

**FRESNO-CLOVIS STORM WATER QUALITY MANAGEMENT PROGRAM
POST-CONSTRUCTION
STORM WATER QUALITY MANAGEMENT GUIDELINES**

Prepared for

Fresno Metropolitan Flood Control District

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1.1 PURPOSE AND BACKGROUND

These guidelines have been prepared by the Fresno Metropolitan Flood Control District for the Fresno-Clovis Storm Water Quality Management Program (Program) to provide the local development industry with specific guidance regarding minimum best management practices (BMPs) to incorporate into new developments and significant redevelopments for the control of pollutants in post-construction storm water runoff. While such BMPs are intended to control pollution in storm water runoff from completed, stabilized sites, they are most effective when selected and designed during the pre-construction project planning and design phase. Control of pollutants in post-construction storm water runoff is essential to achieve the Program's primary goals of protecting the beneficial uses of surface waters, protecting regional groundwater quality, and protecting the long term use of the regional storm drainage system for flood control, groundwater recharge, and recreation.

The Program prepared these guidelines in response to requirements contained in the 1987 revisions to the Clean Water Act which specify that municipalities shall develop programs that "implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment." Additionally, these guidelines are intended to assist project owners, developers, and contractors in the preparation of Storm Water Pollution Prevention Plans (SWPPPs), which are required for obtaining coverage under the State of California's General Permit for Storm Water Discharges associated with Construction Activity (General Permit).

While the guidelines may assist owners and developers in complying with particular aspects of the storm water regulations, mere implementation of the recommended measures will not in itself ensure compliance with federal, state, and local laws, regulations, and ordinances. The burden of comprehensive compliance rests solely with the owner and developer of each project and or site.

1.2 GUIDELINES OBJECTIVES

These guidelines are intended for the control of post-construction storm water pollution only. A separate set of guidelines is available for the control of pollutants in runoff during construction. Both guidelines should be reviewed before construction begins, preferably during the project planning and design phase, to ensure appropriate control selection and timely implementation. These guidelines have the following general objectives:

- Encourage site designs that minimize increases in runoff volume - Increases in impervious area that typically accompany new development reduce storm water infiltration, resulting in increases in runoff volume leaving a site. Because pollutant load is proportional to runoff volume, development-related increases in runoff volume transport greater pollutant loads off-site. This effect is magnified by the tendency of impervious surfaces to collect and store pollutants (e.g., from spills, leaks, atmospheric deposition, etc.) between storm events. Innovative site design and layout can minimize increases in runoff volume and pollutant load by minimizing new impervious areas and directing runoff to permeable, landscaped areas.
- Emphasize pollution prevention in site design - One of the objectives of the Fresno-Clovis Storm Water Quality Management Plan is "to develop a cost-effective program which focuses on preventing the pollution of urban storm water." In keeping with this objective, these guidelines emphasize preventive "source control" measures such as covering storage areas to keep out rainfall and providing secondary containment to capture potential spills or leaks.
- Ensure provision of appropriate storm water quality treatment facilities - Many common pollutants in storm water runoff can be removed by simple treatment facilities (e.g., retention/detention basins, vegetated swales). The need for treatment facilities typically depends on the size of a proposed development, the nature of the expected activities and associated pollutants at the completed site, and the availability of regional treatment facilities to accept runoff from the completed site.
- Prevent non-storm water discharges from new development - Non-storm water discharges are prohibited by the Clean Water Act because of their potential to impact the beneficial

uses of surface water bodies. In the Fresno-Clovis area, non-storm water discharges also have the potential to impact the regional drinking water aquifer. Non-storm water discharges typically result from the discharge of spilled materials or process waters to illegal interior drains or as a consequence of willful or uninformed dumping of materials or liquids into storm drains or surface water bodies or courses. Some non-storm water discharges that are not in contact with industrial activities (e.g., air conditioning condensate, fire control water line testing, landscaping overflow, etc.) are not prohibited and are conditionally allowed into the District's storm drainage system. Refer to the Fresno Metropolitan Flood Control District's (the District) policy on prohibited and conditionally allowable non-storm water discharges for additional information.

MINIMUM PRACTICES FOR CONTROL OF POLLUTANTS IN POST-CONSTRUCTION SITE RUNOFF

The BMPs contained in the tables on the following pages are organized by land use into the following categories:

- All New Development
- Single Family Residential
- Multi-family Residential
- Commercial/Industrial

All new developments should comply with the BMPs contained in the first table; additional BMPs should be implemented based on the land use category of the project. Public agency projects should use the commercial/industrial BMPs that most closely match the nature of the project.

In general, each BMP may be categorized as either source control or treatment control. Source control BMPs are those which prevent storm water pollution at the source, before it occurs, while treatment control BMPs remove pollutants from storm water runoff. These guidelines emphasize source controls. Treatment controls are recommended only for specific commercial and industrial situations. Maintenance, inspection and repair procedures should be identified for the selected source and treatment control BMPs to ensure they are maintained in a good and effective condition, and are promptly repaired or restored as necessary.

Refer to the California Storm Water Best Management Practice Handbooks for additional information about the applicability, design, operation, and maintenance of BMPs.

2.1 SOURCE CONTROL BMPS

The source control BMPs contained on the following tables involve:

- compliance with other regulatory requirements which affect storm water pollution potential;
- site layout planning;
- landscaping;
- covering and containing activities which may potentially pollute storm water;
- preventing non-storm water discharges; and
- education concerning storm water pollution.

The applicability of many of the source control BMPs to projects depends on the expected post-construction site activities. Refer to the State BMP Handbooks for further information regarding the applicability of source control BMPs.

2.2 TREATMENT CONTROL BMPS

Typical treatment control BMPs include vegetated swales and filter strips and storm water retention/detention basins. These BMPs reduce the velocity of storm water runoff, thereby encouraging sediment and particulate pollutants to settle out. Additional pollutant removal mechanisms may include vegetative uptake and filtration, depending on the BMP selected. The attached BMP tables identify when treatment BMPs are recommended for a new development. Refer to the State BMP Handbooks (March 1993) for information regarding the design, operation, and maintenance of treatment BMPs.

REFERENCES

California Regional Water Quality Control Board: San Francisco Bay Region. December, 1993. "Staff Recommendations for New and Re-Development Controls for Storm Water Programs." Draft document.

California Storm Water Quality Task Force. March 1993. "California Storm Water Best Management Practice Handbooks: Construction Activity."

California Storm Water Quality Task Force. March 1993. "California Storm Water Best Management Practice Handbooks: Industrial/Commercial."

California Storm Water Quality Task Force. March 1993. "California Storm Water Best Management Practice Handbooks: Municipal."

City of Santa Monica (State of California). Chapter 7.10 of City Code: Urban Runoff Pollution.

Orange County (State of California) NPDES Storm Water Permit Program. April, 1993. "Drainage Area Management Plan."

State of Washington Department of Ecology. February 1992. "Stormwater Management Manual for the Puget Sound Basin (The Technical Manual)."

DEVELOPMENT TYPE: ALL NEW DEVELOPMENT

- ND-1 Obtain NPDES Construction Permit if project disturbs more than 5 acres.
- ND-2 Distribute educational/informational materials to purchasers concerning storm water pollution prevention and water quality treatment facilities.
- ND-3 Wherever possible, maximize use of pervious areas and disconnect impervious areas from municipal storm drain system (e.g., route roof runoff to landscaped areas instead of to driveway, drain driveways and sidewalks to landscaped areas).
- ND-4 Encourage use of drought-tolerant landscaping to minimize irrigation runoff and application of fertilizers and herbicides.
- ND-5 Stencil storm drain inlets to discourage illegal dumping.
- ND-6 Do not connect interior drains or inlets to storm drain system; do not connect sinks to storm drain system.
- ND-7 For urban density developments, provide regional storm water quality treatment through District Master Planned facilities. In areas outside the District: 1) encourage annexation to the District where practical; or 2) where annexation to the District is not practical, require regional treatment through facilities operated and maintained by a County approved entity.
- ND-8 Provide energy dissipation, stabilized outfalls, high-flow bypasses, streambank stabilization, and other structural control measures as necessary to prevent channel erosion.
- ND-9 Provide documentation of all geotechnical, hydrologic, and hydraulic analyses, calculations, and assumptions used in design of runoff control facilities.

DEVELOPMENT TYPE: SINGLE FAMILY RESIDENTIAL

SF-1 Where feasible, do not pipe roof or backyard runoff directly to the street. Maximize drainage of site runoff through landscaped areas. Also, minimize roof drainage to pavement (driveway/street).

Experimental BMP(s):

SF-2 Construct driveways/sidewalks from pervious materials (e.g., pervious concrete, lattice or grid pavement) or drain driveway/sidewalk runoff to landscaped areas.

DEVELOPMENT TYPE: MULTI-FAMILY RESIDENTIAL

MF-1 Minimize roof drainage to pavement (driveway/street).

MF-2 Post signs to prohibit car washing or construct common car wash facility(ies). Post a sign explaining proper use of the car wash facility and forbidding oil changing in the wash area and discharge of materials other than vehicle wash waters. Wash waters may not be discharged to the storm drain system. Either:

a) Construct Covered Vehicle Wash Facility

Completely pave and enclose vehicle/equipment wash areas, capture and recycle wash water or discharge to sanitary sewer (approval required by POTW); or

b) Construct Vehicle Wash Pad

1. Pave vehicle/equipment wash area, preferably with portland cement concrete and berm the perimeter to prevent the run-on of storm water and the runoff of wash waters. Size the wash area to extend four feet on all sides of the vehicles/equipment being washed.
2. Collect wash waters in trench drains or a catch basin; connect the drain(s) either to the sanitary sewer (approval required by POTW, may require installation/maintenance of an oil/water separator) or to a dead-end sump for collection and proper disposal.
3. Install a positive control valve that can be shut when washing is not occurring to prevent the entry of storm water into the drain system.
4. Inspect and clean slump regularly.

MF-3 Use covered bins or cover waste storage/recycling areas.

MF-4 Provide litter and debris control, and vacuum sweep all parking lots with 100 or more spaces monthly.

MF-5 Post signs to prohibit vehicle maintenance, or construct covered designated vehicle maintenance areas with fluid recycling receptacles, spill cleanup materials, and signs describing appropriate disposal of automotive liquids and appropriate spill cleanup and disposal procedures.

DEVELOPMENT TYPE: COMMERCIAL/INDUSTRIAL

IND-1 Comply with all pertinent federal, state and local regulations.

- a) Comply with all federal, state, and local regulations for design of materials storage and handling areas (e.g., requirements for Spill Prevention Control and Countermeasure Plans, Uniform Building and Fire Codes, etc.).
- b) Comply with all federal, state, and local regulations for solid and hazardous waste disposal.
- c) Comply with all state and local regulations for discharge of process and pre-treated wastewaters to the sanitary sewer.
- d) Obtain NPDES Industrial Permit prior to facility completion/commencement of operations (if project is a regulated facility).

IND-2 Prevent storm water pollution in runoff from materials storage and handling areas.

- a) For hazardous materials and wastes, herbicides, pesticides, volatile and semi-volatile organic compounds, acids and caustics, and soluble metals, cover all storage/handling areas to prevent contact of such materials with storm water. Berm or grade to prevent storm water run-on. Drainage connections from such areas to the storm drain system are prohibited. Provide secondary containment to capture spills or leaks. Properly remove and dispose of all spilled or leaked materials.
- b) For other potential pollutants either cover storage/handling areas to prevent contact of materials with storm water, or, treat runoff from such areas in vegetated swales prior to discharge to municipal storm drain system. Direct connections to storm drain system are prohibited.
- c) Provide litter/debris control and vacuum sweep uncovered paved material storage and handling areas monthly.

IND-3 Prevent pollution of storm water runoff from loading/unloading areas.

- a) Where hazardous materials and wastes, herbicides, pesticides, volatile and semi-volatile organic compounds, acids and caustics, and soluble metals, are loaded/unloaded:
 - cover loading dock or area to prevent contact of storm water with any spilled materials.
 - berm or grade loading/unloading area to prevent storm water run-on and spilled material runoff.
 - if liquid materials are loaded or unloaded, drain loading area to dead end sump for spill control (inspect and clean sump regularly; properly dispose of removed materials).

DEVELOPMENT TYPE: COMMERCIAL/INDUSTRIAL

b) Where other materials are loaded/unloaded either:

- design loading/unloading area as in IND-3 a) above (i.e., cover loading dock/area, berm or grade to prevent storm water run-on, and drain to dead end sump if liquids loaded/unloaded); or
- berm or grade loading/unloading area to prevent storm water run-on, drain runoff through a vegetated swale prior to discharge to the municipal storm drain system. Direct connections to the storm drain system are prohibited. If liquids are loaded/unloaded, provide a shutoff valve for spill control above the discharge to the swale.

c) Provide litter/debris control and vacuum sweep uncovered paved loading/unloading areas monthly.

IND-4 Prevent pollution of storm water runoff from vehicle fueling areas.

- a) Cover the fuel island to prevent contact of rainwater with any spilled materials; a roof canopy should prevent entry of wind-blown rain.
- b) Pave the fuel island with portland cement concrete (automotive fluids may dissolve asphaltic concrete, or may be absorbed into the blacktop and released later) and berm or grade to prevent the runoff of spilled fuel and automotive fluids and the run-on of storm water.
- c) Collect liquids spilled on the fuel island in perimeter drains or a catch basin and discharge to a dead-end sump. Inspect and clean sump regularly; properly dispose of removed materials.
- d) Post fueling area with "No Topping Off" signs and install automatic shutoff on dispenser nozzles.

IND-5 Prevent pollution of storm water runoff from vehicle/equipment washing activities.

- a) Preferred approaches are to take vehicles/equipment to a commercial washing facility or to construct a completely enclosed vehicle/equipment wash facility and capture and recycle wash water or discharge to sanitary sewer (approval required by POTW); or
- b) If enclosing is infeasible: 1. Pave designated vehicle/equipment wash area (preferably with portland cement concrete) and berm the perimeter to prevent the run-on of stormwater and the runoff of wash waters. Size the wash area to extend four feet on all sides of the vehicles/equipment being washed. 2. Collect wash waters in trench drains or a catch basin; connect the drain(s) either to the sanitary sewer (approval required by POTW, may require installation/maintenance of an oil/water separator) or to a dead-end sump for collection and proper disposal. 3. Install a positive control valve that can be shut when washing is not occurring to prevent the entry of storm water into the drain system. 4. Inspect and clean sump regularly. 5. Wash waters may not be discharged to the storm drain.

And: post a sign forbidding oil changing in the wash area and discharge of materials other than vehicle/equipment wash waters.

DEVELOPMENT TYPE: COMMERCIAL/INDUSTRIAL

IND-6 Prevent pollution of storm water runoff from other source areas/activities.

- a) Use covered waste bins or cover solid waste storage areas and berm or grade to prevent run-on of storm water.
- b) Provide litter/debris control and vacuum sweep parking lots monthly.
- c) If outdoor vehicle/equipment maintenance activities cannot be avoided, construct designated, covered, paved, and bermed maintenance areas (away from storm drain inlets) to prevent contact of spilled or leaked materials with rainwater or storm water run-on. Provide fluid recycling receptacles, spill cleanup materials, and signs describing appropriate disposal of wastes and appropriate spill cleanup and disposal procedures.
- d) Implement practices and install facilities as necessary to prevent contamination of storm water related to outdoor manufacturing activities; potential practices depend on the specific activity (in general, the best alternative is to enclose an activity within a roofed structure).

IND-7 Capture and treat site runoff.

- a) Route roof runoff through vegetated swales prior to discharge to the storm drainage system.
- b) If regional storm water quality treatment is unavailable, then capture and route all site runoff through a storm water quality control facility demonstrated capable of achieving necessary levels of treatment.