

JUNE 30, 2020

Riverside County Flood Control
and Water Conservation District
Local Implementation Plan

Santa Ana Region

ORDER NO. R8-2010-0033

Riverside County Flood Control and Water Conservation District LIP

CERTIFICATION



I certify under penalty of law that this Local Implementation Plan 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.

Signed: _____

RICHARD J. BOON
Chief of Watershed Protection Division
Riverside County Flood Control
and Water Conservation District

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1.0 EXECUTIVE SUMMARY

This Local Implementation Plan (LIP) describes the specific Urban Runoff management programs and activities that are implemented to comply with the requirements of the Municipal Separate Storm Sewer System (MS4) Permit, Order No. R8-2010-0033, issued to the Riverside County Permittees in the Santa Ana Region (SAR) by the Santa Ana Regional Water Quality Control Board (Santa Ana Regional Board) on January 29, 2010 (2010 SAR MS4 Permit). This is the fourth MS4 Permit that has been issued to Riverside County by the Santa Ana Regional Board. This LIP provides a description of the programs and activities that the Riverside County Flood Control and Water Conservation District (District) is implementing to comply with the 2010 SAR MS4 Permit and to reduce pollutants in Urban Runoff to the Maximum Extent Practicable (MEP). This LIP will be updated at least annually to incorporate new and revised compliance programs specified in the 2010 SAR MS4 Permit.

In general, this LIP provides details regarding the District's implementation of the programs described for the SAR in the latest version of the Riverside County Drainage Area Management Plan (DAMP). The LIP is the principal document that comprehensively translates the MS4 Permit requirements into actions that the District implements to manage water quality in the MS4. The DAMP describes the overall Urban Runoff management strategies being implemented by the Permittees in the SAR of Riverside County. The terms and acronyms used in this LIP are defined in the glossary of the DAMP. To assist in facilitating correlation, references to the applicable section(s) of the 2010 SAR MS4 Permit are provided for each of the compliance activities presented in the LIP.

2.0 INTRODUCTION TO THE DISTRICT LOCAL IMPLEMENTATION PLAN

2.1 PROGRAM OVERVIEW

The Clean Water Act of 1987 established requirements for discharges of Urban Runoff from MS4s under the National Pollutant Discharge Elimination System (NPDES) program. The 2010 SAR MS4 Permit regulates discharges of Urban Runoff from MS4 facilities in the SAR of Riverside County. The Permittees covered under the 2010 SAR MS4 Permit are the County of Riverside, the Riverside County Flood Control and Water Conservation District (District), and the Cities of Riverside County in the SAR. Each Permittee is responsible for compliance with the 2010 SAR MS4 Permit. The 2010 SAR MS4 Permit was issued to the Riverside County Permittees by the Santa Ana Regional Board on January 29, 2010.

This LIP is a programmatic document developed by the District to describe its specific internal management of the Urban Runoff Management Program as well as plans, policies, and procedures necessary to manage Urban Runoff and to comply with the 2010 SAR MS4 Permit. This LIP together with the DAMP are the principal documents that comprehensively translate the 2010 SAR MS4 Permit requirements into programs and implementation plans for the District. The various program elements of this LIP and associated District Divisions and Sections are depicted in Table A-2 found within Appendix A - Program Management.

2.2 DISTRICT MS4 FACILITIES

The major MS4 facilities owned and operated by the District and regulated under the 2010 SAR MS4 Permit consist of underground storm drains, open channels, retention basins, and detention basins. A summary and map of the District MS4 facilities is provided in Appendix A.

Within the jurisdictional boundaries of the District, additional MS4 storm drains, channels and basins may be present that are not owned by the District. These may include MS4 owned/operated by other Permittees of the 2010 SAR MS4 Permit, and other non-MS4 Permittee entities, including federal, state, tribal, and private MS4 systems.

The District maintains a map of the MS4 facilities that it owns and operates, and outfalls to Receiving Waters (IX.E.a). Each year, the District updates this map and identifies modifications and additions to its major MS4 facilities in the Annual Report (III.B.2.g). An updated map is provided in Appendix A.

The table in Figure 2-1 below lists the proximate and downstream Receiving Waters that lie within the District and the associated 303(d) listings, if any. Additionally, the completed hydromodification susceptibility map was provided as a component of the Regional Geodatabase as part of the Watershed Action Plan, as identified in the 2010 SAR MS4 Permit (XII.B.3 and 8).

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Figure 2-1. Receiving Waters and 303(d) Listings

Receiving Water	303(d) Listings
Canyon Lake	Nutrients, Pathogens
Chino Creek, Reach 1B	Pathogens, Nutrients, Chemical Oxygen Demand
Cucamonga Creek, Reach 1	Cadmium, Coliform Bacteria, Copper, Lead, Zinc
Lake Elsinore	Nutrients, PCBs, Sediment Toxicity
Fulmore Lake	Pathogens
Mill Creek (Prado Area)	Nutrients
Santa Ana River, Reach 3	Pathogens, Lead, Copper
Santa Ana River, Reach 4	Pathogens
Prado Park Lake	Nutrients, Pathogens
Temescal Creek, Reach 1	pH
Temescal Creek, Reach 6	Indicator Bacteria

2.3 ALLOWED DISCHARGES

The following discharges need not be prohibited unless identified by the District or the Regional Board Executive Officer as a significant source of pollutants (VI.A.1 of the 2010 SAR MS4 Permit):

1. Discharges composed entirely of stormwater.
2. Air conditioning condensate.
3. Irrigation water from agricultural sources.
4. Discharges covered by an NPDES permit, Waste Discharge Requirements, or waivers issued by the Regional Board or State Board.
5. Discharges from landscape irrigation, lawn/garden watering, and other irrigation waters. These discharges are minimized through public education and water conservation efforts, as described in Section 9.0: Residential Sources.
6. Passive foundation drains.
7. Passive footing drains.
8. Water from crawl space pumps.
9. Non-commercial vehicle washing (e.g., residential car washing, excluding engine degreasing and car washing fundraisers by non-profit organizations).
10. Dechlorinated swimming pool discharges (cleaning wastewater and filter backwash may not be discharged to the MS4 facilities or to Waters of the U.S.).
11. Diverted stream flows.
12. Rising groundwaters and natural springs.

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13. Uncontaminated groundwater infiltration as defined in 40 CFR 35.2005 (20) and Uncontaminated Pumped Groundwater (as defined in DAMP Appendix A, Glossary).
14. Flows from riparian habitats and wetlands.
15. Emergency firefighting flows, i.e., flows necessary for the protection of life and property do not require BMPs and need not be prohibited. However, appropriate BMPs to reduce the discharge of pollutants to the MEP must be implemented when they do not interfere with health and safety issues (see also Appendix G of the DAMP).
16. Waters not otherwise containing wastes as defined in California Water Code Section 13050(d).
17. Other types of discharges identified and recommended by the District and approved by the Regional Board.

3.0 PROGRAM MANAGEMENT

3.1 DEPARTMENTAL RESPONSIBILITIES

There are multiple District divisions and sections responsible for implementing various elements of this LIP and meeting the requirements of the 2010 SAR MS4 Permit. An organizational chart depicting the various District divisions and sections, position titles, and contact information of key personnel with implementation responsibilities is provided in A.2 LIP Departmental Responsibilities. Additionally, the organizational chart contains the specific responsibilities of each department/organizational unit and the key personnel by position title. Table A.2 LIP Departmental Responsibilities further elaborates specific LIP responsibilities by position titles and District Division/Section.

3.2 COOPERATIVE ACTIVITIES

The District participates in an Implementation Agreement with the other MS4 Permittees within the SAR of Riverside County. Through this agreement, the District and the other Permittees contribute funds to implement various aspects of the 2010 SAR MS4 Permit requirements regionally. This approach allows for more consistent permit compliance, implementation of programs, increases cost effectiveness, and provides consistent messages for the public.

Other interagency agreements and other cooperative activities supporting the implementation of the 2010 SAR MS4 Permit requirements are described in the DAMP (III.B.2.e).

3.3 FISCAL RESOURCES

The District exercises its full authority to secure the resources necessary to meet the requirements of the 2010 SAR MS4 Permit. The District makes capital expenditures and incurs operation and maintenance (O&M) costs to implement this LIP and to meet the requirements of the 2010 SAR MS4 Permit (XVIII.A). Additional information about how resources and personnel are used within each of the program elements listed below can be found within Sections 3 through 13 of this document. Specific budgets and allocations are described in the Annual Reports.

Reporting

Each year the expenditures incurred during the preceding fiscal year and the budgeted expenditures planned for the current and next fiscal year are provided in the Annual Report (XVIII.B.1, 2, 3, 5 of the 2010 SAR MS4 Permit). The table presented in Figure 3-1 is used for reporting the fiscal information.

Figure 3-1. Fiscal Resources

Program Element	Funding Source(s)
Program Management and Reporting	NPDES Benefit Assessment
Annual Fee for MS4 NPDES Permit	Not Applicable
Implementation Agreement Shared Cost	Co-Permittees
Elimination of Illicit Connections & Illegal Discharges	NPDES Benefit Assessment

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Municipal Facilities and Activities	Zones 1-5 Capital Improvement Funds, Zones 1-5 Maintenance Funds
Development Planning	Developer Fees (Deposit Based)
Private Development Construction (Inspections)	Not Applicable
Industrial and Commercial Sources (Inspections)	Not Applicable
Public Education & Outreach	NPDES Benefit Assessment
Other [Regional Pollution Prevention]	NPDES Benefit Assessment
Other [Water Quality Monitoring]	NPDES Benefit Assessment

3.4 LEGAL AUTHORITY

The District's Enabling Act (Act 6642) does not provide land use or police powers to the District to control industrial, commercial, or development. Therefore, the District does not have ordinances to regulate private development activities, private construction or grading activities, or private businesses or residents.

To ensure compliance with the requirements of the 2010 SAR MS4 Permit, the District relies on Combined Legal Authority with the other Permittees of the 2010 SAR MS4 Permit. Combined Legal Authority is defined in the USEPA's Part 2 Permit Application Guidance as the sum of all the Co-Permittees' legal authorities which allows an individual Co-Permittee to fulfill every component in the 2010 SAR MS4 Permit (VIII.A). The Urban Runoff Management and Discharge Controls addressed by the District and Permittees through Combined Legal Authority include:

1. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and non-compliance with their ordinances and permits. The appropriate Permittee, within their jurisdiction, has authority, to the extent permitted by California and Federal law and subject to the limitations on municipal action under the constitutions of California and the United States, to enter, monitor, inspect, and gather evidence (pictures, videos, samples, documents, etc.) from residential, industrial, commercial, and construction sites discharging into the MS4 within the limits of its statutory authority. The appropriate Permittee progressively and decisively takes enforcement actions against violators of the Stormwater Ordinance. These enforcement actions meet the guidelines and procedures listed in Sections 3.4 and 4.8 of the DAMP;
2. Control the contribution of pollutants to the MS4;
3. Stop pollutant discharge or threat of discharge if a discharger is unable or unwilling to correct significant non-compliance where there is a serious threat to public health or the environment;
4. Require the use of BMPs to prevent or reduce the discharge of pollutants into the MS4 consistent with the MEP standard;
5. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of pollutants to the MS4; and
6. The appropriate Permittee's Stormwater Ordinance and other local regulatory mechanisms include sanctions to ensure compliance within their jurisdiction. Sanctions shall include but are not limited to: oral and/or written warnings, notice of violation or non-compliance, administrative compliance

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orders, stop work or cease and desist order, a civil citation or injunction, and/or the imposition of monetary penalties or criminal prosecution (infraction or misdemeanor). These sanctions are issued in a decisive manner within a predetermined timeframe, from the time of the violation's occurrence and/or follow-up inspection.

3.4.1 Legal Authority Certification and Reporting

Prior to January 29, 2012, the District submitted an updated certification statement, signed by the District's County Counsel that all necessary legal authority is in accordance with 40 CFR 122.26(d)(2)(i) (A-F) and to comply with VIII.G of the 2010 SAR MS4 Permit through adoption of ordinances and/or municipal code modifications. A copy of the District's signed certification of legal authority is included in Appendix A.4.

3.5 ENFORCEMENT

As described within this LIP, the District's enabling act does not provide authority to require compliance of private or public property owners with the 2010 SAR MS4 Permit requirements. Compliance with the Urban Runoff related ordinances is mandated through implementation of the Enforcement/Compliance Strategy described in Section 3.4.2 of the DAMP.

The enforcement/compliance response could be administrative, civil, or criminal and should be based on the severity of the violation. The responsible District Division and the types of enforcement/compliance responses, in order of increasing severity, are:

- Watershed Protection Division
 - Education and information
 - Follow-up inspection

When more severe enforcement or compliance responses are required, the District will forward information regarding the violation to the appropriate Permittee contact with jurisdiction over the land use or activity. The following enforcement actions will be implemented by the appropriate Permittee, as described within their LIP:

- Verbal warning;
- Written warning;
- Notice of violation or non-compliance;
- Administrative compliance order;
- Stop work order or cease and desist order;
- Civil citation or injunction;
- Administrative fine; and
- Referral to the Environmental Crimes Strike Force for criminal prosecution (infraction or misdemeanor).

3.6 DATABASE MANAGEMENT

As part of a proactive approach to stormwater compliance, the District maintains databases to track various program requirements. These include, but are not limited to:

- ◆ IC/ID Incident Response; and
- ◆ Training provided to staff;

District's procedures for maintaining the databases are included in various sections of this LIP.

3.7 POLICIES AND PROCEDURES

The District implements the following procedures to ensure and promote accountability for implementing the compliance programs and the responsibilities summarized in Section 3.0 within Table A.2 located in Appendix A (IV.A.1.e of the 2010 SAR MS4 Permit).

3.8 TMDL / WQBEL COMPLIANCE

The District's jurisdiction falls within the Middle Santa Ana River (MSAR) and Lake Elsinore/Canyon Lake (LE/CL) sub-watersheds boundaries. Total Maximum Daily Loads (TMDLs) have been established for bacteria and nutrients for discharges within these sub-watersheds.

The Riverside County MSAR Permittees prepared a Comprehensive Bacteria Reduction Plan (CBRP) that describes the specific actions that have or will be taken to achieve compliance with the Urban Wasteload Allocation (WLA) during the Dry Season (April 1st through October 31st) prior to December 31, 2015. The Regional Board approved the CBRP as the final Water Quality Based Effluent Limitation (WQBEL) for the Dry Season Urban WLA on February 10, 2012. In approving the CBRP as the final WQBELs, the Regional Board found that the CBRP, when fully implemented, shall achieve compliance with the WLA for Bacterial Indicator. The District will implement the actions specified in the CBRP (VI.D.1 of the 2010 SAR MS4 Permit) and describe such actions within Section 12 of this LIP. Prior to approval and implementation of the CBRP, the District entered into an interagency Task Force agreement to implement the bacterial indicator TMDL through the Santa Ana Watershed Project Authority (SAWPA). A copy of the agreement is located in Appendix A.3.

The LE/CL Permittees prepared a Comprehensive Nutrient Reduction Plan (CNRP) that describes the specific actions that have or will be taken to achieve compliance with the Urban WLA by December 31, 2020. The Regional Board approved the CNRP on July 19, 2013. Section 12 of this LIP describes the actions the District will take to implement the CNRP. Prior to approval and implementation of the CNRP, the District entered into an interagency Task Force agreement to implement the nutrient TMDL through the Santa Ana Watershed Project Authority (SAWPA). A copy of the agreement is located in Appendix A.3. The LE/CL TMDL is being revised. The TMDL Technical Report was submitted to the Santa Ana Regional Board in December 2018, and the draft Basin Plan Amendment Package was circulated for public review and peer review during the first half of 2019. The Task Force and the Regional Board are working together throughout this process.

3.9 RECEIVING WATER LIMITATIONS

The 2010 SAR MS4 Permit requires that discharges of Urban Runoff from the District shall not cause or contribute to exceedances of Receiving Water Quality Standards for surface waters or groundwater. The DAMP and the District LIP are designed to achieve compliance with the Receiving Water Limitations to the MEP (VII.B of the 2010 SAR MS4 Permit). The District complies with the Receiving Water Limitations through timely implementation of control measures and other actions to reduce pollutants in Urban Runoff as described in this LIP and in accordance with the 2010 SAR MS4 Permit. If it is determined that discharges originating from within the District's right of way are causing or contributing to exceedances of Water Quality Standards that persist, notwithstanding implementation of the control measures specified in the LIP, the District will comply with the procedure specified in Section VII.D of the 2010 SAR MS4 Permit as follows:

Notification

If the District determines that discharges from its MS4 are causing or contributing to an exceedance within a receiving water of an applicable Receiving Water Quality Standard, within two (2) working days, the Watershed Protection Division will provide oral or e-mail notification to the Executive Officer identifying the pertinent information and data supporting the determination, and commit to submitting a full report in accordance with the reporting procedures below.

If the Watershed Protection Division is notified by the Executive Officer of a determination by the Regional Board that discharges from the District's MS4 are causing or contributing to an exceedance within a receiving water of an applicable Receiving Water Quality Standard, within two (2) working days, the Watershed Protection Division will acknowledge such notification via e-mail, and formally request any pertinent supporting information and data not included in the original notification. Following receipt and validation of all information supporting such a determination, the District will commit to providing a full report in accordance with the reporting procedures below.

Reporting

If the exceedance documented pursuant to the notification above is solely due to discharges to the MS4 from activities or areas outside the Permittee's jurisdiction or control, within ten (10) working days of becoming aware of the situation, the District will provide documentation of these discharges to the Executive Officer. Subsequently, the District will document the situation within the Annual Report (VII.D.4).

Otherwise, following the notifications above, the District will, within the annual report covering the date of the notification (unless the Executive Officer directs an earlier submittal), provide a report with:

- 1) A description of the BMPs that are currently being implemented and the additional BMPs that will be implemented to prevent or reduce those pollutants that are causing or contributing to the exceedance of the applicable Receiving Water Quality Standards; and
- 2) An implementation schedule for any new/revised BMPs. If the Executive Officer directs any modifications to the report, within thirty (30) days, the District will submit a revised report.

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Update Compliance Programs

Within thirty (30) days following approval by the Executive Officer of the report described above, the District will revise the applicable sections of this LIP and, where applicable, coordinate with the other Permittees to update the DAMP and/or the monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required.

The District will implement the revised programs in accordance with the approved schedule for implementation of any new/revised BMPs.

4.0 ELIMINATION OF ILLICIT CONNECTIONS AND ILLEGAL DISCHARGES

The DAMP describes the Discharge Limitations and Prohibitions applicable to the District's MS4 (Section 4.1), Non-prohibited Non-Stormwater Discharges (Section 4.2), Procedures to Track Illegal Discharges to their Sources (Section 4.3), IDDE Resources (Section 4.4), IC/ID Prevention (Section 4.5), IC/ID Detection and Elimination (Section 4.6), IC/ID Response and Reporting (Section 4.7), Enforcement for IC/IDs (Section 4.8), Litter Control (Section 4.9), Sanitary Wastes (Section 4.10), and Waste Collection Programs (Section 4.11).

IC/IDs to the District's MS4 facilities are detected and investigated through a combination of programs and approaches targeted at a variety of the potential pollutant sources. Potential IC/IDs involving the MS4 facilities and sources tributary to them are identified and investigated through four types of activities. They are also identified and investigated as part of the existing construction site inspection program and industrial and commercial facility inspection programs. The four activities currently used for detection of IC/IDs are:

1. Dry Weather inspections;
2. Dry Season monitoring;
3. Third-party notifications; and
4. Business inspections through municipal facility inspections (IX).

4.1 IC/ID PREVENTION

As described in Section 3.4 herein, the District has established combined legal authority to prevent IC/IDs into its MS4. This program component identifies key behaviors of neighborhoods, generating sites, and municipal operations that produce intermittent and transitory discharges. These key "discharge behaviors" are then targeted for improved pollution prevention practices that can prevent or reduce the risk of discharge. The District then applies a wide range of education and enforcement tools to promote the desired pollution prevention practices. The various programs described in Sections 5 through 9 of this LIP are intended to help prevent IC/IDs from occurring. Additionally, Section 10 of this LIP describes the public education efforts implemented by the District to ensure that the public is informed of these requirements.

4.2 IC/ID DETECTION AND ELIMINATION

Although the District's overall programs described in Section 5 through 10 of this LIP are designed to help prevent IC/IDs into the District's MS4, the following summarizes the various specific methods implemented by the District to detect and eliminate any potential IC/IDs.

4.2.1 MS4 Facility Inspections

The District maintains an inventory and map of its MS4 facilities and Outfalls to the Receiving Waters. During the regular maintenance of MS4s described in Section 5.6.5 herein, the Operations and Maintenance Division – Maintenance Section (Maintenance Section) inspects the MS4 facilities to identify Illicit

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Connections and notes evidence of any Illegal Discharges. This is the most direct method to detect IC/IDs and utilizes the existing Maintenance Section field staff to look for any discharge that appears unusual or may produce a foul odor or coloring. The maintenance supervisor is familiar with the existing MS4 and the drainage patterns within the region and can take steps to identify the source of what appears to be an IC/ID.

4.2.2 Third-Party IC/ID Reports

Third-party notifications are a direct source of IC/ID information. Residents are encouraged to call their local police, sheriff department, or code enforcement to report observed spills or Illegal Discharges (contact phone numbers for reporting IC/IDs can be found in the other Permittees' LIP). The District also participates in the regional stormwater hotline number operational within Riverside County at 1.800.506.2555, which deals with the reporting of Illegal Discharges and related items. Upon receiving notification from staff or a third party, the District follows the procedures identified in Section 4.3 below.

4.2.3 IC/ID: Construction Site Inspections

As described in Section 7 herein, the District implements a program to track and verify that construction sites of District facilities or construction sites that require an encroachment permit from the District are complying with the applicable conditions of the 2010 SAR MS4 Permit. As part of that program, construction inspectors supplement the IC/ID Program by assuring that appropriate BMPs are being implemented to prevent Illegal Discharges, and that no Illicit Connections occur during the installation phase of new MS4 facilities (XI.B.3.c of the 2010 SAR MS4 Permit). Illegal Connections are prohibited by the District and are initially verified during the plan check process. Construction inspectors are responsible for verifying conformance with the approved plans and conducting inspections at Construction Sites. The inspectors will issue a Stop Work Order if an IC/ID is observed during an inspection and, if applicable, will follow the relevant procedures of Section 4.3 below. The Stop Work Order will cease after the IC/ID has been removed or eliminated (XI.A.11 of the 2010 SAR MS4 Permit). If the site continues to have IC/IDs, District staff will consider other enforcement actions.

4.2.4 IC/ID: Monitoring Activities

The District implements a program to conduct proactive investigations of MS4 Major Outfalls owned/operated by the District. The program to conduct these Major Outfall investigations is described in the Consolidated Monitoring Program (CMP), and response activities are described in Section 4.3 below. District staff that perform IC/ID monitoring activities are identified in Appendix A.2.

4.2.5 Non-Jurisdictional IC/IDs

Where non-jurisdictional IC/IDs are identified within the District's jurisdiction, the responsible party is notified by the Watershed Protection Division regarding the Regional Board requirements, and the Regional Board Executive Officer is notified of the non-jurisdictional IC/ID (IX.K of the 2010 SAR MS4 Permit).

4.2.6 Sewage Management

The District cooperates and coordinates with the local sanitation districts as described in Appendix E of the DAMP to swiftly respond to and contain sewage spills that may discharge into its MS4 facilities.

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As part of those efforts, the District allows local sanitation districts immediate 24-hour access to its MS4 facilities to address and contain sewage spills. The District also works cooperatively with the local sanitation districts to determine and control the impact of infiltration from leaking sanitary sewer systems on Urban Runoff quality (X.A of the 2010 SAR MS4 Permit).

4.3 IC/ID RESPONSE AND REPORTING

Per the 2010 SAR MS4 Permit, Permittees shall control, consistent with the MEP standard, Illegal Discharges (including the discharge of spills, leaks, or dumping of any materials other than stormwater and authorized non-stormwater) into the MS4. The District implements the following procedures to respond to and eliminate IC/IDs:

Initial Response

Based on the information reported, the Watershed Protection Division will assess if the IC/ID is an emergency that poses an immediate threat to human health or the environment.

- a. If yes:
 - i. Investigation must occur within 24 hours of being put on notice by staff or a third party.
 - ii. Follow notification procedures in DAMP Section 4.7.
- b. If no:
 - i. Response must occur within 10 business days of being put on notice by staff or a third party.

Investigation

1. The Watershed Protection Division conducts field screening, visual observations, and performs a source investigation; if there is no active discharge, standing water, or other evidence of recent discharges (stains), reconnaissance is complete at that location and observations are noted on the Field Data Sheet and the location is marked for future follow-up if necessary.
2. If there is an active discharge or evidence of recent dry-weather flow, staff will estimate flow and collect the following field parameters – pH, temperature, and specific conductivity and photographs of the discharge and the point of entry to the MS4 will be taken. If the field parameters exceed follow-up criteria identified in the CMP, or if there is other visible evidence of an Illegal Discharge, a continued investigation will be necessary.
3. Where the initial investigation identified in Step 2 indicated a potential Illegal Discharge, the District will perform a source investigation as follows:
 - a. Active discharge with flow
 - Trace the source of the discharge as far upstream as possible.
 - Additional field measurements may be collected and documented (as outlined above) where there is no other evidence of the IC/ID source.
 - b. No active discharge but evidence of IC/ID is present at time of investigation
 - Trace the source of the discharge as far upstream as possible.

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Elimination

4. If the source is not identified:
 - a. Attempt to narrow down potential source areas and make note in the investigation file.
 - b. Where appropriate, public education material is to be provided.
 - c. Location is marked for future follow-up where appropriate.
 - i. Follow-up visit(s) will confirm if the IC/ID has recurred and will attempt to locate source. If IC/ID has not recurred or has been eliminated, it is noted, and the complaint/investigation is closed.
5. If the source is identified, and:
 - a. The source is in the jurisdiction of another Permittee
 - i. The appropriate Permittee is notified, and further action is performed by that Permittee.
 - b. The source is a permitted, allowed, or exempted discharge under the jurisdiction of the District:
 - i. If applicable, a copy of the regulatory permit authorizing the discharge will be obtained. The findings of the investigation will be noted in the file and the case will be closed.
 - ii. If it is determined that a permitted, allowed, or exempted discharge is exposed to a source of pollutants (e.g., recently applied fertilizers or pesticides) and will be treated as an Illegal Discharge, see bullet c.
 - iii. If a permitted discharge is perceived to be a threat to human health or the environment, it will be reported to the Regional Board/Cal-EMA.
 - c. The source is an Illegal Discharge under the jurisdiction of the District:
 - i. The source is provided with educational material about IC/IDs, and an attempt is made to have the source resolve the situation immediately.
 - ii. Where appropriate, the District forwards information of the Illegal Discharge to the appropriate Permittee's code enforcement staff and they will implement enforcement procedures consistent with their LIP.
 - iii. Follow-up as appropriate to ensure that the IC/ID is eliminated or permitted within 60 days.
 - d. The source is part of a HazMat incident, it is reported to the Incident Commander (IC) upon arrival. Coordination with the HazMat team takes place and samples are only collected with approval of the IC as samples may be done in conjunction with future legal action. Under no circumstances is a site entered or field measurements collected if conditions are unsafe.

Clean-up

The District ensures the discharge is cleaned up, that no further environmental degradation occurs, and that the responsible party(ies) restore the area back to its original state to the MEP.

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Report

The District prepares the IC/ID Report, documents the investigation and outcomes as required by the 2010 SAR MS4 Permit, and reports the incident to the Regional Board, if required.

4.4 IC/ID DATABASE

The District maintains a database summarizing IC/ID incident response and tracking return to compliance (including IC/IDs detected as part of field monitoring activities). Responsible staff for IC/ID investigations and database management are described in Appendix A.2. The IC/ID information is documented and updated within the database on an ongoing basis and is included with the Annual Report (IX.H of the 2010 SAR MS4 Permit).

5.0 DISTRICT FACILITIES AND ACTIVITIES

5.1 PLANNING DISTRICT FACILITIES

The District's mission is to responsibly manage stormwater in service of safe, sustainable, and livable communities. If the District builds public works projects that meet the criteria for New Development and Significant Redevelopment projects, the District will incorporate the development of a project-specific Water Quality Management Plan (WQMP) into the process of planning, designing, and preparing construction plans and specifications (XII.A.9 of the 2010 SAR MS4 Permit). Other public works projects will be required to implement site design and source control BMPs as applicable to the project.

Most District's public works projects are considered as either a utility or watershed protection project and are exempt from preparing a WQMP. However, each of the District's public works projects that meet the criteria for a New Development and Significant Redevelopment Project will include Site Design and Source Control and Treatment Control BMPs as outlined in the WQMP (XII.D of the 2010 SAR MS4 Permit). These BMPs will be required in the planning phases prior to the issuance of any grading or building permits. Applicable Public Works Projects will not be allowed to continue through the development process until all of the applicable items in the WQMP have been addressed. District projects that do not require a WQMP but may potentially cause significant water quality impacts to Receiving Waters will be required to include site design and source control BMPs similar to those outlined in the WQMP. If the projects are changed after initial review, the District will check to see if the changes to the project now trigger the need for a WQMP.

The procedures to ensure that a project specific WQMP is prepared for District New Development and Significant Redevelopment projects are as follows:

- ◆ Design and Construction Division – Design Section will complete a "WQMP Applicability Checklist" (Appendix C) to determine if a WQMP is required and typically will confirm with the Watershed Protection Division;
- ◆ If the project meets the definition of New Development or Significant Redevelopment as defined in Section XII.D.2 of the 2010 SAR MS4 Permit, the Design and Construction Division or design/architect engineering contractor will prepare the WQMP for the project, consistent with the requirements of the WQMP that are included in the DAMP; and
- ◆ Other Public Works Projects will comply with Section 6.5.4 of the DAMP.

5.2 WQMP REVIEW AND APPROVAL

For District New Development and Significant Redevelopment public works projects, the preliminary project specific WQMP, whether developed in-house or by a contractor, will be forwarded to the Design Section for a thorough review of all items requested in the WQMP. The reviewer will use the District Project WQMP Applicability Checklist (Appendix C) to determine if the project specific WQMP is complete. The Design Section will approve the final WQMP. Prior to initiating grading or construction activities, the Design Section will ensure that the construction plans for its public works projects incorporate the Structural BMPs described in the approved final WQMP. The District will review plans and specifications for conformity with the approved final WQMP and consistency with the low impact

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development (LID) BMP design criteria provided in the DAMP Appendix I - Water Quality Management Plan (XII.A.9). Appendix A.2 includes the position/title of the reviewers under the respective departments responsible for implementing these reviews and approvals.

5.3 ROAD PROJECTS

The District does not plan, design, nor construct road projects. Road improvements may be proposed through coordination and partnership with the Riverside County Transportation Department.

5.4 PROJECT CLOSEOUT

During construction closeout, the District will assure satisfactory completion of the requirements in a project specific WQMP by (XII.I of the 2010 SAR MS4 Permit):

- ◆ Verifying that Structural BMPs have been constructed and installed in conformance with approved plans and specifications;
- ◆ Assuming responsibility for the long-term funding and implementation, operation, maintenance, repair, and/or replacement of BMPs; and
- ◆ Confirming that the District is prepared to implement all Non-Structural BMPs.

Where applicable, the operation and maintenance procedures for the Treatment Control BMPs included in the project specific WQMP will be incorporated into a Municipal Facility Pollution Prevention Plan (see DAMP Appendix F). For District projects, upon completion of construction when contract close-out occurs, the responsibility for implementation, operation, and maintenance of BMPs will transfer from the contractor to the appropriate department, and become part of the District's program for operation and maintenance of their municipal facilities described in Section 5.6 herein.

5.5 DISTRICT CONSTRUCTION ACTIVITIES

Section 5.2 of the DAMP describes how the District ensures that its construction projects are in compliance with the latest version of the Construction General Permit (CGP), the General De Minimis Permit, and the requirements of the 2010 SAR MS4 Permit. As described in Section 5.1 above, the District prepares a WQMP for all applicable New Development and Significant Redevelopment Projects, which also meets the post-construction requirements in the CGP (XIV.G.1.e of the 2010 SAR MS4 Permit). District projects, which are mostly considered Linear Underground/Overhead Projects (LUPs), are not subject to post-construction requirements in the CGP.

Application for Coverage Under the CGP

All District construction sites are maintained in compliance with the latest adopted version of the CGP (XIV.G.1.a of the 2010 SAR MS4 Permit). The discharges from Permittee owned and/or operated Construction Sites are authorized by the 2010 SAR MS4 Permit, provided they are in compliance with the terms and conditions of the CGP, except that separate coverage under that Permit is not required and additional permit filing fees are not required. The specific compliance requirements are as follows:

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- a. Applicable District construction activities must be in compliance with the latest adopted version of the CGP. Please note that the latest CGP, 2009-0009-DWQ, was amended by 2010-0013-DWQ and 2012-0006-DWQ and includes LUPs.
- b. The 2010 SAR MS4 Permit authorizes the discharge of stormwater runoff from District Construction Projects that may result in land disturbance consistent with the acreage criteria of the CGP.
- c. Prior to commencement of construction activities, the District submits Permit Registration Documents (PRDs): 1) Notice of Intent (NOI); 2) Risk Assessment; 3) Site & Location Map; 4) Stormwater Pollution Prevention Plan (SWPPP); and 5) Signed Certification Statement by using the State Board SMARTS system. A construction SWPPP is prepared and implemented for each construction project subject to the CGP; SWPPPs prepared by contractors are reviewed and approved by the District (XIV.G.1.f of the 2010 SAR MS4 Permit).
- d. The District ensures that applicable District Construction Projects comply with the requirements of the latest version of the CGP. This includes ensuring that PRDs are filed on time, ensuring that certification and training requirements for Qualified SWPPP developer (QSD) and Qualified SWPPP practitioner (QSP) are met, and ensuring that required monitoring and reporting are conducted. The District reviews and approves SWPPPs prepared by their contractors. For Risk Levels 2 and 3, a Rain Event Action Plan (REAP) is prepared 48 hours prior to any likely precipitation event (per NOAA data).
- e. The District's Water Quality Compliance Section gives advance notice to the Regional Board Executive Officer of planned changes in the construction activity, which may result in non-compliance with the latest version of the CGP.

Note: No permit filing fee is required. The filing fees for the PRDs are waived for Permittee construction projects (XIV.G.1.c of the 2010 SAR MS4 Permit). To ensure that the project is correctly registered in the SMARTS system and to avoid being assessed a filing fee, the Design and Construction Division ensures that:

1. In order for the Permittee construction project to be correctly registered and to avoid being required to pay the fee for Permit coverage, the following two steps must be taken when first registering the project: 1) From the welcome page in the SMARTS system, go to the "Apply for a New Notice of Intent (NOI)" link; 2) When prompted to select a permit type, select "Region 8 MS4 Capital Improvement Projects". If these steps are not completed upon the initial registration of the project, a filing fee will be assessed.
2. For projects registered as a "Region 8 MS4 Capital Improvement Project", there will be no WDID number assignment; only an AppID number will be assigned. Accordingly, the SWPPP title page and any other document that references the "WDID Number" should be changed to read "CGP SMARTS AppID Number" for these Permittee owned and/or operated Construction Sites.

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In addition to compliance with the discharge requirements, construction sites covered under the CGP are required to conduct monitoring and to provide the data in the Annual Reports via the State Board SMARTS system by September 1st of each year consistent with the requirements of the CGP.

Termination of Coverage

Upon completion of the construction project, the District files the following via the SMARTS system: 1) a Notice of Termination (NOT); 2) photographs of the completed project; 3) a site map depicting the project location, including the latitude and longitude if appropriate; and 4) copies of the final field verification reports (XIV.G.1.d of the 2010 SAR MS4 Permit). Emergency projects to protect public health and safety are exempt from the requirement to comply with the CGP until the emergency ends (XIV.G.1.h of the 2010 SAR MS4 Permit).

Responsible Parties

In compliance with the CGP, the District has designated the Chief of Design and Construction Division as the Approved Signatory (AS). The AS is responsible for signing and certifying all PRDs and NOTs (Provision IV.I of the CGP). As defined in Provision IV.I of the CGP, the AS for a municipality must be "a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the construction or land disturbance project". There are significant penalties for falsification of reports (see Provision IV.N of the CGP).

5.6 OPERATION AND MAINTENANCE OF DISTRICT FACILITIES

The District implements measures to ensure that their facilities and activities do not cause or contribute to a pollution or nuisance in Receiving Waters (XIV.A of the 2010 SAR MS4 Permit). Section 5.3 of the DAMP describes the program implemented by each Permittee for the operation, maintenance, and inspection of their municipal facilities and activities. District implements that program as follows and staff responsible for these various activities are identified in Appendix A.2.

5.6.1 Inventory of Facilities

The District maintains an inventory of their municipal facilities in Appendix B. At a minimum, the database will include, but is not limited to the following types of facilities:

1. Facilities and activities discharging directly to environmentally sensitive areas such as 303(d) listed waterbodies or those with a RARE beneficial use designation.
2. Corporate yards including maintenance and storage yards for materials, waste, equipment, and vehicles.
3. Maintenance facilities serving parks and recreation facilities.
4. Other municipal areas and activities that the Permittee determines to be a potential source of pollutants.

This inventory is maintained in Appendix B and provides pertinent information on the facility and the elements described below, such as the location and inspection information. Staff responsible for the updates to the FPPP and inspections are outlined in Appendix A.2.

5.6.2 Facility Pollution Prevention Plans (FPPP)

A Facility Pollution Prevention Plan (FPPP) is maintained for each municipal facility identified in Appendix B. Each FPPP is designed to meet the requirements of Provision XIV.C of the 2010 SAR MS4 Permit utilizing the FPPP template included in Appendix F of the DAMP. The FPPP is typically maintained onsite at each individual facility, however, for facilities that do not maintain onsite staff, maintenance equipment, or materials, a copy of the FPPP for the applicable category of municipal operation is maintained at the centralized maintenance facility (i.e., corporate yard) corresponding to the operations category or where the maintenance contracts are administered (District main office). The inventory of municipal facilities in Appendix B identifies the location of the FPPP for each facility, and Appendix A.2 identifies the staff responsible for implementation and update of the FPPP. Each FPPP also includes a facility inspection form that is used to record inspection findings.

5.6.3 Annual Inspection

The District inspects all of its fixed facilities and field operations annually, whereas any District-owned Structural Post-Construction BMPs installed after January 29, 2010 would be inspected annually prior to the Rainy Season. The inspections are designed to ensure that the FPPP is up to date, BMPs are implemented, operating, and are maintained properly, and all BMPs are working effectively. The staff responsible for conducting such inspections is identified in Appendix A.2.

Findings of the inspections are recorded in the FPPP applicable to the facility. If vector problems are identified, the District works with the appropriate *Vector Control Authority* from the list below to remedy the problems.

Unincorporated areas of Riverside County

Northwest area of Riverside County: Northwest Mosquito & Vector Control number, 951.340.9792. The Vector Control number for the County is: Vector Control at Riverside County Environmental Health 888.722.4234 during office hours (Monday-Friday 7:00 a.m. - 5:30 p.m.) and 951.782.2968 to leave a message after hours.

City of Beaumont

Vector Control at Riverside County Environmental Health
888.722.4234 during office hours and 951.782.2968 to leave a message after hours

City of Calimesa

Northwest Mosquito & Vector Control District
951.340.9792

City of Canyon Lake

Northwest Mosquito & Vector Control District
951.340.9792

City of Corona

Northwest Mosquito & Vector Control District
951.340.9792

City of Eastvale

Northwest Mosquito & Vector Control District
951.340.9792

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City of Hemet

Vector Control at Riverside County Environmental Health
888.722.4234 during office hours and 951.782.2968 to leave a message after hours

City of Jurupa Valley

Northwest Mosquito & Vector Control District
951.340.9792

City of Lake Elsinore

Northwest Mosquito & Vector Control District
951.340.9792

City of Norco

Northwest Mosquito & Vector Control District
951.340.9792

City of Menifee

Vector Control at Riverside County Environmental Health
888.722.4234 during office hours and 951.782.2968 to leave a message after hours

City of Moreno Valley

Vector Control at Riverside County Environmental Health
888.722.4234 during office hours and 951.782.2968 to leave a message after hours

City of Perris

Vector Control at Riverside County Environmental Health
888.722.4234 during office hours and 951.782.2968 to leave a message after hours

City of Riverside

Northwest Mosquito & Vector Control District
951.340.9792

City of San Jacinto

Vector Control at Riverside County Environmental Health
888.722.4234 during office hours and 951.782.2968 to leave a message after hours

5.6.4 Municipal Activities

The Municipal Activities conducted by the District include:

- ◆ Pesticide and/or herbicide application;
- ◆ Painting;
- ◆ Outdoor loading and unloading of materials;
- ◆ Outdoor storage of raw materials;
- ◆ Operation of corporation yards (vehicle and equipment maintenance, storage, etc.);
- ◆ Waste handling and disposal;
- ◆ Grading;
- ◆ Construction;

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- ◆ Fence Repair; and
- ◆ Mowing.

Standard BMPs that are used when performing the routine activities identified above are provided in Appendix B.

5.6.5 Catch Basin and MS4 Facility Maintenance

At a minimum, 80% of the District's open channels, catch basins, retention/detention basins, and wetlands created for Urban Runoff treatment are inspected, cleaned, and maintained annually, with 100% of the facilities maintained in a two-year period (XIV.E of the 2010 SAR MS4 Permit). The District performs maintenance on its catch basins and MS4 facilities, and verifies, to the MEP, that its MS4 facilities are appropriately maintained. The District annually reviews, updates, and implements a clean out schedule and frequency for its MS4 facilities including open channels, catch basins, retention/detention facilities and wetlands created for Urban Runoff treatment during the Wet and Dry Seasons to protect Receiving Water quality to the MEP (XIV.D of the 2010 SAR MS4 Permit). The MS4 facility clean out schedule and frequency are as follows:

Table 5-1 MS4 Clean out Schedule and Frequency

<u>Facility</u>	<u>Annually</u>	<u>Every Two Years</u>
Open Channels	80%	100%
Catch Basins	80%	100%
Retention/Detention Basins	80%	100%
Created Wetlands	80%	100%

During the annual inspection and maintenance of the above listed MS4 facilities, the District first inspects the facilities for visual evidence of Illegal Discharges, litter and/or debris accumulation, and other maintenance issues. Specifically, the Maintenance Section cleans those retention/detention basins and MS4 facilities in which the storage volume is found to be 25% or more full or if accumulated sediment or debris impairs the hydraulic capacity of the facility (XIV.D of the 2010 SAR MS4 Permit). The District additionally examines opportunities to retrofit existing MS4 facilities with water quality protection measures, where necessary and feasible (XIV.F of the 2010 SAR MS4 Permit).

5.6.6 Landscape Maintenance

The District promotes the use of native vegetation into facility landscaping. In addition, schedules for irrigation and chemical application are included in landscape designs to the extent feasible (XIV.C.3 & 4 of the 2010 SAR MS4 Permit). The Maintenance Section sets irrigation schedules and schedules of chemical applications.

5.6.7 Pesticide Application

Integrated pest management measures that rely on non-chemical solutions are utilized to the extent practicable (XIV.C.2 of the 2010 SAR MS4 Permit). Unused pesticides, herbicides, and fertilizers are collected and properly disposed of (XIV.C.5 of the 2010 SAR MS4 Permit). The District pesticide applicators (including contractors) maintain appropriate training, permits, and certifications (XIV.C.1 of the 2010 SAR MS4 Permit). Responsible staff and department are provided in Appendix A.2.

5.6.8 Encroachment Permits

There may be New Development and Significant Redevelopment projects that are not regulated under the 2010 SAR MS4 Permit. For runoff from such projects that require encroachment permits for connections to the District's MS4 facilities, within the limits of its legal authority, the Plan Check Section requires applicants to design their projects consistent with the MEP standard and implement the applicable requirements of the 2010 SAR MS4 Permit, including the model WQMP (III.B.2.f of the 2010 SAR MS4 Permit).

5.6.9 Trash BMPs

In the 2004-2005 Annual Report, the Permittees characterized trash that was removed from their MS4, determined its main source(s), and developed and implemented appropriate BMPs to reduce and/or to eliminate the discharge of trash and debris to Waters of the U.S. to the MEP. The District continues to implement BMPs to prevent discharges of trash, and annually reviews and evaluates the effectiveness of its litter/trash BMPs by assessing the volume and character of trash removed during annual MS4 facility maintenance described in Section 5.6.5 above. This assessment occurs during the annual reporting process by the Water Quality Compliance Section. The findings of the reviews are reported in the Annual Report (IX.G & J of the 2010 SAR MS4 Permit).

5.7 DISCHARGES FROM DISTRICT OWNED AND/OR OPERATED FACILITIES AND ACTIVITIES

The 2010 SAR MS4 Permit authorizes the District to discharge De Minimis types of discharges listed below. The Regional Board is notified by the District at least 15 days prior to the start of the discharge by submitting a NOI and required supporting documents utilizing the form provided in Appendix 7 to the 2010 SAR MS4 Permit (VI.B; XIV.G.2 of the 2010 SAR MS4 Permit).

The following types of discharges from District owned and/or operated facilities and activities are authorized under the 2010 SAR MS4 Permit (VI.B of the 2010 SAR MS4 Permit) provided they are in compliance with the terms and conditions of the General De Minimis Permit, except that the Permittees need not pay the filing fee (XIV.G.2 of the 2010 SAR MS4 Permit):

1. Discharges from potable water sources, including waterline flushing, super chlorinated waterline flushing, fire hydrant system flushing, and hydrostatic test water from pipelines, tanks, and vessels: These discharges are required to be dechlorinated to a concentration of 0.1 ppm or less, pH adjusted if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments.
2. Discharges from lawn, greenbelt and median watering, and other irrigation runoff from non-agricultural operations. These discharges are required to be minimized through requirements consistent with Section 5.3 of the DAMP.
3. Dechlorinated swimming pool discharges: These discharges are required to be dechlorinated to a concentration of 0.1 ppm or less, pH adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments. Swimming pool cleaning wastewater and filter backwash must not be discharged to the MS4.
4. Discharges from facilities that extract, treat, and discharge water diverted from Waters of the U.S. These discharges are required to meet the following conditions:

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- ◆ The discharges to Waters of the U.S. must not contain pollutants added by the treatment process or pollutants in greater concentration than the influent;
 - ◆ The discharge must not cause or contribute to a condition of erosion;
 - ◆ The discharge must be in compliance with Section 401 of the CWA; and
 - ◆ Conduct monitoring in accordance with Section XIX of the 2010 SAR MS4 Permit.
5. Construction dewatering wastes: The maximum daily concentration limit for Total Suspended Solids (TSS) must not exceed 75 mg/L; sulfides must not exceed 0.4 mg/L; total petroleum hydrocarbons must not exceed 0.1 mg/L; and oil and grease must not exceed 15 mg/L.
6. For all De Minimis type of discharges: The pH of the discharge is required to be within 6.5 to 8.5 pH units and there must be no visible oil and grease in the discharge.
7. Table 4-1 of the Basin Plan incorporates TDS/TIN WQOs for groundwater and surface waters within the SAR. City/County/District discharges to Receiving Waters are required to ensure compliance with the following Dry Season conditions:
- ◆ For discharges to surface waters where groundwater will not be affected by the discharge, the maximum daily concentration (mg/L) of TDS and/or TIN of the effluent must not exceed the WQOs for the Receiving Water receiving the discharge, as specified in Table 4-1 of the Basin Plan;
 - ◆ For discharges to surface waters where the groundwater will be affected by the discharge, the TDS and/or TIN concentrations of the effluent must not exceed the WQOs for the surface water where the effluent is discharged and the affected groundwater management zone, as specified in Table 4-1 of the Basin Plan. The more restrictive WQOs will govern. However, treated effluent exceeding the groundwater management zone WQOs may be returned to the same management zone from which it was extracted without reduction of the TDS or TIN concentrations so long as the concentrations of those constituents are no greater than when the groundwater was first extracted. Incidental increases in the TDS and TIN concentrations (such as may occur during air stripping) of treated effluent will not be considered increases for the purposes of determining compliance with this discharge specification; and
 - ◆ The Regional Board may add categories of non-stormwater discharges that are not significant sources of pollutants or remove categories of non-stormwater discharges listed above based on a finding that the discharges are a significant source of pollutants.

6.0 DEVELOPMENT PLANNING

6.1 INTRODUCTION

As discussed in Section 5, the District primarily plans, designs, and constructs flood control and Watershed Protection Projects. If the District builds a Development Project in the Santa Ana Region in the future, such as a satellite maintenance yard, the District will implement the applicable provisions of this section. The District supports the County's implementation of the following programs related to the planning and permitting of Development Projects within unincorporated Riverside County. Section 6.0 of the DAMP describes the development project approval process implemented by the County to ensure that 1) Urban Runoff from New Development and Significant Redevelopment Projects is reduced to the MEP, 2) the volume and velocity of post-development runoff will be controlled, and 3) WQOs will not be violated by New Development and Significant Redevelopment projects.

6.2 GENERAL PLAN

The District does not maintain a General Plan. Watershed protection principles and objectives for managing Urban Runoff for land developments are reflected in the appropriate policies, goals, and objectives of the other Permittees' General Plans.

6.3 WATERSHED ACTION PLAN

The Watershed Action Plan (WAP), required by Provision XII.B of the 2010 SAR MS4 Permit, describes and implements the Permittees' approach to coordinated watershed management. The objective of the WAP is to address watershed scale water quality impacts of urbanization associated with urban TMDL Waste Load Allocations (WLAs), stream system vulnerability to hydromodification from urban runoff, cumulative impacts of development on vulnerable streams, preservation of beneficial uses of streams, and protection of water resources, including groundwater recharge areas. The WAP document includes the following:

- ◆ **Hydromodification Susceptibility Documentation and Mapping Report** - Delineation of existing unarmored or soft-armored stream channels in the Permit Area that are vulnerable to hydromodification from New Development and Significant Redevelopment projects.
- ◆ **Regional Geodatabase** - An integrated, World Wide Web available Geodatabase and web interface. The web interface is designed to allow for the input of a project location/area, and then output a report of design related constraints and information specific to that project, such as watershed and hydrologic subarea(s), downstream Receiving Waters including hydromodification susceptibility and 303(d) listed pollutants, soil types, Multiple Species Habitat Conservation Plan (MSHCP) areas, flood zones, land use designations, District Master/Area Drainage Plans, MS4 facilities, etc.
- ◆ **Hydromodification Management Plan (HMP)** - A plan to help manage increases in runoff volumes and decreases in times of concentration that may result from New Development and Significant Redevelopment projects over one acre. The HMP will help the user identify whether the project is subject to Hydrologic Conditions of Concern (HCOC) requirements and when required, meet the HCOC requirements.

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- ◆ **Causes of Degradation and Aggradation in the Santa Ana Region Report** - Identifies potential causes of stream degradation and aggradation in the SAR. Subwatersheds analyzed include the Upper San Jacinto River, Middle and Lower San Jacinto River, Temescal Wash, and San Timoteo Wash. The Middle Santa Ana River (MSAR) subwatershed was not investigated in the report.
- ◆ **Hydromodification Management Plan Evaluation Program** - Defines a protocol as required by 2010 SAR MS4 Permit that is being implemented by the Permittees to evaluate potential impacts to specific channel segments deemed most susceptible to hydromodification. This plan identifies two sites that need to be monitored, including an assessment methodology, and required follow-up actions based on monitoring results.
- ◆ **Subwatershed Fact Sheets** - Provides land uses, waterbodies, habitat areas, groundwater basins, beneficial uses, and facts for the Middle Santa Ana River Watershed and the San Jacinto River Watershed.
- ◆ **Santa Ana Watershed BMP Retrofit Assessment** - Recommendations to identify candidate areas for retrofits within existing public and private MS4s, parks and recreational areas that may incorporate opportunities for addressing TMDL implementation plans, hydromodification from urban runoff, LID implementation, and pollutant discharge reduction.

The WAP and supporting documents were approved by the Regional Board on April 20, 2017 and are available at <http://content.rcflood.org/NPDES/SantaAnaWS.aspx>. The Regional Geodatabase, referred to as the "Stormwater & Water Conservation Tracking Tool" (SWCT²) is available at <http://rcstormwatertool.org/SWCTT/>.

6.4 CEQA ENVIRONMENTAL REVIEW PROCESS

The District does not regulate private developments. The County of Riverside's environmental review process as it relates to private Development Projects is described in the County's LIP.

6.5 DEVELOPMENT PROJECT REVIEW, APPROVAL, AND PERMITTING

The County of Riverside's Planning Department requires applicants for Development Projects that require discretionary approvals for New Development and Significant Redevelopment Projects to minimize the short and long-term adverse impacts on Receiving Water quality by requiring appropriate site design and source control BMPs for all Development Projects and for projects that meet the criteria for New Development and Significant Redevelopment Projects in Provision XII.D.2 of the 2010 SAR MS4 Permit (Priority Development Projects) by: 1) Reviewing, approving, and verifying implementation of project-specific WQMPs, implementation of LID principles, where feasible; 2) addressing HCOCs (XII.E.9 of the 2010 SAR MS4 Permit); and 3) verifying that long-term BMP operation and maintenance mechanisms are in place prior to project closure or issuance of certificates of occupancy.

6.5.1 Process Overview

During the County's planning process and prior to project approval and issuance of local permits, the District provides recommended conditions of approval to the County to confirm projects comply with the County's ordinances, permits, etc. However, the County reviews the WQMPs to ensure that Priority Development Projects' discharges of Stormwater Pollutants from the MS4 will be reduced to the MEP, will

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not cause or contribute to a violation of Water Quality Standards, and will comply with the County's ordinances, permits, plans, requirements, and with the 2010 SAR MS4 Permit.

All New Development and Redevelopment projects that are submitted to the County for discretionary approval or permitting are required by the County to fill out a Project Application Form. Based on the results of that form, each project is categorized as either a 'Priority Development Project' or 'Other Development Project'. Priority Development Projects are comprised of all New Development and Significant Redevelopment Projects as defined in Permit Section XII.D.2 of the 2010 SAR MS4 Permit. For all Priority Development Projects that are submitted to the Permittees, the project applicant is required to prepare a project specific WQMP that is in conformance with the Santa Ana Region WQMP for Urban Runoff, which is located in Appendix I of the DAMP. Copies of applications/checklists used by the County can be found within the County's LIP.

The County's Planning Department coordinates the land use case processing, which includes compliance with CEQA procedures, general plan conformity, ordinance consistency, and public health and safety requirements. The County's Planning Department works closely with many other departments to ensure proper review of these issues. The District provides land development review services to the County with regard to flood control in the unincorporated areas of the County. The Transportation Department provides land development review services to the County of Riverside with regard to water quality issues and compliance with the WQMP. The primary objective of the WQMP, through application of Site Design, Source Control, and Treatment Control BMPs on a project-specific basis, is to ensure that the land use approval and permitting process will help minimize and mitigate the impact of Urban Runoff from the project on Receiving Waters and the pre-development condition.

The ordinance that provides the County the authority to implement and enforce the WQMP is discussed in the County's LIP. The policies and procedures for project review, approval, permitting, and permit close-out are described in the sections following this one.

The Transportation Department reviews preliminary project-specific WQMPs, recommends standard conditions of approval, and reviews final project-specific WQMPs for Priority Development category projects as described in the 2010 SAR MS4 Permit. Other Development Projects are required to incorporate Site Design, Source Control, and/or Treatment Control BMPs through similar conditions of approval or permit conditions as described in Section 6.5.4 of the DAMP (XII.D.6 of the 2010 SAR MS4 Permit). Refer to the County of Riverside's LIP.

6.5.2 Identifying Development Projects Requiring a Project-Specific WQMP

The County Planning Department's Project Application Form includes a WQMP Applicability Checklist that allows a project proponent to self-certify the need for a project-specific WQMP. Project proponents must complete the appropriate project application packets as part of their project submittal. Upon receipt of a completed project application, the County Planner accepting the case will review the self-certification to determine if a project specific WQMP is required. If a project-specific WQMP is required, the County's Planning Department will verify that a preliminary project-specific WQMP is included with the packet. If the County's Planning Department determines that the project has a District maintained facility on site, and is within a FEMA/DWR floodplain, or requires an encroachment permit from the District, they will then

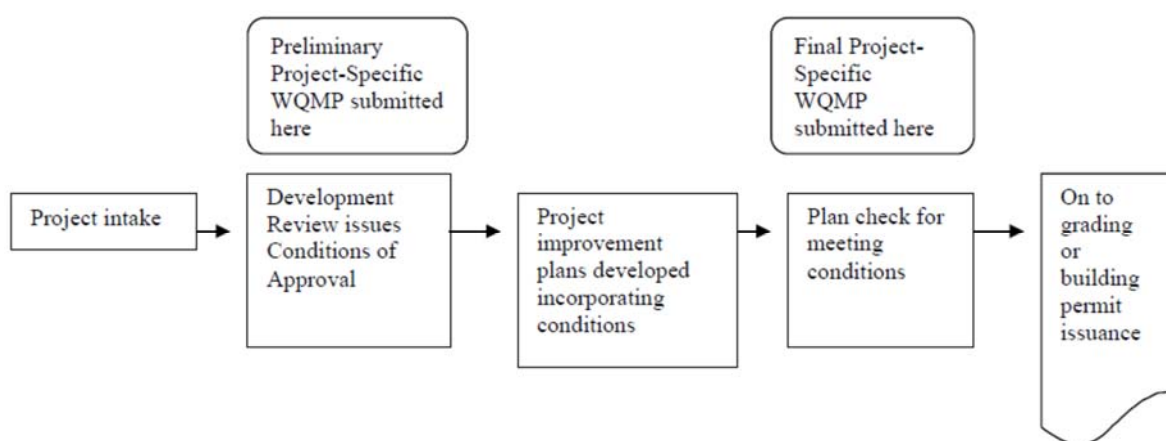
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forward copies of the project application to the District's Development Review/Plan Check Sections for review, and as applicable, the District will recommend conditions of approval.

The staff/position responsible for implementation of this identification is provided in Appendix A.2.

6.5.3 Review of Preliminary Project-Specific WQMPs

The County's Planning Department requires project-specific WQMPs to be submitted as "preliminary" during the discretionary or land use entitlement phase depending upon the level of detail known about the overall project design at the time project approval is sought. However, prior to recordation of the final parcel map or issuance of a building permit, the project applicant must submit the final project specific WQMP for review and approval. A typical review and approval process flow chart is shown below.



Prior to issuing conditions of approval for projects requiring a preliminary project-specific WQMP, the County and the Transportation Department will review the preliminary project-specific WQMP to ensure (XII.A of the 2010 SAR MS4 Permit):

- ◆ That the proposed project and land uses are accurately described;
- ◆ That pollutants and Hydrologic Conditions of Concern associated with the proposed project are properly identified (XII.E.9.a of the 2010 SAR MS4 Permit);
- ◆ That appropriate post-construction BMPs to control the identified pollutants and Hydrologic Conditions of Concern are proposed (XII.E.9.a of the 2010 SAR MS4 Permit);
- ◆ That the post-construction BMPs proposed are acceptable and properly incorporated into the design for the proposed project (XII.D of the 2010 SAR MS4 Permit); and
- ◆ That the entity(ies) responsible for long-term maintenance and the mechanism for funding the proposed post-construction BMPs is preliminarily identified (XII.K of the 2010 SAR MS4 Permit).

The District staff and department responsible for carrying out the tasks in this sub-section is provided in Appendix A.2. Also, refer to the County of Riverside's LIP.

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6.5.4 Review of Other Development Projects

The Transportation Department recommends to the County Planning Department water quality related conditions of approval for discretionary development projects that are not classified as New Development and Significant Redevelopment projects but may have water quality impacts. These types of discretionary development projects are classified as other development projects' and are required to incorporate Site Design BMPs and Source Control BMPs, as applicable and feasible, into project plans to ensure that the discharge of pollutants from the development will be reduced to the MEP (XII.D.6 of the 2010 SAR MS4 Permit). For other development projects' that directly discharge Urban Runoff to Receiving Waters listed as Impaired on the CWA Section 303(d) List, Treatment Control BMPs may also be required on a project-specific and/or sub-regional or regional basis. Brief descriptions of Site Design BMPs, Source Control BMPs, and Treatment Control BMPs that should be incorporated as applicable on other development projects' are provided below. Refer to the County of Riverside's LIP.

Table 6-2. Summary of BMPs for Other Development Projects

BMP Category		Applicable Projects
Site Design BMPs		Required for all Other Development Projects, to the maximum extent practicable.
Source Control BMPs	Non-Structural BMPs	Required for all Other Development Projects. <ul style="list-style-type: none"> • Education/Training for Property Owners, Operators, Tenants, Occupants, or Employees • Activity Restrictions • Irrigation System and Landscape Maintenance • Common Area Litter Control • Street Sweeping Private Streets and Parking Lots • Drainage Facility Inspection and Maintenance
	Structural BMPs	Required for all Other Development Projects that incorporate the target project features. <ul style="list-style-type: none"> • MS4 Stenciling and Signage • Landscape and Irrigation System Design • Protection of Slopes and Channels • Provide: <ul style="list-style-type: none"> – Community Car Wash Racks – Wash Water Controls for Food Preparation Areas • Properly Design and Maintain: <ul style="list-style-type: none"> – Fueling Areas – Air/Water Supply Area Drainage – Trash Storage Areas – Loading Docks – Maintenance Bays – Vehicle and Equipment Wash Areas – Outdoor Material Storage Areas – Outdoor Work Areas or Processing Areas
	Treatment Control BMPs: Project-Specific, Regional, or Sub-Regional	May be required on a case-by-case basis for Other Development Projects that discharge Urban Runoff to Receiving Waters listed as impaired on the State Board's 303(d) List.

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The District staff and department responsible for carrying out the applicable tasks in this sub-section are provided in Appendix A.2.

6.5.5 Conditions of Approval

The Transportation Department recommends to the County conditions of approval to assist the County in ensuring that their requirements of Section 6 of the DAMP are implemented (XII.A.3 of the 2010 SAR MS4 Permit). In the design for replacement of existing culverts or construction of new culverts and/or bridge crossings, the County Planning Department verifies that appropriate BMPs to reduce erosion and mitigate hydromodification are included in the design (XII.A.5 & 8 of the 2010 SAR MS4 Permit). In addition, the standard conditions of approval specify proper maintenance and operation of Structural Post-Construction BMPs, including requirements for vector control (XII.K.1 of the 2010 SAR MS4 Permit). Refer to the County of Riverside's LIP.

6.5.6 Review and Approval of Final Project-Specific WQMPs

Based on the conditions of approval issued by and, if applicable, the preliminary project-specific WQMP approved by the County and the County Planning Department, in coordination with the Transportation Department, will ensure that the final project-specific WQMP is prepared and is consistent with the requirements of the WQMP, and the entity(ies) responsible for BMP maintenance and the mechanism for BMP funding are identified prior to WQMP approval. Refer to the County of Riverside's LIP.

The District staff and department responsible for carrying out the applicable tasks in this sub-section is provided in Appendix A.2.

6.5.7 Plan Check: Issuance of Grading or Building Permits

The County's Building and Safety Department will review or approve grading or building plans for construction phase related impacts. When projects reach the plan check phase, the applicant must have an approved final WQMP since the construction plans must incorporate all the Structural BMPs identified in the approved final WQMP. Construction plans are reviewed for conformity with the project's approved final WQMP. The designs of Structural Post-Construction BMPs are reviewed to verify inclusion of control measures necessary to effectively minimize the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, flies, etc. This review is coordinated with the local vector agencies (see Section 5.6.3). The design review also verifies that Structural Post-Construction BMPs provide adequate access for maintenance. The construction plans will include descriptions, locations, and design details of all the BMPs that are in substantial conformance with the preliminary approvals (XI.B.3 of the 2010 SAR MS4 Permit).

Standard notes that are required to be added to grading plans disturbing one acre or more are discussed in Section 6.5.7.1 of the DAMP. Refer to the County of Riverside's LIP.

6.5.8 Structural Post-Construction BMP Database

The County of Riverside maintains a database, as described within the County's LIP, to track the operation and maintenance of the Structural Post-Construction BMPs installed after January 29, 2010 (XII.H.2; XII.K of the 2010 SAR MS4 Permit).

6.5.9 Field Verification of BMPs & Permit Closeout

The field verification of BMPs and Permit closeout process is described within the County's LIP.

6.5.10 Post-Construction BMP Inspections

The Post-Construction BMP inspection process is described within the County's LIP.

6.5.11 Change of Ownership and Recordation

The Change of Ownership and Recordation process is described within the County's LIP.

6.6 IN-LIEU PROGRAMS AND ALTERNATIVES

The SAR Permittees may collectively or individually propose to establish an Urban Runoff fund to be used for Urban Water Quality Improvement Projects (XII.G.2 of the 2010 SAR MS4 Permit). The SAR Permittees may also establish, where feasible and practicable, a water quality credit system for alternatives to infiltration, harvesting and use, evapotranspiration, and other LID and hydromodification requirements (XII.G.4 of the 2010 SAR MS4 Permit).

7.0 PRIVATE DEVELOPMENT CONSTRUCTION ACTIVITY

The District regulates private construction activities that occur within its rights-of-way through conditions established in an encroachment permit, as well as District construction projects as discussed in Section 5.1. In areas outside of District rights of way, the other Permittees, within their respective jurisdictions, implement programs as described within their respective LIPs.

District staff and sections responsible for the activities described in this section are identified in Appendix A.2.

7.1 PERMIT ISSUANCE

Prior to the issuance of encroachment permits, the District requires the applicant to obtain coverage under the CGP, where applicable (XI.A.5 of the 2010 SAR MS4 Permit). Where coverage under the CGP appears to apply, the District verifies coverage on the State Water Resources Control Board's web page at:

http://www.swrcb.ca.gov/water_issues/programs/stormwater/databases.shtml#const_db

7.2 INVENTORY DATABASE

The Plan Check Section maintains an electronic database inventory of all construction sites within District rights-of-way for which active building or grading permits have been issued and activities at the site include: soil movement; uncovered storage of materials or wastes, such as dirt, sand, or fertilizer; or exterior mixing of cementaceous products, such as concrete, mortar, or stucco. Construction Sites are included in the database regardless of whether they are subject to the CGP, other NPDES permits or Waste Discharge Requirements (XI.A.1 of the 2010 SAR MS4 Permit).

Supporting files are also maintained, including a record of inspection dates, results of each inspection, photographs and video (if any), and a summary of any enforcement actions taken (XI.A.2 of the 2010 SAR MS4 Permit).

7.3 ISSUANCE OF ENCROACHMENT PERMITS

Prior to issuance of encroachment permits, the Plan Check Section:

- ◆ Verifies that the project applicant, where applicable, has obtained coverage under the CGP;
- ◆ Requires implementation of the BMPs identified in Table 7-1 of the DAMP in Construction Site erosion and sediment control plans, as appropriate and applicable;
- ◆ Ensures that the erosion and sediment control plans includes appropriate erosion and sediment control BMPs (i.e., erosion measures for slopes greater than a certain length or hillside developments, ingress/egress controls, perimeter controls, run-on diversion, if significant) such that a distinct and effective combination of BMPs consistent with the site risk is implemented through all phases of construction; and
- ◆ Categorizes the project as a high, medium, or low threat to water quality. The factors for prioritization include soil erosion potential, project size, proximity, and sensitivity of Receiving

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Waters. At minimum, high priority Construction Sites include sites disturbing 50 acres and greater; sites disturbing over one acre with Direct Discharge to Receiving Waters with CWA Section 303(d) listed waters for sediment or turbidity impairments; site-specific characteristics; and any other relevant factor. At a minimum, medium priority Construction Sites include sites disturbing between 10 to less than 50 acres of disturbed soil (XI.B.2 of the 2010 SAR MS4 Permit).

7.4 CONSTRUCTION SITE INSPECTION

District construction inspectors inspect the inventoried construction sites according to the schedule below:

Table 7-1: Construction Inspection Frequency

Priority	Supporting Criteria ^(a)	Wet Season ^(b) Inspection Frequency
High	<u>Project Size</u> Sites that disturb an area greater than 50 acres (initial inventory) <u>Proximity and Sensitivity of Receiving Waters</u> Sites disturbing an area greater than one (1) acre with Direct Discharge to Receiving Waters with CWA Section 303(d) listed waters for sediment or turbidity Impairments and site-specific characteristics ^(c) . <u>Soil Erosion Potential</u> Hillside sites that disturb an area greater than five (5) acres <u>History of Compliance</u> Sites that disturb an area greater than one (1) acre with a low-range (0-50%) compliance with respective City/County NPDES site inspection/verification checklists	Once monthly
Medium	<u>Project Size</u> Sites disturbing an area between 10 to less than 50 acres. <u>History of Compliance</u> Sites that received repeated verbal notification of non-compliance with respective City/County NPDES site inspection/verification checklists	Twice
Low	<u>Project Size</u> Sites disturbing one (1) to less than 10 acres. <u>History of Compliance</u> Sites that are in compliance with respective City/County NPDES site inspection/verification checklists Sites that disturb an area of one (1) acre or greater	Once

Notes:

- ^(a) Prioritization factors listed in 2010 SAR MS4 Permit §XI.B.2 include soil erosion potential, project size, proximity and sensitivity to Receiving Waters, and history of compliance. §XI.B.3 of the 2010 SAR MS4 Permit describes the minimum inspection requirements, which are reflected in inspection checklists.
- ^(b) Wet season: October 1st to May 31st
- ^(c) The Construction General Permit Order No. 2009-0009-DWQ includes risk-based characterization of construction sites based on site-specific conditions.

These inspections are documented utilizing the Construction Site Inspection Form provided in Appendix D. The District does not need to inspect Construction Sites already inspected by the Regional Board if the inspection was conducted within the inspection timeframe specified in Appendix D (XI.A.8 of the 2010 SAR MS4 Permit).

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At a minimum, the following items are addressed during Construction Site Inspections (DAMP Section 7.4):

- ◆ For projects of one acre or more, verify that an NOI has been submitted via the State Board SMARTS system. Verification is typically made by reviewing a printed copy of the NOI or showing the WDID Number issued for the site. As Permittees become aware of changes in ownership, Permittees will notify Regional Board staff;
- ◆ For projects of one acre or more, verify that a SWPPP is onsite;
- ◆ Verification that the BMPs implemented onsite are effective for the appropriate phase of construction (preliminary stage, mass grading stage, streets and utilities stage, etc.); and
- ◆ Check for poorly managed authorized non-stormwater discharges or evidence of unauthorized non-stormwater discharges that may be potential IC/IDs to an MS4.

Depending on the findings of the inspection, additional follow-up inspections, as well as enforcement actions pursuant to Section 7.6 below, may be conducted.

7.5 THIRD-PARTY NOTIFICATIONS

The District responds to complaints received from third parties regarding Construction Sites within their jurisdiction in a timely manner to ensure that they are not a source of pollutants to the MS4 and the Receiving Waters (XI.A.9 of the 2010 SAR MS4 Permit). When the District receives notice by its staff or a third party of a non-Emergency Situation representing a possible violation of the CGP issued to a Construction Site, the District, within two (2) working days, provides oral or e-mail notice to the Regional Board of the location where the incident occurred and the nature of the incident. After this notification, the District is not required to take any further action regarding the CGP but does take appropriate actions to bring the Construction Site into compliance with the requirements of the 2010 SAR MS4 Permit as described in Section 7.6 below.

7.6 CONSTRUCTION ENFORCEMENT

The District's escalating enforcement process is described in Section 3.5 and is designed to achieve prompt corrections at Construction Sites for non-compliance with the District's encroachment permit conditions or the requirements of the 2010 SAR MS4 Permit.

The Construction Management and Plan Check Sections respond to construction complaints received from third parties and works with the Water Quality Compliance Section to assure the Santa Ana Regional Board that corrective actions have been implemented, if warranted. The enforcement/compliance response should be based on the severity of the violation. The types of enforcement/compliance responses available, in typical order of increasing severity, are:

1. Construction Management and Plan Check Section – Verbal warning
2. Construction Management and Plan Check Section – Written warning
3. Construction Management and Plan Check Section – Stop work order or cease and desist order

Watershed Protection Division: Referral to the Environmental Crimes Strike Force for criminal prosecution (infraction or misdemeanor). The entire Enforcement/Compliance Strategy and sanctions for non-compliance are described in Section 3.4.2 of the DAMP.

7.7 NOTIFICATIONS TO REGIONAL BOARD

The District provides notification to the Regional Board of potential non-filers under the CGP discovered by the District (XI.A.6 of the 2010 SAR MS4 Permit).

8.0 INDUSTRIAL AND COMMERCIAL SOURCES

As discussed in Section 3.4, the District does not have land use or police powers. Therefore, the District does not have the authority to regulate industrial or commercial facilities. The other Permittees, within their respective jurisdiction, implement programs as described within their LIP that are designed to help prevent or reduce discharges to the MS4 from causing or contributing to a violation of Water Quality Standards in Receiving Waters.

9.0 RESIDENTIAL SOURCES PROGRAM

As discussed in Section 3.4, the District does not have land use or police powers. Therefore, the District does not have the authority to regulate residential activities. The other Permittees, within their respective jurisdiction, implement programs as described within their LIP that are designed to help prevent or reduce discharges to the MS4 from causing or contributing to a violation of Water Quality Standards in Receiving Waters.

10.0 PUBLIC EDUCATION AND OUTREACH

The Permittees contribute funds through the Implementation Agreement to the District, who in turn implements the region-wide public education and outreach program described in the DAMP on behalf of all of the Riverside County Permittees. The regional program, referred to as the Riverside County Watershed Protection Program, has been designed to address the requirements of the 2010 SAR MS4 Permit (Section 10.1), the objectives of the public education and outreach program (Section 10.2), implementation of the program (Section 10.3), and the specific components of the program, including public participation (Section 10.4). The goal of the public and business education programs is to target 100% of the residents, including businesses, commercial, and industrial establishments. A Public Education Sub-Committee referred to as the Public Education Strategic Taskforce (PEST) has been established among the Permittees to provide oversight and guidance for the implementation of the Riverside County Watershed Protection Program (XIII.I of the 2010 SAR MS4 Permit). The Permittees finalized the five-year Public Education Strategic Plan and are implementing it.

10.1 PUBLIC BEHAVIOR EDUCATION

The Riverside County Watershed Protection Program promotes public awareness through many activities, including:

- ◆ Operation of a 1.800 hotline for information and reporting Illegal Discharges;
- ◆ Creation and hosting of a public education website;
- ◆ Participating in community or regional events;
- ◆ Distributing brochures and e-newsletters;
- ◆ Conducting presentations at schools; and
- ◆ Conducting outreach at local businesses.

Annually, the District also participates in at least one community, regional, and/or countywide event to distribute public education materials related to Urban Runoff Pollution Prevention (XIII.J of the 2010 SAR MS4 Permit). Educational materials are available at the District's main office. When feasible, the Riverside County Watershed Protection Program will participate in joint outreach programs with other agencies including, but not limited to, the Santa Ana Watershed Project Authority, Resource Conservation Districts, non-profit agencies and other county and municipal stormwater programs to ensure that a consistent message on stormwater pollution prevention is disseminated to the public (XIII.D of the 2010 SAR MS4 Permit). This information is provided in the Annual Reports.

Educational materials regarding household use of fertilizers, pesticides, herbicides and other chemicals, pet waste, household hazardous waste, pool and spa maintenance, etc. are distributed to the community. The Permittees also implement programs to educate property owners to use pollution prevention BMPs and to maintain onsite hydrologically functional landscape controls (XII.E.6).

10.2 PUBLIC EDUCATION

In cooperation with the SAR Permittees, the District implements an assessment program to measurably increase the public's knowledge of its community regarding MS4 and impacts of Urban Runoff on

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Receiving Waters. Programs are also implemented to measure the change in behavior of its target communities to reduce pollutant releases to the MS4 and the environment (XIII.C of the 2010 SAR MS4 Permit).

The Riverside County Watershed Protection Program develops, maintains, and distributes BMP guidance for the control of those potentially polluting activities which include: guidelines for the household use of fertilizers, pesticides, herbicides and other chemicals, guidance for mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting. These guidance documents are distributed to the public, through community events, meetings, and the Riverside County Watershed Protection website www.rcwatershed.org (XIII.F of the 2010 SAR MS4 Permit).

10.3 BUSINESS EDUCATION

The District develops appropriate educational materials, including BMP brochures. The District provides the Permittees these educational materials to distribute to all new industrial and commercial enterprises within their respective jurisdictions at the time appropriate permits (e.g., business licenses or occupancy permits) are issued (XIII.G of the 2010 SAR MS4 Permit). Guidance documents are available to mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting businesses (XIII.L of the 2010 SAR MS4 Permit). These guidance materials are available to the public, trade associations, etc. through participation in community events, trade association meetings, and are available for download on the program website (XIII.F of the 2010 SAR MS4 Permit).

The Riverside County Watershed Protection Program distributes BMP fact sheets for mobile businesses that include: laws and regulations dealing with Urban Runoff and discharges to the MS4, appropriate BMPs, and proper procedures for disposing of wastes generated from each mobile business category (XIII.L; XI.D.6 of the 2010 SAR MS4 Permit).

Appendix E.2 contains electronic BMP facts sheets as well as Public Education handouts.

10.4 PUBLIC PARTICIPATION

In cooperation with the SAR Permittees through the Riverside County Watershed Protection Program, the District will continue to maintain and enhance public education materials to encourage the public to report the following:

- Illegal dumping and unauthorized, non-stormwater discharges from residential, industrial, construction, and commercial sites into public streets, storm drains, and to surface waterbodies and their tributaries;
- Clogged storm drains; and
- Over-irrigation runoff.

The hotline number to report illegal dumping (800.506.2555) and the Riverside County Watershed Protection Program website (www.rcwatershed.org) are listed on the District's website <http://www.rcflood.org> (XIII.H of the 2010 SAR MS4 Permit).

11.0 TRAINING

11.1 PROGRAM MANAGEMENT

11.1.1 Training Program Update

The DAMP and this LIP will be updated to include a program to provide formal and, where necessary, informal training to District staff that implements the requirements of the 2010 SAR MS4 Permit. Formal training may consist of regional training or individual training provided by the District. Informal training (i.e., tailgate training) is implemented by the District on an as-needed basis to supplement the formal training (XV.A).

Formal Training: The formal training program will educate Permittee staff responsible for implementing requirements of the 2010 SAR MS4 Permit by providing training on the following Permittee activities: construction site inspection, WQMP review, residential/industrial/commercial site inspection, and Permittee facility maintenance. Additionally, the District offers Permittee staff transportation project guidance, and illicit connection and illegal discharge trainings through its formal training program. Formal training may be conducted in classrooms or using videos, DVDs, or other multimedia including virtual training via webinars or online platforms. The program will consider all applicable Permittee staff such as stormwater program managers, construction/industrial/commercial/residential inspectors, planners, engineers, public works crew, etc., and shall define the required knowledge and competencies for each Permittee compliance activity, outline the curriculum, include testing or other procedures to determine that the trainees have acquired the requisite knowledge to carry out their duties, and provide proof of completion of training such as a certificate of completion and/or attendance sheets. The formal training curriculum will:

- ◆ Highlight the potential effects that Permittee or public activities related to their job duties can have on water quality;
- ◆ Provide an overview of the principle applicable water quality laws and regulations that are the basis for the requirements in the DAMP;
- ◆ Discuss the provisions of the DAMP that relate to the duties of the target audience including, but not limited to:
 - The requirements of the DAMP regarding Stormwater Ordinances, resolutions, codes, and standards that relate to the duties of the target audience, including enforcement thereof;
 - Overview of CEQA requirements contained in Section XII.C of the 2010 SAR MS4 Permit;
 - Implementation and assessment of SWPPPs and FPPPs relative to the duties of the target audience;
 - Selection, implementation, and maintenance of appropriate BMPs relative to the duties of the target audience; and

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- Tools, checklists, and procedures included in the DAMP to assist in implementing the requirements of the 2010 SAR MS4 Permit relative to the duties of the target audience.

Informal Training: The informal training will ensure that staff have the requisite knowledge to implement the applicable provisions in the District LIP, such as (but not limited to):

- ◆ The requirements of local stormwater ordinances, resolutions, codes, and standards that relate to the duties of the target audience;
- ◆ Local tools, checklists, and/or procedures to implement the requirements of the 2010 SAR MS4 Permit relative to the duties of the target audience;
- ◆ The proper use and maintenance of erosion and sediment controls; and
- ◆ Vector control issues related to Stormwater Pollution control BMPs.

11.1.2 Training Recordkeeping

The District maintains a written and/or electronic record of stormwater training provided to its staff (XV.A), which is provided in each Annual Report.

11.2 ELIMINATION OF IC/IDS

The District will continue to provide IC/ID training in its training program.

11.3 PERMITTEE FACILITIES AND ACTIVITIES

Formal and informal training is provided to District staff that implements provisions of the 2010 SAR MS4 Permit. Training of District staff responsible for implementing municipal maintenance programs are described in Section 5.6 of the DAMP.

11.4 DEVELOPMENT PLANNING

The educational program for developers, contractors, and training of District staff involved with WQMP reviews is described in Section 6.7 of the DAMP. The District will provide Watershed Action Plan training integrated within the WQMP training, as appropriate, including training for upper-level managers and directors (XII.B.9).

11.5 PRIVATE DEVELOPMENT CONSTRUCTION ACTIVITY

The District does not have the authority to regulate industrial or commercial facilities.

11.6 TRAINING SCHEDULE

The District conducts training on implementation of the 2010 SAR MS4 Permit compliance programs as follows:

1. New District employees responsible for implementing requirements of the 2010 SAR MS4 Permit receives informal training within six (6) months of hire and formal training within one (1) year of hire.
2. District facility maintenance staff receives formal training at least once every two (2) years.

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3. District inspection employees receive formal or informal refresher training focused on appropriate BMP implementation at least once a year prior to the Rainy Season.
4. Other existing District employees responsible for implementing the requirements of the 2010 SAR MS4 Permit receive formal training at least once during the term of the 2010 SAR MS4 Permit.
5. The start date for training programs described in this section will be no later than six (6) months after Regional Board Executive Officer approval of DAMP updates applicable to the District activities described in Section XIV of the 2010 SAR MS4 Permit.

The District will require verification of BMP training from contract staff where applicable. The Permittee(s) will also include designated Regional Board staff on training notification e-mails announcing upcoming formal training sessions.

12.0 TOTAL MAXIMUM DAILY LOAD (TMDL) IMPLEMENTATION

12.1 INTRODUCTION

The Federal Clean Water Act Section 303(d) requires that states identify Receiving Waters that do not or are not expected to meet water quality standards (Beneficial Uses, WQOs, and the antidegradation policy). Once a waterbody has been identified and placed on the 303(d) List of Impaired waters, states are required to develop a Total Maximum Daily Load (TMDL) to address each pollutant causing impairment. A TMDL defines how much of a pollutant a waterbody can tolerate and still meet Water Quality Standards. Each TMDL must account for all sources of the pollutant, including discharges from wastewater treatment facilities, runoff from homes, forested lands, agriculture, streets or highways, contaminated soils/sediments, legacy contaminants, onsite disposal systems (septic systems), and aerial deposition.

Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (permitted discharges) and contributions from non-point sources, including natural background. In addition to accounting for past and current activities, TMDLs may consider projected growth that could increase pollutant levels. TMDLs allocate allowable pollutant loads to each source and identify management measures that, when implemented, will assure that Water Quality Standards are attained. State Water Code Section 13000 also requires the Regional Boards to develop implementation plans to define schedules, dischargers, tasks, and other actions necessary to attain Water Quality Standards.

The District provides assistance to the Co-Permittees with the development and implementation of programs to comply with TMDL Waste Load Allocations (WLA) and TMDL Implementation Plan tasks. Specific TMDL regulated waterbodies that the Co-Permittees discharge to are identified in Tables 12-1 and 12-2. Existing TMDL WLAs and implementation plan tasks assigned to the Co-Permittees as part of USEPA approved TMDLs are also summarized in Tables 12-1 and 12-2.

Several tables from Chapter 5 of the SAR Basin Plan are summarized in this section of the LIP. However, the Basin Plan is a living document and is amended on occasion. The Basin Plan should always be reviewed for the most accurate and up-to-date information regarding TMDL compliance requirements.

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**Table 12-1. TMDLs Adopted and Approved by the Regional Board and USEPA
and Associated Waste Load Allocations**

Waterbody	Pollutant/Stressor	Assigned Dischargers	WLA
Canyon Lake (Resolution R8-2004-0037)	Total Phosphorus – MS4 Discharges	County of Riverside, Cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Menifee, Moreno Valley, Murrieta, Riverside, Wildomar, and Beaumont	306 kg/yr (total) based on a 10-year running average to be achieved as soon as possible, but no later than by December 31, 2020
	Total Nitrogen – MS4 Discharges	County of Riverside, Cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Menifee, Moreno Valley, Murrieta, Riverside, Wildomar, and Beaumont	3,974 kg/yr (total) based on a 10-year running average to be achieved as soon as possible, but no later than by December 31, 2020
Lake Elsinore (Resolution R8-2004-0037)	Total Phosphorus – MS4 Discharges	County of Riverside, Cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Menifee, Moreno Valley, Murrieta, Riverside, Wildomar, and Beaumont	124 kg/yr (total) based on a 10-year running average to be achieved as soon as possible, but no later than by December 31, 2020
	Total Nitrogen – MS4 Discharges	County of Riverside, Cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Menifee, Moreno Valley, Murrieta, Riverside, Wildomar, and Beaumont	349 kg/yr (total) based on a 10-year running average to be achieved as soon as possible, but no later than by December 31, 2020
Middle Santa Ana River Reach 3 (Resolution R8-2005-0001)	Bacterial Indicators – MS4 Discharges	County of Riverside, Cities of Corona, Eastvale, Jurupa Valley, Riverside, and Norco	<p><u>Dry Conditions</u> Fecal Coliform: log mean less than 180 organisms/100 ml based on five or more samples per 30-day period, and not more than 10% of the samples exceed 360 organisms/100 ml for any 30-day period to be achieved as soon as possible, but no later than December 31, 2020 <i>E.coli</i>: log mean less than 113 organisms/100 ml based on five or more samples per 30-day period, and not more than 10% of the samples exceed 212 organisms/ 100 ml for any 30-day period to be achieved as soon as possible, but no later than December 31, 2015</p> <p><u>Wet Conditions</u> Fecal Coliform: 5-sample/30-day Logarithmic Mean less than 180 organisms/100ml, and not more than 10% of the samples exceed 360 organisms/100ml for any 30-day period. 5-sample/30-day Logarithmic Mean less than 113 organisms/100mL, and not more than 10% of the samples exceed 212</p>

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			organisms/100mL for any 30-day period to be achieved as soon as possible, but no later than December 31, 2025. <i>E.coli</i> : 5-sample/30-day Logarithmic Mean less than 113 organisms/100mL, and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period to be achieved as soon as possible, but no later than December 31, 2025.
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Table 12-2. Adopted TMDLs and Implementation Tasks

TMDL	Implementation Plan Task	Schedule	Responsible Party
Nutrient TMDLs for Lake Elsinore and Canyon Lake (Resolution R8-2004-0037)	Task 4 – Nutrient Water Quality Monitoring Program for Lake Elsinore, Canyon Lake and the San Jacinto Watershed	Complete and approved by Regional Board March 2006	County of Riverside, Cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Moreno Valley, Murrieta, Riverside, and Beaumont
	Task 6 – On site Disposal Systems (Septic System) Management Plan	Dependent on State Board approval of relevant regulations - ongoing	County of Riverside, Cities of Perris, Moreno Valley, and Murrieta
	Task 7 – Urban Discharges – Revise DAMP and WQMP	Complete	County of Riverside, Cities of Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, Menifee, Moreno Valley, Murrieta, Riverside, Wildomar, and Beaumont
	Task 9 – Lake Elsinore In-Lake Sediment Nutrient Reduction Plan	Complete	
	Task 10 – Canyon Lake In-Lake Sediment Treatment Evaluation	Complete	
	Task 11 – Watershed and Lake Elsinore and Canyon Lake In-Lake Model Updates	Complete	
	Task 12 – Pollutant Trading Plan	Pending	
Middle Santa Ana River Watershed Bacterial Indicator TMDL (Resolution R8-2005-0001)	Task 3 – Develop and Implement Watershed Wide Bacterial Indicator Water Quality Monitoring Program	Complete	County of Riverside, Cities of Corona, Eastvale, Jurupa Valley, Riverside, and Norco
	Task 4.1 – Urban Discharges – Develop Urban Source Evaluation Plan	Complete	
	Task 4.3 & 4.5 - Revise DAMP and WQMP	Complete	

12.2 TMDL IMPLEMENTATION STRATEGY

USEPA's Interim Permitting Approach for Water Quality Based Effluent Limitations (WQBEL) in Storm Water Permits, 60 Federal Register 43761 (Aug. 26, 1996) recognizes the need for an iterative BMP approach to control pollutants in stormwater discharges. In addition, USEPA recommends the use of the term "phased TMDLs" for TMDLs with significant data uncertainty where the state expects that the loading capacity and allocation scheme will be revised in the near future as additional information is collected.

The Permittees have continued to work with the Regional Board staff to determine if it is appropriate to implement TMDL WLAs through a phased TMDL and/or iterative BMP process. The Regional Board describes the TMDL WLA and implementation requirements in the TMDL implementation plan. TMDL implementation plans assign responsibilities to specific MS4 dischargers to identify sources of impairment, to propose BMPs to address those sources, and to monitor, evaluate, and revise BMPs based on the effectiveness of the BMP implementation program. Once a TMDL is approved by USEPA, the Regional Board is then required to amend existing NPDES Permits to incorporate either narrative or numeric WQBEL consistent with the intent of the TMDL. In many cases, efforts to address the underlying TMDL impairment are already underway prior to approval of the TMDL. For the Middle Santa Ana River and San Jacinto River Watersheds, the Regional Board incorporated TMDL requirements into the 2010 SAR MS4 Permit.

Because TMDLs often regulate a broad cross-section of dischargers beyond MS4 Permittees, the stakeholders generally form a task force to address an implementation plan task assigned to multiple dischargers. A task force utilizes economies of scale for implementing TMDL compliance tasks and assists in the pursuit of grant opportunities. Task forces specifically are useful to develop a regional BMP compliance document, implement regional compliance monitoring, and develop stakeholder consensus on necessary recommendations regarding modification to the TMDL or Basin Plan that are necessary to protect Beneficial Uses or to recognize site specific conditions. Such Basin Plan amendments are usually submitted to the Regional Board through the Basin Plan Triennial Review Process. In the Middle Santa Ana River and San Jacinto River Watersheds, the Permittees formed the Middle Santa Ana River Bacteria TMDL Task Force (MSAR TMDL Task Force) and the Lake Elsinore and Canyon Lake Nutrient TMDL Task Force (LE/CL TMDL Task Force), respectively, to implement the TMDL requirements.

12.3 LAKE ELSINORE / CANYON LAKE NUTRIENT TMDL

12.3.1 Regional Board Action History

In 1998, the Santa Ana Regional Board listed Lake Elsinore and Canyon Lake as impaired waterbodies in the Clean Water Act Section 303(d) List for excessive levels of nutrients. Lake Elsinore was also listed for low dissolved oxygen (DO) among other constituents.

In 2000, the Santa Ana Regional Board initiated the process to develop a nutrient TMDL (with response targets for Chlorophyll *a*, low DO, and ammonia) for Lake Elsinore and Canyon Lake, as required by the Federal Clean Water Act and California's Non-Point Source Pollution Control Plan. This process included the formation of the Lake Elsinore/Canyon Lake (LE/CL) TMDL Workgroup in August 2000, as well as the development and implementation of various in-lake and watershed water quality monitoring programs.

In December 2004, the Santa Ana Regional Board adopted the proposed Lake Elsinore and Canyon Lake Nutrient TMDL Basin Plan Amendment. The Basin Plan Amendment established nutrient WLAs and Load Allocations (LA) and included an implementation plan. The Implementation Plan requires stakeholders to develop various nutrient management plans and long-term monitoring plans aimed at identifying

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appropriate lake management measures reducing nutrient discharges to Lake Elsinore and Canyon Lake and assessing the appropriateness of TMDL targets and allocations.

The LE/CL TMDL has implemented a phased approach in recognition of the limits of the current data and that optimum strategies for TMDL compliance may change with better data. Work on the TMDL is ongoing through the efforts of the LE/CL Nutrient TMDL Task Force.

According to the Final California 2014 and 2016 Integrated Report, the Santa Ana Regional Board recommended delisting the Canyon Lake Bacterial Indicator Impairment since applicable water quality standards for the pollutant are not being exceeded. The State Water Resources Control Board staff recommended the decision to be approved by the State Board.

12.3.2 LE/CL TMDL Task Force

Since August 2000, TMDL Task Force efforts have been coordinated and administered through the Lake Elsinore San Jacinto Watersheds Authority (LESJWA), a joint powers authority. As a result of the adoption of the TMDL in 2004, the TMDL dischargers formally organized the existing TMDL stakeholder group into a funded TMDL Task Force. The purpose of the Task Force is to conduct studies necessary to collect data to analyze the appropriateness of the TMDL, identify in-lake and regional watershed solutions, pursue grants, coordinate activities among all of the various stakeholders, and recommend appropriate revision to the Basin Plan language regarding Lake Elsinore and Canyon Lake based on data collection and analysis.

12.3.3 Comprehensive Nutrient Reduction Plan

The 2010 SAR MS4 Permit incorporated requirements addressing the LE/CL Nutrient TMDL and allowed the Permittees to propose a Comprehensive Nutrient Reduction Plan (CNRP), a long-term plan designed to achieve compliance with WLAs established in the LE/CL TMDLs. The Regional Board approved the CNRP on July 19, 2013 and it is now a narrative for effluent limits for the LE/CL TMDL.

12.3.4 Final WQBELs for the LE/CL Nutrient TMDL

According to Section II.F.23 of the 2010 SAR MS4 Permit, in the absence of an approved CNRP, the WLAs specified in the approved LE/CL TMDL will constitute as the final numeric WQBELs.

The Regional Board established specific requirements for the content of the CNRP. These requirements can be found in Section VI.D.2 in the 2010 SAR MS4 Permit. The Permittees submitted and obtained approval for a CNRP which describes in detail the specific actions that have been taken or will be taken to achieve compliance with the urban WLA by December 31, 2020. The CNRP includes the following:

- Evaluation of the effectiveness of BMPs and other control actions implemented. This evaluation shall include the following:
 - The specific ordinance(s) adopted or proposed for adoption to reduce the concentration of nutrients in urban sources.
 - The specific BMPs implemented to reduce the concentration of urban nutrient sources and the water quality improvements expected to result from these BMPs.

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- The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of water quality objectives for nutrients.
 - The specific regional treatment facilities and the locations where such facilities will be built to reduce the concentration of nutrients discharged from the urban sources and the expected water quality improvements to result when the facilities are complete.
- Proposed method for evaluating progress towards compliance with the nutrient WLA for urban runoff. The progress evaluation shall include:
 - The scientific and technical documentation used to conclude that the CNRP, once fully implemented, is expected to achieve compliance with the urban WLAs for nutrients by December 31, 2020.
 - A detailed schedule for implementing the CNRP. The schedule must identify discrete milestone decision points and alternative analyses necessary to assess satisfactory progress towards meeting the urban WLAs for nutrients by December 31, 2020. The schedule must also indicate which agency or agencies are responsible for meeting each milestone.
 - The specific metric(s) that will be established to demonstrate the effectiveness of the CNRP and acceptable progress towards meeting the urban WLAs for nutrients by December 31, 2020.
 - The DAMP, WQMP, and LIPs shall be revised consistent with the CNRP no more than 180 days after the CNRP is approved by the Regional Board.
 - Detailed description of any additional BMPs planned, and the time that is required to implement them. In the event that data from the watershed-wide water quality monitoring program indicates that water quality objectives for nutrients are still being exceeded after the CNRP is fully implemented.

12.3.5 Permittee Compliance Strategy

12.3.5.1 Implementation Plan

Due to limits in the quality of monitoring data, the Santa Ana Regional Board and dischargers agreed to incorporate USEPA's interim approach for TMDL implementation (60 FR 43761) by proposing a phased implementation of the LE/CL TMDL. The TMDL also allows the dischargers, until 2020, to comply with nutrient WLAs and LAs so that iterative BMP implementation can also be considered. The TMDL Implementation Plan also provides for an initial phase of data collection and analysis necessary to determine if a use attainability analysis, site-specific objective, or other regulatory actions such as modifications to TMDL numeric targets, LAs, or WLAs are appropriate.

The CNRP was approved by the Regional Board on July 19, 2013. This LIP has been updated with the specific compliance tasks that the District will implement. The approved CNRP incorporates the overall implementation steps and elements that the LE/CL Nutrient TMDL Permittees are implementing to comply with the requirements that are described below. The District describes the specific actions it has taken consistent with the CNRP in its annual report.

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12.3.5.2 CNRP Implementation-Watershed-based BMPs

The CNRP includes the following BMPs to be implemented:

1. **Ordinances development:** The District will work with Permittees to evaluate the need to revise existing or establish new ordinances to reduce sources of nutrients in the watershed.
2. **Street sweeping and debris removal:** The District implements street sweeping practices as described in Section 5.6.4 of this LIP to help remove pollutants, including nutrient sources, before they enter the MS4 within its facilities.
3. **Inspection and Enforcement:** The District will continue implementation of inspections and enforcement programs.
4. **Septic System Management:** The District will work with the Department of Environmental Health to continue the implementation of the septic system management plan.
5. **Public Education and Outreach:** The District will continue implementation of the public education and outreach program.
6. **WQMP Implementation:** The District will implement the approved LID-based WQMP.

12.3.5.3 In-lake Remediation Projects

The CNRP includes the following in-lake remediation projects to be implemented:

1. **Lake Elsinore:** The Lake Elsinore Aeration Mixing System (LEAMS) incorporated into the CNRP is currently being implemented. During CNRP implementation, the MS4 Permittees will support the continued operation of this system as needed to comply with urban WLAs. However, the Permittees will continue to evaluate alternative compliance approaches including use of chemical additives such as alum. If it is determined that an alternative approach is more cost effective for achieving compliance with the urban WLAs and septic LAs, the Permittees will recommend revision to the CNRP.
2. **Canyon Lake:** The Task Force has completed detailed evaluations of aeration, oxygenation, and chemical addition (Anderson, 2008; CDM, 2011; Anderson, 2012b; Anderson, 2012c). Based on these evaluations, the Task Force has determined that chemical addition, using aluminum sulfate (alum), is the most effective in-lake nutrient control strategy to achieve interim numeric targets for the response variables, chlorophyll-a and DO. Between September 2013 and September 2015, five alum applications were performed according to the schedule outlined in the CNRP. Since the fifth alum application was completed in September of 2015, the LE/CL Nutrient TMDL Permittees evaluated water quality data in the lake and determined that progress toward the response targets achieved was substantial and warranted modification(s) to the alum application plan. The alum application plan was expanded to continue treating Canyon Lake with alum twice annually, as well as modifying the plan to include treatment of the lake north of the causeway, where the San Jacinto River discharges into Canyon Lake.

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The LE/CL TMDL is currently being revised by the LE/CL TMDL Task Force to reflect realistic numerical targets for DO to incorporate controllability by means of an allowable exceedance frequency, which is representative of the pre-development condition in the watershed. The 2012 DYRESM-CAEDYM simulations of lake water quality expected for a pre-development level of watershed nutrient loads will be used as the basis for determining the uncontrollable frequency of exceeding a final DO target of at least 5 mg/L in the hypolimnion. A cumulative frequency plot of average daily DO data from the two-year period of alum applications (September 2013 through September 2015) was compared to the pre-development cumulative frequency to determine whether sufficient improvement to DO was achieved with the alum applications. It was determined that additional alum treatments to Canyon Lake will continue to improve water quality and make additional progress toward achieving the interim numeric targets for the response variables, chlorophyll-a and DO.

12.3.5.4 TMDL Task Specific to the District

The Regional Board approved the CNRP on July 19, 2013. The District has updated this LIP with the specific compliance tasks that it will implement and helps provide resources and services to the LE/CL TMDL Task Force.

12.3.5.5 Onsite Disposal Systems Management Plan

Task 6 of the LE/CL Nutrient TMDL Implementation Plan requires that no later than six (6) months after the effective date of an agreement between the County of Riverside and the Santa Ana Regional Board to implement regulations adopted pursuant to Water Code Sections 13290-13291.7, or if no such agreement is required or completed, within 12 months of the effective date of these regulations, the County and the Cities of Perris, Moreno Valley, and Murrieta shall, as a group, submit a septic system management plan to identify and address nutrient discharges from septic systems within the San Jacinto Watershed. The Septic System Management Plan implements regulations adopted by the State Water Resources Control Board pursuant to California Water Code Sections 13290 – 13291.7.

The State Water Resources Control Board (SWRCB) is currently promulgating regulations for Sections 13290-13291.7. Upon adoption of these regulations by the SWRCB, the named Permittees will develop the required Septic System Management Plan in accordance with Task 6. The Septic System Management Plan may be incorporated into the DAMP and/or WQMP upon its completion.

The County of Riverside adopted Ordinance 856 on August 29, 2006 which prohibited new septic systems in two designated areas of Quail Valley, which is within the San Jacinto Watershed. This prohibition affects 1,530 lots, constituting 59% of the undeveloped lots in those areas. The Ordinance also mandated the connection of all existing homes in Quail Valley to a sewer system within one (1) year of its availability. In addition to this Ordinance the Department of Environmental Health refined the review process for septic systems and revised County Ordinance 650 on May 18, 2006 to preclude lots that would be contributory to the surfacing septic waste issue in the region.

In addition, the Permittees partnered with the San Jacinto River Watershed Council to obtain a Proposition 50 IRWM Planning Grant, which included a task to develop preliminary data for a septic system management plan for the San Jacinto Watershed that was completed on November 17, 2007. The grant funded the development of a map of areas of concentrated septic systems that may be adversely impacting

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surface waters or groundwaters within the watershed and a basis for prioritizing response actions. The Prop 50 IRWM Planning Grant Septic System Management Plan will form the basis for the final Task 6 Septic System Management Plan, which will be completed no later than six months after the effective date of an agreement between the County of Riverside and the Santa Ana Regional Board to implement regulations adopted pursuant to Water Code Sections 13290-13291.7, or if no such agreement is required or completed, within 12 months of the effective date of these regulations.

12.3.5.5.1 Urban Discharges

Task 7 of the LE/CL Nutrient TMDL Implementation Plan mandates that various urban runoff dischargers modify compliance documents as necessary to comply with the LE/CL Nutrient TMDL. Tasks 7.1 and 7.2 require the specified Permittees (County of Riverside, Cities of Beaumont, Canyon Lake, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Perris, Riverside, and San Jacinto) to modify the DAMP and WQMP (Appendix I to the DAMP), respectively, to address TMDL Implementation Plan requirements. These revisions were completed. Necessary revisions to comply with Tasks 7.1 and 7.2 are incorporated throughout the DAMP and are summarized in the following paragraphs, specifically:

- ◆ A summary of the Permittees' strategy for complying with the LE/CL TMDL WLA assigned to the specified Permittees.
- ◆ A description of the programmatic BMPs implemented by the Permittees to address this TMDL, including public education and outreach, inspection, and enforcement actions taken by the Permittees.
- ◆ In addition, a description of the Permittees' participation in the LE/CL TMDL Task Force and LESJWA and their roles in assisting the Permittees in implementing Tasks 4, 9, 10, 11, and 12 of the LE/CL Nutrient TMDL Implementation Plan.
- ◆ A description of how the Permittees propose to address BMP effectiveness evaluations.
- ◆ A description of how the Permittees propose to conduct monitoring to determine compliance with LE/CL Nutrient TMDL WLAs assigned to the Permittees.
- ◆ In addition to the compliance programs specified above, the Permittees also implement the following additional compliance programs that manage nutrient discharges to Lake Elsinore and Canyon Lake:
 - The Permittees have coordinated with local sanitary sewer operators to develop a Sanitary Sewer Overflow (SSO) response procedure designed to protect the MS4 from impacts of SSOs. In addition, the Permittees have summarized County Health Department regulations related to septic system management.
 - The Permittees implement a comprehensive HHW collection program designed to collect fertilizers among other potential pollutants. This collection program helps to reduce the nutrient loading from urban areas to Lake Elsinore and Canyon Lake.
 - Applicable Permittee public works projects are required to comply with WQMP requirements (Section 5.1 of the DAMP). See DAMP Appendix I for specific WQMP requirements that address TMDLs.

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- Permittee construction projects are required to comply with the provisions of the CGP, including the preparation of a SWPPP. The SWPPP ensures that stormwater and non-stormwater pollutant discharges, including sediments, nutrients, and other pollutants from Permittee construction projects are mitigated.
- The Permittees developed maintenance schedules and report on BMP and MS4 maintenance activities annually. The maintenance schedules promote proper operation of publicly owned BMPs and MS4 facilities and assist with mitigating pollutant discharges from MS4s and effective pollutant removal from BMPs. The maintenance schedule and general procedures for the operations and maintenance of the District's MS4 system can be found in Appendix B.4.
- The Permittees are required to develop, implement, and maintain facility-specific pollution prevention plans. A summary of applicable nutrient-related BMPs to be incorporated into the facility-specific PPPs is provided. Nutrient management measures include BMPs for outdoor material storage, building and grounds maintenance, housekeeping practices, landscape maintenance, and water and sewer utility maintenance. Additional BMPs are identified and incorporated as necessary to address unique discharges from the facility.
- During General Plan updates, the Permittees are asked to evaluate their General Plans' ability to address several policy questions including, "Are there existing or proposed TMDLs or other such regulations pertaining to Receiving Waters in the jurisdiction?" If so, the Permittees are asked to consider additional watershed protection principles and objectives for managing urban runoff.
- The Permittees have implemented procedures to ensure that New Development and Significant Redevelopment projects address their water quality impacts. These procedures include requiring developers to identify the impacts of their projects, propose appropriate BMPs to mitigate those impacts, and identify perpetual maintenance mechanisms to ensure that those BMPs will continue to function throughout the life of the development. Requirements for project types rising to WQMP status are addressed in Appendix I of the DAMP. Projects not rising to WQMP status, defined as 'Other Development Projects' are also required to mitigate their impacts. The DAMP specifically notes that Other Development Projects are required to implement Site Design BMPs and Source Control BMPs. Other Development Projects may also be required to implement Treatment Control BMPs if they discharge urban runoff to receiving waters listed as impaired on the State Board's 303(d) list.
- The WQMP is designed to specifically address the TMDL requirements. Per Provision XII.D.2 of the 2010 SAR MS4 Permit, the Permittees must require developments of the applicable categories to implement a WQMP. BMPs must include LID BMPs including minimizing urban runoff, conserving natural areas and minimizing directly connected impervious areas. Source Control BMPs include resident education (including garden and lawn care guides, pet waste brochures and HHW/ABOP event brochures), irrigation system and landscape maintenance restrictions, common area litter control, drainage facility inspection and maintenance, wash water controls for food preparation areas, and properly designed trash storage areas and outdoor material storage areas. Developers must also

propose adequate operation, maintenance, and funding mechanisms to ensure the efficacy of the BMPs for the life of the development.

- The District has also developed new, more comprehensive BMP guidance for use by the Permittees and the development community to assure compliance with the nutrient WLAs for urban runoff. The revised guidance focuses on landscape based BMPs with infiltration components. These BMPs are more effective at addressing nutrient sources from New Development by reducing runoff volume and trapping nutrients in sand media.
- Construction sites that disturb an area greater than one acre and are located adjacent to, within 200 feet of, or directly discharge to an identified impaired waterbody within the Permit area are assigned a high priority for wet weather inspections.
- The Permittees are required to inspect a number of industrial and commercial facilities including nurseries, greenhouses, landscape and hardscape installation business bases of operation, restaurants, and facilities handling hazardous wastes. The Permittees review the activities of these businesses to ensure compliance with local stormwater ordinances and the 2010 SAR MS4 Permit. Inspectors specifically look for observations of non-stormwater discharges, potential Illicit Connections and illegal Discharges to the MS4, and for implementation and maintenance of appropriate minimum BMPs, including a quantitative assessment of the effectiveness of the BMPs implemented. Appropriate education materials are also distributed.

123.5.6 Other TMDL Tasks Including Permittee Dischargers

The following tasks outlined in the LE/CL TMDL¹ are assigned to a number of stakeholders in the TMDL, including specific Permittees. The major task being undertaken by the LE/CL Task Force is the revision of the TMDL. The TMDL Technical Report was submitted to the Santa Ana Regional Board in December 2018, and the draft Basin Plan Amendment Package was circulated for public review and peer review during the first half of 2019. The Task Force and the Regional Board staff are working on addressing peer review comments and bringing this before the Santa Ana Regional Board.

123.5.7 Effectiveness Analysis

The existing effectiveness and qualitative assessments described in the DAMP meet TMDL BMP evaluation requirements. In summary, the District annually reviews its programs for indications of internal process/procedure deficiencies that need to be addressed to properly implement specified BMPs. Every five years as part of the ROWD, the District evaluates the overall effectiveness of its MS4 programs, including attainment of specified WLAs and TMDL Implementation Plan requirements, and make appropriate changes to MS4 Permit compliance programs. As part of CNRP submittal, an annual reporting worksheet was created to track the progress the Permittees are making toward implementation.

123.5.8 Monitoring for Compliance with the TMDL

Urban WLA compliance monitoring is achieved through Task 4 of the TMDL Implementation Plan, which requires three separate monitoring programs (watershed-wide, Lake Elsinore, and Canyon Lake monitoring programs). The three monitoring programs are administered by the TMDL Task Force to determine compliance with TMDL WLAs and LAs. The monitoring program is supported by District staff and funded

¹http://www.sawpa.org/tmdl/Lake_Elsinore_Canyon_Lake.html

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from designated Permittees. The TMDL Task Force prepares and submits annual reports on behalf of the Permittees.

In addition, the Permittees' NPDES MS4 Monitoring Program also collects data on nutrient discharges. The Permittees also participate in regional monitoring efforts sponsored by the Southern California Stormwater Monitoring Coalition, the Southern California Coastal Watershed Research Group, California Stormwater Quality Association, and other groups as appropriate. Data and conclusions from these programs are analyzed and summarized as part of the Permittees' annual monitoring reports.

12.4 THE MIDDLE SANTA ANA RIVER TMDL

12.4.1 Regional Board Action History

In August 2001, the Santa Ana Regional Board initiated TMDL development to address the excess levels of Bacterial Indicators in Reach 3 of the Santa Ana River, Cucamonga Creek, and Mill Creek. This effort included the formation of the Middle Santa Ana River (MSAR) TMDL Workgroup. This workgroup (which includes representatives from cities in Riverside, San Bernardino, and Los Angeles counties, the Counties of Riverside and San Bernardino, agriculture and dairy operators, and environmental groups) worked in cooperation with Santa Ana Regional Board staff to assess Bacterial Indicator sources to the impaired waterbodies and identify potential mitigation measures.

The objectives of the workgroup efforts include the development and implementation of a water quality monitoring program to evaluate in-stream "Bacterial Indicator" concentrations. In addition, a field survey was conducted to evaluate the extent, frequency, and degree to which these waterbodies are used by the public for recreational activities (REC-1 and REC-2). Funding for this project has been provided in full or in part through an agreement with the State Board pursuant to the Costa-Machado Water Act of 2000 (Proposition 13) and any amendments thereto for the implementation of California's Nonpoint Source Pollution Control Program.

Beginning in February 2002, the workgroup developed and implemented an extensive Bacterial Indicator water quality monitoring program. Samples were collected by Santa Ana Regional Board staff and stakeholder agencies at 10-13 locations on a weekly basis for nine 30-day sampling periods. These sampling periods occurred during February, March, July and September of 2002, January and March of 2003, and from January through mid-April 2004. Agencies who participated in the monitoring program included the San Bernardino County Flood Control District, City of Riverside, Orange County Water District, Inland Empire Utilities Agency, and Chino Basin Watermaster. Results of this program verified significant impairments to the identified waterbodies and established the basis of the Santa Ana Regional Board TMDL Report.

The TMDL workgroup also conducted a Beneficial Use survey of the watershed as part of the data collection effort to support the development of TMDLs for the Middle Santa Ana River Watershed. The primary objective of this effort was to collect data to evaluate the extent, frequency, and degree to which the Santa Ana River Channel and its Chino Basin tributaries are used by the public for recreational activities (REC-1 and REC-2). The Middle Santa Ana River TMDL was adopted by the Regional Board on August 26, 2005.

Riverside County Flood Control and Water Conservation District LIP

The 2010 SAR MS4 Permit incorporated requirements addressing the MSAR TMDL. The 2010 SAR MS4 Permit allowed the Permittees to propose a CBRP for the MSAR TMDL by December 31, 2010. The Regional Board approved the CBRP on February 10, 2012 and it is now a narrative WQBEL for the MSAR TMDL.

12.4.2 MSAR TMDL Task Force

In 2002, the stakeholder groups formed a TMDL Task Force. TMDL Task Force efforts have been coordinated and administered through the Santa Ana Watershed Project Authority (SAWPA), a joint powers authority. SAWPA's jurisdiction extends throughout the Santa Ana River Watershed, crossing over multiple jurisdictional lines. Their jurisdictional scope and expertise have been instrumental in carrying out interagency functions. The purpose of the Task Force is to conduct studies necessary to collect data to analyze sources of impairments and potential mitigation measures, pursue grants, and coordinate activities among all of the various stakeholders.

The TMDL Implementation Plan also provides for an initial phase of data collection and analysis necessary to determine if a Use Attainability Analysis, Site-Specific Objective or other regulatory actions such as modifications to TMDL numeric targets, LAs or WLAs are appropriate. The Storm Water Quality Standards Task Force (SWQSTF) was created to reevaluate Water Quality Standards as they relate to stormwater and dry weather flows within the watershed necessary to protect REC-1 Beneficial Uses. Changes to the Water Quality Standards and an evaluation of Beneficial Uses would be incorporated into the Basin Plan through the triennial review process.

12.4.3 Comprehensive Bacteria Reduction Plan

The MSAR Permittees prepared a Comprehensive Bacteria Reduction Plan (CBRP) that describes the specific actions that have or will be taken to achieve compliance with the Urban WLA during the Dry Season (April 1st through October 31st) by December 31, 2015. The Regional Board approved the CBRP as a final WQBEL for the Dry Season Urban WLA on February 10, 2012. In approving the CBRP as the final WQBEL, the Regional Board found that the CBRP, when fully implemented, shall achieve the Urban WLA for Bacterial Indicator. The CBRP is currently being implemented and will be updated and/or revised based on findings from implementation of the CBRP once a new SAR MS4 Permit is developed and approved.

12.4.4 Final WQBELs for MSAR Bacterial Indicator TMDL under Dry Season Conditions

Section VI.D.1 of the 2010 SAR MS4 Permit requires that the final WQBELs for Bacterial Indicators during the Dry Season in the MSAR must be achieved by December 31, 2015. For the MSAR TMDL, the approved CBRP is the narrative WQBEL.

In cooperation with the San Bernardino County MSAR MS4 Permittees, the Riverside County MSAR Permittees developed and obtained Regional Board approval for the CBRP. The CBRP describes the specific actions that have or will be taken to achieve compliance with the Urban WLA during the Dry Season (April 1st through October 31st). The CBRP includes:

1. Schedule for developing Ordinances (where necessary) to reduce the concentration of Bacterial Indicators in urban sources.

Riverside County Flood Control and Water Conservation District LIP

2. The specific BMPs implemented to reduce the concentration of Bacterial Indicators from urban sources and the water quality improvements expected to result from these BMPs.
3. The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of WQOs for Bacterial Indicators.
4. Process for identifying regional and/or sub-regional treatment facilities to reduce the levels of Bacterial Indicator discharged from urban sources should result from source evaluation indicates that it is necessary to propose such facilities.
5. The scientific and technical documentation used to conclude that the CBRP, once fully implemented, is expected to achieve compliance with the Urban WLA for Bacterial Indicators.
6. A detailed schedule for implementing the CBRP. The schedule identified discrete milestones to assess satisfactory progress toward meeting the Urban WLA during the Dry Season. The schedule also indicates which agency or agencies are responsible for meeting each milestone.
7. The specific metric(s) that were established to demonstrate the effectiveness of the CBRP and acceptable progress toward meeting the Urban WLA for Bacterial Indicator.
8. Detailed descriptions of any additional BMPs planned, and the time required to implement those BMPs, in the event that data from the watershed-wide water quality monitoring program indicates that WQOs for Bacterial Indicators are still being exceeded after the CBRP is fully implemented.
9. A schedule for developing a CBRP needed to comply with the Urban WLA for Bacterial Indicator during the Wet Season (November 1st through March 31st) to achieve compliance by December 31, 2025.

The CBRP is currently being implemented and will be re-evaluated during the new SAR MS4 Permit to determine if a revision or updates are necessary. In the event that no updates/revisions are needed, then the Urban WLA for the Dry Season specified in the MSAR TMDL will become the final numeric WQBELs for Bacterial Indicators in the Dry Season as follows:

- ◆ WLA for Fecal Coliform from Urban Sources for the Dry Season (April 1st through October 31st)². 5-sample/30-day logarithmic mean less than 180 organisms/100mL and not more than 10% of the samples exceed 360 organisms/100mL for any 30-day period.
- ◆ WLA for *E. coli* from Urban Sources for the Dry Season (April 1st through October 31st)³. 5-sample/30-day logarithmic mean less than 113 organisms/100 mL and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period.

² 5-sample/30-day logarithmic mean less than 180 organisms/100mL and not more than 10% of the samples exceed 360 organisms/100mL for any 30-day period.

³ 5-sample/30-day logarithmic mean less than 113 organisms/100 mL and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period.

12.4.5 District Compliance Strategy

12.4.5.1 Implementation Plan

The overall implementation steps and elements that the MSAR Permittees are implementing to comply with the MSAR TMDL are incorporated into the approved CBRP and described below. The specific actions the District has taken consistent with the CBRP are described in each applicable annual report.

12.4.5.2 CBRP Implementation-Specific BMPs

The CBRP includes seven BMPs to be implemented:

1. Transient Camps: The Permittees will continue to report to the District the locations of known or discovered transient camps within the District's MS4, which may be contributing to elevated levels of bacteria in Dry Weather flows, and to coordinate with the District as necessary for the removal of the encampment. In addition, if the District discovers, as a result of the Urban Source Evaluations described in Section 12.3.5.4, any transient camps outside of the MS4 that are impacting water quality, the District will coordinate transient camp closures in coordination with appropriate local agencies.
2. IDDE Program: The District implements the IDDE Program described in Section 4.0 of this LIP to reduce or eliminate problematic Dry Weather flows to the MS4.
3. Street Sweeping and Debris Removal: The Permittees will continue to implement street sweeping practices as described in Section 5 of the DAMP to help remove pollutants, including bacterial indicator sources, before they enter the MS4. The Permittees have evaluated the need to revise existing practices to reduce sources of Bacterial Indicators in the watershed.
4. Irrigation or Water Conservation Practices: The District assisted the Permittees in evaluating existing irrigation and water conservation BMPs to determine if enhancements to existing BMPs where necessary.
5. Water Quality Management Plan Revision: The Permittees revised the WQMP per the schedule in the CBRP (Attachment E).
6. Septic System Management Plan: The Permittees addressed this requirement per the schedule in the CBRP (Attachment E).
7. Pet Waste Management: The Permittees addressed this requirement per the schedule in the CBRP (Attachment E)

12.4.5.3 CBRP Implementation-Inspection Criteria

The MSAR TMDL Permittees, working together through the MSAR TMDL Task Force, have collected data from Tier 1 sites as outlined in the CBRP. This data will be used to make informed decisions regarding the potential for each MS4 Outfall or group of outfalls to discharge controllable sources of Bacterial Indicators. A summary report of the findings of the Tier 1 monitoring, with prioritized drainage areas for source assessments, was developed and submitted to the Regional Board on March 31, 2013. In these prioritized drainage areas, the District's Watershed Protection Division assists the Permittees with conducting source assessments and evaluating mitigation alternatives. As necessary,

Riverside County Flood Control and Water Conservation District LIP

this assessment will include sampling of Tier 2 sites upstream of the impacted Tier 1 site. A report which included alternatives to mitigate sources of controllable Bacterial Indicator sources within the prioritized drainage area was developed in December 2014. The District has assisted the Permittees in selecting a mitigation alternative based on the finding of the Tier 2 monitoring report. If a non-structural BMP was selected as their mitigation alternative, the Permittees then implemented non-structural BMP. On the other hand, if a Structural BMP was selected as their mitigation alternative, the Permittees then completed the project identification phase of the CIP process prior to March 31, 2015. Details on this element of CBRP implementation as well as an implementation schedule are contained in the CBRP (Attachment C and E, see DAMP Appendix M).

12.4.5.4 CBRP Implementation-Regional Treatment

In response to the Urban Source Evaluations described in Section 12.4.5.3 above, the District has identified Structural BMPs to help mitigate the controllable urban sources of Dry Weather flows and Bacterial Indicators. The proposed BMPs are outfall specific, but future BMPs as needed may be constructed for regional benefits. In addition, the Permittees are implementing the approved Watershed Action Plan which includes an evaluation of retrofit opportunities (update to the 2005 BMP Retrofit Study). The District has considered the results of this study to help select mitigation alternatives for prioritized drainage areas resulting from Tier 2 monitoring report. The District will work with the Permittees to take proposed structural BMP(s) through their Capital Improvement Project process to BMP construction.

The District in coordination with the Permittees have identified three outfall sites that Structural BMPs can be implemented to mitigate controllable urban sources of Dry Weather flows and Bacterial Indicators. Eastvale MDP Line D and Eastvale MDP Line E are two Structural BMPs that are currently in the CIP. The District and its partners are considering to potentially divert dry weather flows to an existing sewer system by aiming to capture and treat dry weather flows.

The District is working with the City of Riverside to evaluate the feasibility of diverting this small volume of dry weather flows from the MS4 system to the City's Riverside Water Quality Control Plant by means of a sewer diversion.

13.0 PROGRAM REPORTING, EVALUATION, AND REVISION

The District implements the reporting (Section 12.1), program evaluation (Section 12.2), and program revision elements (Section 12.4) described in the DAMP.

District staff that implements these requirements are identified in Appendix A.2.

13.1 PROGRAM OVERVIEW

The District maintains a map of the MS4 facilities that it owns and operates, and outfalls to Receiving Waters (IX.E.a of the 2010 SAR MS4 Permit). Each year, the District updates this map and identifies modifications and additions to its major MS4 facilities in the Annual Report (III.B.2.g of the 2010 SAR MS4 Permit).

13.2 PROGRAM MANAGEMENT

13.2.1 Interagency Agreements

Interagency agreements and other cooperative activities supporting the implementation of the 2010 SAR MS4 Permit requirements are described in the DAMP (III.B.2.e). Modifications to the interagency agreements and changes in the cooperative activities are described in the Annual Reports.

13.2.2 Fiscal Analysis

Each year the expenditures incurred during the preceding fiscal year and the budgeted expenditures planned for the current and next fiscal year are provided in the Annual Report (XVIII.B.1, 2, 3, 5 of the 2010 SAR MS4 Permit). The table presented in Figure 3-1 is suggested for use in reporting the District's fiscal information.

13.2.3 Legal Authority

In October 2011, the District submitted an updated certification statement, signed by the County Counsel that all necessary legal authority in accordance with 40 CFR 122.26(d)(2)(i) (A-F) and to comply with the 2010 SAR MS4 Permit through adoption of ordinances and/or municipal code modifications.

13.3 ELIMINATION OF IC/IDS

13.3.1 MS4 Facility Inspections

The District's schedule to conduct and implement systematic investigations of MS4 open channel facilities is described in Section 5.6.3 herein and for Major Outfalls is described in Section 4.2.4 herein (IX.E.b of the 2010 SAR MS4 Permit).

The District annually reviews and evaluates the IC/ID Program to determine if the program needs to be adjusted. Findings of the reviews and evaluations are submitted in the Annual Report (IX.G of the 2010 SAR MS4 Permit).

13.3.2 IC/ID Database

The District provides the IC/ID database and evaluations of the IC/ID component of the LIP in the Annual Reports (IX.H of the 2010 SAR MS4 Permit).

These measurable goals are considered in an overall assessment of the effectiveness of the IC/ID component. In addition, major accomplishments of the IC/ID component and changes to be implemented in the subsequent year to improve the effectiveness of the program are included in the Annual Report. A reporting form for summarizing this evaluation is included in the DAMP.

13.4 DISTRICT FACILITIES AND ACTIVITIES

13.4.1 Facilities and Activities

The findings of an annual evaluation of the District's activities and facilities to determine the need for revisions to Section 5 of the DAMP or the Permittee component of the LIP and a schedule for any needed revisions will be included in the Annual Report (XIV.A of the 2010 SAR Annual Report).

In addition, major accomplishments of the Permittee activities and facilities component and changes to be implemented in the subsequent year to improve the effectiveness of the program will be included in the evaluation. A reporting form for summarizing this evaluation is included in the DAMP.

13.5 DEVELOPMENT PLANNING

13.5.1 Watershed Action Plan

The WAP and supporting documents were approved by the Regional Board on April 20, 2017. This LIP was revised when the Watershed Action Plan was approved by the Regional Board.

13.5.2 Hydromodification Management Plan

The WAP and supporting documents including the Hydromodification Management Plan were approved by the Regional Board on April 20, 2017.

13.5.3 WQMP

The SAR Permittees are using the approved 2012 WQMP that addresses LID principles and HCOC consistent with the MEP standard. A revised WQMP incorporating the WAP and a proposed spreadsheet for minimizing the size of bioretention BMPs was submitted to the Regional Board in November 2019.

13.5.4 LID Feasibility Criteria

By July 29, 2011, the SAR Permittees developed technically based feasibility criteria for project evaluation to determine the feasibility of implementing LID BMPs. These criteria were submitted to the Regional Board for approval (XII.G.1 of the 2010 SAR MS4 Permit).

By January 29, 2012, the SAR Permittees developed a procedure for streamlining regulatory agency approval of regional Treatment Control BMPs. The findings of a review of these procedures have been included in the Annual Report (XII.D.5 of the 2010 SAR MS4 Permit).

13.5.5 Annual Report

An evaluation of the development planning component of the LIP is also included in each Annual Report.

In addition, major accomplishments of the development planning component and changes to be implemented in the subsequent year to improve the effectiveness of the program will be included in the evaluation.

13.6 PRIVATE DEVELOPMENT CONSTRUCTION ACTIVITY

13.6.1 Construction Site Database

The District maintains an electronic database inventory of all active Construction Sites within District rights of way. This database is made available to the Regional Board upon request.

13.6.2 Notifications

When the District receives notice by its staff or a third party of a non-emergency situation representing a possible violation of the CGP issued to a Construction Site, the District provides oral or e-mail notice to the Regional Board of the location where the incident occurred and the nature of the incident.

13.6.3 Annual Reports

An evaluation of the construction component of the LIP will also be included in the Annual Report.

In addition, major accomplishments of the construction component and changes to be implemented in the subsequent year to improve the effectiveness of the program will be included in the evaluation.

13.7 PUBLIC EDUCATION

As part of the Annual Report, the District will review its public education and outreach efforts and revise its activities to adapt to the needs identified in the annual reassessment of program priorities with particular emphasis on addressing pollutants of concern (XIII.A of the 2010 SAR MS4 Permit). A status report on the requirements of Section XIII of the 2010 SAR MS4 Permit and any changes to the ongoing public education program will be described in the Annual Report (XIII.B of the 2010 SAR MS4 Permit).

13.8 TRAINING

Formal training will be summarized and documented in the Annual Reports.

14.0 MONITORING

The 'area-wide' monitoring program is described fully in the CMP, and includes routine monitoring for the Santa Ana Region, TMDL-based monitoring, regional monitoring, and integrated watershed monitoring activities.

In addition, proactive IC/ID Outfall investigations are conducted by the District in accordance with Section 4.2.4 herein.

APPENDIX A Program Management

- A.1 Summary of District MS4 Facilities**
- A.2 LIP Departmental Responsibilities**
- A.3 Interagency and Interdepartmental Agreements**
- A.4 Stormwater/Urban Runoff Ordinances**
- A.5 Certification of Legal Authority**

Summary of District MS4 Facilities

MS4 Facility Type	Number of Facilities	Length/Size of MS4 Facility Type
Underground Storm Drains	2,064	381 miles
Open Channels	881	252 miles
Levees	40	28 miles
Retention and Detention Basins	76	1,555 acres

Riverside County Flood Control and Water Conservation District LIP

Table A-2. LIP Departmental Responsibilities

Program Element (Permit reference)	LIP Section	Responsible Division/Section	Responsible Staff (Name or Title as appropriate)
3.0 Program Management (III, VI, VII, VIII)	3.1 – Departmental Responsibilities – Maintain matrix	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or Senior Civil Engineer/EPM
	3.2 – Cooperative Activities		
	3.3 – Fiscal Resources		
	3.4 – Legal Authority		
	3.7 – Policies and Procedures		
	3.9 – Receiving Water Limitations		
4.0 Elimination of Illicit Connections and Illegal Discharges (IX)	4.1 IC/ID Prevention	Varies as described in this table for LIP Sections 5 through 9	Varies
	4.2.1 MS4 Facility Inspections –	Maintain Inventory & Map – Operations and Maintenance/Operations Engineering	EPM/Senior Civil Engineer
	4.2.1 MS4 Facility Inspections -	Conduct Inspections – Operations and Maintenance/Maintenance	Maintenance Superintendent
	4.2.2 Third-Party IC/ID Reports	Watershed Protection/Water Quality Compliance	NPDES Coordinator
	4.2.3 IC/ID Construction Site Inspections	Design and Construction/Construction Management	EPM/Senior Civil Engineer
		Plan Check/Planning	EPM/Senior Civil Engineer
	4.2.4 IC/ID Monitoring Activities	Watershed Protection/Watershed Monitoring	Senior Flood Control Planner
	4.2.5 Non-Jurisdictional IC/IDs	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or Senior Civil Engineer/EPM

Riverside County Flood Control and Water Conservation District LIP

Program Element (Permit reference)	LIP Section	Responsible Division/Section	Responsible Staff (Name or Title as appropriate)
	4.2.6 Sewage Management	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or Senior Civil Engineer/EPM
	4.3 IC/ID Response and Reporting	Initial Investigation – Watershed Protection	Senior Flood Control Planner or Senior Civil Engineer/EPM
		Source Investigation – Watershed Protection/Watershed Monitoring	Senior Flood Control Planner
		Elimination – Coordination with local code enforcement agencies and known Dischargers: Watershed Protection	Senior Flood Control Planner or Senior Civil Engineer/EPM
	4.4 IC/ID Database	Watershed Protection	NPDES Coordinator
5.0 Permittee Facilities and Activities (XII, XIV))	5.1 Planning Permittee Facilities	Planning Projects – Planning/Project Planning	EPM/Senior Civil Engineer
		Review WQMP Applicability Checklist – Design and Construction/Design	EPM/Senior Civil Engineer
	5.2 – WQMP Review & Approval	Design and Construction/Design	EPM/Senior Civil Engineer
	5.3 – Road Projects	N/A with exceptions to potential partnerships and coordination with County Transportation	
	5.4 – Project Closeout	Design and Construction/Construction Management	EPM/Senior Civil Engineer
	5.5 – Permittee Construction Activities	Submit PRDs – Design and Construction	EPM/Senior Civil Engineer (Submittal of documents), Principal Engineer (Approval)
		Prepare 90% Construction SWPPP – Design and Construction/Design	EPM/Senior Civil Engineer
		Review of 90% Construction SWPPP – Watershed Protection/Water Quality Compliance	EPM/Senior Civil Engineer or Senior Flood Control Planner
		Final SWPPP – Contractor	N/A
		Construction Inspection – Design and Construction/Construction Management	EPM/Senior Civil Engineer

Riverside County Flood Control and Water Conservation District LIP

Program Element (Permit reference)	LIP Section	Responsible Division/Section	Responsible Staff (Name or Title as appropriate)
		Notify Executive Officer of Non-Compliance – Watershed Protection	Division Chief
		Conduct CGP monitoring – Design and Construction/Construction Management	Division Chief
		Submit NOT – Design and Construction/Construction Management	Division Chief
	5.6 – Operation & Maintenance of Permittee Facilities	Operations and Maintenance	Maintenance Section
	5.6.1 Inventory of Facilities	Operations and Maintenance/Operations Engineering	EPM/Senior Civil Engineer
	5.6.2 FPPPs	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or EPM/Senior Civil Engineer
	5.6.3 Annual Inspection	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or EPM/Senior Civil Engineer
	5.6.4 Municipal Activities	Implement BMPs – Operations and Maintenance/Maintenance	EPM/Senior Civil Engineer/Maintenance Superintendent
	5.6.5 MS4 Facility Maintenance	Operations and Maintenance/Maintenance	Maintenance Superintendent
	5.6.6 Landscape maintenance	Irrigation Schedules – Operations and Maintenance/Maintenance Section	Maintenance Superintendent
	5.6.7 Pesticide Application	Operations and Maintenance/Maintenance	Maintenance Superintendent
	5.6.8 Encroachment Permits	Planning/Plan Check	EPM/Senior Civil Engineer
	5.6.9 Trash BMPs	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or EPM/ Senior Civil Engineer/Maintenance Superintendent
	5.7 Permittee De Minimis Discharges	Design and Construction or Plan Check/Planning	EPM/Senior Civil Engineer
6.0 Development Planning (XII)	6.1 Introduction	N/A	
	6.2 General Plan	N/A	

Riverside County Flood Control and Water Conservation District LIP

Program Element (Permit reference)	LIP Section	Responsible Division/Section	Responsible Staff (Name or Title as appropriate)
	6.3 Watershed Action Plan	Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or EPM/Senior Civil Engineer
	6.4 CEQA Process	N/A for District, Refer to County LIP	
	6.5 Development Project Processing		
	6.5.1 WQMP Checklist		
	6.5.2 Identify WQMP Projects		
	6.5.3 Review Preliminary WQMPs	N/A for District, Refer to County LIP	
	6.5.4 Review Other Development Projects		
	6.5.5 Conditions of Approval		
	6.5.6 Review Final WQMPs		
	6.5.7 Grading/Building Permits	N/A for District, Refer to County LIP	
	6.5.8 Structural BMP Database		
	6.5.9 Field Verify BMPs		
	6.5.10 Post Construction BMP Inspections		
	6.5.11 Change of Ownership Recordation		
7.0 Private Development Construction (X & XI)			
	7.1 Verify CGP Coverage	See Sections 7.3 and 7.4	See Sections 7.3 and 7.4
	7.2 Inventory Database	Planning/Plan Check	EPM/Senior Civil Engineer
	7.3 Encroachment Permit Issuance	Planning/Plan Check	EPM/Senior Civil Engineer
	7.4 Inspect Construction Sites	Planning/Plan Check	EPM/Senior Civil Engineer
	7.5 Third-Party Notifications	Planning/Plan Check	EPM/Senior Civil Engineer

Riverside County Flood Control and Water Conservation District LIP

Program Element (Permit reference)	LIP Section	Responsible Division/Section	Responsible Staff (Name or Title as appropriate)
	7.6 Construction Enforcement	Construction Management/Design and Construction	EPM/Senior Civil Engineer
	7.7 Notifications to Regional Board	Watershed Protection or Design and Construction	Senior Flood Control Planner or Division Chief
8.0 Industrial and Commercial Sources (XI.B.&C)		N/A	
9.0 Residential Sources (XI.E)		N/A	
10.0 Public Education & Outreach (XIII)			
	10.1 Public Behavior Education - Riverside County Watershed Protection Program	Watershed Protection	Government Affairs Officer
	10.2 Pollutant Education - Riverside County Watershed Protection Program	Watershed Protection	Government Affairs Officer
	10.3 Business Education - Riverside County Watershed Protection Program	Watershed Protection	Government Affairs Officer
	10.4 Public Participation - Riverside County Watershed Protection Program	Watershed Protection	Government Affairs Officer
11.0 Training (XV)			
	11.1.1 Training Program Update	Watershed Protection	Administrative Services Analyst
	11.1.2 Training Recordkeeping	Watershed Protection	Administrative Services Analyst

Riverside County Flood Control and Water Conservation District LIP

Program Element (Permit reference)	LIP Section	Responsible Division/Section	Responsible Staff (Name or Title as appropriate)
	11.2 Elimination of IC/IDs	See 11.3 through 11.7	See 11.3 through 11.7
	11.3 Permittee Facilities and Activities	Watershed Protection	Administrative Services Analyst
	11.4 Development Planning	Watershed Protection	Administrative Services Analyst
	11.5 Private Development Construction Activity	Watershed Protection	Administrative Services Analyst
	11.6 Training Schedule	Watershed Protection	Administrative Services Analyst
12.0 TMDL Implementation (VI.D)		Watershed Protection/Water Quality Compliance and Watershed Monitoring	Senior Flood Control Planner or EPM/Senior Civil Engineer
13.0 Program Reporting, Evaluation, and Revision		Watershed Protection/Water Quality Compliance	Senior Flood Control Planner or EPM/Senior Civil Engineer
14.0 Monitoring (XIX)		Watershed Protection/Watershed Monitoring	Senior Flood Control Planner

**Insert Appendix A.3, Interagency and Interdepartmental
Agreements**

AGREEMENT DISTRIBUTION

DATE: **05/18/17**

NAME:

**Multi-Year Agreement for Hazardous Materials Emergency Response Team
Services FY 2017/18 to FY 2021/22**

PROJECT NO.: **N/A**

[] COOPERATIVE AGREEMENT

[**x**] **Multi-Year Agreement**

PARTIES: **District and COUNTY (Riverside County Fire Department)**

FROM: **TRI**

TO:	No. of Copies	No. of EC	Action / Comments
J. Uhley		1	
B. Monroy	1		Original for scanning. Please return orig.
Dept Contact (incl Division Chief)		1	Stuart McKibbin & Charlene Warren - Watershed Protection Division
Construction Inspection			
Account Payable			
Finance		1	Copy for file
Tract File			
Agreements		1	Copy for file

SUBMITTAL TO THE FLOOD CONTROL AND
WATER CONSERVATION DISTRICT
BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA



ITEM
11.2
(ID # 3940)

MEETING DATE:
Tuesday, May 9, 2017

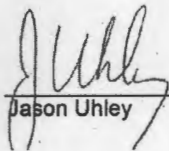
FROM : FLOOD CONTROL DISTRICT:

SUBJECT: FLOOD CONTROL DISTRICT: Multi-Year Agreement for Hazardous Materials
Emergency Response Team Services, ALL Districts; Contract Number of Years:
5; [\$1,825,000] District Funds 100%

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve the Multi-Year Agreement between the District and the County of Riverside;
and
2. Authorize the Chairman to execute the Multi-Year Agreement on behalf of the District.

ACTION: Policy

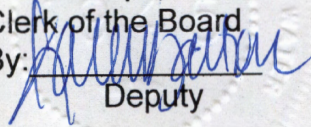

Jason Uhley

4/18/2017

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Tavaglione, seconded by Supervisor Jeffries and duly
carried by unanimous vote, IT WAS ORDERED that the above matter is approved as
recommended.

Ayes: Jeffries, Tavaglione, Washington and Ashley
Nays: None
Absent: None
Date: May 9, 2017
xc: Flood

Kecia Harper-Ihem
Clerk of the Board
By: 
Deputy

**SUBMITTAL TO THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT BOARD
OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

FINANCIAL DATA	Current Fiscal Year	Next Fiscal Year	Total Cost	Ongoing Cost
COST	\$ 0	\$365,000	\$1,825,000	\$ 0
NET COUNTY COST	\$ 0	\$365,000	\$1,825,000	\$ 0
SOURCE OF FUNDS: See Source of Funds Supplemental			Budget Adjustment: No	
			For Fiscal Year: 17/18 – 21/22	

C.E.O. RECOMMENDATION: Approve

BACKGROUND:

Summary

This Agreement is necessary for the District to contribute funds to the Riverside County Fire Department's Hazardous Materials Emergency Response Team for emergency response services to control the discharge of pollutants in runoff to waters of the United States.

The National Pollutant Discharge Elimination System (NPDES) Permits for Riverside County require Riverside County's municipal stormwater permittees (District, County of Riverside, Coachella Valley Water District, and the incorporated Cities) to respond to emergency spills in the County of Riverside.

In compliance with the NPDES Permits, the District has chosen to continue to help financially support the Hazardous Materials Emergency Response Team for its emergency response services.

County Counsel has approved this Agreement as to legal form. A companion item appears on the County of Riverside's agenda this same date.

Previous Agreement referenced on May 21, 2013 as agenda item 11-2.

Impact on Residents and Businesses

Existing funding mechanisms (Special Revenue Zone Funds) will be utilized for District cost-share expenditures; no incremental impact to residents or private businesses.

SUPPLEMENTAL:

Additional Fiscal Information

The financial contribution to help support Hazardous Materials Emergency Response Team for Fiscal Years 2017/18 through 2021/22 will be paid annually in the amount of three hundred sixty-five thousand dollars (\$365,000) for a total of one million eight hundred twenty-five thousand dollars (\$1,825,000).

			FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	Total
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**SUBMITTAL TO THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT BOARD
OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

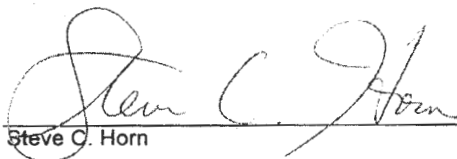
ZONE 1	25110 (221)	16.9%	\$ 61,685.00	\$ 61,685.00	\$ 61,685.00	\$ 61,685.00	\$ 61,685.00	\$308,425.00
ZONE 2	25120 (222)	27.7%	\$101,087.00	\$101,087.00	\$101,087.00	\$101,087.00	\$101,087.00	\$505,435.00
ZONE 3	25130 (223)	4.3%	\$ 15,695.00	\$ 15,695.00	\$ 15,695.00	\$ 15,695.00	\$ 15,695.00	\$ 78,475.00
ZONE 4	25140 (224)	27.6%	\$100,758.00	\$100,758.00	\$100,758.00	\$100,758.00	\$100,758.00	\$503,790.00
ZONE 5	25150 (225)	6.0%	\$ 21,827.00	\$ 21,827.00	\$ 21,827.00	\$ 21,827.00	\$ 21,827.00	\$109,135.00
ZONE 6	25160 (226)	9.1%	\$ 33,069.00	\$ 33,069.00	\$ 33,069.00	\$ 33,069.00	\$ 33,069.00	\$165,345.00
ZONE 7	25170 (227)	8.5%	\$ 30,879.00	\$ 30,879.00	\$ 30,879.00	\$ 30,879.00	\$ 30,879.00	\$154,395.00
								\$1,825,000.00

Contract History and Price Reasonableness

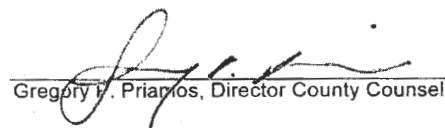
The Multi-Year Agreement for Hazardous Materials Emergency Response Team is a continued partnership to support the MS4 Permit compliance program. The costs remain unchanged from the previous 5-year agreement.

ATTACHMENTS:

Multi-Year Agreement


Steve C. Horn

5/1/2017


Gregory V. Priamos, Director County Counsel

4/17/2017

MULTI-YEAR AGREEMENT

For Hazardous Materials Emergency Response Team

Services FY 2017/18 to FY 2021/22

The Riverside County Flood Control and Water Conservation District ("DISTRICT"), and the County of Riverside ("COUNTY"), hereby agree as follows concerning COUNTY'S Hazardous Materials Emergency Response Team:

RECITALS

A. Congress in 1987 added Section 402(p) to the Federal Clean Water Act (CWA) {33 U.S.C. §1342(p)}; and

B. Section 402(p) requires certain municipalities to obtain a National Pollutant Discharge Elimination System (NPDES) Permit to discharge stormwater from Municipal Separate Storm Sewer Systems (MS4s) into waters of the United States; and

C. Pursuant to 33 U.S.C. §1342(p) (2) (C), (D) and (E), DISTRICT, COUNTY, the Coachella Valley Water District (CVWD) and certain incorporated Cities within Riverside County have obtained NPDES Permits for municipal stormwater discharges; and

D. Section 402(p) further requires the United States Environmental Protection Agency (USEPA) to promulgate regulations requiring NPDES Permit applications; and

E. USEPA promulgated such regulations and adopted them in November 1990; and

F. USEPA has delegated its authority to the California State Water Resources Control Board (SWRCB) to administer the NPDES Permit process within the State of California; and

G. SWRCB has in turn delegated its NPDES permitting authority to the Regional Water Quality Control Boards (RWQCBs) to administer the NPDES Permit process

1 within the boundaries of their respective regions; and

2 H. DISTRICT and CVWD are authorized to provide for the control of flood
3 and stormwater within their respective jurisdictions of the County of Riverside and are
4 empowered to investigate, examine, measure, analyze, study and inspect matters pertaining
5 to flood and stormwaters; and

6
7 I. DISTRICT, COUNTY, CVWD and certain incorporated Cities within
8 Riverside County have obtained NPDES Permits from their respective RWQCBs in order
9 to comply with Section 402(p); and

10 J. The NPDES Permits require the municipal permittees to develop
11 comprehensive stormwater discharge management programs to improve water quality and
12 to respond to emergency incidents to control the discharge of pollutants to the waters of the
13 United States in the County of Riverside; and

14
15 K. COUNTY, through the Riverside County Fire Department, staffs and
16 maintains a Hazardous Materials Emergency Response Team ("TEAM"); and

17 L. In accordance with certain responsibilities described in the NPDES
18 Permits and the NPDES Stormwater Discharge Permit Implementation Agreements for the
19 Santa Ana Region (Santa Ana Drainage Area) dated February 9, 2011; San Diego Region (Santa
20 Margarita Drainage Area) dated July 12, 2016; and Colorado River Basin Region (Whitewater
21 Drainage Area) dated April 24, 2014, DISTRICT wishes to contribute a lump sum amount
22 of not to exceed one million eight hundred twenty-five thousand dollars (\$1,825,000)
23 ("CONTRIBUTION"), to help support TEAM'S existence and its current activity status for
24 Fiscal Years 2017/18 through 2021/22 as set forth herein.

25
26 NOW, THEREFORE, the parties hereto do mutually agree as follows:

27 1. DISTRICT CONTRIBUTION – Within sixty (60) days after execution
28 of this Agreement, DISTRICT shall pay COUNTY for CONTRIBUTION to help support

1 TEAM'S existence and its current activity status for Fiscal Years 2017/18 through 2021/22 as
2 set forth herein. Payments will be made annually in the amount of three hundred sixty-five
3 thousand dollars (\$365,000) for a total of one million eight hundred twenty-five thousand dollars
4 (\$1,825,000).

5
6 2. ANNUAL PROGRAM REVIEW – During January of each year,
7 DISTRICT and COUNTY representatives shall meet and review program status, scope, costs,
8 priorities, and projected activities for TEAM.

9 3. USE OF CONTRIBUTION – COUNTY shall use CONTRIBUTION
10 only for salaries, equipment and maintenance of TEAM.

11 4. INDEMNITY AND HOLD HARMLESS – COUNTY shall indemnify
12 and hold DISTRICT, its officers, employees and agents free and harmless from all claims,
13 actions, damages and liabilities of whatsoever kind and nature arising from death, personal
14 injury, property damage or other cause asserted or based upon any act or omission of TEAM
15 relating to or in any way connected with the accomplishment of the work or performance of
16 services of TEAM. As part hereto of the foregoing indemnity, COUNTY agrees to protect and
17 to defend at its own expense, including attorneys' fees, DISTRICT, its officers, agents and
18 employees from any and all legal action based upon any negligent acts or omissions, as stated
19 hereinabove, by any person or persons.
20

21
22 5. REPORTS AND INFORMATION – COUNTY shall submit to
23 DISTRICT on or before August 15th a report summarizing the activities, responses, and cases
24 handled or performed by TEAM between July 1st and June 30th of the previous Fiscal Year.
25 The report shall consist of a narrative describing TEAM, its operations and any major spills,
26 and a categorization of TEAM'S responses showing the following: responses inside and outside
27 DISTRICT'S jurisdiction, traffic related responses, industrial related responses, drug
28 enforcement responses, and other response categories. The report shall also include a

description of current TEAM operating expenses and revenue sources (budget).

6. TEAM OPERATIONS – This Agreement does not give DISTRICT any authority to dictate the day to day activities of TEAM, or grant DISTRICT any authority over any TEAM personnel other than that stated in this paragraph. TEAM shall, at DISTRICT'S request, provide timely response to emergency incidents where a hazardous material is entering or has a reasonable potential to enter a DISTRICT owned storm drain facility, provided that TEAM is not already committed to another incident. TEAM shall respond to emergency incidents irrespective of the local jurisdiction (City or County) in which said DISTRICT facilities are located.

7. TERM OF AGREEMENT – This Agreement shall commence on the date of execution thereof and shall continue in effect until June 30, 2022.

8. TERMINATION OF AGREEMENT – Either party may terminate the provisions of this Agreement subject to six (6) month's written notice thereof. Once written notice is made by either party, the annual CONTRIBUTION will be prorated and refunded to DISTRICT to terminate this Agreement.

9. NOTICES – Any and all notices sent or required to be sent to the parties of this Agreement will be mailed by first class mail, postage prepaid, to the following addresses:

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
1995 Market Street
Riverside, CA 92501
Attn: Water Quality Compliance Section

COUNTY OF RIVERSIDE
FIRE DEPARTMENT
210 West San Jacinto Avenue
Perris, CA 92570
Attn: Bill Weiser, Chief Bautista Division

//

//

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on

MAY 09 2017

(to be filled in by Clerk of the Board)

RECOMMENDED FOR APPROVAL:

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

By: Jason E. Uhley

JASON E. UHLEY
General Manager-Chief Engineer

By: Marion Ashley

MARION ASHLEY, Chairman
Riverside County Flood Control and Water
Conservation District Board of Supervisors

APPROVED AS TO FORM:

ATTEST:

GREGORY P. PRIAMOS
County Counsel

KECIA HARPER-IHEM
Clerk of the Board

By: Neal R. Kipnis

NEAL R. KIPNIS
Deputy County Counsel

By: Kecia Harper-Ihem

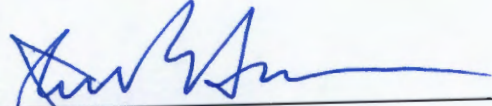
Deputy

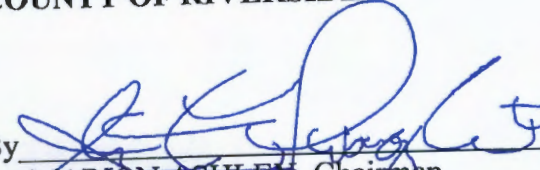
(SEAL)

Multi-Year Agreement for
Hazardous Materials Emergency Response Team Services
FY 2017/18 to FY 2021/22
04/06/2017
TRI:blm

1 RECOMMENDED FOR APPROVAL:

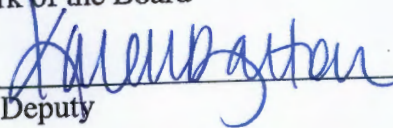
COUNTY OF RIVERSIDE

2
3 By 
4 JOHN R. HAWKINS
5 CAL FIRE/Riverside County Fire Chief

By 
~~MARION ASHLEY~~, Chairman
County of Riverside Board of Supervisors
JOHN TAVAGLIONE

6 ATTEST:

7 KECIA HARPER-IHEM
8 Clerk of the Board

9 By 
Deputy

10 (SEAL)

11
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25 Multi-Year Agreement for
26 Hazardous Materials Emergency Response Team Services
27 FY 2017/18 to FY 2021/22
03/22/2017
28 TRI:mcv

AGREEMENT DISTRIBUTION

DATE: 08/08/18

PROJECT NAME Household Hazardouse Waste Collection Programs FY 2018 to FY 2022/ 23

PROJECT NO.: N/A

☐ COOPERATIVE AGREEMENT

☐ CONSULTING SERVICES AGREEMENT

☒ OTHER: Multi - Year Agreement

PARTIES: RCFC / and County of Riverside

FROM: BK

TO:	No. of Copies	No. of EC	Action/Comment
J. UHLEY			
B. CULLEN			
Beth Monroy	1		Original for scanning. Please return orig.
Dept Contact Edwin Quinonez		1	Copy for file
Construction Inspection			
Finance - Darrylenn P./Sunita J. Kathryn G./ Marilyn W. / Jeanine		1	Copy for file
Tract file/Johnson			
Agreements			

COMMENTS _____

**SUBMITTAL TO THE FLOOD CONTROL AND
WATER CONSERVATION DISTRICT
BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**



ITEM
11.3
(ID # 7229)

MEETING DATE:

Tuesday, June 26, 2018

FROM : FLOOD CONTROL DISTRICT:

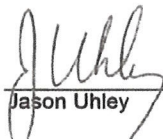
SUBJECT: FLOOD CONTROL DISTRICT: Approve the Multi-Year Agreement Between the Riverside County Flood Control and Water Conservation District and Riverside County Waste Resources Department for the Household Hazardous Waste Collection Programs, All Districts, 5 Years. [\$1,500,000 Total - District Funds 100%] (Companion Item to MT Item 6850)

RECOMMENDED MOTION: That the Board of Supervisors:

1. Approve the Multi-Year Agreement for Household Hazardous Waste Collection Programs between the Riverside County Flood Control and Water Conservation District (District) and the Riverside County Waste Resources Department (Waste Resources);
2. Authorize the Chairman to execute the Agreement documents on behalf of the District; and
3. Direct the Clerk of the Board to return two (2) executed Agreements to the District.

Prev. Agn. Ref.: 11-4 of 09/24/13

ACTION: Policy



Jason Uhley

6/13/2018

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Tavaglione, seconded by Supervisor Perez and duly carried, IT WAS ORDERED that the above matter is approved as recommended.

Ayes: Jeffries, Tavaglione, Washington and Perez
Nays: None
Absent: Ashley
Date: June 26, 2018
xc: Flood

Kecia Harper-Ihem
Clerk of the Board
By: 
Deputy

**SUBMITTAL TO THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT BOARD
OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**

FINANCIAL DATA	Current Fiscal Year:	Next Fiscal Year:	Total Cost:	Ongoing Cost
COST	\$ 0	\$300,000	\$1,500,000	\$ 0
NET COUNTY COST	\$ 0	\$ 0	\$ 0	\$ 0
SOURCE OF FUNDS: 25180 947540 527240 NPDES Whitewater Assessment - NPDES Contributions – 10%; 25190 947560 527240 NPDES Santa Ana Assessment – NPDES- 80%; 25200 947580 527240 NPDES Santa Margarita Assessment – NPDES – 10%			Budget Adjustment: No	
			For Fiscal Year: 18/19 – 22/23	

C.E.O. RECOMMENDATION: Approve

BACKGROUND:

Summary

Since 1993 the District has provided funding in support of the Household Hazardous Waste Collection and Anti-Freeze, Batteries, Oil and Latex Paint collection programs as part of its NPDES area-wide municipal stormwater management program. In compliance with the NPDES Permits, the District has chosen to continue to provide financial support for Waste Resources area-wide program services. Therefore, the District will contribute an amount not exceed three hundred thousand dollars (\$300,000) in each fiscal year towards the program. A prior Agreement has been approved by the Board of Supervisors on 09/24/13 [Agenda Item No. 11-4] for the same contract amount. This Agreement continues the existing funding arrangements for these programs from FY 2018-19 through FY 2022-23.

County Counsel has approved this Agreement as to legal form. A companion item (Minute Traq Item 6850) appears on the Waste Resources agenda this same date.

Impact on Residents and Businesses

Funding will be provided by the District's annual NPDES Benefit Assessments levied in the Santa Ana, Santa Margarita and Whitewater Benefit Assessment Areas. Execution of the Agreement imposes no additional impacts to residents and businesses.

Additional Fiscal Information

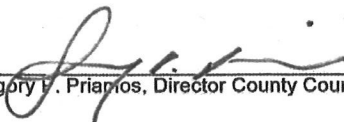
Sufficient funding is available in the District's budget for Fiscal Year 2018-19 and will be included in the proposed budget(s) in future years as appropriate.

ATTACHMENT:

1. Multi-Year Agreement

AMR:cw
P8/221281

**SUBMITTAL TO THE FLOOD CONTROL AND WATER CONSERVATION DISTRICT BOARD
OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA**



Gregory F. Priamos, Director County Counsel 6/14/2018

MULTI-YEAR AGREEMENT

For Household Hazardous Waste Collection Programs
FY 2018/19 to FY 2022/23

The Riverside County Flood Control and Water Conservation District, a body politic ("DISTRICT"), and the County of Riverside, a political subdivision of the State of California, on behalf of the Department of Waste Resources ("COUNTY"), hereby agree as follows:

RECITALS

- A. Congress in 1987 added Section 402(p) to the Federal Clean Water Act (CWA) {33 U.S.C. §1342(p)}; and
- B. Section 402(p) requires certain municipalities to obtain a National Pollutant Discharge Elimination System (NPDES) Permit to discharge stormwater from Municipal Separate Storm Sewer Systems (MS4s) into waters of the United States; and
- C. Pursuant to 33 U.S.C. §1342(p) (2) (C), (D) and (E), DISTRICT, County of Riverside, the Coachella Valley Water District (CVWD) and certain incorporated Cities within Riverside County have obtained NPDES Permits for municipal stormwater discharges; and
- D. Section 402(p) further requires the United States Environmental Protection Agency (USEPA) to promulgate regulations requiring NPDES Permits for designated industrial activities and certain MS4s; and
- E. USEPA promulgated such regulations and adopted them in November 1990;
and
- F. USEPA has delegated its authority to the California State Water Resources Control Board (SWRCB) to administer the NPDES Permit process within the State of California;
and

G. SWRCB has in turn delegated its NPDES permitting authority to the Regional Water Quality Control Boards (RWQCBs) to administer the NPDES Permit process within the boundaries of their respective regions; and

H. DISTRICT and CVWD are authorized to provide for the control of flood and stormwater within their respective jurisdictions of the County of Riverside and are empowered to investigate, examine, measure, analyze, study and inspect matters pertaining to flood and stormwaters; and

I. DISTRICT, County of Riverside, CVWD and the incorporated Cities (except for the City of Blythe) within Riverside County have obtained NPDES MS4 Permits from the respective RWQCBs in order to comply with Section 402(p); and

J. USEPA regulations and the NPDES MS4 Permits require municipalities to control the contribution of pollutants to the municipal storm sewer by stormwater discharges associated with industrial activity and the quality of stormwater discharged from the sites of industrial activity; and

K. DISTRICT, in accordance with its responsibilities as a Principal Permittee, is developing comprehensive stormwater management programs within the County of Riverside and in the region; and

L. COUNTY, conducts certain area-wide collection programs and activities pertaining to hazardous waste management, hazardous materials facility compliance inspections, and health and safety code inspections; and

M. Certain aspects of COUNTY activities are consistent with the goals and objectives of NPDES MS4 Permits and the Best Management Practices (BMP) included in the Permittee's regional Drainage Area Management Plans (DAMP); and

N. DISTRICT wishes to support certain COUNTY programs and activities by contributing an amount not to exceed three hundred thousand dollars (\$300,000) per fiscal year, hereinafter called "CONTRIBUTION", for Fiscal Years 2018/19 through 2022/23 to sustain the scope of certain COUNTY programs and activities to meet the requirements of NPDES MS4 Permits as set forth herein. The total amount of DISTRICT CONTRIBUTION under this Agreement shall not exceed one million five hundred thousand dollars (\$1,500,000); and

O. It is understood that this Agreement does not change existing responsibilities for compliance with any NPDES MS4 Permit, and COUNTY, through any services provided, is not assuming responsibility for NPDES MS4 Permit compliance requirements as they exist or may be established; and

P. Cooperation between DISTRICT and the COUNTY in these matters is in the best interest of the public.

NOW, THEREFORE, the parties hereto do mutually agree as follows:

1. NPDES PROGRAM ACTIVITIES – COUNTY, will perform certain NPDES program activities as long as adequate manpower is available within COUNTY's staff and reimbursement from DISTRICT is sufficient to perform the activities agreed to including the following: Household Hazardous Waste (HHW) Collection Program, and Antifreeze, Battery, Oil and Latex Paint (ABOP) Program. A scope of services and budget for the HHW and ABOP Programs are described below.

(a) TEMPORARY HHW COLLECTION FACILITY (THHWCF)
PROGRAM:

(i) COUNTY, shall conduct not less than fifteen (15) HHW collection events during the first Fiscal Year of this Agreement. Additional events for future Fiscal Years will be

scheduled based on the amount of DISTRICT's contribution to specifically support the HHW program. A minimum of two

(2) THHWCF events or a single permanent HHW site shall be established in each of the three (3) NPDES MS4 Permit areas (Santa Ana, Santa Margarita and Whitewater watersheds).

(ii) COUNTY and DISTRICT shall advertise scheduled HHW collection events in countywide and/or local newspapers.

(iii) DISTRICT and COUNTY shall work cooperatively with the County of Riverside, incorporated Cities, and other interested parties to provide technical assistance and/or coordinate additional HHW collection sites within the NPDES Permit areas.

(b) PERMANENT HHW COLLECTION FACILITY (PHHWCF) AND ABOP PROGRAM:

(i) COUNTY, shall operate at least one (1) PHHWCF and/or ABOP collection center in each of the Santa Ana, Santa Margarita and Whitewater River Watersheds.

(ii) DISTRICT and COUNTY shall work cooperatively with the County of Riverside, incorporated Cities, and other interested parties to facilitate the establishment of additional PHHWCF and/or collection centers within the NPDES Permit areas.

2. ANNUAL PROGRAM REVIEW – During January of each year, DISTRICT and the COUNTY representatives shall meet and review program status, scope, costs,

priorities, projected activities and available funding sources for NPDES PROGRAM ACTIVITIES:

- (a) DISTRICT and COUNTY staff shall review available funding resources and develop a preliminary schedule for NPDES program activities based on DISTRICT's contribution to NPDES PROGRAM ACTIVITIES for the upcoming Fiscal Year.

3. USE OF ABOP/HHW CONTRIBUTION – The COUNTY shall use CONTRIBUTION only for salaries, training, equipment, supplies, waste disposal and other expenses related to providing NPDES PROGRAM ACTIVITIES as agreed upon by DISTRICT and COUNTY.

4. INDEMNITY AND HOLD HARMLESS - The COUNTY shall indemnify and hold DISTRICT, its officers, employees and agents free and harmless from all claims, actions, damages and liabilities of whatsoever kind and nature arising from death, personal injury property damage or other cause asserted or based upon any act or omission of or by person or persons associated with NPDES PROGRAM ACTIVITIES relating to or in any way connected with the accomplishment of the work or performance of services of NPDES PROGRAM ACTIVITIES. As part hereto of the foregoing indemnity, the COUNTY agrees to protect and to defend at its own expense, including attorneys' fees, DISTRICT, its officers, agents and employees from any and all legal action based upon any negligent acts or omissions, as stated herein, by any person or persons.

5. REPORTS AND INFORMATION – The COUNTY shall submit to DISTRICT on or before October 1st a report on NPDES PROGRAM ACTIVITIES performed

by the COUNTY during the previous Fiscal Year (July 1st through June 30th). The report shall include but not be limited to:

- (a) Narrative describing the HHW Program (to include a summary of each collection event) and ABOP Program performed by the COUNTY pursuant to this Agreement during the prior Fiscal Year.
- (b) Quantities of materials collected by the HHW and ABOP Programs, cost of waste disposal, and costs associated with labor, supply, equipment and materials costs.

6. HHW EVENT – For the purposes of this Agreement, a HHW event is a THHWCF event operated by COUNTY.

7. PAYMENT – For Fiscal Years 2018/19 through 2022/23, COUNTY shall invoice DISTRICT on or before April 30th of each fiscal year for a lump sum amount of three hundred thousand dollars (\$300,000). DISTRICT shall pay within thirty (30) days after receipt of appropriate invoice from COUNTY. The total amount to be paid to COUNTY pursuant to this Agreement shall not exceed three hundred thousand dollars (\$300,000) in any fiscal year and shall not exceed the sum of one million five hundred thousand dollars (\$1,500,000) for the entire term of this Agreement.

8. CONTINGENCY – CONTRIBUTION shall be contingent upon the approval by DISTRICT's Board of Supervisors of the annual Benefit Assessment levies for the Santa Ana, Santa Margarita and Whitewater Watershed Benefit Assessment Areas and based on available funding. In the event that DISTRICT funds determined to be available will be less than the agreed upon not to exceed amount of three hundred thousand dollars (\$300,000) for the next fiscal year, DISTRICT will notify COUNTY in January of the current fiscal year of the deficiency in the Benefit Assessment Area's funds so that COUNTY may adjust, after

consultation and agreement by DISTRICT, the scope of NPDES PROGRAM ACTIVITIES to be provided for the remainder of the current fiscal year or the next fiscal year.

9. COMPLIANCE WITH NPDES PERMITS – NPDES PROGRAM ACTIVITIES, as specified herein, will be performed by COUNTY under this Agreement. Nothing in this Agreement shall be construed as making COUNTY responsible for NPDES Permits compliance.

10. NON-INTERFERENCE – DISTRICT understands and agrees that it shall not directly supervise or interfere with any of the COUNTY activities contemplated hereunder.

11. TERM OF AGREEMENT – This Agreement shall commence on the date of execution thereof and shall continue in effect until June 30, 2023.

12. TERMINATION OF AGREEMENT – Either party may terminate the provisions of this Agreement related to the HHW and ABOP Programs subject to six (6) months written notice thereof.

13. APPLICABILITY OF PRIOR AGREEMENTS – This Agreement constitutes the entire Agreement between the parties with respect to the subject matter; all prior agreements, representations, statements, negotiations and understandings are hereby superseded.

14. NOTICES – Any and all notices sent or required to be sent to the parties of this Agreement will be mailed by first class mail, postage prepaid, to the following addresses:

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
1995 Market Street
Riverside, CA 92501
Attn: Richard Boon

RIVERSIDE COUNTY DEPARTMENT
OF WASTE RESOURCES
14310 Frederick Street
Moreno Valley, CA 92553
Attn: Elizabeth Thompson

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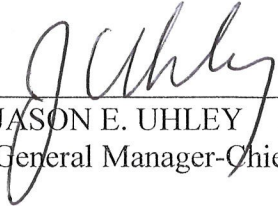
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IN WITNESS WHEREOF, the parties hereto have executed this Agreement on


JUN 26 2018

(to be filled in by Clerk of the Board)

RECOMMENDED FOR APPROVAL:


By 
JASON E. UHLEY
General Manager-Chief Engineer

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

By 
MARION ASHLEY, Chairman
Riverside County Flood Control and Water
Conservation District Board of Supervisors

APPROVED AS TO FORM:

GREGORY P. PRIAMOS
County Counsel

By 
Kristine Bell-Valdez
Supervising Deputy County Counsel

ATTEST:

KECIA HARPER-IHEM
Clerk of the Board

By 
Deputy

(SEAL)

Multi-Year Agreement for Household Hazardous Waste Collection Programs
FY 2018/19 to FY 2022/23
05/31/2018
AMR:cw

RECOMMENDED FOR APPROVAL:

COUNTY OF RIVERSIDE

By


HANS W. KERNKAMP
General Manager – Chief Engineer

By


CHUCK WASHINGTON, Chairman
Riverside County Board of Supervisors

APPROVED AS TO FORM:

ATTEST:

GREGORY P. PRIAMOS
County CounselKECIA HARPER-IHEM
Clerk of the Board

By


SYNTHIA M. GUNZEL
Chief Deputy County Counsel

By


Deputy
(SEAL)

Multi-Year Agreement for Household Hazardous Waste Collection Programs
FY 2018/19 to FY 2022/23
05/31/2018
AMR:cw

**AGREEMENT TO FORM
THE MIDDLE SANTA ANA RIVER WATERSHED
TMDL TASK FORCE**

This Agreement, is made this **1st day of December, 2012**, between the SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT ("SB FLOOD CONTROL"), the RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT ("RIVERSIDE FLOOD CONTROL"), the CITY OF CORONA ("CORONA"), CITY OF NORCO ("NORCO"), CITY OF RIVERSIDE ("RIVERSIDE"), CITY OF EASTVALE ("EASTVALE"), CITY OF JURUPA VALLEY ("JURUPA VALLEY"), COUNTY OF RIVERSIDE, CITY OF CLAREMONT ("CLAREMONT"), CITY OF POMONA ("POMONA"), the SANTA ANA REGION REGIONAL WATER QUALITY CONTROL BOARD ("REGIONAL BOARD"), AGRICULTURAL OPERATORS (represented by CHINO BASIN WATERMASTER) and the SANTA ANA WATERSHED PROJECT AUTHORITY ("SAWPA"). SB FLOOD CONTROL, RIVERSIDE FLOOD CONTROL, CITIES OF RIVERSIDE, CORONA, NORCO, EASTVALE, JURUPA VALLEY, CLAREMONT and POMONA, COUNTY OF RIVERSIDE, REGIONAL BOARD and SAWPA are individually and collectively referred to herein as "PARTY" and "PARTIES" respectively.

RECITALS

This Agreement is entered into on the basis of the following facts, understandings, and intentions of the PARTIES:

A. SAWPA is a joint powers public agency, organized and existing pursuant to the laws of the State of California and that certain Joint Exercise of Powers Agreement ("JPA") dated January 1975, as amended, exercising powers common to its Member Agencies, which include Eastern Municipal Water District, Inland Empire Utilities Agency, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District.

B. SAWPA's mission is to initiate and to assist its Member Agencies in cooperative programs and projects to improve and protect water quality, including planning, financing, and implementation; and to coordinate such programs and projects with federal, state, regional, and local agencies.

C. The Middle Santa Ana River Watershed (MSAR) is regulated by the REGIONAL BOARD, is within the Santa Ana River Watershed and within the jurisdictions of both the SB FLOOD CONTROL and RIVERSIDE FLOOD CONTROL.

D. The Reach 3 Santa Ana River Bacterial Indicator Total Maximum Daily Loads ("TMDL") for six MSAR Waterbodies were incorporated into the Water Quality Control Plan – Santa Ana River Basin ("BASIN PLAN") by Resolution No. R8-2005-0001, adopted by the "REGIONAL BOARD" on August 26, 2005.

E. The San Bernardino County Flood Control District, Orange County and Riverside County Flood Control and Water Conservation District formed the Storm Water Quality Standards Task Force ("Storm Water Task Force") to evaluate the REGIONAL BOARD's BASIN PLAN criteria for bacterial indicators and recreational beneficial use designations for waterbodies within the Santa Ana Watershed, including the MSAR.

F. The Storm Water Task Force has recommended several modifications to the BASIN PLAN including alternative bacterial quality indicators and modifications to recreational beneficial use designations. These recommendations were approved by the Santa Ana Regional Board on June 15, 2012. The State Water Resource Control Board, Office of Administrative Law and U.S. Environmental Protection Agency have yet to review and approve the amendment. Adoption of these regulations will directly affect the implementation of the TMDL.

G. Coordinating TMDL Implementation Plan tasks contained within Chapter 5 of the Basin Plan with the work of the Storm Water Task Force will benefit the public by ensuring that beneficial uses of the Santa Ana River are protected appropriately and ensuring efficient use of government resources.

H. The TMDL identifies the County of San Bernardino, the County of Riverside, the Cities of Ontario, Chino, Chino Hills, Montclair, Rancho Cucamonga, Upland, Rialto, Fontana, Norco, Riverside, Corona, Pomona and Claremont and agricultural operators, including confined animal and feeding operations ("CAFOs") as dischargers who must comply with the TMDL requirements (hereinafter "DISCHARGERS"). The Cities of Eastvale and Jurupa Valley incorporated after the adoption of the TMDL. The cities of Eastvale and Jurupa Valley within the County of Riverside have incorporated since the adoption of the TMDL and the Riverside County MS4 Permit. The Cities of Eastvale and Jurupa Valley have submitted Letters of Intent dated March 27, 2012 and December 21, 2011, respectively, to the Regional Board indicating their intent to comply with the Riverside County MS4 Permit requirements, including applicable TMDL requirements. They are herein also considered DISCHARGERS for the purposes of this Agreement.

I. Both SB FLOOD CONTROL and RIVERSIDE FLOOD CONTROL serve as Principal Permittees for the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permits ("MS4 Permit") issued to their respective counties and cities within the Santa Ana Watershed by the REGIONAL BOARD. The San Bernardino County MS4 Permit (Board Order No. R8-2010-0036) and the Riverside County MS4 Permit (Board Order No. R8-2010-0033) are subject to revision based on studies and plans developed in compliance with the TMDL.

J. The COUNTY OF RIVERSIDE and CITIES OF RIVERSIDE, CORONA and NORCO are Co-Permittees to the Riverside County MS4 Permit. The County of San Bernardino and the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Rialto and Upland are Co-Permittees to the San Bernardino County MS4 Permit. The Cities of Claremont and Pomona are Co-Permittees to the Los Angeles County MS4 Permit (Board Order R4-2006-0074). The cities of Eastvale and Jurupa Valley within the County of Riverside incorporated after the adoption of the Riverside County MS4 Permit. The Cities of Eastvale and Jurupa Valley have submitted Letters of Intent dated March 27, 2012 and December 21, 2011, respectively, to the Regional Board indicating their intent to comply with the Riverside County MS4 and are herein considered Co-Permittees to the Riverside County MS4 Permit.

K. In the interest of ensuring that TMDL Implementation Plan compliance requirements are met, SB FLOOD CONTROL, as Principal Permittee for its respective NPDES MS4 Permit, and on behalf of its NPDES MS4 Permit Co-Permittees named individually and/or jointly in the TMDL under Resolution No. R8-2005-0001; and RIVERSIDE FLOOD CONTROL, the CITY OF RIVERSIDE, NORCO, CORONA, EASTVALE, JURUPA VALLEY the COUNTY OF RIVERSIDE, SAWPA, CITY OF CLAREMONT AND THE CITY OF POMONA, AGRICULTURAL OPERATORS, and REGIONAL BOARD have hereby agreed to enter into a cooperative agreement to form a task force ("TMDL TASK FORCE") to coordinate certain tasks identified in the TMDL Implementation Plan with the work of the Storm Water Task Force.

L. The participation of the Parties in this Agreement and the TMDL TASK FORCE is voluntary and for the mutual benefit of the Parties as a means of achieving the water quality goals set forth in the TMDL. Nothing contained in this Agreement shall be interpreted as an admission of liability or acceptance of responsibility for any tasks not explicitly assigned to the Parties or an individual Party by this Agreement, or an admission of liability or acceptance of responsibility for compliance with the TMDL.

M. The remaining DISCHARGERS identified in Recital H above which are not PARTIES to this Agreement may join this TMDL TASK FORCE at a later date. Pro Rata Cost shares for non-PARTY DISCHARGERS will be calculated as part of each Budget. Because those non-PARTY DISCHARGERS have not yet agreed to participate in the TMDL TASK FORCE, certain TMDL Implementation Plan requirements will not receive the full resources and funding contemplated by the REGIONAL BOARD at the time of the TMDL adoption.

N. The REGIONAL BOARD is appointed as a non-voting, non-funding PARTY of the TMDL TASK FORCE. As a non-voting, non-funding PARTY, the REGIONAL BOARD is authorized only to make recommendations upon the functioning of this TMDL TASK FORCE and the development of this program. The REGIONAL BOARD retains authority to regulate the TASK FORCE PARTIES to the extent that they are so authorized under state or federal law and do not relinquish any existing authority or responsibility as a result of participation in this Agreement.

O. In exchange for taking the lead in implementing the TMDL Implementation Plan through the TMDL TASK FORCE, the REGIONAL BOARD has agreed to work with TMDL TASK FORCE members to determine priorities and modified schedules necessary to accommodate the TMDL Implementation Task requirements within available and reasonable budgets and to ensure that TMDL Implementation Plan requirements are coordinated to the maximum extent practicable with the Storm Water Task Force work. The TMDL TASK FORCE and REGIONAL BOARD will take into consideration those DISCHARGERS that are PARTIES to this AGREEMENT in determining appropriate priorities and schedules for the TMDL TASK FORCE work.

P. It is expected that revisions to the BASIN PLAN proposed by the Storm Water Task Force may result in new or modified Recreational Beneficial Uses and Water Quality Objectives for stream segments regulated by the TMDL, including Reach 3 of the Santa Ana River, Cucamonga Creek and Chino Creek. If attainment of Water Quality Objectives, and thereby Beneficial Uses in Reach 3 of the Santa Ana River, Cucamonga Creek, or Chino Creek is achieved as a result of the Storm Water Task Force effort, BMPs implemented by watershed stakeholders, or other conditions that result in attainment of such Beneficial Uses, the PARTIES to this Agreement shall evaluate the continued need to evaluate and monitor those waterbodies under this Agreement. Removal of Agreement from future participation in the TMDL TASK FORCE if those participants are no longer tributary to remaining impaired waterbodies identified in the TMDL.

NOW, THEREFORE, the parties hereto mutually agree as follows:

SECTION I - Delegation of Responsibilities

- A. The PARTIES shall:
1. Jointly participate in the TMDL TASK FORCE, providing technical guidance and input to TMDL TASK FORCE tasks.
 2. Review and comment on draft and final draft deliverables and reports.
 3. Provide the TMDL TASK FORCE Administrator with information needed to satisfy the study and reporting requirements described in the TMDL Implementation Plan or other work of the TMDL Task Force.
 4. Provide the TMDL TASK FORCE Administrator with staff support and resources to assist in completing work of the TMDL TASK FORCE, as required and as agreed to by PARTIES.
- B. LOS ANGELES COUNTY PERMITTEES.
1. The City of Claremont and the City of Pomona shall participate as normal members of the TMDL TASK FORCE under Section 1.A, however, pursuant to Recital L., above, the participation of the Parties in this Agreement and the TMDL TASK FORCE is voluntary and for the mutual benefit of the Parties as a means of achieving the water quality goals set forth in the TMDL. Nothing contained in this Agreement shall be interpreted as an admission of liability or acceptance of responsibility for any tasks not explicitly assigned to the Parties or an individual Party by this Agreement, or an admission of liability or acceptance of responsibility for compliance with the TMDL.

2. The City of Claremont expressly reserves the right to withdraw from this Agreement and the Task Force at any time, for any reason, with appropriate notice as set forth in section VII.A., below.
3. Notwithstanding the requirements of Section VII, the City expressly reserves the right to withdraw from this Agreement and the Task Force upon thirty (30) days notice to the Parties in the event that the Los Angeles Regional Water Quality Control Board imposes requirements on the City of Claremont that contradict or render moot any Work of the Task Force as defined in Section II, below, or that would significantly increase the cost to the City of implementing any Work of the Task Force as defined in Section II, below.

C. SAWPA shall:

Function as the TMDL TASK FORCE Administrator and shall:

1. Organize and facilitate TMDL TASK FORCE meetings.
2. Perform secretarial, clerical and administrative services, including providing meeting summaries to TMDL TASK FORCE members.
3. Manage TMDL TASK FORCE funds and prepare annual reports of TMDL TASK FORCE assets and expenditures.
4. Act as the contracting party, for the benefit of the TMDL TASK FORCE, for contracts with all consultants, contractors, vendors, and other entities.
5. Seek funding grants to assist with achieving the work of the TMDL TASK FORCE and other goals and objectives of the TMDL TASK FORCE.
6. Coordinate with other agencies and organizations as necessary to facilitate TMDL TASK FORCE work.
7. Prepare quarterly and annual reports, as required by the TMDL Implementation Plan or as requested by the TMDL Task Force, and submit them as required by the TMDL Implementation Plan or as requested by the TMDL Task Force on behalf of the TMDL TASK FORCE.
8. Provide TMDL TASK FORCE members an opportunity to comment and approve any reports or other work product developed.
9. Coordinate and facilitate the addition of other DISCHARGERS to the TMDL TASK FORCE.

D. REGIONAL BOARD shall:

1. Function as an advisory member without financial obligation to the TMDL TASK FORCE, which may seek REGIONAL BOARD advice, input and support.
2. Work with the TMDL TASK FORCE to determine appropriate priorities and schedules for TMDL Implementation Plan tasks based on available resources and TMDL Implementation Plan DISCHARGER participation.

SECTION II – Work of the TASK FORCE

A. The TMDL TASK FORCE shall retain consulting services and provide staff support as necessary to review scientific and other assumptions contained within the TMDL, and perform other work as necessary to complete the tasks described below:

1. Investigate Long Term TMDL Implementation Structure, Cost Sharing Formula, and Funding Sources.
2. TMDL Implementation Task 3 –Implement, Report and Update a Watershed-Wide Bacterial Indicator Water Quality Monitoring Program.
3. TMDL Implementation Task 4 –Implement, Report and Update Bacterial Indicator Urban Source Evaluation Activities as authorized by the Task Force.
4. Undertake such other plans, programs, and studies as authorized by the TMDL TASK FORCE.
5. Develop and approve an annual workplan and budget (hereinafter “BUDGET”) prior to December 31st of each year.

SECTION III – Budget

A. Each annual BUDGET shall be adopted by a majority vote of the TMDL TASK FORCE and ratified by a majority of the PARTIES prior to January 31st of each year during which this Agreement remains in force. Each such approved annual BUDGET shall take effect during the next fiscal year following the adoption of that BUDGET, commencing on July 1st of each year and continuing through June 30th of the following year.

B. Each annual BUDGET shall not exceed a total of Three Hundred Thousand Dollars (\$300,000.00), excluding the value of in-kind services and aggregate grant funding, unless a majority of the PARTIES vote to authorize an amount in excess of the \$300,000.00 cap for any one proposed annual BUDGET.

C. The TMDL TASK FORCE Administrator shall prepare and submit a written proposed annual BUDGET for the subsequent fiscal year to the TMDL TASK FORCE and thereafter to the PARTIES prior to November 30th. The proposed BUDGET prepared by the TMDL TASK FORCE Administrator shall include a line-item explanation of proposed expenditures and anticipated costs for the subsequent fiscal year, according to the scope of work developed by the TMDL TASK FORCE for that fiscal year.

D. The TMDL TASK FORCE Administrator shall prepare and submit pro rata cost share invoices to each PARTY based on the approved annual BUDGET and the methodology described in Section IV of the Agreement prior to the date of July 1 in the fiscal year which the BUDGET takes effect.

E. Each of the PARTIES shall pay a pro rata cost share of each annual budget, based on the TMDL TASK FORCE Administrator’s pro rata cost share invoice, and which amount and any amount in arrears shall be due and payable to the TMDL TASK FORCE Administrator prior to the date of August 31st in the fiscal year for which it is due.

F. The BUDGET for the fiscal year 2012-2013 is attached hereto as Exhibit "A" and incorporated herein by this reference. Approval of this Agreement shall constitute approval of the BUDGET for fiscal year 2012-2013. Each of the PARTIES shall pay its pro-rata cost share of the BUDGET for fiscal year 2012-2013, as calculated in Section IV of this Agreement within 30 days of its approval of this Agreement. Pro rata cost shares for fiscal year 2012-2013 are attached hereto as Exhibit "A".

G. The TMDL TASK FORCE Administrator shall endeavor to minimize carry-over fund balances to those necessary to complete work of the TMDL TASK FORCE and shall limit contingencies to those necessary to ensure work of the TMDL TASK FORCE is not impeded. Excess not necessary to complete budgeted work of the TMDL TASK FORCE or maintain adequate reserves shall be credited back to the PARTIES in the BUDGET consistent with the pro rata cost share methodology described in Section IV below within 60 days after the accounting provided. The PARTIES shall agree to a reasonable reserve balance as part of each year's BUDGET.

H. After September 30 of each year, the TMDL TASK FORCE Administrator shall provide an accounting of all pro rata cost shares collected via cash or in-kind contributions collected per Section IV below. If pro rata cost shares collected are less than BUDGET, the TMDL TASK FORCE shall meet with Regional Board staff to determine appropriate priorities for scheduled TMDL TASK FORCE work and revise BUDGET based on available funds. The TMDL TASK FORCE and REGIONAL BOARD should take into account which DISCHARGERS are PARTIES to this AGREEMENT in determining appropriate priorities and schedules for the TMDL TASK FORCE.

Section IV – Pro Rata Cost Shares

The pro rata cost shares to fund the BUDGET shall be calculated as follows:

A. TMDL TASK FORCE administrative costs to develop plans and reports required under Tasks 3 and 4 (see Exhibit "A") shall be shared equally by the DISCHARGERS.

B. Pro rata cost shares assigned to DISCHARGERS who are not PARTIES to this Agreement shall be considered unfunded portions of the BUDGET and be addressed per Section III.H of this Agreement.

C. In addition, in the event that the TMDL TASK FORCE requires the services of a consultant or consultants to prepare manuals, develop programs, or perform studies relevant to the TMDL TASK FORCE work, the costs of said consultant services will be shared by the PARTIES, in such a manner as approved by the PARTIES. Each PARTY may choose to provide in-kind services in lieu of cash payment, if acceptable to the PARTIES. The value of the in-kind services shall be determined by TMDL TASK FORCE Administrator based on the approved BUDGET.

SECTION V – Term of the Agreement

This Agreement shall become effective on the date the last PARTY of the TMDL TASK FORCE executes it or December 1, 2012 (whichever occurs later). The term of the Agreement shall be for five (5) years unless terminated by a PARTY as provided in Section VII below. This Agreement may be renewed or extended for an additional term(s) in up to 5-year increments by written mutual consent of the PARTIES.

SECTION VI – Additional Parties

Any agency, entity or person recognized by the TMDL TASK FORCE as a DISCHARGER responsible for TMDL Implementation Plan Tasks 3 or 4 may be added as a PARTY to this Agreement by a written amendment signed by all of the current PARTIES.

SECTION VII – Withdrawal

A. Any PARTY may withdraw from the TASK FORCE effective 60 days after giving written notice to TASK FORCE Administrator. The withdrawing PARTY shall not be entitled to a refund of any unspent contribution that that PARTY made toward the current, future or preceding BUDGET. The withdrawing PARTY shall be responsible for all lawfully assessed penalties as a consequence of that PARTY's withdrawal from the TASK FORCE. The costs allocations to the remaining PARTIES will be recalculated in the following BUDGET year.

B. As a non-voting, non-funding PARTY of the TASK FORCE, the REGIONAL BOARD may withdraw from the TASK FORCE effective 30 days after giving written notice to the TASK FORCE Administrator. Notwithstanding withdrawal from the TASK FORCE, at all times, the REGIONAL BOARD retains authority to regulate TASK FORCE PARTIES only to the extent that they are so authorized under state and federal law and do not relinquish any existing authority or responsibility as a result of non-participation as a TASK FORCE PARTY under this Agreement.

C. Notwithstanding the foregoing, any PARTY may withdraw from the TMDL TASK FORCE upon 60 days written notice in the event that all waterbodies to which it is tributary are delisted from the Clean Water Act 303(d) List of Water Quality Limited Segments ("303(d) List") or otherwise removed from the Middle Santa Ana River Pathogen TMDL Implementation Plan requirements via Basin Plan Amendment. Upon providing such notice to the TMDL TASK FORCE Administrator, the PARTY or PARTIES shall no longer be responsible for paying a pro rata share of the BUDGET until and unless a waterbody or waterbodies to which it is tributary is added to the 303(d) List for impairment of Recreational Beneficial Uses via pathogen indicators. Within 60 days of receiving notice of the withdrawal pursuant to this sub-paragraph B, the TMDL TASK FORCE Administrator shall provide the withdrawing PARTY with an accounting of the funds allocated for evaluation or monitoring of the delisted or otherwise removed waterbody or waterbodies, which are no longer needed by reason of such delisting, and shall credit any unused excess to the withdrawing PARTY on a pro rata cost share basis.

SECTION VIII – Non-compliance with TMDL Requirements

Any PARTY found in non-compliance by the REGIONAL BOARD with conditions of the TMDL within its jurisdictional boundaries shall be solely liable for any enforcement actions and assessed penalties.

SECTION IX – Amendments to this Agreement

This AGREEMENT may be amended in writing signed by all of the PARTIES.

SECTION X – Authorized Signatories

Except for Agreements and documents authorized by the TMDL TASK FORCE to be signed by the TMDL TASK FORCE Administrator, the General Manager-Chief Engineer of the RIVERSIDE FLOOD CONTROL and the Flood Control Engineer of SB FLOOD CONTROL, the Chief Executive Officers of the COUNTY OF RIVERSIDE, and the City Managers of the CITIES OF CORONA, NORCO, EASTVALE, JURUPA VALLEY, RIVERSIDE, AGRICULTURAL OPERATORS CLAREMONT and POMONA are hereby authorized to execute all documents related to this TMDL TASK FORCE. The aforementioned authorized signatories may also designate in writing alternative representatives to sign such documents.

SECTION XI – Notices

All notices shall be deemed effective when personally delivered or five (5) days after deposit in the U.S. Mail, postage prepaid.

Any notices sent or required to be sent to any PARTY shall be mailed to the following addresses:

SAN BERNARDINO COUNTY
FLOOD CONTROL DISTRICT
825 East Third Street
San Bernardino, CA 92415

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
1995 Market Street
Riverside, CA 92501

CITY OF CORONA
400 S. Vicentia Avenue
Corona, CA 92882

CITY OF NORCO
2870 Clark Avenue
Norco, CA 91760

CITY OF RIVERSIDE
3900 Main Street
Riverside, CA 92522

COUNTY OF RIVERSIDE
Executive Office
4080 Lemon Street, 4th Floor
Riverside, CA 92501

CITY OF EASTVALE
12363 Limonite Ave., Ste. 910
Eastvale, CA 91752

CITY OF JURUPA VALLEY
8304 Limonite Ave., Ste. M
Jurupa Valley, CA

CITY OF CLAREMONT
207 Harvard Avenue
Claremont, CA 91711

CITY OF POMONA
505 S. Garey Avenue
Pomona, CA 91766

AGRICULTURAL OPERATORS
Chino Basin Watermaster Agricultural Pool
13545 South Euclid, Unit B
Ontario, CA 91762

SANTA ANA REGION REGIONAL WATER QUALITY CONTROL BOARD
3737 Main Street, Suite 500
Riverside, CA 92501

SANTA ANA WATERSHED PROJECT AUTHORITY
11615 Sterling Avenue
Riverside, CA 92503

SECTION XII – Governing Law

This Agreement will be governed and construed in accordance with the laws of the State of California. If any provision or provisions of this agreement shall be held to be invalid, illegal, or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired hereby.

SECTION XIII – Consent to Waiver or Breach

No term or provision hereof shall be deemed waived and no breach excused, unless a waiver or breach is consented to in writing and signed by the other PARTIES. Consent by the PARTIES to a waiver or breach by any other PARTY shall not constitute consent to any different or subsequent waiver or breach.

SECTION XIV – Execution in Counterparts

This Agreement may be executed and delivered in any number of counterparts or copies ("counterpart") by the PARTIES hereto. When each PARTY has signed and delivered at least one counterpart to the other PARTIES hereto, each counterpart shall be deemed an original and, taken together, shall constitute one and the same Agreement, which shall be binding and effective as to the PARTIES hereto.

SECTION XV – Deliverables

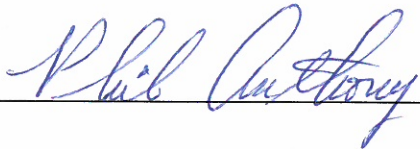
All work, documents or things produced, including originals prepared by anyone in connection with, or pertaining to, the work under this Agreement shall become the property in whole and in part of all PARTIES, jointly and severally.

SECTION XVI – Indemnification

Each PARTY agrees to indemnify, defend, and hold harmless the remaining PARTIES, including their special districts, officials, agents, officers and employees from and against any and all liabilities, claims, expenses, damages, fines, penalties arising from any act or omission of the indemnifying PARTY, its officials, agents, officers, and employees, in connection with this Agreement, including but not limited to defense costs, legal fees, claims, actions, and causes of action for damages of any nature whatsoever, including but not limited to bodily injury, death, personal injury, or property damage; provided, however, that no PARTY shall indemnify another PARTY for that PARTY'S own negligence or willful misconduct.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement to be effective as of the day and year first above written.

SANTA ANA WATERSHED PROJECT AUTHORITY

BY 

TITLE _____

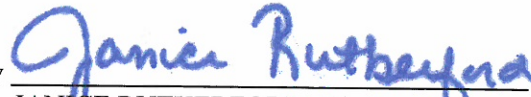
DATE _____

Signature pages for parties named on page 1 of this Agreement to be attached and signed in counterpart.

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

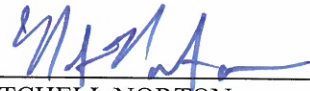
RECOMMENDED FOR APPROVAL:

By 
GERRY NEWCOMBE
Director, Flood Control District

By 
JANICE RUTHERFORD, Chairman
Board of Directors of the San Bernardino
County Flood Control District

APPROVED AS TO FORM:

JEAN-RENE BASLE
County Counsel

By 
MITCHELL NORTON
Deputy County Counsel


ATTEST:

LAURA H. WELCH
Clerk of the Board of Supervisors of the
County of San Bernardino

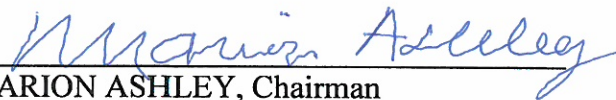
By 
Deputy
(SEAL)



RECOMMENDED FOR APPROVAL:

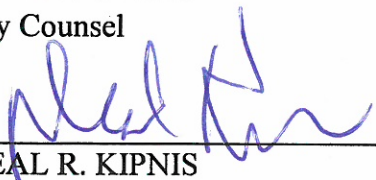
By 
For WARREN D. WILLIAMS
General Manager-Chief Engineer

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

By 
MARION ASHLEY, Chairman
Riverside County Flood Control and Water
Conservation District Board of Supervisors

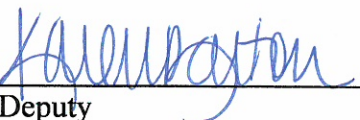
APPROVED AS TO FORM:

PAMELA J. WALLS
County Counsel

By 
NEAL R. KIPNIS
Deputy County Counsel

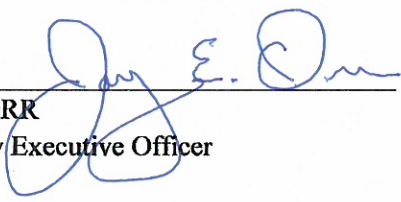
ATTEST:

KECIA HARPER-IHEM
Clerk of the Board

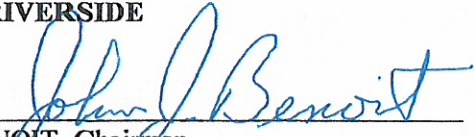
By 
Deputy

(SEAL)

RECOMMENDED FOR APPROVAL:

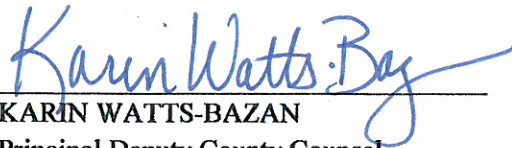
By 
JAY ORR
County Executive Officer

COUNTY OF RIVERSIDE

By 
JOHN BENOIT, Chairman
County of Riverside Board of Supervisors

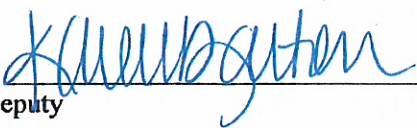
APPROVED AS TO FORM

PAMELA J. WALLS
County Counsel

By 
KARIN WATTS-BAZAN
Principal Deputy County Counsel

ATTEST:

KECIA HARPER-IHEM
Clerk to the Board

By 
Deputy

(SEAL)

CITY OF CORONA

BY Karen Spiegel
Mayor

DATE 1/14/13

APPROVED AS TO FORM

By [Signature]
City Attorney

CITY OF RIVERSIDE

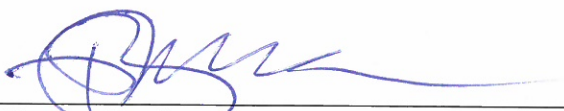
RECOMMENDED FOR APPROVAL:


BY 
City Manager 

DATE July 17, 2013

APPROVED AS TO FORM _____

ATTEST:

By 
Deputy City Attorney

By 
City Clerk

CERTIFIED AS TO FUNDS AVAILABILITY:

By: 
Finance Director

CITY OF NORCO

BY Berwin Hanna

Mayor - Berwin Hanna

DATE May 21, 2014

APPROVED AS TO FORM

By

John Harper
City Attorney

John Harper


ATTEST:

By

Brenda K. Jacobs
City Clerk

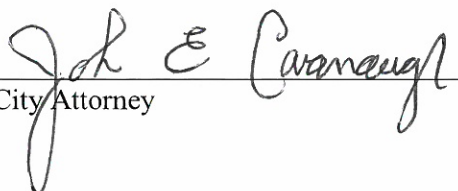
Brenda K. Jacobs, CMC

CITY OF EASTVALE

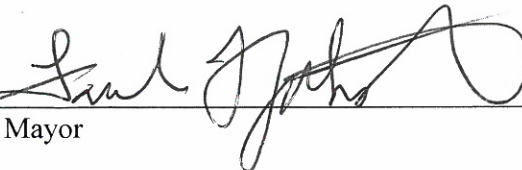
BY _____
Mayor Pro Tem

DATE _____

APPROVED AS TO FORM

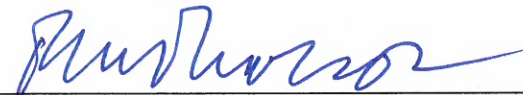
By _____
City Attorney

CITY OF JURUPA VALLEY

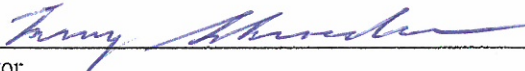
BY _____
Mayor

DATE August 7, 2014

APPROVED AS TO FORM

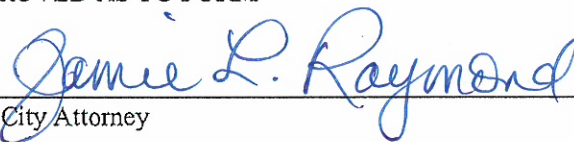
By _____
City Attorney

CITY OF CLAREMONT

BY 
Mayor

DATE 12/19/2012

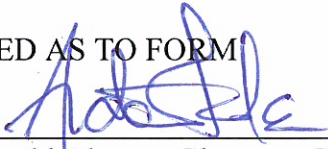
APPROVED AS TO FORM

By 
City Attorney

CITY OF POMONA

BY: 
Elliott Rothman, Mayor

DATE: 03/13/2013

APPROVED AS TO FORM
BY: 
Arnold Alvarez-Glasman, City Attorney

IN WITNESS WHEREOF, the Parties have executed this Agreement entitled
"AGREEMENT TO FORM THE MIDDLE SANTA ANA WATERSHED TMDL TASK FORCE"

SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD

BY Kurt V. Berchtold
Kurt V. Berchtold
Executive Officer

DATE 12/1/12

APPROVED AS TO FORM

By David Rice
David Rice
Legal Counsel

AGRICULTURAL OPERATORS (represented by CHINO BASIN WATERMASTER)

BY 

TITLE Chairman Robert Feenstra

DATE 6-13-13

APPROVED AS TO FORM

By _____
Attorney

Exhibit A

Approved 2012-13: Middle Santa Ana River Pathogen TMDL Task Force

Summary: TMDL Task Force Implementation Schedule and Budget		A	B	C
Summary Expenses		Task Force Draft Budget 2012-13	tier 1 monit Draft Budget 2012-13	Total Draft Budget 2012-13
TASK FORCE:	Administration (assumes quarterly meetings)	\$ 30,000		\$ 30,000
	Grant Preparation	\$ 20,000		\$ 20,000
TASK FORCE:	TMDL Compliance Expert	\$ 25,000		\$ 25,000
TMDL Implementation:	Task 3 - Watershed-wide Monitoring Program	\$ 80,000		\$ 80,000
	San Bernardino County MS4 Program (estimated in-kind contribution)	\$ 50,000		\$ 50,000
TMDL Implementation:	Tasks 4 & 5 - Source Evaluation / Management		\$ 134,460	\$ 134,460
Estimated Total Annual TMDL Implementation Budget		\$ 205,000	\$ 134,460	\$ 339,460
Applied Task Force Carryover Funds:		\$ 80,000		\$ 80,000
Estimated Total Stakeholder Cash Contribution		\$ 75,000	\$ 134,460	\$ 209,460

Detailed: Named TMDL Party Pro Rata Budget Cost Shares		Task Force Draft Budget 2012-13	tier 1 monit Draft Budget 2012-13	Total Draft Budget 2012-13 **
MSAR TMDL Task Force Participants Cost Shares:				
A.	San Bernardino County MS4 Program *	\$ (10,713)	\$ 66,784	\$ 56,071
B.	County of Riverside	\$ 6,389	\$ 11,279	\$ 17,668
C.	City of Riverside	\$ 6,389	\$ 11,279	\$ 17,668
D.	City of Corona	\$ 6,389	\$ 11,279	\$ 17,668
E.	City of Norco	\$ 6,389	\$ 11,279	\$ 17,668
F.	City of Eastvale	\$ 11,389	\$ 11,279	\$ 22,668
G.	City of Jurupa Valley	\$ 11,389	\$ 11,279	\$ 22,668
H.	Agriculture	\$ 6,389	\$ -	\$ 6,389
I.	Forest Service	\$ -	\$ -	\$ -
J.	City of Pomona	\$ 6,389	\$ -	\$ 6,389
K.	City of Claremont	\$ 6,389	\$ -	\$ 6,389
Applied Task Force Carryover Funds:		\$ 98,213		\$ 98,213
Subtotal:		\$ 155,000	\$ 134,460	\$ 289,460

Notes:

* San Bernardino County MS4 Program includes in-kind contribution for staff time to conduct watershed compliance monitoring estimated at \$50,000

** Includes cash adjustment to San Bernardino County MS4 Program to bring all stakeholder contributions to equal.

Description of Revised 2009-11 Task Force Budget		
Annual Task Force Administration		

1. Organize and facilitate TMDL TASK FORCE meetings,
2. Perform secretarial, clerical and administrative services, including providing meeting summaries to TMDL TASK FORCE members,
3. Manage TMDL TASK FORCE funds and prepare annual reports of TMDL TASK FORCE assets and expenditures,
4. Act as the contracting party, for the benefit of the TMDL TASK FORCE, for contracts with all consultants, contractors, vendors and other entities,
5. Seek funding grants to assist with achieving the work of the TMDL TASK FORCE and other goals and objectives of the TMDL TASK FORCE.
6. Coordinate with other agencies and organizations as necessary to facilitate TMDL TASK FORCE work.
7. Administer the preparation of quarterly and annual reports, as required by the TMDL Implementation Plan, and submit them as required by the TMDL Implementation Plan on behalf of the TMDL TASK FORCE.
8. Provide TMDL TASK FORCE members an opportunity to comment and approve any reports or other work product developed.
9. Coordinate and facilitate the addition of other DISCHARGERS to the TMDL TASK FORCE.

TMDL Compliance Expert

Task #1: Support stakeholders as a Regulatory Strategist and Compliance Expert .

Task #2: Develop approach for considering natural background loads when assessing TMDL compliance with bacteria targets

Task #3: Facilitate development of a practical regulatory definition for "maximum extent practicable" wrt reducing bacterial loads from controllable human sources.

Task #4: Coordinate with CDM to prepare the final reports for the USE and ASE studies.

TMDL Task 3 - Annual Watershed-wide Monitoring Program

Watershed-Wide Monitoring Program to assess compliance with REC-1 use water quality objectives for fecal coliform and evaluate numeric targets established for E. coli.

Constituents:

Field Analysis: Temperature, conductivity, pH, dissolved oxygen, and turbidity

Laboratory Water Quality Analysis: Fecal coliform, E. coli, and total suspended solids (TSS)

Sample sites (6): Icehouse Canyon Creek, Chino Creek at Central Avenue, Santa Ana River at Pedley Avenue, Santa Ana River at MWD Crossing, Prado Park Lake at Lake Outlet, Mill Creek at Chino-Corona Road

Dry Season (April 1 – October 31):

15 continuous weeks – July to October

5 continuous weeks – May to June (2008)

Wet Season (November 1 – March 31):

11 continuous weeks – December to February

4 samples from one storm event

TMDL Task 4 - Urban Source Evaluation / Management

Additional Characterization of Pathogen Indicator Pollution using available water quality data

Additional Bacteroides Analysis

Approved FY 2013-14 Budget: Middle Santa Ana River Pathogen TMDL Task Force

Summary: TMDL Task Force Implementation Schedule and Budget			
Summary Expenses	Task Force Budget 2013-14	tier 2 monit Budget 2013-14	Total Budget 2013-14
TASK FORCE: Administration (assumes quarterly meetings)	\$ 30,000		\$ 30,000
Grant Preparation	\$ 20,000		\$ 20,000
TASK FORCE: TMDL Compliance Expert	\$ 25,000		\$ 25,000
TMDL Implementation: Task 3 - Watershed-wide Monitoring Program	\$ 80,000		\$ 80,000
San Bernardino County MS4 Program (estimated in-kind contribution)	\$ 50,000		\$ 50,000
TMDL Implementation: Tasks 4 & 5 - Source Evaluation / Management		\$ 134,460	\$ 134,460
Estimated Total Annual TMDL Implementation Budget	\$ 205,000	\$ 134,460	\$ 339,460
Applied Task Force Carryover Funds:			
Estimated Total Stakeholder Cash Contribution	\$ 155,000	\$ 134,460	\$ 289,460

Detailed: Named TMDL Party Pro Rata Budget Cost Shares	Task Force Budget 2013-14	tier 2 monit Budget 2013-14	Total Budget 2013-14
MSAR TMDL Task Force Participants Cost Shares:			
A. San Bernardino County MS4 Program *	\$ 52,500	\$ 66,784	\$ 119,284
B. County of Riverside	\$ 11,389	\$ 11,279	\$ 22,668
C. City of Riverside	\$ 11,389	\$ 11,279	\$ 22,668
D. City of Corona	\$ 11,389	\$ 11,279	\$ 22,668
E. City of Norco	\$ 11,389	\$ 11,279	\$ 22,668
F. City of Eastvale	\$ 11,389	\$ 11,279	\$ 22,668
G. City of Jurupa Valley	\$ 11,389	\$ 11,279	\$ 22,668
H. Agriculture	\$ 11,389	\$ -	\$ 11,389
I. Forest Service	\$ -	\$ -	\$ -
J. City of Pomona	\$ 11,389	\$ 11,279	\$ 22,668
K. City of Claremont	\$ 11,389	\$ 11,279	\$ 22,668
Applied Task Force Carryover Funds:			
Subtotal:	\$ 155,000	\$ 157,018	\$ 312,018

Notes:

* San Bernardino County MS4 Program includes in-kind contribution for staff time to conduct watershed compliance monitoring estimated at \$50,000

** Includes cash adjustment to San Bernardino County MS4 Program to bring all stakeholder contributions to equal.

Description of Draft 2013-14 Task Force Budget			
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Annual Task Force Administration

1. Organize and facilitate TMDL TASK FORCE meetings,
2. Perform secretarial, clerical and administrative services, including providing meeting summaries to TMDL TASK FORCE members,
3. Manage TMDL TASK FORCE funds and prepare annual reports of TMDL TASK FORCE assets and expenditures,
4. Act as the contracting party, for the benefit of the TMDL TASK FORCE, for contracts with all consultants, contractors, vendors and other entities,
5. Seek funding grants to assist with achieving the work of the TMDL TASK FORCE and other goals and objectives of the TMDL TASK FORCE.
6. Coordinate with other agencies and organizations as necessary to facilitate TMDL TASK FORCE work.
7. Administer the preparation of quarterly and annual reports, as required by the TMDL Implementation Plan, and submit them as required by the TMDL Implementation Plan on behalf of the TMDL TASK FORCE.
8. Provide TMDL TASK FORCE members an opportunity to comment and approve any reports or other work product developed.
9. Coordinate and facilitate the addition of other DISCHARGERS to the TMDL TASK FORCE.

TMDL Compliance Expert

Task #1: Support stakeholders as a Regulatory Strategist and Compliance Expert .

Task #2: Develop approach for considering natural background loads when assessing TMDL compliance with bacteria targets

Task #3: Facilitate development of a practical regulatory definition for "maximum extent practicable" wrt reducing bacterial loads from controllable human sources.

Task #4: Coordinate with CDM to prepare the final reports for the USE and ASE studies.

TMDL Task 3 - Annual Watershed-wide Monitoring Program

Watershed-Wide Monitoring Program to assess compliance with REC-1 use water quality objectives for fecal coliform and evaluate numeric targets established for E. coli.
Constituents:

Field Analysis: Temperature, conductivity, pH, dissolved oxygen, and turbidity

Laboratory Water Quality Analysis: Fecal coliform, E. coli, and total suspended solids (TSS)

Sample sites (6): Icehouse Canyon Creek, Chino Creek at Central Avenue, Santa Ana River at Pedley Avenue, Santa Ana River at MWD Crossing, Prado Park Lake at Lake Outlet, Mill Creek at Chino-Corona Road

Dry Season (April 1 – October 31):

15 continuous weeks – July to October

5 continuous weeks – May to June (2008)

Wet Season (November 1 – March 31):

11 continuous weeks – December to February

4 samples from one storm event

TMDL Task 4 - Urban Source Evaluation / Management

Additional Characterization of Pathogen Indicator Pollution using available water quality data

Additional Bacteroides Analysis

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**AMENDMENT NO. 1
TO THE
AGREEMENT TO FORM THE
MIDDLE SANTA ANA RIVER
TMDL TASK FORCE**

Pursuant to Section V – ‘Term of the Agreement’ of that specific AGREEMENT entitled, “Agreement to Form the Middle Santa Ana River TMDL Task Force” (“Task Force Agreement”), dated December 1, 2012; and

Whereas this Task Force Agreement had been prepared for a five-year term, and therefore is set to expire on the date of December 31, 2017.

Therefore, the TASK FORCE AGENCIES as named in the Agreement (Exhibit A) **hereby agree to the following change:**

- I. Extend the term of the Task Force Agreement for five years, to **December 31, 2022.**

Except as otherwise expressly amended herein, all of the terms, conditions, and provisions of the Agreement to Form the Middle Santa Ana River TMDL Task Force (Exhibit A) shall continue in full force and effect.

This Amendment No. 1 may be executed in original counterparts, which together shall constitute a single Agreement document.

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

SANTA ANA WATERSHED PROJECT AUTHORITY (SAWPA)

BY  8-1-17
Susan Lien Longville, Commission Chair Date

APPROVED AS TO FORM:

By  8/1/17
Larry McKenney, Executive Counsel Date

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

AGRICULTURAL OPERATORS (represented by CHINO BASIN WATERMASTER)

Approved:

By: Robert Feraster
Title: Chairman of the Ag-Pool CBWM
Date: 2-22-19

APPROVED AS TO FORM

By: Robert Feraster

CITY OF JURUPA VALLEY

Approved:

By: _____

Title: _____

Date: _____

APPROVED AS TO FORM

By: _____
City Attorney

ATTEST:

By: _____
City Clerk

CITY OF CLAREMONT

Approved:

By: 

Title: City Manager

Date: 7/17/19

APPROVED AS TO FORM

By: 
City Attorney

ATTEST:

By: 
City Clerk

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

CITY OF CORONA

Approved:

By: _____

Tom Moody
General Manager

Date: _____

9/5/18

ATTEST:

By: _____

Sylvia Edwards
City Clerk

APPROVED AS TO FORM:

By: _____

Dean Derleth
City Attorney

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

CITY OF EASTVALE

Approved:

By: Middle Duster

Title: City Manager

Date: 6/22/10

APPROVED AS TO FORM

By: Eric Vega
City Attorney

ATTEST:

By: AMJ
City Clerk

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

CITY OF JURUPA VALLEY

Approved:

By: 

Gary S. Thompson, City Manager

Date: September 6, 2018

APPROVED AS TO FORM:

By: 

City Attorney

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

CITY OF NORCO

Recommended for Approval:

By: _____

Ted Hoffman, Mayor

Date: August 1, 2018

ATTEST:

By: _____

Cheryl L. Link, CMC, City Clerk

APPROVED AS TO FORM

By: _____

John R. Harper, City Attorney

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

CITY OF POMONA

Approved:

By: M. Lowry for

Title: Linda Lowry, City Manager

Date: 10/23/17

APPROVED AS TO FORM

By: Teresa Chen
City Attorney

Teresa Chen, Deputy City Attorney

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

CITY OF RIVERSIDE

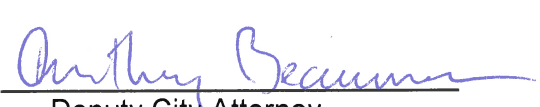
Recommended for Approval:

By:  _____

Title: Assistant City Manager

Date: July 14, 2017

APPROVED AS TO FORM _____ ATTEST:

By:  _____
Deputy City Attorney

By:  _____
City Clerk

CERTIFIED AS TO FUNDS AVAILABILITY:

BY:  _____
Chief Financial Officer/ City Treasurer

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

COUNTY OF RIVERSIDE

Recommended for Approval:

By:  _____

Title: Chairman, Board of Supervisors

Date: JUL 11 2017

APPROVED AS TO FORM

ATTEST:

FORM APPROVED COUNTY COUNSEL

BY:  6-12-17
AARON C. GETTIS DATE

ATTEST:

KECIA HARPER-IHEM, Clerk

By:  _____
DEPUTY

IN WITNESS WHEREOF, the parties hereto have executed this Amendment on

JUL 25 2017

(to be filled in by Clerk of the Board)

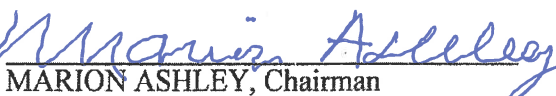
RECOMMENDED FOR APPROVAL:

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

By


JASON E. UHLEY
General Manager-Chief Engineer

By


MARION ASHLEY, Chairman
Riverside County Flood Control and Water
Conservation District Board of Supervisors

APPROVED AS TO FORM:

ATTEST:

GREGORY P. PRIAMOS
County Counsel

KECIA HARPER-IHEM
Clerk of the Board

By

 6-28-17
AARON GETTIS
Deputy County Counsel

By


Deputy

(SEAL)

Amendment No. 1 - Agreement to Form the Middle Santa Ana River Watershed TMDL
Task Force
07/25/17
EL:cw

IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

Recommended for Approval:

By: _____

Title: Robert A. Lovingood, Board Chairman

Date: AUG 22 2017

SIGNED AND CERTIFIED THAT A COPY OF
THIS DOCUMENT HAS BEEN DELIVERED
TO THE CHAIRMAN OF THE BOARD
LAURA H. WELSH
Clerk of the Board of Supervisors
of the County of San Bernardino

By _____



IN WITNESS WHEREOF, the parties hereto have executed this **Amendment No. 1 to the Agreement to Form the Middle Santa Ana River TMDL Task Force**, on the dates set forth below.

SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD

Approved:

By: Steve Smytho

Title: Executive Officer

Date: 11/14/17

APPROVED AS TO FORM

By: Daniel Rice
Legal Counsel

FINAL 6/18/12

**AGREEMENT TO FORM
THE LAKE ELSINORE AND CANYON LAKE TMDL TASK FORCE**

This Agreement to form the Lake Elsinore and Canyon Lake TMDL Task Force (hereinafter "AGREEMENT") is made and effective this **18th day of June, 2012** by and among the following entities, which are hereinafter sometimes collectively referred to as "TASK FORCE AGENCIES" or individually as "TASK FORCE AGENCY":

- California Department of Fish and Game
- California Department of Transportation
- City of Beaumont
- City of Canyon Lake
- City of Hemet
- City of Lake Elsinore
- City of Menifee
- City of Moreno Valley
- City of Murrieta
- City of Perris
- City of Riverside
- City of San Jacinto
- City of Wildomar
- County of Riverside
- Eastern Municipal Water District
- Elsinore Valley Municipal Water District
- March Joint Powers Authority
- Riverside County Flood Control and Water Conservation District
- U.S. Air Force (March Air Reserve Base)
- Western Riverside County Agriculture Coalition (on behalf of the participating Dairy Operators and participating Agricultural Operators in the San Jacinto River Basin)

I. RECITALS

A. Whereas, in 1998, the Santa Ana Regional Water Quality Control Board (hereinafter "Regional Board") designated Lake Elsinore and Canyon Lake in the Lake Elsinore and San Jacinto Watersheds (Collectively the "Watersheds") as "impaired water bodies" pursuant to Section 303(d) of the federal Clean Water Act because of high levels of algae in both lakes and low dissolved oxygen in Lake Elsinore, attributed to excess phosphorus and nitrogen (Nutrients). As a result of said Section 303 designation, the Clean Water Act and California's Non-point Source Pollution Control Plan requires that total maximum daily loads (hereinafter "TMDLs") be established by the Regional Board for these waterbodies;

B. Whereas, in response to the Section 303(d) designation, the Regional Board adopted a Resolution R8-2004-0037 on December 20, 2004 amending the Water Quality Control Plan for the Santa Ana River Basin (BASIN PLAN AMENDMENT) to incorporate nutrient TMDLs for Canyon Lake and Lake Elsinore. The Basin Plan Amendment specifies, among other things, an Implementation Plan, which holds specified stake holders (TASK FORCE AGENCIES) individually and/or jointly liable for complying with the TMDLs by means of specific tasks to be completed by specified dates under penalty of law. These tasks include development and implementation of a watershed-wide nutrient water quality monitoring program, development of an in-lake nutrient monitoring program for Canyon Lake and Lake Elsinore, development of a plan and schedule for in-lake sediment nutrient reduction for Lake Elsinore, development of a plan and schedule for evaluating in-lake sediment nutrient strategies for Canyon Lake, updating watershed and in-lake nutrient TMDL water quality models, developing a pollutant trading plan, and reviewing and revising the TMDL to reflect updated data and science;

C. Whereas, the purpose of this AGREEMENT is to form a task force (hereinafter "TASK FORCE") to implement certain tasks identified in the TMDL Implementation Plan and to pursue TMDL related tasks agreed upon by TASK FORCE AGENCIES;

D. Whereas, the TASK FORCE AGENCIES agree that the purpose of this TASK FORCE is to (1) review and develop recommendations to update the TMDL BASIN PLAN AMENDMENT based on the best available scientific information, and (2) implement TMDL Implementation Plan Tasks identified below and jointly assigned to TASK FORCE AGENCIES, and (3) propose appropriate revisions to the TMDL BASIN PLAN AMENDMENT to the Santa Ana RWQCB, and (4) allow watershed stakeholders to participate in efforts to meet appropriate water quality standards so that Canyon Lake and/or Lake Elsinore can be de-listed from the Clean Water Act 303(d) list of impaired water bodies;

E. Whereas, hundreds of individual agricultural and dairy operators are subject to the Canyon Lake and Lake Elsinore TMDLs and its component TMDL Implementation Plan;

F. Whereas, the Western Riverside County Agricultural Coalition(WRCAC) is a non-profit organization representing the interests of participating agricultural and dairy operators within the San Jacinto Watershed;

G. Whereas, WRCAC's membership is open to any and all agricultural and dairy operators within the San Jacinto watershed;

H. Whereas, March Air Reserve Base (MARB) is an installation of the United States Air Force on federal lands and, as an agency of the federal government, is therefore subject to limitations in its ability to comply with every provision stated herein to the same extent that other non-federal TASK FORCE AGENCIES are able to comply. These limitations are based upon, but not limited to, those identified in the federal Clean Water Act, the federal Antideficiency Act, the principle of sovereign immunity and the holdings of the Supreme Court of the United States, and other binding federal court decisions, as they interpret those sources of federal law. The limitations so mentioned include, but are not limited to, the availability of federal funding to pay for participation in this program, and the ability of MARB to participate directly in sampling, research or data gathering activities which are not located on or near MARB lands or a point source of water discharge arising on MARB lands, or other activities not specifically authorized by the Federal Clean Water Act section 313. To the extent that the limitations described herein prevent MARB from fully participating in any aspect of this program, they reserve the right, in their sole discretion, to participate in the program as a matter of comity. By entering into this agreement, MARB does not authorize any of the TASK FORCE AGENCIES to exercise regulatory authority over them. MARB agrees that State and federal regulatory agencies that are or may become members of this TASK FORCE have regulatory authority over MARB only to the extent permitted by State or Federal Law;

I. Whereas, the TASK FORCE AGENCIES acknowledge and agree that the effectiveness of the TASK FORCE may be improved by the inclusion of other agencies as additional TASK FORCE AGENCIES to the TASK FORCE;

J. Whereas, the Riverside County Flood Control and Water Conservation District (RCFC&WCD) serves as the MS4 PRINCIPAL PERMITTEE for the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Permit (MS4) for the Santa Ana Region of Riverside County;

K. Whereas, the County of Riverside and Cities of Beaumont, Canyon Lake, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Perris, Riverside, San Jacinto, Menifee, Wildomar are MS4 CO-PERMITTEES for the NPDES MS4 Permit for the Santa Ana Region of Riverside County;

L. Whereas, the MS4 PRINCIPAL PERMITTEE and MS4 CO-PERMITTEES collectively represent the MS4 PERMITTEES within the San Jacinto Watershed;

M. Whereas, the NPDES MS4 Permit for the Santa Ana Region of Riverside County is regulated by the Regional Board and subject to the requirements of the nutrient TMDLs for Canyon Lake and Lake Elsinore;

N. Whereas RCFC&WCD has agreed to provide services on behalf of itself as MS4 PRINCIPAL PERMITTEE and on behalf of the MS4 CO-PERMITTEES for the purposes of this AGREEMENT;

O. Whereas, the TMDL assigned nutrient waste load allocations for Supplemental Water addition to Lake Elsinore to stabilize the Lake's elevation;

P. Whereas, the nutrient waste load allocation for Supplemental Water, which includes Island Well water, EVMWD treatment plant effluent, and other sources of non-stormwater, may reduce the TMDL waste load allocation and TMDL load allocation of other point and non-point sources because in-lake nutrient capacity was not adjusted to account for increased lake levels associated with the addition of Supplemental Water;

Q. Whereas, the assumptions regarding load allocations for Supplemental Water may not be consistent with the actual operation of Supplemental Water sources;

R. Whereas, the City of Lake Elsinore and EVMWD previously entered into an agreement to equally share the cost of Supplemental Water addition to the Lake under the "Lake Elsinore Comprehensive Water Management Agreement",

S. Whereas, for the purposes of this Agreement, the City of Lake Elsinore shall be acknowledged and recognized as a separate and equal contributor with EVMWD for the cost and voting rights accorded under this Agreement attributed to EVMWD for Supplemental Water addition;

T. Whereas, the TASK FORCE AGENCIES agree that certain nutrient dischargers have been either inappropriately named or not named as responsible parties for various tasks in the BASIN PLAN AMENDMENT;

U. Whereas, the TASK FORCE AGENCIES agree that agricultural and dairy lands are converting to urban and open space lands;

V. Whereas, the TASK FORCE AGENCIES agree that an amendment to the TMDL to address, at minimum, the proper naming of responsible parties for various tasks in the TMDL Implementation Plan, to correct the load allocation and waste load allocations to properly address the impacts of Supplemental Water on Lake Elsinore, and to revise the load allocation and waste load allocations to address the ongoing conversion of agriculture and dairy lands to urban and/or open space should be addressed as part of a revision to the TMDL Implementation Plan; and

W. Whereas, MARB agrees to budget for and to participate in the TASK FORCE, provided that sufficient funds are appropriated by the Congress, and on the condition that funding requirements under this AGREEMENT do not violate the Anti-deficiency Act, and provided that the TASK FORCE AGENCIES agree to relocate the proposed monitoring station from Kitching Channel to the Heacock drainage channel, and use any fees provided by MARB, for participation in this program, to establish and monitor this station.

II. COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals and mutual covenants contained herein, the TASK FORCE AGENCIES agree as follows:

1. Creation of a Task Force. There is hereby created a "Lake Elsinore and Canyon Lake TMDL Task Force" ("TASK FORCE") consisting of the TASK FORCE AGENCIES and certain Non-Voting, Non-Funding Members as more specifically provided for in paragraph 2 below.
2. Representation on the Task Force.
 - a. Appointment. Concurrently with the execution of this Agreement, each TASK FORCE AGENCY shall, in accordance with such TASK FORCE AGENCY's own governing provisions, appoint one primary representative to the TASK FORCE and one alternate representative to act in the absence of the primary representative (hereinafter collectively referred to as "REPRESENTATIVES" or individually as "REPRESENTATIVE"). The REPRESENTATIVES

shall have the authority to act on behalf of its appointing TASK FORCE AGENCY. The REPRESENTATIVES shall serve at the pleasure of the appointing TASK FORCE AGENCY and may be removed at any time, with or without cause by such TASK FORCE AGENCY; provided, however, that the TASK FORCE AGENCIES acknowledge and agree the continuity of representation on the TASK FORCE is important to the overall effectiveness of the TASK FORCE, and the TASK FORCE AGENCIES further agree to ensure such continuity whenever possible.

- b. Additional Agencies. The TASK FORCE AGENCIES acknowledge and agree that the effectiveness of the TASK FORCE may be improved by the inclusion of other agencies as additional TASK FORCE AGENCIES to the TASK FORCE. Such agencies may join the TASK FORCE on such written terms and conditions as are acceptable to all then existing TASK FORCE AGENCIES of the TASK FORCE, including, but not limited to, agreed-upon cash contributions for past, present, and/or future work, of the TASK FORCE. The inclusion of such agencies as additional TASK FORCE AGENCIES to the TASK FORCE shall be effected by a written amendment to this AGREEMENT signed by all then existing TASK FORCE AGENCIES. Such additional TASK FORCE AGENCIES shall each appoint their TASK FORCE primary REPRESENTATIVE and alternate REPRESENTATIVE as provided in Section II.2.a above or in said written amendment. The following agencies will be considered for inclusion as additional TASK FORCE AGENCIES in future amendments to this Agreement within the meaning of this section:

Any other named stakeholder in any future amendments of the BASIN PLAN AMENDMENT.

-
- c. Non-Voting, Non-Funding Members. The Regional Board, Lake Elsinore and San Jacinto Watersheds Authority and the San Jacinto River Watershed council are hereby appointed as Non-Voting, Non-Funding Members of the TASK FORCE. Additional Non-Voting, Non-Funding Members may be appointed by a majority vote of the TASK FORCE representatives. Non-Voting, Non-Funding Members appointed herein, and any appointed in the future are authorized only to make recommendations upon the functioning of this TASK FORCE and the development of this program. Federal, State and local regulatory agencies acting as Non-Voting, Non-Funding Members, now or in the future, retain authority to regulate TASK FORCE MEMBERS only to the extent that they are so authorized under State and Federal law.
 - d. Dairy and Agricultural Operators. The TASK FORCE AGENCIES acknowledge that the Western Riverside County Agriculture Coalition (WRCAC) shall represent the collective interest of both participating agricultural and dairy operators in the San Jacinto River Watershed in the TASK FORCE at this time. WRCAC shall appoint two primary TASK FORCE REPRESENTATIVES and two alternate REPRESENTATIVES as provided in Section II.2.a. One set of REPRESENTATIVES shall be designated for agricultural operator interests; the other set of REPRESENTATIVES shall be designated for dairy interests for the purposes of this TASK FORCE.
 - e. Committees. The TASK FORCE may establish subcommittees, consisting of REPRESENTATIVES and Non-Voting, Non-Funding Members who shall be selected by, and serve at the pleasure of, the TASK FORCE.
 - f. Task Force Administrator. A TASK FORCE administrator (hereinafter "TASK FORCE ADMINISTRATOR") shall be appointed by the TASK FORCE. The TASK FORCE ADMINISTRATOR shall have the following administrative responsibilities:

- (1) Organizing and facilitating TASK FORCE meetings;
- (2) Secretarial, clerical, and administrative services;
- (3) Managing TASK FORCE funds and preparing annual reports of TASK FORCE assets and expenditures;
- (4) Retaining TASK FORCE-authorized consultants; and
- (5) Seeking funding grants to assist with achieving the work of the TASK FORCE and other goals and objectives approved by TASK FORCE AGENCIES.
- (6) Possible administrator of future pollutant trading (water quality trading) agreements.

The TASK FORCE AGENCIES hereby appoint the Lake Elsinore and San Jacinto Watersheds Authority as the initial TASK FORCE ADMINISTRATOR.

g. Meetings of the Task Force.

- (i) Frequency and Location. The TASK FORCE shall, by resolution or motion, agree upon the time and place for holding its regular meetings. Special meetings may be called at the request of the TASK FORCE ADMINISTRATOR or by a majority of the TASK FORCE REPRESENTATIVES.
- (ii) Task Force Chair. The TASK FORCE REPRESENTATIVES shall select a chair and a vice-chair. The term of the chair and vice-chair shall be one year and shall be rotated among the TASK FORCE REPRESENTATIVES interested in serving as chair.
- (iii) Quorum. One half or more of the REPRESENTATIVES of the TASK FORCE shall constitute a Quorum.
- (iv) Voting. Actions of the TASK FORCE shall be validly taken only when a Quorum is present and upon the affirmative vote of a MAJORITY of the TASK FORCE REPRESENTATIVES. A MAJORITY of the REPRESENTATIVES shall be determined as follows:

Each TASK FORCE AGENCY shall have one vote assigned for each \$1,000 increment of PRO RATA COST SHARE, as described in Paragraph II.5 below, contributed to the TASK FORCE Budget developed for a given fiscal year. A MAJORITY of the REPRESENTATIVES shall consist of greater than 50% of the total votes based on the Budget for the fiscal year during which the action is taken.
- (v) All meetings of the TASK FORCE or any of its committees shall be conducted as may be required by any applicable provisions of the Ralph M. Brown Act (California Government Code §§54950 et seq.). The provisions contained in the Ralph M. Brown Act shall prevail in the event of any conflict with provisions contained in this Agreement.

The TASK FORCE may adopt such additional rules and regulations as may be required for the conduct of its affairs so long as such rules and regulations do not conflict with this Agreement.

3. Work of the Task Force. The TASK FORCE shall perform the following tasks in accordance with guidelines established by the Regional Board:
 - a. To retain consulting services to review scientific and other assumptions contained within the TMDL. Consultant(s) shall provide a report identifying preliminary TMDL opportunities such as site specific objectives, pollutant trading strategies, and integration strategies. The final scope of work shall be approved by the Task Force. The report shall specifically consider assumptions supporting the TMDL. The report should also provide preliminary analysis of the ability to achieve in-lake nutrient reductions and verify that load assignments are appropriate. Upon completion of the report, Consultant(s) shall also review work described herein, and make

recommendations to ensure that work is specifically designed to resolve any deficiencies, where appropriate. Consultant(s) shall also coordinate development of BASIN PLAN AMENDMENT language, in coordination with the Regional Board, which can be used to revise the TMDLs as part of the Regional Board's Triennial Reviews.

- b. TMDL IMPLEMENTATION PLAN Task 4 - Implement a Watershed-wide Nutrient Monitoring Program. This program shall obtain data necessary to update the Lake Elsinore and Canyon Lake Nutrient TMDL, and to determine compliance with interim and final nitrogen and phosphorus allocations, and compliance with the nitrogen and phosphorus TMDLs. Monitoring and management of monitoring data to update the Lake Elsinore and Canyon Lake Nutrient TMDL shall commence immediately upon approval of this Agreement. An annual report summarizing the data collected for the year shall be submitted to the Regional Board by August 15 of each year.
- c. TMDL IMPLEMENTATION PLAN Task 4 - Implement a Lake Elsinore and Canyon Lake Nutrient Monitoring Program. This program shall obtain data necessary to update the Lake Elsinore and Canyon Lake Nutrient TMDLs, and to determine compliance with interim and final nitrogen, phosphorus, chlorophyll A and dissolved oxygen numeric targets. In addition, the monitoring program shall determine the relationship between ammonia toxicity and the total nitrogen allocation to ensure that the total nitrogen allocation will prevent ammonia toxicity in Lake Elsinore and Canyon Lake. Lake monitoring and management of lake monitoring data shall be deferred based on agreement with the Regional Board. Thereafter, an annual report summarizing the data collected for the year shall be submitted to the Regional Board by August 15 of each year.
- d. TMDL IMPLEMENTATION PLAN Tasks 9 and 10 - Implement a Plan to Reduce Nutrients from sediments in Lake Elsinore and Canyon Lake. The projects will be based on prepared plans shall evaluate the efficacy of various in-lake treatment technologies to prevent the release of Nutrients from lake sediments as a long-term strategy for control of Nutrients in the sediment. The program may also include a sediment nutrient monitoring program to evaluate the effectiveness of any technologies that may be implemented. Target Date for Completion Date: July 1, 2015 (Interim TMDL targets) July 1, 2020 (Final TMDL targets).
- e. TMDL IMPLEMENTATION PLAN Task 11 - Implement a Plan and Schedule for Updating the Existing Lake Elsinore/San Jacinto River Watershed Nutrient Model and the Canyon Lake and Lake Elsinore In-Lake Models. Develop and implement a plan and schedule to update and execute Watersheds and in-lake models to track the progress of TMDL efforts. In-lake models should be analyzed as soon as sufficient data becomes available. Target Date for Completion: December 31, 2018.
- f. TMDL IMPLEMENTATION PLAN Task 12 - Investigate, Develop and Implement a Pollutant (Water Quality) Trading Plan. Investigate the feasibility of pollutant trading in the Watersheds, and develop a feasibility plan for Regional Board review and approval. Target Date for Completion: December 31, 2012.
- g. Investigate Long Term TMDL Implementation Structure, Cost Sharing Formula and Funding Sources. Investigate possible long term administrative structures, cost sharing formulas and funding sources that can be used to obtain compliance with the TMDL requirements. Target Date for Completion: December 31, 2012.
- h. Other Tasks. The TASK FORCE may undertake such other plans, programs and studies as authorized by the TASK FORCE pursuant to II.2.g. of this Agreement.

- i. Limitations on MARB. As described above in Section I.h., MARB is an agency of the federal government and is therefore unable to participate in each and every aspect of Section 3 to the same extent as other TASK FORCE MEMBERS. To the extent that it is unable to participate in any tasks under section 3, it reserves the right, in its sole discretion, to participate to the fullest extent that it is able, as a matter of comity.
4. Budgets. The total Annual Budget, adjusted to remove in-kind services, grant funding and funding credits associated with this Agreement shall not exceed \$800,000, except as authorized by the TASK FORCE via two-thirds approval via votes based on the Budget for the then current fiscal year pursuant to II.2.g. of this Agreement. The TASK FORCE ADMINISTRATOR shall prepare and submit a proposed Budget for each fiscal year of this Agreement to the TASK FORCE AGENCIES by November 30th. The proposed Budget shall include all anticipated costs for the scope(s) of work developed by the TASK FORCE for the next fiscal year. The TASK FORCE Representatives shall approve the Budget by December 31st. Each TASK FORCE AGENCY shall pay its PRO-RATA SHARE of the approved fiscal year's TASK FORCE Budget and arrears by August 31st of the following year. The Budget for the fiscal year 2012- 2013 and estimate for fiscal year 2013- 2014 is included as Attachment A to the Agreement. Approval of this Agreement shall constitute approval of the Budget for fiscal year 2012- 2013. Payment of the fiscal year 2012- 2013 Budget shall be by August 31, 2012, or within 30 days of the approval of this Agreement by each TASK FORCE AGENCY, whichever is sooner.

The TASK FORCE ADMINISTRATOR shall endeavor to minimize carry-over fund balances to those necessary to complete work of the TASK FORCE and to maintain contingencies limited to those necessary to ensure work of the TASK FORCE is not impeded. Excess not necessary to complete budgeted work of the TASK FORCE or maintain adequate reserves shall be credited back to the TASK FORCE AGENCIES in the Budget consistent with the PRO-RATA SHARE methodology described in Paragraph II.5 below. THE TASK FORCE AGENCIES shall agree to a reasonable reserve balance as part of each year's Budget.

After September 30th of each year, the TASK FORCE ADMINISTRATOR shall provide an accounting of all PRO RATA SHARES collected via cash or in-kind contributions. If PRO RATA SHARES collected are less than Budget, the TASK FORCE shall meet with Regional Board staff to determine appropriate priorities for scheduled TASK FORCE work and revise Budget based on available funds.

5. Pro-Rata Share Calculation. The annual PRO-RATA SHARE shall be calculated in the following manner:
 - A. TMDL TASK FORCE costs are identified within the Task Force Budget under Part A: Task Force Regulatory/Administrative Budget (see Exhibit "A") and starting in FY 13-14 shall be shared equally by the TASK FORCE AGENCIES .
 - B. TMDL TASK FORCE costs identified within the Task Force Budget under Part B: TMDL Implementation Project Budget (see Exhibit "A") shall be shared by the TASK FORCE AGENCIES, based upon participation in the individual program or project. The PRO-RATA SHARE for each TASK FORCE AGENCIES under Part B shall be per an amount agreed upon and/or in kind services among the participating parties.
 - C. The PRO-RATA SHARE for additional TASK FORCE AGENCIES shall be per in-kind services and/or an amount agreed upon via written amendment of this AGREEMENT per Section II.2.b.

If the estimated funds collected under the PRO-RATA SHARE calculations exceed the BUDGET, the contributions of MS4 CO-PERMITTEES, EVMWD, City of Lake Elsinore, Agricultural Operators, Dairy and other TASK FORCE AGENCIES contributing in excess of the base amount shall be raised or reduced proportionately based on the percentage of their PRO-RATA SHARE, until the estimated total PRO-RATA SHARES equals the BUDGET.

RCFC&WCD shall provide the TASK FORCE ADMINSTRATOR with annual individual MS4 CO-PERMITTEE cost share distribution of the MS4 CO-PERMITTEES PRO-RATA SHARE for each Fiscal Year. The methodology used by RCFC&WCD to calculate the MS4 CO-PERMITTEE cost share distribution may be amended at the NPDES MS4 Management Steering Committee.

Pro rata cost shares assigned to TASK FORCE AGENCIES who are not PARTIES to this Agreement shall be considered unfunded portions of the BUDGET and are addressed in Section II.4, paragraph 3 of this Agreement.

6. In-Kind Credits. The TASK FORCE shall accept in-kind contributions or credits for TASK FORCE work defined under this AGREEMENT per Section II.3 as agreed to annually by the TASK FORCE. The PRO-RATA SHARE of a TASK FORCE AGENCY shall be reduced by the value of IN-KIND CREDITS provided toward agreed-upon budgeted tasks by, or on behalf, of the TASK FORCE AGENCY(S). Credits shall be applied to each budget period and adjusted at the end of each budget year based on actual verified costs unless deferred to a future budget year among the TASK FORCE AGENCIES with credits.
7. Modifications to the TASK FORCE PRO-RATA SHARE methodology. The methodology deriving the TASK FORCE PRO-RATA SHARE as provided in Section II.5 of this Agreement may be modified upon written approval of all then existing TASK FORCE AGENCIES who's PRO-RATA SHARE would be affected.
8. The TASK FORCE AGENCIES shall cooperate fully with one another to attain the purposes of this Agreement.
9. Nothing in this Agreement, nor the work set forth in this Agreement, nor any activity approved or carried out by the TASK FORCE AGENCIES hereunder, is intended to be nor shall be interpreted as a waiver by TASK FORCE AGENCIES of the "Maximum Extent Practicable" standard set forth in the Clean Water Act (33 U.S.C. Section 1251 *et seq.*).
10. Each TASK FORCE AGENCY shall indemnify, defend, and hold each of the other TASK FORCE AGENCIES, including their special districts, officials, agents, officers, and employees, harmless from and against any and all liability and expense arising from any act or omission of such TASK FORCE AGENCY, its officials, agents, officers, and employees, in connection with this Agreement, including but not limited to defense costs, legal fees, claims, actions, and causes of action for damages of any nature whatsoever, including but not limited to bodily injury, death, personal injury, or property damage; provided, however, that no TASK FORCE AGENCY shall indemnify another TASK FORCE AGENCY for that TASK FORCE AGENCY's own negligence or willful misconduct.

MARB, as an agency of the federal government, is unable to indemnify or hold harmless any other TASK FORCE AGENCY for any liability arising under this agreement. MARB expressly does not indemnify or hold harmless any other TASK FORCE AGENCY for any injuries or liabilities, to itself, to any third party or to MARB, or its employees under this agreement or any activities carried out under authority of this agreement.

11. In light of the provisions of Section 895.2 of the Government Code of the State of California imposing certain tort liability jointly upon public entities solely by reason of such entities being parties to an agreement (as defined in Section 895 of said Code), each of the TASK FORCE

AGENCIES hereto, pursuant to the authorization contained in Sections 895.4 and 895.6 of said Code, shall assume the full liability imposed upon it or any of its officers, agents, or employees by law for injury caused by any act or omission occurring in the performance of this Agreement to the same extent that such liability would be imposed in the absence of Section 895.2 of said Code. To achieve the above stated purpose, each of the TASK FORCE AGENCIES indemnifies, defends, and holds harmless each other TASK FORCE AGENCY for any liability, cost, or expense that may be imposed upon such other TASK FORCE AGENCY solely by virtue of said Section 895.2. The provisions of Section 2778 of the California Civil Code are made a part hereof as if incorporated herein.

MARB, as an agency of the federal government, is unable to indemnify or hold harmless any other TASK FORCE AGENCY for any liability arising under this agreement. MARB expressly does not indemnify or hold harmless any TASK FORCE AGENCY for any injuries or liabilities, to itself, to any third party or to MARB or their employees under this agreement or any activities carried out under authority of this agreement. Tort liability for federal employees, including employees of MARB, is expressly authorized and limited by the Federal Tort Claims Act, which will control liability of MARB and their employees under the terms of this agreement.

12. All obligations of CALTRANS under the terms of this Agreement are subject to the appropriation of the resources by the Legislature and the allocation of resources by the California Transportation Commission. This Agreement has been written before ascertaining the availability of Federal or State legislative appropriation of funds, for the mutual benefit of the TASK FORCE AGENCIES in order to avoid program and fiscal delays that would occur if the Agreement were executed after that determination was made. This Agreement is valid and enforceable as to each of the CALTRANS as if sufficient funds have been made available to CALTRANS by the United States Government or California State Legislature for the purposes set forth in this Agreement. If the United States Government or the California State Legislature does not appropriate sufficient funds for CALTRANS to participate in this Agreement, this Agreement may be amended in writing by the TASK FORCE AGENCIES to reflect any agreed-upon reduction in the percentage of funds contributed by CALTRANS to continue its participation in this Agreement. CALTRANS, however, has the option to withdraw from this Agreement in the event sufficient funds are not appropriated for CALTRANS. Should CALTRANS exercise its option to withdraw from this Agreement, CALTRANS shall remain responsible for its share of liability, if any, incurred while participating in this Agreement.
13. No TASK FORCE AGENCY shall have a financial obligation to any other TASK FORCE AGENCY under this Agreement, except as expressly provided herein.
14. Any notices, invoices, reports, correspondence, or other communication concerning this Agreement shall be directed to the TASK FORCE AGENCY REPRESENTATIVE on file with the TASK FORCE ADMINISTRATOR, except that any TASK FORCE AGENCY may change its name or address by giving the other TASK FORCE AGENCIES at least ten days written notice of the new name or address.
15. The TASK FORCE AGENCIES are, and shall at all times remain as to each other, wholly independent entities. No TASK FORCE AGENCY to this Agreement shall have power to incur any debt, obligation, or liability on behalf of any other TASK FORCE AGENCY unless expressly provided to the contrary by this Agreement. No employee, agent, or officer of a TASK FORCE AGENCY shall be deemed for any purpose whatsoever to be an agent, employee or officer of another TASK FORCE AGENCY.

16. This Agreement shall be binding upon and shall inure to the benefit of the respective successors, heirs, and assigns of each TASK FORCE AGENCY.
17. This Agreement shall be governed by, interpreted under, and construed and enforced in accordance with the laws of the State of California, except as to the March Air Reserve Base to whom federal law is applicable.
18. If any provision of this Agreement shall be determined by any court to be invalid, illegal, or unenforceable to any extent, the remainder of this Agreement shall not be affected and this Agreement shall be construed as if the invalid, illegal, or unenforceable provision had never been contained in this Agreement.
19. Each individual TASK FORCE AGENCY has been represented by its own separate counsel in the preparation and negotiation of this Agreement. Accordingly, this Agreement shall be construed according to its fair language and any ambiguities shall not be resolved against the drafting TASK FORCE AGENCY.
20. Each of the persons signing below on behalf of a TASK FORCE AGENCY represents and warrants that he or she is authorized to sign this Agreement on behalf of such TASK FORCE AGENCY.
21. Duration of Agreement. This Agreement shall terminate **June 30, 2017** (unless extended by mutual agreement of all TASK FORCE AGENCIES), provided that all debts and liabilities of the TASK FORCE are satisfied. Notwithstanding the foregoing, each TASK FORCE AGENCY reserves the right to withdraw from the TASK FORCE at any time, upon sixty (60) days prior written notice to the TASK FORCE. TASK FORCE contingency, projects, and studies underway at the time of withdrawal shall continue to be fully funded by the withdrawing TASK FORCE AGENCY until the end of the fiscal year in which the TASK FORCE AGENCY gave notice to withdraw.
22. Counterparts. This Agreement may be executed simultaneously or in counterparts, each of which shall be deemed an original, and together shall constitute one and the same instrument.
23. Amendment. This Agreement may not be amended except in a writing signed by all the TASK FORCE AGENCIES.

IN WITNESS WHEREOF, the TASK FORCE AGENCIES have executed this AGREEMENT on the date set forth below:

Approved FY 2012-13 Budget: Lake Elsinore & Canyon Lake TMDL Task Force

Summary Task Force Expenditures

Budget
2012-13

Part A: Task Force Regulatory/Administrative Budget

1. Task Force Administration	\$ 50,000
Task Force Administrator (LESJWA)	
Annual Water Quality Reporting and Database Management	
Amend Task Force Agreement	
Grant Preparation	
2. TMDL Compliance Expert	\$ 50,000
Risk Sciences	
3. Pollutant Trading Program Development	\$ 60,000
TBD	
4. Contingency (approximately 10% of direct stakeholder expenses)	\$ 16,000
TMDL Task Force Regulatory/Administrative Budget	\$ 176,000

Part B: TMDL Implementation Project Budget

1. TMDL Compliance Monitoring	
Watershed-wide Nutrient Monitoring Program	\$ 85,000
Watershed-wide Nutrient Monitoring & Report Preparation (Weston Solutions)	\$ 70,000
Wet Year Watershed-wide Monitoring (weather dependant) (RCFC&WCD)	\$ -
Lab Analysis, Watershed-wide Monitoring (RCFC&WCD)	\$ 15,000
Stream gauge O&M (RCFC&WCD)	\$ -
Lake Elsinore Nutrient Monitoring Program	\$ -
Lake Elsinore Nutrient Monitoring & Lab Analysis (EVMWD)	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring & Lab Analysis (EVMWD)	\$ -
2. Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M (to be handled by separate agreement)	
O&M	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -
Fishery Management O&M	\$ -
Carp Removal Program	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -
3. Canyon Lake Project Alternatives	\$ 220,000
Permitting	\$ 30,000
O&M Agreement	\$ 20,000
Detailed Design	\$ 150,000
Construction	\$ -
O&M	\$ -
Project Administration (10% of budgeted expenses)	\$ 20,000
Pollutant Trading Administration (3% of O&M Costs)	\$ -
	\$ -
	\$ -
	\$ -
TMDL Task Force Implementation Budget	\$ 305,000

TMDL Task Force Budget : \$ 481,000

Task Force Agency Contributions Summary

**Budget
2012-13**

1. Task Force Agency Allocation

	Administrative (Part A)	Project Implementation (Part B)	Total
MS4 Co-Permittees (Total)	\$ 105,600	\$ 249,988	\$ 355,588
Riverside County	\$ 18,981	\$ 44,935	\$ 63,916
City of Beaumont	\$ 2,249	\$ 5,324	\$ 7,574
City of Canyon Lake	\$ 1,958	\$ 4,636	\$ 6,595
City of Hemet	\$ 13,087	\$ 30,980	\$ 44,067
City of Lake Elsinore	\$ 6,955	\$ 16,466	\$ 23,421
City of Moreno Valley	\$ 30,284	\$ 71,691	\$ 101,974
City of Murrieta	\$ 375	\$ 888	\$ 1,263
City of Perris	\$ 9,560	\$ 22,632	\$ 32,192
City of Riverside	\$ 1,710	\$ 4,047	\$ 5,757
City of San Jacinto	\$ 6,420	\$ 15,197	\$ 21,617
City of Menifee	\$ 11,796	\$ 27,925	\$ 39,721
City of Wildomar	\$ 2,225	\$ 5,267	\$ 7,492
Elsinore Valley Municipal Water District (EVMWD)	\$ 8,800	\$ 4,250	\$ 13,050
San Jacinto Agricultural Operators	\$ 8,800	\$ 19,478	\$ 28,278
San Jacinto Dairy & CAFO Operators	\$ 8,800	\$ 10,034	\$ 18,834
CALTRANS - freeway	\$ 8,800	\$ 4,250	\$ 13,050
CA DF&G - San Jacinto Wetlands	\$ 8,800	\$ 4,250	\$ 13,050
Eastern Municipal Water District	\$ 8,800	\$ 4,250	\$ 13,050
March Air Reserve Base Joint Powers Authority	\$ 8,800	\$ 4,250	\$ 13,050
US Air Force (March Air Reserve Base)	\$ 8,800	\$ 4,250	\$ 13,050
Total Funding Required	\$ 176,000	\$ 305,000	\$ 481,000

Notes:

Task Force Administration

- Organize and facilitate TMDL TASK FORCE and TAC meetings,
- Perform secretarial, clerical and administrative services, including providing meeting summaries to TMDL TASK FORCE members,
- Manage TMDL TASK FORCE funds and prepare annual reports of TMDL TASK FORCE assets and expenditures,
- Serve as the contracting party, for the benefit of the TMDL TASK FORCE, for contracts with all consultants, contractors, vendors and other entities,
- Seek funding grants to assist with achieving goals and objectives of the TMDL TASK FORCE.
- Coordinate with other agencies and organizations as necessary to facilitate TMDL TASK FORCE work.
- Administer the preparation of quarterly and annual reports, as required by the TMDL Implementation Plan, and submit them as required by the TMDL Implementation Plan on behalf of the TMDL TASK FORCE.
- Possible administrator of future pollutant trading (water quality trading) agreements.

TMDL Compliance Expert

- Support Task Force Agency as a Regulatory Strategist and Compliance Expert .
- Develop implementation strategy to address TMDL compliance with nutrient targets
- Plan and prepare Basin Plan Amendment for TMDL
- Sub-contract out pollutant trading agreement preparation by consultant

Task Force Agency Contributions Detailed Tables**Part A: Task Force Regulatory/Administrative Budget****Task Force Regulatory/Administrative Expenses**

	Allocation
MS4 Co-Permittees	\$ 105,600
Riverside County	\$ 18,981
City of Beaumont	\$ 2,249
City of Canyon Lake	\$ 1,958
City of Hemet	\$ 13,087
City of Lake Elsinore	\$ 6,955
City of Moreno Valley	\$ 30,284
City of Murrieta	\$ 375
City of Perris	\$ 9,560
City of Riverside	\$ 1,710
City of San Jacinto	\$ 6,420
City of Menifee	\$ 11,796
City of Wildomar	\$ 2,225
Elsinore Valley Municipal Water District (EVMWD)	\$ 8,800
San Jacinto Agricultural Operators	\$ 8,800
San Jacinto Dairy & CAFO Operators	\$ 8,800
CALTRANS - freeway	\$ 8,800
CA DF&G - San Jacinto Wetlands	\$ 8,800
Eastern Municipal Water District	\$ 8,800
March Air Reserve Base Joint Powers Authority	\$ 8,800
US Air Force (March Air Reserve Base)	\$ 8,800
Funding Required	\$ 176,000

Part B: TMDL Implementation Project Budget**TMDL Compliance Monitoring Expenses****Watershed-wide Nutrient Monitoring Program**

	Allocation
MS4 Co-Permittees	\$ 51,000
Riverside County	\$ 9,167
City of Beaumont	\$ 1,086
City of Canyon Lake	\$ 946
City of Hemet	\$ 6,320
City of Lake Elsinore	\$ 3,359
City of Moreno Valley	\$ 14,626
City of Murrieta	\$ 181
City of Perris	\$ 4,617
City of Riverside	\$ 826
City of San Jacinto	\$ 3,100
City of Menifee	\$ 5,697
City of Wildomar	\$ 1,075
Elsinore Valley Municipal Water District (EVMWD)	\$ 4,250
San Jacinto Agricultural Operators	\$ 4,250
San Jacinto Dairy & CAFO Operators	\$ 4,250
CALTRANS - freeway	\$ 4,250
CA DF&G - San Jacinto Wetlands	\$ 4,250
Eastern Municipal Water District	\$ 4,250
March Air Reserve Base Joint Powers Authority	\$ 4,250
US Air Force (March Air Reserve Base)	\$ 4,250
Funding Required	\$ 85,000

Lake Elsinore Nutrient Monitoring Program**Allocation**

MS4 Co-Permittees	\$ -
Riverside County	\$ -
City of Beaumont	\$ -
City of Canyon Lake	\$ -
City of Hemet	\$ -
City of Lake Elsinore	\$ -
City of Moreno Valley	\$ -
City of Murrieta	\$ -
City of Perris	\$ -
City of Riverside	\$ -
City of San Jacinto	\$ -
City of Menifee	\$ -
City of Wildomar	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -
San Jacinto Agricultural Operators	\$ -
San Jacinto Dairy & CAFO Operators	\$ -
CALTRANS - freeway	\$ -
CA DF&G - San Jacinto Wetlands	\$ -
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	\$ -
US Air Force (March Air Reserve Base)	\$ -
Funding Required	\$ -

Canyon Lake Nutrient Monitoring Program**Allocation**

MS4 Co-Permittees	\$ -
Riverside County	\$ -
City of Beaumont	\$ -
City of Canyon Lake	\$ -
City of Hemet	\$ -
City of Lake Elsinore	\$ -
City of Moreno Valley	\$ -
City of Murrieta	\$ -
City of Perris	\$ -
City of Riverside	\$ -
City of San Jacinto	\$ -
City of Menifee	\$ -
City of Wildomar	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -
San Jacinto Agricultural Operators	\$ -
San Jacinto Dairy & CAFO Operators	\$ -
CALTRANS - freeway	\$ -
CA DF&G - San Jacinto Wetlands	\$ -
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	\$ -
US Air Force (March Air Reserve Base)	\$ -
Funding Required	\$ -

Lake Elsinore Project Alternatives***Aeration & Destratification System O&M*****Allocation**

MS4 Co-Permittees	\$ -
Riverside County	\$ -
City of Beaumont	\$ -
City of Canyon Lake	\$ -
City of Hemet	\$ -
City of Lake Elsinore	\$ -
City of Moreno Valley	\$ -
City of Murrieta	\$ -
City of Perris	\$ -
City of Riverside	\$ -
City of San Jacinto	\$ -
City of Menifee	\$ -
City of Wildomar	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -
San Jacinto Agricultural Operators	\$ -
San Jacinto Dairy & CAFO Operators	\$ -
CALTRANS - freeway	\$ -
CA DF&G - San Jacinto Wetlands	\$ -
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	\$ -
US Air Force (March Air Reserve Base)	\$ -
Funding Required	\$ -

Lake Elsinore Project Alternatives***Fishery Management O&M*****Allocation**

MS4 Co-Permittees	\$ -
Riverside County	\$ -
City of Beaumont	\$ -
City of Canyon Lake	\$ -
City of Hemet	\$ -
City of Lake Elsinore	\$ -
City of Moreno Valley	\$ -
City of Murrieta	\$ -
City of Perris	\$ -
City of Riverside	\$ -
City of San Jacinto	\$ -
City of Menifee	\$ -
City of Wildomar	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -
San Jacinto Agricultural Operators	\$ -
San Jacinto Dairy & CAFO Operators	\$ -
CALTRANS - freeway	\$ -
CA DF&G - San Jacinto Wetlands	\$ -
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	\$ -
US Air Force (March Air Reserve Base)	\$ -
Funding Required	\$ -

Canyon Lake Project Alternatives

	Allocation
MS4 Co-Permittees	\$ 198,988
Riverside County	\$ 35,767
City of Beaumont	\$ 4,238
City of Canyon Lake	\$ 3,690
City of Hemet	\$ 24,660
City of Lake Elsinore	\$ 13,106
City of Moreno Valley	\$ 57,065
City of Murrieta	\$ 707
City of Perris	\$ 18,015
City of Riverside	\$ 3,221
City of San Jacinto	\$ 12,097
City of Menifee	\$ 22,228
City of Wildomar	\$ 4,193
Elsinore Valley Municipal Water District (EVMWD)	\$ -
San Jacinto Agricultural Operators	\$ 15,228
San Jacinto Dairy & CAFO Operators	\$ 5,784
CALTRANS - freeway	
CA DF&G - San Jacinto Wetlands	
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	
US Air Force (March Air Reserve Base)	
	\$ 220,000

Cost formula : based upon the 1:1 ratio of TP to TN contributions from urban and agricultural runoff as projected in the respective Riverside County Comprehensive Nutrient Reduction Plan and San Jacinto Agricultural Nutrient Reduction Plan

Task Force Agency Contributions Detailed Tables

	Allocation
MS4 Co-Permittees (Total)	\$ 355,588
Task Force Regulatory/Administrative Expenses	\$ 105,600
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 51,000
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 198,988
Riverside County	\$ 63,916
Task Force Regulatory/Administrative Expenses	\$ 18,981
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 9,167
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 35,767
	\$ -
City of Beaumont	\$ 7,574
Task Force Regulatory/Administrative Expenses	\$ 2,249
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 1,086
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 4,238
	\$ -
City of Canyon Lake	\$ 6,595
Task Force Regulatory/Administrative Expenses	\$ 1,958
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 946
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 3,690

City of Hemet	\$ 44,067
Task Force Regulatory/Administrative Expenses	\$ 13,087
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 6,320
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 24,660
City of Lake Elsinore	\$ 23,421
Task Force Regulatory/Administrative Expenses	\$ 6,955
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 3,359
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 13,106
City of Moreno Valley	\$ 101,974
Task Force Regulatory/Administrative Expenses	\$ 30,284
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 14,626
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 57,065
City of Murrieta	\$ 1,263
Task Force Regulatory/Administrative Expenses	\$ 375
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 181
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 707

City of Perris	\$ 32,192
Task Force Regulatory/Administrative Expenses	\$ 9,560
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,617
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 18,015
City of Riverside	\$ 5,757
Task Force Regulatory/Administrative Expenses	\$ 1,710
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 826
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 3,221
City of San Jacinto	\$ 21,617
Task Force Regulatory/Administrative Expenses	\$ 6,420
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 3,100
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 12,097
City of Menifee	\$ 39,721
Task Force Regulatory/Administrative Expenses	\$ 11,796
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 5,697
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 22,228

City of Wildomar	\$ 7,492
Task Force Regulatory/Administrative Expenses	\$ 2,225
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 1,075
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 4,193
Elsinore Valley Municipal Water District (EVMWD)	\$ 13,050
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ -
San Jacinto Agricultural Operators	\$ 28,278
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 15,228
San Jacinto Dairy & CAFO Operators	\$ 18,834
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ 5,784

CALTRANS - freeway	\$ 13,050
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ -
CA DF&G - San Jacinto Wetlands	\$ 13,050
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ -
Eastern Municipal Water District	\$ 13,050
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ -
March Air Reserve Base Joint Powers Authority	\$ 13,050
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ -
US Air Force (March Air Reserve Base)	\$ 13,050
Task Force Regulatory/Administrative Expenses	\$ 8,800
TMDL Compliance Monitoring Expenses	
Watershed-wide Nutrient Monitoring Program	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -
Canyon Lake Nutrient Monitoring Program	\$ -
Lake Elsinore Project Alternatives	
Aeration & Destratification System O&M	\$ -
Fishery Management O&M	\$ -
Canyon Lake Project Alternatives	\$ -
Total:	\$ 481,000

PROJECTED - Task Force Agency Contributions through FY 2010-11

	Cummulative Credit / (Debit)
MS4 Co-Permittees (Total)	\$ 359,205
Riverside County	\$ 72,513
City of Beaumont	\$ 5,009
City of Canyon Lake	\$ 5,384
City of Hemet	\$ 33,909
City of Lake Elsinore	\$ 106,017
City of Moreno Valley	\$ 77,550
City of Murrieta	\$ 2,247
City of Perris	\$ 23,561
City of Riverside	\$ 3,642
City of San Jacinto	\$ 15,348
City of Menifee	\$ 11,798
City of Wildomar	\$ 2,225
Elsinore Valley Municipal Water District (EVMWD)	\$ 91,830
San Jacinto Agricultural Operators	\$ 28,985
San Jacinto Dairy & CAFO Operators	\$ 16,452
CALTRANS - freeway	\$ -
CA DF&G - San Jacinto Wetlands	\$ -
US Forest Service (USFS)	\$ -
Eastern Municipal Water District	\$ -
March Air Reserve Base Joint Powers Authority	\$ -
US Air Force (March Air Reserve Base)	\$ -
Total Credits	\$ 855,677

Task Force Agency Contributions Detailed Tables

Part A: Task Force Regulatory/Administrative Budget

Task Force Regulatory/Administrative Expenses

	Budget 2013-14	Budget 2014-15	Budget 2015-16
	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ 99,000	\$ 165,000	\$ 165,000
Riverside County	\$ 8,250	\$ 13,750	\$ 13,750
City of Beaumont	\$ 8,250	\$ 13,750	\$ 13,750
City of Canyon Lake	\$ 8,250	\$ 13,750	\$ 13,750
City of Hemet	\$ 8,250	\$ 13,750	\$ 13,750
City of Lake Elsinore	\$ 8,250	\$ 13,750	\$ 13,750
City of Moreno Valley	\$ 8,250	\$ 13,750	\$ 13,750
City of Murrieta	\$ 8,250	\$ 13,750	\$ 13,750
City of Perris	\$ 8,250	\$ 13,750	\$ 13,750
City of Riverside	\$ 8,250	\$ 13,750	\$ 13,750
City of San Jacinto	\$ 8,250	\$ 13,750	\$ 13,750
City of Menifee	\$ 8,250	\$ 13,750	\$ 13,750
City of Wildomar	\$ 8,250	\$ 13,750	\$ 13,750
Elsinore Valley Municipal Water District (EVMWD)	\$ 8,250	\$ 13,750	\$ 13,750
San Jacinto Agricultural Operators	\$ 8,250	\$ 13,750	\$ 13,750
San Jacinto Dairy & CAFO Operators	\$ 8,250	\$ 13,750	\$ 13,750
CALTRANS - freeway	\$ 8,250	\$ 13,750	\$ 13,750
CA DF&G - San Jacinto Wetlands	\$ 8,250	\$ 13,750	\$ 13,750
Eastern Municipal Water District	\$ 8,250	\$ 13,750	\$ 13,750
March Air Reserve Base Joint Powers Authority	\$ 8,250	\$ 13,750	\$ 13,750
US Air Force (March Air Reserve Base)	\$ 8,250	\$ 13,750	\$ 13,750
Funding Required	\$ 165,000	\$ 275,000	\$ 275,000

Part B: TMDL Implementation Project Budget

TMDL Compliance Monitoring Expenses

Watershed-wide Nutrient Monitoring Program

	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ 51,000	\$ 51,000	\$ 51,000
Riverside County	\$ 4,250	\$ 4,250	\$ 4,250
City of Beaumont	\$ 4,250	\$ 4,250	\$ 4,250
City of Canyon Lake	\$ 4,250	\$ 4,250	\$ 4,250
City of Hemet	\$ 4,250	\$ 4,250	\$ 4,250
City of Lake Elsinore	\$ 4,250	\$ 4,250	\$ 4,250
City of Moreno Valley	\$ 4,250	\$ 4,250	\$ 4,250
City of Murrieta	\$ 4,250	\$ 4,250	\$ 4,250
City of Perris	\$ 4,250	\$ 4,250	\$ 4,250
City of Riverside	\$ 4,250	\$ 4,250	\$ 4,250
City of San Jacinto	\$ 4,250	\$ 4,250	\$ 4,250
City of Menifee	\$ 4,250	\$ 4,250	\$ 4,250
City of Wildomar	\$ 4,250	\$ 4,250	\$ 4,250
Elsinore Valley Municipal Water District (EVMWD)	\$ 4,250	\$ 4,250	\$ 4,250
San Jacinto Agricultural Operators	\$ 4,250	\$ 4,250	\$ 4,250
San Jacinto Dairy & CAFO Operators	\$ 4,250	\$ 4,250	\$ 4,250
CALTRANS - freeway	\$ 4,250	\$ 4,250	\$ 4,250
CA DF&G - San Jacinto Wetlands	\$ 4,250	\$ 4,250	\$ 4,250
Eastern Municipal Water District	\$ 4,250	\$ 4,250	\$ 4,250
March Air Reserve Base Joint Powers Authority	\$ 4,250	\$ 4,250	\$ 4,250
US Air Force (March Air Reserve Base)	\$ 4,250	\$ 4,250	\$ 4,250
Funding Required	\$ 85,000	\$ 85,000	\$ 85,000

Lake Elsinore Nutrient Monitoring Program

	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ -	\$ 90,000	\$ 90,000
Riverside County	\$ -	\$ 7,500	\$ 7,500
City of Beaumont	\$ -	\$ 7,500	\$ 7,500
City of Canyon Lake	\$ -	\$ 7,500	\$ 7,500
City of Hemet	\$ -	\$ 7,500	\$ 7,500
City of Lake Elsinore	\$ -	\$ 7,500	\$ 7,500
City of Moreno Valley	\$ -	\$ 7,500	\$ 7,500
City of Murrieta	\$ -	\$ 7,500	\$ 7,500
City of Perris	\$ -	\$ 7,500	\$ 7,500
City of Riverside	\$ -	\$ 7,500	\$ 7,500
City of San Jacinto	\$ -	\$ 7,500	\$ 7,500
City of Menifee	\$ -	\$ 7,500	\$ 7,500
City of Wildomar	\$ -	\$ 7,500	\$ 7,500
Elsinore Valley Municipal Water District (EVMWD)	\$ -	\$ 7,500	\$ 7,500
San Jacinto Agricultural Operators	\$ -	\$ 7,500	\$ 7,500
San Jacinto Dairy & CAFO Operators	\$ -	\$ 7,500	\$ 7,500
CALTRANS - freeway	\$ -	\$ 7,500	\$ 7,500
CA DF&G - San Jacinto Wetlands	\$ -	\$ 7,500	\$ 7,500
Eastern Municipal Water District	\$ -	\$ 7,500	\$ 7,500
March Air Reserve Base Joint Powers Authority	\$ -	\$ 7,500	\$ 7,500
US Air Force (March Air Reserve Base)	\$ -	\$ 7,500	\$ 7,500
Funding Required	\$ -	\$ 150,000	\$ 150,000

Canyon Lake Nutrient Monitoring Program

	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ -	\$ 97,059	\$ 97,059
Riverside County	\$ -	\$ 8,824	\$ 8,824
City of Beaumont	\$ -	\$ 8,824	\$ 8,824
City of Canyon Lake	\$ -	\$ 8,824	\$ 8,824
City of Hemet	\$ -	\$ 8,824	\$ 8,824
City of Lake Elsinore	\$ -	\$ 8,824	\$ 8,824
City of Moreno Valley	\$ -	\$ 8,824	\$ 8,824
City of Murrieta	\$ -	\$ 8,824	\$ 8,824
City of Perris	\$ -	\$ 8,824	\$ 8,824
City of Riverside	\$ -	\$ 8,824	\$ 8,824
City of San Jacinto	\$ -	\$ 8,824	\$ 8,824
City of Menifee	\$ -	\$ 8,824	\$ 8,824
City of Wildomar	\$ -	\$ -	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -	\$ -	\$ -
San Jacinto Agricultural Operators	\$ -	\$ 8,824	\$ 8,824
San Jacinto Dairy & CAFO Operators	\$ -	\$ 8,824	\$ 8,824
CALTRANS - freeway	\$ -	\$ 8,824	\$ 8,824
CA DF&G - San Jacinto Wetlands	\$ -	\$ 8,824	\$ 8,824
Eastern Municipal Water District	\$ -	\$ -	\$ -
March Air Reserve Base Joint Powers Authority	\$ -	\$ 8,824	\$ 8,824
US Air Force (March Air Reserve Base)	\$ -	\$ 8,824	\$ 8,824
Funding Required	\$ -	\$ 150,000	\$ 150,000

Lake Elsinore Project Alternatives
Aeration & Destratification System O&M

	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ -	\$ -	\$ -
Riverside County	\$ -	\$ -	\$ -
City of Beaumont	\$ -	\$ -	\$ -
City of Canyon Lake	\$ -	\$ -	\$ -
City of Hemet	\$ -	\$ -	\$ -
City of Lake Elsinore	\$ -	\$ -	\$ -
City of Moreno Valley	\$ -	\$ -	\$ -
City of Murrieta	\$ -	\$ -	\$ -
City of Perris	\$ -	\$ -	\$ -
City of Riverside	\$ -	\$ -	\$ -
City of San Jacinto	\$ -	\$ -	\$ -
City of Menifee	\$ -	\$ -	\$ -
City of Wildomar	\$ -	\$ -	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -	\$ -	\$ -
San Jacinto Agricultural Operators	\$ -	\$ -	\$ -
San Jacinto Dairy & CAFO Operators	\$ -	\$ -	\$ -
CALTRANS - freeway	\$ -	\$ -	\$ -
CA DF&G - San Jacinto Wetlands	\$ -	\$ -	\$ -
Eastern Municipal Water District	\$ -	\$ -	\$ -
March Air Reserve Base Joint Powers Authority	\$ -	\$ -	\$ -
US Air Force (March Air Reserve Base)	\$ -	\$ -	\$ -
Funding Required	\$ -	\$ -	\$ -

Lake Elsinore Project Alternatives
Fishery Management O&M

	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ -	\$ -	\$ -
Riverside County	\$ -	\$ -	\$ -
City of Beaumont	\$ -	\$ -	\$ -
City of Canyon Lake	\$ -	\$ -	\$ -
City of Hemet	\$ -	\$ -	\$ -
City of Lake Elsinore	\$ -	\$ -	\$ -
City of Moreno Valley	\$ -	\$ -	\$ -
City of Murrieta	\$ -	\$ -	\$ -
City of Perris	\$ -	\$ -	\$ -
City of Riverside	\$ -	\$ -	\$ -
City of San Jacinto	\$ -	\$ -	\$ -
City of Menifee	\$ -	\$ -	\$ -
City of Wildomar	\$ -	\$ -	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -	\$ -	\$ -
San Jacinto Agricultural Operators	\$ -	\$ -	\$ -
San Jacinto Dairy & CAFO Operators	\$ -	\$ -	\$ -
CALTRANS - freeway	\$ -	\$ -	\$ -
CA DF&G - San Jacinto Wetlands	\$ -	\$ -	\$ -
Eastern Municipal Water District	\$ -	\$ -	\$ -
March Air Reserve Base Joint Powers Authority	\$ -	\$ -	\$ -
US Air Force (March Air Reserve Base)	\$ -	\$ -	\$ -
Funding Required	\$ -	\$ -	\$ -

Canyon Lake Project Alternatives
Alum Addition

	Allocation	Allocation	Allocation
MS4 Co-Permittees	\$ 330,000	\$ 407,000	\$ 407,000
Riverside County	\$ 60,814	\$ 75,004	\$ 75,004
City of Beaumont	\$ 7,206	\$ 8,887	\$ 8,887
City of Canyon Lake	\$ 6,274	\$ 7,739	\$ 7,739
City of Hemet	\$ 41,928	\$ 51,711	\$ 51,711
City of Lake Elsinore	\$ 22,284	\$ 27,484	\$ 27,484
City of Moreno Valley	\$ 97,025	\$ 119,664	\$ 119,664
City of Murrieta	\$ -	\$ -	\$ -
City of Perris	\$ 30,630	\$ 37,777	\$ 37,777
City of Riverside	\$ 5,477	\$ 6,755	\$ 6,755
City of San Jacinto	\$ 20,567	\$ 25,367	\$ 25,367
City of Menifee	\$ 37,794	\$ 46,612	\$ 46,612
City of Wildomar	\$ -	\$ -	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ -	\$ -	\$ -
San Jacinto Agricultural Operators	\$ -	\$ -	\$ -
San Jacinto Dairy & CAFO Operators	\$ -	\$ -	\$ -
CALTRANS - freeway	\$ -	\$ -	\$ -
CA DF&G - San Jacinto Wetlands	\$ -	\$ -	\$ -
Eastern Municipal Water District	\$ -	\$ -	\$ -
March Air Reserve Base Joint Powers Authority	\$ -	\$ -	\$ -
US Air Force (March Air Reserve Base)	\$ -	\$ -	\$ -
	\$ 330,000	\$ 407,000	\$ 407,000

Task Force Agency Contributions Detailed Tables

	Allocation	Allocation	Allocation
MS4 Co-Permittees (Total)	\$ 480,000	\$ 810,059	\$ 810,059
Task Force Regulatory/Administrative Expenses	\$ 99,000	\$ 165,000	\$ 165,000
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 51,000	\$ 51,000	\$ 51,000
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 90,000	\$ 90,000
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 97,059	\$ 97,059
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 330,000	\$ 407,000	\$ 407,000
Riverside County	\$ 73,314	\$ 109,327	\$ 109,327
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 60,814	\$ 75,004	\$ 75,004
City of Beaumont	\$ 19,706	\$ 43,211	\$ 43,211
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 7,206	\$ 8,887	\$ 8,887
City of Canyon Lake	\$ 18,774	\$ 42,062	\$ 42,062
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 6,274	\$ 7,739	\$ 7,739
City of Hemet	\$ 54,428	\$ 86,035	\$ 86,035
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 41,928	\$ 51,711	\$ 51,711

City of Lake Elsinore	\$ 34,784	\$ 61,808	\$ 61,808
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 22,284	\$ 27,484	\$ 27,484
City of Moreno Valley	\$ 109,525	\$ 153,988	\$ 153,988
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 97,025	\$ 119,664	\$ 119,664
City of Murrieta	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
City of Perris	\$ 43,130	\$ 72,100	\$ 72,100
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 30,630	\$ 37,777	\$ 37,777
City of Riverside	\$ 17,977	\$ 41,079	\$ 41,079
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 5,477	\$ 6,755	\$ 6,755
City of San Jacinto	\$ 33,067	\$ 59,690	\$ 59,690
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 20,567	\$ 25,367	\$ 25,367

City of Menifee	\$ 50,294	\$ 80,936	\$ 80,936
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ 37,794	\$ 46,612	\$ 46,612
City of Wildomar	\$ 12,500	\$ 25,500	\$ 25,500
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ -	\$ -
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
Elsinore Valley Municipal Water District (EVMWD)	\$ 12,500	\$ 25,500	\$ 25,500
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ -	\$ -
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
San Jacinto Agricultural Operators	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
San Jacinto Dairy & CAFO Operators	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
CALTRANS - freeway	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -

CA DF&G - San Jacinto Wetlands	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
Eastern Municipal Water District	\$ 12,500	\$ 25,500	\$ 25,500
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ -	\$ -
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
March Air Reserve Base Joint Powers Authority	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
US Air Force (March Air Reserve Base)	\$ 12,500	\$ 34,324	\$ 34,324
Task Force Regulatory/Administrative Expenses	\$ 8,250	\$ 13,750	\$ 13,750
TMDL Compliance Monitoring Expenses			
Watershed-wide Nutrient Monitoring Program	\$ 4,250	\$ 4,250	\$ 4,250
Lake Elsinore Nutrient Monitoring Program	\$ -	\$ 7,500	\$ 7,500
Canyon Lake Nutrient Monitoring Program	\$ -	\$ 8,824	\$ 8,824
Lake Elsinore Project Alternatives			
Aeration & Destratification System O&M	\$ -	\$ -	\$ -
Fishery Management O&M	\$ -	\$ -	\$ -
Canyon Lake Project Alternatives	\$ -	\$ -	\$ -
Total:	\$ 580,000	\$ 1,067,000	\$ 1,067,000

DRAFT FY 2013-14 Budget: Lake Elsinore & Canyon Lake TMDL Task Force

Summary Task Force Expenditures

Part A: Task Force Regulatory/Administrative Budget

Task Force Administration

	Budget 2013-14	Budget 2014-15	Budget 2015-16
Task Force Administrator (LESJWA)	\$ 50,000	\$ 50,000	\$ 50,000
Annual Water Quality Reporting and Database Management			
Amend Task Force Agreement			
Grant Preparation			
TMDL Compliance Expert	\$ 50,000	\$ 50,000	\$ 50,000
Risk Sciences			
Update of Watershed and In-Lake Nutrient Models	\$ -	\$ 100,000	\$ 100,000
Watershed Modeling		\$ 100,000	\$ 100,000
in-lake Modeling			
Review and Revision of Water Quality Objectives	\$ 50,000	\$ 25,000	\$ 25,000
DO Target Adjustment		\$ 25,000	\$ 25,000
Contingency	\$ 15,000	\$ 50,000	\$ 50,000
TMDL Task Force Regulatory/Administrative Budget	\$ 165,000	\$ 275,000	\$ 275,000

Part B: TMDL Implementation Project Budget

TMDL Compliance Monitoring

Watershed-wide Nutrient Monitoring Program

Watershed-wide Nutrient Monitoring & Report Preparation (Weston Solutions)	\$ 85,000	\$ 85,000	\$ 85,000
Wet Year Watershed-wide Monitoring (weather dependant) (RCFC&WCD)	\$ 70,000	\$ 70,000	\$ 70,000
Lab Analysis, Watershed-wide Monitoring (RCFC&WCD)	\$ -	\$ -	\$ -
Stream gauge O&M (RCFC&WCD)	\$ 15,000	\$ 15,000	\$ 15,000
	\$ -	\$ -	\$ -

Lake Elsinore Nutrient Monitoring Program

Lake Elsinore Nutrient Monitoring & Lab Analysis (EVMWD)	\$ -	\$ 150,000	\$ 150,000
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Canyon Lake Nutrient Monitoring Program

Canyon Lake Nutrient Monitoring & Lab Analysis (EVMWD)	\$ -	\$ 150,000	\$ 150,000
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Lake Elsinore Project Alternatives

Aeration & Destratification System O&M (to be handled by separate agreement)

O&M	\$ -	\$ -	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -	\$ -	\$ -

Fishery Management O&M

Carp Removal Program	\$ -	\$ -	\$ -
Pollutant Trading Administration (3% of O&M Costs)	\$ -	\$ -	\$ -

Canyon Lake Project Alternatives

Chemical Additions - Alum Dosing (2 applications annually)	\$ 330,000	\$ 407,000	\$ 407,000
Consulting Support	\$ 270,000	\$ 270,000	\$ 270,000
O&M Agreement	\$ 30,000	\$ -	\$ -
Detailed Design	\$ -	\$ -	\$ -
Construction	\$ -	\$ -	\$ -
Effectiveness Monitoring	\$ -	\$ 100,000	\$ 100,000
O&M	\$ -	\$ -	\$ -
Project Administration (10% of budgeted expenses)	\$ 30,000	\$ 37,000	\$ 37,000
Pollutant Trading Administration (3% of O&M Costs)	\$ -	\$ -	\$ -

TMDL Task Force Implementation Budget \$ 415,000 \$ 792,000 \$ 792,000

TMDL Task Force Budget : \$ 580,000 \$ 1,067,000 \$ 1,067,000

Task Force Agency Contributions Summary

Task Force Agency Allocation

	Budget 2013-14 Total	Budget 2014-15 Total	Budget 2015-16 Total
MS4 Co-Permittees (Total)	\$ 480,000	\$ 810,059	\$ 810,059
Riverside County	\$ 73,314	\$ 109,327	\$ 109,327
City of Beaumont	\$ 19,706	\$ 43,211	\$ 43,211
City of Canyon Lake	\$ 18,774	\$ 42,062	\$ 42,062
City of Hemet	\$ 54,428	\$ 86,035	\$ 86,035
City of Lake Elsinore	\$ 34,784	\$ 61,808	\$ 61,808
City of Moreno Valley	\$ 109,525	\$ 153,988	\$ 153,988
City of Murrieta	\$ 12,500	\$ 34,324	\$ 34,324
City of Perris	\$ 43,130	\$ 72,100	\$ 72,100
City of Riverside	\$ 17,977	\$ 41,079	\$ 41,079
City of San Jacinto	\$ 33,067	\$ 59,690	\$ 59,690
City of Menifee	\$ 50,294	\$ 80,936	\$ 80,936
City of Wildomar	\$ 12,500	\$ 25,500	\$ 25,500
Elsinore Valley Municipal Water District (EVMWD)	\$ 12,500	\$ 25,500	\$ 25,500
San Jacinto Agricultural Operators	\$ 12,500	\$ 34,324	\$ 34,324
San Jacinto Dairy & CAFO Operators	\$ 12,500	\$ 34,324	\$ 34,324
CALTRANS - freeway	\$ 12,500	\$ 34,324	\$ 34,324
CA DF&G - San Jacinto Wetlands	\$ 12,500	\$ 34,324	\$ 34,324
Eastern Municipal Water District	\$ 12,500	\$ 25,500	\$ 25,500
March Air Reserve Base Joint Powers Authority	\$ 12,500	\$ 34,324	\$ 34,324
US Air Force (March Air Reserve Base)	\$ 12,500	\$ 34,324	\$ 34,324
Total Funding Required	\$ 580,000	\$ 1,067,000	\$ 1,067,000

Prop 84 Round 2 IRWM Funding

Canyon Lake Hybrid Treatment process - Phase 1

Total Grant Funding

Budget 2013-14	Budget 2014-15	Budget 2015-16
\$ -	\$ 250,000	\$ 250,000
\$ -	\$ 250,000	\$ 250,000

Notes:

Task Force Administration

- Organize and facilitate TMDL TASK FORCE and TAC meetings.
- Perform secretarial, clerical and administrative services, including providing meeting summaries to TMDL TASK FORCE members.
- Manage TMDL TASK FORCE funds and prepare annual reports of TMDL TASK FORCE assets and expenditures.
- Serve as the contracting party, for the benefit of the TMDL TASK FORCE, for contracts with all consultants, contractors, vendors and other entities.
- Seek funding grants to assist with achieving goals and objectives of the TMDL TASK FORCE.
- Coordinate with other agencies and organizations as necessary to facilitate TMDL TASK FORCE work.
- Administer the preparation of quarterly and annual reports, as required by the TMDL Implementation Plan, and submit them as required by the TMDL Implementation Plan on behalf of the TMDL TASK FORCE.
- Possible administrator of future pollutant trading (water quality trading) agreements.

TMDL Compliance Expert

- Support Task Force Agency as a Regulatory Strategist and Compliance Expert .
- Develop implementation strategy to address TMDL compliance with nutrient targets
- Plan and prepare Basin Plan Amendment for TMDL
- Sub-contract out pollutant trading agreement preparation by consultant

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement on the dates shown adjacent their respective signatures. This Agreement becomes effective as of the date of the latest signature page received.

LAKE ELSINORE AND SAN JACINTO WATERSHEDS AUTHORITY

BY Mark Nuth

TITLE LESJWA Authority Administrator

DATE 2/22/13

APPROVED AS TO FORM

BY Jimmy for J.S. ALVAREZ
Attorney

CALIFORNIA DEPARTMENT OF TRANSPORTATION

BY [Signature]

TITLE District Director - District 8

DATE 2/28/13

APPROVED AS TO FORM

BY [Signature]
Attorney

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

BY  _____
Mayor

DATE 12-4-12

CITY OF CANYON LAKE

BY _____
Mayor

DATE _____

CITY OF HEMET

BY _____
Mayor

DATE _____

CITY OF LAKE ELSINORE

BY _____
Mayor

DATE _____

CITY OF MENIFEE

BY _____
Mayor

DATE _____

CITY OF MORENO VALLEY

BY _____
Mayor

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CITY OF MURRIETA

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CITY OF PERRIS

BY _____
Mayor

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CITY OF RIVERSIDE

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Mayor

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CITY OF SAN JACINTO

BY _____
Mayor

DATE _____

CITY OF WILDOMAR

BY _____
Mayor

DATE _____

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

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**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

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Mayor

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CITY OF CANYON LAKE

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CITY OF WILDOMAR

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Mayor

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**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

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DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

BY _____
Mayor

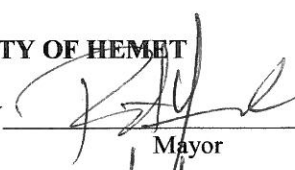
DATE _____

CITY OF CANYON LAKE

BY _____
Mayor

DATE _____

CITY OF HEMET

BY  _____
Mayor

DATE 9/11/12

CITY OF LAKE ELSINORE

BY _____
Mayor

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CITY OF MENIFEE

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CITY OF SAN JACINTO

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Mayor

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CITY OF WILDOMAR

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Mayor

DATE _____

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

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DATE _____

CITY OF BEAUMONT

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Mayor

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CITY OF CANYON LAKE

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Mayor

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CITY OF HEMET

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Mayor

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CITY OF LAKE ELSINORE

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Mayor

DATE 7/10/12

CITY OF MENIFEE

BY _____
Mayor

DATE _____

CITY OF MORENO VALLEY

BY _____
Mayor

DATE: _____

CITY OF MURRIETA

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Mayor

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CITY OF PERRIS

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Mayor

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CITY OF SAN JACINTO

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Mayor

DATE _____

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

BY _____

Mayor

DATE _____

CITY OF CANYON LAKE

BY _____

Mayor

DATE _____

CITY OF HEMET

BY _____

Mayor

DATE _____

CITY OF LAKE ELSINORE

BY _____

Mayor

DATE _____

CITY OF MENIFEE

BY _____

Mayor

DATE 10/2/19

CITY OF MORENO VALLEY

BY _____

Mayor

DATE: _____

CITY OF MURRIETA

BY _____

Mayor

DATE _____

CITY OF PERRIS

BY _____

Mayor

DATE _____

CITY OF RIVERSIDE

BY _____

Mayor

DATE _____

CITY OF SAN JACINTO

BY _____

Mayor

DATE _____

CITY OF WILDOMAR

BY _____

Mayor

DATE _____

Approved as to Form

Joseph W. Fletcher, City Attorney

CITY OF MORENO VALLEY

BY Richard A. Stewart
Mayor

DATE 9/10/12

BY Janet Halberd
City Clerk

DATE 9/10/12

APPROVED AS TO FORM

BY [Signature]
City Attorney

DATE 9/18/12

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

BY _____
Mayor

DATE _____

CITY OF CANYON LAKE

BY _____
Mayor

DATE _____

CITY OF HEMET

BY _____
Mayor

DATE _____

CITY OF LAKE ELSINORE

BY _____
Mayor

DATE _____

CITY OF MENIFEE

BY _____
Mayor

DATE _____

CITY OF MORENO VALLEY

BY _____
Mayor

DATE: _____

CITY OF MURRIETA

BY  Mayor

DATE August 21, 2012

Attest: A. Kay Kinson City Clerk

CITY OF PERRIS

BY _____
Mayor

DATE _____

CITY OF RIVERSIDE

BY _____
Mayor

DATE _____

CITY OF SAN JACINTO

BY _____
Mayor

DATE _____

CITY OF WILDOMAR

BY _____
Mayor

DATE _____

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

BY _____

Mayor

DATE _____

CITY OF CANYON LAKE

BY _____

Mayor

DATE _____

CITY OF HEMET

BY _____

Mayor

DATE _____

CITY OF LAKE ELSINORE

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CITY OF MENIFEE

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Mayor

DATE _____

CITY OF MORENO VALLEY

BY _____

Mayor

DATE: _____

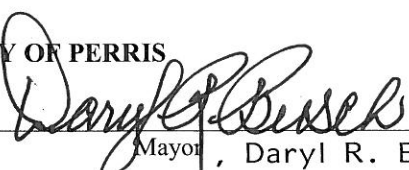
CITY OF MURRIETA

BY _____

Mayor

DATE _____

CITY OF PERRIS

BY  _____
Mayor, Daryl R. Busch

DATE 2/19/14

CITY OF RIVERSIDE

BY _____

Mayor

DATE _____

CITY OF SAN JACINTO

BY _____

Mayor

DATE _____

CITY OF WILDOMAR

BY _____

Mayor

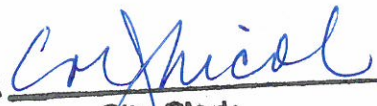
DATE _____

IN WITNESS WHEREOF, the Parties have executed this Agreement entitled
"AGREEMENT TO FORM THE LAKE ELSINORE AND CANYON LAKE TMDL
TASK FORCE"

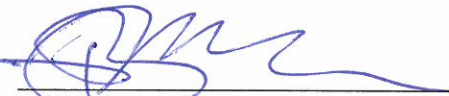
CITY OF RIVERSIDE

BY 
City Manager 

DATE July 17, 2013

Attest: 
City Clerk

APPROVED AS TO FORM

By 
City Attorney

CERTIFIED AS TO FUNDS AVAILABILITY:

By: 
Finance Director

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

BY _____
Mayor

DATE _____

CITY OF CANYON LAKE

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CITY OF HEMET

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CITY OF LAKE ELSINORE

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CITY OF MORENO VALLEY

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CITY OF RIVERSIDE

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CITY OF SAN JACINTO

BY _____
Mayor

DATE 7-5-12

CITY OF WILDOMAR

BY _____
Mayor

DATE _____

**CALIFORNIA DEPARTMENT OF
FISH AND GAME**

BY _____

DATE _____

**CALIFORNIA DEPARTMENT OF
TRANSPORTATION**

BY _____

DATE _____

CITY OF BEAUMONT

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Mayor

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CITY OF CANYON LAKE

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CITY OF WILDOMAR

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Mayor

DATE 12/17/12

COUNTY OF RIVERSIDE

BY _____

JOHN TAVAGLIONE

ATTEST:

KECIA HARPER-IHEM, Clerk

By _____

DEPUTY

FORM APPROVED BY COUNTY COUNSEL
BY: NEAL R. KIPNIS D/

EASTERN MUNICIPAL WATER DISTRICT

BY _____

DATE _____

**ELSINORE VALLEY MUNICIPAL
WATER DISTRICT**

BY _____

DATE _____

MARCH JOINT POWERS AUTHORITY

BY _____

DATE _____

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

BY _____

DATE _____

**U.S. AIR FORCE
(MARCH AIR RESERVE BASE)**

BY _____

DATE _____

**WESTERN RIVERSIDE COUNTY
AGRICULTURE COALITION**

BY _____

DATE _____

**SANTA ANA REGIONAL WATER QUALITY
CONTROL BOARD**

BY _____

DATE _____

COUNTY OF RIVERSIDE

BY _____

DATE _____

**U.S. AIR FORCE
(MARCH AIR RESERVE BASE)**

BY _____

DATE _____

EASTERN MUNICIPAL WATER DISTRICT

BY 

DATE 11.7.12

**WESTERN RIVERSIDE COUNTY
AGRICULTURE COALITION**

BY _____

DATE _____

**ELSINORE VALLEY MUNICIPAL
WATER DISTRICT**

BY _____

DATE _____

**SANTA ANA REGIONAL WATER QUALITY
CONTROL BOARD**

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DATE _____

MARCH JOINT POWERS AUTHORITY

BY _____

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**RIVERSIDE COUNTY FLOOD CONTROL
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EASTERN MUNICIPAL WATER DISTRICT

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AND WATER CONSERVATION DISTRICT**

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DATE _____

**ELSINORE VALLEY MUNICIPAL
WATER DISTRICT**

BY _____

DATE _____

**SANTA ANA REGIONAL WATER QUALITY
CONTROL BOARD**

BY _____

DATE _____

MARCH JOINT POWERS AUTHORITY

BY *Arin M. Stone*

DATE *3/31/14*


**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

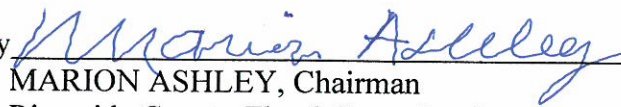
BY _____

DATE _____

1
2 RECOMMENDED FOR APPROVAL:

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

3
4 By 
5 WARREN D. WILLIAMS
6 General Manager-Chief Engineer

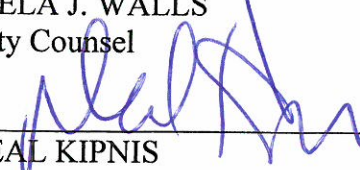
By 
MARION ASHLEY, Chairman
Riverside County Flood Control and
Water Conservation District
Board of Supervisors

7 APPROVED AS TO FORM:

ATTEST:

8 PAMELA J. WALLS
9 County Counsel

KECIA HARPER-IHEM
Clerk of the Board

10 By 
11 NEAL KIPNIS
12 Deputy County Counsel

By 
Deputy

(SEAL)

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25 Agreement to Form the Lake Elsinore
26 and Canyon Lake TMDL Task Force
27 9/11/12
28 KEC:blj

COUNTY OF RIVERSIDE

BY _____

DATE: _____

EASTERN MUNICIPAL WATER DISTRICT

BY _____

DATE: _____

**ELSINORE VALLEY MUNICIPAL
QUALITY WATER DISTRICT**

BY _____

DATE: _____

**MARCH JOINT POWERS AUTHORITY
(LESJWA)**

BY _____

DATE: _____

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

BY _____

DATE: _____

**U.S. AIR FORCE
(MARCH AIR RESERVE BASE)**

BY *S. C. Mahaney*
SAMUEL C. MAHANEY, Col, USAFR
Commander, 452d Air Mobility Wing

DATE: *12 Dec 12*

**WESTERN RIVERSIDE COUNTY
AGRICULTURE COALITION**

BY _____

DATE: _____

**SANTA ANA REGIONAL WATER
CONTROL BOARD**

BY _____

DATE: _____

**LAKE ELSINORE & SAN JACINTO
WATERSHEDS AUTHORITY**

BY _____

DATE: _____

COUNTY OF RIVERSIDE

BY _____

DATE _____

**U.S. AIR FORCE
(MARCH AIR RESERVE BASE)**

BY _____

DATE _____

EASTERN MUNICIPAL WATER DISTRICT

BY _____

DATE _____

**WESTERN RIVERSIDE COUNTY
AGRICULTURE COALITION**

BY 

DATE 11-1-2012

**ELSINORE VALLEY MUNICIPAL
WATER DISTRICT**

BY _____

DATE _____

**SANTA ANA REGIONAL WATER QUALITY
CONTROL BOARD**

BY _____

DATE _____

MARCH JOINT POWERS AUTHORITY

BY _____

DATE _____

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

BY _____

DATE _____

COUNTY OF RIVERSIDE

BY _____

DATE _____

**U.S. AIR FORCE
(MARCH AIR RESERVE BASE)**

BY _____

DATE _____

EASTERN MUNICIPAL WATER DISTRICT

BY _____

DATE _____

**WESTERN RIVERSIDE COUNTY
AGRICULTURE COALITION**

BY _____

DATE _____

**ELSINORE VALLEY MUNICIPAL
WATER DISTRICT**

BY _____

DATE _____

**SANTA ANA REGIONAL WATER QUALITY
CONTROL BOARD**

BY K. V. Blt

DATE 6/18/12

MARCH JOINT POWERS AUTHORITY

BY _____

DATE _____

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

BY _____

DATE _____

COUNTY OF RIVERSIDE

BY _____

DATE _____

**U.S. AIR FORCE
(MARCH AIR RESERVE BASE)**

BY _____

DATE _____

EASTERN MUNICIPAL WATER DISTRICT

BY _____

DATE _____

**WESTERN RIVERSIDE COUNTY
AGRICULTURE COALITION**

BY _____

DATE _____

**ELSINORE VALLEY MUNICIPAL
WATER DISTRICT**

BY _____

DATE _____

**SANTA ANA REGIONAL WATER QUALITY
CONTROL BOARD**

BY _____

DATE _____

MARCH JOINT POWERS AUTHORITY

BY _____

DATE _____

**LAKE ELSINORE & SAN JACINTO
WATERSHEDS AUTHORITY (LESJWA)**

BY Nancy C. Horton

DATE 7-25-2012

**RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT**

BY _____

DATE _____

Insert Appendix A.4, Certification of Legal Authority

PAMELA J. WALLS
County Counsel

OFFICE OF COUNTY COUNSEL
COUNTY OF RIVERSIDE



KATHERINE A. LIND
Assistant County Counsel

3960 ORANGE STREET, SUITE 500
RIVERSIDE, CA 92501-3674
TELEPHONE: 951/955-6300
FAX: 951/955-6322 & 951/955-6363

December 29, 2011

Mr. Kurt V. Berchtold, Executive Officer
California Regional Water Quality Control Board –
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501

Re: Order No. R8-2010-0033 (NPDES No. CAS 618033) of the California Regional Water
Quality Control Board – Santa Ana Region.

Dear Mr. Berchtold:


This letter is being provided to you and your Board pursuant to Section VIII.G. of the above-referenced Order. This office serves as legal counsel for the Riverside County Flood Control and Water Conservation District (the "Flood Control District"). We have reviewed the provisions of the above-referenced Order, the applicable statutes with regard to the organization of the Flood Control District, and all other laws, statutes, ordinances, regulations and rules that we deemed appropriate.

Based on this review, this office is of the opinion that the Flood Control District, as "Principal Permittee," as this term is defined in said Order, appears to have adequate legal authority to perform the necessary responsibilities as set forth in said Order, and when required by said Order to do so, appears to have adequate legal authority to implement and enforce the applicable provisions of said Order in accordance with applicable state and federal laws. Moreover, the Flood Control District reserves the right to modify and/or update its legal authority as the need arises during the term of said Order so that the provisions contained therein may be more effectively carried out.

Please do not hesitate to contact me in the event that you have any questions or comments, I may be reached at (951) 955-6347.

Sincerely,

PAMELA J. WALLS
County Counsel


DAVID H. K. HUFF
Deputy County Counsel

DHKH:psg

APPENDIX B PERMITTEE FACILITIES AND ACTIVITIES

B.1 Inventory of Municipal Facilities

B.2 BMPs for Municipal Activities

B.3 De Minimis Discharges

B.4 Maintenance Schedule

Insert Appendix B.1

Table 1. Municipal Facility Inventory

#	Facility Name	Location	Type
1	Riverside County Flood Control and Water Conservation District	1995 Market St Riverside, CA 92501	Corporate Yard

The District's corporate yard is subject to annual inspections as outlined in the 2010 SAR MS4 Permit.

Insert Appendix B.2



Graphic by: Margie Winter

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges.

Approach

The municipality must address non-stormwater discharges from its fixed facilities by assessing the types of non-stormwater discharges and implementing BMPs for the discharges determined to pose environmental concern. For field programs

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



the field staff must be trained to now what to look for regarding non-stormwater discharges and the procedures to follow in investigating the detected discharges.

Suggested Protocols**Fixed Facility*****General***

- Post “No Dumping” signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Landscaping and beautification efforts of hot spots might also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.

Illicit Connections

- Locate discharges from the fixed facility drainage system to the municipal storm drain system through review of “as-built” piping schematics.
- Use techniques such as smoke testing, dye testing and television camera inspection (as noted below) to verify physical connections.
- Isolate problem areas and plug illicit discharge points.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for several days following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- Review the “as-built” piping schematic as a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.

- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Storm Sewer

- TV Cameras can be employed to visually identify illicit connections to the fixed facility storm drain system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Clean up spills on paved surfaces with as little water as possible. Use a rag for small spills, 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 a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See fact sheet SC-11 Spill Prevention, Control, and Clean Up.

Field Program

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially ones that involve more than one jurisdiction and those that are not classified as hazardous, which are often not responded to as effectively as they need to be.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- See SC-74 Stormwater Drainage System Maintenance for additional information.

Field Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- During routine field program maintenance field staff should look for evidence of illegal discharges or illicit connection:
 - Is there evidence of spills such as paints, discoloring, etc.
 - Are there any odors associated with the drainage system
 - Record locations of apparent illegal discharges/illicit connections and notify appropriate investigating agency.
- If trained, conduct field investigation of non-stormwater discharges to determine whether they pose a threat to water quality.

Recommended Complaint Investigation Equipment

- **Field Screening Analysis**
 - pH paper or meter
 - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
 - Sample jars
 - Sample collection pole
 - A tool to remove access hole covers
- **Laboratory Analysis**
 - Sample cooler
 - Ice
 - Sample jars and labels
 - Chain of custody forms.
- **Documentation**
 - Camera
 - Notebook
 - Pens
 - Notice of Violation forms

- Educational materials

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any onsite drainage points observed.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Enforcement

- Educate the responsible party if identified on the impacts of their actions, explain the stormwater requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
 - Contact the responsible party to discuss methods of eliminating the non-stormwater discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
 - Provide information regarding BMPs to the responsible party, where appropriate.
 - Begin enforcement procedures, if appropriate.
 - Continue inspection and follow-up activities until the illicit discharge activity has ceased.
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

Training

- Train technical staff to identify and document illegal dumping incidents.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Train employees to identify non-stormwater discharges and report them to the appropriate departments.
- Train staff who have the authority to conduct surveillance and inspections, and write citations for those caught illegally dumping.

- Train municipal staff responsible for surveillance and inspection in the following:
 - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
 - OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).
 - Procedural training (field screening, sampling, smoke/dye testing, TV inspection).
- Educate the identified responsible party on the impacts of his or her actions.

Spill Response and Prevention

- See SC-11 Spill Prevention Control and Clean Up

Other Considerations

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The cost of fees for dumping at a proper waste disposal facility are often more than the fine for an illegal dumping offense, thereby discouraging people from complying with the law. The absence of routine or affordable pickup service for trash and recyclables in some communities also encourages illegal dumping. A lack of understanding regarding applicable laws or the inadequacy of existing laws may also contribute to the problem.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Many facilities do not have accurate, up-to-date schematic drawings.
- Can be difficult to locate illicit connections especially if there is groundwater infiltration.

Requirements***Costs***

- Eliminating illicit connections can be expensive especially if structural modifications are required such re-plumbing cross connections under an existing slab.
- Minor cost to train field crews regarding the identification of non-stormwater discharges. The primary cost is for a fully integrated program to identify and eliminate illicit connections and illegal dumping. However, by combining with other municipal programs (i.e. pretreatment program) cost may be lowered.
- Municipal cost for containment and disposal may be borne by the discharger.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

What constitutes a “non-stormwater” discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:
 - Diverted stream flows;
 - Rising found waters;
 - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
 - Uncontaminated pumped ground water;
 - Foundation drains;
 - Springs;
 - Water from crawl space pumps;
 - Footing drains;
 - Air conditioning condensation;
 - Flows from riparian habitats and wetlands;
 - Water line and hydrant flushing ;
 - Landscape irrigation;
 - Planned and unplanned discharges from potable water sources;
 - Irrigation water;
 - Individual residential car washing; and
 - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Illegal Dumping

- Establish a system for tracking incidents. The system should be designed to identify the following:
 - Illegal dumping hot spots
 - Types and quantities (in some cases) of wastes
 - Patterns in time of occurrence (time of day/night, month, or year)
 - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
 - Responsible parties

Outreach

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people on the street who are aware of the problem and who have the tools to at least identify the incident, if not correct it. There are a number of ways of accomplishing this:

- Train municipal staff from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report the incidents.
- Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act (see below).
- Educate the public. As many as 3 out of 4 people do not understand that in most communities the storm drain does not go to the wastewater treatment plant. Unfortunately, with the heavy emphasis in recent years on public education about solid waste management, including recycling and household hazardous waste, the sewer system (both storm and sanitary) has been the likely recipient of cross-media transfers of waste.
- Provide the public with a mechanism for reporting incidents such as a hot line and/or door hanger (see below).
- Help areas where incidents occur more frequently set up environmental watch programs (like crime watch programs).
- Train volunteers to notice and report the presence and suspected source of an observed pollutant to the appropriate public agency.

What constitutes a “non-stormwater” discharge?

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of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Storm Drain Stenciling

- Stencil storm drain inlets with a message to prohibit illegal dumpings, especially in areas with waste handling facilities.
- Encourage public reporting of improper waste disposal by a HOTLINE number stenciled onto the storm drain inlet.
- See Supplemental Information section of this fact sheet for further detail on stenciling program approach.

Oil Recycling

- Contract collection and hauling of used oil to a private licensed used oil hauler/recycler.
- Comply with all applicable state and federal regulations regarding storage, handling, and transport of petroleum products.
- Create procedures for collection such as; collection locations and schedule, acceptable containers, and maximum amounts accepted.
- The California Integrated Waste Management Board has a Recycling Hotline, (800) 553-2962, that provides information and recycling locations for used oil.

Household Hazardous Waste

- Provide household hazardous waste (HHW) collection facilities. Several types of collection approaches are available including permanent, periodic, or mobile centers, curbside collection, or a combination of these systems.

Training

- Train municipal employees and contractors in proper and consistent methods for waste disposal.
- Train municipal employees to recognize and report illegal dumping.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Federal Regulations (RCRA, SARA, CERCLA) and state regulations exist regarding the disposal of hazardous waste.
- Municipalities are required to have a used oil recycling element and a HHW element within their integrated waste management plan.
- Significant liability issues are involved with the collection, handling, and disposal of HHW.

Examples

The City of Palo Alto has developed a public participation program for reporting dumping violations. When a concerned citizen or public employee encounters evidence of illegal dumping, a door hanger (similar in format to hotel “Do Not Disturb” signs) is placed on the front doors in the neighborhood. The door hanger notes that a violation has occurred in the neighborhood, informs the reader why illegal dumping is a problem, and notes that illegal dumping carries a significant financial penalty. Information is also provided on what citizens can do as well as contact numbers for more information or to report a violation.

The Port of Long Beach has a state of the art database incorporating storm drain infrastructure, potential pollutant sources, facility management practices, and a pollutant tracking system.

The State Department of Fish and Game has a hotline for reporting violations called CalTIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).

The California Department of Toxic Substances Control’s Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

References and Resources

<http://www.stormwatercenter.net/>

California’s Nonpoint Source Program Plan <http://www.co.clark.wa.us/pubworks/bmpman.pdf>

King County Stormwater Pollution Control Manual - <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Orange County Stormwater Program,
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program
(<http://www.projectcleanwater.org>)

Santa Clara Valley Urban Runoff Pollution Prevention Program
http://www.scvurppp-w2k.com/pdf%20documents/PS_ICID.PDF

Spill Prevention, Control & Cleanup SC-11



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable municipal employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment.

Approach

- An effective spill response and control plan should include:
 - Spill/leak prevention measures;
 - Spill response procedures;
 - Spill cleanup procedures;
 - Reporting; and
 - Training
- A well thought out and implemented plan can prevent pollutants from entering the storm drainage system and can be used as a tool for training personnel to prevent and control future spills as well.

Pollution Prevention

- Develop and implement a Spill Prevention Control and Response Plan. The plan should include:

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-11 Spill Prevention, Control & Cleanup

- A description of the facility, the address, activities and materials involved
- Identification of key spill response personnel
- Identification of the potential spill areas or operations prone to spills/leaks
- Identification of which areas should be or are bermed to contain spills/leaks
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures
- Spill response procedures including:
 - Assessment of the site and potential impacts
 - Containment of the material
 - Notification of the proper personnel and evacuation procedures
 - Clean up of the site
 - Disposal of the waste material and
 - Proper record keeping
- Product substitution – use less toxic materials (i.e. use water based paints instead of oil based paints)
- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of materials that are brought into the facility or into the field.

Suggested Protocols

Spill/Leak Prevention Measures

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain can not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.

Spill Prevention, Control & Cleanup SC-11

- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For field programs, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spill are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly.
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.

Training

- Educate employees about spill prevention, spill response and cleanup on a routine basis.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
 - The employees should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
 - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan if one is available.
- Training of staff from all municipal departments should focus on recognizing and reporting potential or current spills/leaks and who they should contact.
- Employees responsible for aboveground storage tanks and liquid transfers for large bulk containers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

Spill Response and Prevention

- Identify key spill response personnel and train employees on who they are.
- Store and maintain appropriate spill cleanup materials in a clearly marked location near storage areas; and train employees to ensure familiarity with the site's spill control plan and/or proper spill cleanup procedures.
- Locate spill cleanup materials, such as absorbents, where they will be readily accessible (e.g. near storage and maintenance areas, on field trucks).

SC-11 Spill Prevention, Control & Cleanup

- Follow the Spill Prevention Control and Countermeasure Plan if one is available.
- If a spill occurs, notify the key spill response personnel immediately. If the material is unknown or hazardous, the local fire department may also need to be contacted.
- If safe to do so, attempt to contain the material and block the nearby storm drains so that the area impacted is minimized. If the material is unknown or hazardous wait for properly trained personnel to contain the materials.
- Perform an assessment of the area where the spill occurred and the downstream area that it could impact. Relay this information to the key spill response and clean up personnel.

Spill Cleanup Procedures

- Small non-hazardous spills
 - Use a rag, damp cloth or absorbent materials for general clean up of liquids
 - Use brooms or shovels for the general clean up of dry materials
 - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
 - Dispose of any waste materials properly
 - Clean or dispose of any equipment used to clean up the spill properly
- Large non-hazardous spills
 - Use absorbent materials for general clean up of liquids
 - Use brooms, shovels or street sweepers for the general clean up of dry materials
 - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
 - Dispose of any waste materials properly
 - Clean or dispose of any equipment used to clean up the spill properly
- For hazardous or very large spills, a private cleanup company or Hazmat team may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

Reporting

- Report any spills immediately to the identified key municipal spill response personnel.

Spill Prevention, Control & Cleanup SC-11

- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Office of Emergency Service (OES)
- Spills that pose an immediate threat to human health or the environment may also need to be reported within 24 hours to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour)
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file (see the section on Reporting below). The incident may also be used in briefing staff about proper procedures

Other Considerations

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, if permitted to do so, prohibiting any hard connections to the storm drain.

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of wastes, contaminated soil and water is very expensive

Maintenance

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the response and containment of a spill. A good record keeping system helps the municipality minimize incident recurrence, correctly respond with appropriate containment and cleanup activities, and comply with legal requirements.

SC-11 Spill Prevention, Control & Cleanup

A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm drain.

These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Examples

The City of Palo Alto includes spill prevention and control as a major element of its highly effective program for municipal vehicle maintenance shops.

References and Resources

King County Stormwater Pollution Control Manual - <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Orange County Stormwater Program

http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Spill Prevention, Control & Cleanup SC-11

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>



Description

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff. Implementing the following management practices can help prevent fuel spills and leaks.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Use properly maintained offsite fueling stations whenever possible. These businesses are better equipped to handle fuel and spills properly.
- Educate employees about pollution prevention measures and goals
- Focus pollution prevention activities on containment of spills and leaks, most of which may occur during liquid transfers.

Suggested Protocols

General

- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	



SC-20 Vehicle and Equipment Fueling

- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain. Labels are not necessary for plumbing fixtures directly connected to the sanitary sewer but may be useful to help eliminate confusion about where the drain leads.
- Post signs to remind employees not to top off the fuel tank when filling and signs that ban employees from changing engine oil or other fluids at that location.
- Report leaking vehicles to fleet maintenance.
- Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in highly impervious areas. Proper maintenance of these devices is necessary.
- Accumulated non-contaminated stormwater (e.g., in a secondary containment) should be released prior to next storm.
- Ensure the following safeguards are in place:
 - Overflow protection devices on tank systems to warn the operator to automatically shutdown transfer pumps when the tank reaches full capacity.
 - Protective guards around tanks and piping to prevent vehicle or forklift damage.
 - Clearly tagging or labeling all valves to reduce human error.
 - Automatic shut off for severed fuel hoses.

Fuel Dispensing Areas

- Maintain clean fuel-dispensing areas using dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills. Do not wash down areas with water.
- Fit underground storage tanks with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.
- Fit fuel dispensing nozzles with "hold-open latches" (automatic shutoffs) except where prohibited by local fire departments.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Design fueling area to prevent stormwater runoff and spills.
- Cover fueling area with an overhanging roof structure or canopy so that precipitation cannot come in contact with the fueling area and if possible use a perimeter drain or slope pavement inward with drainage to a blind sump (must be properly maintained and water properly disposed of); pave area with concrete rather than asphalt.

- Apply a suitable sealant that protects the asphalt from spilled fuels in areas where covering is infeasible and the fuel island is surrounded by pavement.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Cover storm drains in the vicinity during transfer.

Outdoor Waste Receptacle Area

- Spot clean leaks and drips routinely to prevent runoff of spillage.
- Minimize the possibility of stormwater pollution from outside waste receptacles by using an effective combination of the following:
 - use only watertight waste receptacle(s) and keep the lid(s) closed, or
 - grade and pave the waste receptacle area to prevent runoff of stormwater, or
 - install a roof over the waste receptacle area, or
 - install a low containment berm around the waste receptacle area, or
 - use and maintain drip pans under waste receptacles. Containment areas and drip pans must be properly maintained and collected water disposed of properly (e.g., to sanitary sewer). Several drip pans should be stored in a covered location near outdoor waste receptacle area so that they are always available, yet protected from precipitation when not in use.
- Post “no littering” signs.

Air/Water Supply Area

- Minimize the possibility of stormwater pollution from air/water supply areas by implementing an effective combination of the following:
 - spot clean leaks and drips routinely to prevent runoff of spillage, or
 - grade and pave the air/water supply area to prevent runoff of stormwater, or
 - install a roof over the air/water supply area, or
 - install a low containment berm around the air/water supply area. Maintain containment areas and dispose of contaminated water properly (e.g., to sanitary sewer).

Inspection

- Aboveground Tank Leak and Spill Control:
 - Check for external corrosion and structural failure.

SC-20 Vehicle and Equipment Fueling

- Check for spills and overfills due to operator error.
 - Check for failure of piping system.
 - Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
 - Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
 - Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
 - Periodically, integrity testing should be conducted by a qualified professional.
- Inspect and clean, if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year.

Training

- Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Make sure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- Train employees on proper fueling and cleanup procedures.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place stockpiles of spill cleanup materials where they are readily accessible.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly and dispose properly.
- Store portable absorbent booms (long flexible shafts or barriers made of absorbent material) in unbermed fueling areas.
- Report spills promptly.
- Install an oil/water separator and connect to the sanitary sewer (if allowed), if a dead-end sump is not used to collect spills.

Other Considerations

- Carry out all federal and state requirements regarding underground storage tanks, or install above ground tanks.

Requirements

Costs

- The retrofitting of existing fueling areas to minimize stormwater exposure or spill runoff can be expensive. Good design must occur during the initial installation.
- Extruded curb along the “upstream” side of the fueling area to prevent stormwater runoff is of modest cost.

Maintenance

- Clean oil/water separators at appropriate intervals.
- Keep ample supplies of spill cleanup materials onsite.
- Inspect fueling areas, storage tanks, catch basin inserts, containment areas, and drip pans on a regular schedule.

Supplemental Information

Design Considerations

Designing New Installations

The elements listed below should be included in the design and construction of new or substantially remodeled facilities.

Fuel Dispensing Areas

- Fuel dispensing areas must be paved with Portland cement concrete (or, equivalent smooth impervious surface), with a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents runoff of stormwater to the extent practicable. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the “fuel dispensing area” stated above.
- The fuel dispensing area must be covered, and the cover’s minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
- If necessary install and maintain an oil control device in the appropriate catch basin(s) to treat runoff from the fueling area.

Outdoor Waste Receptacle Area

- Grade and pave the outdoor waste receptacle area to prevent runoff of stormwater to the extent practicable.

Air/Water Supply Area

- Grade and pave the air/water supply area to prevent runoff of stormwater to the extent practicable.

SC-20 Vehicle and Equipment Fueling

Designated Fueling Area

- If your facility has large numbers of mobile equipment working throughout the site and you currently fuel them with a mobile fuel truck, consider establishing a designated fueling area. With the exception of tracked equipment such as bulldozers and perhaps small forklifts, most vehicles should be able to travel to a designated area with little lost time. Place temporary “caps” over nearby catch basins or manhole covers so that if a spill occurs it is prevented from entering the storm drain.

Examples

The Spill Prevention Control and Countermeasure (SPCC) Plan, which is required by law for some facilities, is an effective program to reduce the number of accidental spills and minimize contamination of stormwater runoff.

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program’s elements, including specific BMP guidance and lists of equipment suppliers, are also applicable to industrial facilities.

References and Resources

Best Management Practice Guide for Retail Gasoline Outlets, California Stormwater Quality Task Force. 1997.

King County Stormwater Pollution Control Manual –
<http://www.dnr.metrokc.gov/wlr/dss/spcm.htm>

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)

Vehicle and Equipment Cleaning SC-21



Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to stormwater during vehicle and equipment cleaning.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives

Pollution Prevention

- If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.
- Good housekeeping practices can minimize the risk of contamination from wash water discharges.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	



SC-21 Vehicle and Equipment Cleaning

Suggested Protocols

General

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate.
- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited.
- Provide a trash container in wash area.
- Map on-site storm drain locations to avoid discharges to the storm drain system.
- Emphasize the connection between the storm drain system and runoff and help reinforce that car washing activities can have an affect on local water quality. This can be accomplished through storm drain stenciling programs.

Vehicle and Equipment Cleaning

- Design wash areas to properly collect and dispose of wash water when engine cleaning is conducted and when chemical additives, solvents, or degreasers are used. This may include installation of sumps or drain lines to collect wash water or construction of a berm around the designated area and grading of the area to collect wash water as well as prevent stormwater run-on.
- Consider washing vehicles and equipment inside the building if washing/cleaning must occur on-site. This will help to control the targeted constituents by directing them to the sanitary sewer.
- If washing must occur on-site and outdoor:
 - Use designated paved wash areas. Designated wash areas must be well marked with signs indicating where and how washing must be done. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
 - Oil changes and other engine maintenance cannot be conducted in the designated washing area. Perform these activities in a place designated for such activities.
 - Cover the wash area when not in use to prevent contact with rain water.
- Use hoses with nozzles that automatically turn off when left unattended.
- Perform pressure cleaning and steam cleaning off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as wellhead protection areas for public water supply.

Disposal

- Consider filtering and recycling wash water.

Vehicle and Equipment Cleaning **SC-21**

- Discharge equipment wash water to the sanitary sewer, a holding tank, or a process treatment system, regardless of the washing method used.
- Discharge vehicle wash water to (1) the sanitary sewer, a holding tank, or process treatment system or (2) an enclosed recycling system.
- Discharge wash water to sanitary sewer only after contacting the local sewer authority to find out if pretreatment is required.

Training

- Train employees on proper cleaning and wash water disposal procedures and conduct “refresher” courses on a regular basis.
- Train staff on proper maintenance measures for the wash area.
- Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control and Cleanup.
- Keep your Spill Prevention Control and Counter Measure (SPCC) Plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Clean up spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations (Limitations and Regulations)

- Some municipalities may require pretreatment and monitoring of wash water discharges to the sanitary sewer.
- Steam cleaning can generate significant pollutant concentrations requiring that careful consideration be given to the environmental impacts and compliance issues related to steam cleaning.
- Most car washing best management practices are inexpensive, and rely more on good housekeeping practices (where vehicles are washed, planning for the collection of wash water) than on expensive technology. However, the construction of a specialized area for vehicle washing can be expensive for municipal facilities. Also, for facilities that cannot recycle their wash water the cost of pre-treating wash water through either structural practices or planning for collection and hauling of contaminated water to sewage treatment plants can represent a cost limitation.

Requirements

Costs

- Capital costs vary depending on measures implemented

SC-21 Vehicle and Equipment Cleaning

- Low cost (\$500-1,000) for berm construction,
 - Medium cost (\$5,000-20,000) for plumbing modifications (including re-routing discharge to sanitary sewer and installing simple sump).
 - High cost (\$30,000-150,000) for on-site treatment and recycling.
- O&M costs increase with increasing capital investment.

Maintenance

- Berm repair and patching.
- Sweep washing areas frequently to remove solid debris.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

Supplemental Information

Design Considerations

Designated Cleaning Areas

- Washing operations outside should be conducted in a designated wash area having the following characteristics:
 - Paved with Portland cement concrete,
 - Covered and bermed to prevent contact with stormwater and contain wash water,
 - Sloped for wash water collection,
 - Equipped with an oil/water separator, if necessary.

Examples

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program's elements, including specific BMP guidance and lists of equipment suppliers, are applicable to industrial vehicle service facilities.

The U.S. Postal Service in West Sacramento has a new vehicle wash system that collects, filters, and recycles the wash water.

References and Resources

<http://www.stormwatercenter.net/>

King County - <ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF>

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>



Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Vehicle or equipment maintenance and repair is potentially a significant source of stormwater pollution, due to the use of materials and wastes created that are harmful to humans and the environment. Engine repair and service (e.g. parts cleaning), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if stormwater runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants. Implementation of the following activities will prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance and repair activities.

Approach

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials use.
- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible.
- Keep an accurate, up-to-date inventory of materials.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	

Suggested Protocols



General

- Move maintenance and repair activities indoors whenever feasible.
- Store idle equipment containing fluids under cover.
- Use a vehicle maintenance area designed to prevent stormwater pollution - minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to sanitary sewer.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Post signs at sinks to remind employees, not to pour hazardous wastes down drains.
- Clean yard storm drain inlets(s) regularly.
- Do not pour materials down drains or hose down work areas; use dry sweeping.
- Cover the work area so as to limit exposure to the rain
- Place curbs around the immediate boundaries of the process equipment.
- Build a shed or temporary roof over areas where you park cars awaiting repair or salvage, especially if you handle wrecked vehicles. Build a roof over vehicles you keep for parts.

Material and Waste Handling

- Store materials and wastes under cover whenever possible.
- Designate a special area to drain and replace motor oil, coolant, and other fluids. This area should not have any connections to the storm drain or the sanitary sewer and should allow for easy clean up of drips and spills.
- Drain all fluids from wrecked vehicles immediately. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g. larger pans are needed to contain antifreeze, which may gush from some vehicles).
- Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not dispose of used or leftover cleaning solutions, solvents, and automotive fluids and oil in the sanitary sewer.
- Dispose of all waste materials according to applicable laws and regulations.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.

- Promptly transfer used fluids to the proper waste or recycling drums and store in an appropriately designed area that can contain spills. Don't leave drip pans or other open containers lying around.
- Do not dispose of oil filters in trash cans or dumpsters, which may leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Most municipalities prohibit or discourage disposal of these items in solid waste facilities. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked and/or dead batteries in a non-leaking covered secondary container and dispose of properly at recycling or household hazardous waste facilities..

Maintenance and Repair Activities

- Provide a designated area for vehicle maintenance.
- Keep equipment clean, don't allow excessive build-up of oil and grease.
- If temporary work is being conducted outside: Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips. The collected drips and spills must be disposed, reused, or recycled properly.
- If possible, perform all vehicle fluid removal or changing inside or under cover to prevent the runoff of stormwater and the runoff of spills:
 - Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
 - Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans or other open containers lying around.
 - Keep drip pans or containers under vehicles or equipment that might drip during repairs.
 - Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- If equipment (e.g., radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.
- Monitor parked vehicles closely for leaks and place pans under any leaks to collect the fluids for proper disposal or recycling.

Parts Cleaning

- Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- Do all liquid cleaning at a centralized station so the solvents and residues stay in one area.

- Discharge wastewater generated from steam cleaning and pressure washing to an appropriate treatment control that is connected to a blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC-21 for more information on steam cleaning.
- Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

Inspection

- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Make sure incoming vehicles are checked for leaking oil and fluids. Apply controls accordingly.

Training

- Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business). The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11 Spill Prevention, Control & Cleanup for more information.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Place adequate stockpiles of spill cleanup materials where they are readily accessible.
- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Use the following three-step method for cleaning floors:
 - Clean spills with rags or other absorbent materials
 - Sweep floor using dry absorbent material
 - Mop the floor. Mop water may be discharged to the sanitary sewer via a toilet or sink.
- Remove absorbent materials used for cleaning small spills promptly and properly.
- Do not saturate rags or absorbent material to eliminate need for disposal of spilled material as hazardous waste.

Other Considerations

- Space and time limitations may preclude all work being conducted indoors.
- It may not be possible to contain and clean up spills from vehicles/equipment brought onsite after working hours.
- Drain pans (usually 1 ft. x 1 ft.) are generally too small to contain antifreeze, so drip pans (3 ft. x 3 ft.) may have to be purchased or fabricated.
- Identification of engine leaks may require some use of solvents, which may require disposal as hazardous waste.
- Installation of structural treatment practices for pretreatment controls of wastewater discharges can be expensive.
- Prices for recycled materials and fluids may be higher than those of non-recycled materials.
- Some facilities can be limited by a lack of providers of recycled materials, and by the absence of businesses to provide services such as hazardous waste removal, structural treatment practice maintenance or solvent equipment and solvent recycling.

Requirements

Costs

- Should be low, but will vary depending on the size of the facility.

Maintenance

- Sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Recycling

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (e.g., 1,1,1-trichloroethane) separate from non-chlorinated solvents (e.g., kerosene and mineral spirits).

Many products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

- Recycling is always preferable to disposal of unwanted materials.
- Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
- Label and track the recycling of waste material (e.g. used oil, spent solvents, batteries).

SC-22 Vehicle and Equipment Repair

- Purchase recycled products to support the market for recycled materials.

Safer Alternatives

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

- Use non-caustic detergents instead of caustic cleaning for parts cleaning.
- Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sewer.
- 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 list of active ingredients to see whether it contains chlorinated solvents.
- Choose cleaning agents that can be recycled.
- Refer to SC-61 Safer Alternative Products fact sheet for more information.

References and Resources

DTSC Doc. No. 619a Switching to Water Based Cleaners

DTSC Doc. No. 621 <http://www.stormwatercenter.net/>

King County - <ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF>

Model Urban Runoff Program: A How-To-Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Loading and unloading of material may include package products, barrels, and bulk products. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>

Approach

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of materials with the potential to contaminate stormwater.
- Prevent stormwater runoff.
- Regularly check equipment for leaks.



Suggested Protocols***Loading and Unloading – General Guidelines***

- Develop an operations plan that describes procedures for loading and/or unloading.
- Do not conduct loading and unloading during wet weather, whenever possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- A seal or door skirt between delivery vehicles and building can reduce or prevent exposure to rain.
- Design loading/unloading area to prevent stormwater runoff which would include grading or berming the area, and positioning roof downspouts so they direct stormwater away from the loading/unloading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/ unloading area to a drain that is connected to a dead-end sump.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g. fork lift operators) and contractors on proper spill containment and cleanup.
- Employees trained in spill containment and cleanup should be present during the loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.

- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your spill prevention Control and countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Space, material characteristics and/or time limitations may preclude all transfers from being performed indoors or under cover.

Requirements

Costs

- Should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Regular broom dry-sweeping of area.
- Conduct major clean-out of loading and unloading area and sump prior to October 1 of each year.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

As appropriate loading or unloading of liquids should occur indoors so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
 - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
 - Transfer area should be designed to prevent runoff of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- Transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer (if allowed). A positive control valve should be installed on the drain.
- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:
 - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.
 - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

<http://www.stormwatercenter.net/>

King County - <ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF>

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Accidental releases of materials from above ground liquid storage tanks, drums, and dumpsters present the potential for contaminating stormwaters with many different pollutants. Tanks may store many potential stormwater runoff pollutants, such as gasoline, aviation gas, diesel fuel, ammonia, solvents, syrups, etc. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>

Approach

Pollution Prevention

- Educate employees about pollution prevention measures and goals
- Keep an accurate, up-to-date inventory of the materials delivered and stored on-site. Re-evaluate inventory needs and consider purchasing alternative products. Properly dispose of outdated products.
- Try to keep chemicals in their original containers, and keep them well labeled.



Suggested Protocols***General***

- Develop an operations plan that describes procedures for loading and/or unloading. Refer to SC-30 Outdoor Loading/Unloading for more detailed BMP information pertaining to loading and unloading of liquids.
- Protect materials from rainfall, runoff, and wind dispersal:
 - Cover the storage area with a roof.
 - Minimize stormwater runoff by enclosing the area or building a berm around it.
 - Use a “doghouse” structure for storage of liquid containers.
 - Use covered dumpsters for waste product containers.
- Employ safeguards against accidental releases:
 - Provide overflow protection devices to warn operator or automatic shut down transfer pumps.
 - Provide protection guards (bollards) around tanks and piping to prevent vehicle or forklift damage, and
 - Provide clear tagging or labeling, and restricting access to valves to reduce human error.
- Berm or surround tank or container with secondary containment system using dikes, liners, vaults, or double walled tanks.
- Contact the appropriate regulatory agency regarding environmental compliance for facilities with “spill ponds” designed to intercept, treat, and/or divert spills.
- Have registered and specifically trained professional engineers can identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.

Storage Areas

- Provide storage tank piping located below product level with a shut-off valve at the tank; ideally this valve should be an automatic shear valve with the shut-off located inside the tank.
- Provide barriers such as posts or guard rails, where tanks are exposed, to prevent collision damage with vehicles.
- Provide secure storage to prevent vandalism.
- Place tight-fitting lids on all containers.
- Enclose or cover the containers where they are stored.

- Raise the containers off the ground by use of pallet or similar method, with provisions for spill control and secondary containment.
- Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.
- Place drip pans or absorbent materials beneath all mounted container taps, and at all potential drip and spill locations during filling and unloading of containers. Drip pans must be cleaned periodically, and all collected liquids and soiled absorbent materials must be reused/recycled or properly disposed.
- Ensure that any underground or aboveground storage tanks shall be designed and managed in accordance with applicable regulations, be identified as a potential pollution source, have secondary containment, such as a berm or dike with an impervious surface.
- Rainfall collected in secondary containment system must not contain pollutants for discharge to storm drain system.

Container Management

- Keep containers in good condition without corrosion or leaky seams.
- Place containers in a lean-to structure or otherwise covered to keep rainfall from reaching the drums.
- Replace containers if they are deteriorating to the point where leakage is occurring. Keep all containers undercover to prevent the entry of stormwater. Employees should be made aware of the importance of keeping the containers free from leaks.
- Keep waste container drums in an area such as a service bay. Drums stored outside must be stored in a lean-to type structure, shed or walk-in container.

Storage of Hazardous Materials

- Storage of reactive, ignitable, or flammable liquids must comply with the fire and hazardous waste codes.
- Place containers in a designated area that is paved, free of cracks and gaps, and impervious in order to contain leaks and spills. The area should also be covered.
- Surround stored hazardous materials and waste with a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain and a dead-end sump should be installed in the drain.

Inspection

- Provide regular inspections:
 - Inspect storage areas regularly for leaks or spills.

- Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- Label new or secondary containers with the product name and hazards.

Training

- Train employees (e.g. fork lift operators) and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees in proper storage measures.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Employees trained in emergency spill cleanup procedures should be present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Operator errors can be prevented by using engineering safe guards and thus reducing accidental releases of pollutant.
- Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area.
- See Aboveground Tank Leak and Spill Control section of the Spill Prevention, Control & Cleanup fact sheet (SC-11) for additional information.

Other Considerations

- Storage sheds often must meet building and fire code requirements.
- The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.
- All specific standards set by federal and state laws concerning the storage of oil and hazardous materials must be met.
- Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code.
- Storage of oil and hazardous materials must meet specific federal and state standards including:
 - Spill Prevention Control and Countermeasure Plan (SPCC) Plan
 - Secondary containment
 - Integrity and leak detection monitoring
 - Emergency preparedness plans

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls, such as berms or safeguards against accidental controls.

Maintenance

- Conduct weekly inspection.
- Sweep and clean the storage area regularly if it is paved, do not hose down the area to a storm drain.

Supplemental Information

- The most common causes of unintentional releases are:
 - Installation problems,
 - Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves),
 - External corrosion and structural failure,
 - Spills and overfills due to operator error, and
 - Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Further Detail of the BMP***Dikes***

One of the best protective measures against contamination of stormwater is diking. Containment dikes are berms or retaining walls that are designed to hold spills. Diking is an effective pollution prevention measure for above ground storage tanks and railcar or tank truck loading and unloading areas. The dike surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater side of the dike area. Diking can be used in any industrial or municipal facility, but it is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas.

- For single-wall tanks, containment dikes should be large enough to hold the contents of the storage tank for the facility plus rain water.
- For trucks, diked areas should be capable of holding an amount equal to the volume of the tank truck compartment. Diked construction material should be strong enough to safely hold spilled materials.
- Dike materials can consist of earth, concrete, synthetic materials, metal, or other impervious materials.
- Strong acids or bases may react with metal containers, concrete, and some plastics.
- Where strong acids or bases are stored, alternative dike materials should be considered. More active organic chemicals may need certain special liners for dikes.
- Dikes may also be designed with impermeable materials to increase containment capabilities.
- Dikes should be inspected during or after significant storms or spills to check for washouts or overflows.
- Regular checks of containment dikes to insure the dikes are capable of holding spills should be conducted.
- Inability of a structure to retain stormwater, dike erosion, soggy areas, or changes in vegetation indicate problems with dike structures. Damaged areas should be patched and stabilized immediately.
- Accumulated stormwater in the containment area should be analyzed for pollutants before it is released to surface waters. If pollutants are found or if stormwater quality is not determined, then methods other than discharging to surface waters should be employed (e.g., discharge to sanitary sewer if allowed).
- Earthen dikes may require special maintenance of vegetation such as mulching and irrigation.

Curbing

Curbing is a barrier that surrounds an area of concern. Curbing is similar to containment diking in the way that it prevents spills and leaks from being released into the environment. The curbing is usually small scaled and does not contain large spills like diking. Curbing is common at many facilities in small areas where handling and transfer liquid materials occur. Curbing can redirect stormwater away from the storage area. It is useful in areas where liquid materials are transferred from one container to another. Asphalt is a common material used for curbing; however, curbing materials include earth, concrete, synthetic materials, metal, or other impenetrable materials.

- Spilled materials should be removed immediately from curbed areas to allow space for future spills.
- Curbs should have manually-controlled pump systems rather than common drainage systems for collection of spilled materials.
- The curbed area should be inspected regularly to clear clogging debris.
- Maintenance should also be conducted frequently to prevent overflow of any spilled materials as curbed areas are designed only for smaller spills.
- Curbing has the following advantages:
 - Excellent runoff control,
 - Inexpensive,
 - Ease of installment,
 - Provides option to recycle materials spilled in curb areas, and
 - Common industry practice.

Examples

The “doghouse” design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment. The unit has been used successfully at Lockheed Missile and Space Company in Sunnyvale.

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000
<http://www.nalms.org/bclss/storage.html>

King County Stormwater Pollution Control Manual –
<http://dnr.metrokc.gov/wlr/dss/spcm.htm>

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>

Outdoor Equipment Maintenance SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, solid waste treatment and disposal, are examples of process operations that can lead to contamination of stormwater runoff. Source controls for outdoor process equipment operations and maintenance include reducing the amount of waste created, enclosing or covering all or some of the equipment, installing secondary containment, and training employees.

Approach

Pollution Prevention

- Perform the activity during dry periods.
- Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.

Suggested Protocols

- Consider enclosing the activity in a building and connecting the floor drains to the sanitary sewer.
- Cover the work area with a permanent roof.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (runon prevention). If allowed, connect process equipment area to public sewer.
- Dry clean the work area regularly.

Training

- Train employees to perform the activity during dry periods only and to use less or non-toxic materials.
- Train employee and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	



SC-32 Outdoor Equipment Maintenance

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your spill prevention control and countermeasure (SPCC) plan up-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Space limitations may preclude enclosing some equipment.
- Storage sheds often must meet building and fire code requirements.

Requirements

Costs

- Costs vary depending on the complexity of the operation and the amount of control necessary for stormwater pollution control.
- Providing cover may be expensive.

Maintenance

- Conduct routine preventive maintenance, including checking process equipment for leaks.
- Clean the storm drain system regularly.

Supplemental Information

Further Detail of the BMP

Hydraulic/Treatment Modifications

In some cases it may be necessary to capture and treat polluted stormwater. If the municipality does not have its own process wastewater treatment system, consider discharging to the public sewer system. Use of the public sewer might be allowed under the following conditions:

- If the activity area is very small (less than a few hundred square feet), the local sewer authority may be willing to allow the area to remain uncovered with the drain connected to the public sewer.
- It may be possible under unusual circumstances to connect a much larger area to the public sewer, as long as the rate of stormwater discharges does not exceed the capacity of the wastewater treatment plant. The stormwater could be stored during the storm and then transferred to the public sewer when the normal flow is low, such as at night.

References and Resources

California's Nonpoint Source Program Plan <http://www.swrcb.ca.gov/nps/index.html>

Outdoor Equipment Maintenance SC-32

Clark County Stormwater Pollution Control Manual

<http://www.co.clark.wa.us/pubworks/bmpman.pdf>

King County Stormwater Pollution Control Manual <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Santa Clara Valley Urban Runoff Pollution Prevention Program <http://www.scvurppp.org>

The Stormwater Managers Resource Center <http://www.stormwatercenter.net/>

Outdoor Storage of Raw Materials SC-33



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. To prevent or reduce the discharge of pollutants to stormwater from material delivery and storage, pollution prevention and source control measures, such as minimizing the storage of hazardous materials on-site, enclosing or covering materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, preventing stormwater runoff and runoff, and training employees and subcontractors must be implemented.

Approach

Pollution Prevention

- Employee education is paramount for successful BMP implementation.
- Minimize inventory of raw materials.
- Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- Try to keep chemicals in their original containers, and keep them well labeled.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-33 Outdoor Storage of Raw Materials

Suggested Protocols

General

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof, and bermed, or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene or hypalon should be used over all materials stored outside.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring. (applicable to small stockpiles only).
- If the stockpiles are so large that they cannot feasibly be covered and contained, implement erosion control practices at the perimeter of your site and at any catch basins to prevent erosion of the stockpiled material off site,
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Keep outdoor storage containers in good condition.
- Keep storage areas clean and dry.
- Design paved areas to be sloped in a manner that minimizes the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5 percent is recommended.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps or store indoors.

Raw Material Containment

- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers if applicable.
- Prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas, by placing a curb along the perimeter of the area. The area inside the curb should slope to a drain. Liquids should be drained to the sanitary sewer if allowed. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Tanks should be bermed or surrounded by a secondary containment system.
- Release accumulated stormwater in petroleum storage areas prior to the next storm. At a minimum, water should pass through an oil/water separator and, if allowed, discharged to a sanitary sewer.

Outdoor Storage of Raw Materials SC-33

Inspection

- Conduct regular inspections of storage areas so that leaks and spills are detected as soon as possible.
- Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.

Training

- Employees should be well trained in proper material storage.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.
- Have employees trained in spill containment and cleanup present during loading/unloading of dangerous waste, liquid chemicals and other potentially hazardous materials.

Other Considerations

- Storage sheds often must meet building and fire code requirements. Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code and the National Electric Code.
- Space limitations may preclude storing some materials indoors.
- Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain. Storage sheds often must meet building and fire code requirements.
- The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.

SC-33 Outdoor Storage of Raw Materials

Requirements

Costs

- Costs will vary depending on the size of the facility and the necessary controls. They should be low except where large areas may have to be covered.

Maintenance

- Accurate and up-to-date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage area.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.
- Keep outdoor storage areas in good condition (e.g. repair roofs, floors, etc. to limit releases to runoff).

Supplemental Information

Further Detail of the BMP

Raw Material Containment

Paved areas should be sloped in a manner that minimize the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5 percent is recommended.

- Curbing should be placed along the perimeter of the area to prevent the runoff of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas.
- The storm drainage system should be designed to minimize the use of catch basins in the interior of the area as they tend to rapidly fill with manufacturing material.
- The area should be sloped to drain stormwater to the perimeter where it can be collected or to internal drainage alleyways where material is not stockpiled.
- If the raw material, by-product, or product is a liquid, more information for outside storage of liquids can be found under SC-31, Outdoor Container Storage.

Examples

The “doghouse” design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment. The unit has been used successively at Lockheed Missile and Space Company in Sunnyvale.

References and Resources

King County Stormwater Pollution Control Manual - <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Outdoor Storage of Raw Materials SC-33

Model Urban Runoff Program: A How-To-Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runoff and runoff.

Approach

Pollution Prevention

- Reduction in the amount of waste generated can be accomplished using the following source controls such as:
 - Production planning and sequencing
 - Process or equipment modification
 - Raw material substitution or elimination
 - Loss prevention and housekeeping
 - Waste segregation and separation
 - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



Suggested Protocols***General***

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater runoff and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be

disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Runon/Runoff Prevention

- Prevent stormwater runon from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff pollution prevention measures and proper disposal methods.
- Train employees and contractors proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.
- Vehicles transporting waste should have spill prevention equipment that can prevent spills during transport. The spill prevention equipment includes:
 - Vehicles equipped with baffles for liquid waste
 - Trucks with sealed gates and spill guards for solid waste

Other Considerations

- Hazardous waste cannot be re-used or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements***Costs***

- Capital and operation and maintenance costs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

- Minimize the runoff of polluted stormwater from land application of municipal waste on-site by:
 - Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, there is a closed drainage system.
 - Avoiding application of waste to the site when it is raining or when the ground is saturated with water.
 - Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site.
 - Maintaining adequate barriers between the land application site and the receiving waters. Planted strips are particularly good.
 - Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins.
 - Performing routine maintenance to ensure the erosion control or site stabilization measures are working.

References and Resources

King County Stormwater Pollution Control Manual - <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Associations (BASMAA). On-line: <http://www.basmaa.org>

Building & Grounds Maintenance SC-41



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.
- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-41 Building & Grounds Maintenance

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

Building & Grounds Maintenance SC-41

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.
- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water; do not put it in the storm drain, pour over landscaped areas.
- Use hand or mechanical weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occurring or predicted. Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.
- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.

SC-41 Building & Grounds Maintenance

- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Overall costs should be low in comparison to other BMPs.

Maintenance

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping but it is subject to rusting and results in lower quality water. Initially the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time, typically a year, between flushes and may accumulate iron, manganese, lead, copper, nickel and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan <http://www.swrcb.ca.gov/nps/index.html>

King County - <ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF>

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASSMA) <http://www.basmaa.org/>

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) <http://www.basmaa.org/>

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>

Parking/Storage Area Maintenance SC-43



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook).
- Keep accurate maintenance logs to evaluate BMP implementation.

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-43 Parking/Storage Area Maintenance

- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

Controlling Litter

- Post “No Littering” signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel and dispose of litter in the trash.

Surface cleaning

- Use dry cleaning methods (e.g. sweeping or vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- If water is used follow the procedures below:
 - Block the storm drain or contain runoff.
 - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains.
 - Dispose of parking lot sweeping debris and dirt at a landfill.
- When cleaning heavy oily deposits:
 - Use absorbent materials on oily spots prior to sweeping or washing.
 - Dispose of used absorbents appropriately.

Surface Repair

- Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc., where applicable. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

Parking/Storage Area Maintenance SC-43

- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of the parking facilities and stormwater conveyance systems associated with them on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

Requirements

Costs

Cleaning/sweeping costs can be quite large, construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities on a regular basis to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

SC-43 Parking/Storage Area Maintenance

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Use only as much water as necessary for dust control, to avoid runoff.

References and Resources

<http://www.stormwatercenter.net/>

California's Nonpoint Source Program Plan <http://www.swrcb.ca.gov/nps/index.html>

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) <http://www.basma.org>

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>



Description

Over-water activities occur at boat and ship repair yards, marinas, and yacht clubs. The discharge of pollutants to receiving waters during these activities can be prevented or reduced by minimizing over-water maintenance, keeping wastes out of the water, cleaning up spills and wastes immediately, and educating tenants and employees.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible

Suggested Protocols

General

- Perform paint and solvent mixing, fuel mixing, and similar handling of liquids on-shore, to avoid spillage directly in surface water bodies.
- Post signs to indicate proper use and disposal of residual paints, rags, used oil, and other engine fluids.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



- Sweep dry docks before flooding.

On Board Maintenance

- Move maintenance and repair activities on-shore if possible. This action reduces some of the potential for direct pollution on water bodies.
- Used antifreeze should be stored in a separate, labeled drum and recycled.
- Fuel tank vents should have valves to prevent fuel overflows or spills.
- Boats with inboard engines should have oil absorption pads in bilge areas that should be changed when no longer useful or at least once a year.
- Careful consideration must be given to fueling boat engines, recycling used oil, and discarding worn motor parts into proper receptacles to prevent spills.
- Keeping boat motors well-tuned prevents fuel and lubricant leaks and improves fuel efficiency.

Cleaning, Chipping, and Painting

- Shelter any blasting and spray painting activities by hanging wind blocking tarps to prevent sand blasting dust and overspray from escaping.
- Use secondary containment on paint cans.
- Limit over-water hull surface maintenance to sanding and minor painting.
- Major hull resurfacing should occur on land.
- Use ground cloths when painting boats on land.
- Paint mixing should not occur on the dock
- Vacuuming up loose paint chips and paint dust can help to prevent paint and other chemical substances from entering waters.
- Properly dispose of surface chips, used blasting sand, residual paints, and other materials. Use temporary storage containment that is not exposed to rain.
- Use phosphate-free and biodegradable detergents for hull washing.
- Select nontoxic cleaning products that do not harm humans or aquatic life

Disposal of Bilge Water, Ballast Water, and Wastewater

- Collect bilge and ballast water that has an oily sheen on the surface for proper disposal rather than dumping in water or on land.
- Collect and properly dispose of wash water from washing painted boat hulls. Consider taking the boat to a local boat yard that is equipped to collect and treat wash water.

- Pump bilge water discharged at sea through an oil/water separator first and store the oil for discharge into storage tanks on shore for treatment.
- Pump bilge water into storage tanks on shore for analysis, treatment and proper disposal.
- Properly dispose of domestic wastewater and ballast water. DO NOT ALLOW discharge of treated or untreated sewage from vessels to harbors.
- Fecal matter and other solid waste should be contained in a U.S. Coast Guard-approved marine sanitation device (MSD).
- Portable toilets should be emptied into approved shore side waste handling facilities, and MSDs should be discharged into approved pump out stations.
- Avoid the intake of ballast water in shallow water or areas where bottom sediments are suspended.
- Avoid the intake of ballast water where there is an algal bloom in progress.
- Use as fine a filter as is practical on the ballast water intake ports to eliminate as many organisms and as much particulate matter as possible. Tests have been conducted using 300 micron followed by a 25 micron filter on intakes to see how well they work and hold up in practice.
- Dump estuarine or harbour ballast water at sea and take in fresh high salinity water to eliminate both pollutants and estuarine organisms.
- Ballast water may be discharged into large tanks on shore where it is treated, although the large volumes involved make this a very expensive and logistically difficult option.
- Ballast water may also be discharged into specially outfitted tanker ships which meet incoming ships and take in their ballast water for treatment and discharge of the clean water. The sludge produced would still have to be taken ashore for treatment or disposal. This is also an expensive and logistically difficult process.
- Carry out physical or chemical sterilization or neutralization of ballast water in situ, and subsequent neutralization of the sterilant, if required, before discharge.

Training

- Provide regular training to employees and/or contractors regarding stormwater BMPs for over water activities.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible. Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Store and maintain appropriate spill cleanup materials in a location known to all; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Clean up spills on docks or boats immediately.

Other Considerations

- Private tenants at marinas may resist restrictions on shipboard painting and maintenance. Existing contracts with tenants may not allow the owner to require that tenants abide by new rules that benefit water quality. Even biodegradable cleaning agents have been found to be toxic to fish.

Requirements***Costs***

- Most of the BMPs are of low and modest cost. Exceptions are stations for temporary storage of residual paints and engine fluids, and wastewater pumpout facilities.

Maintenance

- Sweep maintenance yard areas, docks and boat ramps weekly to collect sandblasting material, paint chips, oils, and other loose debris, do not hose down the area to the water or a storm drain.

Supplemental Information***Further Detail of the BMP***

- Best management practices for ballast water generally fall into three main categories:
 - Preventing Uptake at the Source - Generally harbors are a poor place to take in ballast water since they are often polluted and when shallow are high in suspended sediments. Open ocean water is a better source of ballast water.
 - Killing or Neutralization During the Voyage - The current fleet of cargo vessels are not built to carry out these processes. New ships should be designed for these kinds of activities but retrofitting may be impossible, difficult or expensive. Any residues or sludges arising from these procedures would have to be separated from the water and discharged on shore for treatment. Many of these processes would render the ballast tanks lethal to the crew and require them to be absolutely airtight and provisions would be necessary for purging and re-introducing a safe breathable atmosphere into the tanks.

- Treatment at the Destination - A further way to reduce the movement of alien organisms in ballast water is to avoid discharge of the ballast water into the destination environment.

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.

<http://www.nalms.org/bclss/bmphome.html#bmp>

King County Stormwater Pollution Control Manual

<http://www.dnr.metrokc.gov/wlr/dss/spcm.htm>

Orange County Stormwater Program

http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>

Description

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals. Related information is provided in BMP fact sheets SC-11 Spill Prevention, Control & Cleanup and SC-34 Waste Handling & Disposal.

Approach

Pollution Prevention

- Purchase only the amount of material that will be needed for foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. See SC-61 Safer Alternative Products for additional information.
- Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, clean up costs and disposal costs.

Suggested Protocols

General

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Dispose of wash water, sweepings, and sediments, properly.
- Recycle or dispose of fluids properly.
- Establish a daily checklist of office, yard and plant areas to confirm cleanliness and adherence to proper storage and security. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.
- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage, landfill).
- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned and disposal of spent material.
- Do a before audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.
- Keep records of water, air and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to BMPs, hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling and disposal.
- Have, and review regularly, a contingency plan for spills, leaks, weather extremes etc. Make sure all employees know about it and what their role is so that it comes into force automatically.

Training

- Train all employees, management, office, yard, manufacturing, field and clerical in BMPs and pollution prevention and make them accountable.
- Train municipal employees who handle potentially harmful materials in good housekeeping practices.
- Train personnel who use pesticides in the proper use of the pesticides. The California Department of Pesticide Regulation license pesticide dealers, certify pesticide applicators and conduct onsite inspections.
- Train employees and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- There are no major limitations to this best management practice.
- There are no regulatory requirements to this BMP. Existing regulations already require municipalities to properly store, use, and dispose of hazardous materials

Requirements

Costs

- Minimal cost associated with this BMP. Implementation of good housekeeping practices may result in cost savings as these procedures may reduce the need for more costly BMPs.

Maintenance

- Ongoing maintenance required to keep a clean site. Level of effort is a function of site size and type of activities.

Supplemental Information

Further Detail of the BMP

- The California Integrated Waste Management Board's Recycling Hotline, 1-800-553-2962, provides information on household hazardous waste collection programs and facilities.

Examples

There are a number of communities with effective programs. The most pro-active include Santa Clara County and the City of Palo Alto, the City and County of San Francisco, and the Municipality of Metropolitan Seattle (Metro).

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.

<http://www.nalms.org/bclss/bmphome.html#bmp>

King County Stormwater Pollution Control Manual - <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities, Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, Revised by California Coastal Commission, February 2002.

Orange County Stormwater Program

http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Mateo STOPPP - (<http://stoppp.tripod.com/bmp.html>)

Descriptions

Promote the use of less harmful products. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies
- Procedures
 - Standard operating procedures (SOPs)
 - Purchasing guidelines and procedures

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	



- Bid packages (services and supplies)
- **Materials**
 - Preferred or approved product and supplier lists
 - Product and supplier evaluation criteria
 - Training sessions and manuals
 - Fact sheets for employees

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Stormwater runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements**Costs**

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.
- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment
(www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products
(http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety
(www.nema.org)

Sustainable Conservation (www.suscon.org)

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (<http://dioxin.abag.ca.gov/>)



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>

Description

Streets, roads, and highways are significant sources of pollutants in stormwater discharges, and operation and maintenance (O&M) practices, if not conducted properly, can contribute to the problem. Stormwater pollution from roadway and bridge maintenance should be addressed on a site-specific basis. Use of the procedures outlined below, that address street sweeping and repair, bridge and structure maintenance, and unpaved roads will reduce pollutants in stormwater.

Approach

Pollution Prevention

- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal)
- Recycle paint and other materials whenever possible.
- Enlist the help of citizens to keep yard waste, used oil, and other wastes out of the gutter.

Suggested Protocols

Street Sweeping and Cleaning

- Maintain a consistent sweeping schedule. Provide minimum monthly sweeping of curbed streets.
- Perform street cleaning during dry weather if possible.



- Avoid wet cleaning or flushing of street, and utilize dry methods where possible.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc. For example:
 - Increase the sweeping frequency for streets with high pollutant loadings, especially in high traffic and industrial areas.
 - Increase the sweeping frequency just before the wet season to remove sediments accumulated during the summer.
 - Increase the sweeping frequency for streets in special problem areas such as special events, high litter or erosion zones.
- Maintain cleaning equipment in good working condition and purchase replacement equipment as needed. Old sweepers should be replaced with new technologically advanced sweepers (preferably regenerative air sweepers) that maximize pollutant removal.
- Operate sweepers at manufacturer requested optimal speed levels to increase effectiveness.
- To increase sweeping effectiveness consider the following:
 - Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
 - Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
 - Develop and distribute flyers notifying residents of street sweeping schedules.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- If available use vacuum or regenerative air sweepers in the high sediment and trash areas (typically industrial/commercial).
- Keep accurate logs of the number of curb-miles swept and the amount of waste collected.
- Dispose of street sweeping debris and dirt at a landfill.
- Do not store swept material along the side of the street or near a storm drain inlet.
- Keep debris storage to a minimum during the wet season or make sure debris piles are contained (e.g. by berming the area) or covered (e.g. with tarps or permanent covers).

Street Repair and Maintenance

Pavement marking

- Schedule pavement marking activities for dry weather.

- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Provide drop cloths and drip pans in paint mixing areas.
- Properly maintain application equipment.
- Street sweep thermoplastic grindings. Yellow thermoplastic grindings may require special handling as they may contain lead.
- Paints containing lead or tributyltin are considered a hazardous waste and must be disposed of properly.
- Use water based paints whenever possible. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer.
- Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Concrete installation and repair

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place sand bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- 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.
- When making saw cuts in pavement, use as little water as possible and perform during dry weather. Cover each storm drain inlet completely with filter fabric or plastic during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site. Alternatively, a small onsite vacuum may be used to pick up the slurry as this will prohibit slurry from reaching storm drain inlets.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Patching, resurfacing, and surface sealing

- Schedule patching, resurfacing and surface sealing for dry weather.
- Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.
- Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.
- Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and maintenance holes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from covered maintenance holes and storm drain inlets when the job is complete.
- Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for clean up and proper disposal of excess materials.
- Use only as much water as necessary for dust control, to avoid runoff.
- Sweep, never hose down streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Equipment cleaning maintenance and storage

- Inspect equipment daily and repair any leaks. Place drip pans or absorbent materials under heavy equipment when not in use.
- Perform major equipment repairs at the corporation yard, when practical.
- If refueling or repairing vehicles and equipment must be done onsite, use a location away from storm drain inlets and watercourses.
- Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mud jacking equipment at the end of each day. Clean in a sink or other area (e.g. vehicle wash area) that is connected to the sanitary sewer.

*Bridge and Structure Maintenance**Paint and Paint Removal*

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Do not transfer or load paint near storm drain inlets or watercourses.

- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint container.
- Plug nearby storm drain inlets prior to starting painting where there is significant risk of a spill reaching storm drains. Remove plugs when job is completed.
- If sand blasting is used to remove paint, cover nearby storm drain inlets prior to starting work.
- Perform work on a maintenance traveler or platform, or use suspended netting or tarps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters if the bridge crosses a watercourse. If sanding, use a sander with a vacuum filter bag.
- Capture all clean-up water, and dispose of properly.
- Recycle paint when possible (e.g. paint may be used for graffiti removal activities). Dispose of unused paint at an appropriate household hazardous waste facility.

Graffiti Removal

- Schedule graffiti removal activities for dry weather.
- Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.
- When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal above.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If such an area is not available, filter runoff through an appropriate filtering device (e.g. filter fabric) to keep sand, particles, and debris out of storm drains.
- If a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump wash water to the sanitary sewer.
- Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

Repair Work

- Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.
- Thoroughly clean up the job site when the repair work is completed.
- When cleaning guardrails or fences follow the appropriate surface cleaning methods (depending on the type of surface) outlined in SC-71 Plaza & Sidewalk Cleaning fact sheet.

- If painting is conducted, follow the painting and paint removal procedures above.
- If graffiti removal is conducted, follow the graffiti removal procedures above.
- If construction takes place, see the Construction Activity BMP Handbook.
- Recycle materials whenever possible.

Unpaved Roads and Trails

- Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes.
- For roadside areas with exposed soils, the most cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils in place while the vegetation is establishing. Native vegetation should be used if possible.
- If vegetation cannot be established immediately, apply temporary erosion control mats/blankets; a comma straw, or gravel as appropriate.
- If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags, or hay bales staked in place.

Non-Stormwater Discharges

Field crews should be aware of non-stormwater discharges as part of their ongoing street maintenance efforts.

- Refer to SC-10 Non-Stormwater Discharges
- Identify location, time and estimated quantity of discharges.
- Notify appropriate personnel.

Training

- Train employees regarding proper street sweeping operation and street repair and maintenance.
- Instruct employees and subcontractors to ensure that measures to reduce the stormwater impacts of roadway/bridge maintenance are being followed.
- Require engineering staff and/or consulting A/E firms to address stormwater quality in new bridge designs or existing bridge retrofits.
- Use a training log or similar method to document training.
- Train employees on proper spill containment and clean up, and in identifying non-stormwater discharges.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Densely populated areas or heavily used streets may require parking regulations to clear streets for cleaning.
- No currently available conventional sweeper is effective at removing oil and grease. Mechanical sweepers are not effective at removing finer sediments.
- Limitations may arise in the location of new bridges. The availability and cost of land and other economic and political factors may dictate where the placement of a new bridge will occur. Better design of the bridge to control runoff is required if it is being placed near sensitive waters.

Requirements

Costs

- The maintenance of local roads and bridges is already a consideration of most community public works or transportation departments. Therefore, the cost of pollutant reducing management practices will involve the training and equipment required to implement these new practices.
- The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a conventional street sweeper is between \$60,000 and \$120,000. Newer technologies might have prices approaching \$180,000. The average useful life of a conventional sweeper is about four years, and programs must budget for equipment replacement. Sweeping frequencies will determine equipment life, so programs that sweep more often should expect to have a higher cost of replacement.
- A street sweeping program may require the following.
 - Sweeper operators, maintenance, supervisory, and administrative personnel are required.
 - Traffic control officers may be required to enforce parking restrictions.
 - Skillful design of cleaning routes is required for program to be productive.
 - Arrangements must be made for disposal of collected wastes.

- If investing in newer technologies, training for operators must be included in operation and maintenance budgets. Costs for public education are small, and mostly deal with the need to obey parking restrictions and litter control. Parking tickets are an effective reminder to obey parking rules, as well as being a source of revenue.

Maintenance

- Not applicable

Supplemental Information***Further Detail of the BMP******Street sweeping***

There are advantages and disadvantages to the two common types of sweepers. The best choice depends on your specific conditions. Many communities find it useful to have a compliment of both types in their fleet.

Mechanical Broom Sweepers - More effective at picking up large debris and cleaning wet streets. Less costly to purchase and operate. Create more airborne dust.

Vacuum Sweepers - More effective at removing fine particles and associated heavy metals. Ineffective at cleaning wet streets. Noisier than mechanical broom sweepers which may restrict areas or times of operation. May require an advance vehicle to remove large debris.

Street Flushers - Not affected by biggest interference to cleaning, parked cars. May remove finer sediments, moving them toward the gutter and stormwater inlets. For this reason, flushing fell out of favor and is now used primarily after sweeping. Flushing may be effective for combined sewer systems. Presently street flushing is not allowed under most NPDES permits.

Cross-Media Transfer of Pollutants

The California Air Resources Board (ARB) has established state ambient air quality standards including a standard for respirable particulate matter (less than or equal to 10 microns in diameter, symbolized as PM₁₀). In the effort to sweep up finer sediments to remove attached heavy metals, municipalities should be aware that fine dust, that cannot be captured by the sweeping equipment and becomes airborne, could lead to issues of worker and public safety.

Bridges

Bridges that carry vehicular traffic generate some of the more direct discharges of runoff to surface waters. Bridge scupper drains cause a direct discharge of stormwater into receiving waters and have been shown to carry relatively high concentrations of pollutants. Bridge maintenance also generates wastes that may be either directly deposited to the water below or carried to the receiving water by stormwater. The following steps will help reduce the stormwater impacts of bridge maintenance:

- Site new bridges so that significant adverse impacts to wetlands, sensitive areas, critical habitat, and riparian vegetation are minimized.

- Design new bridges to avoid the use of scupper drains and route runoff to land for treatment control. Existing scupper drains should be cleaned on a regular basis to avoid sediment/debris accumulation.
- Reduce the discharge of pollutants to surface waters during maintenance by using suspended traps, vacuums, or booms in the water to capture paint, rust, and paint removing agents. Many of these wastes may be hazardous. Properly dispose of this waste by referring to CA21 (Hazardous Waste Management) in the Construction Handbook.
- Train employees and subcontractors to reduce the discharge of wastes during bridge maintenance.

De-icing

- Do not over-apply deicing salt and sand, and routinely calibrate spreaders.
- Near reservoirs, restrict the application of deicing salt and redirect any runoff away from reservoirs.
- Consider using alternative deicing agents (less toxic, biodegradable, etc.).

References and Resources

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program

http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 2001. Fresh Concrete and Mortar Application Best Management Practices for the Construction Industry. June.

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United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Roadway and Bridge Maintenance. On-line http://www.epa.gov/npdes/menuofbmeps/poll_13.htm



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. This fact sheet describes good housekeeping practices that can be incorporated into the municipality's existing cleaning and maintenance program.

Approach

Pollution Prevention

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).

Suggested Protocols

Surface Cleaning

- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Block the storm drain or contain runoff when cleaning with water. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed. (Permission may be required from local sanitation district.)

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



- Block the storm drain or contain runoff when washing parking areas, driveways or drive-throughs. Use absorbents to pick up oil; then dry sweep. Clean with or without soap. Collect water and pump to a tank or discharge to sanitary sewer if allowed. Street Repair and Maintenance.

Graffiti Removal

- Avoid graffiti abatement activities during rain events.
- Implement the procedures under Painting and Paint Removal in SC-70 Roads, Streets, and Highway Operation and Maintenance fact sheet when graffiti is removed by painting over.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if authorized to do so if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound). Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

Surface Removal and Repair

- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.
- Designate an area for clean up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.
- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to landscaping or collected and pumped to the sanitary sewer if allowed.

Concrete Installation and Repair

- Schedule asphalt and concrete activities for dry weather.

- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place sand bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- 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.
- Protect applications of fresh concrete from rainfall and runoff until the material has dried.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Clean parking lots on a regular basis with a street sweeper.

Training

- Provide regular training to field employees and/or contractors regarding surface cleaning and proper operation of equipment.
- Train employee and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include current sweeper technology to remove oil and grease.
- Surface cleaning activities that require discharges to the local sewerage agency will require coordination with the agency.
- Arrangements for disposal of the swept material collected must be made, as well as accurate tracking of the areas swept and the frequency of sweeping.

Requirements***Costs***

- The largest expenditures for sweeping and cleaning of sidewalks, plazas, and parking lots are in staffing and equipment. Sweeping of these areas should be incorporated into street sweeping programs to reduce costs.

Maintenance

Not applicable

Supplemental Information***Further Detail of the BMP***

Community education, such as informing residents about their options for recycling and waste disposal, as well as the consequences of littering, can instill a sense of citizen responsibility and potentially reduce the amount of maintenance required by the municipality.

Additional BMPs that should be considered for parking lot areas include:

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Structural BMPs such as storm drain inlet filters can be very effective in reducing the amount of pollutants discharged from parking facilities during periods of rain.

References and Resources

Bay Area Stormwater Management Agencies Association (BASMAA). 1996. Pollution From Surface Cleaning Folder <http://www.basmaa.org>

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Orange County Stormwater Program

http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Plan. 2001. Municipal Activities Model Program Guidance. November.

Description

The primary pollutant of concern in municipal swimming pool water is chlorine or chloramine used as a disinfectant. This water, if discharged to the storm drain system, can be toxic to aquatic life. In lakes, lagoons, and fountains, the pollutants of concern are chemical algaecides that are added to control algae mainly for aesthetic reasons (visual and odor). Following the procedures noted in this fact sheet will reduce the pollutants in this discharge.

Approach

Pollution Prevention

- Prevent algae problems with regular cleaning, consistent adequate chlorine levels, and well-maintained water filtration and circulation systems.
- Manage pH and water hardness to minimize corrosion of copper pipes.

Suggested Protocols

Pools and Fountains

- Do not use copper-based algaecides. Control algae with chlorine or other alternatives, such as sodium bromide.
- Do not discharge water to a street or storm drain when draining pools or fountains; discharge to the sanitary sewer if permitted to do so. If water is dechlorinated with a neutralizing chemical or by allowing chlorine to dissipate for a few days (do not use the facility during this time), the water may be recycled/reused by draining it gradually onto a landscaped area. Water must be tested prior to discharge to ensure that chlorine is not present.
- Prevent backflow if draining a pool to the sanitary sewer by maintaining an "air gap" between the discharge line and the sewer line (do not seal the connection between the hose and sewer line). Be sure to call the local wastewater treatment plant for further guidance on flow rate restrictions, backflow prevention, and handling special cleaning waste (such as acid wash). Discharge flows should be kept to the low levels typically possible through a garden hose. Higher flow rates may be prohibited by local ordinance.
- Provide drip pans or buckets beneath drain pipe connections to catch leaks. This will be especially pertinent if pool or spa water that has not been dechlorinated is pumped through piping to a discharge location.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-72 Fountains & Pools Maintenance

- Never clean a filter in the street or near a storm drain.
- Rinse cartridge filters onto a dirt area, and spade filter residue into soil.
- Backwash diatomaceous earth filters onto dirt. Dispose of spent diatomaceous earth in the garbage. Spent diatomaceous earth cannot be discharged to surface waters, storm drainage systems, septic systems, or on the ground.
- If there is not a suitable dirt area discharge filter backwash or rinsewater to the sanitary sewer if permitted to do so by the local sewerage agency.

Lakes and Lagoons

- Reduce fertilizer use in areas around the water body. High nitrogen fertilizers can produce excess growth requiring more frequent mowing or trimming, and may contribute to excessive algae growth.
- To control bacteria, discourage the public from feeding birds and fish (i.e. place signs that prohibit feeding of waterfowl).
- Consider introducing fish species that consume algae. Contact the California Department of Fish and Game for more information on this issue.
- Mechanically remove pond scum (blue-green algae) using a 60 micron net.
- Educate the public on algae and that no controls are necessary for certain types of algae that are beneficial to the water body.
- Control erosion by doing the following:
 - Maintain vegetative cover on banks to prevent soil erosion. Apply mulch or leave clippings to serve as additional cover for soil stabilization and to reduce the velocity of stormwater runoff.
 - Areas should be designed (sloped) to prevent runoff and erosion and to promote better irrigation practices.
 - Provide energy dissipaters (e.g. riprap) along banks to minimize potential for erosion.
 - Confine excavated materials to surfaces away from lakes. Material must be covered if rain is expected.
- Conduct inspections to detect illegal dumping of clippings/cuttings in or near a lake. Materials found should be picked up and properly disposed of.
- Avoid landscape wastes in and around lakes should be avoided by either using bagging equipment or by manually picking up the material. Collect trash and debris from within water bodies where feasible
- Provide and maintain trash receptacles near recreational water bodies to hold refuse generated by the public.

- Increase trash collection during peak visitation months (generally June, July and August).

Training

- Train maintenance personnel to test chlorine levels and to apply neutralizing chemicals.
- Train personnel regarding proper maintenance of pools, ponds and lakes.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Managers of pools located in sensitive areas or adjacent to shorelines should check with the appropriate authorities to determine if code requirements apply.
- Cleanup activities at lakes and lagoons may create a slight disturbance for local aquatic species. If the lake is recognized as a wetland, many activities, including maintenance, may be subject to regulation and permitting.

Requirements

Costs

- The maintenance of pools and lakes is already a consideration of most municipal public works departments. Therefore the cost associated with this BMP is minimal and only reflects an increase in employee training and public outreach.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

When dredging is conducted, adhere to the following:

- Dredge with shovels when laying/maintaining pipes.
- To determine amount to dredge, determine rate of volume loss due to sediments.
- For large lakes, dredge every 10 years.
- When dredging small lakes, drain lake.
- When dredging large lakes, use vacuum equipment.
- After dredging test sediment piles for proper disposal. Dredged sediment can be used as fill, or may have to be land filled.

SC-72 Fountains & Pools Maintenance

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line:

<http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Los Angeles County Stormwater Quality. Public Agency Activities Model Program. On-line:

http://ladpw.org/wmd/npdes/public_TC.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.



Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	<input checked="" type="checkbox"/>



- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols***Mowing, Trimming, and Weeding***

- Whenever possible use mechanical methods of vegetation removal (e.g. mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
 - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
 - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
 - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
 - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
 - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
 - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
 - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information***Further Detail of the BMP******Waste Management***

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line:

<http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities

http://ladpw.org/wmd/npdes/model_links.cfm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmpps/poll_8.htm



Photo Credit: Geoff Brosseau

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff that may contain certain pollutants. Maintaining catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Approach

Suggested Protocols

Catch Basins/Inlet Structures

- Municipal staff should regularly inspect facilities to ensure the following:
 - Immediate repair of any deterioration threatening structural integrity.
 - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
 - Stenciling of catch basins and inlets (see SC-75 Waste Handling and Disposal).
- Clean catch basins, storm drain inlets, and other conveyance structures in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-74 Drainage System Maintenance

- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Record the amount of waste collected.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed of. Do not dewater near a storm drain or stream.
- Except for small communities with relatively few catch basins that may be cleaned manually, most municipalities will require mechanical cleaners such as eductors, vacuums, or bucket loaders.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect flushed effluent and pump to the sanitary sewer for treatment.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge from cleaning a storm drain pump station or other facility to reach the storm drain system.
- Conduct quarterly routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.
- Sample collected sediments to determine if landfill disposal is possible, or illegal discharges in the watershed are occurring.

Open Channel

- Consider modification of storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a stream or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies

(SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS

Illicit Connections and Discharges

- During routine maintenance of conveyance system and drainage structures field staff should look for evidence of illegal discharges or illicit connections:
 - Is there evidence of spills such as paints, discoloring, etc.
 - Are there any odors associated with the drainage system
 - Record locations of apparent illegal discharges/illicit connections
 - Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of up gradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
 - Once the origin of flow is established, require illicit discharger to eliminate the discharge.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
 - Illegal dumping hot spots
 - Types and quantities (in some cases) of wastes
 - Patterns in time of occurrence (time of day/night, month, or year)
 - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
 - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

- The State Department of Fish and Game has a hotline for reporting violations called Cal TIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).
- The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Only properly trained individuals are allowed to handle hazardous materials/wastes.
- Train municipal employees from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report illegal dumping.
- Train municipal employees and educate businesses, contractors, and the general public in proper and consistent methods for disposal.
- Train municipal staff regarding non-stormwater discharges (See SC-10 Non-Stormwater Discharges).

Spill Response and Prevention

- Refer to SC-11, Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Cleanup activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and disposal of flushed effluent to sanitary sewer may be prohibited in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Private property access rights may be needed to track illegal discharges up gradient.

- Requirements of municipal ordinance authority for suspected source verification testing for illicit connections necessary for guaranteed rights of entry.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget. A careful study of cleaning effectiveness should be undertaken before increased cleaning is implemented. Catch basin cleaning costs are less expensive if vacuum street sweepers are available; cleaning catch basins manually can cost approximately twice as much as cleaning the basins with a vacuum attached to a sweeper.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary. Encouraging reporting of illicit discharges by employees can offset costs by saving expense on inspectors and directing resources more efficiently. Some programs have used funds available from "environmental fees" or special assessment districts to fund their illicit connection elimination programs.

Maintenance

- Two-person teams may be required to clean catch basins with vector trucks.
- Identifying illicit discharges requires teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Requires technical staff to detect and investigate illegal dumping violations, and to coordinate public education.

Supplemental Information

Further Detail of the BMP

Storm Drain flushing

Sanitary sewer flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in sanitary sewer systems. The same principles that make sanitary sewer flushing effective can be used to flush storm drains. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as to an open channel, to another point where flushing will be initiated, or over to the sanitary sewer and on to the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. The deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to

cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce the impacts of stormwater pollution, a second inflatable device, placed well downstream, may be used to re-collect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to re-collect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75 percent for organics and 55-65 percent for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm drain flushing.

Flow Management

Flow management has been one of the principal motivations for designing urban stream corridors in the past. Such needs may or may not be compatible with the stormwater quality goals in the stream corridor.

Downstream flood peaks can be suppressed by reducing through flow velocity. This can be accomplished by reducing gradient with grade control structures or increasing roughness with boulders, dense vegetation, or complex banks forms. Reducing velocity correspondingly increases flood height, so all such measures have a natural association with floodplain open space. Flood elevations laterally adjacent to the stream can be lowered by increasing through flow velocity.

However, increasing velocity increases flooding downstream and inherently conflicts with channel stability and human safety. Where topography permits, another way to lower flood elevation is to lower the level of the floodway with drop structures into a large but subtly excavated bowl where flood flows were allowed to spread out.

Stream Corridor Planning

Urban streams receive and convey stormwater flows from developed or developing watersheds. Planning of stream corridors thus interacts with urban stormwater management programs. If local programs are intended to control or protect downstream environments by managing flows delivered to the channels, then it is logical that such programs should be supplemented by management of the materials, forms, and uses of the downstream riparian corridor. Any proposal for stream alteration or management should be investigated for its potential flow and stability effects on upstream, downstream, and laterally adjacent areas. The timing and rate of flow from various tributaries can combine in complex ways to alter flood hazards. Each section of channel is unique, influenced by its own distribution of roughness elements, management activities, and stream responses.

Flexibility to adapt to stream features and behaviors as they evolve must be included in stream reclamation planning. The amenity and ecology of streams may be enhanced through the landscape design options of 1) corridor reservation, 2) bank treatment, 3) geomorphic restoration, and 4) grade control.

Corridor reservation - Reserving stream corridors and valleys to accommodate natural stream meandering, aggradation, degradation, and over bank flows allows streams to find their own form and generate less ongoing erosion. In California, open stream corridors in recent urban developments have produced recreational open space, irrigation of streamside plantings, and the aesthetic amenity of flowing water.

Bank treatment - The use of armoring, vegetative cover, and flow deflection may be used to influence a channel's form, stability, and biotic habitat. To prevent bank erosion, armoring can be done with rigid construction materials, such as concrete, masonry, wood planks and logs, riprap, and gabions. Concrete linings have been criticized because of their lack of provision of biotic habitat. In contrast, riprap and gabions make relatively porous and flexible linings. Boulders, placed in the bed reduce velocity and erosive power.

Riparian vegetation can stabilize the banks of streams that are at or near a condition of equilibrium. Binding networks of roots increase bank shear strength. During flood flows, resilient vegetation is forced into erosion-inhibiting mats. The roughness of vegetation leads to lower velocity, further reducing erosive effects. Structural flow deflection can protect banks from erosion or alter fish habitat. By concentrating flow, a deflector causes a pool to be scoured in the bed.

Geomorphic restoration - Restoration refers to alteration of disturbed streams so their form and behavior emulate those of undisturbed streams. Natural meanders are retained, with grading to gentle slopes on the inside of curves to allow point bars and riffle-pool sequences to develop. Trees are retained to provide scenic quality, biotic productivity, and roots for bank stabilization, supplemented by plantings where necessary.

A restorative approach can be successful where the stream is already approaching equilibrium. However, if upstream urbanization continues new flow regimes will be generated that could disrupt the equilibrium of the treated system.

Grade Control - A grade control structure is a level shelf of a permanent material, such as stone, masonry, or concrete, over which stream water flows. A grade control structure is called a sill, weir, or drop structure, depending on the relation of its invert elevation to upstream and downstream channels.

A sill is installed at the preexisting channel bed elevation to prevent upstream migration of nick points. It establishes a firm base level below which the upstream channel can not erode.

A weir or check dam is installed with invert above the preexisting bed elevation. A weir raises the local base level of the stream and causes aggradation upstream. The gradient, velocity, and erosive potential of the stream channel are reduced. A drop structure lowers the downstream invert below its preexisting elevation, reducing downstream gradient and velocity. Weirs and drop structure control erosion by dissipating energy and reducing slope velocity.

When carefully applied, grade control structures can be highly versatile in establishing human and environmental benefits in stabilized channels. To be successful, application of grade control structures should be guided by analysis of the stream system both upstream and downstream from the area to be reclaimed.

Examples

The California Department of Water Resources began the Urban Stream Restoration Program in 1985. The program provides grant funds to municipalities and community groups to implement stream restoration projects. The projects reduce damages from streambank and watershed instability and floods while restoring streams' aesthetic, recreational, and fish and wildlife values.

In Buena Vista Park, upper floodway slopes are gentle and grassed to achieve continuity of usable park land across the channel of small boulders at the base of the slopes.

The San Diego River is a large, vegetative lined channel, which was planted in a variety of species to support riparian wildlife while stabilizing the steep banks of the floodway.

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Objectives

- Cover
- Contain
- Educate
- Reduce/Reuse

Description

It is important to control litter to eliminate trash and other materials in stormwater runoff. Waste reduction is a major component of waste management and should be encouraged through training and public outreach. Management of waste once it is collected may involve reuse, recycling, or proper disposal.

Approach

Pollution Prevention

- Reuse products when possible.
- Encourage recycling programs with recycling bins, used oil collection, etc.

Suggested Protocols

Solid Waste Collection

- Implement procedures, where applicable, to collect, transport, and dispose of solid waste at appropriate disposal facilities in accordance with applicable federal, state, and local laws and regulations.
- Include properly designed trash storage areas. If feasible provide cover over trash storage areas.
- Regularly inspect solid waste containers for structural damage. Repair or replace damaged containers as necessary.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.
- Refer to SC-34 Waste Handling and Disposal for more information regarding solid waste facilities.

Waste Reduction and Recycling

- Recycle wastes whenever possible. Many types of waste can be recycled, recycling options for each waste type are limited. All gasoline, antifreeze, waste oil, and lead-acid batteries can be recycled. Latex and oil-based paint can be reused, as well as recycled. Materials that cannot be reused or recycled should either be incinerated or disposed of at a properly permitted landfill.
- Recycling is always preferable to disposal of unwanted materials.
- Recycling bins for glass, metal, newspaper, plastic bottles and other recyclable household solid wastes should be provided at public facilities and/or for residential curbside collection.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Clean out and cover litter receptacles frequently to prevent spillage.

Illegal Dumping

Substances illegally dumped on streets and into the storm drain system and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clipping, and pet wastes.

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Landscaping and beautification efforts of hot spots might also discourage future dumping.
- See SC-74 Drainage System Maintenance, and SC-10 Non-Stormwater Discharges.

Requirements

Costs

- The costs for a solid waste source control program vary depending on the type of method. The cost of a community education program or a plan to increase the number of trash receptacles can be very minimal. Costs for structural controls such as trash racks, bar screens, and silt traps can be quite costly ranging from \$250,000 to \$900,000.
- A collection facility or curbside collection for used oil may result in significant costs. Commercial locations (automobile service stations, quick oil change centers, etc.) as collection points eliminate hauling and recycling costs.
- Collection and disposal of hazardous waste can be very expensive and requires trained operators; laboratory and detection equipment; and extensive record keeping including dates, types, and quantities.
- Use of volunteer work forces can lower storm drain stenciling program costs. Stenciling kits require procurement of durable/disposable items. The stenciling program can aid in the cataloging of the storm drain system. One municipality from the state of Washington has estimated that stenciling kits cost approximately \$50 each. Stencils may cost about \$8 each including the die cost on an order of 1,000. Re-orders cost about \$1/stencil. Stencil designs may be available from other communities. Stencil kits should be provided on a loan basis to volunteer groups free of charge with the understanding that kit remnants are to be returned.

Maintenance

- The primary staff demand for stenciling programs is for program setup to provide marketing and training. Ongoing/follow-up staff time is minimal because of volunteer services.
- Staffing requirements are minimal for oil recycling programs if collection/recycling is contracted out to a used oil hauler/recycler or required at commercial locations.
- Staff requirements for maintaining good housekeeping BMPs at waste handling sites is minimal.

Supplemental Information

Further Detail of the BMP

Waste Reduction

An approach to reduce stormwater pollution from waste handling and disposal is to assess activities and reduce waste generation. The assessment is designed to find situations where waste can be eliminated or reduced and emissions and environmental damage can be minimized. The assessment involves collecting process specific information, setting pollution prevention targets, and developing, screening and selecting waste reduction options for further study. Starting a waste reduction program is economically beneficial because of reduced raw material purchases and lower waste disposal fees.

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Orange County Stormwater Program

http://www.ocwatersheds.com/StormWater/swp_introduction.asp.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

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Objectives

- Contain
- Educate
- Reduce/Minimize

Description

Although the operation and maintenance of public utilities are not considered chronic sources of stormwater pollution, some activities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drain system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Cities that do not provide maintenance of water and sewer utilities must coordinate with the contracting agency responsible for these activities and ensure that these model procedures are followed.

Approach

Pollution Prevention

Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).

Suggested Protocols

Water Line Maintenance and Cleaning

Procedures can be employed to reduce pollutants from discharges associated with water utility operation and maintenance activities. Planned discharges may include fire hydrant testing, flushing water supply mains after new construction, flushing lines due to complaints of taste and odor, dewatering mains for maintenance work. Unplanned discharges from treated, recycled water, raw water, and groundwater systems operation and maintenance activities can occur from water main

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



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breaks, sheared fire hydrants, equipment malfunction, and operator error.

Planned discharges

- Identify a suitable discharge option in the following order of preference:
 - Apply to the land.
 - Reuse water for dust suppression, irrigation, or construction compaction.
 - Discharge to a sanitary sewer system with approval.
 - Discharge to the storm drain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.). Examples of some storm drain protection options include:
 - Silt fence – appropriate where the inlet drains a relatively flat area.
 - Gravel and wire mesh sediment filter – Appropriate where concentrated flows are expected.
 - Wooden weir and fabric – use at curb inlets where a compact installation is desired.
- Prior to discharge, inspect discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).
- General Design considerations for inlet protection devices include the following:
 - The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
 - Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

Unplanned Discharges

- Stop the discharge as quickly as possible.
- Inspect flow path of the discharged water:
 - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions

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- Identify the potential for pollutants to be washed into the waterway
- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

Sanitary Sewer Maintenance

Applicable to municipalities who own and operated a sewage collection system. Facilities that are covered under this program include sanitary sewer pipes and pump stations owned and operated by a municipality. The owner of the sanitary sewer facilities is the entity responsible for carrying out this prevention and response program.

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.
- Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified
- Cleaning activities may require removal of tree roots and other identified obstructions.
- During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:
 - Cracked/deteriorating pipes
 - Leaking joints/seals at manhole
 - Frequent line plugs
 - Line generally flows at or near capacity
 - Suspected infiltration or exfiltration.
- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.
- Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure.

Spills and Overflows

- Identify and track sanitary sewer discharges. Identify dry weather infiltration and inflow first. Wet weather overflow connections are very difficult to locate.

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- Locate wet weather overflows and leaking sanitary sewers using conventional source identification techniques such as monitoring and field screening. Techniques used to identify other illicit connection sources can also be used for sewer system evaluation surveys (see SC74 Drainage System Operation and Maintenance).
- Implement community awareness programs for monitoring sanitary sewer wet weather overflows. A citizen's hotline for reporting observed overflow conditions should be established to supplement field screening efforts.
- Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.
- When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drain system or receiving waters. Methods may include:
 - Blocking storm drain inlets and catch basins
 - Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.)
 - Removing the material with vacuum equipment
- Record required information at the spill site.
- Perform field tests as necessary to determine the source of the spill.
- Develop notification procedures regarding spill reporting.

Septic Systems

- Ensure that homeowners, installers, and inspectors are educated in proper maintenance of septic systems. This may require coordination with staff from other departments. Outreach to homeowners should include inspection reminders informing them that inspection and perhaps maintenance is due for their systems. Recommend that the system be inspected annually and pumped-out regularly.
- Programs which seek to address failing septic systems should consider using field screening to pinpoint areas where more detailed onsite inspection surveys are warranted.

Training

- Conduct annual training of water utility personnel and service contractors. (field screening, sampling, smoke/dye testing, TV inspection).
- OSHA-required Health and Safety Training 29 CFR 1910.120 plus annual Refresher Training (as needed).
- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).

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Spill Response and Prevention

- See previous section regarding spills and overflows.
- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Enact ordinance granting “right-of-entry” to locate potentially responsible parties for sewer overflows.
- Reliance on individual onsite inspection to detect failed septic systems can be a major limitation. The individual onsite inspection is very labor-intensive and requires access to private property to pinpoint the exact location of the failing system.
- A significant limitation to correcting failing septic systems is the lack of techniques available for detecting individual failed septic systems.

Requirements

Costs

- Departmental cooperation recommended for sharing or borrowing staff resources and equipment from municipal wastewater department.
- Infiltration, inflow, and wet weather overflows from sanitary sewers are very labor and equipment intensive to locate.
- The costs associated with detecting and correcting septic system failures are subject to a number of factors, including availability of trained personnel, cost of materials, and the level of follow-up required to fix the system problems.

Maintenance

- Minimum 2-person teams to perform field screening and associated sampling.
- Larger teams required for implementing other techniques (i.e. zinc chloride smoke testing, fluorometric dye testing, television camera inspection and physical inspection with confined space entry) to identify sewer system leaks.
- Program coordination required for handling emergencies, record keeping, etc.
- Many of the problems associated with improper use of septic systems may be attributed to lack of user knowledge on operation and maintenance. Educational materials for homeowners and training courses for installers and inspectors can reduce the incidence of pollution from these widespread and commonly used pollution control devices.

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Supplemental Information

Further Detail of the BMP

Onsite Sewage Disposal Systems

New onsite sewage disposal systems should be designed, located, and installed away from open waterbodies and sensitive resources such as wetlands and floodplains. A protective separation between the OSDS and groundwater should also be established. OSDSs should be operated and maintained to prevent surface water discharges and reduce pollutant loadings to groundwater. Inspection of OSDSs should occur regularly and repairs made immediately. New or replacement plumbing fixtures should be of the high efficiency type.

Typical Sanitary Sewer Problems

- Old and deteriorated main and lateral pipes - Sewers range in age from 30 to 100 years with an average age of 50 years.
- Cracked sewer pipes - Existing sewers are mostly clay pipes which can crack as they deteriorate with age and also by earth movement.
- Misaligned and open pipe joints - Most of the mortar used to seal the joints between sections of clay pipe has deteriorated.
- Undersized sewer pipe - The existing sewer system is overloaded due to new sewer hook-ups, underground water infiltration, and illegal roof and/or yard drain connections.
- Defective manholes - Old manholes are made of bricks. Typical problems associated with brick manholes are loose bricks, missing bricks, and misaligned manholes.
- Missing and/or unrecorded sewer pipes and manholes - This problem is typical in the easement/backline sewer. Sewer pipe locations shown on the sewer record map are different from the actual sewer location.
- Sewer main under houses and other improvements - Complaints of sewer main alignment crossing the house and other improvements. A solution to this problem requires an agreement with the property owner for a new sewer easement at a relocated line.

Causes of Sanitary Sewer Backups

- Root infiltration - Tree roots are a major cause of backups.
- Water inflow/infiltration - Rain water entering the sewer pipe causes overflows.
- Solids - Typical solids that buildup in the pipe and cause backups are grease, dirt, bones, tampons, paper towels, diapers, broken dishware, garbage, concrete, and debris.
- Structural defects in pipes and manholes - Sags in the line, cracks, holes, protruding laterals, misaligned pipe, offset joints are all possible causes of backups.

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Design Considerations

Sanitary sewer overflows can often be reduced or eliminated by a number of practices, in addition to sewer system cleaning and maintenance, including the following:

- Reducing infiltration and inflow through rehabilitation and repair of broken or leaking sewer lines.
- Enlarging or upgrading the capacity of sewer lines, pump stations, or sewage treatment plants.
- Constructing wet weather storage and treatment facilities to treat excess flows.
- Addressing SSOs during sewer system master planning and facilities planning.

Septic Systems

Two field screening techniques that have been used with success at identifying possible locations of failing septic systems are the brightener test and color infrared (CIR) aerial photography. The first involves the use of specific phosphorus-based elements found in many laundry products, often called brighteners, as an indicator of the presence of failing onsite wastewater systems. The second technique uses color infrared (CIR) aerial photography to characterize the performance of septic systems. This method has been found to be a quick and cost-effective method for assessing the potential impacts of failing systems and uses variations in vegetative growth or stress patterns over septic system field lines to identify those systems that may potentially be malfunctioning. Then a more detailed onsite visual and physical inspection will confirm whether the system has truly failed and the extent of the repairs needed. These inspections may be carried out by county health departments or other authorized personnel.

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Insert Appendix B.3

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

General Procedures for the Operation and Maintenance of Facilities

August 2019

The District is charged with the operation and maintenance of many miles of channels, storm drains, levees, dams and retention basins. This document describes how these facilities are maintained and the responsibility for said maintenance.

The District's Operations and Maintenance (O&M) Division is responsible for the ongoing inspection, operations and maintenance of all District facilities consisting of underground storm drains, opened unlined and lined channels, levees, detention basins and debris dams. The O&M Superintendent is directly responsible for the continuing inspection operation and maintenance of these facilities. To accomplish this, the O&M Superintendent directs a staff of Technicians, Maintenance Supervisors and Assistant Supervisors who in turn direct Equipment Operators, and Maintenance and Construction Workers. (See Exhibit A – Division Organizational Chart.)

The O&M Superintendent is responsible for training and directing his personnel so that routine maintenance is performed safely and effectively, while ensuring that problems are detected in the early stages and appropriate corrective measures are taken. To assist in this effort, the District has adopted a computerized maintenance management system. This system provides a systematic method of planning, inspecting, tracking and documenting all maintenance work performed, materials and equipment used and costs for all on each individual facility.

In the case of facilities constructed for the District by the U.S. Army Corps of Engineers (Corps), the District is required to submit a semi-annual report to the Corps documenting quarterly inspections and maintenance tasks performed. Projects constructed through programs of the U.S. Soil Conservation Service, and owned and operated by the District, are inspected jointly on an annual basis. Dams under the jurisdiction of the State of California Department of Safety of Dams (DSOD) are inspected annually by a representative of DSOD and District personnel.

On-Going O&M Procedures

Inspections – All facilities are inspected on an on-going basis with known trouble areas visited more often. In addition, all facilities are inspected after light rainstorms and after significant seismic activity. During periods of heavy rain and/or flooding, all facilities are patrolled throughout the event. District engineering and technical personnel are assigned to these patrols to supplement the maintenance personnel during these emergency periods.

1. Underground Storm Drains: Inlets and outlets to these facilities are critical and can be a major source of problems if not adequately maintained. Accordingly, all of these facilities are kept clear of debris and vegetation. Inlets within street right of way are maintained by the Riverside County Transportation Department for those within the unincorporated areas or by the respective City for those located within city limits. In connection with the District's National Pollutants Discharge Elimination System (NPDES) program all underground storm drains have

been inspected by using remote controlled camcorders. This inspection process is continued on an as-needed basis depending on maintenance needs and water quality issues.

2. Open Channels (Including Earthen Facilities and Leveed Channels): It is the District's policy, within the original design parameters, to keep open channels free of vegetation, trash, debris and miscellaneous materials. This must be accomplished in a manner that is in compliance with all applicable environmental rules and regulations administered by the resource's agencies (State Department of Fish and Wildlife (CDFW), Corps, State Water Resources Control Board, and U.S. Fish and Wildlife.) To this end, the District has entered into a long-term maintenance Memorandum of Understanding (MOU) with CDFW. This MOU is especially important to allow for earthen facilities to be maintained to their original lines and grade. Maintenance access roads are kept free of weeds, and rodent and erosion damage is repaired as needed. Vegetation in earthen bottom channels and levees is kept to a height that will not impede or divert flows toward channel sideslopes or levee embankments. Any structural damage, i.e., cracked concrete, settling, warping of invert of channel sides is repaired as necessary. Subdrain systems are checked for proper functioning. Security fencing is inspected and repaired as needed. Graffiti is removed from all structures within District right of way.
3. Levees: Levees are kept free of growth and drift deposits. Erosion and rodent damage is routinely repaired. Rodent problems are controlled by an on-going program of rodenticide placed in dispensers/feeders. Hardened slope facing is kept repaired and or replaced as needed. Drainage structures through levees are kept in good working condition. Outlets are kept free of debris and riprap is maintained to prevent erosion and undermining. The levees are surveyed annually, and after significant seismic activity, to determine if any settlement or other movement has occurred. Any significant movement is reviewed to determine if remedial work is needed.
4. Retention and Debris Basins: Material deposited in these facilities is removed as allowed by environmental rules and regulations to maintain the facilities' design volumes. The embankments are tracked to repair erosions and rills and the maintenance roads are kept free of undesired growth. Rodent damage is controlled through the use of rodenticide feeders. Inlets and outlets are kept free of debris build-up and control gates are kept in good working order.
5. Dams: Dams are surveyed annually and after significant seismic activity for unusual settlement. Any significant movement is reviewed to determine if remedial work is needed. Selected vegetation is allowed on the embankment slopes to minimize erosion. Maintenance roads are kept free of all growth and rodent problems are controlled through the use of rodenticide feeders. Outlet structures are kept free of debris and gates are kept in good working order. Dams that fall under the jurisdiction of the DSOD are jointly inspected annually with that department and concerns are addressed as needed.

APPENDIX C Development Planning

C.1 Standard Conditions of Approval for Private Development Construction Activities

Insert Appendix C.1

Appendix C.1 – Standard List of Approval for Development Construction Activities

The County of Riverside—Transportation Department reviews all WQMPs. Refer to the County of Riverside's LIP for their conditions of approval.

APPENDIX D Private Development Construction

D.1 Construction Site Inspection Form

Insert Appendix D.1

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
MS4 INSPECTION REPORT

Part 1. Inspection Frequency		
<input type="checkbox"/> Biweekly <input type="checkbox"/> Monthly <input type="checkbox"/> As needed		
Part 2. General Information		
Date of Inspection: Inspection Date	Time of Inspection:	Next Inspection By: Click here to enter a date.
Site Information		
<input type="checkbox"/> Encroachment Permit	EP #	
<input type="checkbox"/> Land Use Case	Case #	
<input type="checkbox"/> District Project	Project Name / # : /	
<input type="checkbox"/> Other		
Brief description of construction activities:		
Weather		
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide the following information:		
Estimate storm beginning (date and time): Select Storm Date.		Estimate storm duration (hours):
Estimate time since last storm (days or hours):		
External Responsible Party Information		
Party Name:		Contact Info (Email):
Follow-up Transmittal		
Transmitted to: (Email)		Transmitted by: (Email)
Transmitted on:		
Inspector Information		
Inspector Name:		Inspector Title:
Signature:		Date: Select Report Date.

Part 3. BMP Observations			
Instructions: Check "YES" if inspected BMP is implemented and appears to be regularly maintained. Check "NO" if BMP is either not implemented or requires maintenance. Briefly describe any deficiencies in Part 4 "Comments and Recommendations". Check "N/A" if the BMP is not appropriate for site conditions.			
Minimum BMPs.	Is BMP Implemented?		
	Yes	No	N/A
A. Erosion Controls			
1. Are grading activities avoided during rain events and conducted during the dry season to the greatest extent feasible? (EC-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are the natural hydrologic features and riparian buffers and corridors preserved to the greatest extent feasible? (EC-2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
MS4 INSPECTION REPORT

Part 3. BMP Observations

Instructions: Check "YES" if inspected BMP is implemented and appears to be regularly maintained. Check "NO" if BMP is either not implemented or requires maintenance. Briefly describe any deficiencies in Part 4 "Comments and Recommendations". Check "N/A" if the BMP is not appropriate for site conditions.

Minimum BMPs.	Is BMP Implemented?		
	Yes	No	N/A
3. Are temporary stabilization or reseeded, such as Hydraulic Mulch, Hydroseeding, Straw Mulch, Geotextiles and Mats or Wood Mulching, provided for inactive disturbed areas as well as for finished slopes, open space, utility backfill, and completed lots? (EC-3, EC-4, EC-6, EC-7, or EC-8)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Are erosion controls to protect steep slopes or to route runoff around the site such as Earth Dikes, Drainage Swales, Lined Ditches, or Temporary Slope Drains implemented and maintained? (EC-9, EC-11)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Are erosion controls such as Outlet Protection, Velocity Dissipation Devices, or Streambank Stabilization implemented and maintained to prevent erosion within waterways? (EC-10, EC-12)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Sediment Controls			
1. Are perimeter controls, such as Fiber Rolls or Straw Bale Barrier implemented and maintained to minimize erosion and sediment discharges from the site? (SE-5, SE-9)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are sediment controls such as check dams implemented and maintained to reduce scour and channel erosion within a constructed swale or drainage ditch? (SE-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If implemented, is the Active Treatment System effective at reducing sediment discharge from the site? (SE-11)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Tracking Controls			
1. Are tracking controls, such as Stabilized Construction Entrance/Exit, Stabilized Construction Roadway, or Entrance/Outlet Tire Wash implemented and maintained to reduce trackout of sediment onto adjacent streets? (TC-1, TC-2, or TC-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Wind Erosion Controls			
1. Are wind erosion controls implemented and maintained to reduce dust from the site? (WE-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Non-Stormwater Controls			
1. Are Temporary Stream Crossing BMPs implemented and maintained to prevent erosion and downstream sedimentation caused by vehicles crossing a stream or ditch? (NS-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Waste Management Controls (Within District Rights - of - Way)			
1. Are potential sources hazardous materials, such as fuel, chemicals, stockpiled materials and portable toilets contained? (WM-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are construction waste materials appropriately disposed of? (WM-5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part 4. Comments and Recommendations			

APPENDIX E Public Education/Training

E.1 Summary of Training Provided

E.2 Electronic BMP Fact Sheets

Insert Appendix E.1

Public Education and Training

Area-Wide MS4 Program Contributions

The District continues to provide financial support for several important area-wide BMP programs implemented on behalf of the Permittees. The programs currently include:

Public Education

The District provides for coordination and oversight of the area-wide NPDES public education and outreach efforts in all three watersheds, including public events, school and adult education programs, printed brochures, and commercial mass-media campaigns. This includes continued development and distribution of focused educational outreach materials for specific industries and businesses such as restaurants, auto repair shops, mobile cleaning businesses, and other industrial activities that are potential sources of stormwater pollution.

The District finalized the five-year Riverside County Watershed Protection Program Public Education Strategic Plan which will apply community based social marketing-based approaches to the issue of eliminating dry weather runoff arising from excess irrigation runoff.

The District continues to chair the Public Education Strategic Taskforce (PEST) Meetings that include Permittee representation from the Santa Ana, Santa Margarita and Whitewater River Watersheds to review elements of regional public education programs and program materials.

With the help of a consultant, the District continues to maintain the revised Riverside County Watershed Protection Program website (<http://www.rcwatershed.org/>) as well as maintaining a social media presence by updating its Facebook page and sending out monthly newsletters for subscribers.

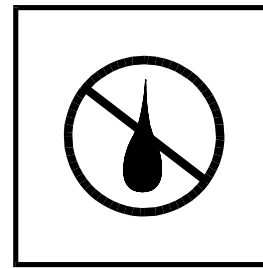
Training for Municipal Employees

Formal training classes are provided to improve understanding of NPDES Permit requirements, the DAMP, and stormwater BMPs. The classes focus on methods to reduce and/or eliminate sources of stormwater pollution from public agency facilities and activities, implementation of the WQMP and Transportation Project Guidance (TPG), local stormwater ordinances, and State Construction and Industrial General Permit requirements. Training is conducted specifically for construction inspection staff, industrial/commercial facilities inspection staff, municipal facilities maintenance staff, and staff responsible for new development/redevelopment project review. The training program has been provided to Permittees via the learning management system, an online platform.

Municipal training courses within the Santa Ana Region include the following:

- Construction Site Inspections (construction/post construction)
- Industrial/Commercial Facility Inspections
- Municipal Facilities & Activities
- Water Quality Management Plan
- Transportation Project Guidance
- Illegal Connection/Illicit Discharge (without meter calibration)

Insert Appendix E.2



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and/or the transport of pollutants off site.

Appropriate Applications

- Water conservation practices are implemented on all construction sites and wherever water is used.
- Applies to all construction projects.

Limitations

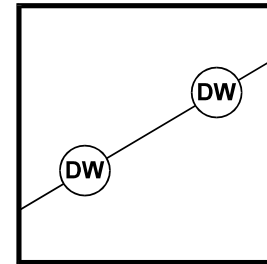
- None identified.

Standards and Specifications

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Vehicles and equipment washing on the construction site is discouraged.
- Avoid using water to clean construction areas. Do not use water to clean pavement. Paved areas shall be swept and vacuumed.
- Direct construction water runoff to areas where it can infiltrate into the ground.
- Apply water for dust control in accordance with the Standard Specifications Section 10, and WE-1, "Wind Erosion Control."
- Report discharges to RE immediately.

Maintenance and
Inspection

- Inspect water equipment at least weekly.
- Repair water equipment as needed.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Dewatering Operations are practices that manage the discharge of pollutants when non-storm water and accumulated precipitation (storm water) must be removed from a work location so that construction work may be accomplished.

Appropriate Applications

- These practices are implemented for discharges of non-storm water and storm water (accumulated rain water) from construction sites. Non-storm water includes, but is not limited to, groundwater, dewatering of piles, water from cofferdams, water diversions, and water used during construction activities that must be removed from a work area.
- Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (storm water) from depressed areas at a construction site.
- Storm water mixed with non-storm water should be managed as non-storm water.

Limitations

- Dewatering operations for non-storm water will require, and must comply with, applicable local permits, project-specific permits, and regulations.
- Site conditions will dictate design and use of dewatering operations.
- A dewatering plan shall be submitted as part of the SWPPP/WPCP detailing the location of dewatering activities, equipment, and discharge point.
- The controls discussed in this best management practice (BMP) address sediment only. If the presence of polluted water with hazardous substances is identified in the contract, the contractor shall implement dewatering pollution controls as required by the contract documents. If the quality of water to be removed by dewatering is not identified as polluted in the contract documents, but is later determined by observation or testing to be polluted, the contractor shall notify the Resident Engineer (RE) and comply with Standard Specifications Section 5-1.116, "Differing Site Conditions."

Standards and Specifications

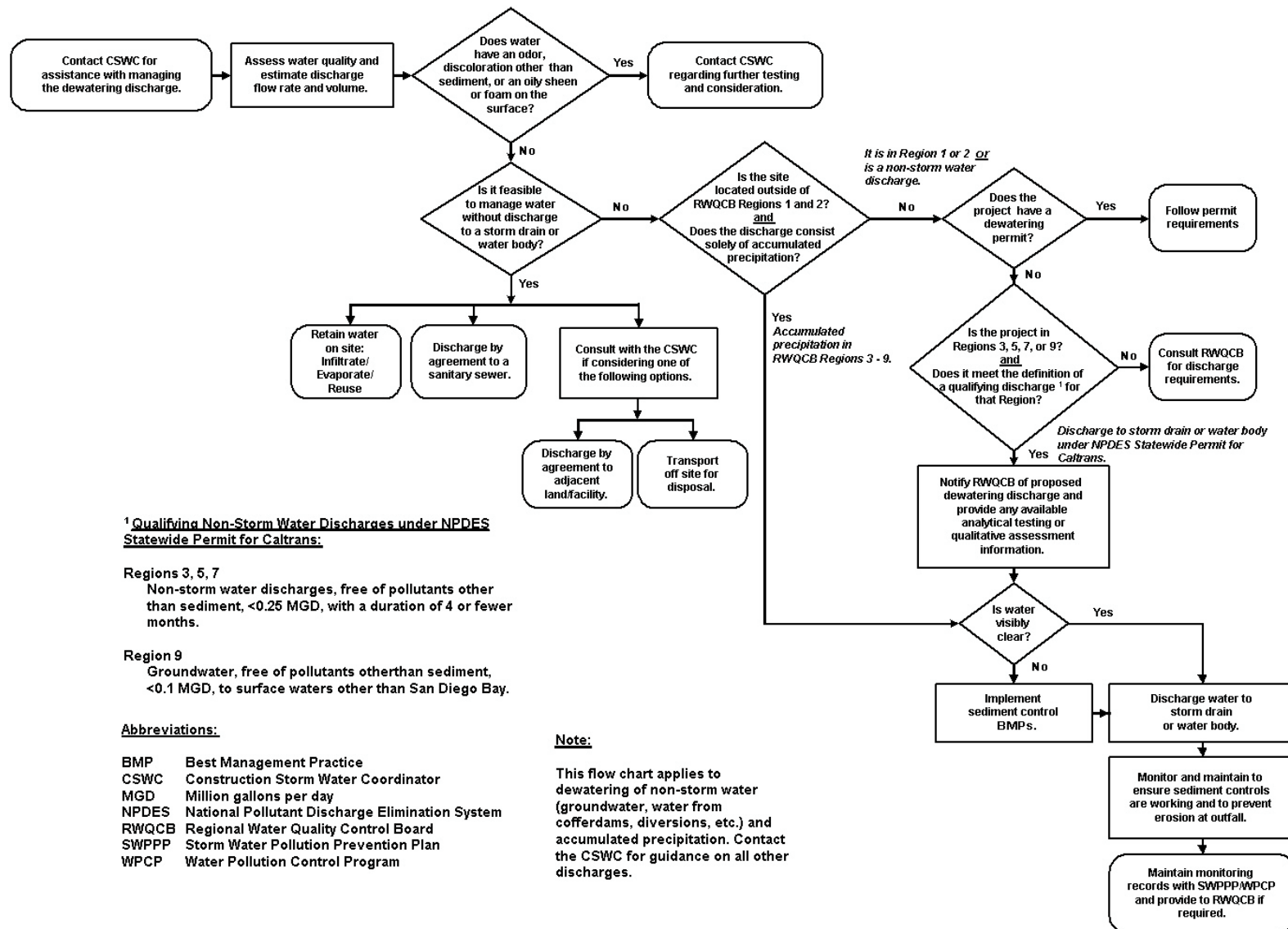
- Avoid dewatering discharges where possible by using the water for dust control, by infiltration, etc.
- Dewatering shall be conducted in accordance with the Field Guide to Construction Site Dewatering, October 2001, CTSW-RT-01-010.
- Dewatering for accumulated precipitation (storm water) shall follow this BMP and use treatment measures specified herein.
- The RWQCB may require a separate NPDES permit prior to the dewatering discharge of non-storm water. These permits will have specific testing, monitoring, and discharge requirements and can take significant time to obtain.
- Except in RWQCB Regions 1 and 2, the discharge of accumulated precipitation (storm water) to a water body or storm drain is subject to the requirements of Caltrans NPDES permit. Sediment control and other appropriate BMPs (e.g., outlet protection/energy dissipation) must be employed when this water is discharged.
- RWQCB Regions 1 and 2 require notification and approval prior to any discharge of water from construction sites.
- In RWQCB Regions 3, 5, 7, and 9 non-storm water dewatering for discharges meeting certain conditions are allowed under an RWQCB general dewatering NPDES Permit. Notification and approval from the RWQCB is required prior to conducting these operations. This includes storm water that is mixed with groundwater or other non-storm water sources. Once the discharge is allowed, appropriate BMPs must be implemented to ensure that the discharge complies with all permit requirements. Conditions for potential discharge under an RWQCB general dewatering NPDES Permit include:
 - Regions 3, 5, 7: Non-storm water discharges, free of pollutants other than sediment, <0.25 MGD, with a duration of 4 or fewer months.
 - Region 9: Groundwater, free of pollutants other than sediment, <0.10 MGD, to surface waters other than San Diego Bay.
- The flow chart shown on Page 4 shall be utilized to guide dewatering operations.
- The RE will coordinate monitoring and permit compliance.
- Discharges must comply with regional and watershed-specific discharge requirements.
- Additional permits or permissions from other agencies may be required for dewatering cofferdams or diversions.
- Dewatering discharges must not cause erosion at the discharge point.

Maintenance and Inspection

- Dewatering records shall be maintained for a period of 3 years.
- Inspect all BMPs implemented to comply with permit requirements frequently and repair or replace to ensure the BMPs function as designed.
- Conduct water quality monitoring pursuant to the “Storm Water Dewatering Operations BMP Discharge Monitoring Forms”.
- Accumulated sediment removed during the maintenance of a dewatering device may be incorporated in the project at locations designated by the RE or disposed of outside the right-of-way in conformance with the Standard Specifications.
- Accumulated sediment that is commingled with other pollutants must be disposed of in accordance with all applicable laws and regulations and as approved by the RE.

Dewatering Operations

NS-2



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Sediment Treatment A variety of methods can be used to treat water during dewatering operations from the construction site. Several devices are presented in this section that provide options to achieve sediment removal. The size of particles present in the sediment and Permit or receiving water limitations on sediment are key considerations for selecting sediment treatment option(s); in some cases, the use of multiple devices may be appropriate.

Category 1: Constructed Settling Technologies

The devices discussed in this category are to be used exclusively for dewatering operations only.

Sediment/Desilting Basin (SC-2)

Description:

A desilting basin is a temporary basin with a controlled release structure that is formed by excavation and/or construction of an embankment to detain sediment-laden runoff and allow sediment to settle out before discharging.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, and silt and some metals that settle out with the sediment.

Implementation:

- Excavation and construction of related facilities is required.
- Temporary desilting basins must be fenced if safety is a concern.
- Outlet protection is required to prevent erosion at the outfall location.

Maintenance:

- Maintenance is required for safety fencing, vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Sediment Trap (SC-3)

Description:

A sediment trap is a temporary basin formed by excavation and/or construction of an earthen embankment across a waterway or low drainage area to detain sediment-laden runoff and allow sediment to settle out before discharging.

Appropriate Applications:

- Effective for the removal of large and medium sized particles (sand and gravel) and some metals that settle out with the sediment.

Implementation:

- Excavation and construction of related facilities is required.
- Trap inlets shall be located to maximize the travel distance to the trap outlet.
- Use rock or vegetation to protect the trap outlets against erosion.

Maintenance:

- Maintenance is required for vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Category 2: Mobile Settling Technologies

The devices discussed in this category are typical of tanks that can be used for sediment treatment of dewatering operations. A variety of vendors are available who supply these tanks.

Weir Tank

Description:

A weir tank separates water and waste by using weirs. The configuration of the weirs (over and under weirs) maximizes the residence time in the tank and determines the waste to be removed from the water, such as oil, grease, and sediments.

Appropriate Applications:

- The tank removes trash, some settleable solids (gravel, sand, and silt), some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

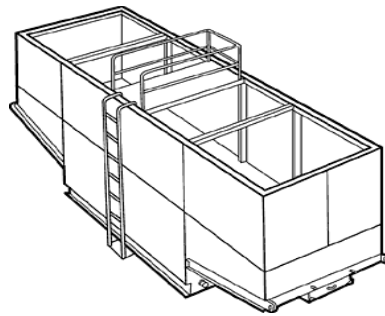
Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors shall be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal must be by licensed waste disposal company.

Schematic Diagrams:



Weir Tanks

Dewatering Tank

Description:

A dewatering tank removes debris and sediment. Flow enters the tank through the top, passes through a fabric filter, and is discharged through the bottom of the tank. The filter separates the solids from the liquids.

Appropriate Applications:

- The tank removes trash, gravel, sand, and silt, some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors shall be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal must be by licensed waste disposal company.

Schematic Diagrams:



Dewatering Tanks

Category 3: Basic Filtration Technologies

Gravity Bag Filter

Description:

A gravity bag filter, also referred to as a dewatering bag, is a square or rectangular bag made of non-woven geotextile fabric that collects sand, silt, and fines.

Appropriate Applications:

- Effective for the removal of sediments (gravel, sand, and silt). Some metals are removed with the sediment.

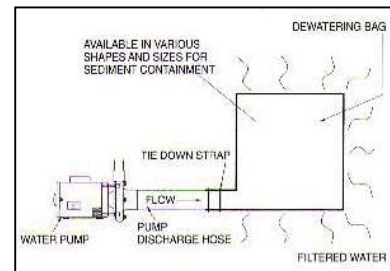
Implementation:

- Water is pumped into one side of the bag and seeps through the bottom and sides of the bag.
- A secondary barrier, such as a rock filter bed or straw/hay bale barrier, is placed beneath and beyond the edges of the bag to capture sediments that escape the bag.

Maintenance:

- Inspection of the flow conditions, bag condition, bag capacity, and the secondary barrier is required.
- Replace the bag when it no longer filters sediment or passes water at a reasonable rate.
- The bag is disposed off-site, or on-site as directed by the RE.

Schematic Diagrams:



Gravity Bag Filter

Category 4: Advanced Filtration Technologies

Sand Media Particulate Filter

Description:

Water is treated by passing it through canisters filled with sand media. Generally, sand filters provide a final level of treatment. They are often used as a secondary or higher level of treatment after a significant amount of sediment and other pollutants have been removed.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, and silt and some metals, as well as the reduction of biochemical oxygen demand (BOD) and turbidity.
- Sand filters can be used for standalone treatment or in conjunction with bag and cartridge filtration if further treatment is required.
- Sand filters can also be used to provide additional treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filters require monthly service to monitor and maintain the sand media.

Schematic Diagrams:



Sand Media Particulate Filters

Pressurized Bag Filter

Description:

A pressurized bag filter is a unit composed of single filter bags made from polyester felt material. The water filters through the unit and is discharged through a header, allowing for the discharge of flow in series to an additional treatment unit. Vendors provide pressurized bag filters in a variety of configurations. Some units include a combination of bag filters and cartridge filters for enhanced contaminant removal.

Appropriate Applications:

- Effective for the removal of sediment (sand and silt) and some metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Oil absorbent bags are available for hydrocarbon removal.
- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filter bags require replacement when the pressure differential exceeds the manufacturer's recommendation.

Schematic Diagrams:



Pressurized Bag Filter

Cartridge Filter

Description:

Cartridge filters provide a high degree of pollutant removal by utilizing a number of individual cartridges as part of a larger filtering unit. They are often used as a secondary or higher (polishing) level of treatment after a significant amount of sediment and other pollutants are removed. Units come with various cartridge configurations (for use in series with pressurized bag filters) or with a larger single cartridge filtration unit (with multiple filters within).

Appropriate Applications:

- Effective for the removal of sediment (sand, silt, and some clays) and metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Hydrocarbons can effectively be removed with special resin cartridges.
- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance.

Maintenance:

- The cartridges require replacement when the pressure differential exceeds the manufacturer's recommendation.

Schematic Designs:



Cartridge Filter

Dewatering Operations

NS-2

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM ^a	
Central Coast Region (RWQCB 3) For Inland Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}				
Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
Dissolved Oxygen	mg/L			
pH	unitless			
Turbidity	JTUs			

DISCHARGE LIMITATIONS ^{g, h, i}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
Dissolved Oxygen	mg/L	--	5.0 ^j
pH	unitless	--	Between 7.0 - 8.5 ^j
Turbidity	JTUs	--	20% (Where Ambient is 0 - 50 JTUs)
			10 (Where Ambient is 50 - 100 JTUs)
			10% (Where Ambient is > 100 JTUs)

NOTES:

Ambient - Upstream sample result (i.e., R-1)

BMP - Best Management Practice

JTUs - Jackson turbidity units

mg/L - Milligrams per liter

RWQCB - Regional Water Quality Control Board

SAR - Sodium absorption ratio

-- - Not required

> - Greater Than

a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDE permit or Waste Discharge Requirements.

b All inland surface waters, enclosed bays, and estuaries. Based on the 1994 RWQCB 3 Basin Plan.

[<http://www.swrcb.ca.gov/rwqcb3/BasinPlan/Index.htm>]

c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

d Each constituent will be analyzed in the effluent and the two receiving water samples.

e Dissolved oxygen, pH, and turbidity are required to be analyzed throughout the basin.

The following constituents shall be sampled if suspected to present in the discharge: ammonia for toxicity, MBAS, PCBs, phenols, and phthalate esters are required to be analyzed throughout the basin, however, bacteria, boron, chemical color, temperature, and total dissolved solids shall be analyzed if the project lies in an area designated for a specific beneficial use, as noted in the Basin Plan.

f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface waters.

h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

i Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Biostimulatory substances, floating material, oil and grease, pesticides, sediment, settleable materials, suspended materials, and tastes and odors.

j In addition, dissolved oxygen and pH have specific beneficial uses discharge limitations. See basin plan for specific limitations.



Dewatering Operations

NS-2

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM ^a	
Los Angeles Region (RWQCB 4) Los Angeles and Ventura Counties For Inland Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}				
Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
pH	unitless			
Turbidity	NTUs			
TDS ^j	mg/L			

DISCHARGE LIMITATIONS ^{g, h, k, i}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 6.5 - 8.5 ^j
Turbidity	NTUs	--	20% (Where Ambient is 0 - 50 NTUs)
			10% (Where Ambient is > 50 NTUs)
TDS	mg/L	--	See Table 3-8 in Basin Plan

NOTES:

Ambient - Upstream sample result (ie. R-1)

BMP - Best Management Practice

mg/L - Milligrams per liter

NTUs - Nephelometric turbidity units

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDES permit or Waste Discharge Requirements.

b All inland surface waters, enclosed bays, and estuaries, including wetlands. Based on the 1995 RWQCB 4 Basin Plan.

[http://www.swrcb.ca.gov/rwqcb4/html/meetings/tmdl/Basin_plan/basin_plan_doc.html]

c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

d Each constituent will be analyzed in the effluent and the two receiving water samples.

e pH, and turbidity are required to be analyzed throughout the basin, however, ammonia, bacteria/coliform, boron, chemical constituents, chloride, dissolved oxygen, methylene blue activated substances, nitrogen, pesticides, polychlorinated biphenyls, radioactive substances, sodium absorption ratio, sulfate, temperature, and total dissolved solids shall be analyzed if the project lies in an area designated for a specific beneficial use, as noted in the Basin Plan.

f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface waters

h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

i Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Bioaccumulation, biochemical oxygen demand, biostimulatory substances, color, exotic vegetation, floating material, oil and grease, solid/suspended/settleable materials, tastes and odors, and toxicity.

j In addition, ambient pH levels shall not be changed more than 0.2 units for inland surface waters, and 0.5 for bays or estuaries from natural conditions.

k See Table 3-8 in Basin Plan for applicable watershed



Dewatering Operations

NS-2

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM ^a

Central Valley Region (RWQCB 5)
Sacramento River Basin and The San Joaquin River Basin
For Inland Surface Waters ^b

GENERAL INFORMATION

Project Name	
Contract No.	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}

Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
pH	unitless			
Turbidity	NTUs			

DISCHARGE LIMITATIONS ^{g, h, i}

Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 6.5 - 8.5
Turbidity	NTUs	--	1 NTU increase (Where Ambient is 0 - 5 NTUs)
			20% increase (Where Ambient is 5 - 50 NTUs)
			10 NTU increase (Where Ambient is 50 - 100 NTUs)
			10% increase (Where Ambient is > 100 NTUs)

NOTES:

Ambient - Upstream sample result (i.e., R-1)

BMP - Best Management Practice

NTUs - Nephelometric turbidity units

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDES permit or Waste Discharge Requirements.

^b All surface waters in the Sacramento and San Joaquin River Basins, including the Delta. Based on the 1998 RWQCB 5a/5b Basin Plan.
[http://www.swrcb.ca.gov/rwqcb5/available_documents/index.html#anchor616381]

^c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

^d Each constituent will be analyzed in the effluent and the two receiving water samples.

^e Turbidity and pH are required to be analyzed throughout the basin, however, bacteria, chemical constituents, dissolved oxygen, pesticides, radioactivity, salinity, and temperature shall be analyzed if the project lies in an area designated for a specific beneficial use or along a specific waterbody, as noted in the Basin Plan.

^f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

^g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface water.

^h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

ⁱ Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Biostimulatory substances, color, floating material, oil and grease, sediment, settleable material, suspended material, tastes and odors, and toxicity.



Dewatering Operations

NS-2

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM ^a	
Central Valley Region (RWQCB 5) Tulare Lake Basin For Inland Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}				
Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
pH	unitless			
Turbidity	NTUs			
Dissolved Oxygen	mg/L			
Electrical Conductivity	umho/cm			

DISCHARGE LIMITATIONS ^{g, h, i}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 6.5 - 8.3 0.3 unit change for background
Turbidity	NTUs	--	1 (Where Ambient is 0 - 5 NTUs) 20% (Where Ambient is 5 - 50 NTUs) 10 (Where Ambient is 50 - 100 NTUs) 10% (Where Ambient is > 100 NTUs)
Dissolved Oxygen	mg/L		See Table III-1 in Basin Plan
Electrical Conductivity	umho/cm		See Table III-2 in Basin Plan

NOTES:

Ambient - Upstream sample result (i.e., R-1)

BMP - Best Management Practice

cm - Centimeter

mg/L - Milligrams per liter

NTUs - Nephelometric turbidity units

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

^a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDES permit or Waste Discharge Requirements.

^b Based on the 1995 RWQCB 5c Basin Plan. [http://www.swrcb.ca.gov/rwqcb5/available_documents/index.html#anchor616381]

^c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

^d Each constituent will be analyzed in the effluent and the two receiving water samples.

^e Bacteria, chemical constituents, pesticides, radioactivity, salinity, and temperature shall be analyzed for a specific beneficial use as noted in the Basin Plan. Ammonia is suspected at elevated levels.

^f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

^g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface water

^h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan

ⁱ Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Biostimulatory substances, color, floating material, oil and grease, sediment, settleable material, suspended material, tastes and odors, and toxicity.



Dewatering Operations

NS-2

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM ^a	
Lahontan Region (RWQCB 6) For Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}			
Constituents	Units	Results	
		Effluent	Receiving Water ^f
			Upstream (R-1)
pH	unitless		
Turbidity	NTUs		

DISCHARGE LIMITATIONS ^{g, h, i}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 6.5 - 8.5 ^j
Turbidity	NTUs	--	10% of Ambient ^j

NOTES:

Ambient - Upstream sample result (i.e., R-1)

BMP - Best Management Practice

NTUs - Nephelometric turbidity units

mg/L - Milligrams per liter

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDES permit or Waste Discharge Requirements.

b All surface waters including wetlands. Based on the 1994 RWQCB 6 Basin Plan.

[http://www.swrcb.ca.gov/rwqcb6/BPlan/BPlan_Index.htm]

c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

d Each constituent will be analyzed in the effluent and the two receiving water samples.

e pH and turbidity are required to be analyzed throughout the basin, however, adjusted sodium adsorption ration, algal growth potential, biological indicators, biostimulatory substances, boron, chemical constituents, chlorophyll-a, clarity, color, dissolved inorganic nitrogen, dissolved orthophosphate, dissolved oxygen, electrical conductivity, fluoride, iron, nitrogen as nitrate, pesticides, plankton counts, radioactivity, sodium adsorption ratio, soluble reactive iron, soluble reactive phosphorous, species composition, sulfate, suspended sediment, tastes & odors, temperatures, total dissolved solids, total alkalinity as carbonate, total kjeldahl nitrogen, total nitrogen, total phosphorous, total reactive iron, toxicity, transparency, un-ionized ammonia shall be analyzed if the project lies in an area designated for a specific beneficial use, as noted in the Basin Plan. Bacteria/Coliform if high levels are suspected. Residual chlorine if suspected to be present.

f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface waters

h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

i Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Floating material, nondegradation of aquatic communities and populations, oil and grease, sediment, settleable materials, and suspended materials.

j In addition, bacteria/coliform, pH, total residual chlorine, and turbidity have specific beneficial uses and/or location specific discharge limitations. See basin plan for specific limitations.



STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM^a Colorado River Basin Region (RWQCB 7) For Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No.	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}				
Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
pH	unitless			
TDS ^g	mg/L			

DISCHARGE LIMITATIONS ^{g, h, i}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 6.0 - 9.0
TDS ^g	mg/L	--	See Basin Plan

NOTES:

BMP - Best Management Practice

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

^a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDES permit or Waste Discharge Requirements.

^b Based on the 2002 RWQCB 7 Water Quality Plan.

[<http://www.swrcb.ca.gov/rwqcb7/documents/RB7Plan.pdf>]

^c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

^d Each constituent will be analyzed in the effluent and the two receiving water samples.

^e Bacteria, biochemical oxygen demand, chemical constituents, chemical oxygen demand, dissolved oxygen, radioactivity, and selenium shall be analyzed for specific beneficial uses as noted in the Basin Plan.

^f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

^g Total Dissolved Solids (TDS) has specific location discharge limitations. See basin plan for specific limitations.

^h If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface waters

ⁱ All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

^j Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Biostimulatory substances, color, floating material, herbicides, oil and grease, pesticides, sediment, settleable and suspended solids, tainting substances, tastes and odors, temperature, toxicity, and turbidity.

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM^a Santa Ana Region (RWQCB 8) For Inland Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}				
Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
pH	unitless			
Turbidity	NTUs			
TDS	mg/L			

DISCHARGE LIMITATIONS ^{g, h, i, j}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 7.0 - 8.6 (bays and estuaries)
		--	Between 6.5 - 8.5 (inland surface waters)
Turbidity	NTUs	--	20% (Where Ambient is 0 - 50 NTUs)
			10 NTUs (Where Ambient is 50 - 100 NTUs)
			10% (Where Ambient is > 100 NTUs)
TDS	mg/L	--	See Table 4-1 in Basin Plan

NOTES:

Ambient - Upstream sample result (i.e., R-1)

BMP - Best Management Practice

NTUs - Nephelometric turbidity units

mg/L - Milligrams per liter

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

^a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDE permit or Waste Discharge Requirements.

^b All inland surface waters including streams, rivers, lakes, and wetlands. Based on the 1995 RWQCB 8 Basin Plan. [<http://www.swrcb.ca.gov/rwqcb8/pdf/R8BPlan.pdf>]

^c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

^d Each constituent will be analyzed in the effluent and the two receiving water samples.

^e Bacteria/coliform, dissolved oxygen, fluoride, methylene blue-activated substances (MBAS), metals, nitrate, radioactivity, temperature, and un-ionized ammonia shall be analyzed for a specific beneficial use, as noted in the Basin Plan. Boron, Residual Chlorine, Hardness, sodium, chloride, total inorganic nitrogen, sulfate, and chemical oxygen demand if present at elevated levels.

^f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

^g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface waters.

^h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

ⁱ Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses of the following: Algae, color, floatables, oil and grease, suspended & settleable solids, sulfides, surfactants, tastes and odors, and toxic substances.

^j Total dissolved solids (TDS), hardness, sodium (Na), chloride (Cl), total inorganic nitrogen (TIN), sulfate (SO₄) and chemical oxygen demand (COD) shall be analyzed for specific waterbodies as identified in the Basin Plan.



Dewatering Operations

NS-2

STORM WATER DEWATERING OPERATIONS BMP DISCHARGE MONITORING FORM ^a	
San Diego Region (RWQCB 9) For Inland Surface Waters ^b	
GENERAL INFORMATION	
Project Name	
Contract No	
Contractor	
Sampler's Name	
Sampler's Signature	
Date Discharge Began	
Date of Sampling	

WATER SAMPLE LOG ^{c, d, e}				
Constituents	Units	Results		
		Effluent	Receiving Water ^f	
			Upstream (R-1)	Downstream (R-2)
pH	unitless			
Turbidity	NTUs			
TDS	mg/L			
Dissolved Oxygen	mg/L			
Color				

DISCHARGE LIMITATIONS ^{g, h, i}			
Constituent	Units	EFFLUENT	RECEIVING WATER
		Daily Maximum	Daily Maximum
pH	unitless	--	Between 6.5 - 8.5
Turbidity	NTUs	--	20% (Where Ambient is 0 - 50 NTUs) 10 NTUs (Where Ambient is 50 - 100 NTUs) 10% (Where Ambient is > 100 NTUs) 0.2 NTUs (ocean waters)
TDS	mg/L		See Table 3-2 in Basin Plan
Dissolved Oxygen	mg/L		5.0 mg/l in inland surface waters 6.0 mg/l in waters with designated COLD beneficial uses
Color		--	See Table 3-2 in Basin Plan

NOTES:

Ambient - Upstream sample result (i.e., R-1)

BMP - Best Management Practice

NTUs - Nephelometric turbidity units

mg/L - Milligrams per liter

RWQCB - Regional Water Quality Control Board

-- - Not required

> - Greater Than

a This form shall be used only for dewatering of storm water/accumulated precipitation. Dewatering non-storm water shall monitor constituents required in the applicable NPDES permit or Waste Discharge Requirements.

b All inland surface waters, enclosed bays, and estuaries and coastal lagoons. Based on the 1994 RWQCB 9 Basin Plan.

[<http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html>]

c Collect monthly samples. The first sample shall be collected at the start of the discharge and the last sample shall be collected at the completion of the discharge. Use the same sample collection criteria for discharges less than one month in duration for a total of two samples per discharge event.

d Each constituent will be analyzed in the effluent and the two receiving water samples.

e Bacteria, E. Coli & enterococci, biostimulatory substances, dissolved oxygen, inorganic chemicals, organic chemicals, pesticides, phenolic compounds, radioactivity, tastes & odors, temperatures, and trihalomethanes shall be analyzed for specific beneficial use, as noted in the Basin Plan.

Un-ionized Ammonia, chloride, sulfate, sodium, iron, manganese, MBAS, boron, and fluoride if suspected at elevated levels.

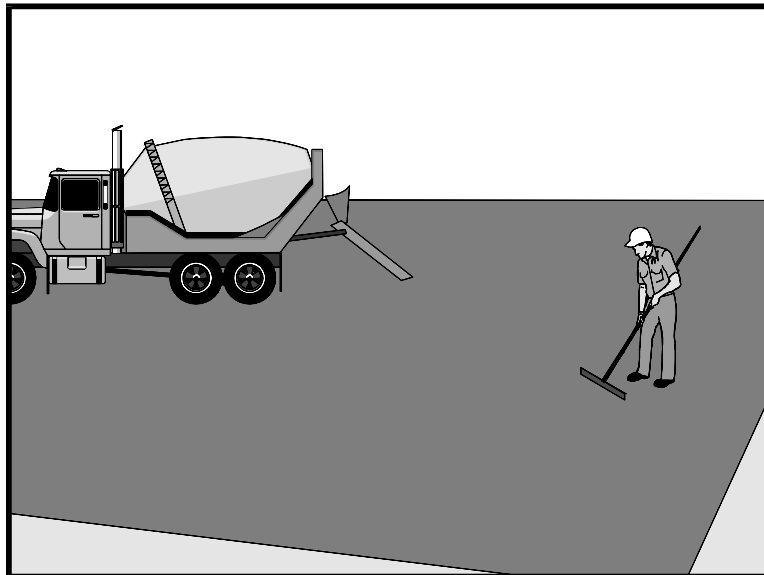
f R-1 shall be collected 100 feet upstream from the closest point of discharge. R-2 shall be collected 100 feet downstream from the closest point of discharge.

g If the results from receiving water sample exceed any of the discharge limits then discontinue dewatering activities to surface waters.

h All discharge limitations are listed in the Water Quality Objectives Section of the Basin Plan.

i Water shall not contain concentrations that cause nuisance or adversely affect beneficial uses as required in the Basin Plan.





Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Procedures and practices for conducting paving, saw cutting, and grinding operations to minimize the transport of pollutants to the storm drain system or receiving water body.

Appropriate Applications

These procedures are implemented where paving, surfacing, resurfacing, grinding or sawcutting, may pollute storm water 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.

Standards and Specifications

- Substances used to coat asphalt transport trucks, asphalt trucks, and asphalt spreading equipment shall not contain soap and shall be non-foaming and non-toxic.
- Place plastic materials under asphaltic concrete (AC) paving equipment while not in use, to catch and/or contain drips and leaks. See also BMP WM-4, "Spill Prevention and Control."
- When paving involves AC, the following steps shall be implemented to prevent the discharge of uncompacted or loose AC, tack coats, equipment cleaners, or other paving materials:
 - Minimize sand and gravel from new asphalt from getting into storm drains, streets, and creeks by sweeping.
 - Old or spilled asphalt must be recycled or disposed as approved by the Resident Engineer (RE).

- AC grindings, pieces, or chunks used in embankments or shoulder backing must not be allowed to enter any storm drain or watercourses. Install silt fence until structure is stabilized or permanent controls are in place.
- Collect and remove all broken asphalt and recycle when practical; otherwise, dispose in accordance with Standard Specification 7-1.13.
- Any AC chunks and pieces used in embankments must be placed above the water table and covered by at least 0.3 m (1 ft) of material.
- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate must not be allowed to enter any storm drain or water courses. Use silt fence until installation is complete.
- Use only non-toxic substances to coat asphalt transport trucks and asphalt spreading equipment.
- Drainage inlet structures and manholes shall be covered with filter fabric during application of seal coat, tack coat, slurry seal, and/or fog seal.
- Seal coat, tack coat, slurry seal, or fog seal shall not be applied if rainfall is predicted to occur during the application or curing period.
- Paving equipment parked onsite shall be parked over plastic to prevent soil contamination.
- Clean asphalt-coated equipment off-site whenever possible. When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in BMP WM-5, “Solid Waste Management.” Any cleaning onsite shall follow BMP NS-8, “Vehicle and Equipment Cleaning.”
- 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 BMP WM-8, “Concrete Waste Management,” or dispose in accordance with Standard Specifications Section 7-1.13.
- Do not allow saw-cut Portland Concrete Cement (PCC) slurry to enter storm drains or watercourses.

Pavement Grinding or Removal

- Residue from PCC grinding operations shall be picked up by means of a vacuum attachment to the grinding machine, shall not be allowed to flow across the pavement, and shall not be left on the surface of the pavement. See also BMP WM-8, “Concrete Waste Management;” and BMP WM-10, “Liquid Waste Management,” and Standard Specifications Section 42-2

“Grindings.”

- Collect pavement digout material by mechanical or manual methods. This material may be recycled if approved by the RE for use as shoulder backing or base material at locations approved by the RE.
- If digout material cannot be recycled, transport the material back to a maintenance facility or approved storage site.
- Digout activities shall not be conducted in the rain.
- When approved by the RE, stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses and stored consistent with BMP WM-3, “Stockpile Management.”
- Disposal or use of AC grindings shall be approved by the RE. See also BMP WM-8, “Concrete Waste Management.”

Thermoplastic Striping

- All thermoplastic striper and pre-heater equipment shutoff valves shall be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering drain inlets, the storm water drainage system, or watercourses.
- The pre-heater shall 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.
- Contractor shall 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. Thermoplastic waste shall be disposed of in accordance with Standard Specification 7-1.13.

Raised/Recessed Pavement Marker Application and Removal

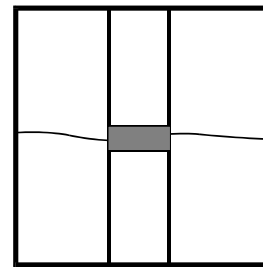
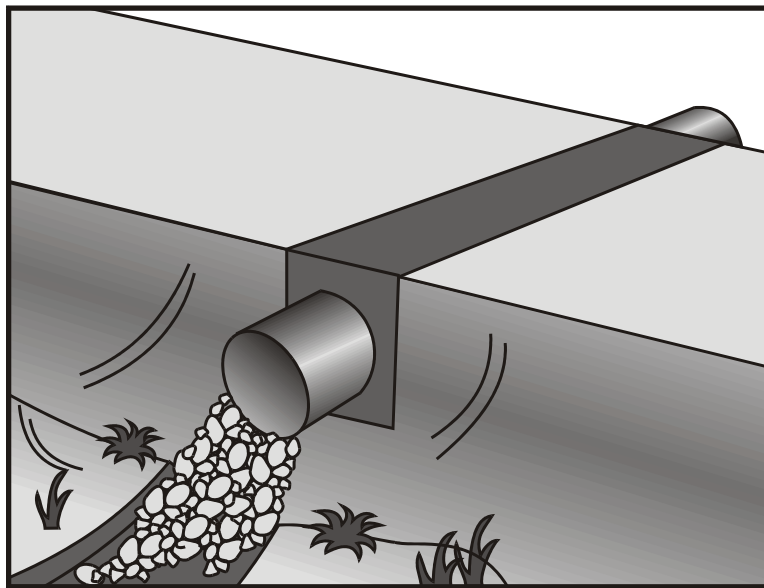
- Do not transfer or load bituminous material near drain inlets, the storm water drainage system or watercourses.
- Melting tanks shall be loaded with care and not filled to beyond six inches from the top to leave room for splashing when vehicle is deadheaded.
- When servicing or filling melting tanks, 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.

- Waste shall be disposed of in accordance with Standard Specification 7-1.13.

Maintenance and Inspection

- Inspect and maintain machinery regularly to minimize leaks and drips.
- Ensure that employees and subcontractors are implementing appropriate measures during paving operations.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

A temporary stream crossing is a structure placed across a waterway that allows vehicles to cross the waterway during construction, minimizing, reducing, or managing erosion and downstream sedimentation caused by the vehicles.

Appropriate Applications

Temporary stream crossings are installed at sites:

- Where appropriate permits have been secured (1601 Agreements, 404 Permits, and 401 Certification).
- Where construction equipment or vehicles need to frequently cross a waterway.
- When alternate access routes impose significant constraints.
- When crossing perennial streams or waterways causes significant erosion.
- Where construction activities will not last longer than one year.

Limitations

- Will usually disturb the waterway during installation and removal.
- May require Regional Water Quality Control Board (RWQCB) 401 Certification, U.S. Army Corps of Engineers 404 permit and approval by California Department of Fish and Game. If numerical-based water quality standards are mentioned in any of these and other related permits, testing and sampling may be required. If monitoring related to these numerical-based water quality standards is not addressed in the contract documents, contact the Resident Engineer (RE).
- Installation may require dewatering or temporary diversion of the stream. See BMP NS-2, "Dewatering Operations" and NS-5, "Clear Water Diversion."
- May become a constriction in the waterway, which can obstruct flood flow and cause flow backups or washouts. If improperly designed, flow backups can increase the pollutant load through washouts and scouring.

- Use of natural or other gravel in the stream for construction of Cellular Confinement System (CCS) (refer to figure at the end of the section) ford crossing will be contingent upon approval by fisheries agencies.
- Ford crossings may degrade water quality due to contact with vehicles and equipment.
- CCS should not be used in excessively high or fast flows.
- Upon completion of construction activities, CCS blocks must be removed from stream.

Standards and Specifications

General Considerations

Location of the temporary stream crossing shall address:

- Site selection where erosion potential is low.
- Areas where the side slopes from highway runoff will not spill into the side slopes of the crossing.

The following types of temporary stream crossings shall be considered:

- Culverts - Used on perennial and intermittent streams.
- Fords - Appropriate during the dry season in arid areas. Used on dry washes and ephemeral streams, and low flow perennial streams. CCS, a type of ford crossing is also appropriate for use in streams.
- Bridges - Appropriate for streams with high flow velocities, steep gradients and/or where temporary restrictions in the channel are not allowed.

Design and installation requires knowledge of stream flows and soil strength. Designs shall be prepared under direction of, and approved by, a registered civil and/or structural engineer. Both hydraulic and construction loading requirements shall be considered with the following:

- Comply with the requirements for culvert and bridge crossings, as contained in the Caltrans Highway Design Manual, particularly if the temporary stream crossing will remain through the rainy season.
- Provide stability in the crossing and adjacent areas to withstand the design flow. The design flow and safety factor shall be selected based on careful evaluation of the risks due to over topping, flow backups, or washout.
- Avoid oil or other potentially hazardous waste materials for surface treatment.

Construction Considerations:

- Stabilize construction roadways, adjacent work area and stream bottom against erosion.

- Construct during dry periods to minimize stream disturbance and reduce costs.
- Construct at or near the natural elevation of the stream bed to prevent potential flooding upstream of the crossing.
- Install temporary sediment control BMPs in accordance with sediment control BMPs presented in Section 4 to minimize erosion of embankment into flow lines.
- Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a water body where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as authorized by the RE, as necessary to complete the work.
- Temporary water body crossings and encroachments shall be constructed to minimize scour. Cobbles used for temporary water body crossings or encroachments shall be clean, rounded river cobble.
- The exterior of vehicles and equipment that will encroach on the water body within the project shall be maintained free of grease, oil, fuel, and residues.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Precautions shall be taken to avoid damage to vegetation by people or equipment. Disturbed vegetation shall be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble shall be removed upon completion of project activities.
- Any temporary artificial obstruction placed within flowing water shall only be built from material, such as clean gravel, that will cause little or no siltation.
- Drip pans shall 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 one hour.
- Conceptual temporary stream crossings are shown in figures at the end of this section.

Specific Considerations:

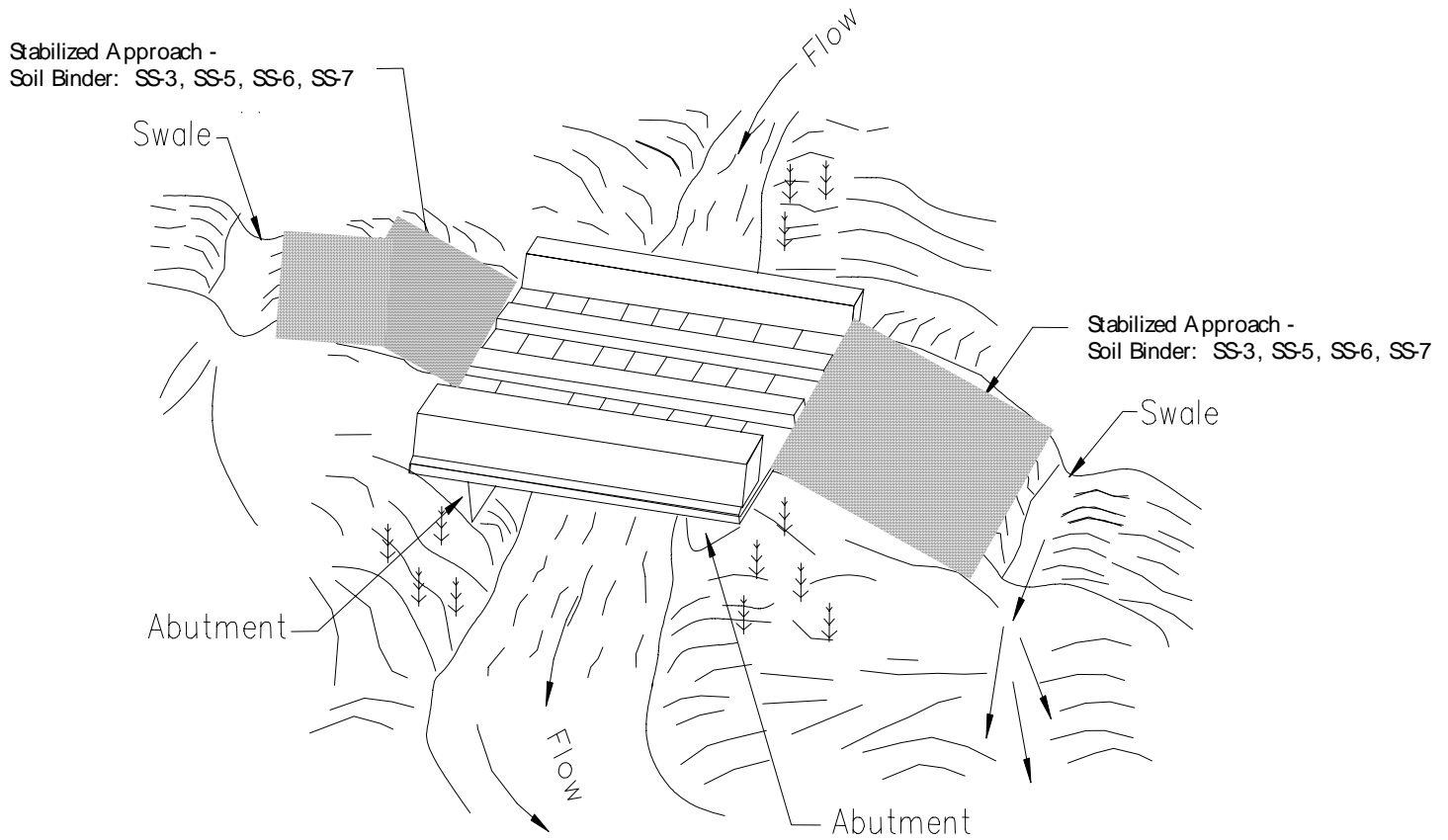
- Culverts are relatively easy to construct and able to support heavy equipment loads.
- Fords are the least expensive of the crossings, with maximum load limits.
- Temporary fords are not appropriate if construction will continue through the rainy season, if thunderstorms are likely, or if the stream is perennial.

- CCS crossing structures consist of clean, washed gravel and cellular confinement system blocks. CCS are appropriate for streams that would benefit from an influx of gravel; for example, salmonid streams, streams or rivers below reservoirs, and urban, channelized streams. Many urban stream systems are gravel-deprived due to human influences, such as dams, gravel mines, and concrete channels.
- CCS allow designers to use either angular or naturally-occurring, rounded gravel, because the cells provide the necessary structure and stability. In fact, natural gravel is optimal for this technique, because of the habitat improvement it will provide after removal of the CCS.
- A gravel depth of 152 to 305 mm (6 to 12 inches) for a CCS structure is sufficient to support most construction equipment.
- An advantage of a CCS crossing structure is that relatively little rock or gravel is needed, because the CCS provides the stability.
- Bridges are generally more expensive to design and construct, but provides the least disturbance of the stream bed and constriction of the waterway flows.

Maintenance and Inspection

Maintenance provisions shall include:

- Periodic removal of debris behind fords, in culverts, and under bridges.
- Replacement of lost protective aggregate from inlets and outlets of culverts.
- Removal of temporary crossing promptly when it is no longer needed.
- Inspection shall, at a minimum, occur weekly and after each significant rainfall, and include:
 - Checking for blockage in the channel, debris buildup in culverts or behind fords, and under bridges.
 - Checking for erosion of abutments, channel scour, riprap displacement, or piping in the soil.
 - Checking for structural weakening of the temporary crossing, such as cracks, and undermining of foundations and abutments.



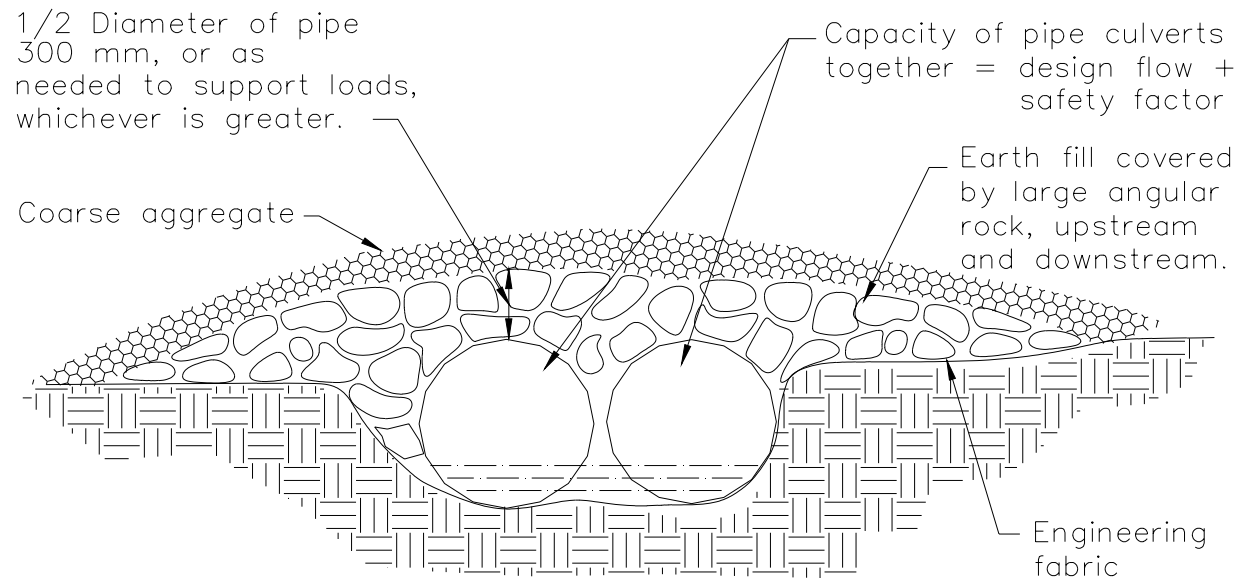
NOTE:

Surface flow of road diverted by swale and/or dike.

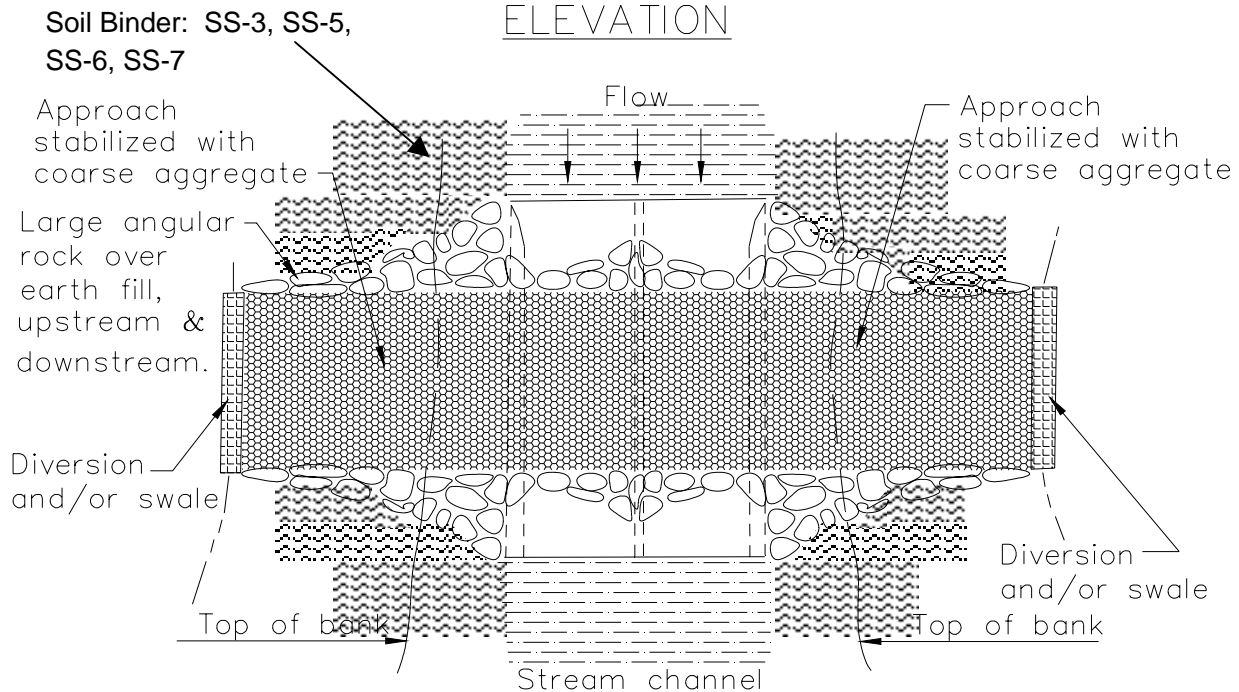
TYPICAL BRIDGE CROSSING
NOT TO SCALE

Temporary Stream Crossing

NS-4



ELEVATION



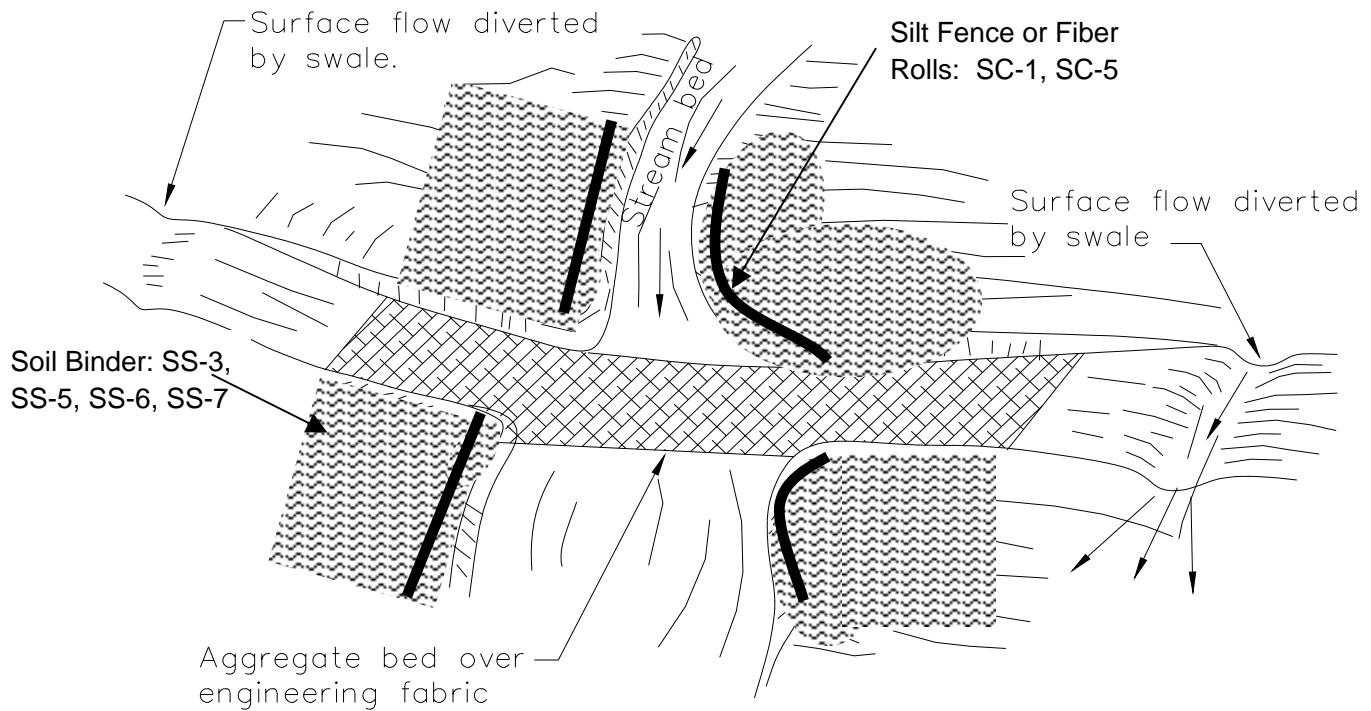
PLAN VIEW

TYPICAL CULVERT CROSSING NOT TO SCALE

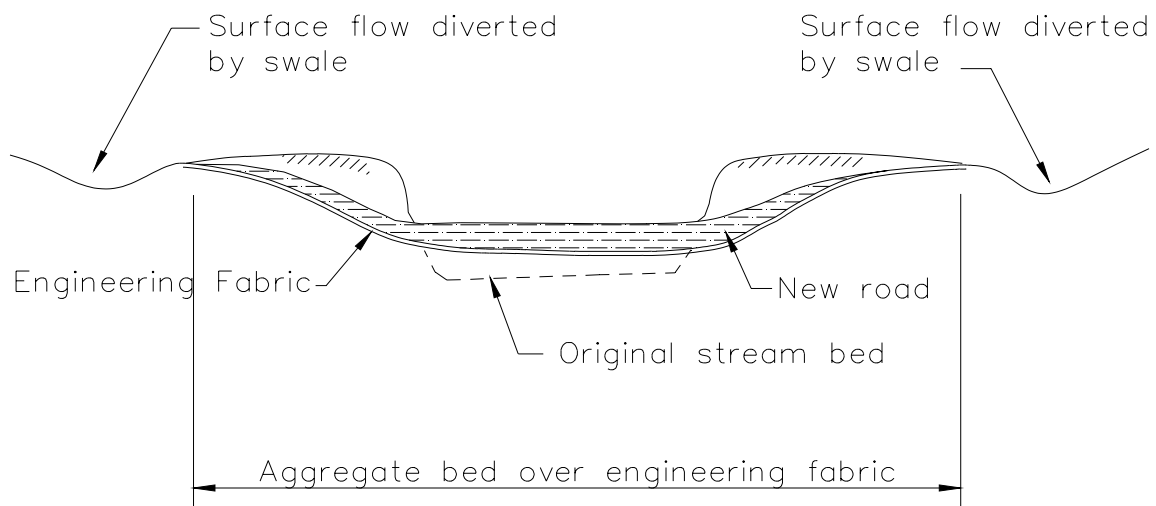


Temporary Stream Crossing

NS-4



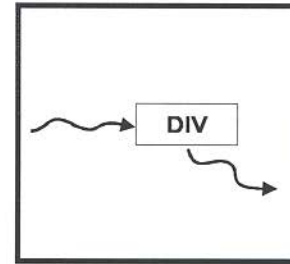
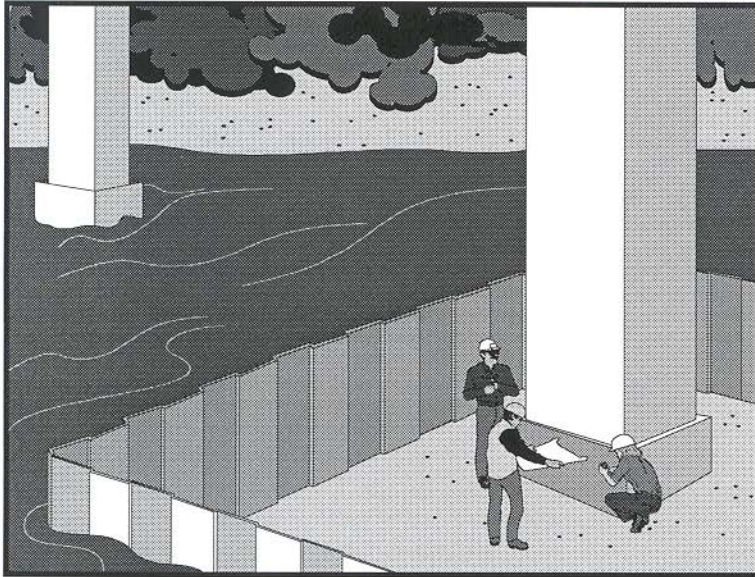
Aggregate approach
1:5 (V:H) Maximum slope on road



TYPICAL FORD CROSSING
NOT TO SCALE



CELLULAR CONFINEMENT SYSTEM



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Clear water diversion consists of a system of structures and measures that intercept clear surface water runoff upstream of a project site, transport it around the work area, and discharge it downstream with minimal water quality degradation for either the project construction operations or the construction of the diversion. Clear water diversions are used in a waterway to enclose a construction area and reduce sediment pollution from construction work occurring in or adjacent to water. Isolation techniques are methods that isolate near shore work from a waterbody. Structures commonly used as part of this system include diversion ditches, berms, dikes, slope drains, rock, gravel bags, wood, sheet piles, aqua barriers, cofferdams, filter fabric or turbidity curtains, drainage and interceptor swales, pipes, or flumes.

Appropriate Applications

- A clear water diversion is typically implemented where appropriate permits (1601 Agreement, 404 Permits, and 401 Water Quality Certifications) have been secured and work must be performed in a live stream or water body.
- Clear water diversions are appropriate for isolating construction activities occurring within or near a water body such as streambank stabilization, or culvert, bridge, pier or abutment installation. They may also be used in combination with other methods, such as clear water bypasses and/or pumps.
- Pumped diversions are suitable for intermittent and low flow streams. Excavation of a temporary bypass channel, or passing the flow through a pipe (called a “flume”) is appropriate for the diversion of streams less than 6 m (20 ft) wide, with flow rates less than 2.8 m³/sec (99 ft³/sec).
- Clear water diversions incorporating clean washed gravel may be appropriate for use in salmon spawning streams.

- Limitations**
- Diversion/encroachment activities will usually disturb the waterway during installation and removal of diversion structures.
 - Specific permit requirements or mitigation measures, such as the U.S. Army Corps of Engineers, California Department of Fish and Game, Federal Emergency Management Agency (FEMA), Regional Water Quality Control Board (RWQCB), etc. may be included in contract documents because of clear water diversion/encroachment activities.
 - Diversion/encroachment activities may constrict the waterway, which can obstruct flood flows and cause flooding or washouts. Diversion structures should not be installed without identifying potential impacts to the stream channel.
 - Diversion or isolation activities should not completely dam stream flow.
 - Dewatering and removal may require additional sediment control or water treatment (See NS-2, “Dewatering Operations”).

Standards and Specifications

General

- Implement guidelines presented in NS-17, Streambank Stabilization to minimize impacts to streambanks.
- Where working areas encroach on live streams, barriers adequate to prevent the flow of muddy water into streams shall be constructed and maintained between working areas and streams. During construction of the barriers, muddying of streams shall be held to a minimum.
- Diversion structures must be adequately designed to accommodate fluctuations in water depth or flow volume due to tides, storms, flash floods, etc.
- Heavy equipment driven in wet portions of a water body to accomplish work shall be completely clean of petroleum residue, and water levels shall be below the gearboxes of the equipment in use, or lubricants and fuels are sealed such that inundation by water shall not result in leaks.
- Mechanical equipment operated in the water shall not be submerged to a point above any axle of said mechanical equipment.
- Excavation equipment buckets may reach out into the water for the purpose of removing or placing fill materials. Only the bucket of the crane/excavator/backhoe may operate in a water body. The main body of the crane/excavator/backhoe shall not enter the water body, except as necessary to cross the stream to access the work site.
- Clear water diversions that require dewatering shall be conducted in accordance with policies and guidelines presented in Field Guide to Construction Site Dewatering, October 2001, CTSW-RT-01-010.

- Stationary equipment such as motors and pumps, located within or adjacent to a water body, shall be positioned over drip pans.
- When any artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall, at all times, be allowed to pass downstream to maintain aquatic life downstream.
- The exterior of vehicles and equipment that will encroach on a water body within the project shall be maintained free of grease, oil, fuel, and residues.
- Equipment shall not be parked below the high water mark unless allowed by a permit.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Precautions shall be taken to avoid damage to vegetation by people or equipment. Disturbed vegetation shall be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run rock to prevent damage to the underlying soil and root structure. The rock shall be removed upon completion of project activities.
- Drip pans shall 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 one hour.
- Where possible, avoid or minimize diversion/encroachment impacts by scheduling construction during periods of low flow or when the stream is dry. See also the project special provisions for scheduling requirements. Scheduling shall also consider seasonal releases of water from dams, fish migration and spawning seasons, and water demands due to crop irrigation.
- Construct diversion structures with materials free of potential pollutants such as soil, silt, sand, clay, grease, or oil.

Temporary Diversions/Encroachments

- Construct diversion channels in accordance with BMP SS-9, “Earth Dikes/Drainage Swales, and Ditches.”
- In high flow velocity areas, stabilize slopes of embankments and diversion ditches using an appropriate liner, in accordance with BMP SS-7, “Geotextiles, Plastic Covers & Erosion Control Blankets/Mats”, or use rock slope protection, as described in Standard Specifications Section 72-2, “Rock Slope Protection.”

- Where appropriate, use natural streambed materials such as large cobbles and boulders for temporary embankment/slope protection, or other temporary soil stabilization methods.
- Provide for velocity dissipation at transitions in the diversion, such as the point where the stream is diverted to the channel and the point where the diverted stream is returned to its natural channel. See also BMP SS-10, “Outlet Protection/Velocity Dissipation Devices.”

Temporary Dry Construction Areas

- When dewatering behind temporary structures to create a temporary dry construction area, such as coffer dams, pass pumped water through a sediment settling device, such as a portable tank or settling basin, before returning water to the water body; See also BMP NS-2, “Dewatering Operations.”
- If the presence of polluted water or sediment is identified in the contract, the contractor shall implement dewatering pollution controls as required by the contract documents. If the quality of water or sediment to be removed while dewatering is not identified as polluted in the contract documents, but is later determined by observation or testing to be polluted, the contractor shall notify the Resident Engineer (RE) and comply with Standard Specifications Section 5-1.116 “Differing Site Conditions.”
- Any substance used to assemble or maintain diversion structures, such as form oil, shall be non-toxic and non-hazardous.
- Any material used to minimize seepage underneath diversion structures, such as grout, shall be non-toxic, non-hazardous, and as close to a neutral pH as possible.

Isolation Techniques:

Isolation techniques are methods that isolate near shore work from a waterbody. Techniques include sheet pile enclosures, water-filled geotextile (Aqua Dam) , gravel berm with impermeable membrane, gravel bags, coffer dams, and K-rail.

Filter Fabric Isolation Technique

Definition and Purpose:

A filter fabric isolation structure (See Figure 1-C) is a temporary structure built into a waterway to enclose a construction area and reduce sediment pollution from construction work in or adjacent to water. This structure is composed of filter fabric, gravel bags, and steel t-posts.

Appropriate Applications:

- Filter fabric may be used for construction activities such as streambank stabilization, or culvert, bridge, pier or abutment installation. It may also be

used in combination with other methods, such as clean water bypasses and/or pumps.

- This method involves placement of gravel bags or continuous berms to “key-in” the fabric, and subsequently staking the fabric in place.
- If spawning gravel (gravel between 25 and 100 mm [1 and 4 inches]) is used, all other components of the isolation can be removed from the stream, and the gravel can be spread out and left as salmon spawning habitat. Whether spawning gravel or other types of gravel are used, only clean washed gravel should be used as infill for the gravel bags or continuous berm.
- This is a method that should be used in relatively calm water, and can be used in smaller streams.

Limitations

- Do not use if the installation, maintenance and removal of the structures will disturb sensitive aquatic species of concern.
- Not appropriate for projects where dewatering is necessary.
- Not appropriate to completely dam streamflow.

Standards and Specifications:

- For the filter fabric isolation method, a non-woven or heavy-duty fabric (refer to Standard Specifications Section 88) is recommended over standard silt fence. Using rolled geotextiles allows non-standard widths to be used.
- Anchor filter fabric with gravel bags filled with clean, washed gravel. Do not use sand. If a bag should split open, the gravel can be left in the stream, where it can provide aquatic habitat benefits.
- Another anchor alternative is a continuous berm, made with the Continuous Berm Machine. This is a gravel-filled bag that can be made in very long segments. The length of the berms is usually limited to 6 m (20 ft) for ease of handling.

Installation

- Place the fabric on the bottom of the stream, and place either a bag of clean, washed gravel or a continuous berm over the bottom of the fabric, such that a bag-width of fabric lies on the stream bottom. The bag should be placed on what will be the outside of the isolation area.
- Pull the fabric up, and place a metal t-post immediately behind the fabric, on the inside of the isolation area; attach the fabric to the post with three diagonal nylon ties.

- Continue placing fabric as described above until the entire work area has been isolated, staking the fabric at least every 1.8 m (6 ft).

Maintenance and Inspection:

- During construction, inspect daily during the workweek.
- Schedule additional inspections during storm events.
- Immediately repair any gaps, holes or scour.
- Remove sediment buildup.
- Remove BMP upon completion of construction activity. Recycle or re-use if applicable.
- Re-vegetate areas disturbed by BMP removal if needed.

Turbidity Curtain Isolation Technique

Definition and purpose:

A turbidity curtain (refer to Figures 1A through 1D) is a fabric barrier used to isolate the near shore work area. The barriers are intended to confine the suspended sediment. The curtain is a floating barrier, and thus does not prevent water from entering the isolated area; rather, it prevents suspended sediment from getting out.

Appropriate applications:

Turbidity curtains should be used where sediment discharge to a stream is unavoidable. They are used when construction activities adjoin quiescent waters, such as lakes, ponds, lagoons, bays, and slow flowing rivers. The curtains are designed to deflect and contain sediment within a limited area and provide sufficient retention time so that the soil particles will fall out of suspension.

Limitations:

- Turbidity curtains should not be used in flowing water; they are best suited for use in ponds, lakes, lagoons, bays, and very slow-moving rivers.
- Turbidity curtains should not be placed across the width of a channel.
- Removing sediment that has been deflected and settled out by the curtain may create a discharge problem through the re-suspension of particles and by accidental dumping by the removal equipment.

Standards and Specifications:

- Turbidity curtains should be oriented parallel to the direction of flow.

- The curtain should extend the entire depth of the watercourse in calm-water situations.
- In wave conditions, the curtain should extend to within 0.3 m (1 ft) of the bottom of the watercourse, such that the curtain does not stir up sediment by hitting the bottom repeatedly. If it is desirable for the curtain to reach the bottom in an active-water situation, a pervious filter fabric may be used for the bottom 0.3 m (1 ft).
- The top of the curtain should consist of flexible flotation buoys, and the bottom shall be held down by a load line incorporated into the curtain fabric. The fabric shall be a brightly colored impervious mesh.
- The curtain shall be held in place by anchors placed at least every 30 m (100 ft).
- First place the anchors, then tow the fabric out in a furled condition, and connect to the anchors. The anchors should be connected to the flotation devices, and not to the bottom of the curtain. Once in place, cut the furling lines, and allow the bottom of the curtain to sink.
- Sediment that has been deflected and settled out by the curtain may be removed if so directed by the on-site inspector or the RE. Consideration must be given to the probable outcome of the removal procedure. It must be asked if it will create more of a sediment problem through re-suspension of the particles or by accidental dumping of material during removal. It is recommended that the soil particles trapped by the turbidity curtain only be removed if there has been a significant change in the original contours of the affected area in the watercourse.
- Particles should always be allowed to settle for a minimum of 6 to 12 hours prior to their removal or prior to removal of the turbidity curtain.

Maintenance and Inspection:

- The curtain should be inspected daily for holes or other problems, and any repairs needed should be made promptly.
- Allow sediment to settle for 6 to 12 hours prior to removal of sediment or curtain. This means that after removing sediment, wait an additional 6 to 12 hours before removing the curtain.
- To remove, install furling lines along the curtain, detach from anchors, and tow out of the water.

K-rail River Isolation

Definition and Purpose:

This is temporary sediment control, or stream isolation method that uses K-rails

(refer to Figure 2) to form the sediment deposition area, or to isolate the in-stream or near-bank construction area.

Barriers are placed end-to-end in a pre-designed configuration and gravel-filled bags are used at the toe of the barrier and also at their abutting ends to seal and prevent movement of sediment beneath or through the barrier walls.

Appropriate Applications:

- The K-rail isolation can be used in streams with higher water velocities than many other isolation techniques.

Limitations:

- The K-rail method does not allow for full dewatering.

Standards and Specifications:

- To create a floor for the K-rail, move large rocks and obstructions. Place washed gravel and gravel-filled bags to create a level surface for K-rail to sit.
- Place the bottom two K-rails adjacent to each other, and parallel to the direction of flow; fill the center portion with gravel bags. Then place the third K-rail on top of the bottom two; there should be sufficient gravel bags between the bottom K-rails such that the top one is supported by the gravel. Place plastic sheeting around the K-rails, and secure at the bottom with gravel bags.
- Further support can be added by pinning and cabling the K-rails together. Also, large riprap and boulders can be used to support either side of the K-rail, especially where there is strong current.

Maintenance and Inspection:

- The barrier should be inspected at least once daily, and any damage, movement or other problems should be addressed immediately.
- Sediment should be allowed to settle for at least 6 to 12 hours prior to removal of sediment, and for 6 to 12 hours prior to removal of the barrier.

Stream Diversions

Definition and Purpose:

Stream diversions consist of a system of structures and measures that intercept an existing stream upstream of the project and, transports it around the work area, and discharges it downstream (refer to Figure 3). The selection of which stream diversion technique to use depends upon the type of work involved, physical characteristics of the site, and the volume of water flowing through the project.

Appropriate Applications:

- Pumped diversions are appropriate in areas where de-watering is necessary.
- Dam-type diversions may serve as temporary access to the site.
- Where work areas require isolation from flows.

Limitations:

- Pumped diversions have limited flow capacity.
- Pumped diversion require frequent monitoring of pumps.
- Large flows during storm events can overtop dams.
- Flow diversion and re-direction with small dams involves in-stream disturbance and mobilization of sediment.

Standards and Specifications:

- Installation guidelines will vary based on existing site conditions and type of diversion used.
- Diversions shall be sized to convey design flood flows.
- Pump capacity must be sufficient for design flow; the upper limit is approximately 0.3 m³/sec (10 cfs) (the capacity of two 200 mm [8 inch] pumps).
- Adequate energy dissipation must be provided at the outlet to minimize erosion.
- Dam materials used to create dams upstream and downstream of diversion should be erosion resistant; materials such as steel plate, sheetpile, sandbags, continuous berms, inflatable water bladders, etc. would be acceptable.
- When constructing a diversion channel, begin excavation of the channel at the proposed downstream end, and work upstream. Once the watercourse to be diverted is reached, and the excavated channel is stable, breach the upstream end, and allow water to flow down the new channel. Once flow has been established in the diversion channel, install the diversion weir in the main channel; this will force all water to be diverted from the main channel.

Maintenance and Inspection:

- Inspect diversion/encroachment structures before and after significant storms, and at least once per week while in service. Inspect daily during the construction.
- Pumped diversions require frequent monitoring of pumps.

- Inspect embankments and diversion channels before and after significant storms, and at least once per week while in service for damage to the linings, accumulating debris, sediment buildup, and adequacy of the slope protection. Remove debris and repair linings and slope protection as required. Repair holes, gaps, or scour.
- Upon completion of work, the diversion or isolation structure should be removed and flow should be re-directed through the new culvert or back into the original stream channel. Recycle or re-use if applicable.

Instream Construction Sediment Control

There are **three** different options currently available for reducing turbidity while working in a stream or river. The stream can be; 1. **isolated** from the area in which work is occurring by means of a water barrier, 2. the stream can be **diverted around** the work site through a pipe or temporary channel, or 3. one can employ **construction practices that minimize sediment suspension**.

The highest hazard for sedimentation from instream construction generally occurs when the sediment control structure is being installed and when it is being removed. Generally the best time to install the stream isolation or diversion structure is when the stream is low. Conversely, the optimum time to remove in-stream diversion or isolation structures may be during the rising limb of a storm hydrograph. A probable “worst time” to release high TSS into a stream system with diminishing aquatic habitat might be when the stream is very low; summer low flow, for example. During these times, the flow may be low while the biological activity in the stream is very high. On the other hand, the addition of short-term spike in TSS or sediment during a big storm discharge might have a relatively low impact on the aquatic habitat or turbidity because the stream is already turbid, and the stream energy is capable of transporting both suspended solids, and large quantities of bedload through the system.

Techniques to minimize Total Suspended Solids (TSS)

- Padding - Padding laid in the stream below the work site may trap some solids that are deposited in the stream during construction. After work is done, the padding is removed from the stream, and placed on the bank to assist in revegetation.
- Clean, washed gravel - Using clean, washed gravel decreases solid suspension, as there are fewer small particles deposited in the stream.
- Excavation using a large bucket -Each time a bucket of soil is placed in the stream, a portion is suspended. Approximately the same amount is suspended whether a small amount of soil is placed in the stream, or a large amount. Therefore, using a large excavator bucket instead of a small one, will reduce the total amount of soil that washes downstream.
- Use of dozer for backfilling - Using a dozer for backfilling instead of a backhoe follows the same principles – the fewer times soil is deposited in the stream, the less soil will be suspended.

- Partial dewatering with a pump - Partially dewatering a stream with a pump reduces the amount of water, and thus the amount of water that can suspend sediment.

Washing Fines

Definition and Purpose:

Washing fines is an “in-channel” sediment control method, which uses water, either from a water truck or hydrant, to wash any stream fines that were brought to the surface of the channel bed during restoration, back into the interstitial spaces of the gravel and cobbles. This technique is useful in both intermittent or ephemeral stream channels with gravelly to cobbly substrate and may be useful in perennial streams just prior to removing isolation structures.

The purpose of this technique is to reduce or eliminate the discharge of sediment from the channel bottom during the first seasonal flows, or “first flush.” Sediment should not be allowed into stream channels; however, occasionally in-channel restoration work will involve moving or otherwise disturbing fines (sand and silt-sized particles) that are already in the stream, usually below bankfull discharge elevation. Subsequent re-watering (resumption of flows) of the channel can result in a plume of turbidity and sedimentation.

This technique washes the fines back into the channel bed. Bedload materials, including gravel cobbles, boulders and those fines, are naturally mobilized during higher storm flows. This technique is intended to delay the discharge until the fines would naturally be mobilized.

Appropriate Applications:

- This technique should be used when construction work is required in channels. It is especially useful in intermittent or ephemeral streams in which work is performed “in the dry”, and which subsequently become re-watered.

Limitations:

- The stream must have sufficient gravel and cobble substrate composition.
- The use of this technique requires consideration of time of year and timing of expected stream flows.
- The optimum time for the use of this technique is in the fall, prior to winter flows.
- Consultation with, and approval from the Department of Fish and Game and the Regional Water Quality Control Board may be required.

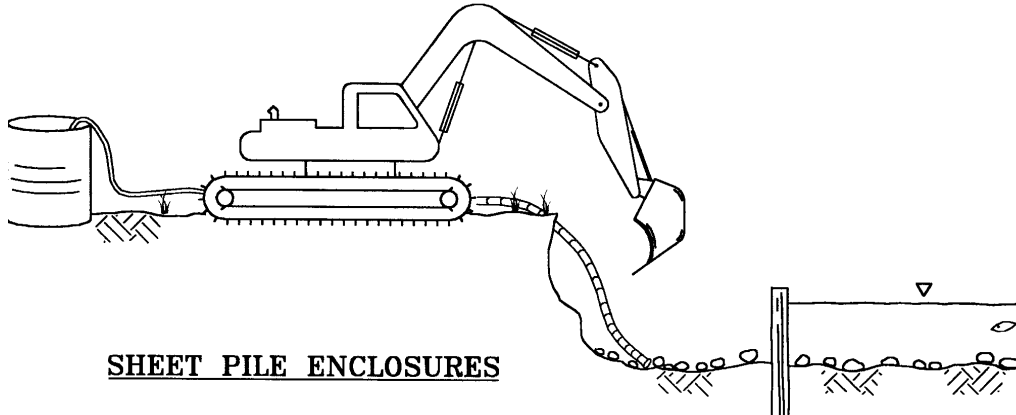
Standards and Specifications:

- Apply sufficient water to wash fines, but not cause further erosion or runoff.
- Apply water slowly and evenly to prevent runoff and erosion.

- Consult with Department of Fish and Game and the Regional Water Quality Control Board for specific water quality requirements of applied water (e.g. chlorine).

BENEFITS/LIMITATIONS

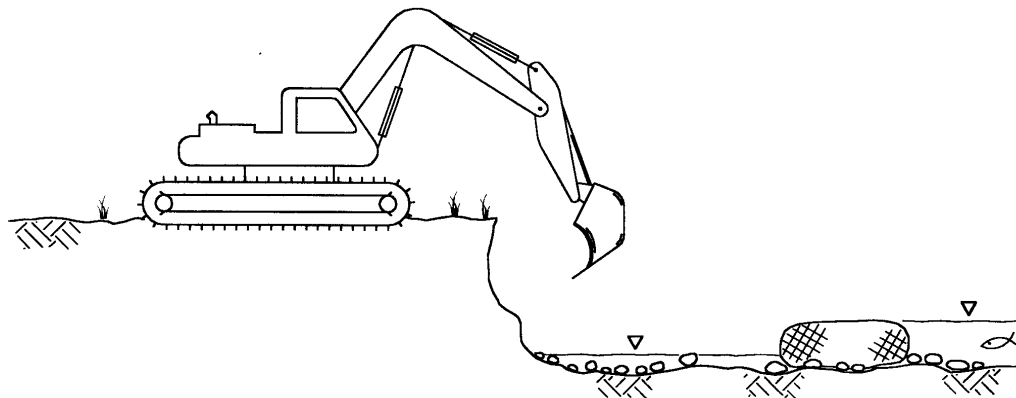
- Allows full dewatering
- Relatively expensive
- Useful in large rivers, lakes, high velocity
- Not really appropriate for small streams
- Requires staging and heavy equipment access areas



SHEET PILE ENCLOSURES

BENEFITS/LIMITATIONS

- Allows partial dewatering
- Moderately expensive
- Ease of installation and removal unknown
- Can be designed for small streams to large rivers



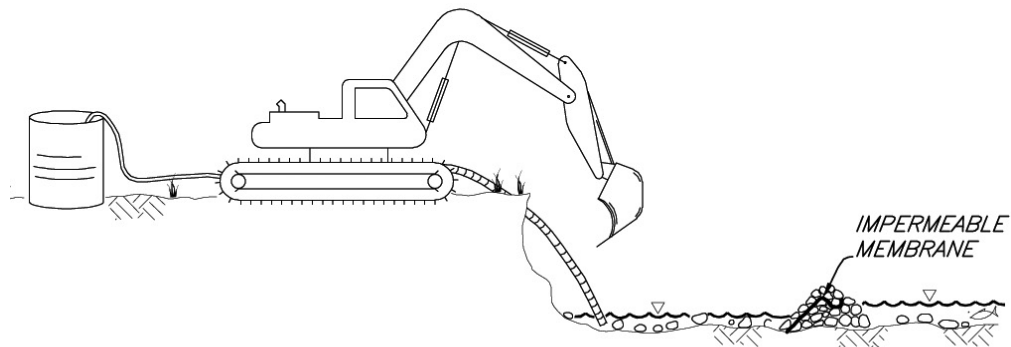
WATER-FILLED GEOTEXTILE (AQUA DAM)

INSTREAM EROSION AND SEDIMENT CONTROL ISOLATION TECHNIQUES

Figure 1A

BENEFITS/LIMITATIONS

- Allows partial dewatering*
- Relatively inexpensive*
- Useful for small streams*
- Minimal TSS when removed*



NOTES:

- Step 1. Install clean gravel with impermeable membrane*
- Step 2. Do work*
- Step 3. Decommission berm by removing impermeable membrane*
- Step 4. Pump work area. Head differential will cause water to flow into work area through gravel*
- Step 5. Remove or spread gravel*

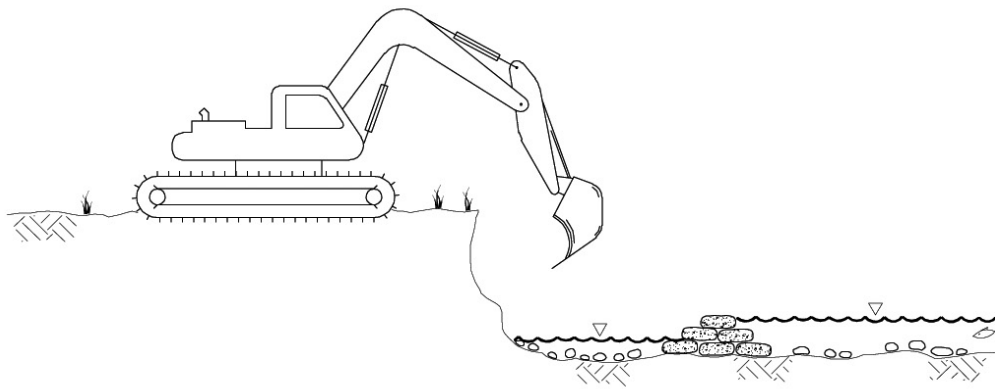
GRAVEL BERM WITH IMPERMEABLE MEMBRANE

INSTREAM EROSION AND SEDIMENT
CONTROL ISOLATION TECHNIQUES

Figure 1B

BENEFITS/LIMITATIONS

- .Difficult to dewater*
- .Inexpensive*
- .Labor intensive to install and remove*
- .Use clean gravel*



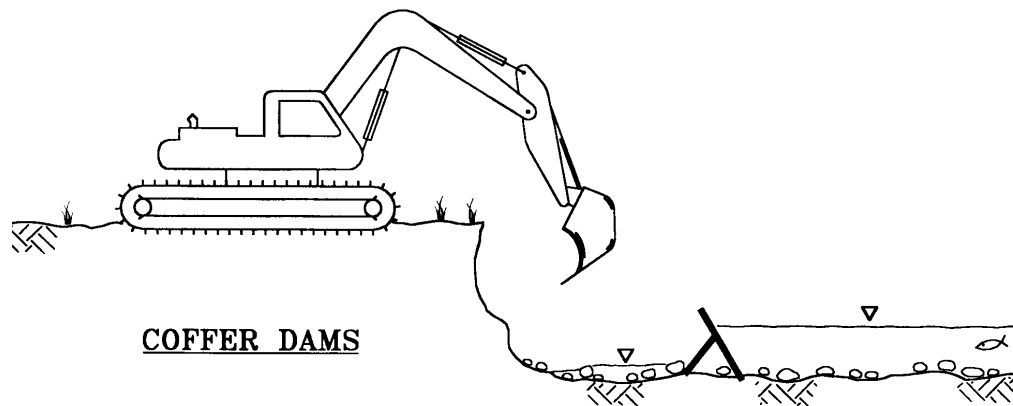
GRAVEL BAG TECHNIQUE

INSTREAM EROSION AND SEDIMENT
CONTROL ISOLATION TECHNIQUES

Figure 1C

BENEFITS/LIMITATIONS

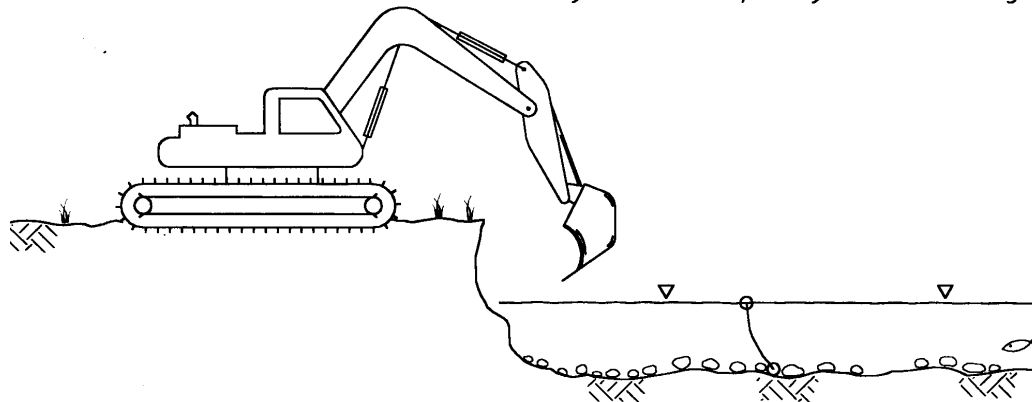
- Allows partial dewatering
- Many different types available
- Relatively expensive
- Can be designed for large and small streams
- Ease of installation and removal unknown



COFFER DAMS

BENEFITS/LIMITATIONS

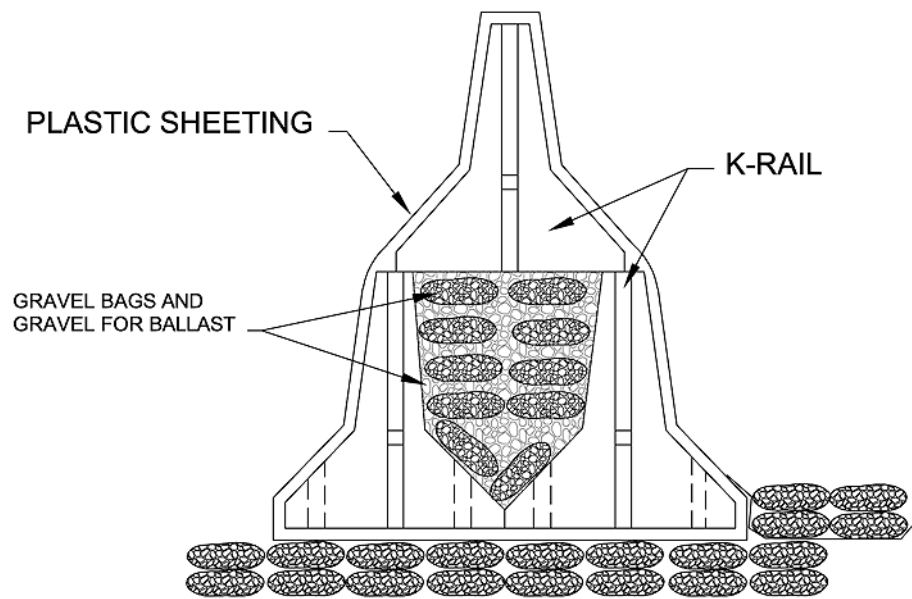
- Does not allow dewatering
- Inexpensive
- Used in slow water lakes only
- Not very effective especially when removing



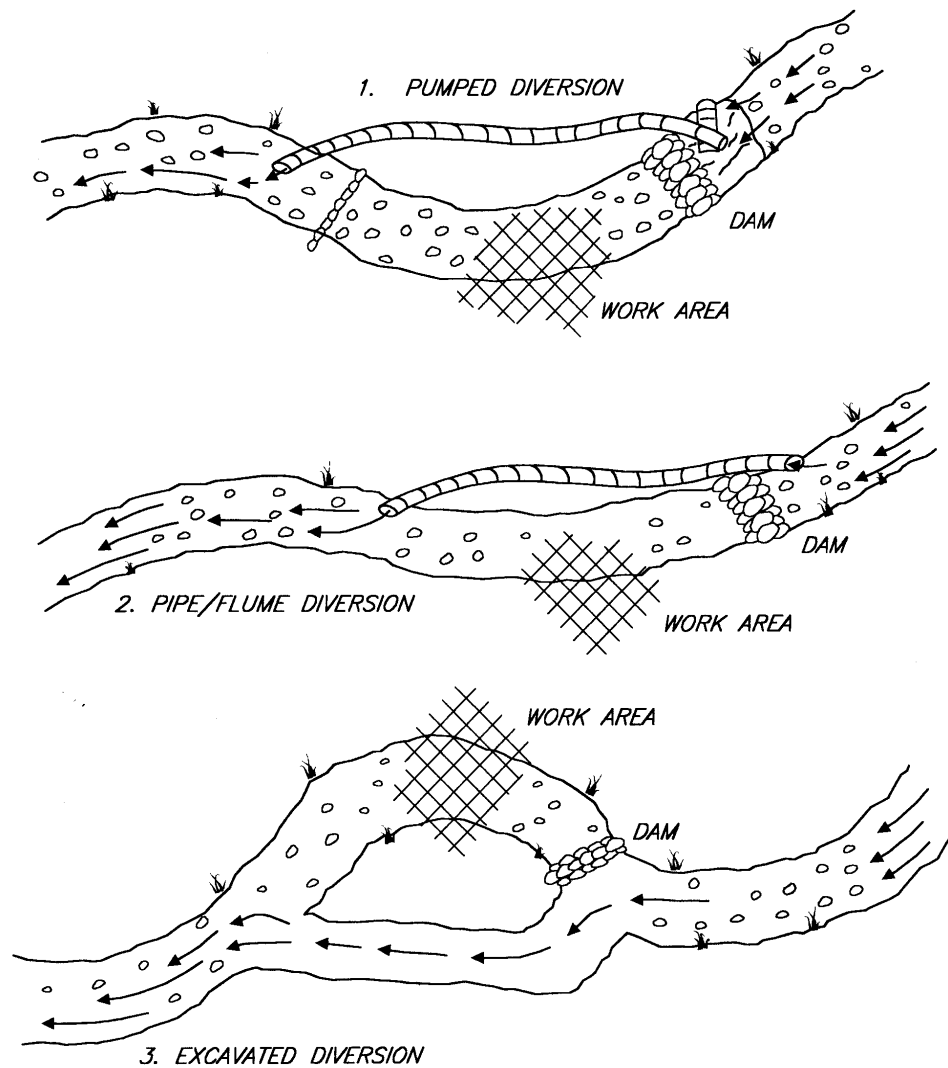
GEOTEXTILES, SILT BARRIERS, CURTAINS

INSTREAM EROSION AND SEDIMENT CONTROL ISOLATION TECHNIQUES

Figure 1D



**K-Rail Isolation
Figure 2**

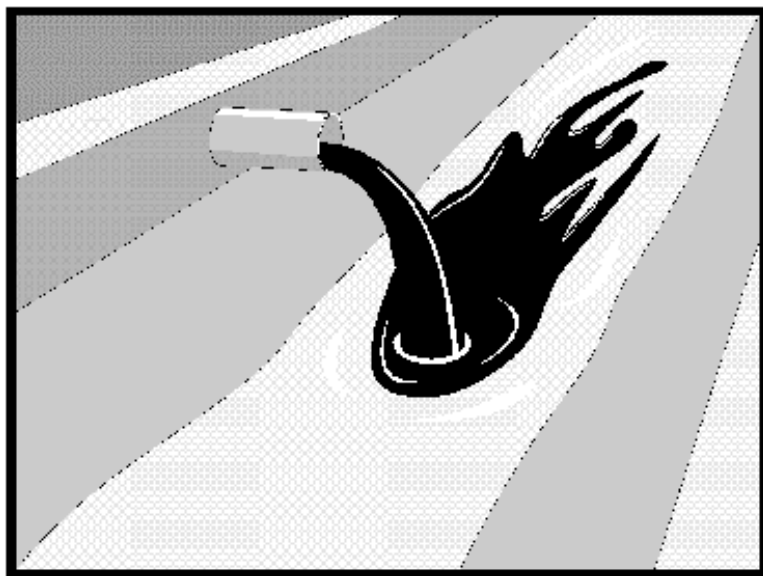


TYPICAL STREAM DIVERSION TECHNIQUES

Figure 3

Illicit Connection/Illegal Discharge Detection and Reporting

NS-6



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

- | | |
|---------------------------------|--|
| Definition 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 to the Resident Engineer (RE). |
| Appropriate Applications | <ul style="list-style-type: none">■ Illicit connection/illegal discharge detection and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site.■ This best management practice (BMP) applies to all construction projects. |
| Limitations | <ul style="list-style-type: none">■ Unlabeled or non-identifiable material shall be assumed to be hazardous.■ 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.■ Procedures and practices presented in this BMP are general. Contractor shall use extreme caution, immediately notify the RE when illicit connections or illegal dumping or discharges are discovered, and take no further action unless directed by the RE.■ If pre-existing hazardous materials or wastes are known to exist onsite, the contractor's responsibility will be detailed in separate special provisions. |

Illicit Connection/Illegal Discharge Detection and Reporting

NS-6

Standards and Specifications

Planning

- Inspect site before beginning the job for evidence of illicit connections or illegal dumping or discharges.
- Inspect site regularly during project execution for evidence of illicit connections or illegal dumping or discharges.
- Observe site perimeter for evidence or potential of illicitly discharged or illegally dumped material, which may enter the job site.

Identification of illicit connections and illegal dumping or discharges.

- 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 subdrain 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 off-site construction projects.



Illicit Connection/Illegal Discharge Detection and Reporting

NS-6

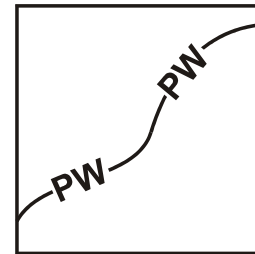
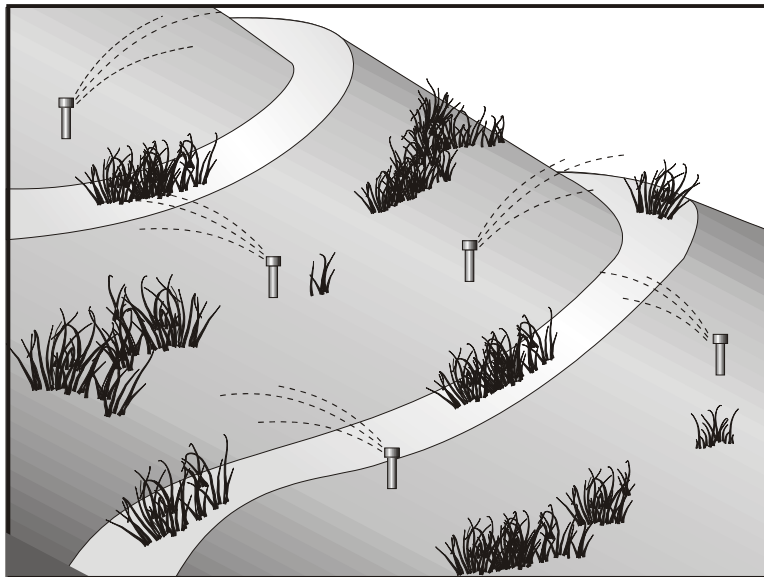
- Rural Areas - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
 - Abnormal water flow during the dry weather season.
 - Non-standard junction structures.
 - Broken concrete or other disturbances at or near junction structures.

Reporting

- Notify the RE of any illicit connections and illegal dumping or discharge incidents at the time of discovery. The RE will notify the District Construction Storm Water Coordinator and the Construction Hazmat Coordinator for reporting.

Cleanup and Removal The contractor is not responsible for investigation and clean up of illicit or illegal dumping or discharges not generated by the contractor. Caltrans may direct contractor to clean up non-hazardous dumped or discharged material on the construction site.





Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Potable Water/Irrigation management 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.

Appropriate Applications

Implement this BMP whenever the above activities or discharges occur at or enter a construction site.

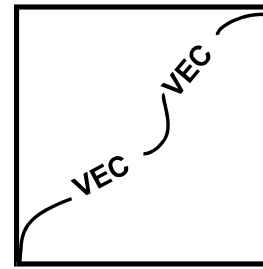
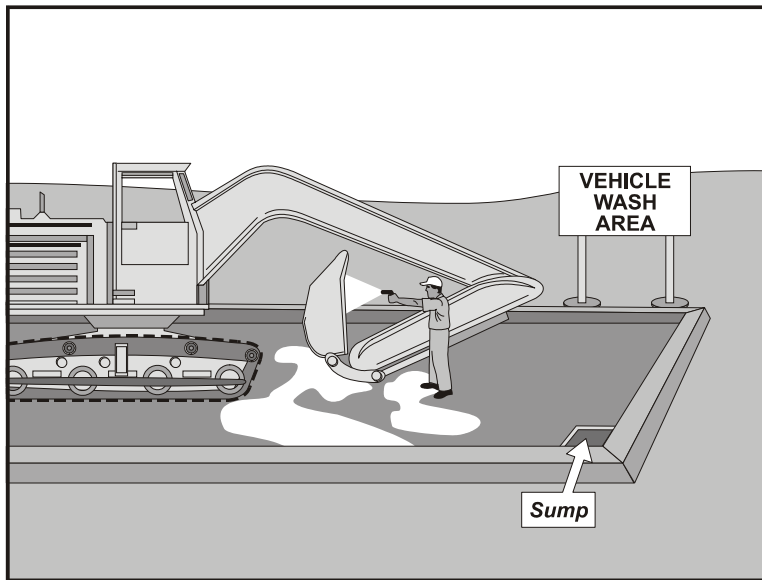
Limitations

- None identified.

Standards and Specifications

- 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.
- RE approval is required prior to commencing any washing activities that could discharge to the storm drain or receiving waterbody.
- Where possible, direct water from off-site sources around or through a construction site in a way that minimizes contact with the construction site.
- When possible, discharges from water line flushing shall be reused for landscaping purposes.
- Shut off the water source to broken lines, sprinklers, or valves as soon as possible to prevent excess water flow.

- | | |
|-------------------------------|--|
| Maintenance and
Inspection | <ul style="list-style-type: none">■ Protect downstream storm water drainage systems and watercourses from water pumped or bailed from trenches excavated to repair water lines.■ Repair broken water lines as soon as possible or as directed by the RE.■ Inspect irrigated areas regularly for signs of erosion and/or discharge. |
|-------------------------------|--|



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Vehicle and equipment cleaning procedures and practices are used to minimize or eliminate the discharge of pollutants from vehicle and equipment cleaning operations to storm drain system or to watercourses.

Appropriate Applications These procedures are applied on all construction sites where vehicle and equipment cleaning is performed.

Limitations ■ None.

- Standards and Specifications**
- On-site vehicle and equipment washing is discouraged.
 - Cleaning of vehicles and equipment with soap, solvents or steam shall not occur on the project site unless the Resident Engineer (RE) has been notified in advance and the resulting wastes are fully contained and disposed of outside the highway right-of-way in conformance with the provisions in the Standard Specifications Section 7-1.13. Resulting wastes and by-products shall not be discharged or buried within the highway right-of-way, 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. The use of diesel for vehicle and equipment cleaning is prohibited.
 - Vehicle and equipment wash water shall be contained for percolation or evaporative drying away from storm drain inlets or watercourses and shall not be discharged within the highway right-of-way. Apply sediment control BMPs if applicable.
 - All vehicles/equipment that regularly enter and leave the construction site must be cleaned off-site.
 - When vehicle/equipment washing/cleaning must occur onsite, and the

operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area shall have the following characteristics, and shall be arranged with the construction storm water coordinator:

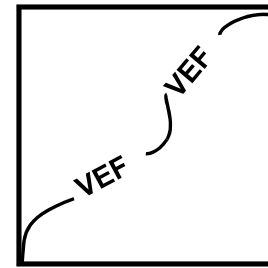
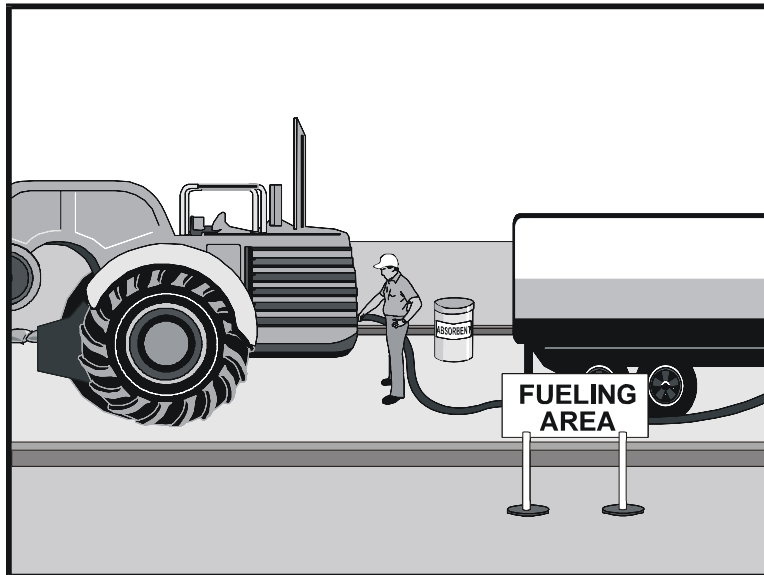
- Located away from storm drain inlets, drainage facilities, or watercourses.
- Paved with concrete or asphalt and bermed to contain wash waters and to prevent run-on and runoff.
- Configured with a sump to allow collection and disposal of wash water.
- Wash waters shall not be discharged to storm drains or watercourses.
- Used only when necessary.

■ When cleaning vehicles/equipment with water:

- Use as little water as possible. High pressure sprayers may use less water than a hose, and shall be considered.
- Use positive shutoff valve to minimize water usage.
- Facility wash racks shall discharge to a sanitary sewer, recycle system or other approved discharge system and shall not discharge to the storm drainage system or watercourses.

Maintenance and Inspection

- The control measure shall be inspected at a minimum of once a week.
- 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 or as directed by the RE.



Standard Symbol

BMP Objectives

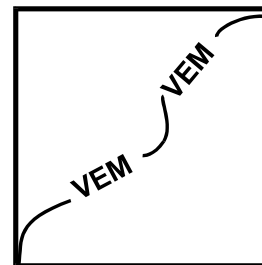
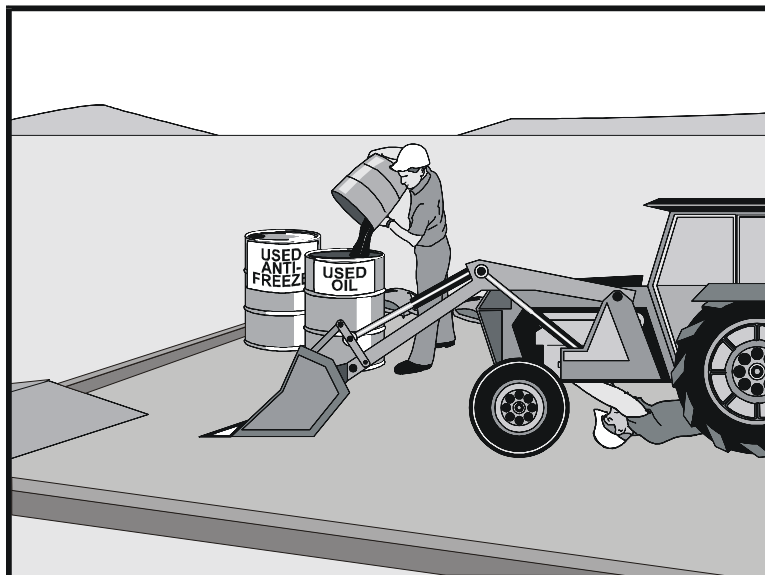
- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose	Vehicle and equipment fueling procedures and practices are designed to minimize or eliminate the discharge of fuel spills and leaks into storm drain systems or to watercourses.
Appropriate Applications	These procedures are applied on all construction sites where vehicle and equipment fueling takes place.
Limitations	<ul style="list-style-type: none"> ■ Onsite vehicle and equipment fueling shall only be used where it's impractical to send vehicles and equipment off-site for fueling.
Standards and Specifications	<ul style="list-style-type: none"> ■ When fueling must occur onsite, the contractor shall select and designate an area to be used, subject to approval of the Resident Engineer (RE). ■ Absorbent spill clean-up materials and spill kits shall be available in fueling areas and on fueling trucks and shall be disposed of properly after use. ■ Drip pans or absorbent pads shall be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area. ■ Dedicated fueling areas shall be protected from storm water run-on and runoff, and shall be located at least 15 m (50 ft) from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas. ■ Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut-off to control drips. Fueling operations shall not be left unattended. ■ Protect fueling areas with berms and/or dikes to prevent run-on, runoff, and to contain spills.

- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD). Ensure the nozzle is secured upright when not in use.
- Fuel tanks shall not be "topped-off."
- Vehicles and equipment shall be inspected on each day of use for leaks. Leaks shall be repaired immediately or problem vehicles or equipment shall be removed from the project site.
- Absorbent spill clean-up materials shall be available in fueling and maintenance areas and used on small spills instead of hosing down or burying techniques. The spent absorbent material shall be removed promptly and disposed of properly.
- Federal, state, and local requirements shall be observed for any stationary above ground storage tanks. Refer to WM-1, "Material Delivery and Storage."
- Mobile fueling of construction equipment throughout the site shall be minimized. Whenever practical, equipment shall be transported to the designated fueling area.

Maintenance and Inspection

- Fueling areas and storage tanks shall be inspected regularly.
- Keep an ample supply of spill cleanup material on the site.
- Immediately cleanup spills and properly dispose of contaminated soil and cleanup materials.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Procedures and practices to minimize or eliminate the discharge of pollutants to the storm drain systems or to watercourses from vehicle and equipment maintenance procedures.

Appropriate Applications

These procedures are applied on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations

- None identified.

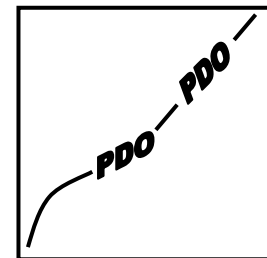
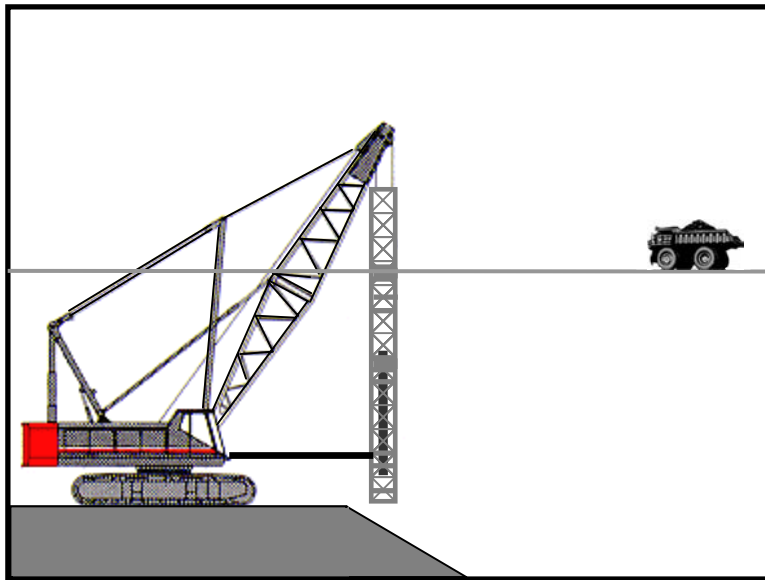
Standards and Specifications

- Drip pans or absorbent pads shall be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- All maintenance areas are required to have spill kits and/or use other spill protection devices.
- Dedicated maintenance areas shall be protected from storm water run-on and runoff, and shall be located at least 15 m (50 ft) from downstream drainage facilities and watercourses.
- Drip Pans or plastic sheeting shall 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 one hour.
- Absorbent spill clean-up materials shall be available in maintenance areas and shall be disposed of properly after use. Substances used to coat asphalt transport trucks and asphalt-spreading equipment shall be non-toxic.
- Use off-site maintenance facilities whenever practical.

- For long-term projects, consider constructing roofs or using portable tents over maintenance areas.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not dump fuels and lubricants onto the ground.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose or recycle used batteries.
- Do not bury used tires.
- Repair of fluid and oil leaks immediately.
- Provide spill containment dikes or secondary containment around stored oil and chemical drums.

Maintenance and Inspection

- Maintain waste fluid containers in leak proof condition.
- Vehicle and equipment maintenance areas shall be inspected regularly.
- Vehicles and equipment shall be inspected on each day of use. Leaks shall be repaired immediately or the problem vehicle(s) or equipment shall be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.



Standard Symbol

BMP Objectives

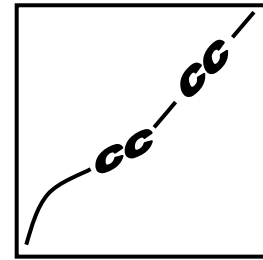
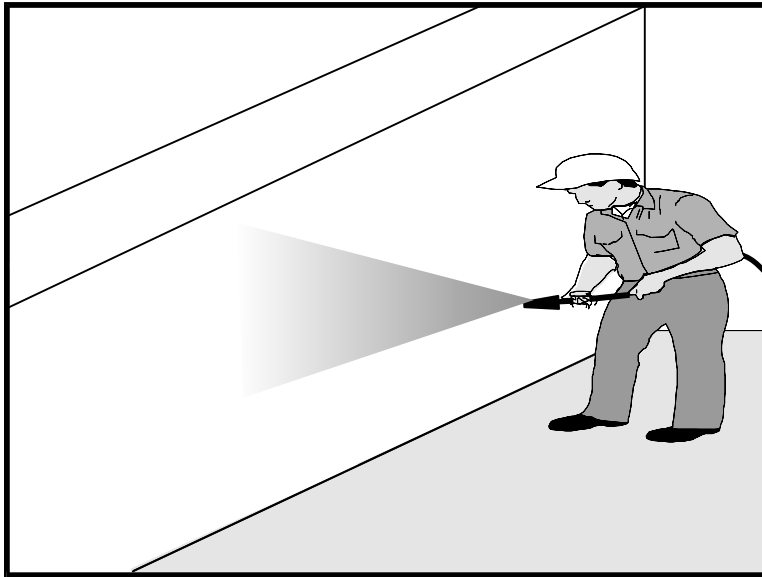
- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose	The construction and retrofit of bridges and retaining walls often include driving piles for foundation support and shoring operations. Driven piles are typically constructed of concrete, steel, or timber. Driven sheet piles are used for shoring and cofferdam construction. Proper control and use of equipment, materials, and waste products from pile driving operations will reduce the discharge of potential pollutants to the storm drain system or watercourses.
Appropriate Applications	These procedures apply to construction sites near or adjacent to a watercourse or groundwater where permanent and temporary pile driving operations (impact and vibratory) take place, including operations using pile shells for construction of cast-in-steel-shell and cast-in-drilled-hole piles.
Limitations	<ul style="list-style-type: none"> ■ None identified.
Standards and Specifications	<ul style="list-style-type: none"> ■ Use drip pans or absorbent pads during vehicle and equipment maintenance, cleaning, fueling, and storage. Refer to BMPs NS-9 “Vehicle and Equipment Fueling” and NS-10 “Vehicle and Equipment Maintenance.” ■ Have spill kits and cleanup materials available at all locations of pile driving. Refer to BMP WM-4 “Spill Prevention and Control.” ■ Keep equipment that is in use in streambeds; or on docks, barges, or other structures over water bodies, leak free. ■ Park equipment over plastic sheeting or equivalent where possible. Plastic sheeting is not a substitute for drip pans or absorbent pads. The storage or use of equipment in streambeds or other bodies of water shall comply with all applicable permits. ■ Implement other BMPs as applicable, such as NS-2 “Dewatering Operations,” WM-5 “Solid Waste Management,” WM-6 “Hazardous Waste Management,” and WM-10 “Liquid Waste Management.”

- When not in use, store pile driving equipment away from concentrated flows of storm water, drainage courses, and inlets. Protect hammers and other hydraulic attachments from run-on by placing them on plywood and covering them with plastic or a comparable material prior to the onset of rain.
- Use less hazardous products, e.g. vegetable oil instead of hydraulic fluid, when practicable.

Maintenance and Inspection

- Inspect pile driving areas and equipment for leaks and spills on a daily basis.
- Inspect equipment routinely and repair equipment as needed (e.g., worn or damaged hoses, fittings, gaskets).



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Concrete curing is used in the construction of structures such as bridges, retaining walls, and pump houses. Concrete curing includes the use of both chemical and water methods. Proper procedures minimize pollution of runoff during concrete curing.

Appropriate Applications All concrete elements of a structure (e.g., footings, columns, abutments, stems, soffit, deck) are subject to curing requirements.

Limitations ■ None identified.

Standards and Specifications

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 BMP WM-1, "Material Delivery and Storage."
- 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 removal as approved by the RE and in accordance with all applicable permits.

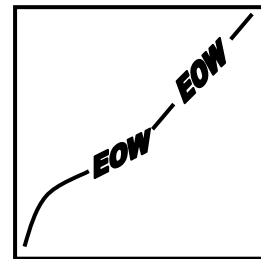
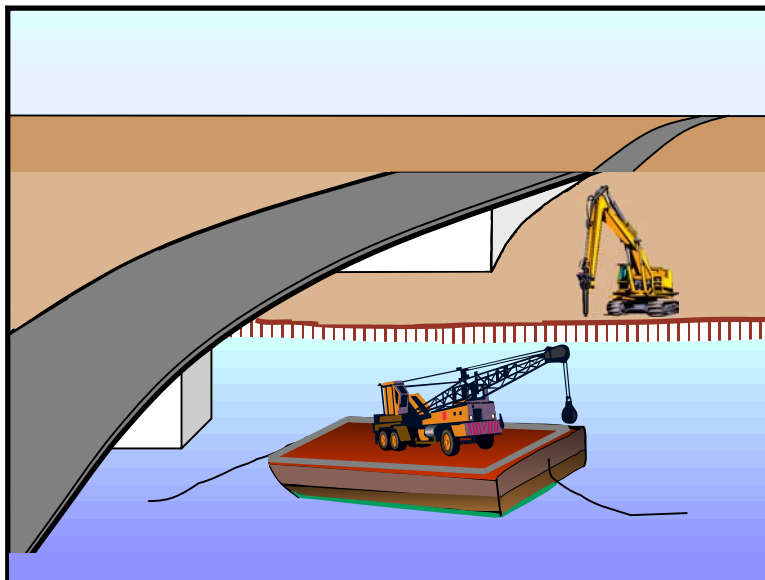
- Collect cure water and transport or dispose of water in a non-erodible manner. See BMPs SS-9, “Earth Dikes/Drainage Swales & Lined Ditches,” SS-10, “Outlet Protection/Velocity Dissipation Devices,” and SS-11, “Slope Drains.”
- Utilize wet blankets or a similar method that maintains moisture while minimizing the use and possible discharge of water.

Maintenance and Inspection

- Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds.
- Inspect any temporary diversion devices, lined channels, or swales for washouts, erosion, or debris. Replace lining and remove debris as necessary.
- Inspect cure containers and spraying equipment for leaks.

Material and Equipment Use Over Water

NS-13



Standard Symbol

BMP Objectives

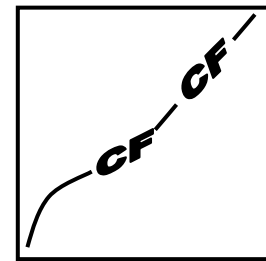
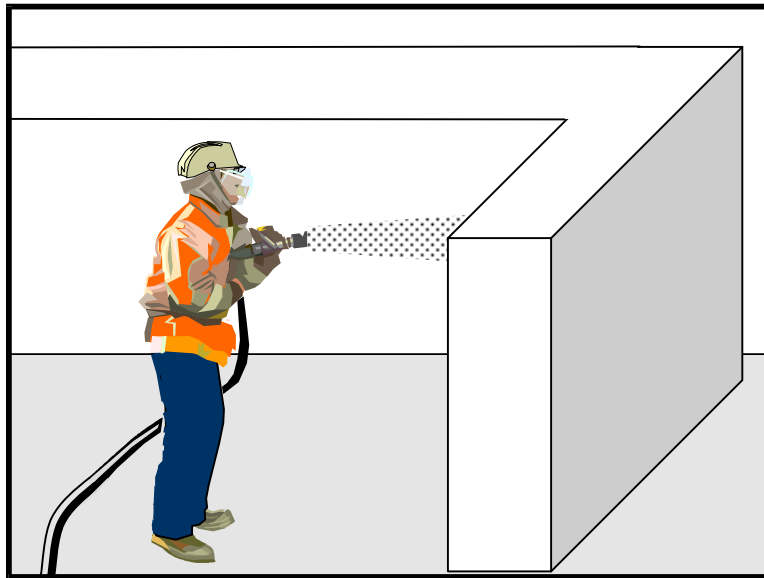
- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose	Procedures for the proper use, storage, and disposal of materials and equipment on barges, boats, temporary construction pads, or similar locations that minimize or eliminate the discharge of potential pollutants to a watercourse.
Appropriate Applications	These procedures shall be implemented for construction materials and wastes (solid and liquid) and any other materials that may be detrimental if released. Applies where materials and equipment are used on barges, boats, docks, and other platforms over or adjacent to a watercourse.
Limitations	■ None identified.
Standards and Specifications	<ul style="list-style-type: none">■ Refer to BMPs WM-1, “Material Delivery and Storage” and WM-4, “Spill Prevention and Control.”■ Use drip pans and absorbent materials for equipment and vehicles and ensure that an adequate supply of spill cleanup materials is available.■ Drip pans shall be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is expected to be idle for more than one hour.■ Maintain equipment in accordance with BMP NS-10, “Vehicle and Equipment Maintenance.” If a leaking line cannot be repaired, remove equipment from over the water.■ Provide watertight curbs or toe boards to contain spills and prevent materials, tools, and debris from leaving the barge, platform, dock, etc.■ Secure all materials to prevent discharges to receiving waters via wind.

- Identify types of spill control measures to be employed, including the storage of such materials and equipment. Ensure that staff are trained regarding the deployment and access of control measures and that measures are being used.
- Ensure the timely and proper removal of accumulated wastes. Refer to BMPs WM-5, “Solid Waste Management” (non-hazardous) and WM-6, “Hazardous Waste Management.”
- Comply with all necessary permits required for construction within or near the watercourse, such as RWQCB, U.S. Army Corps of Engineers, Department of Fish and Game and other local permitting agencies.
- Discharges to waterways shall be reported to the RE immediately upon discovery. A written discharge notification must follow within 7 days.
- Refer to BMP NS-15, “Structure Demolition/Removal Over or Adjacent to Water.”

Maintenance and Inspection

- Inspect equipment for leaks and spills on a daily basis, and make necessary repairs.
- Ensure that employees and subcontractors implement appropriate measures for storage and use of materials and equipment.
- Inspect and maintain all associated BMPs and perimeter controls to ensure continuous protection of the watercourse.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition 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. Proper procedures minimize the impact that concrete finishing methods may have on runoff.
Appropriate Applications	These procedures apply to all construction locations where concrete finishing operations are performed.
Limitations	<ul style="list-style-type: none"> ■ Specific permit requirements may be included in the contract documents for certain concrete finishing operations.
Standards and Specifications	<ul style="list-style-type: none"> ■ Follow containment requirements stated in the project special provisions, if any. ■ Collect and properly dispose of water and solid waste from high-pressure water blasting operations. ■ Collect water from blasting operations and transport or dispose of water in a non-erodible manner. Refer to BMPs SS-9, "Earth Dikes/Drainage Swales & Lined Ditches," SS-10, "Outlet Protection/Velocity Dissipation Devices," and SS-11, "Slope Drains." ■ Direct water from blasting operations away from inlets and watercourses to collection areas for removal (e.g., dewatering) as approved in advance by the RE and in accordance with applicable permits. ■ Protect inlets during sandblasting operations. Refer to BMP SC-10, "Storm Drain Inlet Protection."

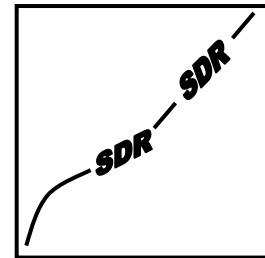
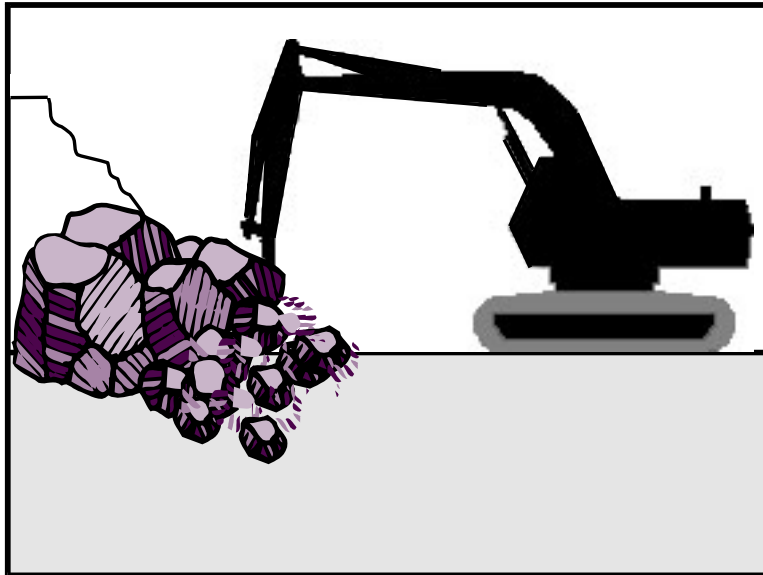
- Refer to BMP WM-8, “Concrete Waste Management.”
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- When blast residue contains a potentially hazardous waste, refer to BMP WM-6, “Hazardous Waste Management.”

Maintenance and Inspection

- Follow inspection procedure as required in the project special provisions.
- At a minimum, inspect containment structures, if any, for damage or voids prior to use each day and prior to the onset of rain.
- At the end of each work shift, remove and contain the liquid and solid wastes from containment structures, if any, and from the general work area.
- Discharges to waterways shall be reported to RE immediately upon discovery. A written discharge notification must follow within 7 days or as required by special provisions.

Structure Demolition/Removal Over or Adjacent to Water

NS-15



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Procedures to protect water bodies from debris and wastes associated with structure demolition or removal over or adjacent to watercourses.

Appropriate Applications

Full bridge demolition and removal, partial bridge removal (e.g., barrier rail, edge of deck) associated with bridge widening projects, concrete channel removal, or any other structure removal that could potentially affect water quality.

Limitations

- Specific permit requirements may be included in the contract documents.

Standards and Specifications

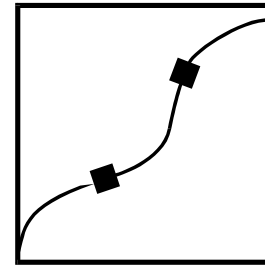
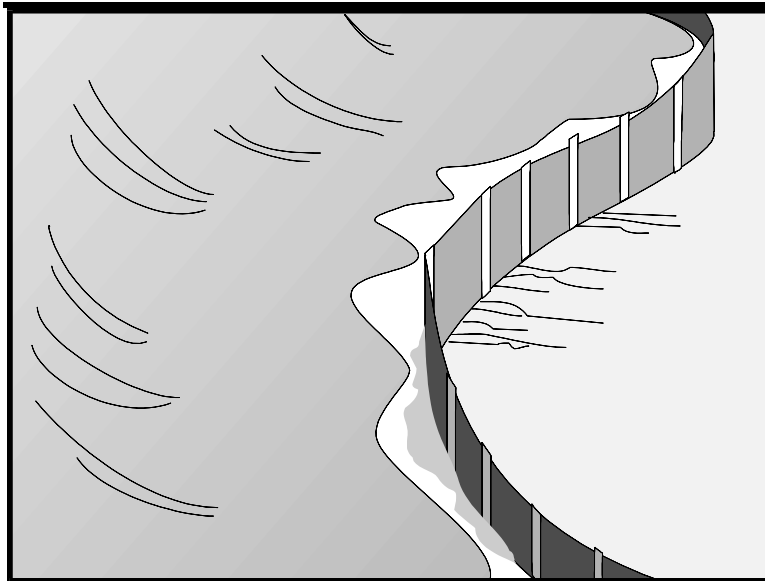
- Do not allow demolished material to enter waterway.
- Refer to BMP NS-5, "Clear Water Diversion" to direct water away from work areas.
- Use attachments on construction equipment such as backhoes to catch debris from small demolition operations.
- Use covers or platforms to collect debris.
- Platforms and covers are to be approved by the RE.
- Stockpile accumulated debris and waste generated during demolition away from watercourses and in accordance with BMP WM-3, "Stockpile Management."
- Ensure safe passage of wildlife, as necessary.
- Discharges to waterways shall be reported to the RE immediately upon discovery. A written discharge notification must follow within 7 days.

Structure Demolition/Removal Over or Adjacent to Water

NS-15

- For structures containing hazardous materials (e.g., lead paint or asbestos) refer to BMP WM-6, “Hazardous Waste Management.” For demolition work involving soil excavation around lead-painted structures, refer to BMP WM-7, “Contaminated Soil Management.”
- Maintenance and Inspection
- Contractor must inspect demolition areas over or near adjacent watercourses on a daily basis.
 - Any debris-catching devices shall be emptied regularly. Collected debris shall be removed and stored away from the watercourse and protected from run-on and runoff.





Standard Symbol

BMP Objectives

- ☐ Soil Stabilization
- ☒ Sediment Control
- ☐ Tracking Control
- ☐ Wind Erosion Control
- ☐ Non-Storm Water Management
- ☐ Materials and Waste Management

Definition and Purpose A silt fence is a temporary linear sediment barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences allow sediment to settle from runoff before water leaves the construction site.

Appropriate Applications Silt fences are placed:

- Below the toe of exposed and erodible slopes.
- Down-slope of exposed soil areas.
- Around temporary stockpiles.
- Along streams and channels.
- Along the perimeter of a project.

Limitations

- Not effective unless trenched and keyed in.
- Not intended for use as mid-slope protection on slopes greater than 1:4 (V:H).
- Must be maintained.
- Must be removed and disposed of.
- Don't use below slopes subject to creep, slumping, or landslides.
- Don't use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Don't use silt fences to divert flow.

Standards and Specifications

Design and Layout

- The maximum length of slope draining to any point along the silt fence shall be 61 m (200 ft) or less.
- Slope of area draining to silt fence shall be less than 1:1 (V:H).
- Limit to locations suitable for temporary ponding or deposition of sediment.
- Fabric life span generally limited to between five and eight months. Longer periods may require fabric replacement.
- Silt fences shall not be used in concentrated flow areas.
- Lay out in accordance with Pages 5 and 6 of this BMP.
- For slopes steeper than 1:2 (V:H) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to water bodies or Environmentally Sensitive Areas (ESAs), additional temporary soil stabilization BMPs shall be used.

Materials

- Silt fence fabric shall be woven polypropylene with a minimum width of 900 mm (36 inches) and a minimum tensile strength of 0.45-kN. The fabric shall conform to the requirements in ASTM designation D4632 and shall have an integral reinforcement layer. The reinforcement layer shall be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric shall be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491. Contractor must submit certificate of compliance in accordance with Standard Specifications Section 6-1.07.
- Wood stakes shall be commercial quality lumber of the size and shape shown on the plans. Each stake shall 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.
- Bar reinforcement may be used, and its size shall be equal to a number four (4) or greater. End protection shall be provided for any exposed bar reinforcement.
- Staples used to fasten the fence fabric to the stakes shall be not less than 45 mm (1.75 inches) long and shall be fabricated from 1.57 mm (0.06 inch) or heavier wire. The wire used to fasten the tops of the stakes together when

joining two sections of fence shall be 3.05 mm (0.12 inch) or heavier wire. Galvanizing of the fastening wire is not required.

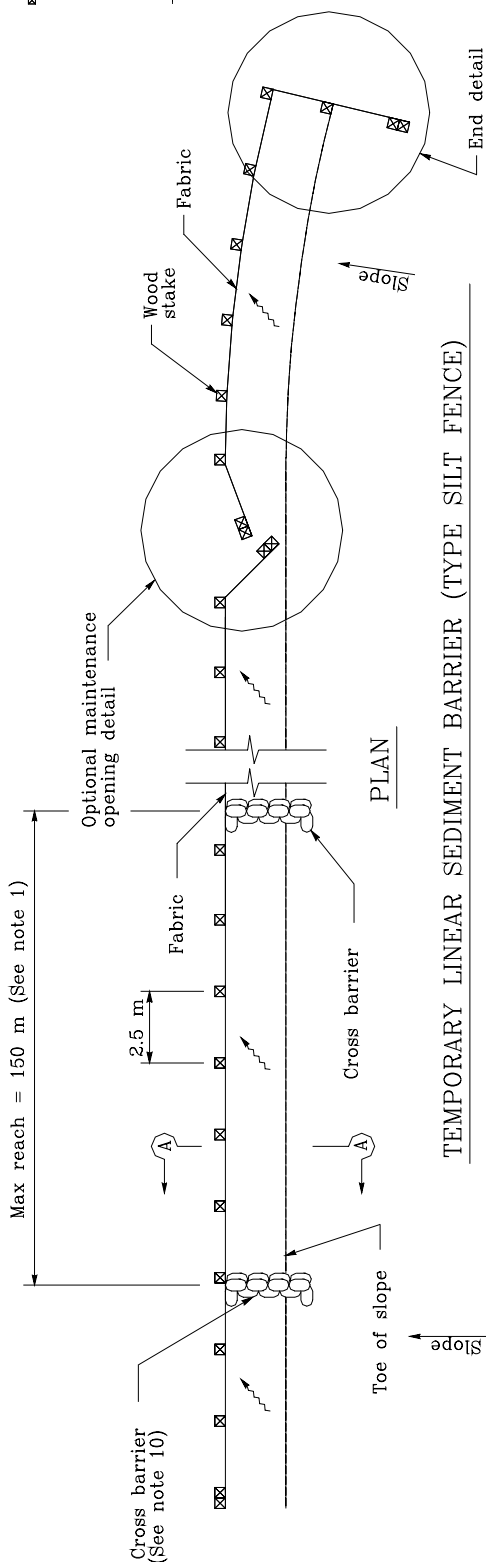
Installation

- Generally, silt fences shall be used in conjunction with soil stabilization source controls up slope to provide effective erosion and sediment control.
- Bottom of the silt fence shall be keyed-in a minimum of 150 mm (12 inches).
- Trenches shall not be excavated wider and deeper than necessary for proper installation of the temporary linear sediment barriers.
- Excavation of the trenches shall be performed immediately before installation of the temporary linear sediment barriers.
- Construct silt fences with a set-back of at least 1m (3 ft) from the toe of a slope. Where a silt fence is determined to be not practical due to specific site conditions, the silt fence may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practical.
- 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 shall the reach exceed 150 meters (490 ft).
- Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
- Install in accordance with Pages 5 and 6 of this BMP.

Maintenance and Inspection

- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric.
- Inspect silt fence when rain is forecast. Perform necessary maintenance, or maintenance required by the Resident Engineer (RE).
- Inspect silt fence following rainfall events. Perform maintenance as necessary, or as required by the RE.
- Maintain silt fences to provide an adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches one-third (1/3) of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the right-of-way in conformance with the Standard Specifications.
- Silt fences that are damaged and become unsuitable for the intended purpose, as determined by the RE, shall be removed from the site of work, disposed of outside the highway right-of-way in conformance with the Standard Specifications, and replaced with new silt fence barriers.

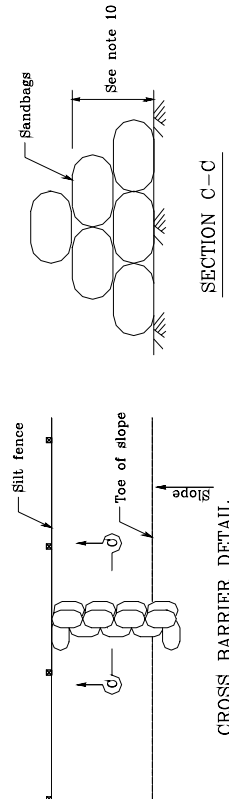
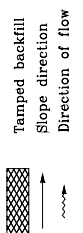
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- Holes, depressions or other ground disturbance caused by the removal of the temporary silt fences shall be backfilled and repaired in conformance with the Standard Specifications.
 - Remove silt fence when no longer needed or as required by the RE. Fill and compact post holes and anchorage trench, remove sediment accumulation, and grade fence alignment to blend with adjacent ground.



NOTES

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 linear barrier, in no case shall the reach length exceed 150m.
2. The last 2.5 m of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 2.5 m maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.

LEGEND

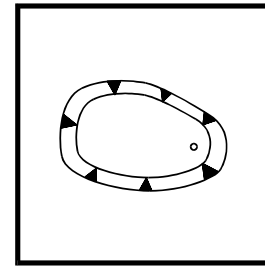
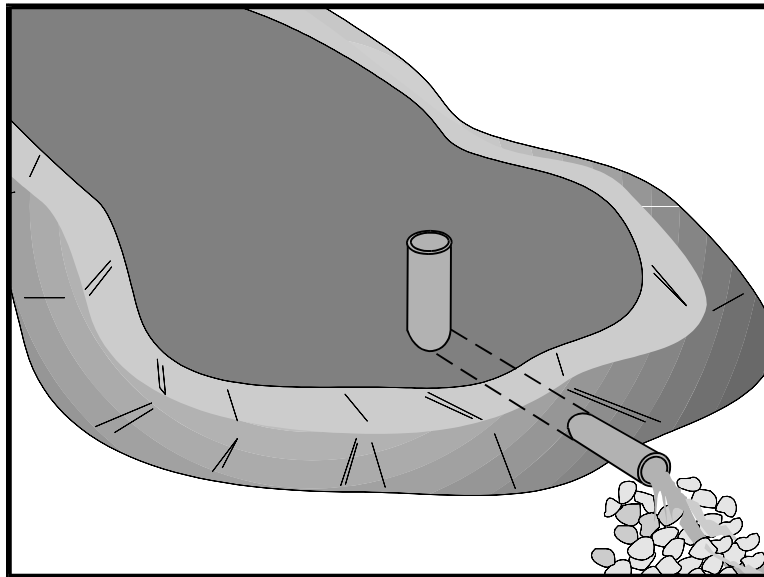


STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION TEMPORARY LINEAR SEDIMENT BARRIER (TYPE SILT FENCE)

NO SCALE
ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

SC-1





Standard Symbol

BMP Objectives

- ☐ Soil Stabilization
- ☒ Sediment Control
- ☐ Tracking Control
- ☐ Wind Erosion Control
- ☐ Non-Storm Water Management
- ☐ Materials and Waste Management

Definition and Purpose

A sediment/desilting basin is a temporary basin formed by excavating and/or constructing an embankment so that sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out before the runoff is discharged (refer to Figures 1 and 2).

Appropriate Applications

Sediment basins shall be designed in accordance with Section A of the State of California NPDES General Permit for Storm Water Discharges Associated with Construction Activities (General Permit). If there is insufficient area to construct a sediment basin in accordance with the General Permit requirements, then the alternate desilting design standards specified herein may be used. This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the RE.

Sediment/Desilting Basins shall be considered for use:

- On construction projects with disturbed areas during the rainy season.
- Where sediment-laden water may enter the drainage system or watercourses.
- At outlets of disturbed soil areas with areas between 2 ha and 4 ha (5 ac and 10 ac).

Limitations

- Alternative BMPs must be thoroughly investigated for erosion control before selecting temporary desilting basins.
- Requires large surface areas to permit settling of sediment.
- Not appropriate for drainage areas greater than 30 ha (75 ac).
- Not to be located in live streams

Standards and Specifications

- For safety reasons, basins shall have protective fencing.
- Size may be limited by availability of right-of-way.
- Limit the contributing area to the sediment/desilting basin to only the runoff from the disturbed soil areas. Use temporary concentrated flow conveyance controls to divert runoff from undisturbed areas away from the sediment/desilting basin.

Sediment Basin

- Sediment basins shall, at a minimum, be designed 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 102 cubic meters (3,600 cubic feet) of storage per 0.4 hectare (1 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 0.9 m (3 ft) nor greater than 1.5 m (5 ft) for safety reasons and for maximum efficiency.

OR

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

$$A_s = 1.2Q/V_s \quad (\text{Eq. 1})$$

Where:

A_s = Minimum surface area for trapping soil particles of a certain size

V_s = Settling velocity of the design particle size chosen

$$Q = C I A$$

Where:

Q = Discharge rate measured in cubic feet per second

C = Runoff coefficient

I = Precipitation intensity for the 10-year, 6-hour rain event

A = 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 V_s 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 0.9 m (3 ft) nor greater than 1.5 m (5 ft) for safety reasons and for maximum efficiency [0.6 m (2 ft) of sediment storage, 0.6 m (2 ft) 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 0.6 m (2 ft) 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.

Desilting Basin

- Desilting basins shall be designed to have a capacity equivalent to 100 cubic meters of storage (as measured from the top of the basin to the principal outlet) per hectare of contributory area. This design is less than the required to capture the 0.01 mm particle size but larger than that required to capture particles 0.02 mm or larger.
- The length of the basin shall be more than twice the width of the basin; the length shall be determined by measuring the distance between the inlet and the outlet.
- The depth must be no less than one (1) meter nor greater than 1.5 m.
- Basins with an impounding levee greater than 1.5 m (5 ft) tall, measured from the lowest point to the impounding area to the highest point of the levee, and basins capable of impounding more than 1000 cubic meters (35,300 cubic feet), shall be designed by a professional Civil Engineer registered with the state of California. The design must be submitted to the Resident Engineer (RE) for approval at least 7 days prior to the basin construction. The design shall include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the basin outlet and bypass structures.

General Requirements

- Design and locate sediment/desilting basins so that they can be maintained. Construct desilting basins prior to the rainy season and construction activities.
- Sediment/desilting basins, regardless of size and storage volume, shall include features to accommodate overflow or bypass flows that exceed the design storm event. The calculated basin volume and proposed location shall be submitted to

the RE for approval at least 3 days prior to the basin construction.

- Construct an emergency spillway to accommodate flows not carried by the principal spillway. Spillway shall consist of an open channel (earthen or vegetated) over undisturbed material (not fill) or constructed of a non-erodible riprap.
- Spillway control section, which is a level portion of the spillway channel at the highest elevation in the channel, shall be a minimum of 6 m (20 ft) in length.
- A forebay, constructed upstream of the basin may be provided to remove debris and larger particles.
- Basin inlets shall be located to maximize travel distance to the basin outlet.
- Rock or vegetation shall be used to protect the basin inlet and slopes against erosion.
- The outflow from the basins shall be provided with outlet protection to prevent erosion and scouring of the embankment and channel. See BMP SS-10, "Outlet Protection/Velocity Dissipation Devices."
- Basin shall be located: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where post-construction (permanent) detention basins will be constructed, (3) where failure would not cause loss of life or property damage, (4) where the basins can be maintained on a year-round basins to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area, and to maintain the basin to provide the required capacity.
- Areas under embankments, structural works, and sediment/desilting basin must be cleared, stripped of vegetation in accordance with Standard Specifications Section 16 – "Clearing and Grubbing."
- Earthwork shall be in accordance with Standard Specifications Section 19 – "Earthwork". Contractor is specifically directed to Standard Specifications Sections 19-5, "Compaction," and 19-6, "Embankment Construction."
- Structure shall be placed on a firm, smooth foundation with the base securely anchored with concrete or other means to prevent floatation.
- Discharge from the basin shall be accomplished through a water quality outlet. An example is shown in Figure 3. The Principal outlet shall consist of a corrugated metal, high density polyethylene (HDPE), or reinforced concrete riser pipe with dewatering holes and an anti-vortex device and trash rack attached to the top of the riser, to prevent floating debris from flowing out of the basin or obstructing the system. This principal structure shall be designed

to accommodate the inflow design storm.

- A rock pile or rock-filled gabions can serve as alternatives to the debris screen, although the designer should be aware of the potential for extra maintenance involved should the pore spaces in the rock pile clog.
- Proper hydraulic design of the outlet is critical to achieving the desired performance of the basin. The water quality outlet should be designed to drain the basin within 24 to 72 hours (also referred to as “drawdown time”). (The 24-hour limit is specified to provide adequate settling time; the 72-hour limit is specified to mitigate vector control concerns.)
- The two most common outlet problems that occur are: (1) the capacity of the outlet is too great resulting in only partial filling of the basin and drawdown time less than designed for; and (2) the outlet clogs because it is not adequately protected against trash and debris. To avoid these problems, the following outlet types are recommended for use: (1) a single orifice outlet with or without the protection of a riser pipe, and (2) perforated riser. Design guidance for single orifice and perforated riser outlets are as follows:

Flow Control Using a Single Orifice At The Bottom Of The Basin

(Figure 1): The outlet control orifice should be sized using the following equation:

$$a = \frac{2A(H - H_o)^{0.5}}{3600CT(2g)^{0.5}} = \frac{(7 \times 10^{-5})A(H - H_o)^{0.5}}{CT} \quad (\text{Eq. 2})$$

where:

- a = area of orifice (ft²) (1 ft² = 0.0929m²)
- A = surface area of the basin at mid elevation (ft²)
- C = orifice coefficient
- T = drawdown time of full basin (hrs)
- G = gravity (32.2 ft/s²)
- H = elevation when the basin is full (ft)
- H_o = final elevation when basin is empty (ft)

With a drawdown time of 40 hours, the equation becomes:

$$a = \frac{(1.75 \times 10^{-6})A(H - H_o)^{0.5}}{C} \quad (\text{Eq. 3})$$

Flow Control Using Multiple Orifices (see Figure2):

$$a_t = \frac{2A(h_{\max})}{CT(2g[h_{\max} - h_{\text{centroid of orifices}}])^{0.5}} \quad (\text{Eq. 4})$$

With terms as described above except:

a_t = total area of orifices

h_{\max} = maximum height from lowest orifice to the maximum water surface (ft)

$h_{\text{centroid of orifices}}$ = height from the lowest orifice to the centroid of the orifice configuration (ft)

Allocate the orifices evenly on two rows; separate the holes by 3x hole diameter vertically, and by 120 degrees horizontally (refer to Figure 3).

Because basins are not maintained for infiltration, water loss by infiltration should be disregarded when designing the hydraulic capacity of the outlet structure.

Care must be taken in the selection of "C"; 0.60 is most often recommended and used. However, based on actual tests, GKY (1989), "Outlet Hydraulics of Extended Detention Facilities for Northern Virginia Planning District Commission", recommends the following:

C = 0.66 for thin materials; where the thickness is equal to or less than the orifice diameter, or

C = 0.80 when the material is thicker than the orifice diameter

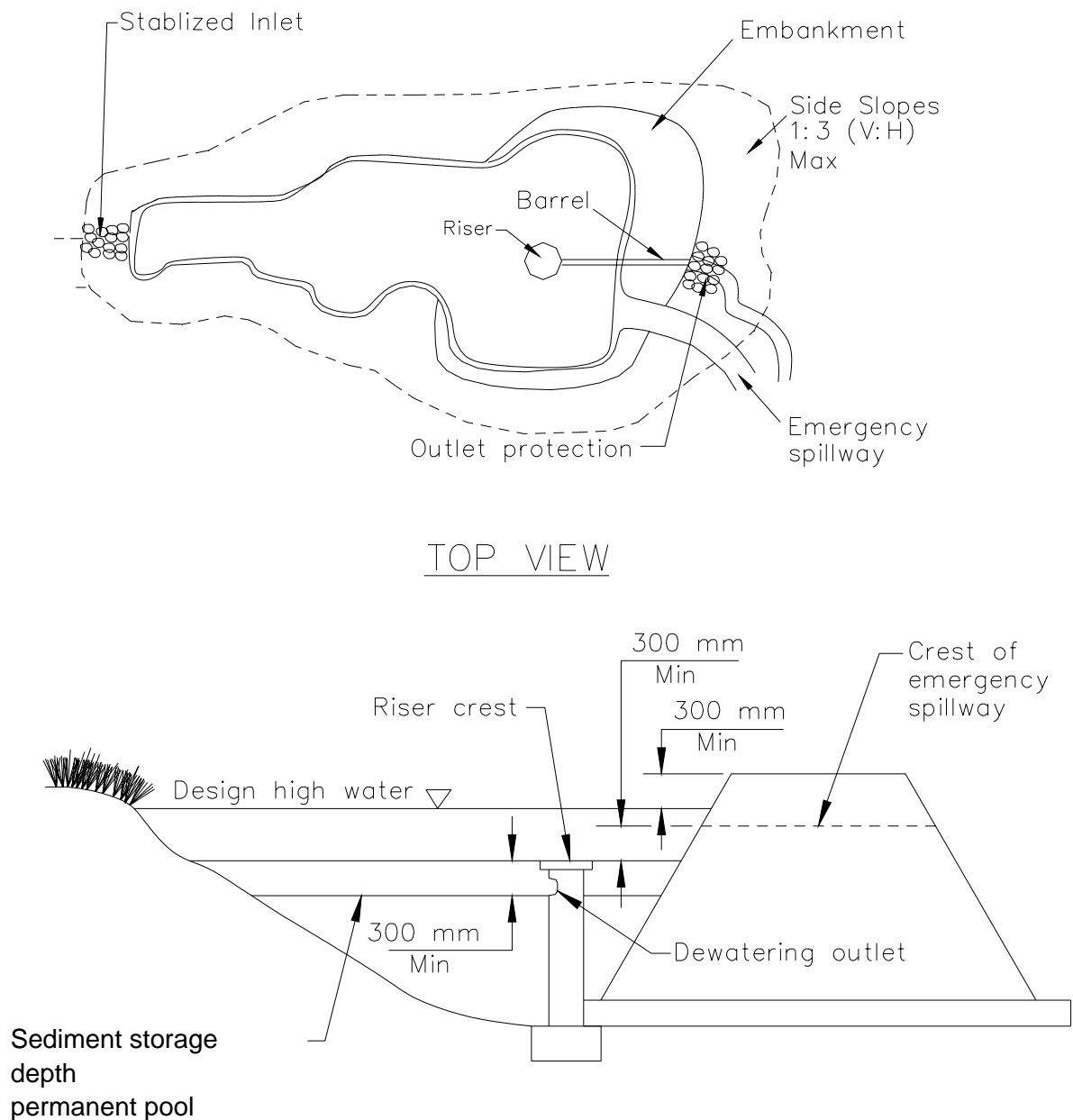
- The Contractor shall verify that the outlet is properly designed to handle the design and peak flows.
- Attach riser pipe (watertight connection) to a horizontal pipe (barrel), which extends through the embankment to toe of fill. Provide anti-seep collars on the barrel.
- Cleanout level shall be clearly marked on the riser pipe
- Avoid dewatering of groundwater to the sediment/desilting basin during the rainy season. Insignificant quantities of accumulated precipitation may be dewatered to the sediment/desilting basin unless precipitation is forecasted within 24 hours. Refer to NS-2 "Dewatering Operations."
- Chain link fencing shall be provided around each sediment/desilting basin to prevent unauthorized entry to the basin or if safety is a concern. Fencing shall be in accordance with Standard Specifications Section 80 – "Fencing."

Maintenance and Inspection

- Inspect sediment/desilting basins before and after rainfall events and weekly during the rest of the rainy season. During extended rainfall events, inspect at

least every 24 hours.

- Examine basin banks for seepage and structural soundness.
- Check inlet and outlet structures and spillway for any damage or obstructions. Repair damage and remove obstructions as needed, or as directed by the RE.
- Remove standing water from the basin within 72 hours after accumulation.
- Check inlet and outlet area for erosion and stabilize if required, or if directed by the RE.
- Remove accumulated sediment when its volume reaches one-third the volume of the sediment storage. Properly dispose of sediment and debris removed from the basin.
- Check fencing for damage and repair as needed or as directed by the RE.



This outlet provides no drainage for permanent pool.

FIGURE 1: SINGLE ORIFICE DESIGN
NOT TO SCALE

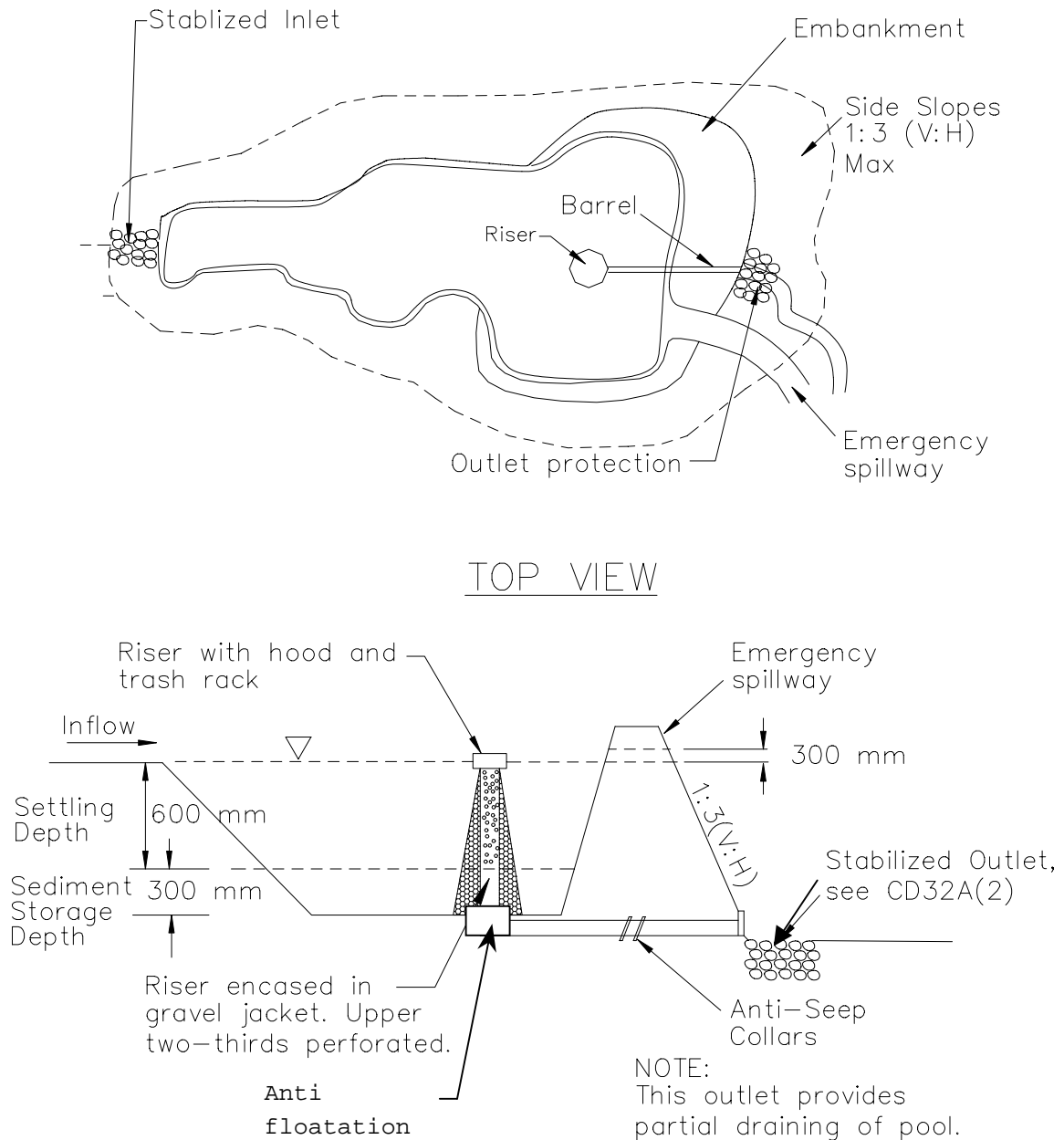
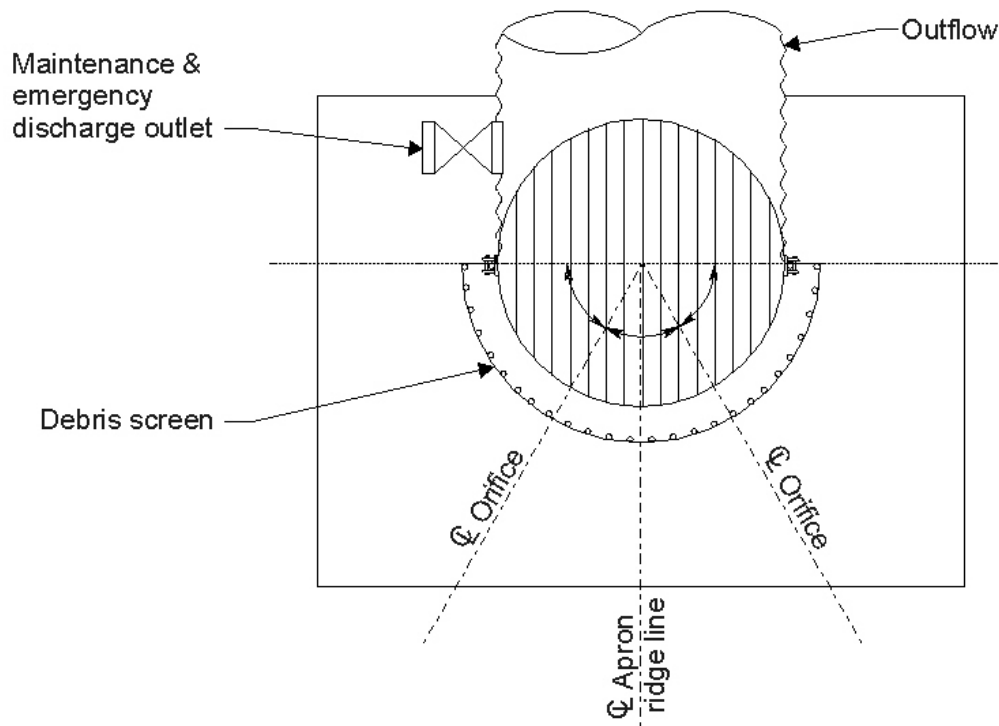


FIGURE 2: MULTIPLE ORIFICE DESIGN
NOT TO SCALE

Plan



Profile

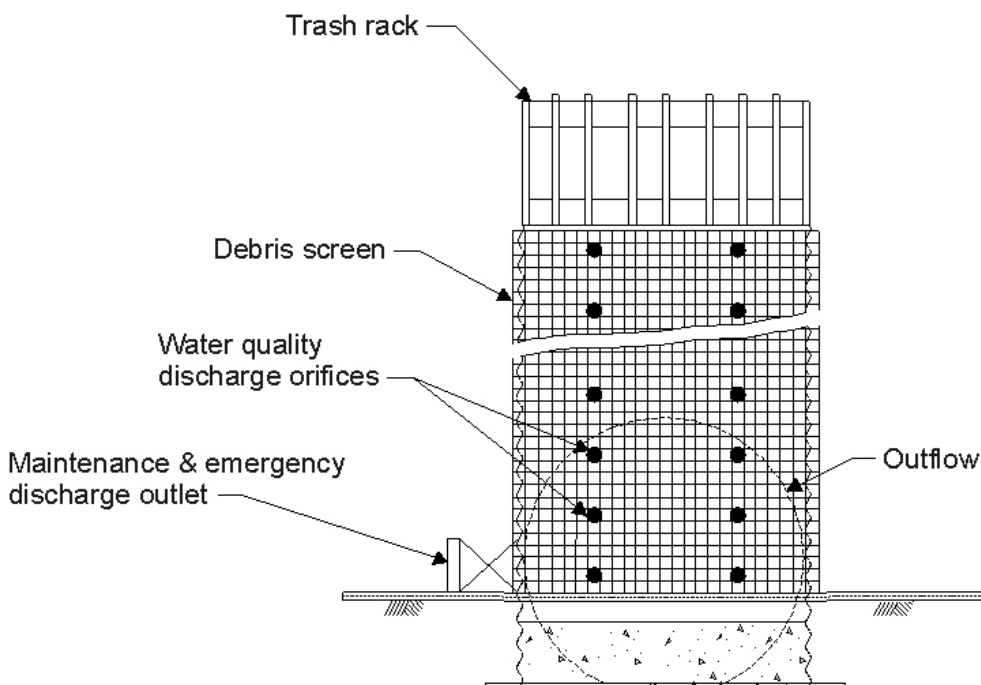
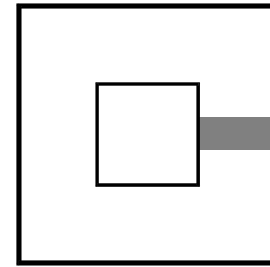
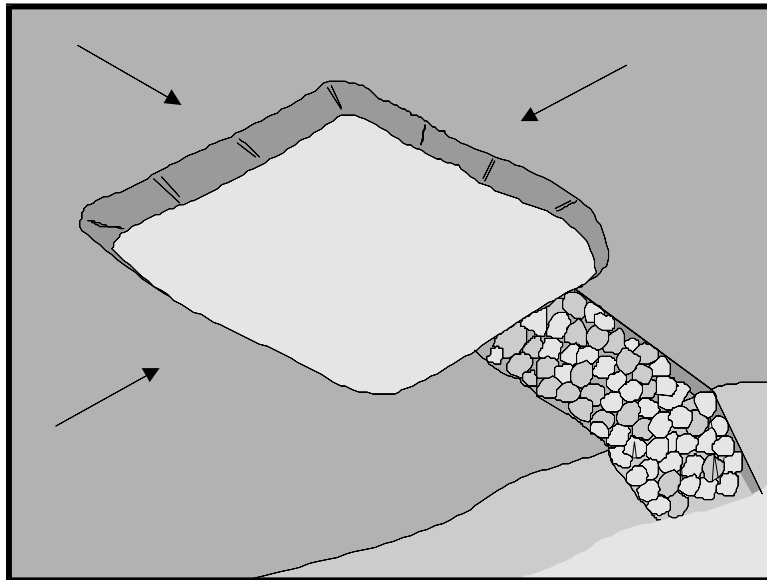


FIGURE 3: MULTIPLE ORIFICE OUTLET RISER
NOT TO SCALE



Standard Symbol

BMP Objectives

- ☐ Soil Stabilization
- ☒ Sediment Control
- ☐ Tracking Control
- ☐ Wind Erosion Control
- ☐ Non-Storm Water Management
- ☐ Materials and Waste Management

Definition and Purpose A sediment trap is a temporary containment area that allows sediment in collected storm water to settle out during infiltration or before the runoff is discharged through a stabilized spillway. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

- Appropriate Applications**
- Sediment traps may be used on construction projects where the drainage area is less than 2 ha (5 ac). Traps should be placed where sediment-laden storm water enters a storm drain or watercourse.
 - This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).
 - As a supplemental control, sediment traps provide additional protection for a water body or for reducing sediment before it enters a drainage system.

- Limitations**
- Requires large surface areas to permit infiltration and settling of sediment.
 - Not appropriate for drainage areas greater than 2 ha (5 ac).
 - Only removes large and medium sized particles and requires upstream erosion control.
 - Attractive and dangerous to children, requiring protective fencing.
 - Not to be located in live streams.
 - Size may be limited by availability of right-of-way.

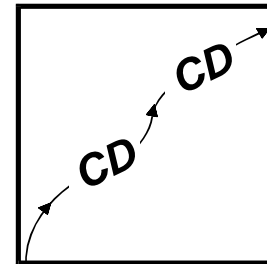
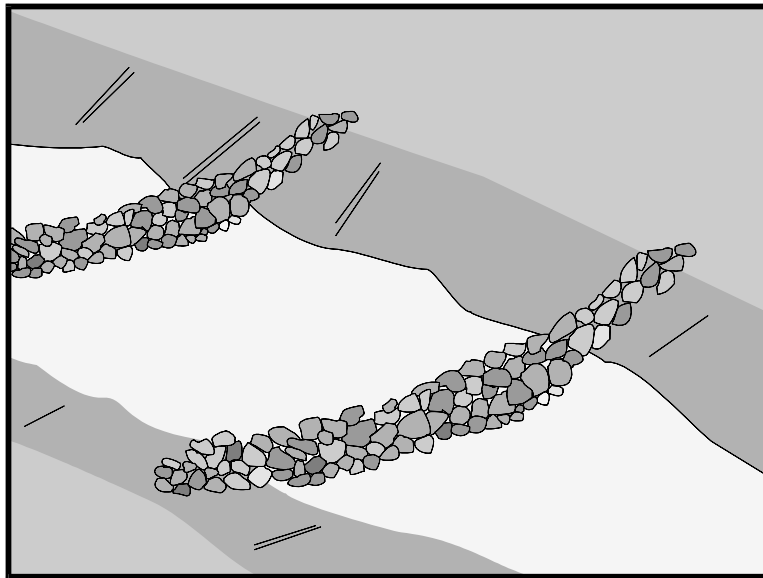
Standards and Specifications

- Construct sediment traps prior to rainy season and construction activities.
- Trap shall be situated according to the following criteria: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where failure would not cause loss of life or property damage, and (3) to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area.
- Trap shall be sized to accommodate a settling zone and sediment storage zone with recommended minimum volumes of 130 m³/ha (67 yd³/ac) and 65 m³/ha (33 yd³/ac) of contributing drainage area, respectively, based on 12.7 mm (0.5 in) of runoff volume over a 24-hr period. Multiple traps and/or additional volume may be required to accommodate site specific rainfall and soil conditions.
- Traps with an impounding levee greater than 1.5 m (5 ft) tall, measured from the lowest point to the impounding area to the highest point of the levee, and traps capable of impounding more than 1000 cubic meters (35,300 cubic feet), shall be designed by a professional Civil Engineer registered with the state of California. The design must be submitted to the Resident Engineer (RE) for approval at least 7 days prior to the basin construction. The design shall include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the trap outlet and bypass structures.
- Earthwork shall be in accordance with Standard Specifications Section 19 – “Earthwork”. Contractor is specifically directed to Standard Specifications Sections 19-5 and 19-6 entitled, “Compaction” and “Embankment Construction,” respectively.
- Areas under embankments, structural works, and sediment traps shall be cleared and stripped of vegetation in accordance with Standard Specifications Section 16 – “Clearing and Grubbing.”
- Use rock or vegetation to protect the trap outlets against erosion.
- Fencing, in accordance with Standard Specifications Section 80 – “Fencing,” shall be provided to prevent unauthorized entry.

Maintenance and Inspection

- Inspect sediment traps before and after rainfall events and weekly during the rest of the rainy season. During extended rainfall events, inspect sediment traps at least every 24 hours.
- If captured runoff has not completely infiltrated within 72 hours then the sediment trap must be dewatered.
- Inspect trap banks for embankment seepage and structural soundness.

- Inspect outlet structure and rock spillway for any damage or obstructions. Repair damage and remove obstructions as needed or as directed by the RE.
- Inspect outlet area for erosion and stabilize if required, or as directed by the RE.
- Remove accumulated sediment when the volume has reached one-third the original trap volume.
- Properly disposed of sediment and debris removed from the trap.
- Inspect fencing for damage and repair as needed or as directed by the RE.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Check dams reduce scour and channel erosion by reducing flow velocity and encouraging sediment settlement. A check dam is a small device constructed of rock, gravel bags, sandbags, fiber rolls, or other proprietary product placed across a natural or man-made channel or drainage ditch.

Appropriate Applications

- Check dams may be installed:
 - In small open channels that drain 4 ha (10 ac) or less.
 - In steep channels where storm water runoff velocities exceed 1.5 m/s (4.9 ft/sec).
 - During the establishment of grass linings in drainage ditches or channels.
 - In temporary ditches where the short length of service does not warrant establishment of erosion-resistant linings.
- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Limitations

- Not to be used in live streams.
- Not appropriate in channels that drain areas greater than 4 ha (10 ac).
- Not to be placed in channels that are already grass lined unless erosion is expected, as installation may damage vegetation.
- Require extensive maintenance following high velocity flows.
- Promotes sediment trapping, which can be re-suspended during subsequent storms or removal of the check dam.

Standards and Specifications

- Not to be constructed from straw bales or silt fence.
- Check dams shall be placed at a distance and height to allow small pools to form behind them. Install the first check dam approximately 5 meters (16 ft) from the outfall device and at regular intervals based on slope gradient and soil type.
- For multiple check dam installation, backwater from downstream check dam shall reach the toe of the upstream dam.
- High flows (typically a 2-year storm or larger) shall safely flow over the check dam without an increase in upstream flooding or damage to the check dam.
- Where grass is used to line ditches, check dams shall be removed when grass has matured sufficiently to protect the ditch or swale.
- Rock shall be placed individually by hand or by mechanical methods (no dumping of rock) to achieve complete ditch or swale coverage.
- Fiber rolls may be used as check dams if approved by the RE or the Construction NPDES Coordinator. Refer to SC-5 “Fiber Rolls.”
- Gravel bags may be used as check dams with the following specifications:

Materials

- **Bag Material:** Bags shall be either polypropylene, polyethylene or polyamide woven fabric, minimum unit weight 135 g/m² (four ounces per square yard), mullen burst strength exceeding 2,070 kPa (300 psi) in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355.
- **Bag Size:** Each gravel-filled bag shall have a length of 450 mm (18 in), width of 300 mm (12 in), thickness of 75 mm (3 in), and mass of approximately 15 kg (33 lb). Bag dimensions are nominal, and may vary based on locally available materials. Alternative bag sizes shall be submitted to the RE for approval prior to deployment.
- **Fill Material:** Fill material shall be between 10 mm and 20 mm (0.4 and 0.8 inch) in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel-filled bags shall be secured such that gravel does not escape. Gravel-filled bags shall be between 13 kg and 22 kg (28 and 48 lb) in mass. Fill material is subject to approval by the RE.

Installation

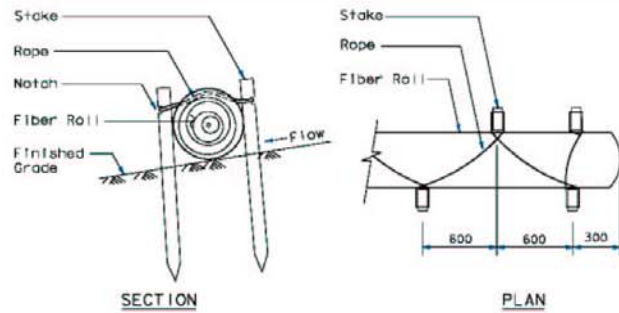
- Install along a level contour.
- Tightly abut bags and stack gravel bags using a pyramid approach.

Gravel bags shall not be stacked any higher than 1 meter (3.2 ft).

- | | |
|-----------------------------------|---|
| Maintenance and Inspection | <ul style="list-style-type: none">– Upper rows of gravel bags shall overlap joints in lower rows.■ Inspect check dams after each significant rainfall event. Repair damage as needed or as required by the RE.■ Remove sediment when depth reaches one-third of the check dam height.■ Remove accumulated sediment prior to permanent seeding or soil stabilization.■ Remove check dam and accumulated sediment when check dams are no longer needed or when required by the RE.■ Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications. |
|-----------------------------------|---|

Check Dams

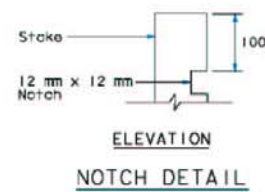
SC-4



SECTION

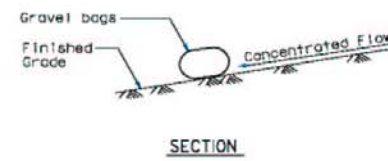
PLAN

STAKING AND LASHING DETAIL



ELEVATION

NOTCH DETAIL

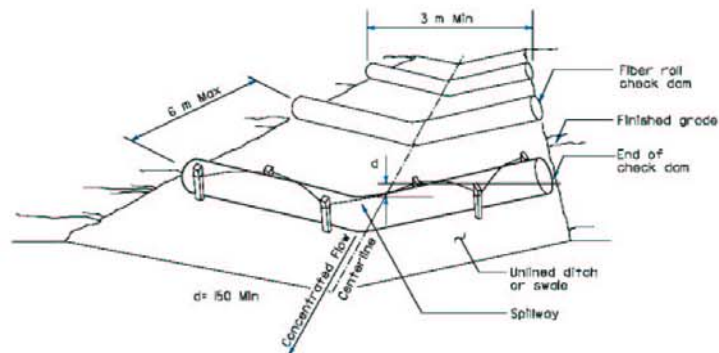


SECTION

TEMPORARY CHECK DAM (TYPE 2)

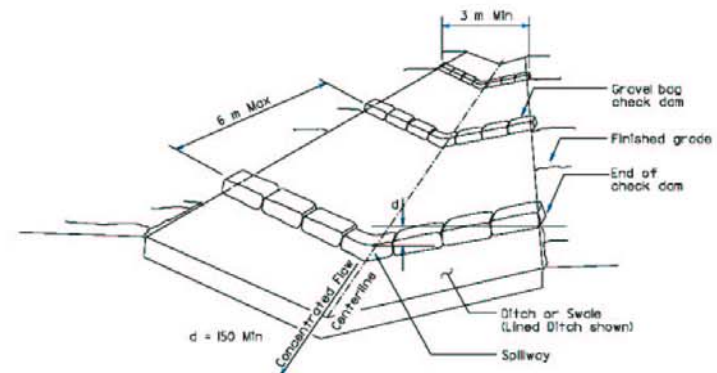
NOTE

1. Spillway depth 'd' shall be maintained to prevent flanking of concentrated flow around the ends of check dam.



PERSPECTIVE

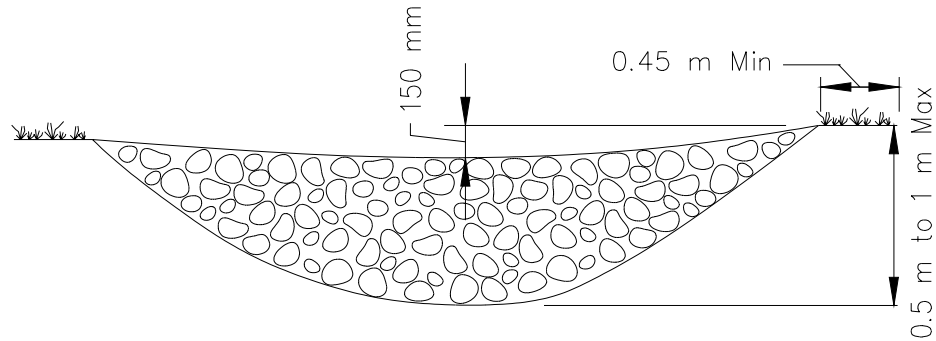
TEMPORARY CHECK DAM (TYPE 1)



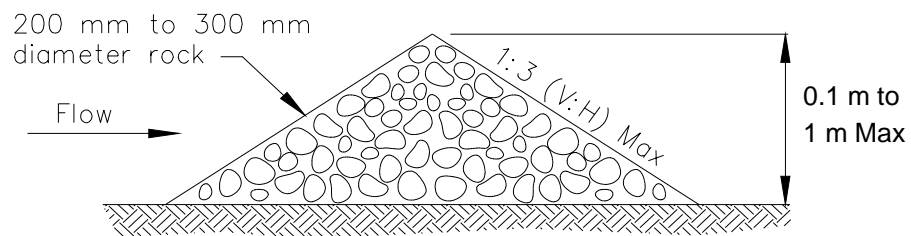
PERSPECTIVE

TEMPORARY CHECK DAM (TYPE 2)



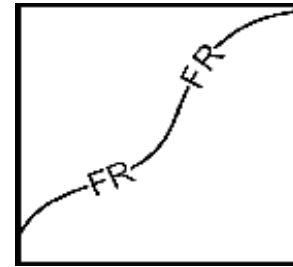


ELEVATION



TYPICAL ROCK CHECK DAM SECTION

ROCK CHECK DAM
NOT TO SCALE



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

A fiber roll consists of wood excelsior, rice or wheat straw, or coconut fibers that is rolled or bound into a tight tubular roll and placed on the toe and face of slopes to intercept runoff, reduce its flow velocity, release the runoff as sheet flow and provide removal of sediment from the runoff. Fiber rolls may also be used for inlet protection and as check dams under certain situations.

Appropriate Applications

- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the RE.
- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Below the toe of exposed and erodible slopes.
- Fiber rolls may be used as check dams in unlined ditches if approved by the Resident Engineer (RE) or the District Construction Storm Water Coordinator (refer to SC-4 “Check Dams”).
- Fiber rolls may be used for drain inlet protection if approved by the RE or the District Construction Storm Water Coordinator (refer to SC-10 “Storm Drain Inlet Protection”).
- Down-slope of exposed soil areas.
- Around temporary stockpiles.
- Along the perimeter of a project.

- Limitations**
- Runoff and erosion may occur if fiber roll is not adequately trenched in.
 - Fiber rolls at the toe of slopes greater than 1:5 may require the use of 500 mm (20" diameter) or installations achieving the same protection (i.e., stacked smaller diameter fiber rolls, etc.).
 - Fiber rolls may be used for drainage inlet protection if they can be properly anchored.
 - Difficult to move once saturated.
 - Fiber rolls could be transported by high flows if not properly staked and trenched in.
 - Fiber rolls have limited sediment capture zone.
 - Do not use fiber rolls on slopes subject to creep, slumping, or landslide.

Standards and Specifications

Fiber Roll Materials

- Fiber rolls shall be either:
 - (1) Prefabricated rolls.
 - (2) Rolled tubes of erosion control blanket.

Assembly of Field Rolled Fiber Roll

- Roll length of erosion control blanket into a tube of minimum 200 mm (8 in) diameter.
- Bind roll at each end and every 1.2 m (4 ft) along length of roll with jute-type twine.

Installation

- Slope inclination of 1:4 or flatter: fiber rolls shall be placed on slopes 6.0 m apart.
- Slope inclination of 1:4 to 1:2: fiber rolls shall be placed on slopes 4.5 m apart.
- Slope inclination 1:2 or greater: fiber rolls shall be placed on slopes 3.0 m apart.
- Stake fiber rolls into a 50 to 100 mm (2 to 4 in) trench.

- Drive stakes at the end of each fiber roll and spaced 600 mm (2 ft) apart if Type 2 installation is used (refer to Page 4). Otherwise, space stakes 1.2 m (4 ft) maximum on center if installed as shown on Pages 5 and 6.
- Use wood stakes with a nominal classification of 19 by 19 mm (3/4 by 3/4 in), and minimum length of 600 mm (24 in).
- If more than one fiber roll is placed in a row, the rolls shall be overlapped; not abutted.

Removal

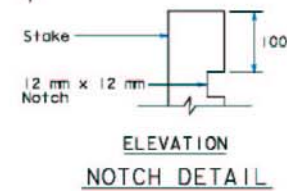
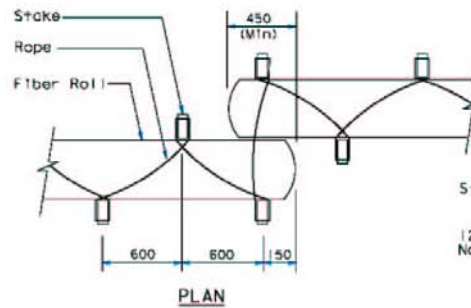
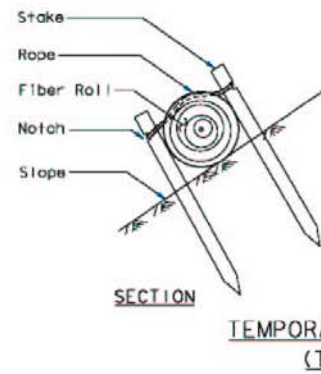
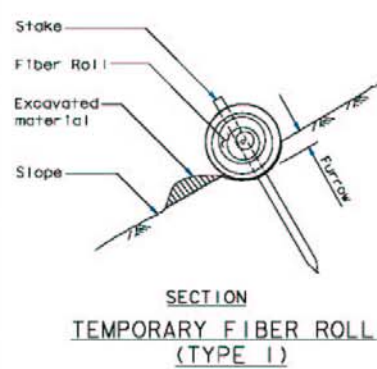
- Fiber rolls are typically left in place.
- If fiber rolls are removed, collect and dispose of sediment accumulation, and fill and compact holes, trenches, depressions or any other ground disturbance to blend with adjacent ground.

Maintenance and Inspection

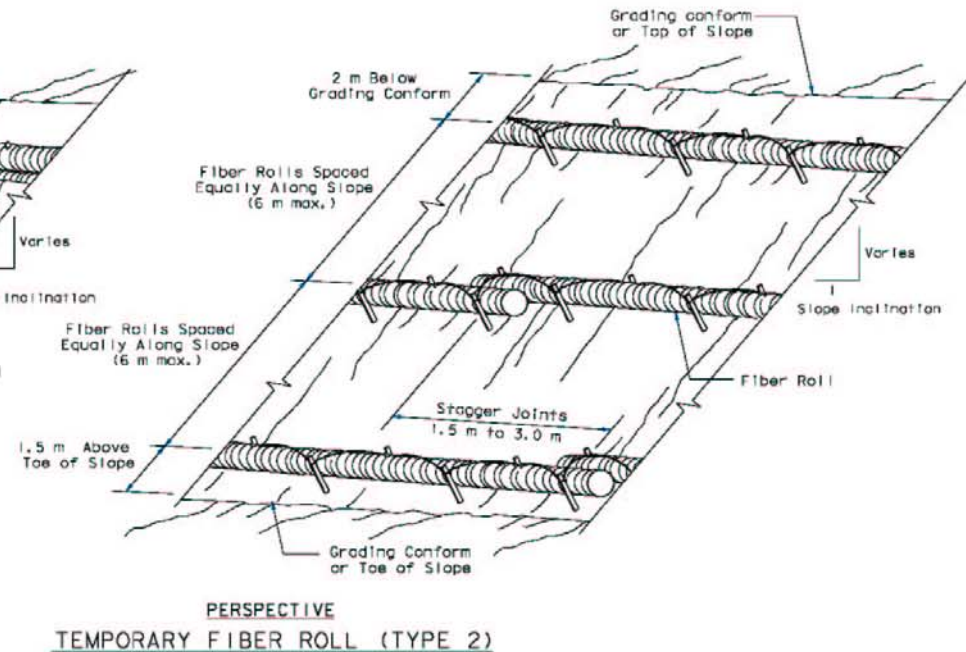
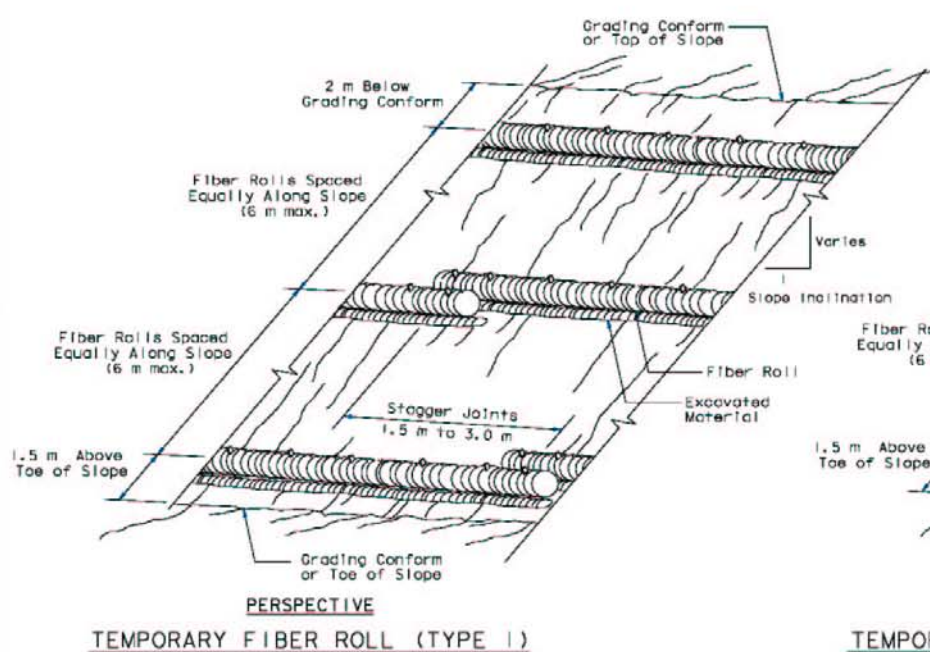
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- Inspect fiber rolls when rain is forecast. Perform maintenance as needed or as required by the RE.
- Inspect fiber rolls following rainfall events and at least daily during prolonged rainfall. Perform maintenance as needed or as required by the RE.
- Maintain fiber rolls to provide an adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches three quarters (3/4) of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.

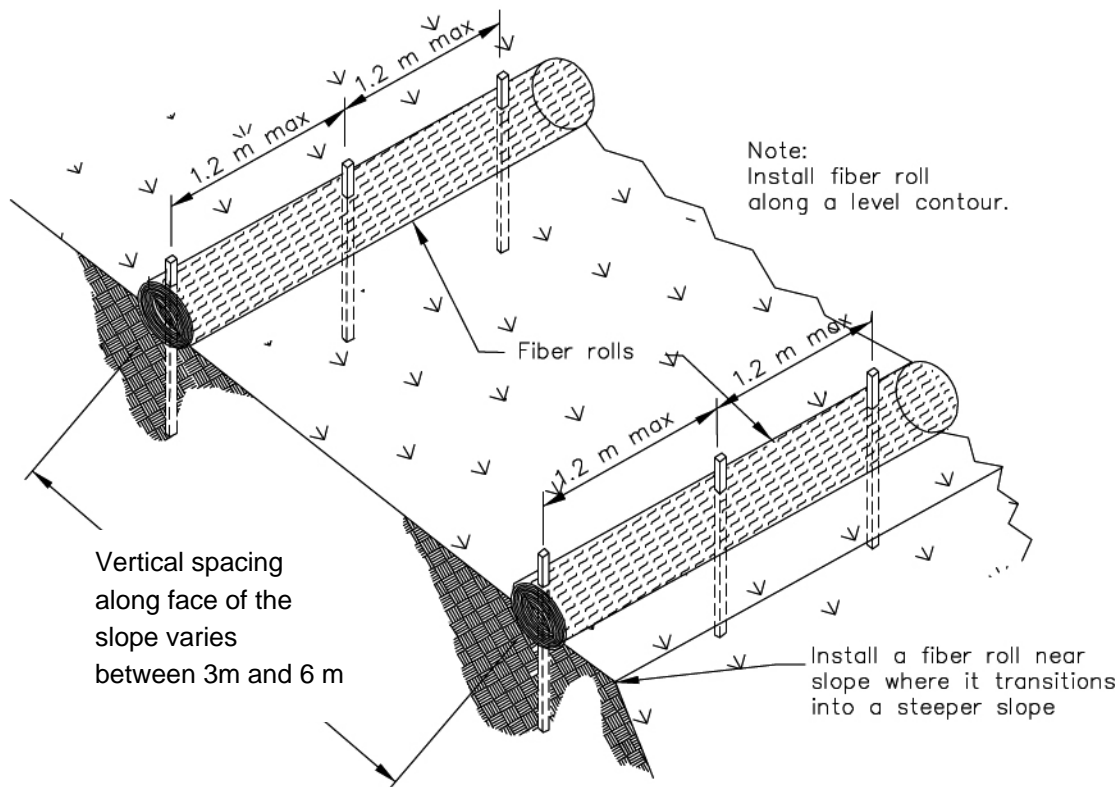
Fiber Rolls

SC-5

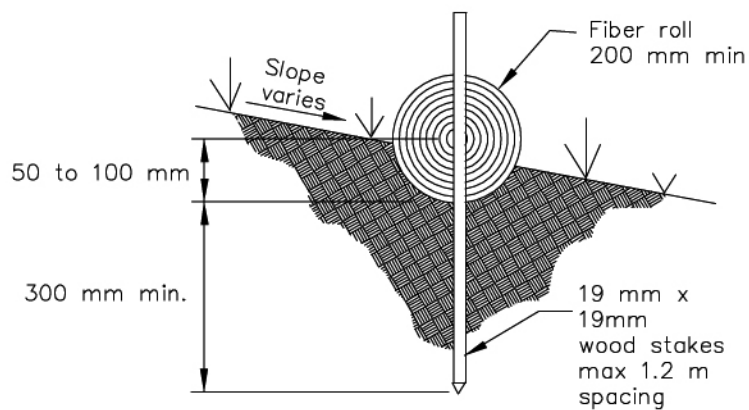


NOTE
1. Temporary fiber roll spacing varies depending upon slope inclination.

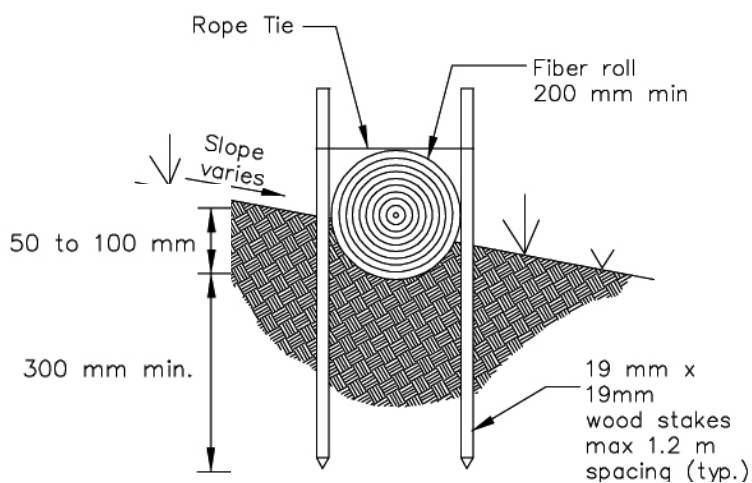
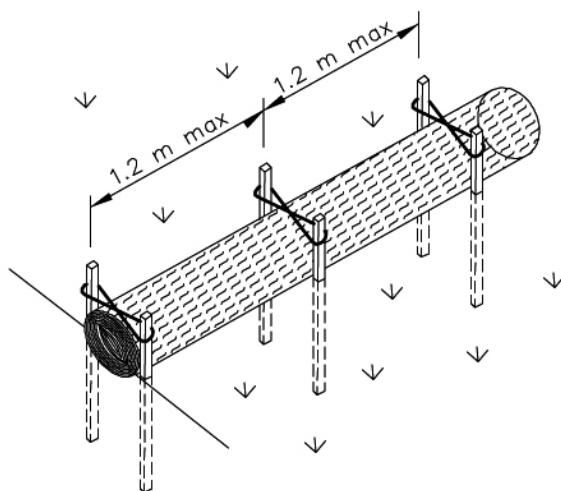




TYPICAL FIBER ROLL INSTALLATION
N.T.S.

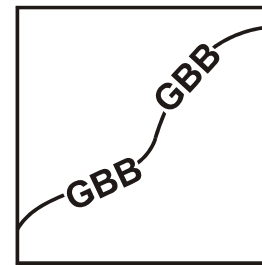
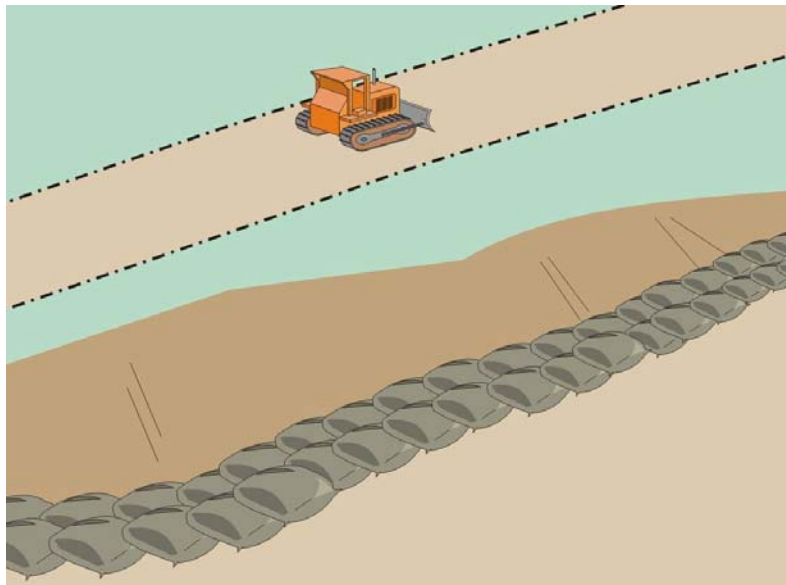


ENTRENCHMENT DETAIL
N.T.S.



OPTIONAL ENTRENCHMENT DETAIL

N.T.S.



Standard Symbol

BMP Objectives

- ☐ Soil Stabilization
- ☒ Sediment Control
- ☐ Tracking Control
- ☐ Wind Erosion Control
- ☐ Non-Storm Water Management
- ☐ Materials and Waste Management

Definition and Purpose

A gravel bag berm consists of a single row of gravel bags that are installed end to end to form a barrier across a slope to intercept runoff, reduce its flow velocity, release the runoff as sheet flow and provide some sediment removal. Gravel bags can be used where flows are moderately concentrated, such as ditches, swales, and storm drain inlets (see BMP SC-10, Storm Drain Inlet Protection) to divert and/or detain flows.

Appropriate Applications

- BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the RE.
- Along streams and channels.
- Below the toe of exposed and erodible slopes.
- Down slope of exposed soil areas.
- Around stockpiles.
- Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, to reduce stream impacts.
- Parallel to a roadway to keep sediment off paved areas.
- At the top of slopes to divert roadway runoff away from disturbed slopes.
- Along the perimeter of a site.
- To divert or direct flow or create a temporary sediment basin.
- During construction activities in stream beds when the contributing drainage

area is less than 2 ha (5 ac).

- When extended construction period limits the use of either silt fences or straw bale barriers.
- When site conditions or construction sequencing require adjustments or relocation of the barrier to meet changing field conditions and needs during construction.
- At grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

Limitations

- Degraded gravel bags may rupture when removed, spilling contents.
- Installation can be labor intensive.
- Limited durability for long term projects.
- When used to detain concentrated flows, maintenance requirements increase.

Standards and Specifications

Materials

- **Bag Material:** Bags shall be woven polypropylene, polyethylene or polyamide fabric, minimum unit weight 135 g/m² (four ounces per square yard), mullen burst strength exceeding 2,070 kPa (300 psi) in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355.
- **Bag Size:** Each gravel-filled bag shall have a length of 450 mm (18 in), width of 300 mm (12 in), thickness of 75 mm (3 in), and mass of approximately 15 kg (33 lb). Bag dimensions are nominal, and may vary based on locally available materials. Alternative bag sizes shall be submitted to the RE for approval prior to deployment.
- **Fill Material:** Gravel shall be between 10 mm and 20 mm (0.4 and 0.8 inch) in diameter, and shall be clean and free from clay balls, organic matter, and other deleterious materials. The opening of gravel-filled bags shall be between 13 kg and 22 kg (28 and 48 lb) in mass. Fill material is subject to approval by the RE.

Installation

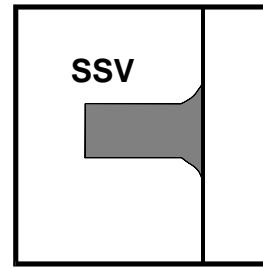
- When used as a linear control for sediment removal:
 - Install along a level contour.
 - Turn ends of gravel bag row up slope to prevent flow around the ends.
 - Generally, gravel bag barriers shall be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment

control.

- When used for concentrated flows:
 - Stack gravel bags to required height using a pyramid approach.
 - Upper rows of gravel bags shall overlap joints in lower rows.
- Construct gravel bag barriers with a set-back of at least 1m from the toe of a slope. Where it is determined to be not practicable due to specific site conditions, the gravel bag barrier may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practicable.
- Requires Certificate of Compliance per Standard Specifications 6-1.07.

Maintenance and Inspection

- Inspect gravel bag berms before and after each rainfall event, and weekly throughout the rainy season.
- Reshape or replace gravel bags as needed, or as directed by the RE.
- Repair washouts or other damages as needed, or as directed by the RE.
- Inspect gravel bag berms for sediment accumulations and remove sediments when accumulation reaches one-third of the berm height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.
- Remove gravel bag berms when no longer needed. Remove sediment accumulations and clean, re-grade, and stabilize the area.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Practices to remove tracked sediment to prevent the sediment from entering a storm drain or watercourse.

Appropriate Applications

These practices are implemented anywhere sediment is tracked from the project site onto public or private paved roads, typically at points of ingress/egress.

Limitations

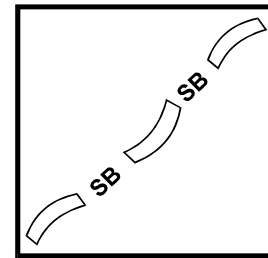
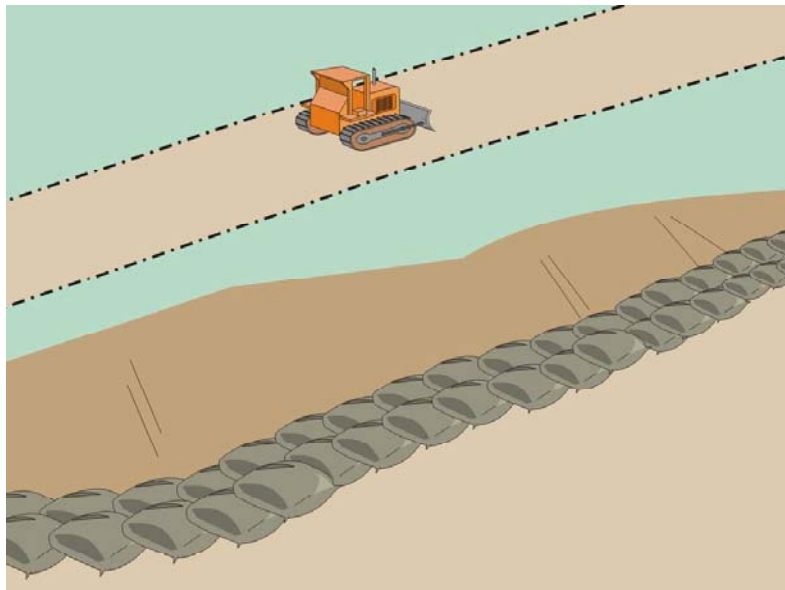
Sweeping and vacuuming may not be effective when soil is wet or muddy.

Standards and Specifications

- Kick brooms or sweeper attachments shall not be used.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking shall be swept and/or vacuumed daily.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project.

Maintenance and Inspection

- Inspect ingress/egress access points daily and sweep tracked sediment as needed, or as required by the Resident Engineer (RE).
- 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 in conformance with the provisions in Standard Specifications Section 7-1.13 .



Standard Symbol

BMP Objectives

- ☐ Soil Stabilization
- ☒ Sediment Control
- ☐ Tracking Control
- ☐ Wind Erosion Control
- ☐ Non-Storm Water Management
- ☐ Materials and Waste Management

Definition and Purpose A sandbag barrier is a temporary linear sediment barrier consisting of stacked sandbags, designed to intercept and slow the flow of sediment-laden sheet flow runoff. Sandbag barriers allow sediment to settle from runoff before water leaves the construction site.

- Appropriate Applications**
- This BMP may be implemented on a project-by-project basis in addition to other BMPs when determined necessary and feasible by the Resident Engineer (RE).
 - Along the perimeter of a site.
 - Along streams and channels.
 - Below the toe of exposed and erodible slopes.
 - Down slope of exposed soil areas.
 - Around stockpiles.
 - Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, to reduce stream impacts.
 - Parallel to a roadway to keep sediment off paved areas.
 - At the top of slopes to divert roadway runoff away from disturbed slopes.
 - To divert or direct flow or create a temporary sediment/desilting basin.
 - During construction activities in stream beds when the contributing drainage area is less than 2 ha (5 ac).

Appropriate Applications

- This BMP may be implemented on a project-by-project basis in addition to other BMPs when determined necessary and feasible by the Resident Engineer (RE).
- Along the perimeter of a site.
- Along streams and channels.
- Below the toe of exposed and erodible slopes.
- Down slope of exposed soil areas.
- Around stockpiles.
- Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, to reduce stream impacts.
- Parallel to a roadway to keep sediment off paved areas.
- At the top of slopes to divert roadway runoff away from disturbed slopes.
- To divert or direct flow or create a temporary sediment/desilting basin.
- During construction activities in stream beds when the contributing drainage area is less than 2 ha (5 ac).
- When extended construction period limits the use of either silt fences or straw bale barriers.
- Along the perimeter of vehicle and equipment fueling and maintenance areas or chemical storage areas.
- To capture and detain non-storm water flows until proper cleaning operations occur.
- When site conditions or construction sequencing require adjustments or relocation of the barrier to meet changing field conditions and needs during construction.
- To temporarily close or continue broken, damaged or incomplete curbs.

Limitations

- Limit the drainage area upstream of the barrier to 2 ha (5 ac).
- Degraded sandbags may rupture when removed, spilling sand.
- Installation can be labor intensive.
- Limited durability for long-term projects.

- When used to detain concentrated flows, maintenance requirements increase.

Standards and Specifications

Materials

- **Sandbag Material:** Sandbag shall be woven polypropylene, polyethylene or polyamide fabric, minimum unit weight 135 g/m² (four ounces per square yard), mullen burst strength exceeding 2,070 kPa (300 psi) in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. Use of burlap is not acceptable.
- **Sandbag Size:** Each sand-filled bag shall have a length of 450 mm (18 in), width of 300 mm (12 in), thickness of 75 mm (3 in), and mass of approximately 15 kg (33 lb.). Bag dimensions are nominal, and may vary based on locally available materials. Alternative bag sizes shall be submitted to the RE for approval prior to deployment.
- **Fill Material:** All sandbag fill material shall be non-cohesive, Class 1 or Class 2 permeable material free from clay and deleterious material, conforming to the provisions in Standard Specifications Section 68-1.025 "Permeable Material". The requirements for the Durability Index and Sand Equivalent do not apply. Fill material is subject to approval by the RE.

Installation

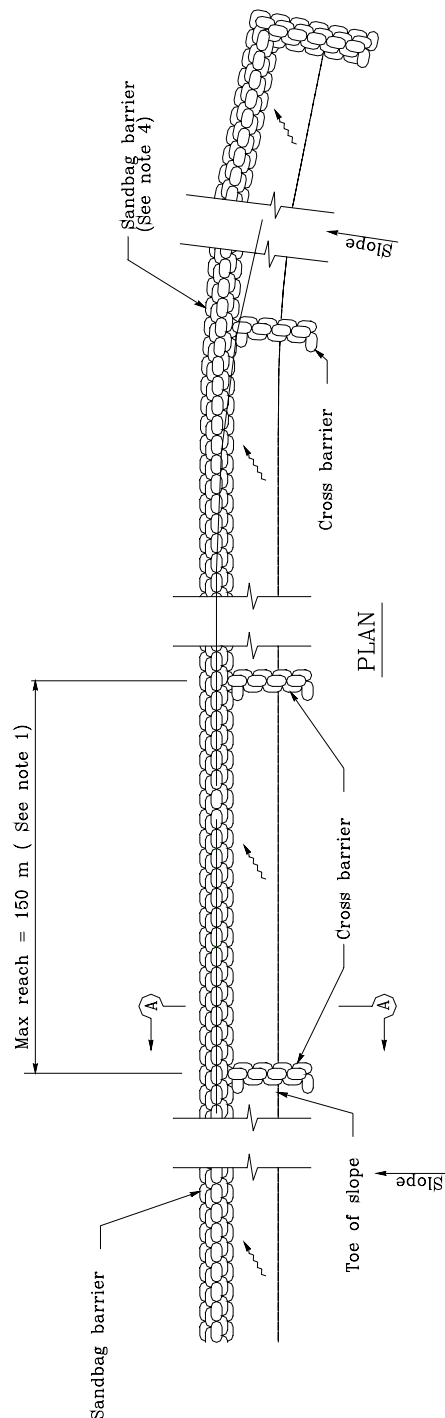
- When used as a linear sediment control:
 - Install along a level contour.
 - Turn ends of sandbag row up slope to prevent flow around the ends.
 - Generally, sandbag barriers shall be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.
 - Install as shown in Pages 4 and 5 of this BMP.
- Construct sandbag barriers with a set-back of at least 1m (3 ft) from the toe of a slope. Where it is determined to be not practical due to specific site conditions, the sandbag barrier may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practicable.

Maintenance and Inspection

- Inspect sandbag barriers before and after each rainfall event, and weekly throughout the rainy season.



- Reshape or replace sandbags as needed, or as directed by the RE.
- Repair washouts or other damages as needed, or as directed by the RE.
- Inspect sandbag barriers for sediment accumulations and remove sediments when accumulation reaches one-third the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.
- Remove sandbags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilized the area.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY LINEAR SEDIMENT BARRIER (TYPE SANDBAG)

NO SCALE

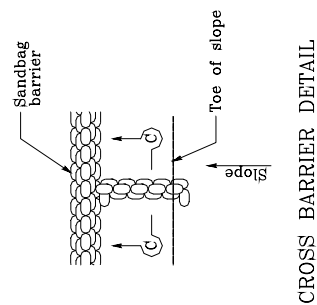
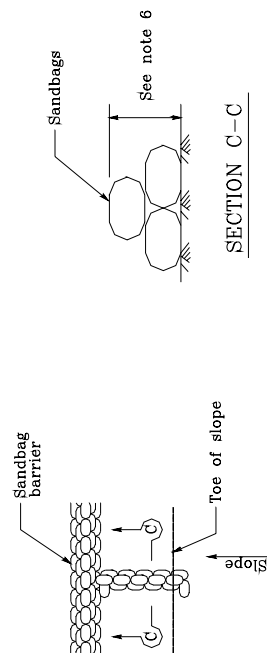
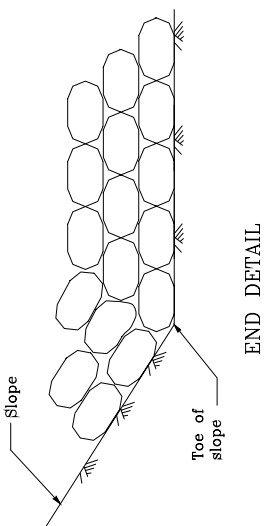
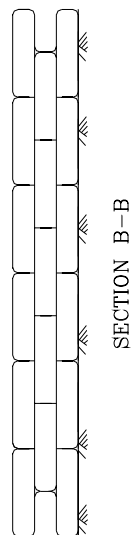
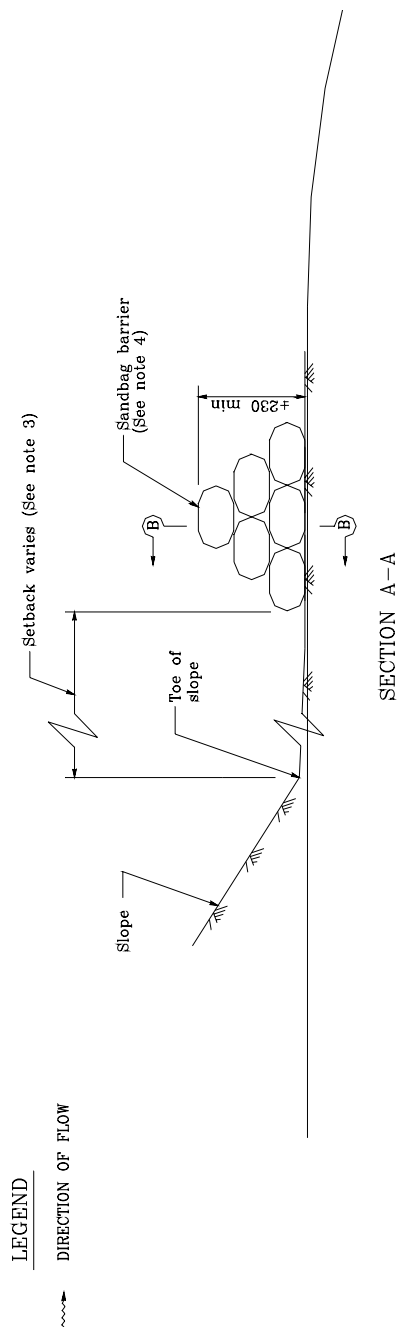
ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

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 150 m.
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.

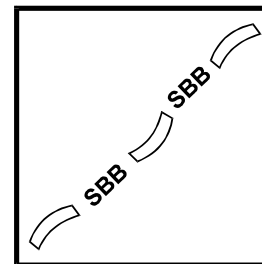
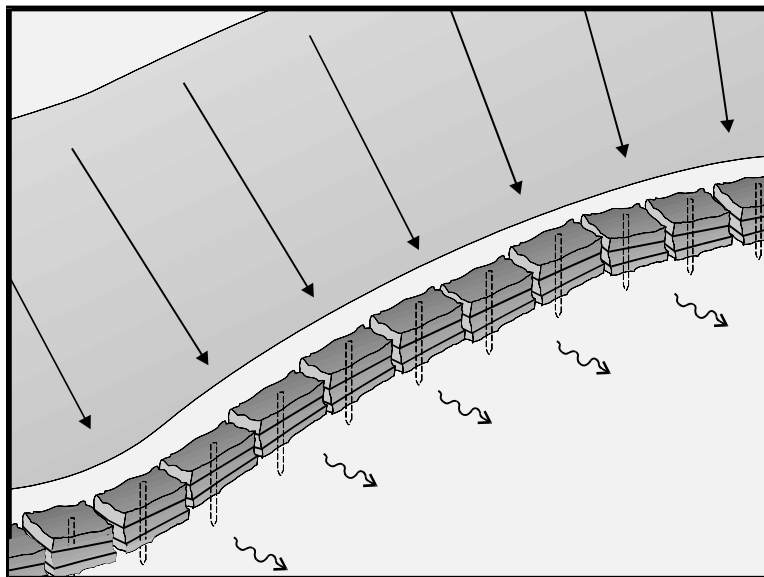
Sandbag Barrier

SC-8



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
TEMPORARY LINEAR SEDIMENT BARRIER
(TYPE SANDBAG)

NO SCALE
ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

A straw bale barrier is a temporary linear sediment barrier consisting of straw bales, designed to intercept and slow sediment-laden sheet flow runoff. Straw bale barriers allow sediment to settle from runoff before water leaves the construction site.

Appropriate Applications

- This BMP may be implemented on a project-by-project basis in addition to other BMPs when determined necessary and feasible by the Resident Engineer (RE).
- Along the perimeter of a site.
- Along streams and channels.
- Below the toe of exposed and erodible slopes.
- Down slope of exposed soil areas.
- Around stockpiles.
- Across minor swales or ditches with small catchments.
- Around above grade type temporary concrete washouts (See BMP WM-8, "Concrete Waste Management").
- Parallel to a roadway to keep sediment off paved areas.

- Limitations
- Installation can be labor intensive.
 - Straw bale barriers are maintenance intensive.
 - Degraded straw bales may fall apart when removed or left in place for extended periods.
 - Can't be used on paved surfaces.
 - Not to be used for drain inlet protection.
 - Shall not be used in areas of concentrated flow.
 - Can be an attractive food source for some animals.
 - May introduce undesirable non-native plants to the area.

Standards and Specifications

Materials

- **Straw Bale Material:** Straw bale materials shall conform to the provisions in Standard Specifications Section 20-2.06, "Straw."
- **Straw Bale Size:** Each straw bale shall be a minimum of 360 mm (14 in) wide, 450 mm (18 in) in height, 900 mm (36 in) in length and shall have a minimum mass of 23 kg (51 lb.) The straw bale shall be composed entirely of vegetative matter, except for the binding material.
- **Bale Bindings:** Bales shall be bound by either steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding shall not be used. Baling wire shall be a minimum diameter of 1.57 mm (0.06 inch). Nylon or polypropylene string shall be approximately 2 mm (0.08 inch) in diameter with a breaking strength of 360 N.
- **Stakes:** Wood stakes shall be commercial quality lumber of the size and shape shown on the plans. Each stake shall be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement shall be equal to a number four designation or greater. End protection shall be provided for any exposed bar reinforcement.

Installation

- Limit the drainage area upstream of the barrier to 0.3 ha/100 m (0.25 ac/100ft) or barrier.
- Limit the slope length draining to the straw bale barrier to 30 m (100 ft.)

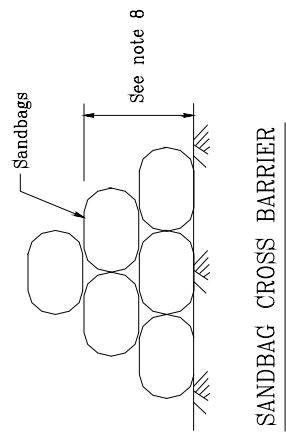
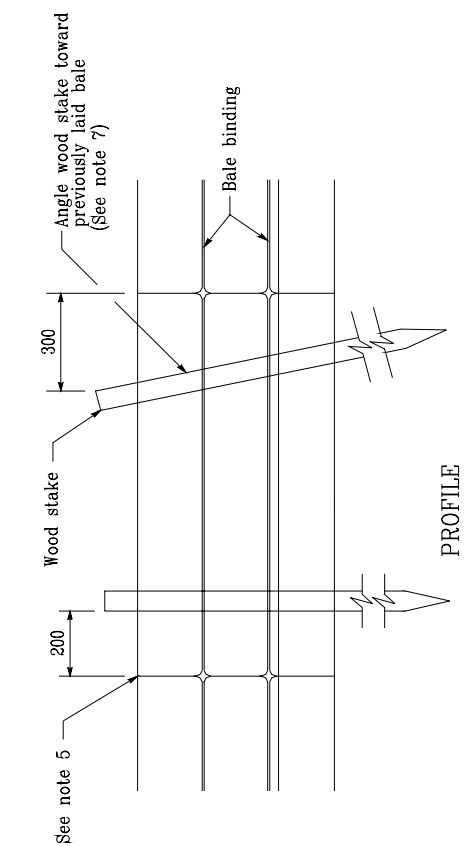
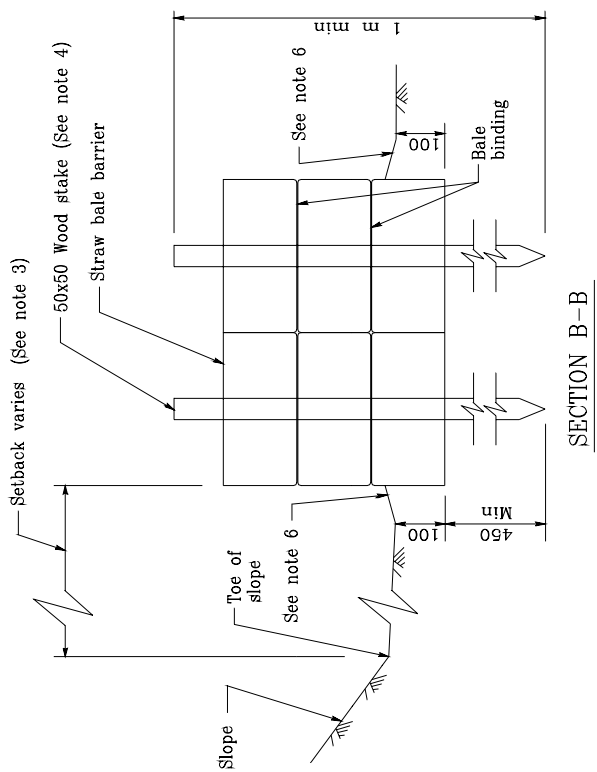
- Slopes of 2:100 (V:H) (2%) or flatter are preferred. If the slope exceeds 1:10 (V:H) (10%), the length of slope upstream of the barrier must be less than 15 m (50 ft).
- Install straw bale barriers along a level contour, with the last straw bale turned up slope.
- Straw bales must be installed in a trench and tightly abut adjacent bales.
- Construct straw bale barriers with a set-back of at least 1 m (3 ft) from the toe of a slope. Where it is determined to be not practical due to specific site conditions, the straw bale barrier may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practical.
- See pages 4 and 5 of this BMP for installation detail.

Maintenance and Inspection

- Inspect straw bale barriers before and after each rainfall event, and weekly throughout the rainy season.
- Inspect straw bale barriers for sediment accumulations and remove sediment when depth reaches one-third the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.
- Replace or repair damage bales as needed or as directed by the RE.
- Repair washouts or other damages as needed or as directed by the RE.
- Remove straw bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilized the area.

Straw Bale Barrier

SC-9



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
TEMPORARY LINEAR SEDIMENT BARRIER
(TYPE STRAW BALE)
NO SCALE
ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

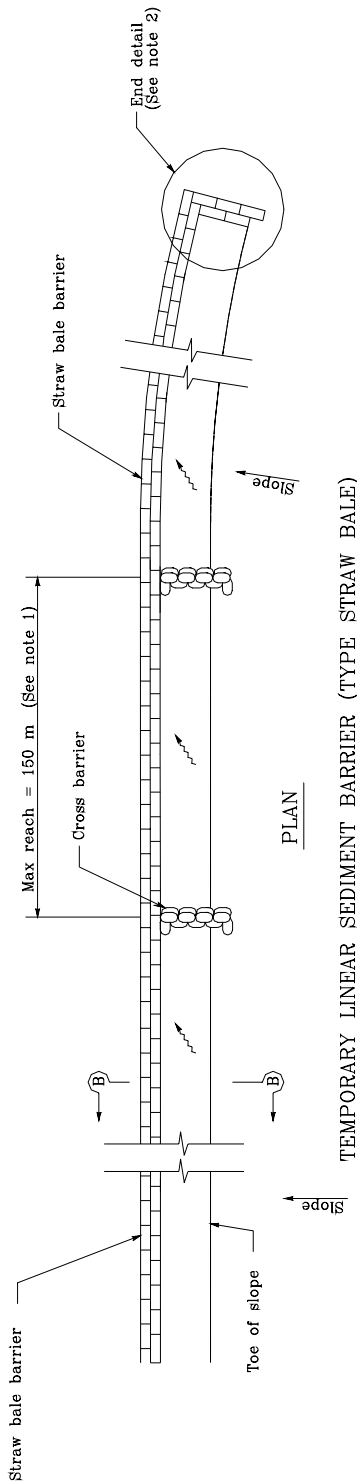
LEGEND

~> DIRECTION OF FLOW



Straw Bale Barrier

SC-9



TEMPORARY LINEAR SEDIMENT BARRIER (TYPE STRAW BALE)



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 linear barrier. In no case shall the reach length exceed 150 m.

2. End of barrier shall be turned up slope.

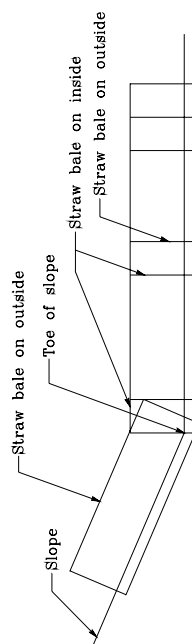
3. Dimension may vary to fit field conditions.

4. Place

5. Tamp

6. Cross

7. ndba



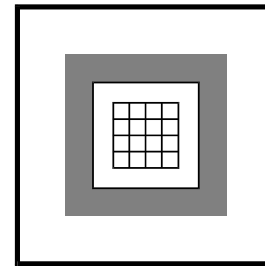
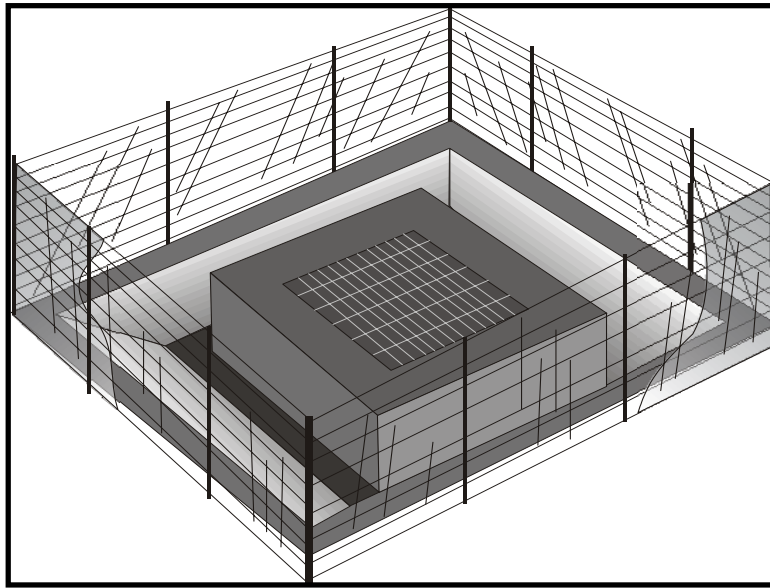
END DETAIL

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY LINEAR SEDIMENT BARRIER
(TYPE STRAW BALE)

NO SCALE

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Devices used at storm drain inlets that are subject to runoff from construction activities to detain and/or to filter sediment-laden runoff to allow sediment to settle and/or to filter sediment prior to discharge into storm drainage systems or watercourses.

Appropriate Applications

- Where ponding will not encroach into highway traffic.
- Where sediment laden surface runoff may enter an inlet.
- Where disturbed drainage areas have not yet been permanently stabilized.
- Where the drainage area is 0.4 ha (1 ac) or less.
- Appropriate during wet and snow-melt seasons.

Limitations

- Requires an adequate area for water to pond without encroaching upon traveled way and should not present itself to be an obstacle to oncoming traffic.
- May require other methods of temporary protection to prevent sediment-laden storm water and non-storm water 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 expected, use other on-site sediment trapping techniques (e.g. check dams) in conjunction with inlet protection.
- Frequent maintenance is required.
- For drainage areas larger than 0.4 ha (1 ac), runoff shall be routed to a sediment trapping device designed for larger flows. See BMPs SC-2, "Sediment/Desilting Basin," and SC-3 "Sediment Trap."

- Filter fabric fence inlet protection is appropriate in open areas that are subject to sheet flow and for flows not exceeding 0.014 m³/s (0.5 cfs).
- Gravel bag barriers for inlet protection are applicable when sheet flows or concentrated flows exceed 0.014 m³/s (0.5 cfs), and it is necessary to allow for overtopping to prevent flooding.
- Fiber rolls and foam barriers are not appropriate for locations where they cannot be properly anchored to the surface.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected and overflow capability is needed.

Standards and Specifications

Identify existing and/or 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.

Methods and Installation

- **DI Protection Type 1 - Filter Fabric Fence** - The filter fabric fence (Type 1) protection is illustrated on Page 5. Similar to constructing a silt fence. See BMP SC-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.
- **DI Protection Type 2 - Excavated Drop Inlet Sediment Trap** - The excavated drop inlet sediment trap (Type 2) is illustrated in Page 6. Similar to constructing a temporary silt fence, See BMP SC-1, "Silt Fence." Size excavated trap to provide a minimum storage capacity calculated at the rate of 130 m³/ha (67 yd³/ac) of drainage area.
- **DI Protection Type 3 – Gravel bag** - The gravel bag barrier (Type 3) is illustrated in Page 7. Flow from a severe storm shall 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 BMP SC-6, "Gravel Bag Berm." Gravel bags shall be used due to their high permeability.
- **DI Protection Type 4 – Foam Barriers and Fiber Rolls** – Foam barrier or fiber roll (Type 4) is placed around the inlet and keyed and anchored to the surface. Foam barriers and fiber rolls are intended for use as inlet protection where the area around the inlet is unpaved and the foam barrier or fiber roll can be secured to the surface. RE or Construction Storm Water Coordinator approval is required.

Maintenance and Inspection

General

- Inspect all inlet protection devices before and after every rainfall event, and weekly during the rest of the rainy season. During extended rainfall events, inspect inlet protection devices at least once every 24 hours.

- Inspect the storm drain inlet after severe storms in the rainy season to check for bypassed material.
- Remove all inlet protection devices within thirty days after the site is stabilized, or when the inlet protection is no longer needed.
 - Bring the disturbed area to final grade and smooth and compact it. Appropriately stabilize all bare areas around the inlet.
 - Clean and re-grade 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.

Requirements by Method

■ ***Type 1 - Filter Fabric Fence***

- This method shall be used for drain inlets requiring protection in areas where finished grade is established and erosion control seeding has been applied or is pending.
- Make sure the stakes are securely driven in the ground and are structurally sound (i.e., not bent, cracked, or splintered, and are reasonably perpendicular to the ground). Replace damaged stakes.
- Replace or clean the fabric when the fabric becomes clogged with sediment. Make sure the fabric does not have any holes or tears. Repair or replace fabric as needed or as directed by the RE.
- At a minimum, remove the sediment behind the fabric fence when accumulation reaches one-third the height of the fence or barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications Section 7-1.13.

■ ***Type 2 – Excavated Drop Inlet Sediment Trap***

- This method may be used for drain inlets requiring protection in areas that have been cleared and grubbed, and where exposed soil areas are subject to grading.
- Remove sediment from basin when the volume of the basin has been reduced by one-half.

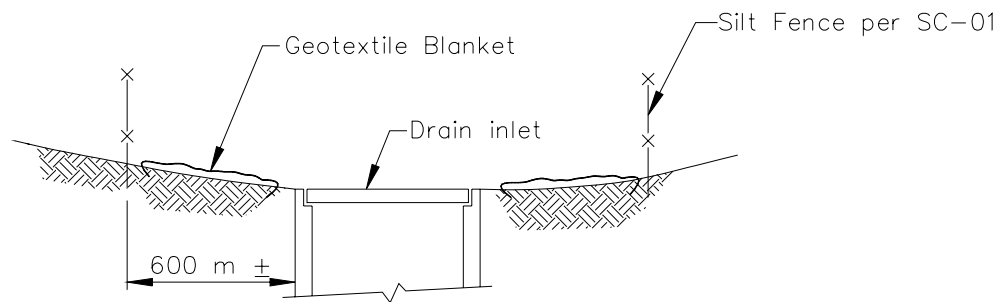
■ ***Type 3 - Gravel Bag Barrier***

- This method may be used for drain inlets surrounded by AC or paved surfaces.
- Inspect bags for holes, gashes, and snags.

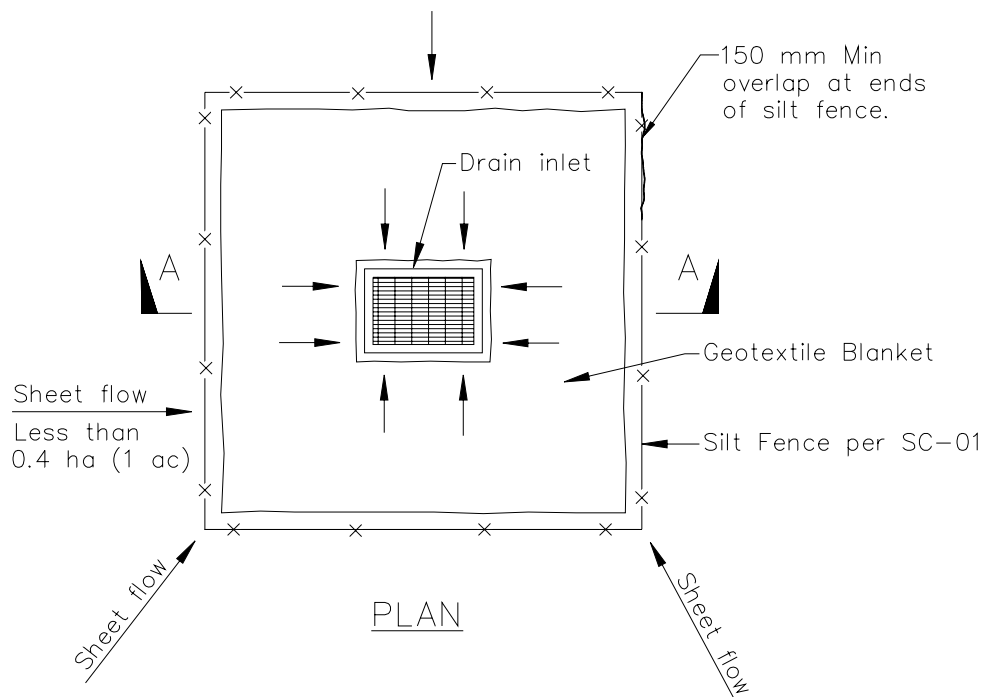
- Check gravel bags for proper arrangement and displacement. Remove the sediment behind the barrier when it reaches one-third the height of the barrier. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications Section 7-1.13.

■ ***Type 4 Foam Barriers and Fiber Rolls***

- This method may be used for drain inlets requiring protection in areas that have been cleared and grubbed, and where exposed soil areas subject to grading. RE or Construction Storm Coordinator approval is required.
- Check foam barrier or fiber roll for proper arrangement and displacement. Remove the sediment behind the barrier when it reaches one-third the height of the barrier. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.



SECTION A-A

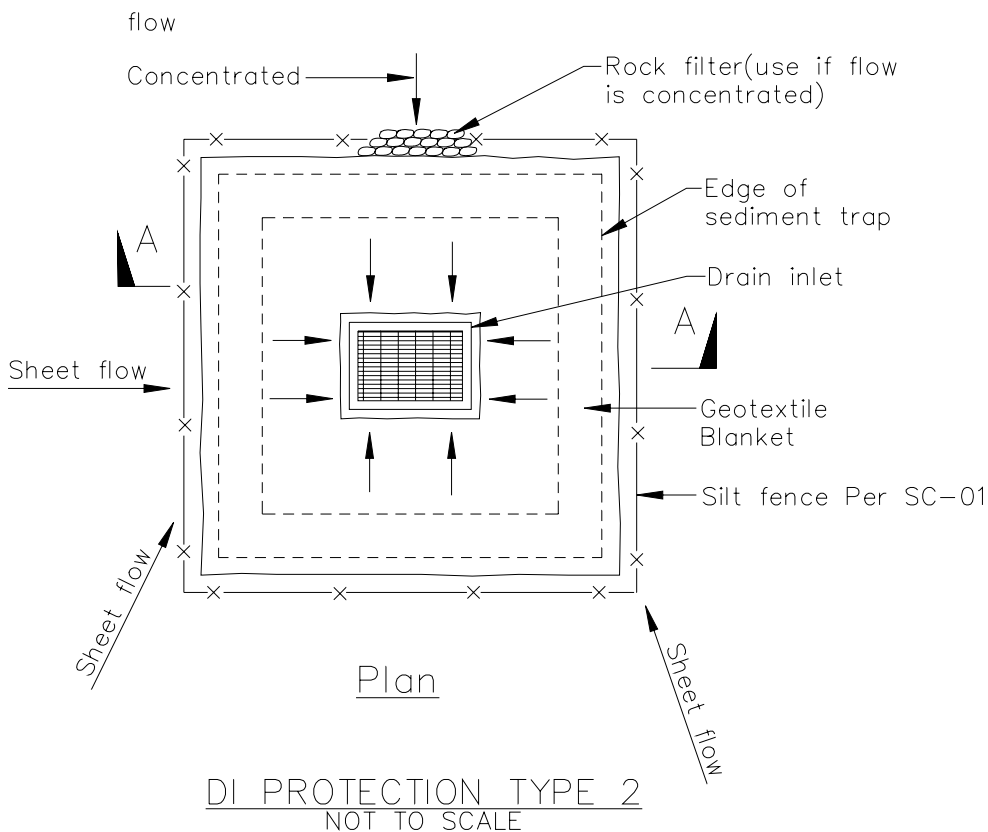
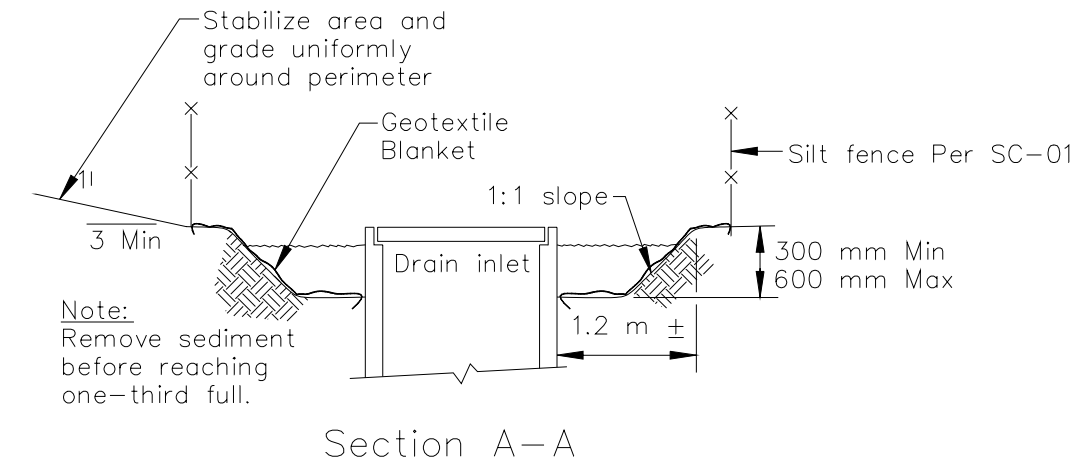


PLAN

DI PROTECTION TYPE 1
NOT TO SCALE

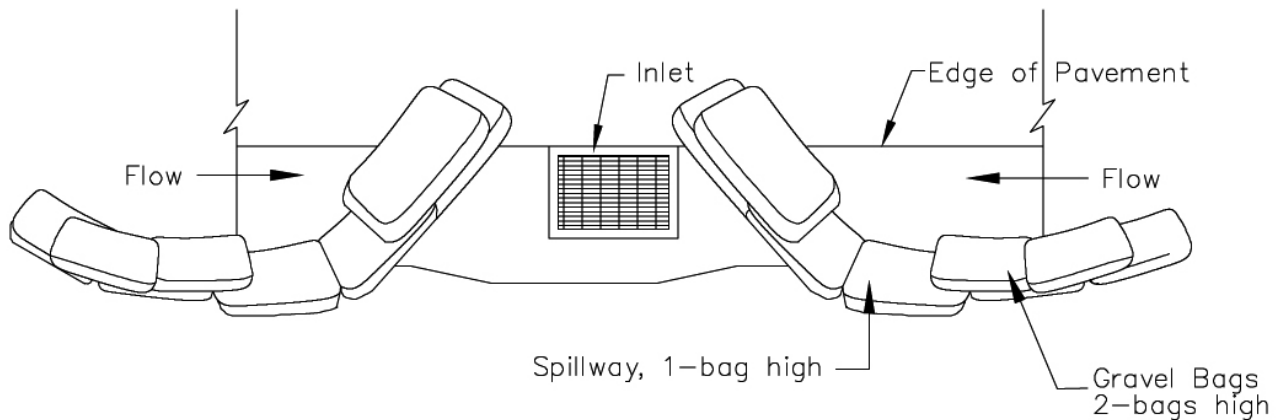
NOTES:

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.

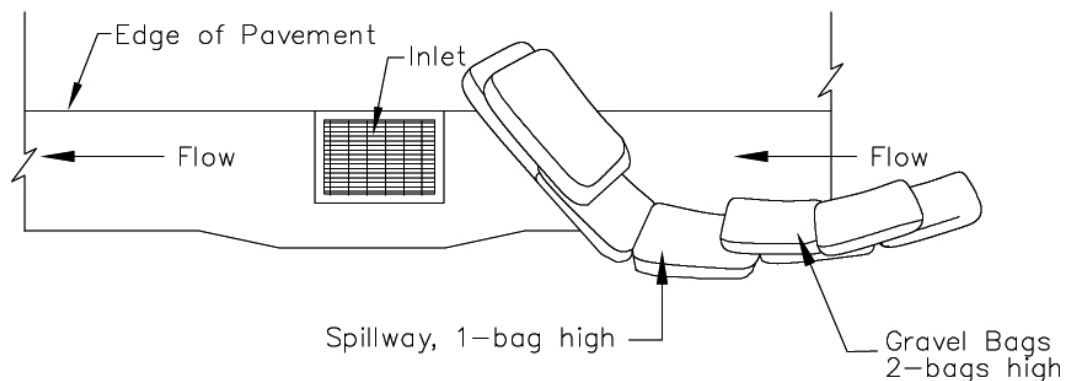


Notes

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.



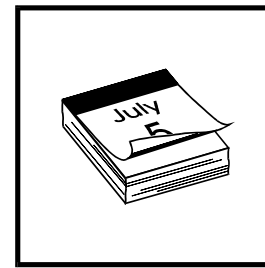
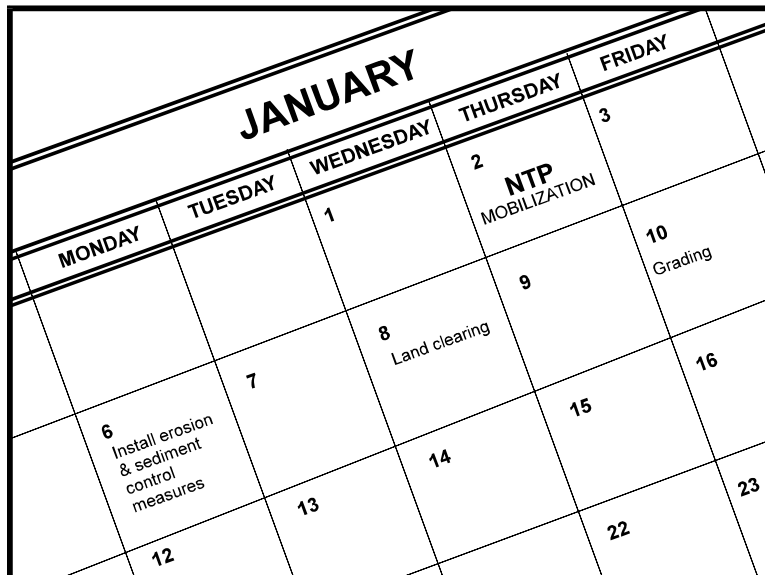
TYPICAL PROTECTION FOR INLET WITH OPPOSING FLOW DIRECTIONS



TYPICAL PROTECTION FOR INLET WITH SINGLE FLOW DIRECTION

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.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose This best management practice (BMP) involves developing, for every project, a schedule that includes sequencing of construction activities with the implementation of construction site BMPs such as temporary soil stabilization (erosion control) and temporary sediment controls measures. 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.

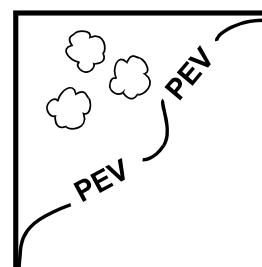
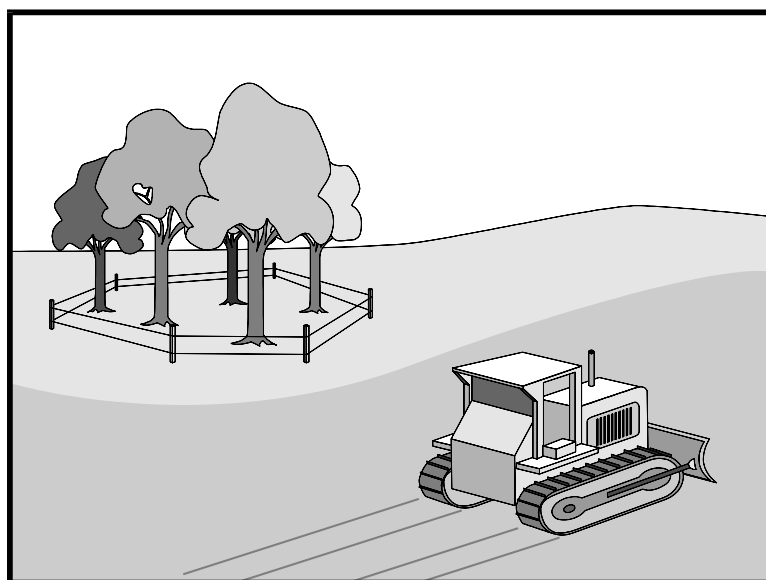
Appropriate Applications Construction sequencing shall be scheduled to minimize land disturbance for all projects during the rainy and non-rainy season. Appropriate BMPs shall be implemented during both rainy and non-rainy seasons.

Limitations None identified.

- Standards and Specifications**
- Developing a schedule and planning the project are the very first steps in an effective storm water program. The schedule shall clearly show how the rainy season relates to soil-disturbing and re-stabilization activities. The construction schedule shall be incorporated into the SWPPP or WPCP.
 - The schedule shall include detail on the rainy season implementation and deployment of:
 - Temporary soil stabilization BMPs.
 - Temporary sediment control BMPs.
 - Tracking control BMPs.
 - Wind erosion control BMPs.

- Non-storm water BMPs.
- Waste management and materials pollution control BMPs.
- Schedule shall also include dates for significant long-term operations or activities that may have planned non-storm water discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, bridge cleaning, etc.
- Schedule work to minimize soil disturbing activities during the rainy season.
- Develop the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, pouring foundations, installing utilities, etc., to minimize the active construction area during the rainy season.
- Schedule major grading operations for the non-rainy season when practical.
- Stabilize non-active areas within 14 days from the cessation of soil-disturbing activities or one day prior to the onset of precipitation, whichever occurs first.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment controls and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year-round to deploy soil stabilization and sediment control practices as required by Section 2 of this Manual. Erosion may be caused during dry seasons by unseasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year-round, and retain and maintain rainy season sediment trapping devices in operational condition.
- 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.
- Consider scheduling when establishing permanent vegetation (appropriate planting time for specified vegetation).
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.

- Maintenance and Inspection
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
 - Amend the schedule when changes are warranted or when directed by the Resident Engineer (RE).
 - The Special Provisions require annual submittal of a rainy season implementation schedule. Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Preservation of existing vegetation is the identification and protection of desirable vegetation that provides erosion and sediment control benefits.

Appropriate Applications

- Preserve existing vegetation at areas on a site where no construction activity is planned or will occur at a later date. Specifications for preservation of existing vegetation can be found in Standard Specifications, Section 7-1.11.
- On a year-round basis, temporary fencing shall be provided prior to the commencement of clearing and grubbing operations or other soil-disturbing activities in areas.
- Clearing and grubbing operations should be staged to preserve existing vegetation.

Limitations Protection of existing vegetation requires planning, and may limit the area available for construction activities.

Standards and Specifications

Timing

- Preservation of existing vegetation shall be provided prior to the commencement of clearing and grubbing operations or other soil-disturbing activities in areas identified on the plans to be preserved, especially on areas designated as Environmentally Sensitive Areas (ESAs).
- Preservation of existing vegetation shall conform to scheduling requirements set forth in the special provisions.

Design and Layout

- Mark areas to be preserved with temporary fencing made of orange polypropylene that is stabilized against ultraviolet light. The temporary fencing shall be at least 1 meter (3.2. ft) tall and shall have openings not larger than 50 mm by 50 mm (2 in by 2 in).

- Fence posts shall be either wood or metal, at the Contractor's discretion, as appropriate for the intended purpose. The post spacing and depth shall be adequate to completely support the fence in an upright position.
- Minimize the disturbed areas by locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling.
- Consider the impact of grade changes to existing vegetation and the root zone.

Installation

- Construction materials, equipment storage, and parking areas shall be located where they will not cause root compaction.
- Keep equipment away from trees to prevent trunk and root damage.
- Maintain existing irrigation systems.
- Employees and subcontractors shall be instructed to honor protective devices. No heavy equipment, vehicular traffic, or storage piles of any construction materials shall be permitted within the drip line of any tree to be retained. Removed trees shall not be felled, pushed, or pulled into any retained trees. Fires shall not be permitted within 30 m (100 ft) of the drip line of any retained trees. Any fires shall be of limited size, and shall be kept under continual surveillance. No toxic or construction materials (including paint, acid, nails, gypsum board, chemicals, fuels, and lubricants) shall be stored within 15 m (50 ft) of the drip line of any retained trees, nor disposed of in any way which would injure vegetation.

Trenching and Tunneling

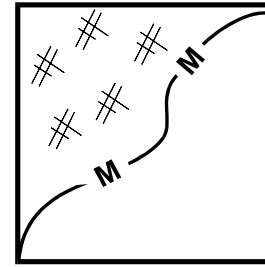
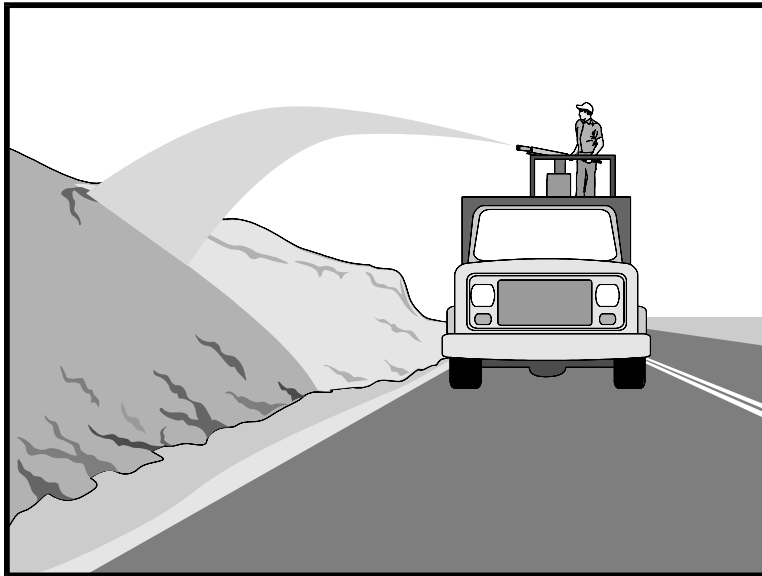
- Trenching shall be as far away from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching and/or tunneling near or under trees to be retained, tunnels shall be at least 450 mm (18 in) below the ground surface, and not below the tree center to minimize impact on the roots.
- Tree roots shall not be left exposed to air; they shall be covered with soil as soon as possible, protected, and kept moistened with wet burlap or peat moss until the tunnel and/or trench can be completed.
- The ends of damaged or cut roots shall be cut off smoothly.
- Trenches and tunnels shall be filled as soon as possible. Careful filling and tamping will eliminate air spaces in the soil which can damage roots.
- Remove any trees intended for retention if those trees are damaged seriously enough to affect their survival. If replacement is desired or required, the new tree shall be of similar species, and at least 50 mm (2 in) caliper, unless

otherwise required by the contract documents.

- After all other work is complete, fences and barriers shall be removed last. This is because protected trees may be destroyed by carelessness during the final cleanup and landscaping.

Maintenance and Inspection During construction, the limits of disturbance shall remain clearly marked at all times. Irrigation or maintenance of existing vegetation shall conform to the requirements in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below shall be followed:

- Serious tree injuries shall be attended to by an arborist.
- During construction, District Environmental shall be contacted to ensure that ESAs are protected.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Hydraulic mulch consists of applying a mixture of shredded wood fiber or a hydraulic matrix and a stabilizing emulsion or tackifier with hydroseeding equipment, which temporarily protects exposed soil from erosion by raindrop impact or wind. This is one of five temporary soil stabilization alternatives to consider.

Appropriate Applications

- Hydraulic mulch is applied to disturbed areas requiring temporary protection until permanent vegetation is established or disturbed areas that must re-disturbed following an extended period of inactivity.

Limitations

- Wood fiber hydraulic mulches are generally short-lived (only last a part of a growing season) and need 24 hours to dry before rainfall occurs to be effective.
- Paper mulches are not permitted.
- Avoid use in areas where the mulch would be incompatible with immediate future earthwork activities and would have to be removed.

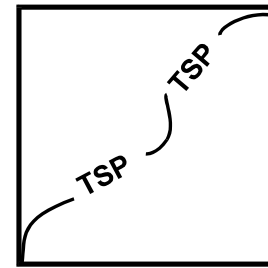
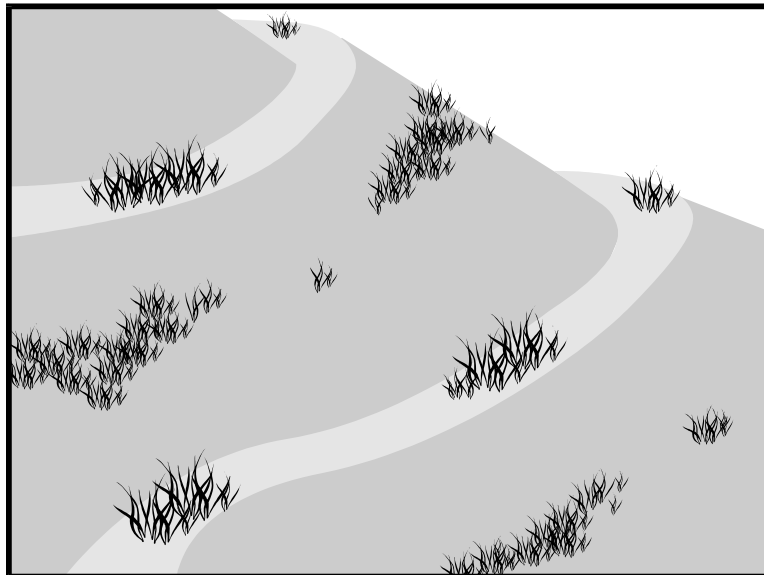
Standards and Specifications

- Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
- Hydraulic matrices require 24 hours to dry before rainfall occurs to be effective unless approved by the Resident Engineer.
- Avoid mulch over-spray onto the traveled way, sidewalks, lined drainage channels, and existing vegetation.
- Selection of hydraulic mulches by the Contractor must be approved by the Resident Engineer (RE) or Construction Storm Water Coordinator.

- Materials for wood fiber based hydraulic mulches and hydraulic matrices shall conform to Standard Specifications Section 20-2.07.
- Hydraulic Mulch
- Wood fiber mulch is a component of hydraulic applications. It is typically applied at the rate of 2,250 to 4,500 kilograms per hectare (kg/ha) (2,000 to 4,000 lb/ac) with 0-5% by weight of a stabilizing emulsion or tackifier (e.g., guar, psyllium, acrylic copolymer) and applied as a slurry. This type of mulch is manufactured from wood or wood waste from lumber mills or from urban sources. Specifications for wood fiber mulch can be found in Standard Specifications Sections 20-2.07 and 20-2.08.
- Hydraulic matrix is a combination of wood fiber mulch and a tackifier applied as a slurry. It is typically applied at the rate of 2,250 to 4,500 kilograms per hectare (kg/Ha) with 5-10% by weight of a stabilizing emulsion or tackifier (e.g., guar, psyllium, acrylic copolymer).
- Hydraulic Matrix
- Hydraulic matrix is a combination of wood fiber mulch and tackifier applied as a slurry. It is typically applied at the rate of 2,250 to 4,500 kg/ha with 5-10% by weight of a stabilizing emulsion or tackifier (e.g., guar, psyllium, acrylic copolymer).
- Bonded Fiber Matrix
- Bonded fiber matrix (BFM) is a hydraulically-applied system of fibers and adhesives that upon drying forms an erosion-resistant blanket that promotes vegetation, and prevents soil erosion. BFMs are typically applied at rates from 3,400 kg/ha to 4,500 kg/ha based on the manufacturer's recommendation. The biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFMs should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFMs require 12 to 24 hours to dry to become effective.

Maintenance and Inspections

- Maintain an unbroken, temporary mulched ground cover throughout the period of construction when the soils are not being reworked. Inspect before expected rain storms and repair any damaged ground cover and re-mulch exposed areas of bare soil.
- After any rainfall event, the Contractor is responsible for maintaining all slopes to prevent erosion.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Hydroseeding typically consists of applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydro-mulch equipment, which temporarily protects exposed soils from erosion by water and wind. This is one of five temporary soil stabilization alternatives to consider.

Appropriate Applications

- Hydroseeding is applied on disturbed soil areas requiring temporary protection until permanent vegetation is established or disturbed soil areas that must be re-disturbed following an extended period of inactivity.

Limitations

- Hydroseeding may be used alone only when there is sufficient time in the season to ensure adequate vegetation establishment and erosion control. Otherwise, hydroseeding must be used in conjunction with a soil binder or mulching (i.e., straw mulch), refer to BMP SS-5, Table 1 for options.
- Steep slopes are difficult to protect with temporary seeding.
- Temporary seeding may not be appropriate in dry periods without supplemental irrigation.
- Temporary vegetation may have to be removed before permanent vegetation is applied.
- Temporary vegetation is not appropriate for short-term inactivity.

Standards and Specifications To select appropriate hydroseeding mixtures, an evaluation of site conditions shall be performed with respect to:

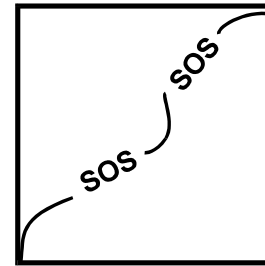
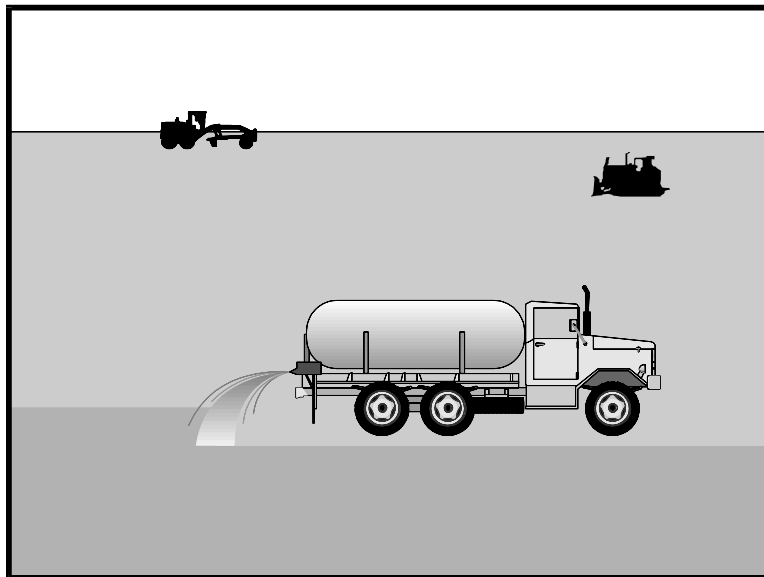
- Soil conditions
 - Site topography
 - Season and climate
 - Vegetation types
 - Maintenance requirements
 - Sensitive adjacent areas
 - Water availability
 - Plans for permanent vegetation
- Selection of hydroseeding mixtures shall be approved by the District Landscape Architect and the Construction Storm Water Coordinator.

The following steps shall be followed for implementation:

- Seed mix shall comply with the Standard Specifications Section 20-2.10, and the project's special provisions.
- Hydroseeding can be accomplished using a multiple-step or one-step process; refer to the special provisions for specified process. The multiple-step process ensures maximum direct contact of the seeds to soil. When the one-step process is used to apply the mixture of fiber, seed, etc., the seed rate shall be increased to compensate for all seeds not having direct contact with the soil.
- Prior to application, roughen the slope, fill area, or area to be seeded with the furrows trending along the contours. Rolling with a crimping or punching type roller or track walking is required on all slopes prior to hydroseeding. Track walking shall only be used where other methods are impractical.
- Apply a straw mulch to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow, refer to Standard Specifications Sections 20-2.06 and 20-3.03.
- All seeds shall be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test; provide the Resident Engineer (RE) with such documentation. The container shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained. All legume seed shall be pellet-inoculated. Inoculant sources shall be species-specific and shall be applied at a rate of 2 kg of inoculant per 100 kg of seed (2-lb inoculant per 100-lb seed), refer to Standard Specifications Section 20-2.10.
- Commercial fertilizer shall conform to the requirements of the California Food and Agricultural Code. Fertilizer shall be pelleted or granular form.

Maintenance and Inspection

- Follow-up applications shall be made as needed to cover weak spots, and to maintain adequate soil protection.
- Avoid over-spray onto the traveled way, sidewalks, lined drainage channels, and existing vegetation.
- All seeded areas shall be inspected for failures and re-seeded, fertilized, and mulched within the planting season, using not less than half the original application rates. Any temporary revegetation efforts that do not provide adequate cover must be reapplied at a scheduled recommended by the Caltrans Landscape Architect or RE.
- After any rainfall event, the Contractor is responsible for maintaining all slopes to prevent erosion.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Soil binders consist of applying and maintaining a soil stabilizer to exposed soil surfaces. Soil binders are materials applied to the soil surface to temporarily prevent water-induced erosion of exposed soils on construction sites. Soil binders also provide temporary dust, wind, and soil stabilization (erosion control) benefits. This is one of five temporary soil stabilization alternatives to consider.

Appropriate Applications

Soil binders are typically applied to disturbed areas requiring short-term temporary protection. Because soil binders can often be incorporated into the work, they may be a good choice for areas where grading activities will soon resume. Application on stockpiles to prevent water and wind erosion.

Limitations

- Soil binders are temporary in nature and may need reapplication.
- Soil binders require a minimum curing time until fully effective, as prescribed by the manufacturer, which may be 24 hours or longer. Soil binders may need reapplication after a storm event.
- Soil binders will generally experience spot failures during heavy rainfall events. If runoff penetrates the soil at the top of a slope treated with a soil binder, it is likely that the runoff will undercut the stabilized soil layer and discharge at a point further down slope.
- Soil binders do not hold up to pedestrian or vehicular traffic across treated areas.
- Soil binders may not penetrate soil surfaces made up primarily of silt and clay, particularly when compacted.
- Storm water quality runoff sampling is required for many soil binders. Soil binders that do not require sampling are identified in the Caltrans SWPPP/WPCP Preparation Manual, Pollutant Table, Attachment S.

- Some soil binders may not perform well with low relative humidity. Under rainy conditions, some agents may become slippery or leach out of the soil.
- May not cure if low temperatures occur within 24 hours of application.

Standards and Specifications

General Considerations

- Site-specific soil types will dictate appropriate soil binders to be used.
- A soil binder must be environmentally benign (non-toxic to plant and animal life), easy to apply, easy to maintain, economical, and shall not stain paved or painted surfaces, refer to Standard Specifications Section 20-2.11.
- Some soil binders are compatible with existing vegetation.
- Performance of soil binders depends on temperature, humidity, and traffic across treated areas.
- Avoid over-spray onto the traveled way, sidewalks, lined drainage channels, and existing vegetation.

Soil Binders Applications

After selecting an appropriate soil binder, the untreated soil surface must be prepared before applying the soil binder. The untreated soil surface must contain sufficient moisture to assist the agent in achieving uniform distribution. In general, the following steps shall be followed:

- Follow manufacturer's recommendations for application rates, pre-wetting of application area, and cleaning of equipment after use.
- Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where rolling is impractical.
- Consider the drying time for the selected soil binder and apply with sufficient time before anticipated rainfall. Soil binders shall not be applied during or immediately before rainfall.
- Avoid over-spray onto the traveled way, sidewalks, lined drainage channels, sound walls, and existing vegetation.
- Soil binders shall not be applied to frozen soil, areas with standing water, under freezing or rainy conditions, or when the air temperature is below 40C (40oF) during the curing period.
- More than one treatment is often necessary, although the second treatment may be diluted or have a lower application rate.
- Generally, soil binders require a minimum curing time of 24 hours before they are fully effective. Refer to manufacturer's instructions for specific cure times.

- For liquid agents:
 - Crown or slope ground to avoid ponding.
 - Uniformly pre-wet ground at 0.14 to 1.4 L/m² (0.03 to 0.3 gal/yd²) or according to manufacturer's recommendations.
 - Apply solution under pressure. Overlap solution 150 to 300 mm (6 to 12 in).
 - Allow treated area to cure for the time recommended by the manufacturer; typically, at least 24 hours.
 - In low humidities, reactivate chemicals by re-wetting with water at 0.5 to 0.9 L/m² (0.1 to 0.2 gal/yd²).

Selecting a Soil Binder

Properties of common soil binders used for erosion control are provided in Table 1 and Appendix B. Use Table 1 to select an appropriate soil binder.

Factors to consider when selecting a soil binder include the following:

- Suitability to situation - Consider where the soil binder will be applied; determine if it needs a high resistance to leaching or abrasion, and whether it needs to be compatible with any existing vegetation. Determine the length of time soil stabilization will be needed, and if the soil binder will be placed in an area where it will degrade rapidly. In general, slope steepness is not a discriminating factor for the listed soil binders.
- Soil types and surface materials - Fines and moisture content are key properties of surface materials. Consider a soil binder's ability to penetrate, likelihood of leaching, and ability to form a surface crust on the surface materials.
- Frequency of application - The frequency of application can be affected by subgrade conditions, surface type, climate, and maintenance schedule. Frequent applications could lead to high costs. Application frequency may be minimized if the soil binder has good penetration, low evaporation, and good longevity. Consider also that frequent application will require frequent equipment clean-up.

After considering the above factors, the soil binders in Table 1 will be generally appropriate as follows:

Plant-Material Based (Short Lived)

-*Guar*: Guar is a non-toxic, biodegradable, natural galactomannan-based hydrocolloid treated with dispersent agents for easy field mixing. It shall be diluted at the rate of 1.2 to 1.8 kg per 1,000 liters (1 to 5 lb per 100 gallons) of water, depending on application machine capacity. Recommended minimum application rates are as follows:

Application Rates for Guar Soil Stabilizer

Slope (V:H):	Flat	1:4	1:3	1:2	1:1
Kg/Ha:	45	50	56	67	78
lb/ac	40	45	50	60	70

-*Psyllium*: Psyllium is composed of the finely ground muciloid coating of plantago seeds that is applied as a dry powder or in a wet slurry to the surface of the soil. It dries to form a firm but rewettable membrane that binds soil particles together but permits germination and growth of seed. Psyllium requires 12 to 18 hours drying time. Psyllium shall be applied at a rate of 90 to 225 kg/ha (80 to 200 lb/ac), with enough water in solution to allow for a uniform slurry flow.

-*Starch*: Starch is non-ionic, cold-water soluble (pre-gelatinized) granular cornstarch. The material is mixed with water and applied at the rate of 170 kg/ha (150 lb/ac). Approximate drying time is 9 to 12 hours.

Plant-Material Based (Long Lived)

-*Pitch and Rosin Emulsion*: Generally, a non-ionic pitch and rosin emulsion has a minimum solids content of 48%. The rosin shall be a minimum of 26% of the total solids content. The soil stabilizer shall be non-corrosive, water-dilutable emulsion that upon application cures to a water insoluble binding and cementing agent. For soil erosion control applications, the emulsion is diluted and shall be applied as follows:

For clayey soil: 5 parts water to 1 part emulsion

For sandy soil: 10 parts water to 1 part emulsion

Application can be by water truck or hydraulic seeder with the emulsion/product mixture applied at the rate specified by the manufacturer. Approximate drying time is 19 to 24 hours.

Polymeric Emulsion Blends

-Acrylic Copolymers and Polymers: Polymeric soil stabilizers shall consist of a liquid or solid polymer or copolymer with an acrylic base that contains a minimum of 55% solids. The polymeric compound shall be handled and mixed in a manner that will not cause foaming or shall contain an anti-foaming agent. The polymeric emulsion shall not exceed its shelf life or expiration date; manufacturers shall provide the expiration date. Polymeric soil stabilizer shall be readily miscible in water, non-injurious to seed or animal life, non-flammable, shall provide surface soil stabilization for various soil types without totally inhibiting water infiltration, and shall not re-emulsify when cured. The applied compound shall air cure within a maximum of 36 to 48 hours. Liquid copolymer shall be diluted at a rate of 10 parts water to 1 part polymer and applied to soil at a rate of 11,000 liters/hectare (1,175 gal/ac).

-Liquid Polymers of Methacrylates and Acrylates: This material consists of a tackifier/sealer that is a liquid polymer of methacrylates and acrylates. It is an aqueous 100% acrylic emulsion blend of 40% solids by volume that is free from styrene, acetate, vinyl, ethoxylated surfactants or silicates. For soil stabilization applications, it is diluted with water in accordance with manufacturer's recommendations, and applied with a hydraulic seeder at the rate of 190 L/ha (20 gal/ac). Drying time is 12 to 18 hours after application.

-Copolymers of Sodium Acrylates and Acrylamides: These materials are non-toxic, dry powders that are copolymers of sodium acrylate and acrylamide. They are mixed with water and applied to the soil surface for erosion control at rates that are determined by slope gradient:

Slope Gradient (V:H)	kg/ha (lb/ac)
Flat to 1:5	3.4 – 5.6 (3-5)
1:5 to 1:3	5.6 – 11.2 (5-10)
1:2 to 1:1	11.2 – 22.4 (10-20)

-Poly-Acrylamide and Copolymer of Acrylamide: Linear copolymer polyacrylamide is packaged as a dry-flowable solid. When used as a stand-alone stabilizer, it is diluted at a rate of 1.5 kg/1,000 liters (1 lb/100 gal) of water and applied at the rate of 5.6 kg/ha (5 lb/ac).

-Hydro-Colloid Polymers: Hydro-Colloid Polymers are various combinations of dry-flowable poly-acrylamides, copolymers and hydro-colloid polymers that are mixed with water and applied to the soil surface at rates of 60 to 70 kg/ha (53 to 62 lb/ac). Drying times are 0 to 4 hours.

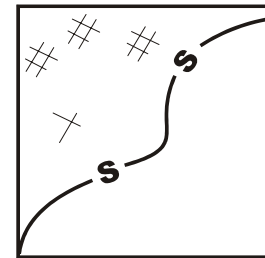
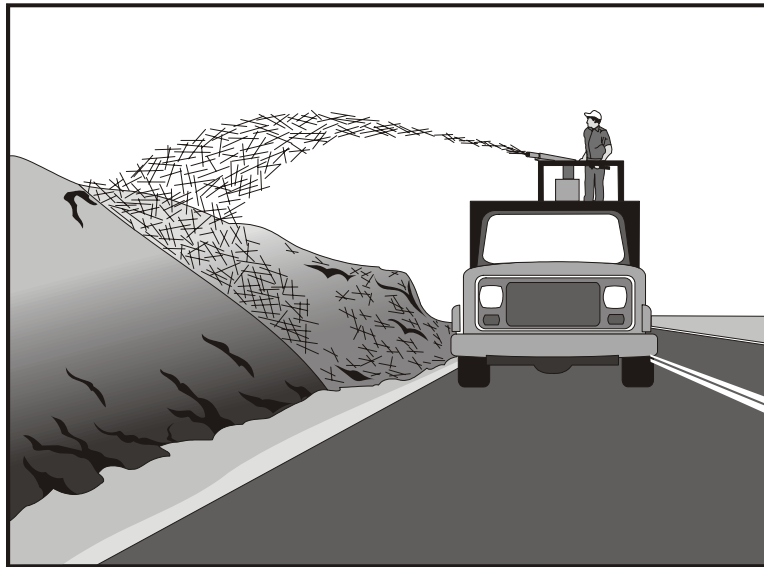
Cementitious-Based Binders

-Gypsum: This is a formulated gypsum-based product that readily mixes with water and mulch to form a thin protective crust on the soil surface. It is composed of high purity gypsum that is ground, calcined and processed into calcium sulfate hemihydrate with a minimum purity of 86%. It is mixed in a hydraulic seeder and applied at rates 4,500 to 13,500 kg/ha (4,000 to 12,000 lb/ac). Drying time is 4 to 8 hours.

- | | |
|-----------------------------------|--|
| Maintenance and Inspection | <ul style="list-style-type: none">■ Reapplying the selected soil binder may be needed for proper maintenance. High traffic areas shall be inspected daily, and lower traffic areas shall be inspected weekly.■ After any rainfall event, the Contractor is responsible for maintaining all slopes to prevent erosion.■ Maintain an unbroken, temporary stabilized area while DSAs are nonactive. Repair any damaged stabilized area and re-apply soil binder to exposed areas. |
|-----------------------------------|--|

Table 1 Properties of Soil Binders for Erosion Control				
Chemicals	Plant Material Based (Short Lived)	Plant Material Based (Long Lived)	Polymeric Emulsion Blends	Cementitious-Based Binders
Relative Cost	Low	Low	Low	Low
Resistance to Leaching	High	High	Low to Moderate	Moderate
Resistance to Abrasion	Moderate	Low	Moderate to High	Moderate to High
Longevity	Short to Medium	Medium	Medium to Long	Medium
Minimum Curing Time before Rain	9 to 18 hours	19 to 24 hours	0 to 24 hours	4 to 8 hours
Compatibility with Existing Vegetation	Good	Poor	Poor	Poor
Mode of Degradation	Biodegradable	Biodegradable	Photodegradable/ Chemically Degradable	Photodegradable/ Chemically Degradable
Labor Intensive	No	No	No	No
Specialized Application Equipment	Water Truck or Hydraulic Mulcher	Water Truck or Hydraulic Mulcher	Water Truck or Hydraulic Mulcher	Water Truck or Hydraulic Mulcher
Liquid/Powder	Powder	Liquid	Liquid/Powder	Powder
Surface Crusting	Yes, but dissolves on rewetting	Yes	Yes, but dissolves on rewetting	Yes
Clean-Up	Water	Water	Water	Water
Erosion Control Application Rate	Varies ⁽¹⁾	Varies ⁽¹⁾	Varies ⁽¹⁾	4,500 to 13,500 kg/ha

(1) Dependant on product, soil type, and slope inclination



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose	Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil with a studded roller or anchoring it with a stabilizing emulsion. This is one of five temporary soil stabilization alternatives to consider.
Appropriate Applications	<ul style="list-style-type: none"> ■ Straw mulch is typically used for soil stabilization as a temporary surface cover on disturbed areas until soils can be prepared for revegetation and permanent vegetation is established. ■ Also typically used in combination with temporary and/or permanent seeding strategies to enhance plant establishment.
Limitations	<ul style="list-style-type: none"> ■ Availability of erosion control contractors and straw may be limited prior to the rainy season due to high demand. ■ There is a potential for introduction of weed-seed and unwanted plant material. ■ When straw blowers are used to apply straw mulch, the treatment areas must be within 45 m (150 ft) of a road or surface capable of supporting trucks. ■ Straw mulch applied by hand is more time intensive and potentially costly. ■ May have to be removed prior to permanent seeding or soil stabilization. ■ “Punching” of straw does not work in sandy soils.

Standards and Specifications

- Straw shall be derived from wheat, rice, or barley.
- All materials shall conform to Standard Specifications Sections 20-2.06, 20-2.07 and 20-2.11.
- A tackifier is the preferred method for anchoring straw mulch to the soil on slopes.
- Crimping, punch roller-type rollers, or track-walking may also be used to incorporate straw mulch into the soil on slopes. Track walking shall only be used where other methods are impractical.
- Avoid placing straw onto the traveled way, sidewalks, lined drainage channels, sound walls, and existing vegetation.
- Straw mulch with tackifier shall not be applied during or immediately before rainfall.

Application Procedures

- Apply loose straw at a minimum rate of 3,570 kg/ha (4,000 lb/ac), or as indicated in the project's special provisions, either by machine or by hand distribution.
- If stabilizing emulsion will be used to anchor the straw mulch in lieu of incorporation, roughen embankment or fill areas by rolling with a crimping or punching-type roller or by track walking before placing the straw mulch. Track walking should only be used where rolling is impractical.
- The straw mulch must be evenly distributed on the soil surface.
- Anchor the mulch in place by using a tackifier or by "punching" it into the soil mechanically (incorporating).
- A tackifier acts to glue the straw fibers together and to the soil surface. The tackifier shall be selected based on longevity and ability to hold the fibers in place.
- A tackifier is typically applied at a rate of 140 kg/ha (125 lb/ac). In windy conditions, the rates are typically 200 kg/ha (178 lb/ac).
- Methods for holding the straw mulch in place depend upon the slope steepness, accessibility, soil conditions and longevity. If the selected method is incorporation of straw mulch into the soil, then do as follows:
 - Applying and incorporating straw shall follow the requirements in Standard Specifications Section 20-3.03.
 - On small areas, a spade or shovel can be used.

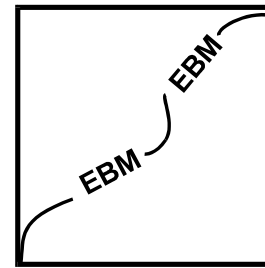
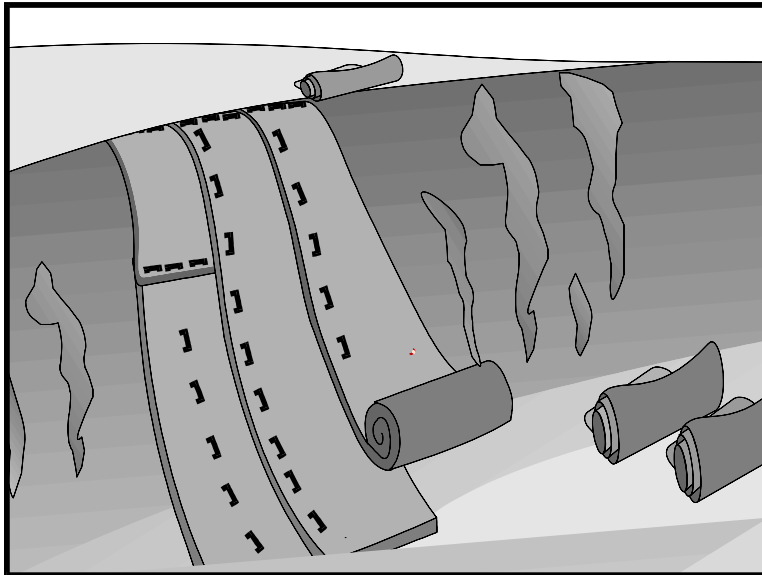
- On slopes with soils, which are stable enough and of sufficient gradient to safely support construction equipment without contributing to compaction and instability problems, straw can be “punched” into the ground using a knife-blade roller or a straight bladed coulter, known commercially as a “crimper.”
- On small areas and/or steep slopes, straw can also be held in place using plastic netting or jute. The netting shall be held in place using 11 gauge wire staples, geotextile pins or wooden stakes. Refer to BMP SS-7, “Geotextiles, Plastic Covers and Erosion Control Blankets/Mats.”

Maintenance and Inspections

- The key consideration in Maintenance and Inspection is that the straw needs to last long enough to achieve erosion control objectives.
- Maintain an unbroken, temporary mulched ground cover while DSAs are non-active. Repair any damaged ground cover and re-mulch exposed areas.
- Reapplication of straw mulch and tackifier may be required by the Resident Engineer (RE) to maintain effective soil stabilization over disturbed areas and slopes.
- After any rainfall event, the Contractor is responsible for maintaining all slopes to prevent erosion.

Geotextiles, Mats, Plastic Covers and Erosion Control Blankets

SS-7



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose This Best Management Practice (BMP) involves the placement of geotextiles, mats, plastic covers, or erosion control blankets to stabilize disturbed soil areas and protect soils from erosion by wind or water. This is one of five temporary soil stabilization alternatives to consider.

Appropriate Applications These measures are used when disturbed soils may be particularly difficult to stabilize, including the following situations:

- Steep slopes, generally steeper than 1:3 (V:H).
- Slopes where the erosion potential is high.
- Slopes and disturbed soils where mulch must be anchored.
- Disturbed areas where plants are slow to develop.
- Channels with flows exceeding 1.0 m/s (3.3 ft/s).
- Channels to be vegetated.
- Stockpiles.
- Slopes adjacent to water bodies of Environmentally Sensitive Areas (ESAs).

- Limitations**
- Blankets and mats are more expensive than other erosion control measures, due to labor and material costs. This usually limits their application to areas inaccessible to hydraulic equipment, or where other measures are not applicable, such as channels.
 - Blankets and mats are generally not suitable for excessively rocky sites, or areas where the final vegetation will be mowed (since staples and netting can catch in mowers).
 - Blankets and mats must be removed and disposed of prior to application of permanent soil stabilization measures.
 - Plastic sheeting is easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
 - Plastic results in 100% runoff, which may cause serious erosion problems in the areas receiving the increased flow.
 - The use of plastic shall be limited to covering stockpiles, or very small graded areas for short periods of time (such as through one imminent storm event), until alternative measures, such as seeding and mulching, may be installed.
 - Geotextiles, mats, plastic covers, and erosion control covers have maximum flow rate limitations; consult the manufacturer for proper selection.

Standards and Specifications

Material Selection

There are many types of erosion control blankets and mats, and selection of the appropriate type shall be based on the specific type of application and site conditions. Selection(s) made by the Contractor must be approved by the Resident Engineer (RE); certification of compliance shall be in accordance with Standard Specifications Section 6-1.07.

Geotextiles

- Material shall be a woven polypropylene fabric with minimum thickness of 1.5 mm (0.06 inch), minimum width of 3.7 m (12 ft) and shall have minimum tensile strength of 0.67 kN (warp) 0.36 kN (fill) in conformance with the requirements in ASTM Designation: D 4632. The permittivity of the fabric shall be approximately 0.07 sec –1 in conformance with the requirements in ASTM Designation: D4491. The fabric shall have an ultraviolet (UV) stability of 70 percent in conformance with the requirements in ASTM designation: D4355. Geotextile blankets shall be secured in place with wire staples or sandbags and by keying into tops of slopes and edges to prevent infiltration of surface waters under Geotextile. Staples shall be made of 3.05-mm (0.12-inch) steel wire and shall be U-shaped with 200-mm (8-inch) legs and 50-mm (2-inch) crown.
- Geotextiles may be reused if, in the opinion of the RE, they are suitable for the use intended.

Plastic Covers

- Plastic sheeting shall have a minimum thickness of 6 mil, and shall be keyed in at the top of slope and firmly held in place with sandbags or other weights placed no more than 3 m (10 ft) apart. Seams are typically taped or weighted down their entire length, and there shall be at least a 300 mm to 600 mm (12 to 24 inches) overlap of all seams. Edges shall be embedded a minimum of 150 mm (6 inches) in soil.
- All sheeting shall be inspected periodically after installation and after significant rainstorms to check for erosion, undermining, and anchorage failure. Any failures shall be repaired immediately. If washout or breakages occurs, the material shall be re-installed after repairing the damage to the slope.

Erosion Control Blankets/Mats

- Biodegradable rolled erosion control products (RECPs) are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. For an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable.
 - **Jute** is a natural fiber that is made into a yarn, which is loosely woven into a biodegradable mesh. It is designed to be used in conjunction with vegetation and has longevity of approximately one year. The material is supplied in rolled strips, which shall be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
 - **Excelsior (curled wood fiber)** blanket material shall consist of machine produced mats of curled wood excelsior with 80 percent of the fiber 150 mm (6 inches) or longer. The excelsior blanket shall be of consistent thickness. The wood fiber shall be evenly distributed over the entire area of the blanket. The top surface of the blanket shall be covered with a photodegradable extruded plastic mesh. The blanket shall be smolder resistant without the use of chemical additives and shall be non-toxic and non-injurious to plant and animal life. Excelsior blanket shall be furnished in rolled strips, a minimum of 1220 mm (48 inches) wide, and shall have an average weight of 0.5 kg/m² (12 lb/ft²), ±10 percent, at the time of manufacture. Excelsior blankets shall be secured in place with wire staples. Staples shall be made of 3.05-mm (0.12 inch) steel wire and shall be U-shaped with 200-mm (8-inch) legs and 50-mm (2-inch) crown.

- **Straw blanket** shall be machine-produced mats of straw with a lightweight biodegradable netting top layer. The straw shall be attached to the netting with biodegradable thread or glue strips. The straw blanket shall be of consistent thickness. The straw shall be evenly distributed over the entire area of the blanket. Straw blanket shall be furnished in rolled strips a minimum of 2 m (6.5 ft) wide, a minimum of 25 m (80 ft) long and a minimum of 0.27 kg/m² (6.4 lb/ft²). Straw blankets shall be secured in place with wire staples. Staples shall be made of 3.05-mm (0.12 inch) steel wire and shall be U-shaped with 200-mm (8-inch) legs and 50-mm (2-inch) crown.
- **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives. The material is designed to enhance revegetation. The material is furnished in rolled strips, which shall be secured to the ground with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Coconut fiber blanket** shall be machine-produced mats of 100% coconut fiber with biodegradable netting on the top and bottom. The coconut fiber shall be attached to the netting with biodegradable thread or glue strips. The coconut fiber blanket shall be of consistent thickness. The coconut fiber shall be evenly distributed over the entire area of the blanket. Coconut fiber blanket shall be furnished in rolled strips with a minimum of 2 m (6.5 ft) wide, a minimum of 25 m (80 ft) long and a minimum of 0.27-kg/m² (6.4 lb/ft²). Coconut fiber blankets shall be secured in place with wire staples. Staples shall be made of 3.05-mm (0.12 inch) steel wire and shall be U-shaped with 200-mm (8-inch) legs and 50-mm (2-inch) crown.
- **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a biodegradable mat. It is designed to be used in conjunction with vegetation and typically has longevity of several years. The material is supplied in rolled strips, which shall be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Straw coconut fiber blanket** shall be machine-produced mats of 70% straw and 30% coconut fiber with a biodegradable netting top layer and a biodegradable bottom net. The straw and coconut fiber shall be attached to the netting with biodegradable thread or glue strips. The straw coconut fiber blanket shall be of consistent thickness. The straw and coconut fiber shall be evenly distributed over the entire area of the blanket. Straw coconut fiber blanket shall be furnished in rolled strips a minimum of 2 m (6.5 ft) wide, a minimum of 25 m (80 ft) long and a minimum of 0.27 kg/m² (6.4 lb/ft²). Straw coconut fiber blankets shall be secured in place with wire staples. Staples shall be made of 3.05-mm (0.12-inch) steel wire and shall be U-shaped with 200-mm (8-inch) legs and 50-mm (2-inch) crown.

- Non-biodegradable RECPs are typically composed of polypropylene, polyethylene, nylon or other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well.
- **Plastic netting** is a lightweight biaxially-oriented netting designed for securing loose mulches like straw to soil surfaces to establish vegetation. The netting is photodegradable. The netting is supplied in rolled strips, which shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Plastic mesh** is an open-weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than 0.5 cm (0.2 inch). It is used with revegetation or may be used to secure loose fiber such as straw to the ground. The material is supplied in rolled strips, which shall be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light. The mat is a dense, three-dimensional mesh of synthetic (typically polyolefin) fibers stitched between two polypropylene nets. The mats are designed to be revegetated and provide a permanent composite system of soil, roots, and geomatrix. The material is furnished in rolled strips, which shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Bonded synthetic fibers** consist of a three-dimensional geomatrix nylon (or other synthetic) matting. Typically it has more than 90% open area, which facilitates root growth. Its tough root-reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high volume discharges. It can be installed over prepared soil, followed by seeding into the mat. Once vegetated, it becomes an invisible composite system of soil, roots, and geomatrix. The material is furnished in rolled strips that shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high-strength continuous-filament geomatrix or net stitched to the bottom. The material is designed to enhance revegetation. The material is furnished in rolled strips, which shall be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

Site Preparation

- Proper site preparation is essential to ensure complete contact of the blanket or matting with the soil.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 50 mm (2 in) to 75 mm (3 in) of topsoil.

Seeding

Seed the area before blanket installation for erosion control and revegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all check slots and other areas disturbed during installation must be re-seeded. Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Anchoring

- U-shaped wire staples, metal geotextile stake pins or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Staples shall be made of 3.05 mm (0.12 inch) steel wire and shall be U-shaped with 200-mm (8-inch) legs and 50-mm (2-inch) crown.
- Metal stake pins shall be 5 mm (0.188 in) diameter steel with a 40 mm (1.5 in) steel washer at the head of the pin.
- Wire staples and metal stakes shall be driven flush to the soil surface.
- All anchors shall be 150 mm (6 in) to 450 mm (18 in) long and have sufficient ground penetration to resist pullout. Longer anchors may be required for loose soils.

Installation on Slopes

Installation shall be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Begin at the top of the slope and anchor the blanket in a 150 mm (6 in) deep by 150 mm (6 in) wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket downslope in the direction of water flow.

- Overlap the edges of adjacent parallel rolls 50 mm (2 in) to 75 mm (3 in) and staple every 1 m (3 ft).
- When blankets must be spliced, place blankets end over end (shingle style) with 150 mm (6 in) overlap. Staple through overlapped area, approximately 300 mm (12 in) apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
- Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples shall be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 (V:H) to 1:2 (V:H), require a minimum of 2 staples/m² (2 staples/yd²). Moderate slopes, 1:2 (V:H) to 1:3 (V:H), require a minimum of 1½ staples/m² (1 ½ staples/yd²), placing 1 staple/m (1 staple/yd) on centers. Gentle slopes require a minimum of 1 staple/m² (1 staple/yd²).

Installation in Channels

Installation shall be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Dig initial anchor trench 300 mm (12 in) deep and 150 mm (6 in) wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 150 mm (6 in) deep and 150 mm (6 in) wide across the channel at 8 m to 10 m (25 ft to 30 ft) intervals along the channels.
- Cut longitudinal channel anchor slots 100 mm (4 in) deep and 100 mm (4 in) wide along each side of the installation to bury edges of matting, whenever possible extend matting 50 mm (2 in) to 75 mm (3 in) above the crest of the channel side slopes.
- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 300 mm (12 in) intervals. Note: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 75 mm (3 in).
- Secure these initial ends of mats with anchors at 300 mm (12 in) intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench. Unroll adjacent mats upstream in similar fashion, maintaining a 75 mm (3 in) overlap.

- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 300 mm (12 in) intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Alternate method for non-critical installations: Place two rows of anchors on 150 mm (6 in) centers at 8 m (25 ft) to 10 m (30 ft) intervals in lieu of excavated check slots.
- Shingle-lap spliced ends by a minimum of 300 mm (12 in) apart on 300 mm (12 in) intervals.
- Place edges of outside mats in previously excavated longitudinal slots, anchor using prescribed staple pattern, backfill and compact soil.
- Anchor, fill and compact upstream end of mat in a 300 mm (12 in) by 150 mm (6 in) terminal trench.
- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

Soil Filling (if specified for turf reinforcement)

- Always consult the manufacturer's recommendations for installation.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes or brooms for fine grading and touch up.
- Smooth out soil filling, just exposing top netting of mat.

Temporary Soil Stabilization Removal

- When no longer required for the work, temporary soil stabilization shall become the property of the Contractor. Temporary soil stabilization removed from the site of the work shall be disposed of outside the highway right-of-way in conformance with the provisions in Standard Specifications Section 7-1.13. If approved by the RE, the contractor may leave the temporary soil stabilizer in place.

Geotextiles, Mats, Plastic Covers and Erosion Control Blankets

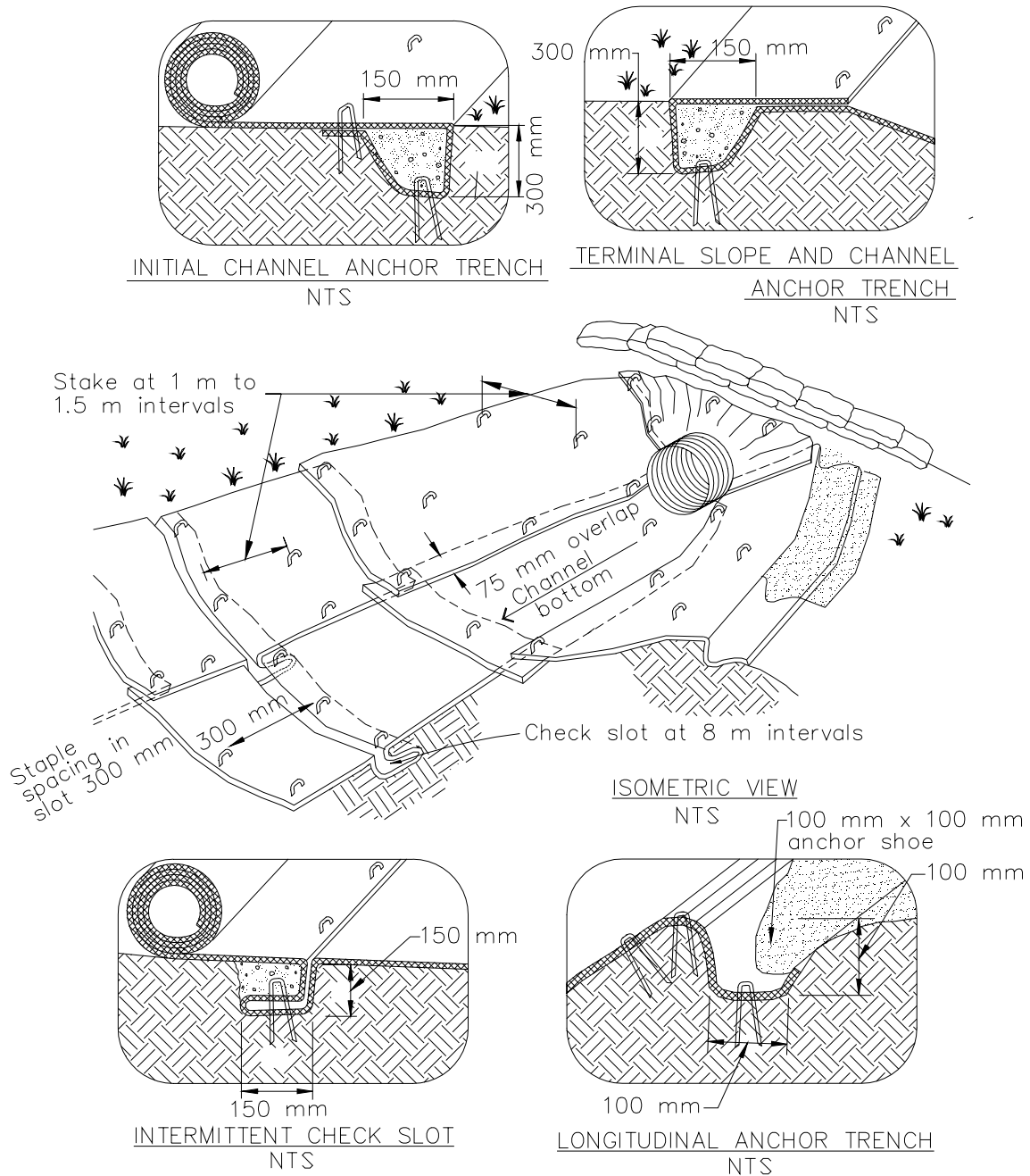
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Maintenance and Inspection

Areas treated with temporary soil stabilization shall be inspected as specified in the special provisions. Areas treated with temporary soil stabilization shall be maintained to provide adequate erosion control. Temporary soil stabilization shall be reapplied or replaced on exposed soils when area becomes exposed or exhibits visible erosion.

- All blankets and mats shall be inspected periodically after installation.
- Installation shall be inspected after significant rain storms to check for erosion and undermining. Any failures shall be repaired immediately.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.

Typical Installation Detail



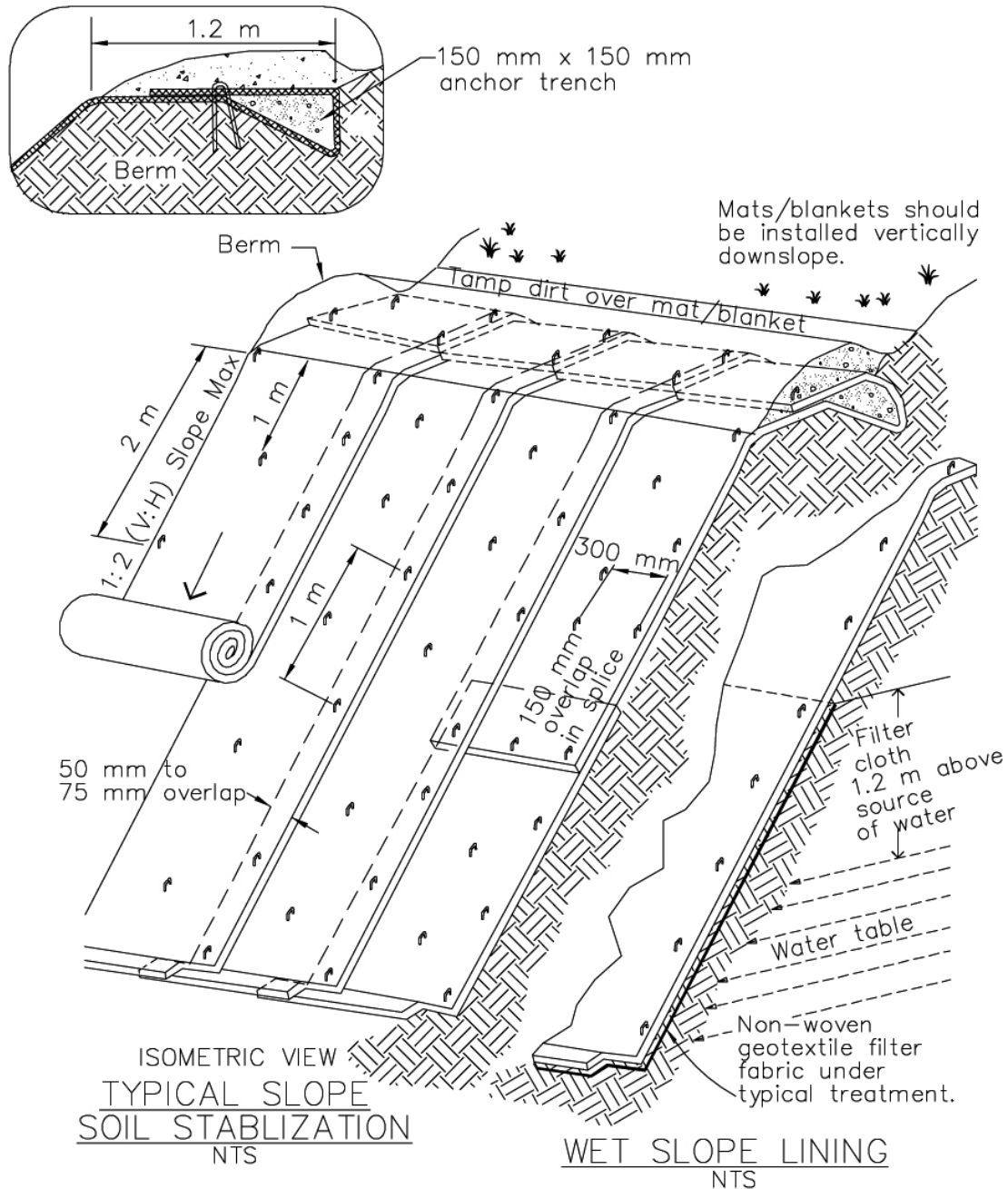
NOTES:

1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

Geotextiles, Mats, Plastic Covers and Erosion Control Blankets

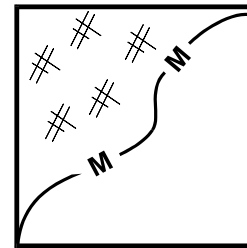
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Typical Installation Detail



NOTES:

1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Wood mulching consist of applying a mixture of shredded wood mulch, bark or compost. Wood mulch is mostly applicable to landscape projects.

The primary function of wood mulching is to reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff.

Appropriate Applications Wood mulching is considered a temporary soil stabilization (erosion control) alternative in the following situations:

- As a stand-alone temporary surface cover on disturbed areas until soils can be prepared for revegetation and permanent vegetative cover can be established.
- As short term, non-vegetative ground cover on slopes to reduce rainfall impact, decrease the velocity of sheet flow, settle out sediment and reduce wind erosion.

Limitations

- Wood mulch may introduce unwanted species.
- Shredded wood does not withstand concentrated flows and is prone to sheet erosion.
- Green material has the potential for the presence of unwanted weeds and other plant materials. Delivery system is primarily by manual labor, although pneumatic application equipment is available.

Standards and Specifications

Mulch Selection

There are many types of mulches, and selection of the appropriate type shall be based on the type of application and site conditions. Prior to use of wood mulches, there shall be concurrence with the District Landscape Architect since some mulch use on construction projects may not be compatible with planned or future projects. Selection of wood mulches by the Contractor shall comply with Standard Specifications Section 20-2.08, and must be approved by the Resident Engineer (RE).

Application Procedures

Prior to application, after existing vegetation has been removed, roughen embankment and fill areas by rolling with a punching-type roller or by track walking. The construction-application procedures for mulches vary significantly depending upon the type of mulching method specified. Two (2) methods are highlighted here:

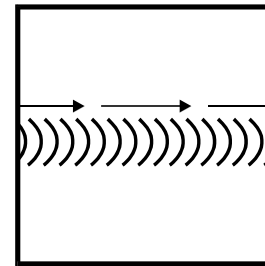
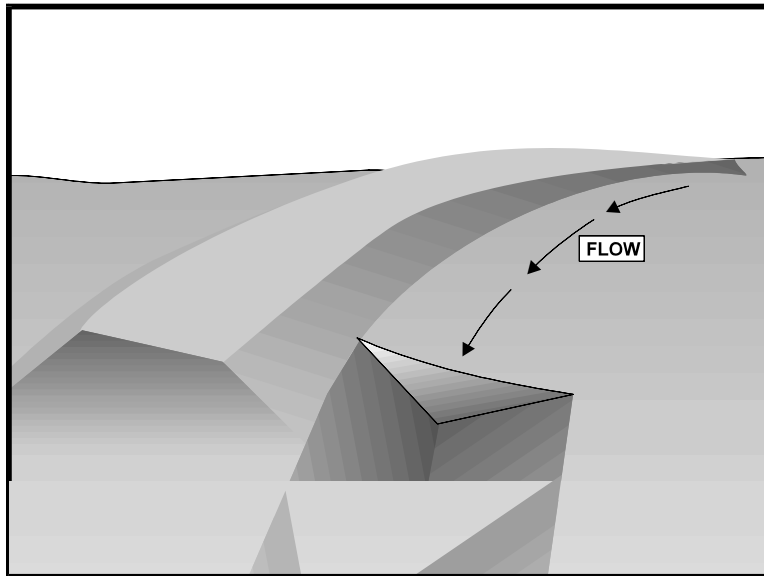
- **Green Material:** This type of mulch is produced by recycling vegetation trimmings such as grass, shredded shrubs and trees. Methods of application are generally by hand, although pneumatic methods are available. Mulch shall be composted to kill weed seeds.
 - It can be used as a temporary ground cover with or without seeding.
 - The green material shall be evenly distributed on site to a depth of not more than 50 mm (2 in).
- **Shredded Wood:** Suitable for ground cover in ornamental or revegetated plantings.
 - Shredded wood/bark is conditionally suitable; see note under limitations.
 - Shall be distributed by hand (although pneumatic methods may be available).
 - The mulch shall be evenly distributed across the soil surface to a depth of 50 mm (2 in) to 75 mm (3 in).
- **Avoid mulch placement onto the traveled way, sidewalks, lined drainage channels, sound walls, and existing vegetation.**
- **All material must be removed before re-starting work on the slopes.**

Maintenance and Inspection

- Regardless of the mulching technique selected, the key consideration in Maintenance and Inspection is that the mulch needs to last long enough to achieve erosion-control objectives. If the mulch is applied as a stand-alone erosion control method over disturbed areas (without seed), it shall last the length of time the site will remain barren or until final re-grading and revegetation.
- Where vegetation is not the ultimate cover, such as ornamental and landscape applications of bark or wood chips, inspection and maintenance shall focus on longevity and integrity of the mulch.

Earth Dikes/Drainage Swales and Lined Ditches

SS-9



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

These are structures that intercept, divert and convey surface run-on, generally sheet flow, to prevent erosion.

Appropriate Applications

- Earth dikes/drainage swales and lined ditches may be used to:
 - Convey surface runoff down sloping land.
 - Intercept and divert runoff to avoid sheet flow over sloped surfaces.
 - Divert and direct runoff towards a stabilized watercourse, drainage pipe or channel.
 - Intercept runoff from paved surfaces.
- Earth dikes/drainage swales and lined ditches also may be used:
 - Below steep grades where runoff begins to concentrate.
 - Along roadways and facility improvements subject to flood drainage.
 - At the top of slopes to divert run-on from adjacent or undisturbed slopes.
 - At bottom and mid-slope locations to intercept sheet flow and convey concentrated flows.
- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Earth Dikes/Drainage Swales and Lined Ditches

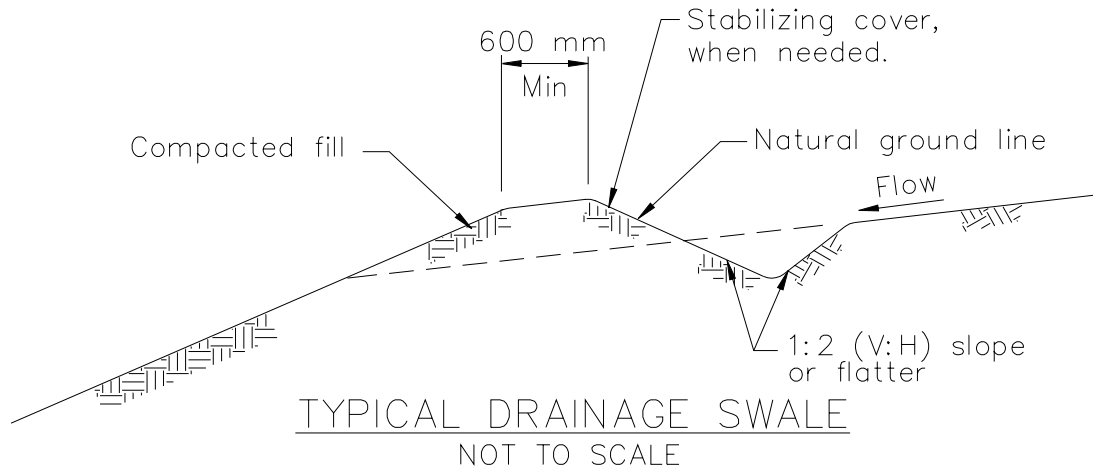
SS-9

- | | |
|-------------------------------------|---|
| Limitations | <ul style="list-style-type: none">■ Earth dikes/drainage swales and lined ditches are not suitable as sediment trapping devices.■ May be necessary to use other soil stabilization and sediment controls, such as check dams, plastics, and blankets, to prevent scour and erosion in newly graded dikes, swales and ditches. |
| Standards and Specifications | <ul style="list-style-type: none">■ Care must be applied to correctly size and locate earth dikes, drainage swales and lined ditches. Excessively steep, unlined dikes and swales are subject to erosion and gully formation.■ Conveyances shall be stabilized.■ Use a lined ditch for high flow velocities.■ Select flow velocity based on careful evaluation of the risks due to erosion of the measure, soil types, over topping, flow backups, washout, and drainage flow patterns for each project site.■ Compact any fills to prevent unequal settlement.■ Do not divert runoff from the highway right-of-way onto other property.■ When possible, install and utilize permanent dikes, swales and ditches early in the construction process.■ Provide stabilized outlets. Refer to SS-10, "Outlet Protection/Velocity/Dissipation Devices." |
| Maintenance and Inspections | <ul style="list-style-type: none">■ Inspect temporary measures prior to the rainy season, after rainfall events, and regularly (approximately once per week) during the rainy season.■ Inspect ditches and berms for washouts. Replace lost riprap, damaged linings or soil stabilizers as needed.■ Inspect channel linings, embankments, and beds of ditches and berms for erosion and accumulation of debris and sediment. Remove debris and sediment, and repair linings and embankments as needed or as directed by the RE.■ Temporary conveyances shall be completely removed as soon as the surrounding drainage area has been stabilized, or at the completion of construction. |



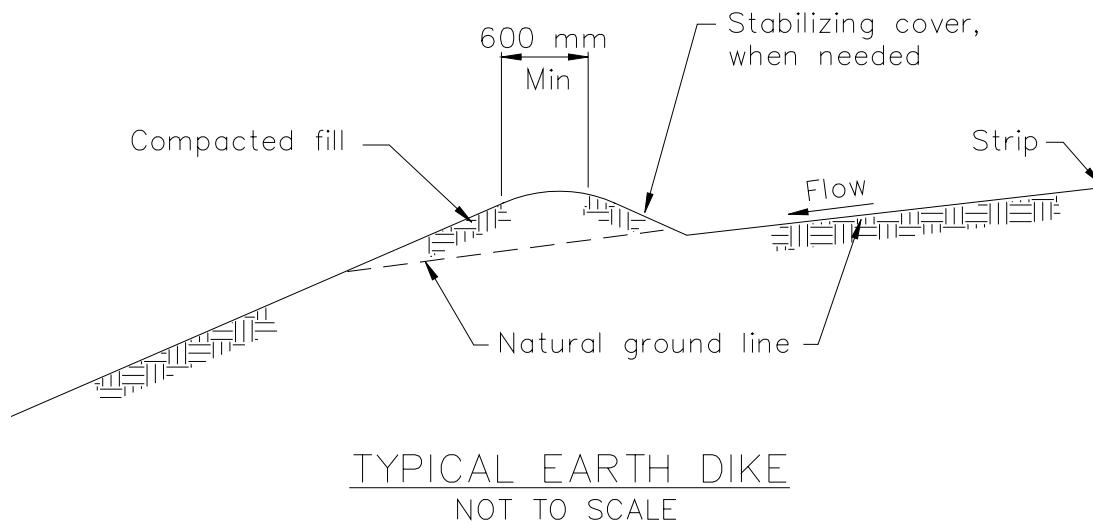
Earth Dikes/Drainage Swales and Lined Ditches

SS-9



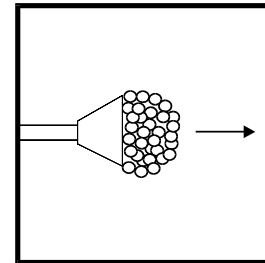
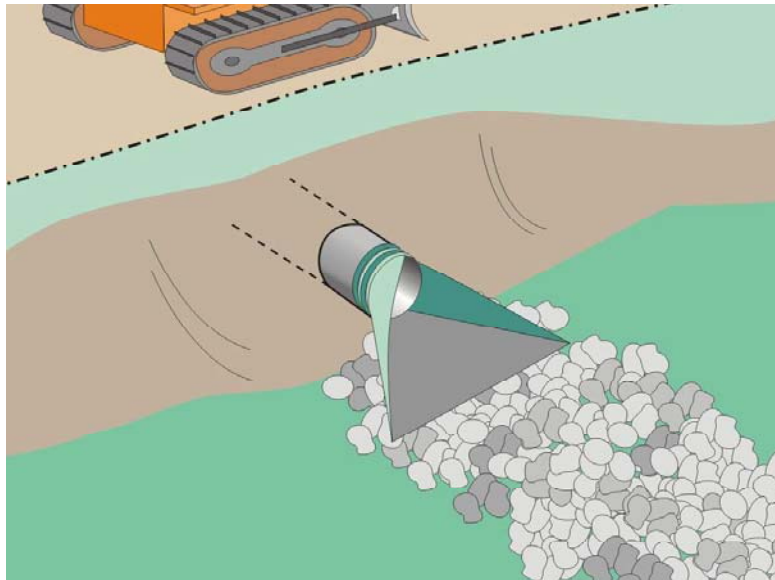
NOTES:

1. Stabilize inlet, outlets and slopes.
2. Properly compact the subgrade, in conformance with Section 19-5 of the Caltrans Standard Specifications.



Outlet Protection/Velocity Dissipation Devices

SS-10



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose These devices are placed at pipe outlets to prevent scour and reduce the velocity and/or energy of storm water flows.

Appropriate Applications

- These devices may be used at the following locations:
 - Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits or channels.
 - Outlets located at the bottom of mild to steep slopes.
 - Discharge outlets that carry continuous flows of water.
 - Outlets subject to short, intense flows of water, such as flash floods.
 - Points where lined conveyances discharge to unlined conveyances.
- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Limitations

- Loose rock may have stones washed away during high flows.
- Grouted riprap may break up in areas of freeze and thaw.
- If there is not adequate drainage, and water builds up behind grouted riprap, it may cause the grouted riprap to break up due to the resulting hydrostatic pressure.

Outlet Protection/Velocity Dissipation Devices

SS-10

Standards and Specifications

- There are many types of energy dissipaters, with rock being the one that is represented in the figure on Page 3. Please note that this is only one example and the RE may approve other types of devices proposed by the contractor.
- Install riprap, grouted riprap, or concrete apron at selected outlet. Riprap aprons are best suited for temporary use during construction.
- Carefully place riprap to avoid damaging the filter fabric.
- For proper operation of apron:
 - Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in upper section of apron.
 - If size of apron riprap is large, protect underlying filter fabric with a gravel blanket.
- Outlets on slopes steeper than 10% shall have additional protection.

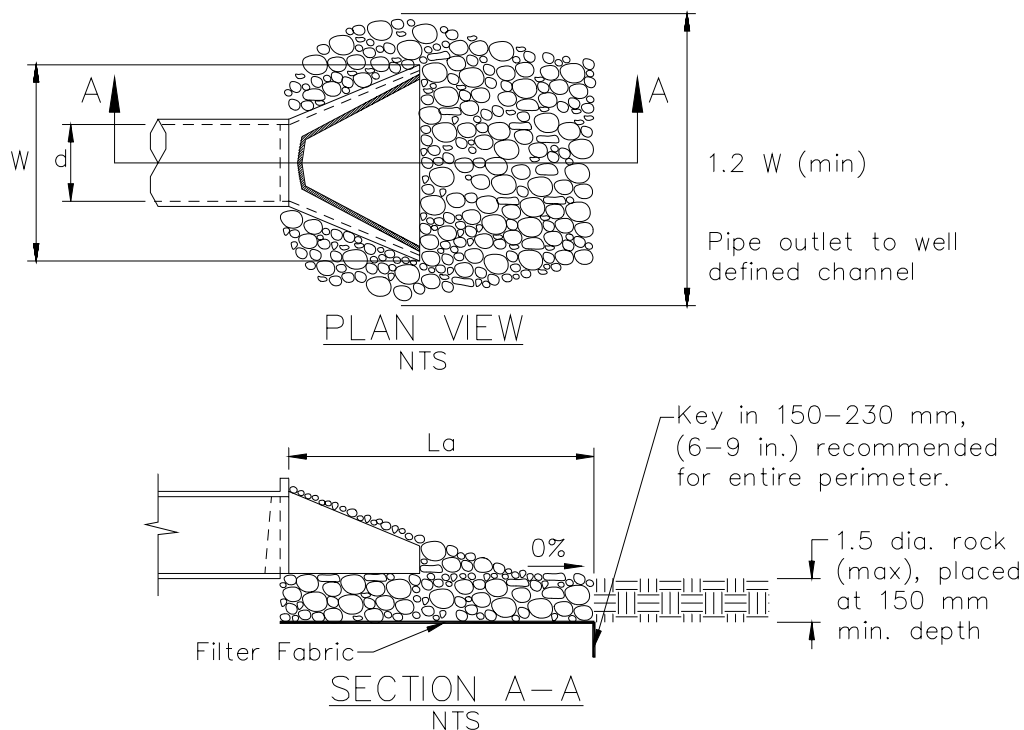
Maintenance and Inspection

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



Outlet Protection/Velocity Dissipation Devices

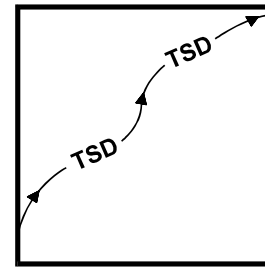
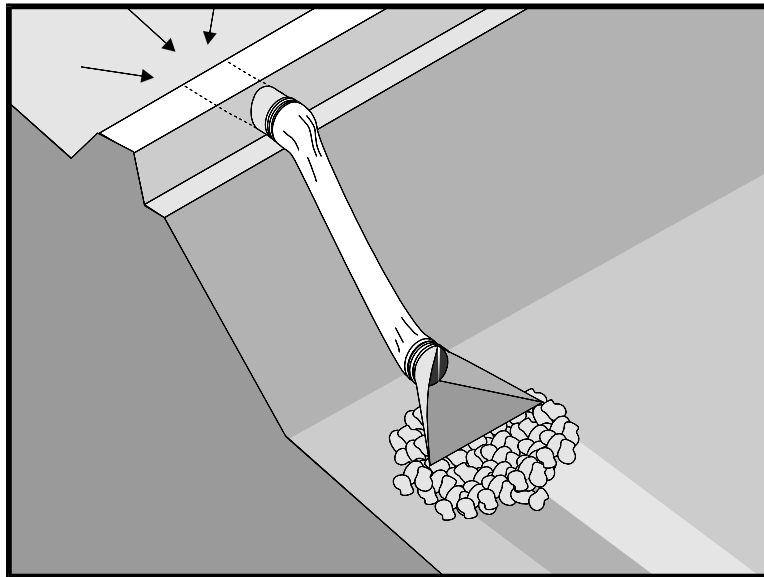
SS-10



Pipe Diameter mm	Discharge m ³ /s	Apron Length, La m	Rip Rap D ₅₀ Diameter Min mm
300	0.14	3	100
	0.28	4	150
450	0.28	3	150
	0.57	5	200
	0.85	7	300
	1.13	8	400
600	0.85	5	200
	1.13	8	200
	1.42	8	300
	1.70	9	400
For larger or higher flows, consult a Registered Civil Engineer			

Source: USDA – SCS





Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose A slope drain is a pipe used to intercept and direct surface runoff or groundwater into a stabilized watercourse, trapping device or stabilized area. Slope drains are used with lined ditches to intercept and direct surface flow away from slope areas to protect cut or fill slopes.

Appropriate Applications

- Slope drains may be used on construction sites where slopes may be eroded by surface runoff.
- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Limitations

- Severe erosion may result when slope drains fail by overtopping, piping, or pipe separation.

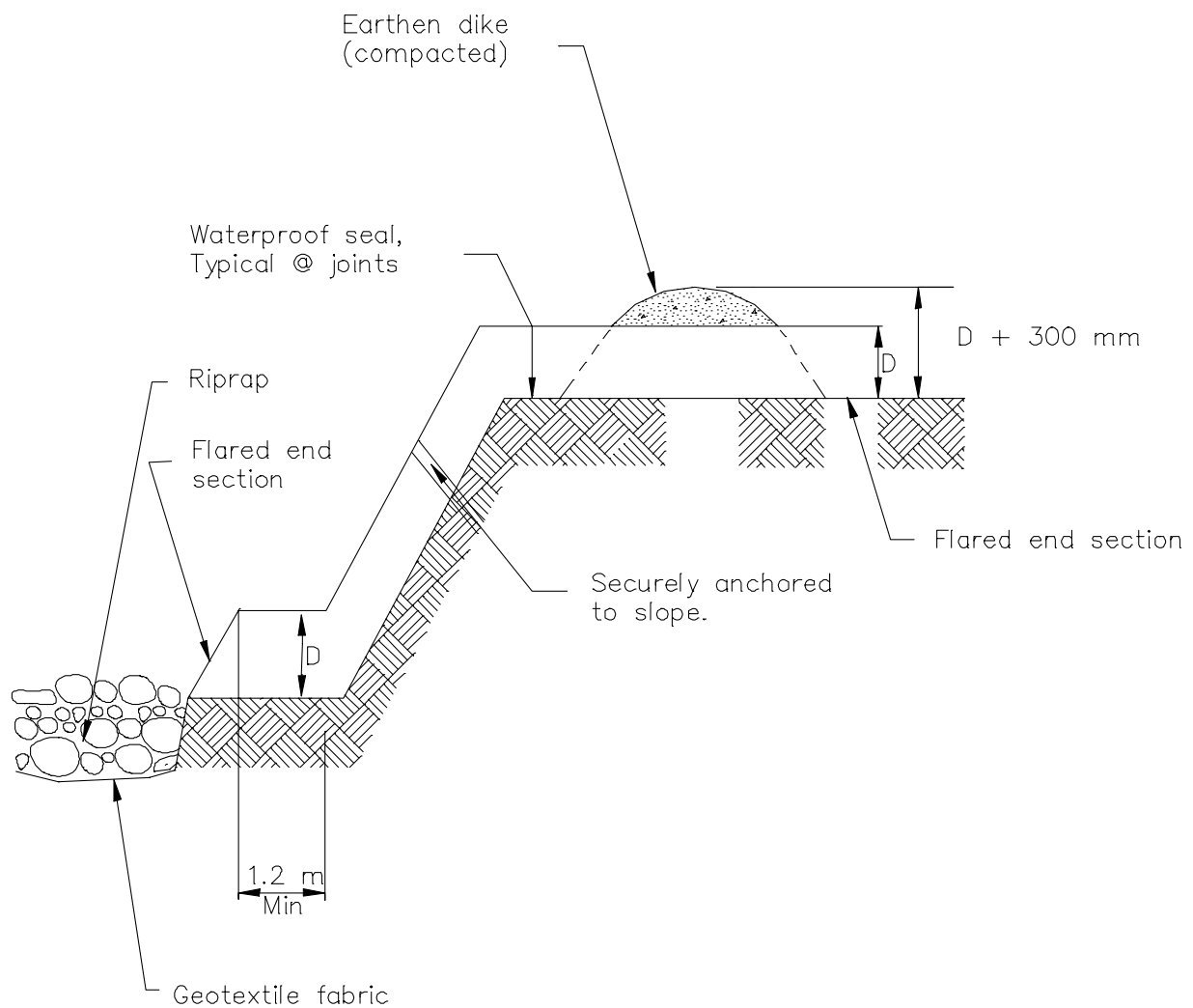
Standards and Specifications

- When using slope drains, limit drainage area to 4 ha (10 ac) per pipe. For larger areas, use a rock-lined channel or a series of pipes.
- Maximum slope generally limited to 1:2 (V:H), as energy dissipation below steeper slopes is difficult.
- Direct surface runoff to slope drains with interceptor dikes. See BMP SS-8, "Earth Dikes/Drainage Swales, and Lined Ditches."
- Slope drains can be placed on or buried underneath the slope surface.
- Recommended materials are PVC, ABS, or comparable pipe.
- When installing slope drains:
 - Install slope drains perpendicular to slope contours.

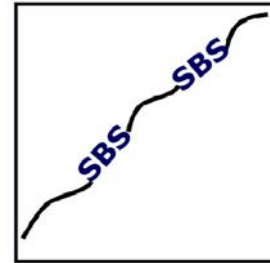
- Compact soil around and under entrance, outlet, and along length of pipe.
- Securely anchor and stabilize pipe and appurtenances into soil.
- Check to ensure that pipe connections are water tight.
- Protect area around inlet with filter cloth. Protect outlet with riprap or other energy dissipation device. For high energy discharges, reinforce riprap with concrete or use reinforced concrete device.
- Protect inlet and outlet of slope drains; use standard flared end section at entrance and exit for pipe slope drains 300 mm (12in) and larger.

Maintenance and Inspection

- Inspect before and after each rain storm, and twice monthly until the tributary drainage area has been stabilized. Follow routine inspection procedures for inlets thereafter.
- Inspect outlet for erosion and downstream scour. If eroded, repair damage and install additional energy dissipation measures. If downstream scour is occurring, it may be necessary to reduce flows being discharged into the channel unless other preventative measures are implemented.
- Inspect slope drainage for accumulations of debris and sediment.
- Remove built-up sediment from entrances, outlets, and within drains as required.
- Make sure water is not ponding onto inappropriate areas (e.g., active traffic lanes, material storage areas, etc.).



TYPICAL SLOPE DRAIN
NOT TO SCALE



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Drainage systems including the stream channel, streambank, and associated riparian areas, are dynamic and sensitive ecosystems that respond to changes in land use activity. Streambank and channel disturbance resulting from construction activities can increase the stream's sediment load, which can cause channel erosion or sedimentation and have adverse affects on the biotic system. Best Management Practices can reduce the discharge of sediment and other pollutants and minimize the impact of construction activities on watercourses. Streams included on the 303(d) list by the State Water Resources Control Board (SWRCB) may require careful evaluation to prevent any increases in sedimentation, siltation and/or turbidity to the stream.

Appropriate Applications These procedures typically apply to all construction projects that disturb or occur within stream channels and their associated riparian areas.

Limitations Specific permit requirements or mitigation measures such as Regional Water Quality Control Board (RWQCB) 401 Certification, U.S. Army Corps of Engineers 404 permit and approval by California Department of Fish and Game may be included in contract documents. If numerical-based water quality standards are mentioned in any of these and other related permits, testing and sampling may be required. Streams included on the 303(d) list by the State Water Resources Control Board because of being impaired by sediment, silt, or turbidity are required to conduct sampling to verify that there is no net increase in sediment load due to construction activities.

Standards and Specifications **PLANNING**

- Proper planning, design, and construction techniques can minimize impacts normally associated with in-stream construction activities. Poor planning can adversely affect soil, fish, and wildlife resources, land uses, or land users. Planning should take into account: scheduling, avoidance of in-stream construction; minimizing disturbance area and construction time period; using

pre-disturbed areas; selecting crossing location; and selecting equipment.

Scheduling (SS-1)

- Construction activities should be scheduled according to the relative sensitivity of the environmental concerns and in accordance with SS-1, “Scheduling.” Scheduling considerations will be different when working near perennial streams vs. ephemeral streams and are as follows:
 - Construction work near perennial streams should optimally be performed during the dry season (see below).
 - When working in or near ephemeral, intermittent, or perennial streams, construction should be performed during the dry season. By their very nature, ephemeral and intermittent streams are usually dry in the summer, and therefore, in-stream construction activities will not cause significant water quality problems. However, when closing the site at the end of the project, wash any fines (see Washing Fines) that were formed in-situ back into the channel the bed material, to decrease pollution from the first rainstorm (“first flush”) of the season. When working near stream channels, erosion and sediment controls (see silt fences, straw bale barriers, etc.) should be implemented on the banks to keep sediment out of stream channel proper.

Minimize Disturbance

- Minimize disturbance through: selection of the narrowest crossing location; limiting the number of equipment trips across a stream during construction; and, minimizing the number and size of work areas (equipment staging areas and spoil storage areas). Place work areas at least 15 m (50 ft) from the stream channel. Provide stabilized access to the stream when in-stream work is required. Field reconnaissance should be conducted during the planning stage to identify work areas.

Use of Pre-Disturbed Areas

- Locate project sites and work areas in pre-disturbed areas when possible.

Selection of Project Site

- Avoid steep and unstable banks, highly erodible or saturated soils, or highly fractured rock.
- Select project site that minimizes disturbance to aquatic species or habitat.

Equipment Selection

- Select equipment that reduces the amount of pressure exerted on the ground surface, and therefore, reduces erosion potential and/or use overhead or aerial access for transporting equipment across drainage channels. Use equipment that exerts ground pressures of less than 5 or 6 pounds per square inch (PSI), where possible. Low ground pressure equipment includes: wide or high

flotation tires (860 to 1850 mm [34 to 72 in] wide); dual tires; bogie axle systems; tracked machines; lightweight equipment; and, central tire inflation systems.

STREAMBANK STABILIZATION

Preservation of Existing Vegetation (SS-2)

- Preserve existing vegetation in accordance with SS-2, “Preservation of Existing Vegetation.” In a streambank environment preservation of existing vegetation provides the following benefits:

Water Quality Protection:

Vegetated buffers on slopes trap sediment and promote groundwater recharge. The buffer width needed to maintain water quality ranges from 5 to 30 m (16 to 98 ft). On gradual slopes, most of the filtering occurs within the first 10 m (33 ft). Steeper slopes require a greater width of vegetative buffer to provide water quality benefits.

Streambank Stabilization:

The root system of riparian vegetation stabilizes streambanks by increasing tensile strength in the soil. The presence of vegetation modifies the moisture condition of slopes (infiltration, evapotranspiration, interception) and increases bank stability.

Riparian Habitat

Buffers of diverse riparian vegetation provide food and shelter for riparian and aquatic organisms. Minimizing impacts to fisheries habitat is a major concern when working near streams and rivers. Riparian vegetation provides shade, shelter, organic matter (leaf detritus and large woody debris), and other nutrients that are necessary for fish and other aquatic organisms. Buffer widths for habitat concerns are typically wider than those recommended for water quality concerns (30 to 500 m [98 to 1,640 ft]).

When working near watercourses, it is important to understand the work site’s placement in the watershed. Riparian vegetation in the headwater streams has a greater impact on overall water quality than vegetation in downstream reaches. Preserving existing vegetation upstream is necessary to maintain water quality, minimize bank failure, and maximize riparian habitat downstream of the work site.

Limitations:

- Local county and municipal ordinances regarding width, extent and type of vegetative buffer required may exceed the specifications provided here; these ordinances should be investigated prior to construction.

Streambank Stabilization Specific Installation:

- As a general rule, the width of a buffer strip between a road and the stream is

recommended to be 15 m (48 ft) plus four times the percent slope of the land, measured between the road and the top of stream bank.

Hydraulic Mulch (SS-3)

- Apply hydraulic mulch on disturbed streambanks above the mean high water level in accordance with SS-3, “Hydraulic Mulch” to provide temporary soil stabilization.

Limitations

- Do not place hydraulic mulch or tackifiers below the mean high water level, as these materials could wash into the channel and impact water quality or possibly cause eutrophication.

Hydroseeding (SS-4)

- Hydroseed disturbed streambanks in accordance with SS-4, “Hydroseeding.”

Limitations

- Do not place tackifiers or fertilizers below the mean high water level, as these materials could wash into the channel and impact water quality or possibly cause eutrophication.

Soil Binders (SS-5)

- Apply soil binders to disturbed streambanks in accordance with SS-5, “Soil Binders.”

Limitations

- Do not place soil binders below the mean high water level. Soil binder must be environmentally benign and non-toxic to aquatic organisms.

Straw Mulch (SS-6)

- Apply straw mulch to disturbed streambanks in accordance with SS-6, “Straw Mulch.”

Limitations

- Do not place straw mulch below the mean high water level, as this material could wash into the channel and impact water quality or possibly cause eutrophication.

Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats (SS-7)

- Install geotextiles, erosion control blankets and plastic as described in SS-7, “Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats” to stabilize disturbed channels and streambanks. Not all applications should be in the channel, for example, certain geotextile netting may snag fish gills and are not appropriate in fish-bearing streams. Geotextile fabrics that are not biodegradable are not appropriate for in-stream use. Additionally, geotextile fabric or blankets placed in channels must be adequate to sustain anticipated

hydraulic forces.

Earth Dikes/Drainage Swales, and Lined Ditches (SS-9)

- Convey, intercept, or divert runoff from disturbed streambanks using SS-9, “Earth Dikes/Drainage Swales, and Lined Ditches.”

Limitations

- Do not place earth dikes in watercourses, as these structures are only suited for intercepting sheet flow, and should not be used to intercept concentrated flow.
- Place appropriately sized outlet protection and energy dissipation in accordance with SS-10, “Outlet Protection/Velocity dissipation Devices.”

Outlet Protection/Velocity Dissipation Devices (SS-10)

- Place outlet protection or velocity dissipation devices at outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits or channels in accordance with SS-10.

Slope Drains (SS-11)

- Use slope drains to intercept and direct surface runoff or groundwater into a stabilized watercourse, trapping device or stabilized area in accordance with SS-11, “Slope Drains.”

Limitations

- Appropriately sized outlet protection/velocity dissipation devices must be placed at outlets to minimize erosion and scour.

STREAMBANK SEDIMENT CONTROL

Silt Fences (SC-1)

- Install silt fences in accordance with SC-1, “Silt Fence” to control sediment. Silt fences should only be installed where sediment-laden water can pond, thus allowing the sediment to settle out.

Fiber Rolls (SC-5)

- Install fiber rolls in accordance with SC-5, “Fiber Rolls” along slope contour above the high water level to intercept runoff, reduce flow velocity, release the runoff as sheet flow and provide removal of sediment from the runoff. In a stream environment, fiber rolls should be used in conjunction with other sediment control methods such as SC-1, “Silt Fence” or SC-9, “Straw Bale Barrier.” Install silt fence, straw bale barrier, or other erosion control methods along the toe of slope above the high water level.

Gravel Bag Berm (SC-6)

- A gravel bag berm or barrier can be utilized to intercept and slow the flow of sediment-laden sheet flow runoff in accordance with SC-6, “Gravel Bag Berm.” In a stream environment gravel bag barriers can allow sediment to settle from runoff before water leaves the construction site and can be used to isolate the work area from the stream.

Limitations:

- Gravel bag barriers are not recommended as a perimeter sediment control practice around streams.

Straw Bale Barrier (SC-9)

- Install straw bale barriers in accordance with SC-9, “Straw Bale Barrier” to control sediment. Straw bale barriers should only be installed where sediment-laden water can pond, thus allowing the sediment to settle out. Install a silt fence in accordance with SC-1, “Silt Fence” on the down-slope side of the straw bale barrier closest to stream channel to provide added sediment control.

Rock Filter

Description and Purpose:

- Rock filters are temporary erosion-control barriers composed of rock that is anchored in place. Rock filters detain the sediment-laden runoff, retain the sediment, and release the water as sheet flow at a reduced velocity. Typical rock filter installations are illustrated at the end of this Section.

Applications:

- Near the toe of slopes that may be subject to flow and rill erosion.

Limitations:

- Inappropriate for drainage areas greater than 2 ha (5 ac).
- Requires sufficient space for ponded water.
- Ineffective for diverting runoff because filters allow water to slowly seep through.
- Rock filter berms are difficult to remove when construction is complete.
- Unsuitable in developed areas or locations where esthetics is a concern.

Specifications:

- Rock: open-graded rock, 19 to 125 mm (0.75 to 5 inches) for concentrated flow applications.
- Woven wire sheathing: 25 mm (1 inch) diameter, hexagonal mesh, galvanized

20-gauge (used with rock filters in areas of concentrated flow).

- In construction traffic areas, maximum rock berm heights should be 300 mm (12 in). Berms should be constructed every 90 m (300 ft) on slopes less than 5:100 (V:H) (5%), every 60 m (200 ft) on slopes between 5:100 (V:H) (5%) and 10:100 (V:H) (10%), and every 30 m (100 ft) on slopes greater than 10:100 (V:H) (10%).

Maintenance and Inspection:

- Inspect berms before and after each significant rainfall event and weekly throughout the rainy season.
- Reshape berms as needed and replace lost or dislodged rock, and/or filter fabric.
- Inspect for sediment accumulation, remove sediment when depth reaches one-third of the berm height or 300 mm (12 in), whichever occurs first.

K-rail

Description and Purpose:

- This is temporary sediment control that uses K-rails to form the sediment deposition area, or to isolate the near-bank construction area. Install K-rails at toe of slope in accordance with procedures described in NS-5, "Clear Water Diversion."
- Barriers are placed end-to-end in a pre-designed configuration and gravel-filled bags are used at the toe of the barrier and also at their abutting ends to seal and prevent movement of sediment beneath or through the barrier walls.

Appropriate Applications:

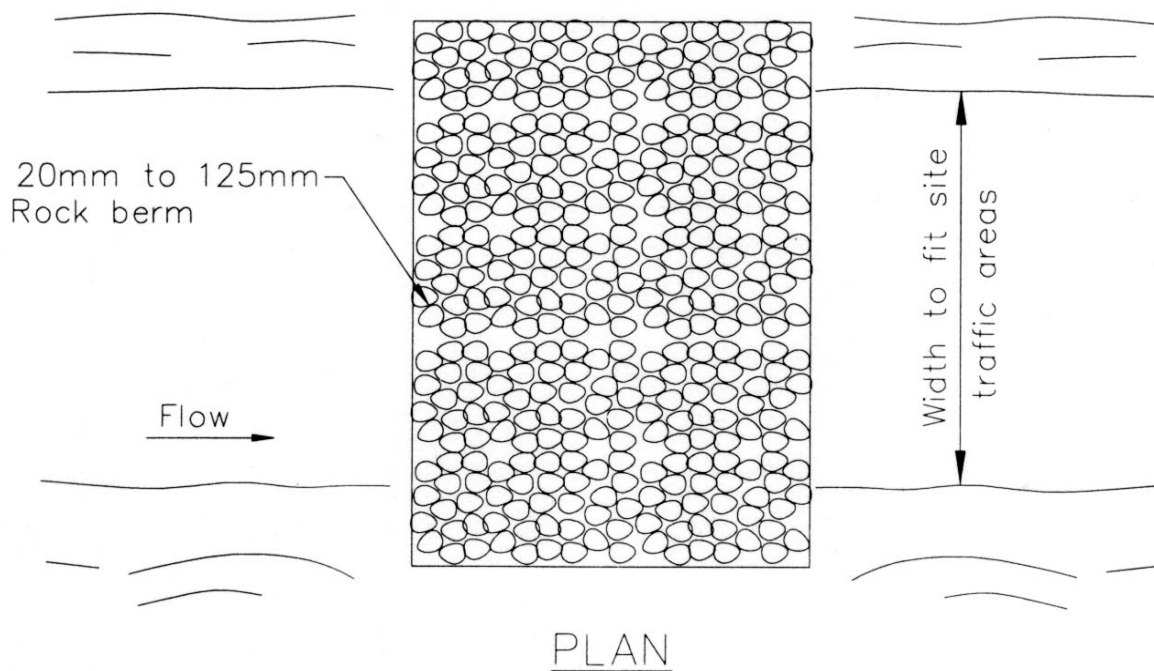
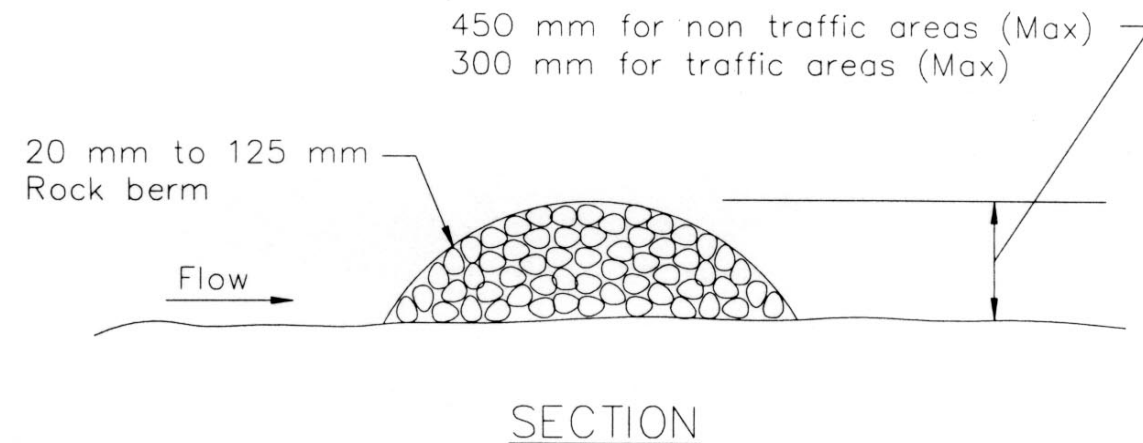
- This technique is useful at the toe of embankments, cut or fill slopes.

Limitations:

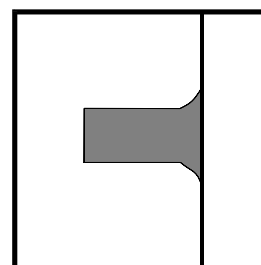
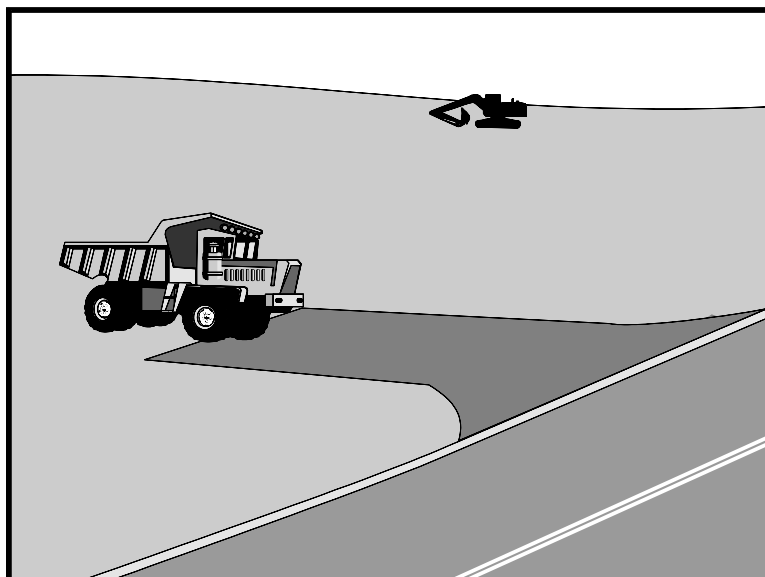
- The K-rail method is not watertight and its proper use should be considered accordingly.

Inspection and Maintenance

- Inspect BMPs daily during construction.
- Maintain and repair BMPs.
- Remove accumulated sediment as necessary.



TYPICAL ROCK FILTER
NOT TO SCALE



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition 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.

Appropriate 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.
- This BMP may be implemented on a project-by-project basis in addition to other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Limitations

- Site conditions will dictate design and need.

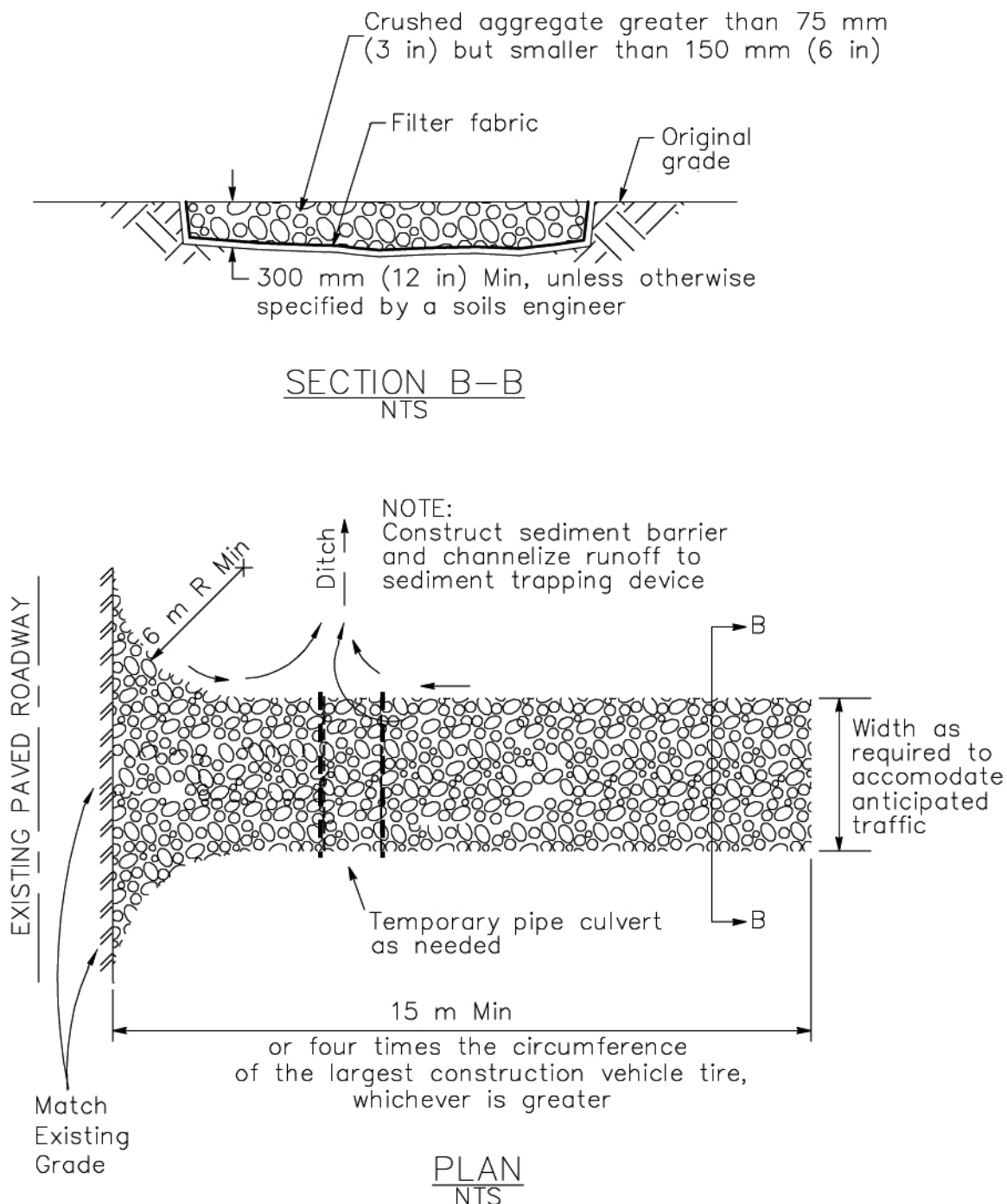
Standards and Specifications

- 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 the heaviest vehicles and equipment that will use it.

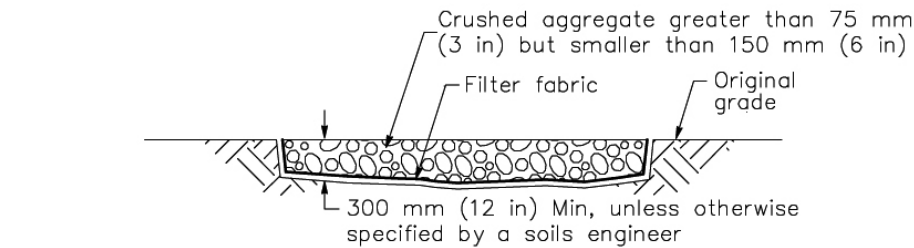
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. The use of asphalt concrete (AC) grindings for stabilized construction access/roadway is not allowed.
- Use of constructed/manufactured steel plates with ribs for entrance/exit access is allowed with written approval from the RE.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 300 mm (12 in) depth, or place aggregate to a depth recommended by the RE. Crushed aggregate greater than 75 mm (3 inches) and smaller than 150 mm (6 inches) shall be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Implement BMP SC-7, “Street Sweeping and Vacuuming” as needed and as required.
- Require all employees, subcontractors, and suppliers to utilize the stabilized construction access.
- All exit locations intended to be used continuously and for a period of time shall have stabilized construction entrance/exit BMPs (TC-1 “Stabilized Construction Entrance/Exit” or TC-3 “Entrance/Outlet Tire Wash”).

Maintenance and Inspection

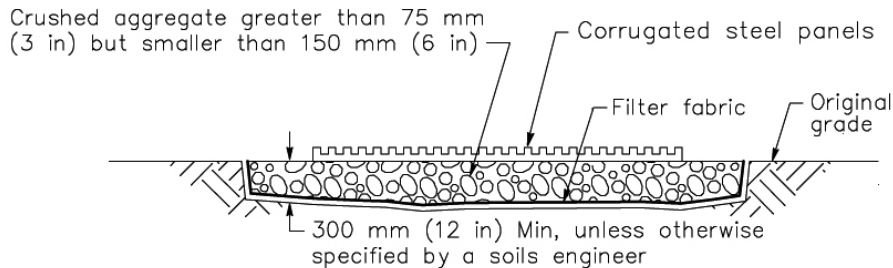
- Inspect routinely for damage and assess effectiveness of the BMP. Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment or as directed by the RE.
- Keep all temporary roadway ditches clear.
- Inspect for damage and repair as needed.



Stabilized Construction Entrance/Exit (Type 1)

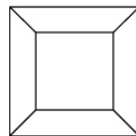


SECTION B-B
NTS

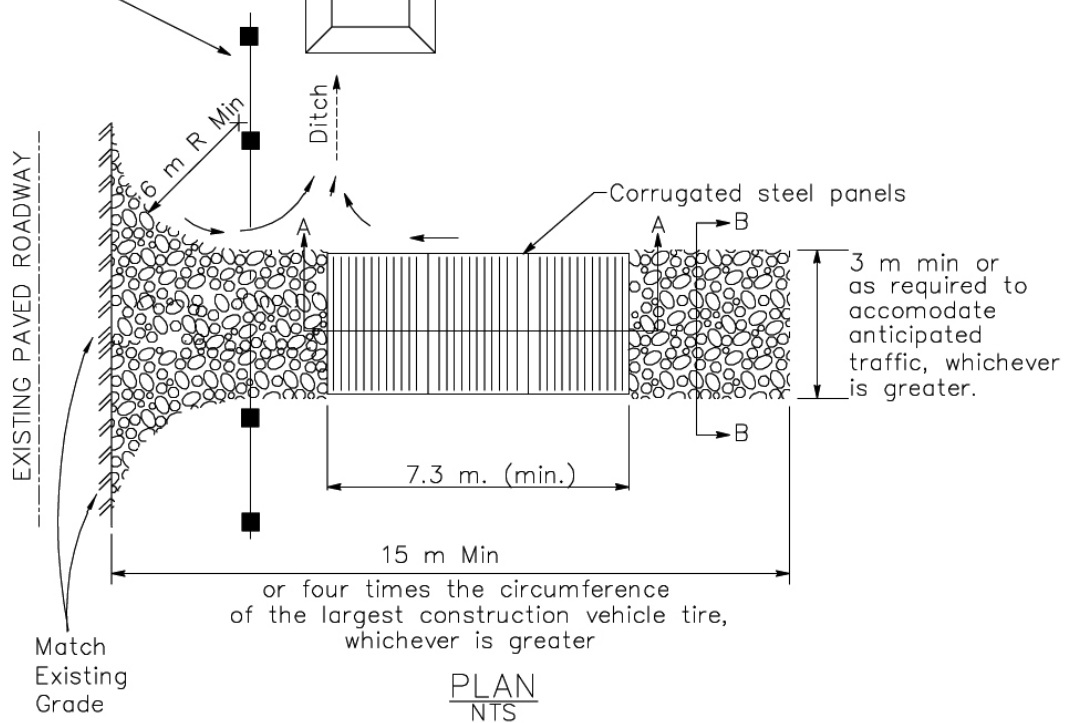


SECTION A-A
NOT TO SCALE

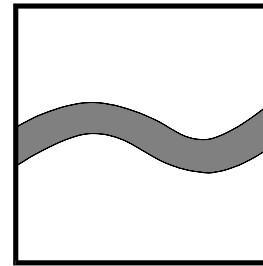
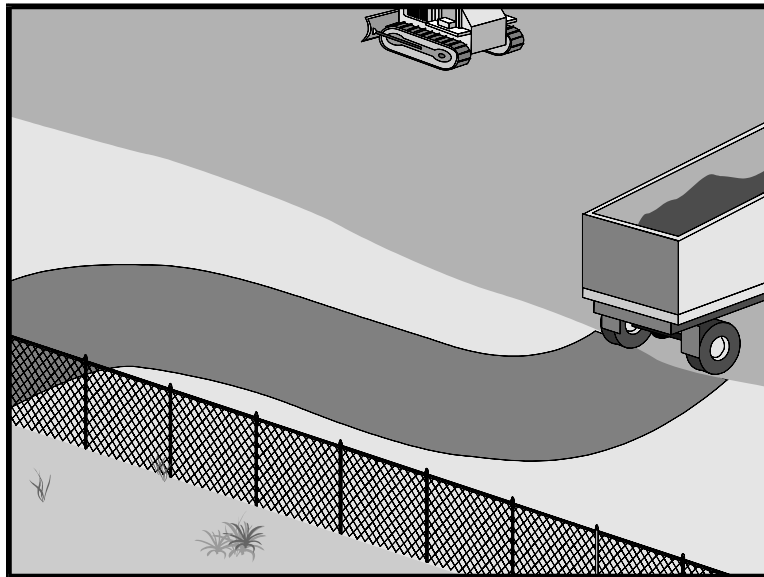
NOTE:
Construct sediment barrier
and channelize runoff to
sediment trapping device



Sediment trapping
device



Stabilized Construction Entrance/Exit (Type 2)



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose A stabilized construction roadway is a temporary access road. It is designed for the control of dust and erosion created by vehicular tracking.

Appropriate Applications

- Construction roadways and short-term detour roads:
 - Where mud tracking is a problem during wet weather.
 - Where dust is a problem during dry weather.
 - Adjacent to water bodies.
 - Where poor soils are encountered.
 - Where there are steep grades and additional traction is needed.

- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Limitations

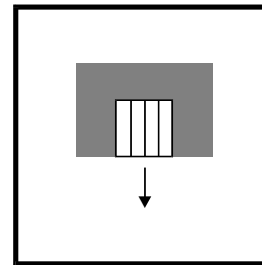
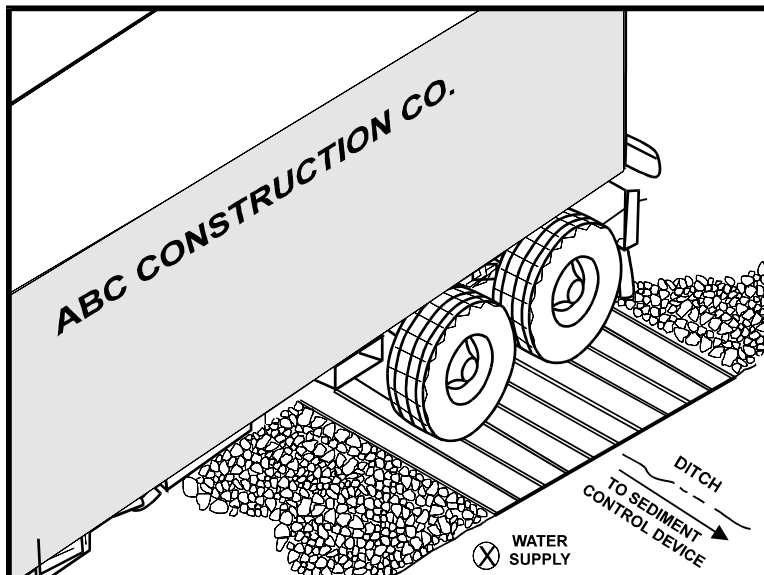
- Materials will likely need to be removed prior to final project grading and stabilization.
- Site conditions will dictate design and need.
- May not be applicable to very short duration projects.
- Limit speed of vehicles to control dust.

Standards and Specifications

- Properly grade roadway to prevent runoff from leaving the construction site.
- Design stabilized access to support the heaviest vehicles and equipment that will use it.
- Stabilize roadway using aggregate, asphalt concrete, or concrete based on longevity, required performance, and site conditions. The use of cold mix asphalt or asphalt concrete (AC) grindings for stabilized construction roadway is not allowed.
- Coordinate materials with those used for stabilized construction entrance/exit points.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 300 mm (12 in) depth, or place aggregate to a depth recommended by the RE or Construction Storm Water Coordinator. Crushed aggregate greater than 75 mm (3 inches) and smaller than 150 mm (6 inches) shall be used.

Maintenance and Inspection

- Inspect routinely for damage and repair as needed, or as directed by the RE.
- Keep all temporary roadway ditches clear.
- When no longer required, remove stabilized construction roadway and re-grade and repair slopes.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

A tire wash is an area located at stabilized construction access points to remove sediment from tires and undercarriages, and to prevent sediment from being transported onto public roadways.

Appropriate Applications

- Tire washes may be used on construction sites where dirt and mud tracking onto public roads by construction vehicles may occur.
- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the Resident Engineer (RE).

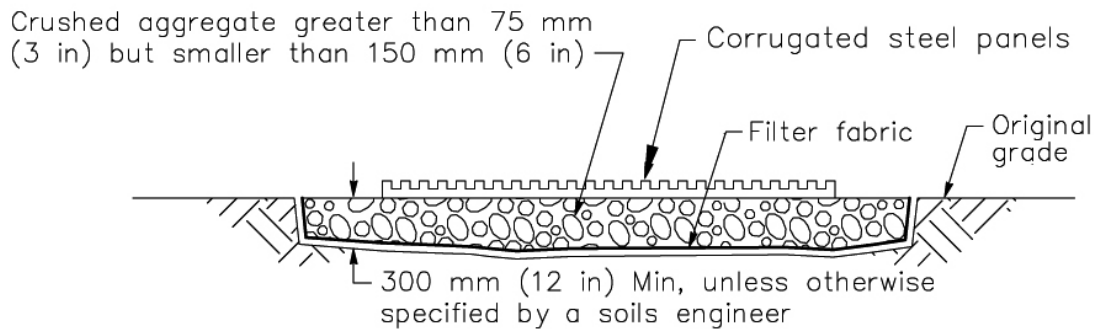
Limitations

- Requires a supply of wash water.
- Requires a turnout or doublewide exit to avoid having entering vehicles drive through the wash area.

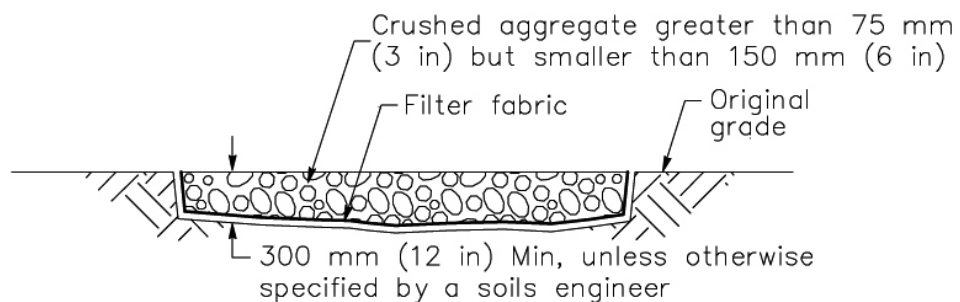
Standards and Specifications

- Incorporate with a stabilized construction entrance/exit. See BMP TC-1, "Stabilized Construction Entrance/Exit."
- Construct on level ground when possible, on a pad of coarse aggregate, greater than 75 mm (3 inches) and smaller than 150 mm (6 inches). A geotextile fabric shall be placed below the aggregate.
- Wash rack shall be designed and constructed/manufactured for anticipated traffic loads.
- Provide a drainage ditch that will convey the runoff from the wash area to a sediment trapping device. The drainage ditch shall be of sufficient grade, width, and depth to carry the wash runoff.

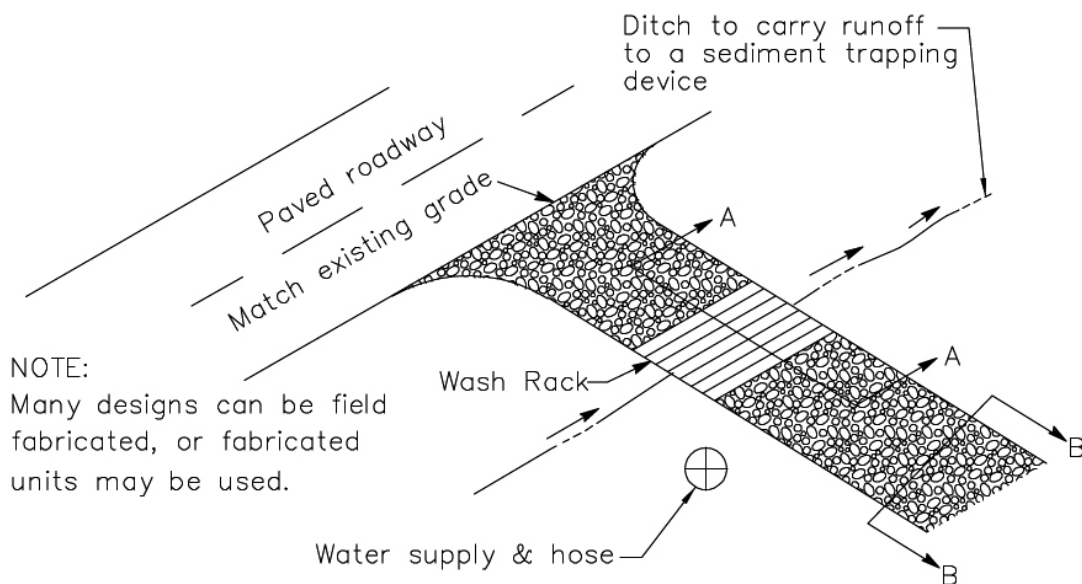
- Require all employees, subcontractors, and others that leave the site with mud-caked tires and/or undercarriages to use the wash facility.
 - Implement BMP SC-7, “Street Sweeping and Vacuuming” as needed.
 - Use of constructed or prefabricated steel plate with ribs for entrance/exit access is allowed with written approval of RE.
- Maintenance and Inspection
- Remove accumulated sediment in wash rack and/or sediment trap to maintain system performance.
 - Inspect routinely for damage and repair as needed.



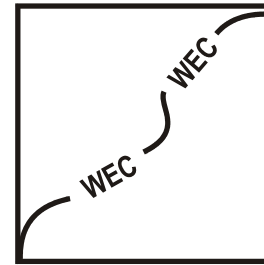
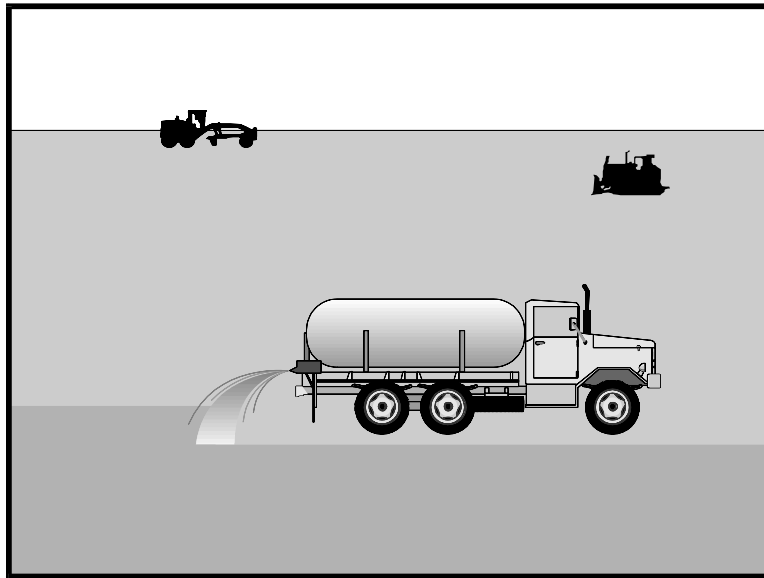
SECTION A-A
NOT TO SCALE



SECTION B-B
NTS



TYPICAL TIRE WASH
NOT TO SCALE



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Wind erosion control consists of applying water and/or other dust palliatives as necessary to prevent or alleviate erosion by the forces of wind. Dust control shall be applied in accordance with Caltrans standard practices. Covering of small stockpiles or areas is an alternative to applying water or other dust palliatives.

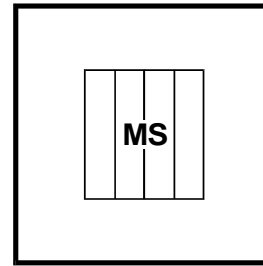
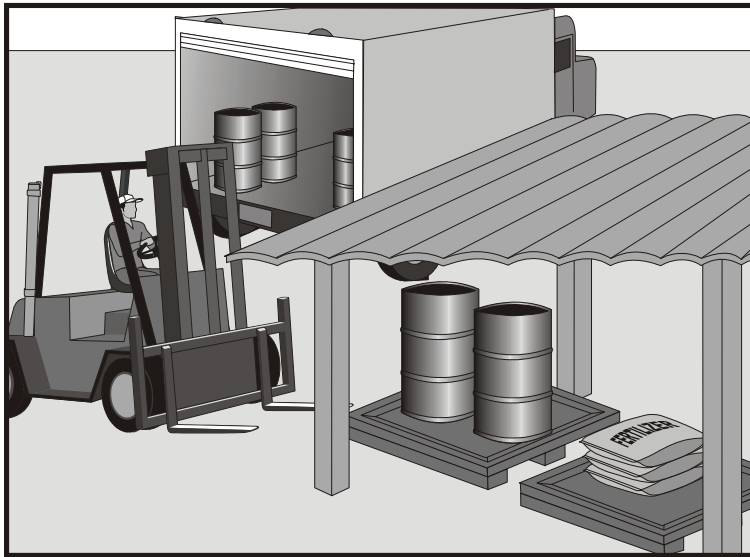
Appropriate Applications ■ This practice is implemented on all exposed soils subject to wind erosion.

Limitations ■ Effectiveness depends on soil, temperature, humidity and wind velocity.

Standards and Specifications

- Water shall 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 shall be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit shall be available at all times to apply water or dust palliative to the project.
- If reclaimed 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 shall not be conveyed in tanks or drain pipes that will be used to convey potable water and there shall be no connection between potable and non-potable supplies. Non-potable tanks, pipes and other conveyances shall be marked "NON-POTABLE WATER - DO NOT DRINK."
- Materials applied as temporary soil stabilizers and soil binders will also provide wind erosion control benefits.

Maintenance and Inspection ■ Check areas that have been protected to ensure coverage.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Procedures and practices for the proper handling and storage of materials in a manner that minimizes or eliminates the discharge of these materials to the storm drain system or to watercourses.

Appropriate Applications These procedures are implemented at all construction sites with delivery and storage of the following:

- Hazardous chemicals such as:
 - Acids,
 - lime,
 - glues,
 - adhesives,
 - paints,
 - solvents, and
 - curing compounds.
- Soil stabilizers and binders.
- Fertilizers.
- Detergents.
- Plaster.
- Petroleum products such as fuel, oil, and grease.
- Asphalt and concrete components.
- Pesticides and herbicides.

- Other materials that may be detrimental if released to the environment.
- Limitations
- Space limitation may preclude indoor storage.
 - Storage sheds must meet building & fire code requirements.

Standards and Specifications

General

- Train employees and subcontractors on the proper material delivery and storage practices.
- Temporary storage area shall be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) shall be supplied to the Resident Engineer (RE) for all materials stored.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall be placed in temporary containment facilities for storage.
- Throughout the rainy season, each temporary containment facility shall have a permanent cover and side wind protection or be covered during non-working days and prior to and during rain events.
- A temporary containment facility shall provide for a spill containment volume able to contain precipitation from a 24-hour, 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 shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids shall be sent to an approved disposal site.
- Sufficient separation shall be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, shall not be stored in the same temporary containment facility.
- Materials shall be stored in their original containers and the original product labels shall be maintained in place in a legible condition. Damaged or otherwise illegible labels shall be replaced immediately.

-
- Bagged and boxed materials shall be stored on pallets and shall not be allowed to accumulate on the ground. To provide protection from wind and rain, throughout the rainy season, bagged and boxed materials shall be covered during non-working days and prior to rain events.
- Stockpiles shall be protected in accordance with BMP WM-3, “Stockpile Management.”
- Minimize the material inventory stored on-site (e.g., only a few days supply).
- Have proper storage instructions posted at all times in an open and conspicuous location.
- Do not store hazardous chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and when possible, under cover in secondary containment.
- Keep hazardous chemicals well labeled and in their original containers.
- Keep ample supply of appropriate spill clean up material near storage areas.
- Also see BMP WM-6, “Hazardous Waste Management”, for storing of hazardous materials.

Material Delivery Practices

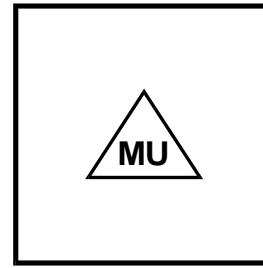
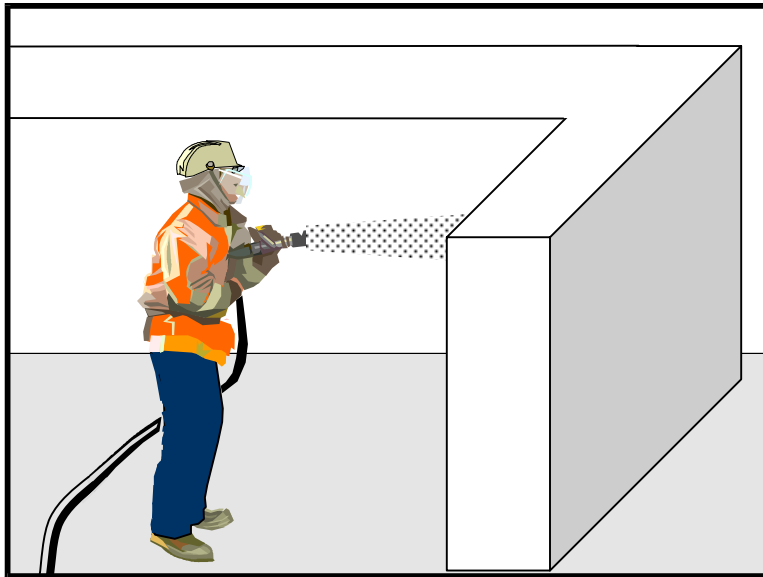
- Keep an accurate, up-to-date inventory of material delivered and stored on-site.
- Employees trained in emergency spill clean-up procedures shall be present when dangerous materials or liquid chemicals are unloaded.

Spill Clean-up

- Contain and clean up any spill immediately.
- If significant residual materials remain on the ground after construction is complete, properly remove and dispose any hazardous materials or contaminated soil.
- See BMP WM-4, “Spill Prevention and Control”, for spills of chemicals and/or hazardous materials.

Maintenance and Inspection

- Storage areas shall be kept clean, well organized, and equipped with ample clean-up supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers, and liners shall be repaired or replaced as needed to maintain proper function.
- Inspect storage areas before and after rainfall events, and at least weekly during other times. Collect and place into drums any spills or accumulated rainwater.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

These are procedures and practices for use of construction material in a manner that minimizes or eliminates the discharge of these materials to the storm drain system or to watercourses.

Appropriate Applications

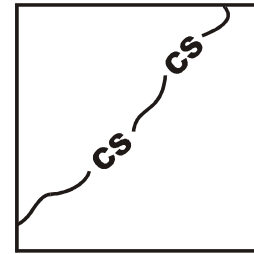
This BMP applies to all construction projects. These procedures apply when the following materials are used or prepared on site:

■ Hazardous chemicals such as:

Acids,
lime,
glues,
adhesives,
paints,
solvents, and
curing compounds.

- Soil stabilizers and binders.
- Fertilizers.
- Detergents.
- Plaster.
- Petroleum products such as fuel, oil, and grease.
- Asphalt and concrete components.
- Pesticides and herbicides.
- Other materials that may be detrimental if released to the environment.

- | | |
|-------------------------------------|--|
| Limitations | ■ Safer alternative building and construction products may not be available or suitable in every instance. |
| Standards and Specifications | <ul style="list-style-type: none">■ Material Safety Data Sheets (MSDS) shall be supplied to the Resident Engineer (RE) for all materials.■ Latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, may be disposed of 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 practical, and rinse to a drain leading to a sanitary sewer where permitted, or into a concrete washout pit. For oil-based paints, clean brushes to the extent practical 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 on-site when practical.■ Do not over-apply fertilizers and pesticides. Prepare only the amount needed. Strictly follow the recommended usage instructions. Apply surface dressings in smaller applications, as opposed to large applications, to allow time for it to work in and to avoid excess materials being carried off-site by runoff.■ Application of herbicides and pesticides shall be performed by a licensed applicator.■ Contractors are required 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. |
| Maintenance and Inspections | ■ Spot check employees and subcontractors monthly throughout the job to ensure appropriate practices are being employed. |



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and storm water pollution from stockpiles of soil, and paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate subbase or pre-mixed aggregate, asphalt binder (so called “cold mix” asphalt) and pressure treated wood.

Appropriate Applications

Implemented in all projects that stockpile soil and other materials.

Limitations

- None identified

Standards and Specifications

- Protection of stockpiles is a year-round requirement.
- Locate stockpiles a minimum of 15 m (50 ft) away from concentrated flows of storm water, drainage courses, and inlets.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information see BMP WE-1, “Wind Erosion Control.”
- Stockpiles of contaminated soil shall be managed in accordance with BMP WM-7, “Contaminated Soil Management.”
- Bagged materials should be placed on pallets and under cover.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials shall be protected further as follows:

■ ***Soil stockpiles:***

- During the rainy seasons, soil stockpiles shall be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- During the non-rainy season, soil stockpiles shall be covered and 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 subbase:***

- During the rainy season, the stockpiles shall be covered or protected with a temporary perimeter sediment barrier at all times.
- During the non-rainy season, the stockpiles shall 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 shall be placed on and covered with plastic or comparable material at all times.
- During the non-rainy season, cold mix stockpiles shall 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:***

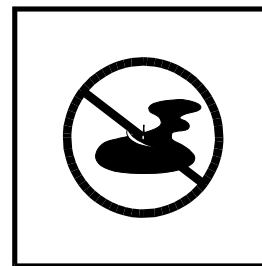
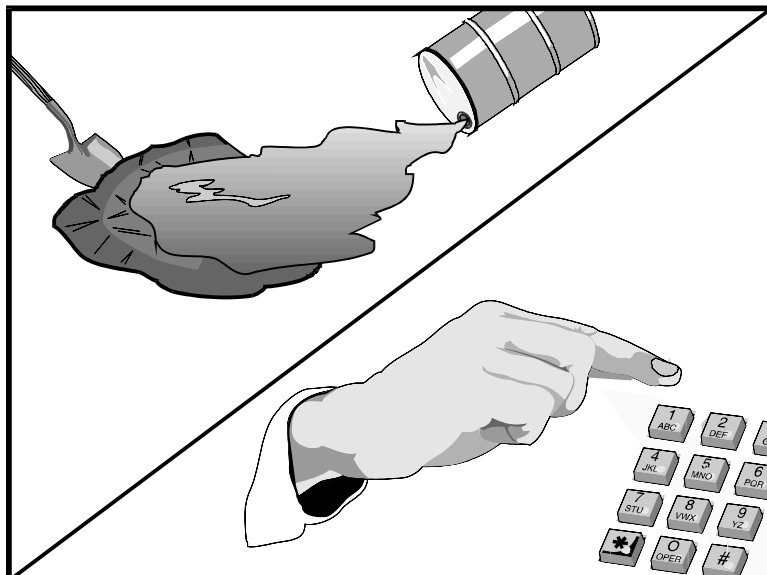
- During the rainy season, treated wood shall be covered with plastic or comparable material at all times.
- During the non-rainy season, treated wood shall be covered with plastic or comparable material and shall be placed on pallets prior to the onset of precipitation.

Protection of Active Stockpiles

Active stockpiles of the identified materials shall be protected further as follows:

- All stockpiles shall be covered, stabilized, or protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix” shall be placed on and covered with plastic or comparable material prior to the onset of precipitation.

- Maintenance and Inspections
- Repair and/or replace perimeter controls and covers as needed, or as directed by the RE, to keep them functioning properly. Sediment shall be removed when sediment accumulation reaches one-third ($1/3$) of the barrier height.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

These procedures and practices are implemented to prevent and control spills in a manner that minimizes or prevents the discharge of spilled material to the drainage system or watercourses.

Appropriate Application

This best management practice (BMP) applies to all construction projects. Spill control procedures are implemented anytime chemicals and/or hazardous substances are stored. Substances may include, but are not limited to:

- Soil stabilizers/binders.
- Dust Palliatives.
- Herbicides.
- Growth inhibitors.
- Fertilizers.
- Deicing/anti-icing chemicals.
- Fuels.
- Lubricants.
- Other petroleum distillates.

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 shall be contained and cleaned up immediately.

Limitations ■ This BMP only applies to spills caused by the contractor.

- Procedures and practices presented in this BMP are general. Contractor shall identify appropriate practices for the specific materials used or stored on-site.

Standards and Specifications

- To the extent that it doesn't compromise clean up activities, spills shall be covered and protected from storm water run-on during rainfall.
- Spills shall not be buried or washed with water.
- Used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose shall be stored and disposed of in conformance with the special provisions.
- Water used for cleaning and decontamination shall not be allowed to enter storm drains or watercourses and shall be collected and disposed of in accordance with BMP WM-10, "Liquid Waste Management."
- Water overflow or minor water spillage shall be contained and shall not be allowed to discharge into drainage facilities or watercourses.
- Proper storage, clean-up and spill reporting instruction for hazardous materials stored or used on the project site shall be posted at all times in an open, conspicuous and accessible location.
- Waste storage areas shall be kept clean, well organized and equipped with ample clean-up supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers and liners shall be repaired or replaced as needed to maintain proper function.

Education

- Educate employees and subcontractors on what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- The Contractor's Water Pollution Control Manager (WPCM) shall oversee and enforce proper spill prevention and control measures.

Cleanup and Storage Procedures

■ 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.
- Remove the absorbent materials promptly and dispose of properly.
- The practice commonly followed for a minor spill is:
 - Contain the spread of the spill.
 - Recover spilled materials.
 - Clean the contaminated area and/or properly dispose of contaminated materials.

■ Semi-Significant Spills

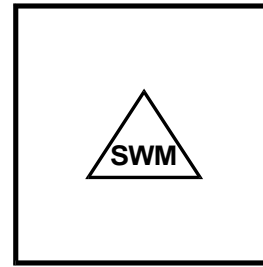
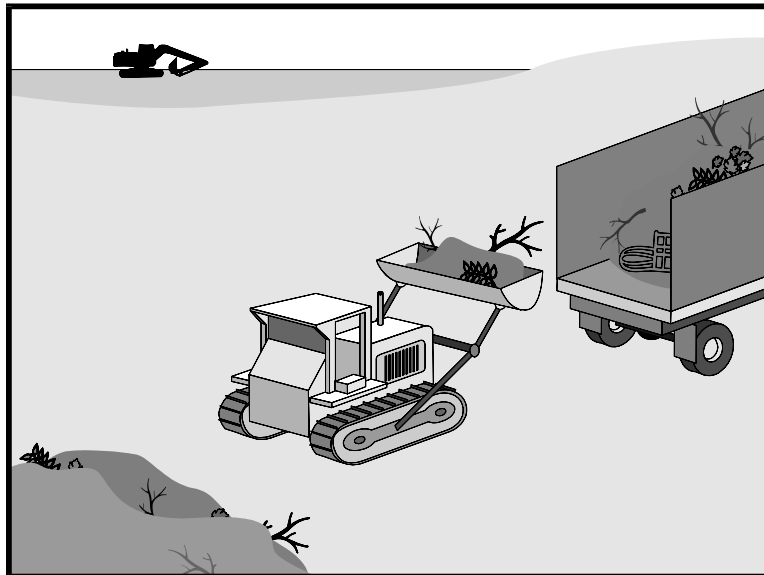
- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.
- Clean up spills immediately:
 - Notify the project foreman immediately. The foreman shall notify the Resident Engineer (RE).
 - Contain spread of the spill.
 - 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 shall be taken:
 - Notify the RE immediately and follow up with a written report.
 - 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, (805) 852-7550.
 - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110, 119, and 302, the contractor shall notify the National Response Center at (800) 424-8802.
 - Notification shall first be made by telephone and followed up with a written report.
 - The services of a spills contractor or a Haz-Mat team shall be obtained immediately. Construction personnel shall not attempt to clean up the spill until the appropriate and qualified staff 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, RWQCB, etc.

**Maintenance and
Inspection**

- Verify weekly that spill control clean up materials are located near material storage, unloading, and use areas.
- Update spill prevention and control plans and stock appropriate clean-up materials whenever changes occur in the types of chemicals used or stored onsite.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Solid waste management procedures and practices are designed to minimize or eliminate the discharge of pollutants to the drainage system or to watercourses as a result of the creation, stockpiling, or removal of construction site wastes.

Appropriate Applications Solid waste management procedures and practices are implemented on all construction projects that generate solid wastes.

Solid wastes include but are not limited to:

- Construction wastes including brick, mortar, timber, steel and metal scraps, sawdust, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials.
- Highway planting wastes, including vegetative material, plant containers, and packaging materials.
- Litter, including food containers, beverage cans, coffee cups, paper bags, plastic wrappers, and smoking materials, including litter generated by the public.

Limitations ■ Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Standards and Specifications

Education

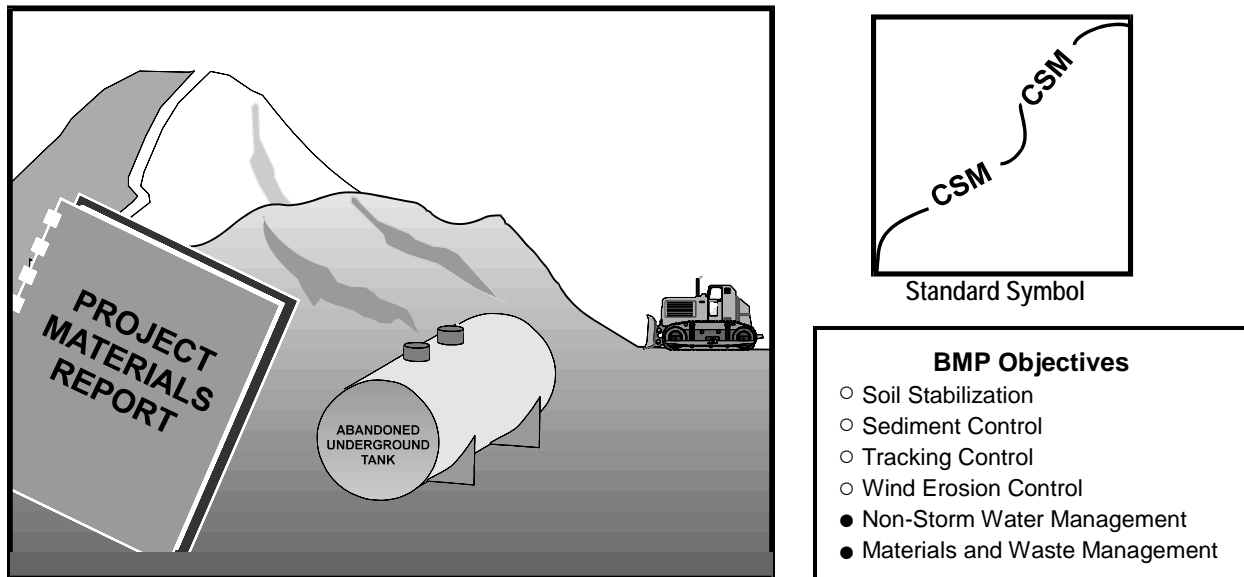
- The Contractor's Water Pollution Control Manager (WPCM) shall oversee and enforce proper solid waste procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.
- 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.
- Wherever possible, minimize production of solid waste materials.

Collection, Storage, and Disposal

- Dumpsters of sufficient size and number shall be provided to contain the solid waste generated by the project and properly serviced.
- Littering on the project site shall be prohibited.
- To prevent clogging of the storm drainage system litter and debris removal from drainage grates, trash racks, and ditch lines shall be a priority.
- Trash receptacles shall be provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Construction debris and litter from work areas within the construction limits of the project site shall 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 shall not be placed in or next to drain inlets, storm water drainage systems or watercourses.
- Full dumpsters shall be removed from the project site and the contents shall be disposed of outside the highway right-of-way in conformance with the provisions in the Standard Specifications Section 7-1.13.
- Litter stored in collection areas and containers shall be handled and disposed of by trash hauling contractors.
- Construction debris and waste shall be removed from the site every two weeks or as directed by the RE.

- Construction material visible to the public shall be stored or stacked in an orderly manner to the satisfaction of the RE.
- Storm water run-on shall 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 shall be located at least 15 m (50 ft) from drainage facilities and watercourses and shall not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters shall be securely covered from wind and rain by covering the waste with tarps or plastic sheeting or protected in conformance with the applicable Disturbed Soil Area protection section.
- Dumpster washout on the project site is not allowed.
- Notify trash hauling contractors that only watertight dumpsters are acceptable for use on-site.
- Plan for additional containers during the demolition phase of construction.
- Plan for more frequent pickup during the demolition phase of construction.
- Construction waste shall be stored in a designated area approved by the RE.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Keep the site clean of litter debris.
- Make sure that toxic liquid wastes (e.g., used oils, solvents, and paints) and chemicals (e.g., acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Dispose of non-hazardous waste in accordance with Standard Specification 7-1.13, Disposal of Material Outside the Highway Right of Way.
- For disposal of hazardous waste, see BMP 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/or surplus building materials when practical. For example, trees and shrubs from land clearing can be converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

- Maintenance and Inspection
- The WPCM shall monitor onsite solid waste storage and disposal procedures.
 - Police site for litter and debris.



Definition and Purpose These are procedures and practices to minimize or eliminate the discharges of pollutants to the drainage system or to watercourses from contaminated soil.

- Appropriate Applications**
- Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, and leaks from underground storage tanks.
 - It may also apply to highway widening projects in older areas where median and shoulder soils may have been contaminated by aerially deposited lead (ADL).

- Limitations**
- The procedures and practices presented in this best management practice (BMP) are general. The contractor shall identify appropriate practices and procedures for the specific contaminants known to exist or discovered on site.

Standards and Specifications ***Identifying Contaminated Areas***

- Contaminated soils are often identified during project planning and development with known locations identified in the plans and specifications. The contractor shall review applicable reports and investigate appropriate call-outs in the plans and specifications.
- The contractor may further identify contaminated soils by investigating:
 - Past site uses and activities.
 - Detected or undetected spills and leaks.
 - Acid or alkaline solutions from exposed soil or rock formations high in acid or alkaline forming elements.

- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris. Test suspected soils at a certified laboratory.

Education

- Prior to performing any excavation work at the locations containing material classified as hazardous, employees and subcontractors shall complete a safety training program which meets 29 CFR 1910.120 and 8 CCR 5192 covering the potential hazards as identified.
- Educate employees and subcontractors in identification of contaminated soil and on contaminated soil handling and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).

Handling Procedures for Material with Aerially Deposited Lead (ADL)

- Materials from areas designated as containing (ADL) may, if allowed by the contract special provisions, be excavated, transported, and used in the construction of embankments and/or backfill.
- Excavation, transportation, and placement operations shall result in no visible dust.
- Use caution to prevent spillage of lead containing material during transport.
- Monitor the air quality during excavation of soils contaminated with lead.

Handling Procedures for Contaminated Soils

- To minimize on-site storage, contaminated soil shall be disposed of properly in accordance with all applicable regulations. All hazardous waste storage will comply with the requirements in Title 22, CCR, Sections 6626.250 to 66265.260.
- Test suspected soils at a DHS approved certified laboratory.
- If the soil is contaminated, work with the local regulatory agencies to develop options for treatment and/or disposal.
- Avoid temporary stockpiling of contaminated soils or hazardous material.
- If temporary stockpiling is necessary:
 - (1) Cover the stockpile with plastic sheeting or tarps.
 - (2) Install a berm around the stockpile to prevent runoff from leaving the area.
 - (3) Do not stockpile in or near storm drains or watercourses.

- Contaminated material and hazardous material on exteriors of transport vehicles shall be removed and placed either into the current transport vehicle or the excavation prior to the vehicle leaving the exclusion zone.
- Monitor the air quality continuously during excavation operations at all locations containing hazardous material.
- Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the contaminated material and the hazardous material.
- Collect water from decontamination procedures and treat and/or dispose of it at an appropriate disposal site.
- Collect non-reusable protective equipment, once used by any personnel, and dispose of at an appropriate disposal site.
- Install temporary security fence to surround and secure the exclusion zone. Remove fencing when no longer needed.
- Excavation, transport, and disposal of contaminated material and hazardous material shall be in accordance with the rules and regulations of the following agencies (the specifications of these agencies supersede the procedures outlined in this BMP):
 - United States Department of Transportation (USDOT).
 - United States Environmental Protection Agency (USEPA).
 - California Environmental Protection Agency (CAL-EPA).
 - California Division of Occupation Safety and Health Administration (CAL-OSHA).
 - Local regulatory agencies.

Procedures for Underground Storage Tank Removals

- Prior to commencing tank removal operations, obtain the required underground storage tank removal permits and approval from the federal, state, and local agencies, which have jurisdiction over such work.
- Arrange to have tested, as directed by the Resident Engineer (RE), any liquid or sludge found in the underground tank prior to its removal to determine if it contains hazardous substances.
- Following the tank removal, take soil samples beneath the excavated tank and perform analysis as required by the local agency representative(s).

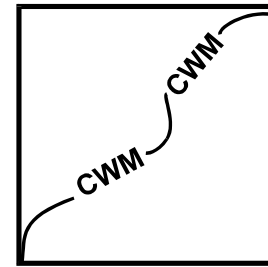
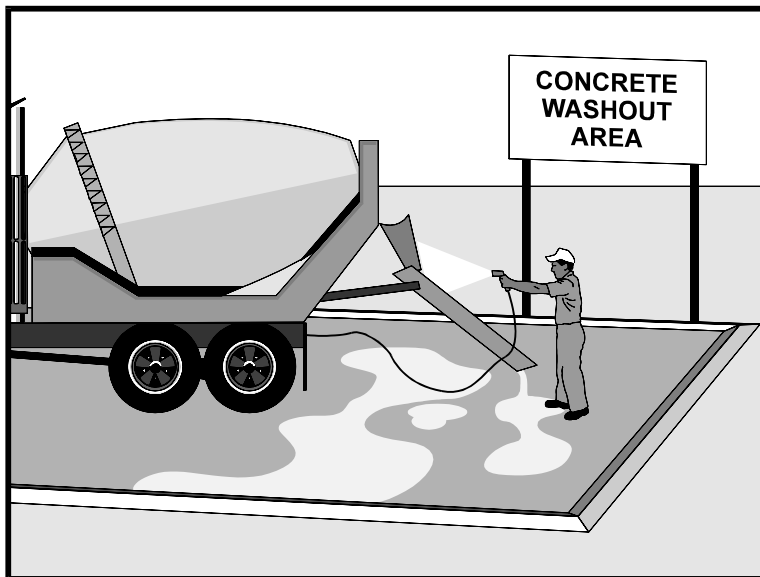
- The underground storage tank, any liquid and/or sludge found within the tank, and all contaminated substances and hazardous substances removed during the tank removal shall be transported to disposal facilities permitted to accept such waste.

Water Control

- Take all necessary precautions and preventive measures to prevent the flow of water, including ground water, from mixing with hazardous substances or underground storage tank excavations. Such preventative measures may consist of, but are not limited to: berms, cofferdams, grout curtains, freeze walls, and seal course concrete or any combination thereof.
- If water does enter an excavation and becomes contaminated, such water, when necessary to proceed with the work, shall be dewatered consistent with BMP NS-2, "Dewatering Operations."

Maintenance and Inspection

- The Contractor's Water Pollution Control Manager, foreman, and/or construction supervisor shall monitor on-site contaminated soil storage and disposal procedures.
- Monitor air quality continuously during excavation operations at all locations containing hazardous material.
- Coordinate contaminated soils and hazardous substances/waste management with the appropriate federal, state, and local agencies.
- Inspect hazardous waste receptacles and areas regularly.



Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose These are procedures and practices that are designed to minimize or eliminate the discharge of concrete waste materials to the storm drain systems or watercourses.

- Appropriate Applications**
- Concrete waste management procedures and practices are implemented on construction projects where concrete is used as a construction material or where concrete dust and debris result from demolition activities.
 - Where slurries containing portland cement concrete (PCC) or asphalt concrete (AC) are generated, such as from sawcutting, coring, grinding, grooving, and hydro-concrete demolition.
 - Where concrete trucks and other concrete-coated equipment are washed on site, when approved by the Resident Engineer (RE). See also NS-8, "Vehicle and Equipment Cleaning."
 - Where mortar-mixing stations exist.

Limitations ■ None identified.

Standards and Specifications

Education

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.
- The Contractor's Water Pollution Control Manager (WPCM) shall oversee and enforce concrete waste management procedures.

Concrete Demolition Wastes

- Stockpile concrete demolition wastes in accordance with BMP WM-3, "Stockpile Management."
- Disposal of hardened PCC and AC waste shall be in conformance with

Standard Specifications Section 7-1.13 or 15-3.02.

Concrete Slurry Waste Management and Disposal

- PCC and AC waste shall not be allowed to enter storm drainage systems or watercourses.
- A sign shall be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities as shown on Page 7.
- A foreman and/or construction supervisor shall monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.
- Residue from saw cutting, coring and grinding operations shall be picked up by means of a vacuum device. Residue shall not be allowed to flow across the pavement and shall not be left on the surface of the pavement. See also BMP NS-3, "Paving and Grinding Operations."
- Vacuumed slurry residue shall be disposed in accordance with BMP WM-5, "Solid Waste Management" and Standard Specifications Section 7-1.13. Slurry residue shall be temporarily stored in a facility as described in "Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures" below), or within an impermeable containment vessel or bin approved by the Engineer.
- Collect and dispose of all residues from grooving and grinding operations in accordance with Standard Specifications Section 7-1.13, 42-1.02 and 42-2.02.

Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures

- Temporary concrete washout facilities shall be located a minimum of 15 m (50 ft) from storm drain inlets, open drainage facilities, and watercourses, unless determined infeasible by the RE. Each facility shall be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign shall be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities. The sign shall be installed as shown on the plans and in conformance with the provisions in Standard Specifications Section 56-2, Roadside Signs.
- Temporary concrete washout facilities shall be constructed above grade or below grade at the option of the Contractor. Temporary concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Temporary washout facilities shall have a temporary pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete

materials generated during washout procedures.

- Perform washout of concrete mixers, delivery trucks, and other delivery systems in designated areas only.
- Wash concrete only from mixer chutes into approved concrete washout facility. Washout may be collected in an impermeable bag or other impermeable containment devices for disposal.
- Pump excess concrete in concrete pump bin back into concrete mixer truck.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete shall be broken up, removed, and disposed of in conformance with the provisions in Standard Specifications Section 7-1.13 or 15-3.02.

Temporary Concrete Washout Facility Type “Above Grade”

- Temporary concrete washout facility Type “Above Grade” shall be constructed as shown on Page 6 or 7, with a recommended minimum length and minimum width of 3 m (10 ft), but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. The length and width of a facility may be increased, at the Contractor’s expense, upon approval from the RE.
- Straw bales, wood stakes, and sandbag materials shall conform to the provisions in BMP SC-9, “Straw Bale Barrier.”
- Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material. Liner seams shall be installed in accordance with manufacturers’ recommendations.
- Portable delineators shall conform to the provisions in Standard Specifications Section 12-3.04, “Portable Delineators.” The delineator bases shall be cemented to the pavement in the same manner as provided for cementing pavement markers to pavement in Standard Specifications Section 85-1.06, “Placement.” Portable delineators shall be applied only to a clean, dry surface.

Temporary Concrete Washout Facility (Type Below Grade)

- Temporary concrete washout facility Type “Below Grade” shall be constructed as shown on page 6, with a recommended minimum length and minimum width of 3m (10 ft). The quantity and volume shall be sufficient to contain all liquid and concrete waste generated by washout operations. The length and width of a facility may be increased, at the Contractor’s expense,

upon approval of the RE. Lath and flagging shall be commercial type.

- Plastic lining material shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears or other defects that compromise the impermeability of the material. Liner seams shall be installed in accordance with manufacturers' recommendations.
- The soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, as determined by the RE, the hardened concrete shall be removed and disposed of in conformance with the provisions in Standard Specifications Section 7-1.13 or 15-3.02. Disposal of PCC dried residues, slurries or liquid waste shall be disposed of outside the highway right-of-way in conformance with provisions of Standard Specifications Section 7-1-13. Materials used to construct temporary concrete washout facilities shall become the property of the Contractor, shall be removed from the site of the work, and shall be disposed of outside the highway right-of-way in conformance with the provisions of the Standard Specifications, Section 7-1.13.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled and repaired in conformance with the provisions in Standard Specifications Section 15-1.02, "Preservation of Property."

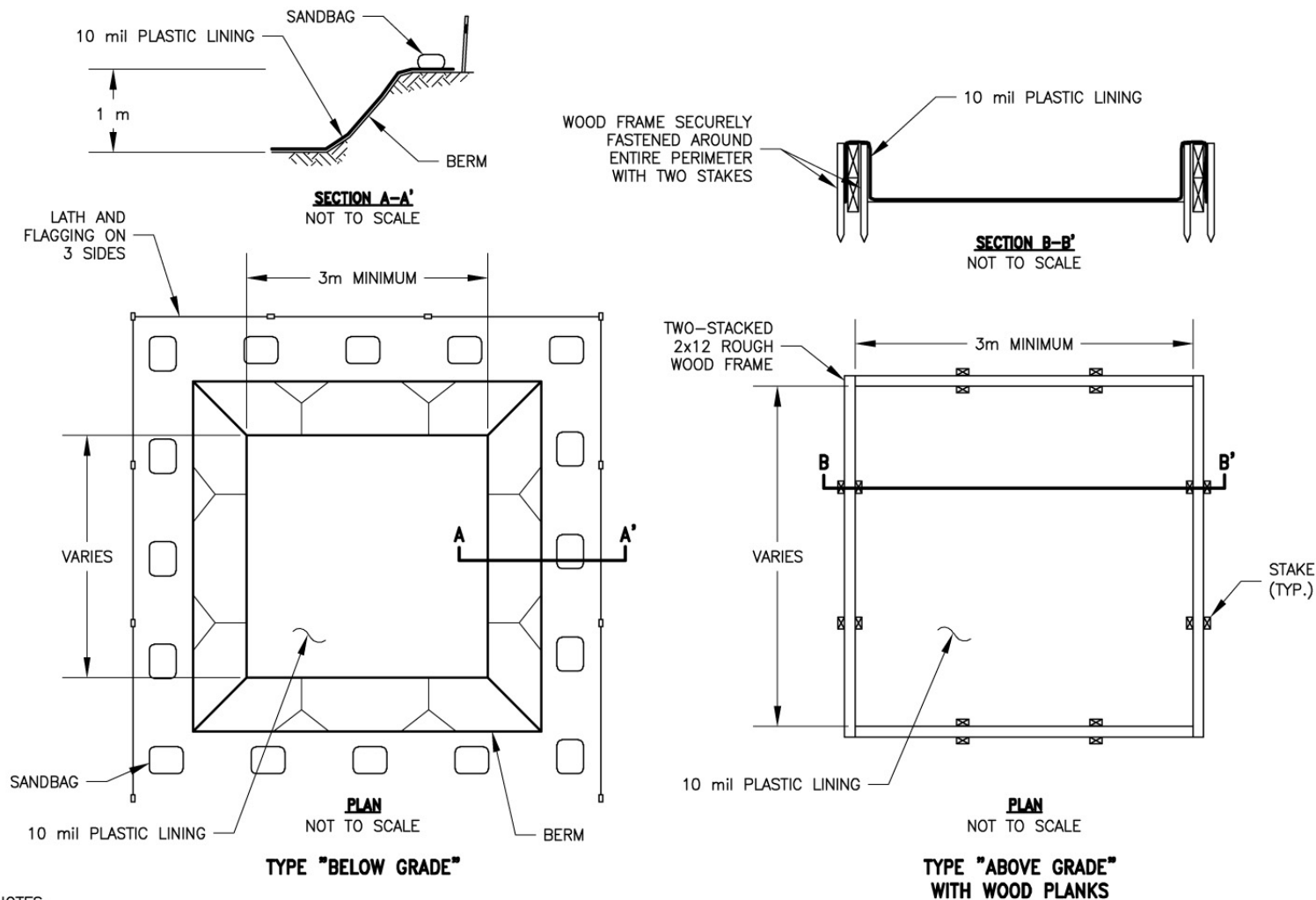
Maintenance and Inspection

- The Contractor's Water Pollution Control Manager (WPCM) shall monitor on site concrete waste storage and disposal procedures at least weekly or as directed by the RE.
- The WPCM shall monitor concrete working tasks, such as saw cutting, coring, grinding and grooving daily to ensure proper methods are employed or as directed by the RE.
- Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 100 mm (4 inches) for above grade facilities and 300 mm (12 inches) for below grade facilities. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials shall be removed and disposed of in conformance with the provisions in Standard Specifications Section 7-1.13 or 15-3.02.
- Existing facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- Temporary concrete washout facilities shall be inspected for damage (i.e.

tears in polyethylene liner, missing sandbags, etc.). Damaged facilities shall be repaired.

Concrete Waste Management

WM-8



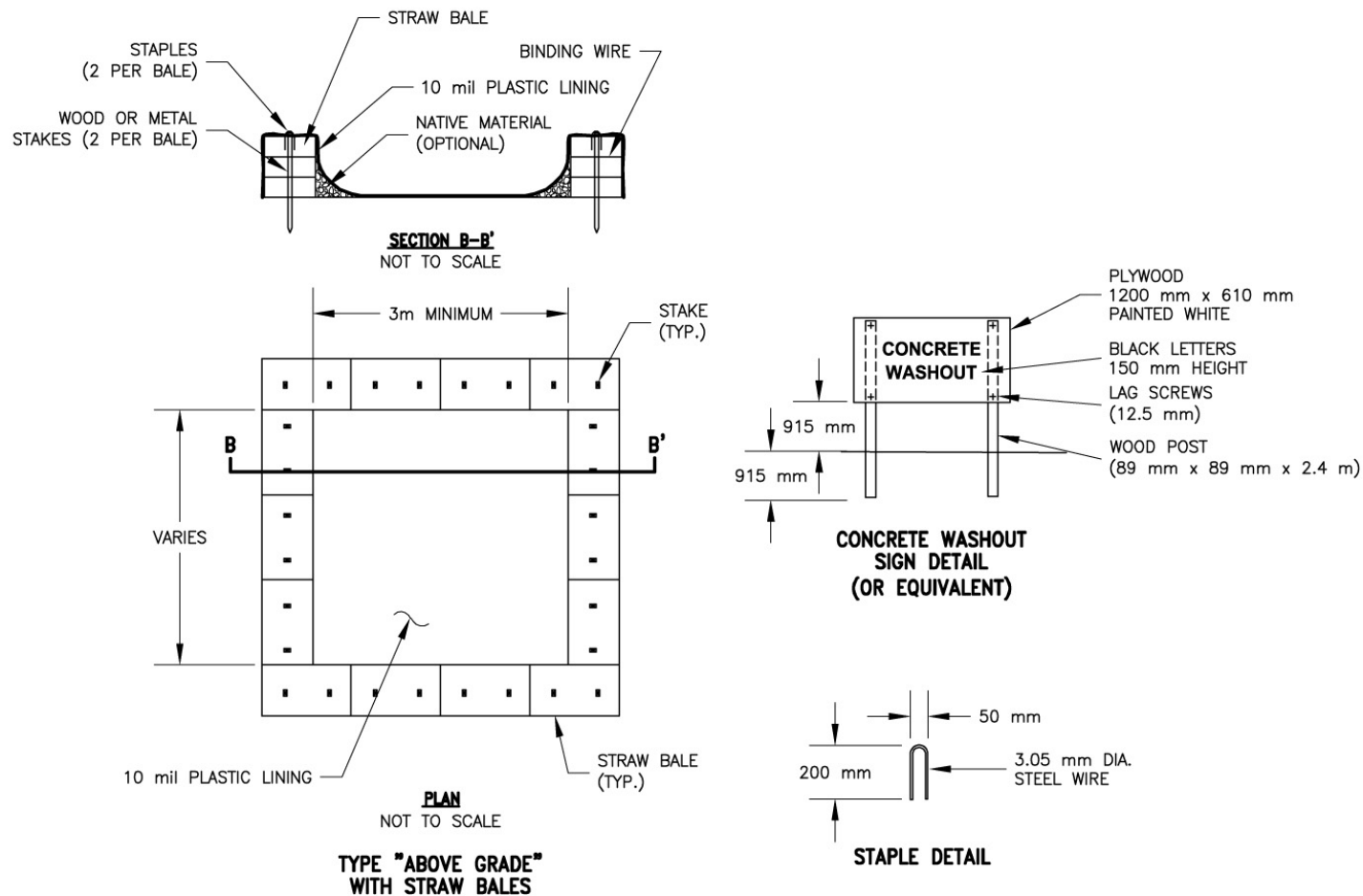
NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE PAGE 6) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



Concrete Waste Management

WM-8

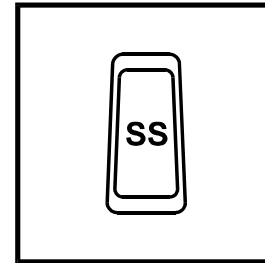
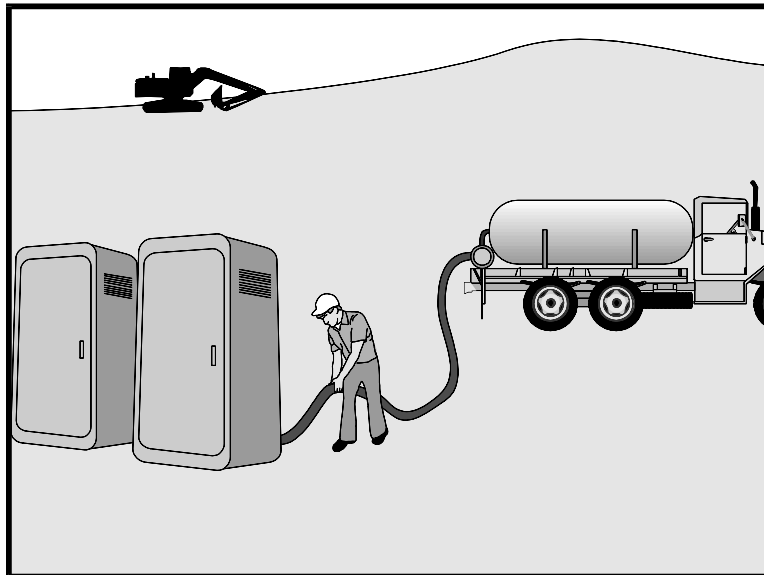


NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE FIG. 4-15) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

CALTRANS/FIG4-14.DWG SAC 8-14-02





Standard Symbol

BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose Procedures and practices to minimize or eliminate the discharge of construction site sanitary/septic waste materials to the storm drain system or to watercourses.

Appropriate Applications Sanitary/septic waste management practices are implemented on all construction sites that use temporary or portable sanitary/septic waste systems.

Limitations ■ None identified.

Standards and Specifications

Education

- Educate employees, subcontractors, and suppliers on sanitary/septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary/septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary/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.

Storage and Disposal Procedures

- Temporary sanitary facilities shall be located away from drainage facilities, watercourses, and from traffic circulation. When subjected to high winds or risk.

- Wastewater shall not be discharged or buried within the highway right-of-way.
 - Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, shall comply with the local health agency, city, county, and sewer district requirements.
 - If using an on site disposal system, such as a septic system, comply with local health agency requirements.
 - Properly connect temporary sanitary facilities that discharge to the sanitary sewer system to avoid illicit discharges.
 - Ensure that sanitary/septic facilities are maintained in good working order by a licensed service.
 - Use only reputable, licensed sanitary/septic waste haulers.
- Maintenance and Inspection
- The Contractor's Water Pollution Control Manager (WPCM) shall monitor onsite sanitary/septic waste storage and disposal procedures at least weekly.