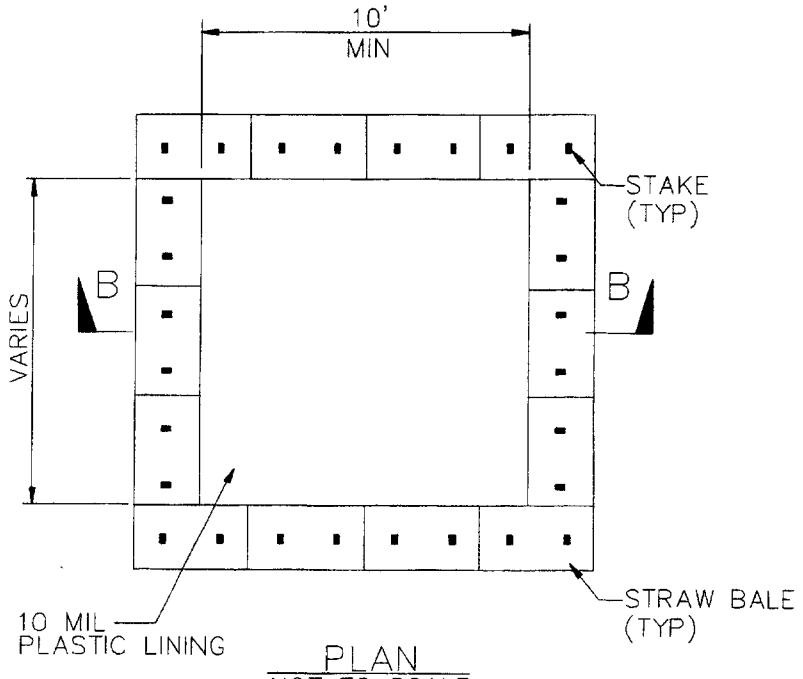
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"



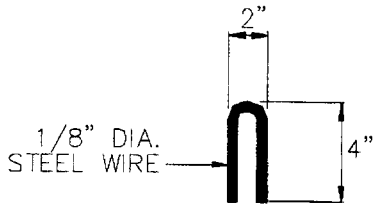
SECTION B–B
NOT TO SCALE

NOTES

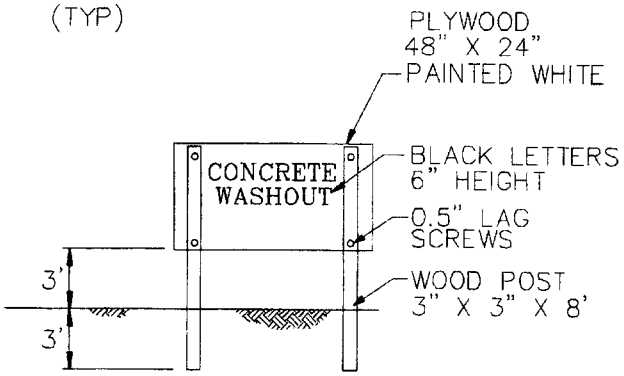
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



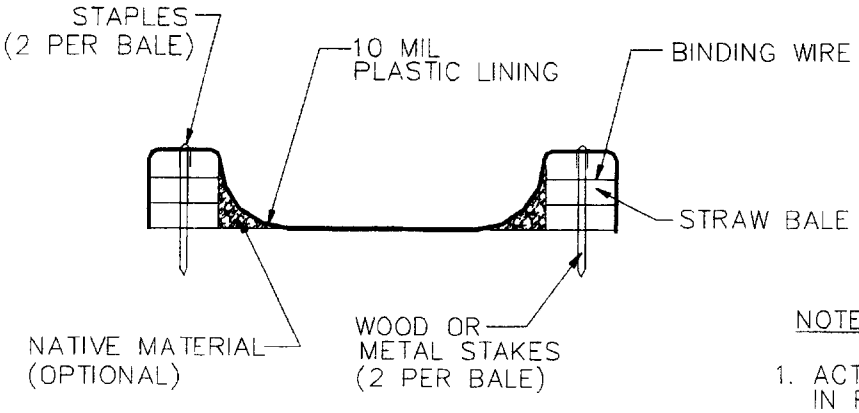
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"
WITH STRAW BALES



STAPLE DETAIL



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)

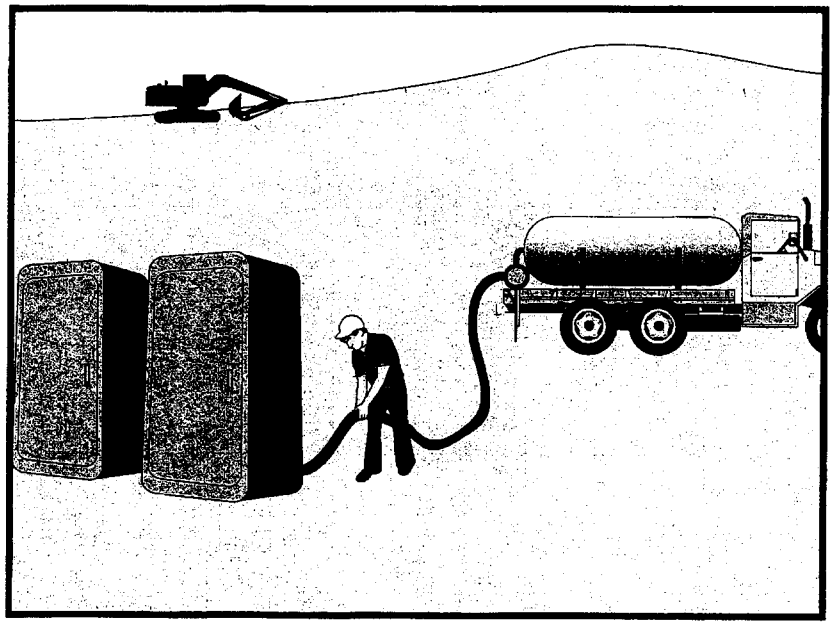


SECTION B–B
NOT TO SCALE

NOTES

1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

Sanitary/Septic Waste Management WM-9



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	✓

Legend:
✓ **Primary Objective**
✓ **Secondary Objective**

Targeted Constituents	
Sediment	
Nutrients	✓
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	✓

Potential Alternatives

None

Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

None identified.

Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.
- Wastewater should not be discharged or buried within the project site.

CASQA
California Stormwater Quality Association

- Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Untreated raw wastewater should never be discharged or buried.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an onsite disposal system (OSDS), such as a septic system, local health agency requirements must be followed.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.

Education

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and septic waste.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

APPENDIX H – POST CONSTRUCTION BMPS

Water Efficient Landscaping

Storm Water Pollution

After The Storm

1-18-2010 Bid Set (Not for Construction)

10 Ways to Save Water Outdoors

Family of
Southern California
Water Agencies

bewaterwise.com

TIP #1 The average homeowner uses twice the amount of water needed to keep plants healthy. Use the watering calculator and index at **be wise.com** to know exactly how much water your plants need.

TIP #2 Check your sprinkler system for leaks, overspray and broken sprinkler heads. Update with drip or other more water-efficient sprinklers where appropriate.

TIP #3 This fall, plant a portion of your garden with beautiful native and California Friendly plants. Browse the plant database at **be wise.com** to find just the right look for your outdoor spaces.

TIP #4 Reduce the amount of water-thirsty grass. Keep only what you need and replace the rest with less-thirsty plants or permeable paving.

TIP #5 For the grass you keep, set your lawnmower blade higher.

TIP #6 Adjust your sprinkler timer downward in September. Plants need less water when days are shorter.

TIP #7 Use a broom instead of the hose for cleaning sidewalks and patios.

TIP #8 Mulch! A layer of bark, gravel, compost, sawdust or low-growing groundcover evens out soil temperature and allows better water retention.

TIP #9 Check the list of invasive plants that hurt our environment at **caleppc.org** and remove any from your garden.

TIP #10 Share these tips with your gardener, neighbors and friends. Water conservation should be a part of every Southern Californian's lifestyle, but that doesn't mean we can't have lush and beautiful outdoor spaces.

be wise.com

IC2. ANIMAL HANDLING AREAS

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	
Bacteria	x
Oil & Grease	
Organics & Toxicants	
Pesticides	
Oxygen Demanding	x

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Use dry cleaning methods to clean animal handling areas regularly.
- Properly collect and dispose of water when water is used for cleaning.
- Prevent animals from moving away from controlled areas where BMPs are in use (e.g. fencing, leashing, etc.)
- Clean storm drain inlet(s) on a regular schedule and after large storms.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. **Use dry cleaning methods to clean animal handling areas regularly.**
   - Sweeping animal handling areas is encouraged over other methods.
   - Properly dispose of droppings, uneaten food, and other potential contaminants.
2. **If water is used for cleaning:**
   - Do not discharge wash water to storm water drains or other receiving waters.
   - Wash water should be collected and pumped to the sanitary sewer, do not allow wash water to enter storm drains. **DO NOT** discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required.
3. **Keep animals in paved and covered areas, if feasible.**
4. **If keeping animals in covered areas is not feasible, cover the ground with vegetation or some other type of ground cover such as mulch.**
5. **Prevent animals from moving away from controlled areas where BMPs are in use (e.g. fencing, leashing, etc.).**

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

Training

1. **Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.**
2. **Train employees on proper spill containment and cleanup.**
   - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
   - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
   - BMP IC17 discusses Spill Prevention and Control in detail.
3. **Establish a regular training schedule, train all new employees, and conduct annual refresher training.**
4. **Use a training log or similar method to document training.**

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

County of Orange
Watershed & Coastal Resources
Stormwater Program
(714)567-6363
or visit our website at:
www.ocwatersheds.com

Stormwater Pollution

What you should know for...

Industrial & Commercial Facilities

Best Management Practices (BMPS) for:

- Industrial
- Commercial Facilities

Riverside County Stormwater Members

Flood Control District
(Lead Agency)
(951) 955-1250

County of Riverside
(951) 955-1000

City of Banning
(951) 922-3130

City of Beaumont
(951) 769-8520

City of Calimesa
(909) 795-9801

City of Canyon Lake
(951) 244-2955

Cathedral City
(760) 770-0349

City of Coachella
(760) 398-3502

City of Corona
(951) 736-2248

City of Desert Hot Springs
(760) 329-6411

City of Hemet
(951) 765-2300

City of Indian Wells
(760) 346-2489

City of San Jacinto
(951) 487-7330

City of Indio
(760) 391-4000

City of Lake Elsinore
(951) 674-3124

City of La Quinta
(760) 777-7000

City of Menifee
(951) 672-6777

City of Moreno Valley
(951) 413-3120

City of Murrieta
(951) 304-2489

City of Norco
(951) 735-3900

City of Palm Desert
(760) 346-0611

City of Palm Springs
(760) 323-8253

City of Perris
(951) 943-6100

City of Rancho Mirage
(760) 324-4511

City of Riverside
(951) 926-5311

City of Temecula
(951) 694-6444

City of Wildomar
(951) 677-7751

Coachella Valley Water District
(760) 398-2651

The Riverside County "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges San Bernardino County's Stormwater Program for their contribution to this brochure.

YOU can prevent Stormwater Pollution following these practices...

Industrial and Commercial Facilities

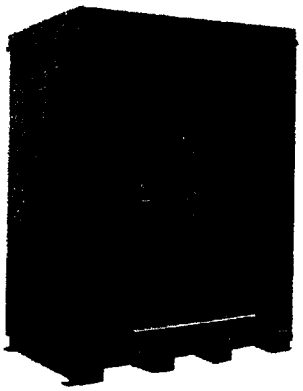
To reduce the amount of pollutants reaching our storm drain system, which leads to many of our water bodies, the Riverside County Stormwater Program has developed Best Management Practices (BMPs) for Industrial and Commercial Facilities. City and County ordinances require that businesses comply with these BMPs, where applicable, to protect local water quality. Local cities and the County are required to verify implementation of these BMPs by performing regular facility inspections.

Prohibited Discharges

- Discontinue all non-stormwater discharges to the storm drain system. It is *prohibited* to discharge any chemicals, paints, lumber, debris, wastes or wastewater into the gutter, street or storm drain.

Outdoor Storage

- Install covers and secondary containment areas for all hazardous materials and wastes stored outdoors in accordance with County and/or City standards.
- Keep all temporary waste containers covered, at all times, except when actively using.
- Sweep outdoor areas instead of using a hose or pressure washer.
- Move all process operations including vehicle and equipment maintenance inside of the building or into a covered and contained area.
- Wash equipment and vehicles in a contained and covered wash bay which is closed-loop or connected to a clarifier sized to local standards, then discharged to a sanitary sewer or take them to a commercial car wash.



Spills and Clean Ups

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep up the area.
- Clean up spills immediately when they occur, using dry clean up methods such as absorbent materials or sweep followed by proper disposal of materials.
- Always have a spill kit available near chemical loading dock doors and vehicle maintenance and fueling areas.
- Follow your Business Emergency Plan, as filed with the County Fire Department.
- Report all prohibited discharges and non-implementation of BMPs to your local Stormwater Coordinator as listed on the back of this pamphlet.
- Report hazardous materials spills to 951-358-5055 or 1-800-304-2226 or call your your local Fire Department Hazmat Team at 911.

Plastic Manufacturing Facilities

AB 258 requires plastic product manufacturers to use best management practices, such as safe storage and clean-up procedures to prevent plastic pellets (nurdles) from entering the waterway. The plastic pellets are released into the environment during transporting, packaging and processing and migrate to waterways through the storm drain system. AB 258 will help protect fish and wildlife from the hazards of plastic pollution.

Training

As prescribed by your local and County Stormwater Ordinance(s), train employees in spill procedures and prohibit non-stormwater discharges to the storm drain system. Applicable Best Management Practice examples can be found at www.cabmphandbooks.com.

Permitting

Stormwater discharges associated with specific categories for commercial and industrial facilities are regulated by the State Water Resources Control Board (SWRCB) through an Industrial Stormwater General Permit. A copy of the General Permit and application forms are available at: www.waterboards.ca.gov, then select stormwater.

To report illegal dumping or for more information on stormwater pollution prevention call: 1-800-506-2555 or e-mail us at: fcnpdes@rcflood.org.

For Information:

LOCAL SEWERING AGENCIES IN RIVERSIDE COUNTY:

City of Beaumont	(909) 769-8520
Belair Homeowners Association	(909) 277-1414
City of Banning	(909) 922-3130
City of Blythe	(760) 922-6161
City of Coachella	(760) 391-5008
Coachella Valley Water District	(760) 398-2651
City of Corona	(909) 736-2259
Desert Center, CSA #51	(760) 227-3203
Eastern Municipal Water District	(909) 928-3777
Elsinore Valley MWD	(909) 674-3146
Farm Mutual Water Company	(909) 244-4198
Idyllwild Water District	(909) 659-2143
Jurupa Community Services Dist.	(909) 685-7434
Lake Hemet MWD	(909) 658-3241
Lee Lake Water District	(909) 277-1414
March Air Force Base	(909) 656-7000
Mission Springs Water District	(760) 329-6448
City of Palm Springs	(760) 323-8242
Rancho Caballero	(909) 780-9272
Rancho California Water Dist.	(909) 676-4101
Ripley, CSA #62	(760) 922-4909
Rubidoux Community Services Dist.	(909) 684-7580
City of Riverside	(909) 782-5341
Silent Valley Club, Inc	(909) 849-4501
Valley Sanitary District	(760) 347-2356
Western Municipal Water District	(909) 780-4170

SPILL RESPONSE AGENCY:

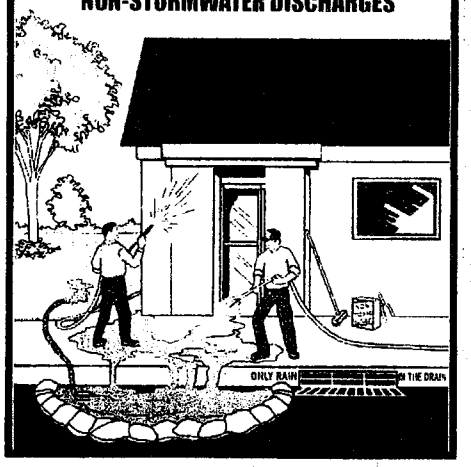
HAZ-MAT:	(909) 358-5055
HAZARDOUS WASTE DISPOSAL:	(909) 358-5055
TO REPORT ILLEGAL DUMPING OR A CLOGGED STORM DRAIN:	1-800-506-2555

StormWater
CleanWater
PROTECTION PROGRAM

StormWater Pollution

OUTDOOR CLEANING ACTIVITIES

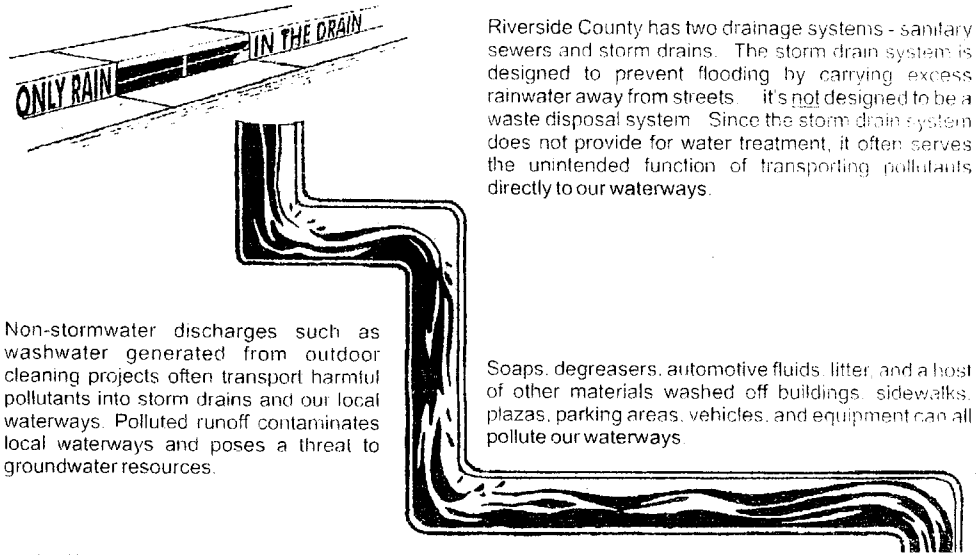
NON-STORMWATER DISCHARGES



GUIDELINES for disposal of washwater from:

- Sidewalk, plaza or parking lot cleaning
- Vehicle washing or detailing
- Building exterior cleaning
- Waterproofing
- Equipment cleaning or degreasing

Do you know . . . where the water should go?



Riverside County has two drainage systems - sanitary sewers and storm drains. The storm drain system is designed to prevent flooding by carrying excess rainwater away from streets. It's not designed to be a waste disposal system. Since the storm drain system does not provide for water treatment, it often serves the unintended function of transporting pollutants directly to our waterways.

Non-stormwater discharges such as washwater generated from outdoor cleaning projects often transport harmful pollutants into storm drains and our local waterways. Polluted runoff contaminates local waterways and poses a threat to groundwater resources.

Soaps, degreasers, automotive fluids, litter, and a host of other materials washed off buildings, sidewalks, plazas, parking areas, vehicles, and equipment can all pollute our waterways.

The Cities and County of Riverside StormWater/CleanWater Protection Program

PLEASE NOTE: The discharge of pollutants into the street, gutters, storm drain system, or waterways - without a Regional Water Quality Control Board permit or waiver - is ***strictly prohibited*** by local ordinances and state and federal law.

Help Protect Our Waterways!

Use These Guidelines For Outdoor Cleaning Activities and Washwater Disposal

Do . . . Dispose of **small amounts of washwater from cleaning building exteriors, sidewalks, or plazas** onto landscaped or unpaved surfaces provided you have the owner's permission and the discharge will not cause flooding or nuisance problems, or flow into a storm drain.

Do . . . Check with your local sewering agency's policies and requirements concerning waste water disposal. **Water from many outdoor cleaning activities** may be acceptable for disposal to the sewer system. See the list on the back of this flyer for phone numbers of the sewering agencies in your area.

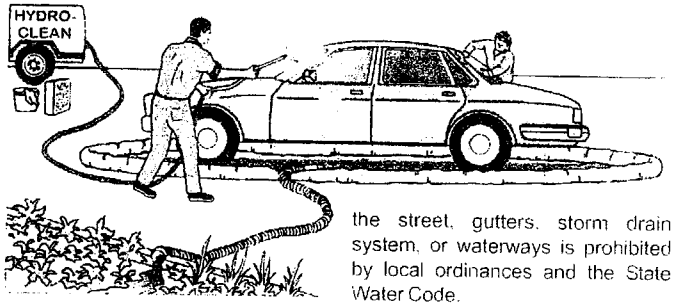
Do . . . Understand that **water (without soap) used to remove dust from clean vehicles** may be discharged to a street or storm drain. **Washwater from sidewalk, plaza, and building surface cleaning** may go into a street or storm drain if ALL of the following conditions are met:

1) The surface being washed is free of residual oil stains, debris and similar pollutants by using dry cleanup methods (sweeping, and cleaning any oil or chemical spills with rags or other absorbent materials before using water).
2) Washing is done with water only - no soap or other cleaning materials.
3) You have not used the water to remove paint from surfaces during cleaning.

Do . . . Understand that **mobile auto detailers** should divert washwater to landscaped or dirt areas. Note: Be aware that soapy washwater may adversely affect landscaping; consult with the property owner. Residual washwater may remain on paved surfaces to evaporate; sweep up any remaining residue. If there is sufficient water volume to reach the storm drain, collect the runoff and obtain permission to pump it into the sanitary sewer. Follow local sewering agency's requirements for disposal.

Regarding Cleaning Agents:

If you must use soap, use biodegradable/phosphate free cleaners. Avoid use of petroleum based cleaning products. Although the use of nontoxic cleaning products is strongly encouraged, ***do*** understand that these products can still degrade water quality and, therefore, the discharge of these products into



the street, gutters, storm drain system, or waterways is prohibited by local ordinances and the State Water Code.

Note: When cleaning surfaces with a high pressure washer or steam cleaning methods, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning, as compared to the use of a low pressure hose, can remove additional materials that can contaminate local waterways.

Other Tips to Help Protect Our Water . . .

Screening Wash Water

Drain Inlet Protection/ Containing & Collecting Wash Water

Equipment and Supplies

EPA
United States Environmental Protection Agency

EPA 841-F-03-003

Protecting Water Quality *from* URBAN RUNOFF

Clean Water Is Everybody's Business

In urban and suburban areas, much of the land surface is covered by buildings and pavement, which do not allow rain and snowmelt to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers, where they seriously harm water quality. To protect surface water quality and groundwater resources, development should be designed and built to minimize increases in runoff.

The most recent National Water Quality Inventory reports that runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third-largest source of impairments to surveyed lakes.

Did you know that because of impervious surfaces like pavement and rooftops, a typical city block generates more than 5 times more runoff than a woodland area of the same size?

How Urbanized Areas Affect Water Quality

Increased Runoff

The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands traps rainwater and snowmelt and allows them to filter slowly into the ground. In contrast, impervious (nonporous) surfaces like roads, parking lots, and rooftops prevent rain and snowmelt from infiltrating, or soaking, into the ground. Most of the rainfall and snowmelt remains above the surface, where it runs off rapidly in unnaturally large amounts.

Storm sewer systems concentrate runoff into smooth, straight conduits. This runoff gathers speed and erosional power as it travels underground. When this runoff leaves the storm drains and empties into a stream, its excessive volume and power blast out streambanks, damaging streamside vegetation and wiping out aquatic habitat. These increased storm flows carry sediment loads from construction sites and other denuded surfaces and eroded streambanks. They often carry higher water temperatures from streets, roof tops, and parking lots, which are harmful to the health and reproduction of aquatic life.

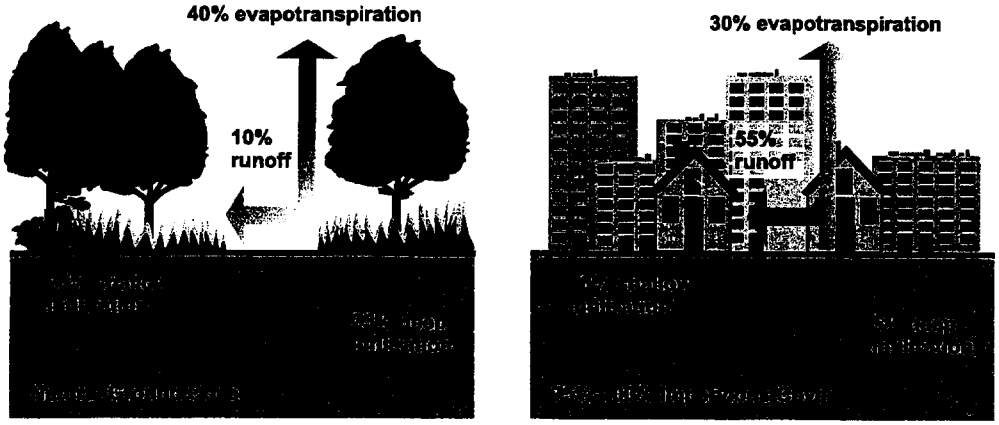
The loss of infiltration from urbanization may also cause profound groundwater changes. Although urbanization leads to great increases in flooding during and immediately after wet weather, in many instances it results in lower stream flows during dry weather. Many native fish and other aquatic life cannot survive when these conditions prevail.

Increased Pollutant Loads

Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. The pollutants include:

- Sediment
- Oil, grease, and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria, and nutrients from pet waste and failing septic systems
- Road salts
- Heavy metals from roof shingles, motor vehicles, and other sources
- Thermal pollution from dark impervious surfaces such as streets and rooftops

These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface ruunoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.

Managing Urban Runoff

What Homeowners Can Do

To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns. Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose. Instead of disposing of yard waste, they can use the materials to start a compost pile. And homeowners can learn to use Integrated Pest Management (IPM) to reduce dependence on harmful pesticides.

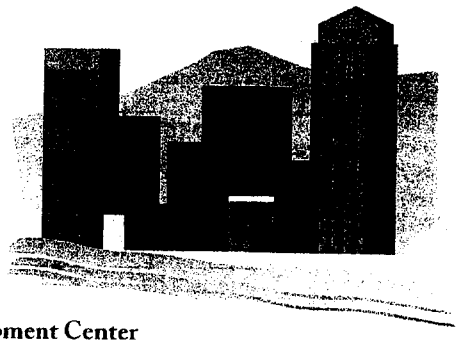
In addition, households can prevent polluted runoff by picking up after pets and using, storing, and disposing of chemicals properly. Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed. Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff. Households served by septic systems should have them professionally inspected and pumped every 3 to 5 years. They should also practice water conservation measures to extend the life of their septic systems.

Controlling Impacts from New Development

Developers and city planners should attempt to control the volume of runoff from new development by using low impact development, structural controls, and pollution prevention strategies. Low impact development includes measures that conserve natural areas (particularly sensitive hydrologic areas like riparian buffers and infiltrable soils); reduce development impacts; and reduce site runoff rates by maximizing surface roughness, infiltration opportunities, and flow paths.

Controlling Impacts from Existing Development

Controlling runoff from existing urban areas is often more costly than controlling runoff from new developments. Economic efficiencies are often realized through approaches that target "hot spots" of runoff pollution or have multiple benefits, such as high-efficiency street sweeping (which addresses aesthetics, road safety, and water quality). Urban planners and others responsible for managing urban and suburban areas can first identify and implement pollution prevention strategi and examine source control opportuni They should seek out priority pollutant reduction opportunities, then protect natural areas that help control runoff, and finally begin ecological restoration and retrofit activities to clean up degraded water bodies. Local governments are encouraged to take lead roles in public education efforts through public signage, storm drain marking, pollution prevention outreach campaigns, and partnerships with citizen groups and businesses. Citizens can help prioritize the clean-up strategies, volunteer to become involved in restoration efforts, and mark storm drains with approved "don't dump" messages.



Related Publications

Turn Your Home into a Stormwater Pollution Solution!
www.epa.gov/nps

This web site links to an EPA homeowner's guide to healthy habits for clean water that provides tips for better vehicle and garage care, lawn and garden techniques, home improvement, pet care, and more.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas
www.epa.gov/owow/nps/urbanmm

This technical guidance and reference document is useful to local, state, and tribal managers in implementing management programs for polluted runoff. Contains information on the best available, economically achievable means of reducing pollution of surface waters and groundwater from urban areas.

Onsite Wastewater Treatment System Resources
www.epa.gov/owm/onsite

This web site contains the latest brochures and other resources from EPA for managing onsite wastewater treatment systems (OWTS) such as conventional septic systems and alternative decentralized systems. These resources provide basic information to help individual homeowners, as well as detailed, up-to-date technical guidance of interest to local and state health departments.

Low Impact Development Center
www.lowimpactdevelopment.org

This center provides information on protecting the environment and water resources through integrated site design techniques that are intended to replicate preexisting hydrologic site conditions.

Stormwater Manager's Resource Center (SMRC)
www.stormwatercenter.net

Created and maintained by the Center for Watershed Protection, this resource center is designed specifically for stormwater practitioners, local government officials, and others that need technical assistance on stormwater management issues.

Strategies: Community Responses to Runoff Pollution
www.nrdc.org/water/pollution/storm/stoinx.asp

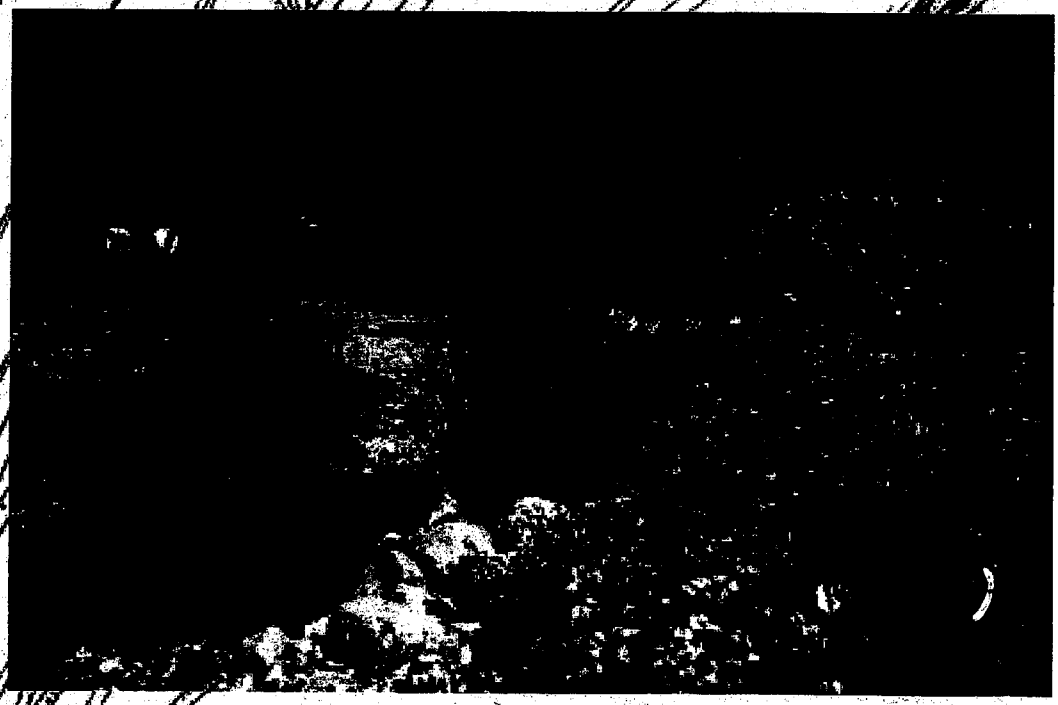
The Natural Resources Defense Council developed this interactive web document to explore some of the most effective strategies that communities are using around the nation to control urban runoff pollution. The document is also available in print form and as an interactive CD-ROM.

For More Information

U.S. Environmental Protection Agency
Nonpoint Source Control Branch (4503T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460
www.epa.gov/nps

Feb 3

Water-Efficient Landscaping:



Preventing Pollution & Using Resources Wisely

A Message from the Administrator

Christine Todd Whitman

I believe water is the biggest environmental issue we face in the 21st Century in terms of both quality and quantity. In the 30 years since its passage, the Clean Water Act has dramatically increased the number of waterways that are once again safe for fishing and swimming. Despite this great progress in reducing water pollution, many of the nation's waters still do not meet water quality goals. I challenge you to join with me to finish the business of restoring and protecting our nation's waters for present and future generations.

United States Environmental Protection Agency
Office of Water (4204M)
EPA832-F-02-002
September 2002
www.epa.gov/owm/water-efficiency/index.htm

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What is Water-efficient Landscaping?

Water, many agree, is our most precious natural resource; without it, life ceases. Yet judging by our water use and consumption practices, many of us in the United States seem to take it for granted. A typical household uses approximately 260 gallons of water per day. "Water conscious" individuals often install high-efficiency shower heads and toilets and wash only full loads of clothes and dishes to reduce consumption. But in the summer, the amount of water used outdoors by a household can exceed the amount used for all other purposes in the entire year. This is especially true in hot, dry climates.

Gardening and lawn care account for the majority of this seasonal increase, but other outdoor activities, such as washing cars and filling swimming pools, also contribute. According to the U.S. Geological Survey, of the 26 billion gallons of water consumed daily in the United States[1], approximately 7.8 billion gallons, or 30 percent[2], is devoted to outdoor uses. The majority of this is used for landscaping. In fact, it is estimated that the typical suburban lawn consumes 10,000 gallons of water above and beyond rainwater each year (Vickers, p 140).

Many mistakenly believe that stunning gardens and beautiful lawns are only possible through extensive watering, fertilization, and pesticide application. As this booklet will demonstrate, eye-catching gardens and landscapes that save water, prevent pollution, and protect the environment are, in fact, easily achieved by employing water-efficient landscaping. Water-efficient landscaping produces attractive landscapes because it utilizes designs and plants suited to local conditions.

This booklet describes the benefits of water-efficient landscaping. It includes several examples of successful projects and programs, as well as contacts, references, and a short bibliography. For specific information about how to best apply water-efficient landscaping principles to your geographical area, consult with your county extension service and local garden and nursery centers. Local governments and water utilities also possess a wealth of information and suggestions for using water more efficiently in all aspects of your life, including landscaping.

Xeriscape garden at Denver Water

1 W.B. Solley, R.R. Pierce, and H.A. Perlman. 1998. *Estimated Use of Water in the United States in 1995* (USGS Circular 1200). USGS. Reston, VA. p.27.

2 Amy Vickers. 2001. *Handbook of Water Use and Conservation*. WaterPlow Press. Amherst, MA. p. 140.

Xeriscaped front yard in Colorado Springs

Many terms and schools of thought have been used to describe approaches to water-efficient landscaping. Some examples include "water-wise," "water-smart," "low-water," and "natural landscaping." While each of these terms varies in philosophy and approach, they are all based on the same principles and are commonly used interchangeably. One of the first conceptual approaches developed to formalize these principles is known as "Xeriscape[3] landscaping." Xeriscape landscaping is defined as "quality landscaping that conserves water and protects the environment." The word "Xeriscape" was coined and copyrighted by Denver Water Department in 1981 to help make water conserving landscaping an easily recognized concept. The word is a combination of the Greek word "*xeros*," which means "dry," and "landscape."

The seven principles upon which Xeriscape landscaping is based are:

- Proper planning and design
- Soil analysis and improvement
- Appropriate plant selection
- Practical turf areas
- Efficient irrigation
- Use of mulches
- Appropriate maintenance

The eight fundamentals of water-wise landscaping, below, illustrate the similarities in the underlaying concepts and principles of Xeriscape landscaping and other water-efficient approaches.

- Group plants according to their water needs.
- Use native and low-water-use plants.
- Limit turf areas to those needed for practical uses.
- Use efficient irrigation systems.
- Schedule irrigation wisely.
- Make sure soil is healthy.
- Remember to mulch.
- Provide regular maintenance.

In short, plan and maintain your landscape with these principles of water efficiency in mind and it will continue to conserve water and be attractive.

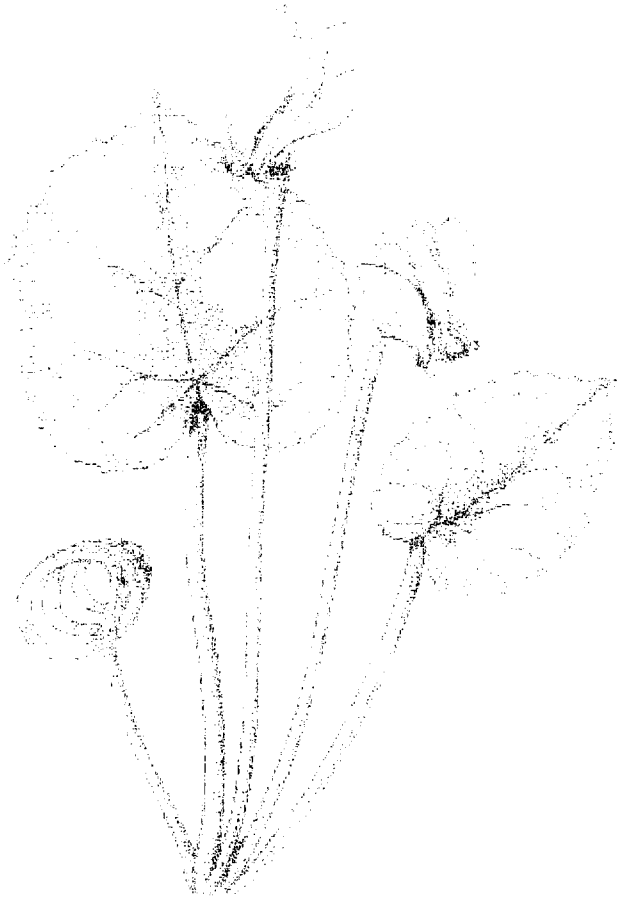
3 Denver Water welcomes the use of the term Xeriscape in books, articles, and speeches promoting water conserving landscape. EPA is using this term with permission from Denver Water. For permission to use "Xeriscape" in your publications, call Denver Water at 303 628-6330.

Why Use Water-efficient Landscaping?

Proper landscaping techniques not only create beautiful landscapes, but also benefit the environment and save water. In addition, attractive, water-efficient, low-maintenance landscapes can increase home values.

Water-efficient landscaping offers many economic and environmental benefits, including:

- Lower water bills from reduced water use.
- Conservation of natural resources and preservation of habitat for plants and wildlife such as fish and waterfowl.
- Decreased energy use (and air pollution associated with its generation) because less pumping and treatment of water is required.
- Reduced home or office heating and cooling costs through the careful placement of trees and plants.
- Reduced runoff of stormwater and irrigation water that carries top soils, fertilizers, and pesticides into lakes, rivers, and streams.
- Fewer yard trimmings to be managed or landfilled.
- Reduced landscaping labor and maintenance costs.
- Extended life for water resources infrastructure (e.g., reservoirs, treatment plants, groundwater aquifers), thus reduced taxpayer costs.



Meadow Sage (Salvia pratensis) *is the background for New Mexico Evening Primrose* (Oenothera berlandieri 'siskiyou')

How is Water-efficient Landscaping Applied?

Landscaping that conserves water and protects the environment is not limited to arid landscapes with only rocks and cacti. Through careful planning, landscapes can be designed to be both pleasing to the senses and kind to the environment. One simple approach to achieving this is applying and adopting the basic principles of water-efficient landscaping to suit your climatic region. The seven principles of Xeriscape landscaping are used below to describe these basic concepts in greater detail.

Dragon's Blood Sedum (Sedum spurium) *under Honeylocust Trees* (Gleditsia triaconthos)

Proper planning and design

Developing a landscape plan is the first and most important step in creating a water-efficient landscape. Your plan should take into account the regional and microclimatic conditions of the site, existing vegetation, topography, intended uses of the property, and most importantly, the grouping of plants by their water needs. Also consider the plants' sun or shade requirements and preferred soil conditions. A well-thought-out landscape plan can serve as your roadmap in creating beautiful, water-efficient landscapes and allow you to continually improve your landscape over time.

Soil analysis and improvements

Because soils vary from site to site, test your soil before beginning your landscape improvements. Your county extension service can analyze the pH levels; nutrient levels (e.g., nitrogen, phosphorus, potassium); and the sand, silt, clay, and organic matter content of your soil. It can also suggest ways to improve your soil's ability to support plants and retain water (e.g., through aeration or the addition of soil amendments or fertilizers).

Appropriate plant selection

Your landscape design should take into account your local climate as well as soil conditions. Focus on preserving as many existing trees and shrubs as possible because established plants usually require less water and maintenance. Choose plants native to your region. Native plants, once established, require very little to no additional water beyond normal rainfall. Also, because they are adapted to local soils and climatic conditions, native plants commonly do not require the addition of fertilizers and are more resistant to pests and disease.

When selecting plants, avoid those labeled "hard to establish," "susceptible to disease," or "needs frequent attention," as these types of plants frequently require large amounts of supplemental water, fertilizers, and pesticides. Be careful when selecting non-indigenous species as some of them may become invasive. An invasive plant might be a water guzzler and will surely choke out native species. Your state or county extension service or local nursery can help you select appropriate plants for your area.

The key to successful planting and transplanting is getting the roots to grow into the surrounding soil as quickly as possible. Knowing when and where to plant is crucial to speeding the establishment of new plants. The best time to plant will vary from species to species. Some plants will thrive when planted in a dormant or inactive state. Others succeed when planted during the season when root generation is highest and sufficient moisture is available to support new growth (generally, spring is the best season, but check plant tags or consult with your local nursery for specific species).

Wine Cup (Callirhoe involucrata) *and Sunset Hyssop* (Agastache rupestris) *in the Denver Water Xeriscape Garden*

Practical turf areas

How and where turf is placed in the landscape can significantly reduce the amount of irrigation water needed to support the landscape. Lawns require a large amount of supplemental water and generally greater maintenance than other vegetation. Use turf where it aesthetically highlights the house or buildings and where it has practical function, such as in play or recreation areas. Grouping turf areas can increase watering efficiency and significantly reduce evaporative and runoff losses. Select a type of grass that can withstand drought periods and become dormant during hot, dry seasons. Reducing or eliminating turf areas altogether further reduces water use.

Efficient irrigation

Efficient irrigation is a very important part of using water efficiently outdoors, and applies in any landscape—whether Xeriscape or conventional. For this reason, an entire section of this booklet addresses efficient irrigation; it can be found on page 6.

Use of mulches

Mulches aid in greater retention of water by minimizing evaporation, reducing weed growth, moderating soil temperatures, and preventing erosion. Organic mulches also improve the condition of your soil as they decompose. Mulches are typically composed of wood bark chips, wood grindings, pine straws, nut shells, small gravel, or shredded landscape clippings. Avoid using rock mulches in sunny areas or around non-arid climate plants, as they radiate large amounts of heat and promote water loss that can lead to scorching. Too much mulch can restrict water flow to plant roots and should be avoided.

Appropriate maintenance

Water and fertilize plants only as needed. Too much water promotes weak growth and increases pruning and mowing requirements. Like any landscape, a water-efficient yard will require regular pruning, weeding, fertilization, pest control, and irrigation. As your water-efficient landscape matures, however, it will require less maintenance and less water. Cutting turf grass only when it reaches two to three inches promotes deeper root growth and a more drought-resistant lawn. As a rule of thumb, mow your turf grass before it requires more than one inch to be removed. The proper cutting height varies, however, with the type of grass, so you should contact your county extension service or local nursery to find out the ideal cutting height for your lawn. Avoid shearing plants or giving them high nitrogen fertilizers during dry periods because these practices encourage water-demanding new growth.

Water-efficient Landscape Irrigation Methods

With common watering practices, a large portion of the water applied to lawns and gardens is not absorbed by the plants. It is lost through evaporation, runoff, or being pushed beyond the root zone because it is applied too quickly or in excess of the plants' needs. The goal of efficient irrigation is to reduce these losses by applying only as much water as is needed to keep your plants healthy. This goal is applicable whether you have a Xeriscape or a conventional landscape.

To promote the strong root growth that supports a plant during drought, water deeply and only when the plant needs water. For clay soils, watering less deeply and more often is recommended. Irrigating with consideration to soil type, the condition of your plants, the season, and weather conditions—rather than on a fixed schedule—significantly increases your watering efficiency. Grouping plants according to similar water needs also makes watering easier and more efficient.

Purple Fountain Grass (Pennisetum setaceum "Rubrum") *and Marigolds* (Calendula officinalis) *in planter bed*

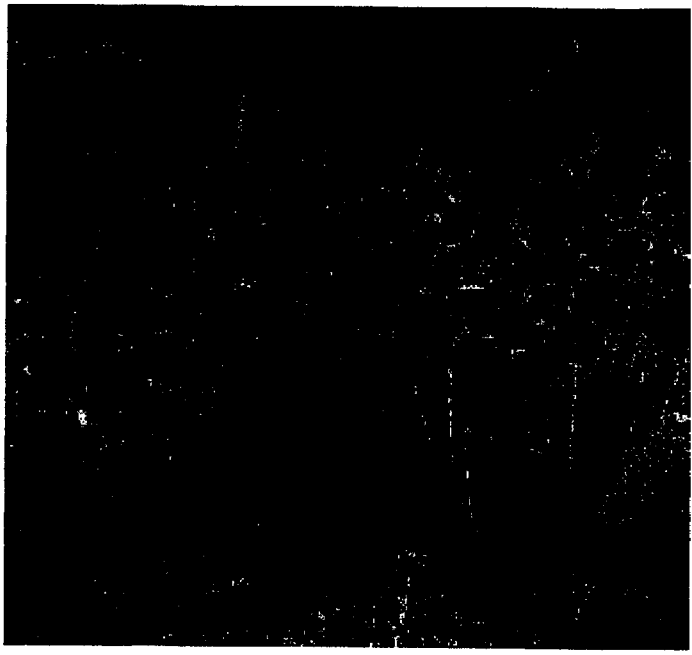
Irrigating lawns, gardens, and landscapes can be accomplished either manually or with an automatic irrigation system. Manual watering with a hand-held hose tends to be the most water-efficient method. According to the AWWA Research Foundation's outdoor end use study, households that manually water with a hose typically use 33 percent less water outdoors than the average household. The study also showed that households with in-ground sprinkler systems used 35 percent more water, those with automatic timers used 47 percent more water, and those with drip irrigation systems used 16 percent more water than households without these types of systems. These results show that in-ground sprinkler and drip irrigation systems must be operated properly to be water-efficient.

You can use a hand-held hose or a sprinkler for manual irrigation. To reduce water losses from evaporation and wind, avoid sprinklers that produce a fine mist or spray high into the air. Soaker hoses can also be very efficient and effective when used properly. Use a hand-held soil moisture probe to determine when irrigation is needed.

To make automatic irrigation systems more efficient, install system controllers such as rain sensors that prevent sprinkler systems from turning on during and immediately after rainfall, or soil moisture sensors that activate sprinklers only when soil moisture levels drop below pre-programmed levels. You can also use a weather-

driven programming system. Drip-type irrigation systems are considered the most efficient of the automated irrigation methods because they deliver water directly to the plants' roots. It is also important to revise your watering schedule as the seasons change. Over-watering is most common during the fall when summer irrigation schedules have not been adjusted to the cooler temperatures.

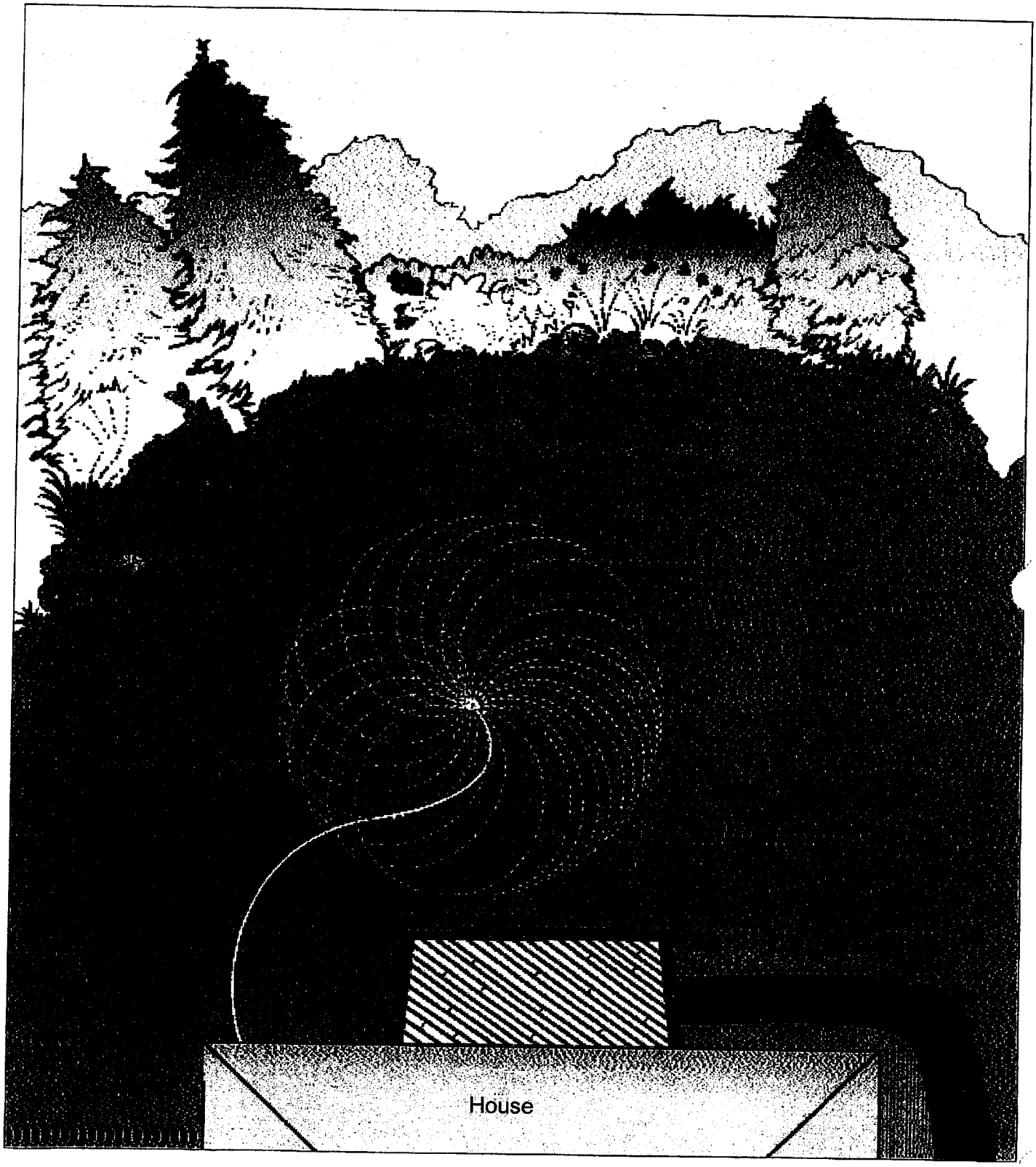
To further reduce your water consumption, consider using alternative sources of irrigation water, such as gray water, reclaimed water, and collected rainwater. According to the AWWA Research Foundation, homes with access to alternative sources of irrigation reduce their water bills by as much as 25 percent.[4] Graywater is untreated household waste water from bathroom sinks, showers, bathtubs, and clothes washing machines. Graywater systems pipe this used water to a storage tank for later outdoor watering use. State and local graywater laws and policies vary, so you should investigate what qualifies as gray water and if any limitations or restrictions apply. Reclaimed water is waste water that has been treated to levels suitable for nonpotable uses. Check with local water officials to determine if it is available in your area. Collected rainwater is rainwater collected in cisterns, barrels, or storage tanks. Commercial rooftop collection systems are available, but simply diverting your downspout into a covered barrel is an easy, low-cost approach. When collecting rainwater, cover all collection vessels to prevent animals and children from entering and to prevent mosquito breeding. Some states might have laws which do not allow collection of rainwater, so be sure to check with your state's water resource agency before implementing a rainwater collection system.



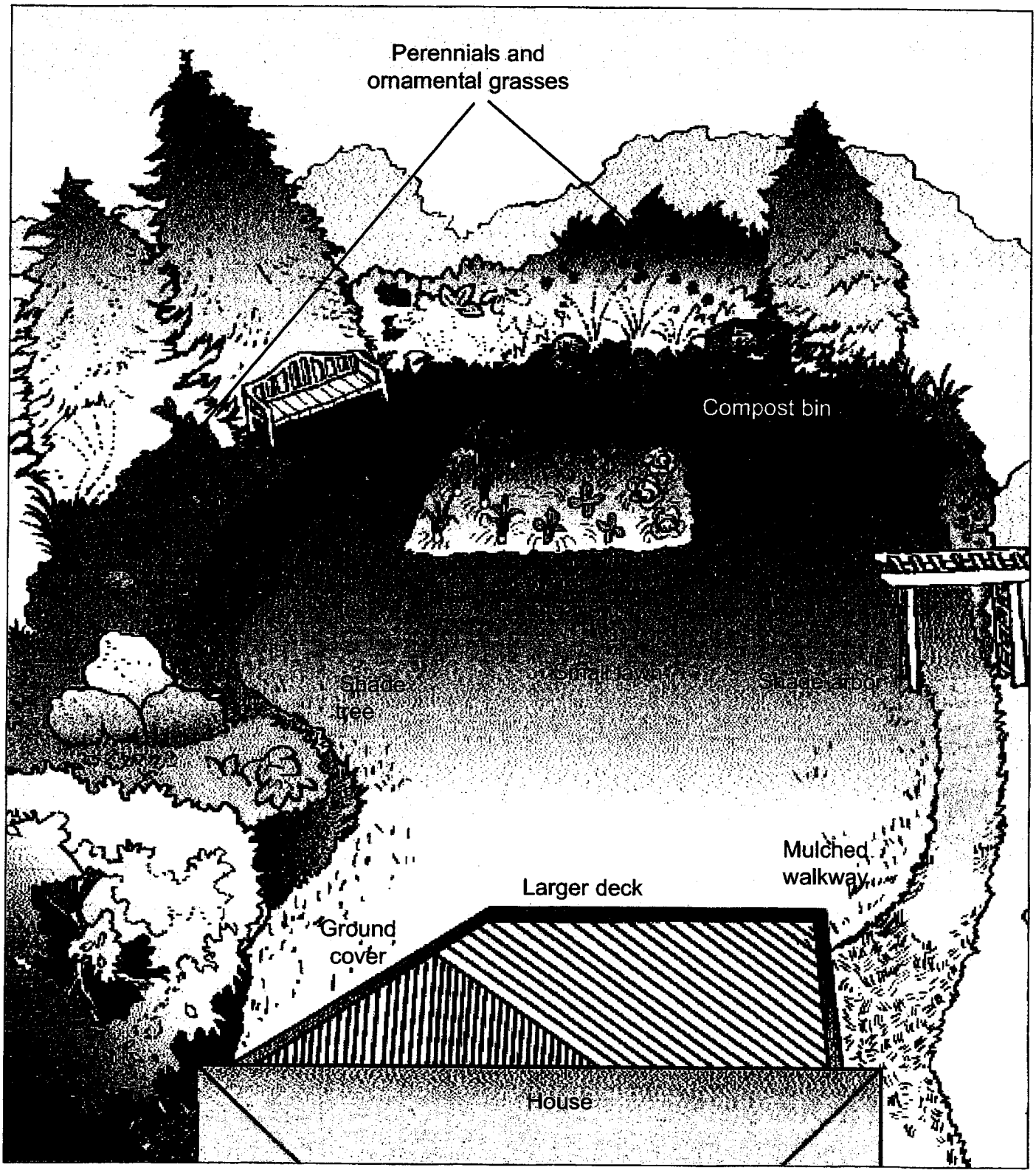
Red Valerian (Centranthus ruber)

4 AWWA Research Foundation. 1999. *Residential End Uses of Water*. <www.waterwiser.org>

Non-xeriscaping



Xeriscaping



Examples of Successful Water-efficient Landscaping Projects

Water-efficient landscaping techniques can be used by individuals, companies, state, tribal, and local governments, and businesses to physically enhance their properties, reduce long-term maintenance costs, and create environmentally conscious landscapes. The following examples illustrate how water-efficient landscapes can be used in various situations.

Oriental Poppies (Paparer orientale)

Homeowner–public/private partnership

- The South Florida Water Management District, the Florida Nurserymen and Growers Association, the Florida Irrigation Society, and local businesses worked together to produce a television video called "Plant It Smart with Xeriscape." The video shows how a typical Florida residential yard can be retrofitted with Xeriscape landscaping to save energy, time, and money. The showcase yard (selected from 70 applicants) had a history of heavy water use—more than 90,000 gallons per month. After the retrofit, the yard's aesthetic value was enhanced; plus it now uses 75 percent less water and relies on yard trimmings for mulch and compost.
- The Southwest Florida Water Management District (SWFWMD), the City of St. Petersburg, and Pinellas County, Florida, produced a video called "Xeriscape It!" It shows a landscape being installed using the seven Xeriscape principles. The SWFWMD also funded several Xeriscape demonstration sites and maintains a Xeriscape demonstration garden at its Brooksville, Florida, headquarters. The garden features a variety of native and non-native plants and is available for public viewing, along with a landscape plant identification guide.
- Residents of Glendale, Arizona, can receive a $100 cash rebate for installing or converting more than half of their landscapable area to non-grass vegetation. The Glendale Water Conservation Office conducts an inspection of the converted lawn to ensure compliance with rebate requirements and then issues a rebate check to the homeowner. The purpose of the Landscape Rebate Program is to permanently reduce the amount of water used to irrigate grass throughout Glendale.

State government

- Although perceived as a water-rich state, Florida became the first to enact a statewide Xeriscape law. Florida's legislature recognized that its growing population and vulnerable environment necessitated legal safeguards for its water resources. The Xeriscape law requires Florida's Departments of Management Ser-

vices and Transportation to use Xeriscape landscaping on all new public properties and to develop a 5-year program to phase in Xeriscape on properties constructed before July 1992. All local governments must also consider requiring the use of Xeriscape and offering incentives to install Xeriscaping.

- Texas also developed legislation requiring Xeriscape landscaping on new construction projects on state property beginning on or after January 1994. Additional legislation, enacted in 1995, requires the Department of Transportation to use Xeriscape practices in the construction and maintenance of roadside parks. All municipalities may consider enacting ordinances requiring Xeriscape to conserve water.

City government

In Las Vegas, Nevada, homeowners can receive up to $1,000 for converting their lawn to Xeriscape, while commercial landowners can receive up to a $50,000 credit on their water bill. The city and several other surrounding communities hope these eye-catching figures will help Las Vegas meet its goal of saving 25 percent of the water it would otherwise have used by the year 2010; to date, it has saved 17 percent. Local officials plan to reach the target with the assistance of incentive programs encouraging Xeriscape, a city ordinance limiting turf to no more than 50 percent of new landscapes, grassroots information programs, and a landscape awards program specifically for Xeriscaped properties. Preliminary results of a five-year study show that residents who converted a portion of their lawns to Xeriscape reduced total water consumption by an average of 33 percent. The xeric vegetation required less than a quarter of the water typically used and one-third the maintenance (both in labor and expenditures) compared to traditional turf.

Yellow Ice Plant (Delosperma nubigenum) *close-up*

Developers

Howard Hughes Properties (HHP), a developer and manager of more than 25,000 acres of residential, commercial, and office development property, has enthusiastically used drought tolerant landscaping on all of its properties since 1990. Most of the company's properties are located in Las Vegas, one of the country's fastest growing metropolitan areas. To conserve resources, the city and county have implemented regulations requiring developers to employ certain Xeriscape principles in new projects. Specifically, a limited percentage of grass can be used on projects, and it must be kept away from streets. As the area's first large-scale developer to recognize the need and value in incorporating drought tolerant landscaping in parks, streetscapes, and open spaces, HHP uses native and desert-adaptive plants that survive and thrive in the Las Vegas climate with minimal to moderate amounts of water.

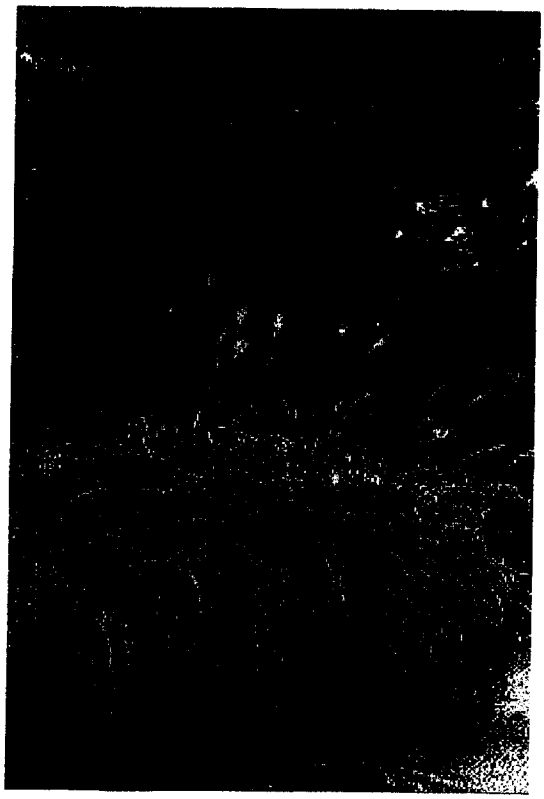
Drip system irrigation controllers are linked to weather stations that monitor the evapotranspiration rate. This allows HHP to determine the correct amount of water to be applied to plants at any given time. HHP tests the irrigation systems regularly and adds appropriate soil amendments to promote healthy plant growth. The maintenance program also includes pest management, the use of mulching mowers, and the use of rock mulch top dressing on all non-turf planting areas. These measures combine to ensure a beautiful, healthy, and responsible landscape.

Public/private partnerships

Even the most water-conscious homeowners in Southern California are over-watering by 50 to 70 gallons per day. The excess water washes away fertilizers and pesticides, which pollute natural waterways. The quantity of water wasted (and the dollars that pay for it) are even more substantial for large-scale commercial properties and developments.

An innovative partnership in Orange County links landscape water management, green material management, and non-point source pollution prevention goals into one program—the Landscape Performance Certification Program. This program emphasizes efficient landscape irrigation and features a "landscape irrigation budget" based on a property's landscape area, type, and the daily weather. The Municipal Water District monitors actual water use through a system of 12,000 dedicated water meters installed by participating landscape managers.

Participants, including landscapers, property managers, and homeowner associations, can compare the actual cost of water used on their property with the calculated budget. Those staying within budget are awarded certification, a proven marketing tool. This new voluntary program is implemented by the Municipal Water District with input from the California Landscape Contractors' Association, the Orange County Integrated Management Department, the Metropolitan Water District of Southern California, and local nurseries and has the support of 32 retailing water suppliers. The program is already credited with increasing the use of arid-climate shrubs and landscaping to accommodate drip irrigation, and has resulted in cost savings to water customers.



Miscanthus sinensis (Miscanthus grass, also called Maiden grass) *variety with leaves turning yellow for fall.*

For More Information

Turkish Speedwell (Veronica Iwanensis) *in background and tulips in foreground.*

The following list of organizations can provide more information on water-efficient landscaping. This is not meant to be an exhaustive list, rather it is intended to help you locate local information sources and possible technical assistance.

Water Management Districts or Utilities

Your local water management district often can provide information on water conservation, including water efficient landscaping practices. Your city, town, or county water management district can be found in the Blue Pages section of your local phone book or through your city, town, or county's Web site if it has one. If you do not know your city, town, or county's Web site, check for a link on your state's Web site. URLs for state Web sites typically follow this format: <www.state.(two letter state abbreviation).us>.

State/County Extension Services

Your state or county extension service is also an excellent source of information. Many extension services provide free publications and advice on home landscaping issues including tips on plant selection and soil improvement. Some also offer a soil analysis service for a nominal fee. Your county extension service can be found in the Blue Pages section of your local phone book under the county government section or through your county's Web site if it has one. The U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service (www.reeusda.gov/statepartners/usa.htm) provides an online directory of land-grant universities which can help you locate your state extension service. Government Guide (www.governmentguide.com) is yet another online resource that might prove helpful in locating state or local agencies.

Organizations

The following is a partial list of organizations located across the United States that provide helpful information on water-efficient landscaping.

American Water Works Association (AWWA)
6666 West Quincy Avenue
Denver, CO 80235
Telephone: 303 794-7711
and
1401 New York Avenue, NW, Suite 640
Washington, DC 20005
Telephone: 202 628-8303
Web: <www.awwa.org>

Arizona Municipal Water Users Association (AMWUA)
Web: <www.amwua.org/program-xeriscape.htm>

BASIN
City of Boulder Environmental Affairs
P.O. Box 791
Boulder, CO 80306
Phone: 303 441-1964
E-mail: basin@bcn.boulder.co. us
Web: <bcn.boulder.co.us/basin/local/seven.html>

Denver Water
1600 West 12th Avenue
Denver, CO 80204
Phone: 303 628-6000
Fax: 303 628-6199
TDDY: 303 534-4116
Office of Water Conservation hotline:
303 628-6343
E-mail: jane.earle@denverwater.org
Web: <www.water.denver.co.gov/conservation/conservframe.html>

New Mexico Water Conservation Program/Water Conservation Clearinghouse
P. O. Box 25102
Santa Fe, NM 87504
Phone: 800 WATER-NM
E-mail: waternm@ose.state.nm.us
Fax: 505 827-3813
Web: <www.ose.state.nm.us/water-info/conservation/index.html>

Project WET - Water Education for Teachers
201 Culbertson Hall
Montana State University
Bozeman, MT 59717
Phone: 406 994-5392
Web: <www.montana.edu/wwwwet>

Rocky Mountain Institute
1739 Snowmass Creek Road
Snowmass, CO 81654-9199
Phone: 970 927-3851
Web: <www.rmi.org>

Southern Nevada Water Authority
1001 S. Valley View Boulevard, Mailstop #440
Las Vegas, NV 89153
Phone: 702 258-3930
Web: <www.snwa.com>

Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 34604-6899
Phone: 352 796-7211 or 800 423-1476 (Florida only)
Web: <www.swfwmd.state.fl.us/watercon/xeris/swfxeris.html>

Sustainable Sources Green Building Program: Sustainable Building Source Book
E-mail: info@greenbuilder.com
Web: <www.greenbuilder.com/sourcebook/xeriscape.html>

Water Conservation Garden – San Diego County
12122 Cuyamaca College Drive West
El Cajon, CA 92019
Phone: 619 660-0614
Fax: 619 660-1687
E-mail: info@thegarden.org
Web: <www.thegarden.org/garden/xeriscape/index.html> and <www.sdcwa.org/manage/conservation-xeriscape.phtml>\

WaterWiser: The Water Efficiency Clearing House
(Operated by AWWA in cooperation with the U.S. Bureau of Reclamation)
6666 West Quincy Avenue
Denver, CO 80235
Phone: 800 559-9855
Fax: 303 794-6303
E-mail: bewiser@waterwiser.org
Web: <www.waterwiser.org>

Xeriscape Colorado!, Inc.
P.O. Box 40202
Denver, CO 80204-0202
Web: <www.xeriscape.org>

Resources

The following is a partial list of publications on resource efficient landscaping. For even more information, particularly on plants suited to your locale, consult your local library, county extension service, nursery, garden clubs, or water utility.

Ball, Ken and American Water Works Association Water Conservation Committee. *Xeriscape Programs for Water Utilities*. Denver: American Water Works Association, 1990.

Bennett, Jennifer. *Dry-Land Gardening: A Xeriscaping Guide for Dry-Summer, Cold-Winter Climates*. Buffalo: Firefly, 1998.

Bennett, Richard E. and Michael S. Hazinski. *Water-Efficient Landscape Guidelines*. Denver: American Water Works Association, 1993.

Brenzel, Kathleen N., ed. *Western Garden Book*, 2001 Edition. Menlo Park: Sunset Publishing Corporation, 2001.

City of Aurora, Colorado Utilities Department. *Landscaping for Water Conservation: Xeriscape!* Aurora: Colorado Utilities Department, 1989.

Johnson, Eric and Scott Millard. *The Low-Water Flower Gardener: 270 Unthirsty Plants for Color, Including Perennials, Ground Covers, Grasses & Shrubs*. Tucson: Ironwood Press, 1993.

Knopf, James M. *The Xeriscape Flower Gardener*. Boulder: Johnson Books, 1991.

Knopf, James M., ed. *Waterwise Landscaping with Trees, Shrubs, and Vines: A Xeriscape Guide for the Rocky Mountain Region, California, and the Desert Southwest*. Boulder: Chamisa Books, 1999.

Knox, Kim, ed. *Landscaping for Water Conservation: Xeriscape*. Denver: City of Aurora and Denver Water, 1989.

Nellis, David W. *Seashore Plants of South Florida and the Caribbean: A Guide to Identification and Propagation of Xeriscape Plants*. Sarasota: Pineapple Press, Inc., 1994.

Perry, Bob. *Landscape Plants for Western Regions: An Illustrated Guide to Plants for Water Conservation*. Claremont: Land Design Publishing, 1992.

Phillips, Judith. *Natural by Design: Beauty and Balance in Southwest Gardens*. Santa Fe: Museum of New Mexico Press, 1995.

Phillips, Judith. *Plants for Natural Gardens: Southwestern Native & Adaptive Trees, Shrubs, Wildflowers & Grasses*. Santa Fe: Museum of New Mexico Press, 1995.

Robinette, Gary O. *Water Conservation in Landscape Design and Maintenance*. New York: Nostrand Reinhold, 1984.

Rumary, Mark. *The Dry Garden*. New York: Sterling Publishing Co., Inc., 1995.

Springer, Lauren. *The Undaunted Garden: Planting for Weather-Resilient Beauty*. Golden: Fulcrum Publishing, 1994.

Springer, Lauren. *Waterwise Gardening*. New York: Prentice Hall Gardening, 1994.

Stephens, Tom, Doug Welsh, and Connie Ellefson. *Xeriscape Gardening, Water Conservation for the American Landscape*. New York: Macmillan Publishing, 1992.

Sunset Books, eds. *Waterwise Gardening: Beautiful Gardens with Less Water*. Menlo Park: Lane Publishing Company, 1989.

Vickers, Amy. *Handbook of Water Use and Conservation*. Amherst, MA: WaterPlow Press, 2001.

Weinstein, Gayle. *Xeriscape Handbook : A How-To Guide to Natural, Resource-Wise Gardening*. Golden: Fulcrum Publishing, 1998.

Williams, Sara. *Creating the Prairie Xeriscape*. Saskatchewan: University Extension Press, 1997.

Winger, David, ed. *Xeriscape Plant Guide: 100 Water-Wise Plants for Gardens and Landscapes*. Golden: Fulcrum Publishing, 1998.

Winger, David, ed. *Xeriscape Color Guide*. Golden: Fulcrum Publishing, 1998.

Winger, David, ed. *Evidence of Care: The Xeriscape Maintenance Journal, 2002, Vol. 1*, Colorado WaterWise Council, 2001.

Acknowledgments

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For copies of this publication contact:
EPA Water Resources Center (RC-4100)
U.S. Environmental Protection Agency
Ariel Rios Building, 1200 Pennsylvania Avenue, NW.
Washington, DC 20460

For more information regarding water efficiency, please contact:
Water Efficiency Program (4204M)
U.S. Environmental Protection Agency
Ariel Rios Building, 1200 Pennsylvania Avenue, NW.
Washington, DC 20460
<www.epa.gov/OWM/water-efficiency/index.htm>

EPA
United States
Environmental Protection Agency (4204M)
Washington, DC 20460

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APPENDIX I - TRAINING & MEETING DOCUMENTATION

TRAINING

Prior to the start of construction, either the Owner or the Owner's representative shall meet with the Contractor to verbally discuss the contents of this SWPPP and to stress the importance of the Contractor conforming to its contents. At a minimum, the construction superintendent and all foremen shall have an awareness of storm water pollution prevention and shall be acquainted with the contents of this SWPPP and its implementation. All training shall be documented per Section A.12 of the GENERAL PERMIT and included in this appendix.

Below is listing of both formal and informal training.

Stephanie Love Callen – Water Quality Regulations Specialist

Instruction Title	Sponsor	Location	Date
Urban Stormwater Management in the Southwest	Co-op	Westin - Long Beach, CA	09/28/98
The New General Construction Stormwater Permit	APWA	Ontario, Ca Convention Center	09/21/99
NPDES Storm Water Permit Compliance	ASCE	Embassy Suites, Buena Park, CA	10/02/99
Stormwater Workshop	SD/REBRAC	San Diego Wastewater Dept.	03/03/00
Stormwater Management Requirements for Construction and Grading	County of San Diego - Public Works	County of San Diego	07/18/00
Storm Water Training Course Phase II	US EPA/Navy	San Diego Hotel	08/17/00
73rd Annual Conference & Expo	WEFTEC	Anaheim Convention Center	10/14/00
Water Quality & Stormwater Treatment	Stormwater Management, Inc.	TKC - Costa Mesa	10/20/00
2000 Annual Meeting	NAFSMA	San Diego - US Grant Hotel	10/23/00
Storm Water Regulations	BIA/AEI CASC	LATimes Conf Ctr	11/02/00
The Road Ahead	SCWMF	Industry Hills Sheraton	11/16/00
Effects of Urban Runoff on Water Quality	UCI - Irvine	UCI - University Club	11/17/00
Understanding Stormwater Management	ASCE	WWW	3/30/02
Stormwater Program Organization	ASCE	WWW	12/28/00
NPDES Phase II	ASCE	WWW	12/21/00
Stormwater Quality Devices	ASCE-HHTG	Elks- Santa Ana	02/01/01
Entry and Inspection for Environmental Compliance	University of California	Fullerton/GG	02/13/01
Using Available Resources to Achieve and Maintain Compliance	University of California	Fullerton/GG	03/14/01
Environmental Compliance Project	University of California	Fullerton/GG	04/03/01
Environmental Compliance Current Issues and Future Possibilities	University of California	Fullerton/GG	04/24/01
Storm Water Compliance	BIA, Cuneo, RWQCB	San Diego Chamber of Commerce	03/22/01
Phase II: How to select install, and inspect	IECA	San Diego, CA	05/30/01
Urban Storm Water Program	Urban Water Institute	Doubletree - Ontario, CA	06/14/01
Water Quality Elements in Development Today	APWA - San Diego Chapter	Four Points Hotel Sheraton	06/19/01

Urban Stormwater Runoff Water Quality	ASCE	Radisson Hotel San Diego	08/23/01
Environmental Perspectives	California State University	Fullerton	08/06/01
The Environmental Agency Framework	California State University	Fullerton	09/17/01
The Environmental Regulatory Framework	California State University	Fullerton	10/04/01
Achieving and Maintaining Environmental Compliance	California State University	Fullerton	11/05/01
Achieving and Maintaining Environmental Compliance Part 2	California State University	Fullerton	01/28/02
Understanding & Implementing the SQUIMP	Ventura County Flood	Ventura County - Hall of Administration	01/30/02
Municipal NPDES Stormwater Permit Renewal	ASCE	D & B Spectrum	03/21/02
Storm Water Regulations Compliance Workshop	BIA/SC	So Cal Gas Energy Resource Center	04/24/02
BMP Clearinghouse	OC Coastal Coalition	Newport Beach Library	04/25/02
Certificate in Environmental Compliance	California State University	Fullerton	6/02
Riverside County MS4 Permit	RWQCB Workshop	Loma Linda City Hall	9/06/02
Construction Storm Water Permit Compliance	RWQCB-8	Costa Mesa Neighborhood Ctr.	09/10/02
Storm Water Management Solutions	CWEA	Anaheim Sheraton	10/22/02
Construction Stormwater Compliance	BIA	Irvine Marriott	10/29/02
Stormwater Best Management Practice Handbooks	CASQA	Gas Co-Downey	4/21/03
Orange County Stormwater Program	ASCE	County of Orange	6/13/03
Orange County DAMP	OC PFRD	Garden Grove Community Ctr.	11/5/03
Erosion and Sediment Control Workshop	RWQCB – Region 8	RWQCB Riverside, CA	11/10/03
Construction Stormwater Compliance	BIA	Mission Viejo Country Club	03/25/04
Construction Stormwater Compliance	BIA	Riverside County Convention Center	03/22/06
New State Storm Water General Permit	SWRCB/RWQCB	City of Rancho Cucamonga	04/17/07
Construction Stormwater Compliance	BIA	Irvine Hilton	04/30/07
Wetlands, Water, the Green Valley	ACOE	Dos Lagos – Corona	06/14/07
Municipal NPDES Stormwater Permit Renewal	ASCE/HHTG	D & B Spectrum	06/07/07
Post Construction BMP's	ASCE	City of Irvine	06/22/07
Storm Water Training	Paradigm	Ontario Airport Doubletree	08/10/07
Low Impact Development	ASCE	Moreno Valley Conference Center	03/27/08
2007 CASQA Conference	ASCE	Costa Mesa Hilton	04/17/08
Low Impact Development	CASQA	MWD – Los Angeles	06/04/08

This section shall include all documentation of all training conducted for the project. The owner and/or the discharger shall be responsible for training their personnel and, if necessary, the contractors working on the site regarding:

- Preparation, revisions, and implementation of the SWPPP;
- BMP design, installation, and maintenance; and
- Inspecting, monitoring and reporting.

Contractors shall be responsible for training their personnel as well as their subcontractors on SWPPP implementation, BMP installation and maintenance, and inspection, monitoring and reporting.

Specific training documents regarding the project pertaining to training for all persons responsible for preparation, implementation, amendments, revisions, and installation and repairs of BMPs for this SWPPP shall be documented.

Training documentation shall include both formal and informal training. Where appropriate, the training documents shall state the date of the meeting, the names of the participants, and the materials discussed.

1-18-2010 Bid Set (Not for Construction)

Certificate of Achievement

In recognition of completion of Construction Storm Water Compliance Training Seminar on April 30, 2007 in Irvine, California

This certificate is presented to

Stephanie Love Callen
MDS Consulting

Building Industry Association of Southern California

Signature

April 30, 2007

Date

CALIFORNIA STATE UNIVERSITY, FULLERTON

UNIVERSITY EXTENDED EDUCATION

presents this

Certificate in

Environmental Compliance

to

Stephanie Love

to commemorate the successful completion of 90 hours of instruction
and the corresponding award of 9.0 Continuing Education Units (CEUs).

June 2002

Robert Voeks, Coordinator
Environmental Studies Program

Harry L. Norman, Dean
University Extended Education

paradigm
ENGINEERING

Certificate of Attendance

Storm Water Management Training

Stephanie Love Callen

name

has attended a three-hour training course outlining the 7 steps to compliance including Storm Water Pollution Prevention Plan, Permits, Best Management Practices, and Record Keeping.

August 10, 2007

date of training

Johnny D. Combs, P.E., REM, CPSWQ
Paradigm Engineering

PDU credits: 3.0

International Erosion Control Association