Preparing and Implementing Storm Water Pollution Prevention Plans (SWPPPs) for Construction

What is a SWPPP?

The SWPPP is a ***site-specific*** plan that is designed to control the discharge of pollutants from the construction site to local storm drains and waterways.

Why Develop a SWPPP for your Construction Project?

The Federal Government Says So
EPA Implements the Clean Water Act

The State of California is Required to Enforce the Clean Water Act
and offers developers the option of complying with the provisions of the Clean Water Act by gaining coverage under the umbrella of the State General Construction Permit.

The State General Construction Permit requires each construction project that disturbs more than one acre to develop and implement a Storm water Pollution Prevention Plan to achieve compliance with the Clean Water Act

Fresno Metropolitan Flood Control District, City of Fresno & City of Clovis
are the State-Designated Regional Agencies for enforcing the Construction General Permit, including SWPPP requirements.

Developers Adore the Construction General Permit SWPPP Requirements
because it saves them from having to work directly with the Environmental Protection Agency and the State Water Quality Control Board.

Storm Water Pollution Prevention Plan (SWPPP)

The Four Major Objectives of a SWPPP:

- Identify pollutant sources on the site that may affect water quality.
- Identify non-storm water discharges on the site.
- Identify, implement and maintain best management practices (BMPs) to reduce pollutants and non-storm water discharges in construction site runoff.
- Identify, construct and maintain post-construction BMPs.

12 Steps to an Effective SWPPP

1. Collect and prepare project information
2. Prepare your construction activity schedule
3. Identify pollutant sources
4. Select and identify locations for BMPs to control those sources
5. Prepare your inspection and maintenance plan (including sampling)
6. Prepare your training plan

12 Steps to an Effective SWPPP *(cont'd)*

7. Compile list of contractors and subcontractors
8. Prepare post-construction storm water management plan
9. Approve and certify the SWPPP
10. Submit Notice of Intent (NOI) to State Board
11. Implement your SWPPP: inspect, maintain, train, document, and amend SWPPP as needed
12. Stabilize the site and submit Notice of Termination

Step 1 – Collect and Prepare Project Information

What information do you need?

- ✓ Site maps: existing & build-out conditions, topography
- ✓ Grading plans
- ✓ USGS topographic map
- ✓ Size of entire site and size of area to be disturbed
- ✓ Size and type of off-site area(s) draining onto your site
- ✓ Engineer's drainage calculations
- ✓ Soils report(s)
- ✓ Location(s) of site discharges e.g., municipal storm drain

Vicinity Map

Create your own, or mark-up a Master Plan topographic map provided by the District or a U.S.G.S. topographic map.

The map must extend at least one-quarter mile beyond the property boundaries of the construction site and include:

- ✓ Project location with respect to major roadways, geographic features, or landmarks;
- ✓ General topography; and
- ✓ North arrow, scale, and legend.

Also show:

- ✓ Off-site drainage areas (outside of the project boundary that drain onto the project site)

Site Plan

Examples of features to show on plan:

- ✓ major topography
- ✓ drainage flow lines
- ✓ site perimeter
- ✓ vegetation to be protected
- ✓ roadways and buildings
- ✓ construction site entrances
- ✓ materials storage and handling areas
- ✓ parking areas
- ✓ places where site discharges to storm drain or waterway

EXAMPLE COLOR CODED SWPPP SITE MAP

Step 2 – Prepare Construction Activity Schedule

- Identify phases (e.g., rough grade; utilities; concrete in place; paved streets; building)
- Describe all major activities for each phase
- Retain a copy of the schedule with the SWPPP
- Update the schedule frequently
- Fresno-Clovis area wet season: October 16 – April 15
- Schedule delays may move work into wet season
- Prepare for contingencies assuming work will occur during wet season
- Be prepared: storm water pollution prevention costs typically increase when work is conducted during the wet season!

Example - Construction Activity Schedule

Worksheet 3.1 - CONSTRUCTION ACTIVITY MILESTONES		
Milestone	**Start Date**	**End Date**
Prepare SWPPP (must be completed for SWRCB to approve coverage under General Storm Water Permit)	__/__/__	__/__/__
Date Notice of Intent (NOI), vicinity map and filing fee submitted to State Water Board	__/__/__	
Wet season dates	10/16/__	04/15/__
Dry season dates	04/16/__	10/15/__
Construction activity ANotice to Proceed@	__/__/__	
Initial ground-breaking (must occur after completion of SWPPP and submittal of NOI)	__/__/__	
Grading/excavation activities	__/__/__	__/__/__
Paving activities	__/__/__	__/__/__
Implement erosion control measures (see Item A.6.a.(4), SWPPP Erosion Control, of the General Construction Permit)	__/__/__	__/__/__
Implement sediment control measures (see Item A.8, SWPPP Sediment Control, of the General Construction Permit)	__/__/__	__/__/__
Site clean-up	__/__/__	__/__/__
Anticipated construction completion date	__/__/__	__/__/__
Anticipated filing of Notice of Termination (NOT) to Regional Board.	__/__/__	__/__/__

Step 3 – Identify Pollutant Sources

Using your preliminary site plan, determine activities that can generate pollutants and/or non- storm water discharges:

- Known areas on the site with existing contamination
- Solid and hazardous waste management areas
- Materials delivery and storage areas
- Vehicle and equipment parking, fueling and maintenance areas
- Paving and concrete operations (including concrete wash-out areas)
- Painting, roofing and landscaping activities
- Non storm water discharges (e.g., street washing)
- What are examples of other non-storm water discharges?

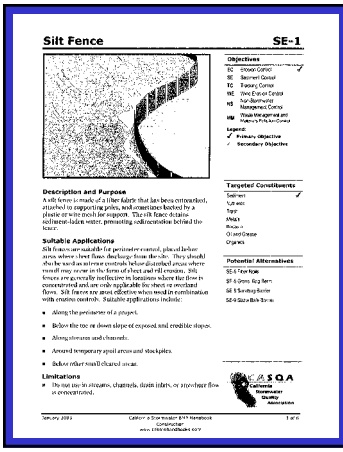
Common Construction Site Pollutants

- **Soil, Dirt and Sediment**
- **Paints and Solvents**
- **Pesticides and Herbicides**
- **Fertilizers**
- **Detergents**
- **Plaster or related products**
- **Concrete compounds**
- **Asphalt compounds**
- **Petroleum products** *fuel, oil, and grease*
- **Hazardous chemicals** *acids, lime, glues, adhesives, and curing compounds*

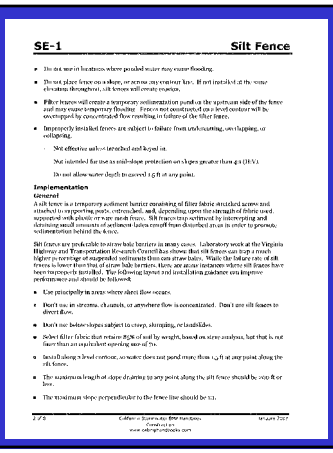
NOTE! **Sediment can be a carrier for most other construction site pollutants, and is itself classified and regulated as a pollutant.**

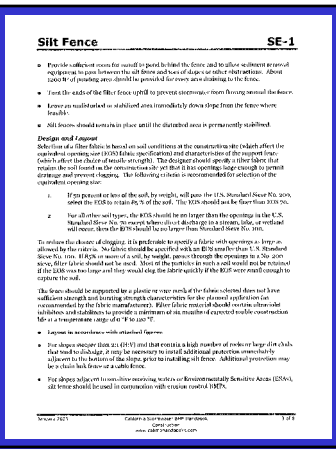
Step 4 – Select BMPs for the following categories:

- Waste Management
- Materials delivery and storage
- Vehicle/equipment management
- Paving operations
- Painting and roofing
- Landscaping activities
- Erosion controls for filling, grading and clearing
- Sediment controls for filling, grading and clearing
- Non storm water discharges


Silt Fence SE-1

BMPs are fully described in the CASQA BMP Handbook


SE-1 Silt Fence


Silt Fence SE-1

SE-1 Silt Fence

Materials

- Silt fence fabric should be woven polypropylene with a minimum width of 36 in., and a minimum tensile strength of 100 lb/linear. The fabric should conform to the requirements in AASHTO designations M288 and should have an integral reinforcement layer. The reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permeability of the fabric should be between 1 and 20 gal/ft²/min in conformance with the requirements in ASTM designation D4491.
- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.
- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.
- There are now products that may use prefabricated plastic holders for the silt fence and use bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end protection for any exposed bar reinforcement.

Installation Guidelines

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of proposed silt fence.
- Bottom of the silt fence should be keyed-in a minimum of 12 in.
- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- When standard-strength filter fabric is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy-duty wire staples at least 1 in. long. The mesh should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the mesh support fence may be eliminated. Filter fabric should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with compacted native material.
- Construct silt fences with a setback of at least 5 ft from the toe of a slope. Where a silt fence is determined to be not practicable due to specific site conditions, the silt fence may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences done in the toe of the slope will be less effective and difficult to maintain.

Silt Fence SE-1

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier, in no case should the reach exceed 500 ft.

Costs

- Average annual cost for installation and maintenance (assumes 6 month useful life): $0.50 per linear foot ($850 per drainage acre). Range of cost is $3.50 - $0.10 per linear foot.

Inspection and Maintenance

- Inspect BMPs prior to forecasted rain, daily during extended rain events, after rain events weekly during the rainy season, and at two week intervals during the non-rainy season.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 6 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed of, and replaced with new silt fence barriers.
- 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 approp riate location.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence must be inspected and maintained.
- Holes, depressions, or other ground disturbance caused by the removal of the silt fences should be backfilled and repaired.

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, United States Environmental Protection Agency, 2005.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

Sediment-station and Erosion Control Practices, and Inventory of Current Practices (Draft), CASPA, 1990.

Southeastern Wisconsin Regional Planning Commission (SWRPC). Costs of Urban Nonpoint Source Water Pollution Control Measures. Technical Report No. 31. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI. 1991

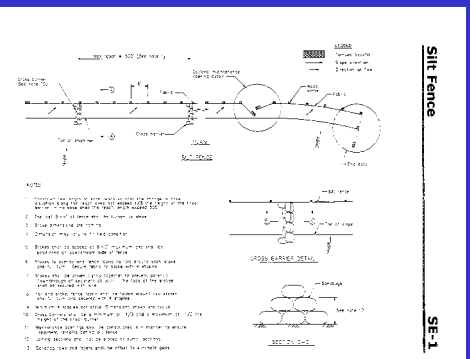
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

SE-1 Silt Fence

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



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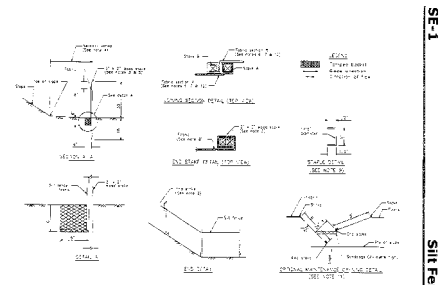
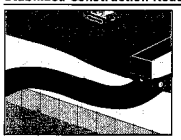


SE-1 Silt Fence

Stabilized Construction Roadway TC-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

Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion and control dust.

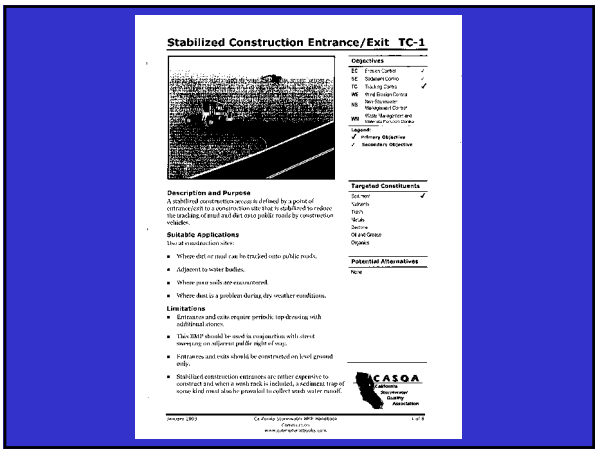
Suitable Applications

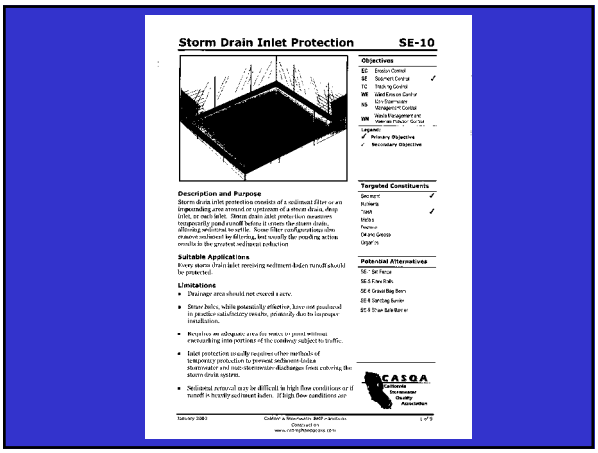
This BMP should be applied for the following conditions:

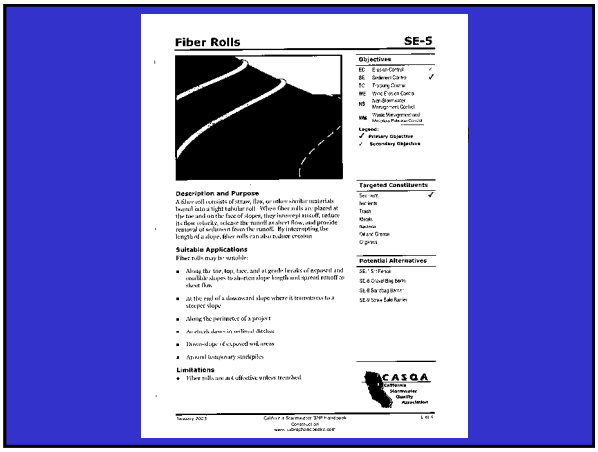
- Temporary Construction Traffic
  - Phased construction projects and off-site road access
  - Construction during wet weather
- Construction roadways and detour roads
  - Where road tracking is a problem during wet weather
  - Where dust is a problem during dry weather
  - Adjacent to water bodies.
  - Where poor soils are encountered

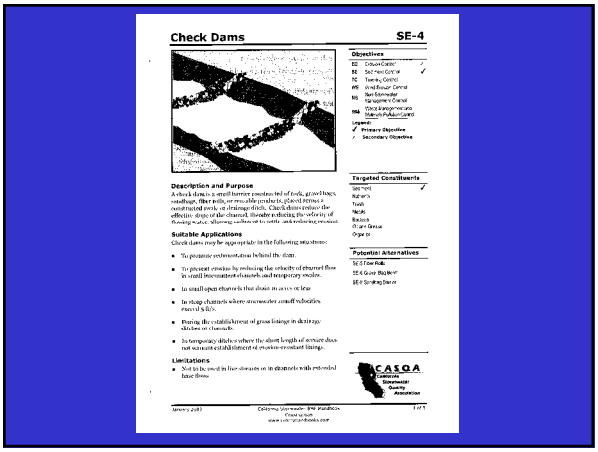
Limitations

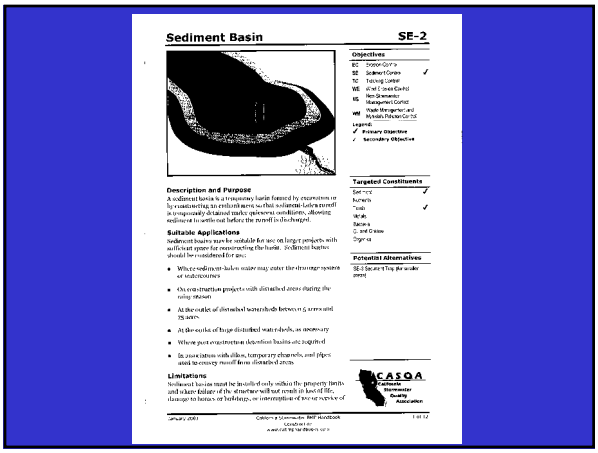
- The roadway must be armored or paved when construction is complete.











Coordinate BMPs with Construction Activities

Principles to follow when scheduling construction:

- Time activities to limit impacts from seasonal changes (wet season: 10/16 – 4/15)
- Install perimeter controls first
- Stabilize site access points
- Protect storm drain inlets and other points where the site discharges to drainage channels or surface waters
- Designate areas for concrete washout, materials delivery/storage, vehicles/equipment and SWPPP availability
- Schedule time(s) for educating employees
- Cover or stabilize exposed soil as soon as practically possible

Step 5 – Prepare Inspection & Maintenance Plan

Your inspection plan should address the following issues:

- ✓ Are there areas contributing pollutants to storm water?
- ✓ Are the BMPs shown on the plans in place?
- ✓ Are the BMPs in good condition and doing the job? If not, what cleaning, repairs or replacements are needed?
- ✓ Are there additional BMPs or actions we can take to protect storm water quality?
- ✓ Is sampling required, due to an observed problem with potential non-visible pollutants?

Plan to Inspect Before, During and After Rain Events

Create or obtain a checklist that works for your project.

Keep all records in the SWPPP.

Step 6 – Prepare a Training Plan

Training in SWPPP Implementation is State-Mandated

Who needs to be trained about the SWPPP?

Superintendents, foremen, supervisors and subcontractors.

What should the SWPPP training cover?

How to use the SWPPP and site plans, how to inspect and maintain BMPs, how to do recordkeeping (including amending the SWPPP), how to work with State and local inspectors, when to notify regulators.

KEEP EVIDENCE OF TRAINING IN YOUR SWPPP!

Step 7 – Compile List of Contractors and Subcontractors

- Include list of contractors and subcontractors whose work may create potential for storm water pollution (virtually everyone)
- Provide name and phone number of responsible official with each firm, responsible for SWPPP compliance and training their employees
- Give a copy of the SWPPP to each contractor and subcontractor (also recommend training as appropriate)
- Add information to this section of the SWPPP as contractors and subcontractors are selected

Remember, the project owner is responsible for compliance with the General Permit, even if the problem was created by a subcontractor !

Step 8 – Identify Post Construction BMPs

Post Construction BMPs may be required to reduce and control runoff from completed projects. Your SWPPP should identify these features and plan for their long-term maintenance (for the life of the project).

For example:

- Grassy swales and filter strips
- Detention basins/ponds
- Constructed wetlands
- In-ground vaults with filters/separators
- Energy dissipators and stabilized outfalls in drainage channels.

Let's Visit the CASQA Online SWPPP Template!

J:\Environmental\NPDES Permit (SWQMP)\Model SWPPP, State Permits and Plans\CASQA model SWPPP\SWPPP.doc

Step 9 – Certify the SWPPP

Who can certify?

Corporation – corporate officer or duly authorized representative

Partnership/Sole Proprietor – general partner or proprietor

Public Agency – principal executive officer, elected official, or duly authorized representative

Note: project manager, engineer or contractor should not certify unless authorized in writing!

What needs to be certified?

Notice of Intent

SWPPP

Annual Re-Certifications

Change of Information Form

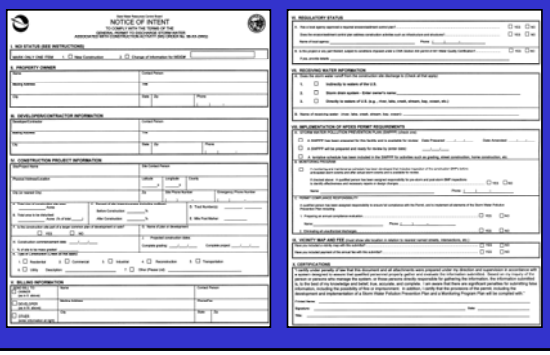
Notice of Termination

Step 10 – Submit the Notice of Intent (NOI)

- The Notice of Intent (NOI) is required as the first step in obtaining coverage under the State's General Permit
- Complete, certify and submit the NOI to the State Water Resources Control Board prior to beginning construction activities
- Attach a site plan
- The State Board will issue a unique Waste Discharge Identification (WDID) Number to the project

Note: Although the State Board issues the permits, the Regional Boards enforce the permits

Notice of Intent (NOI)



Step 11 – Build Stuff & Implement the SWPPP

- Train – ongoing training is key to compliance
- Inspect – inspect as frequently as needed, but at least before and after storm events
- Maintain – repair or replace defective BMPs as soon as possible
- Keep records – keep all documentation w/SWPPP
- Amend SWPPP as needed – sign and date each amendment, and adjust site plan(s) as needed
- Annually Re-certify SWPPP.

Construction & Demolition Waste Diversion

Required of Construction within City of Fresno, City of Clovis and Unincorporated Area

- Mandated by State (AB939 / SB1066)
- Material banned, by County Ordinance from American Avenue and Coalinga Landfills

Materials to be Recycled

- **WOOD** (dimensional and vegetative)
- **METALS** (ferrous & non-ferrous)
- **PAPER and CARDBOARD** (all grades)
- **PLASTIC** (tubing and sheet plastics)
- **ROOFING SHINGLES** (tiles, composites)
- **AGGREGATES** (concrete, brick, asphalt)
- **OTHER CONSTRUCTION MATERIALS**
- **TRADITIONAL RECYCLABLES**

City of Fresno has its own Construction & Demolition Waste Ordinance

Methods of C&D Collection

- Source Separated on Site
  - Separate bin for each major category of materials
- Co-Mingled in one Container
  - One bin for collection of all C&D wastes
- Sub-Contractor contracted service
  - Plumbing bin, Masonry bin, Framer bin, etc.
- Combo of Separation & Co-Mingled
  - Trash bin, Wood & Paper bin, Metals &Plastics bin

Determined by Private Contract, not by City.

Step 12- Stabilize Site and Submit Notice of Termination

There are two types of General Permit termination:

Change in Ownership

Partial termination allowed

Project complete
(no incomplete parcels/lots)

Project partially complete
(Remaining incomplete parcels/lots sold)

Completed project

Construction activity completed

Denuded areas stabilized

Wastes and materials removed

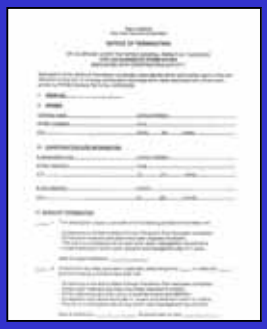
Front yards landscaped or new owners responsible

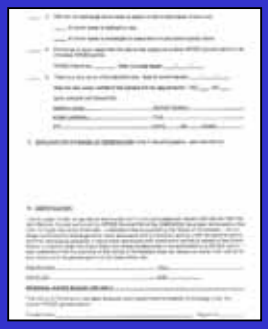
Notice of Termination

A construction project is considered complete, and a Notice of Termination (NOT) should be filed when the following conditions have been met:

- Uniform 70% vegetation coverage, or equivalent stabilization meaures (e.g., blankets, liners, fiber matrices)
- All portions of the site have been transferred to a new owner and the permittee no longer operates the site
- There is NO potential for construction-related storm water pollution
- All elements of the SWPPP have been fully executed
- Construction materials and waste have been properly disposed of
- A post construction storm water management plan is in place as described in the SWPPP for the site

Notice of Termination Form





Submittal of a Notice of Termination that contains falsified information is a violation subject to civil liability (fines) under California's Water Code and the Federal Clean Water Act.

Change of Information (COI) Form

This form must be submitted when ownership and responsibility for storm water discharges shifts to a different person or company, such as when finished lots are sold to an individual homeowner or to a builder.

What to Do?

Complete all filing & fee requirements.

Develop SWPPP specific to your site's most likely problems.

Focus on your site's liabilities.

Correct the existing problem and stay on top of it.

Be Nice to Your Neighbors

Re-Certify Annually

When to Report Problems

Construction activities that cause or contribute to an exceedance of water quality standards must be corrected immediately.

If water at your discharge point is visibly oily or greasy, turbid, or has a strong odor, it may have exceeded water quality standards. Follow these steps:

- Find/fix the problem ASAP to stop the discharge
- Telephone the Regional Board within 48 hours
- Follow up with a written report to the Regional Board within 14-calendar days of the violation

Failure to follow these steps will likely result in a violation, with a fine not to exceed $27,500 per calendar day of such violation (Clean Water Act Section 309).

WARNING!

There are other important General Permit requirements beyond the SWPPP:

READ THE PERMIT!

WARNING!

Compliance with the Construction General Permit is about to become more complex and expensive.

For More Information Contact:
Daniel Rourke,
Patrick Bryan,
Andrew Remus
456-3292

Fresno Metropolitan Flood Control District