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PCBS IN CAULK PROJECT

Best Management Practices

for Reducing PCBs in Runoff Associated with Demolition and Remodeling Projects

Prepared for

SAN FRANCISCO ESTUARY PARTNERSHIP
TAKING ACTION FOR CLEAN WATER

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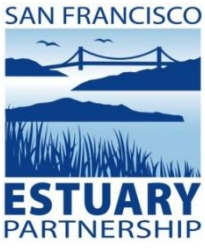

Funding for this project has been provided by a State Water Resources Control Board Proposition 50 Coastal Nonpoint Source grant known as "Taking Action for Clean Water", and from the State Revolving Fund under the American Recovery and Reinvestment Act of 2009 (ARRA). The contents of this document do not necessarily reflect the views and policies of the State Water Resources Control Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. (Gov. Code, § 7550, 40 CFR § 31.20.)

DISCLAIMER

This document is one of several major products for the San Francisco Estuary Partnership's PCBs in Caulk Project, which was created to address potential impacts of polychlorinated biphenyls (PCBs) in caulks and sealants released into stormwater runoff during demolition or remodeling projects in the San Francisco Bay Area. The project is assisting the implementation of the Total Maximum Daily Load (TMDL) for PCBs in San Francisco Bay. The PCBs TMDL includes a plan for reducing PCBs loads that is implemented through permits, including the Municipal Regional National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater (MRP). In the first five-year permit term, starting in 2009, stormwater Permittees are required to investigate the costs, effectiveness, and technical feasibility of several categories of potential PCBs control measures. The PCBs in Caulk Project focused on one such category of potential PCBs controls: measures to minimize the release of PCBs in caulks and sealants to stormwater runoff during demolition or remodeling projects.

In the 2014-2015 timeframe, Permittees and the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) staff will evaluate the potential PCBs controls based on their effectiveness in reducing PCBs loads to stormwater, cost, and other relevant factors, to inform planning further efforts to address PCBs during the next permit term. To the extent that Permittees will be required in future permits to control PCBs in caulks and sealants released during building demolition or remodeling, this document is intended to assist in complying with such requirements.

This document compiles information on Best Management Practices (BMPs) to reduce discharges of PCBs from building demolition or remodeling projects. At the time of publication (2011), use of these BMPs is not required. A companion document, the Model Implementation Process, breaks new ground as the first known attempt to create a potential regional regulatory process to manage PCBs in caulks and sealants to protect water quality. It also leaves many issues for potential future implementers to address.

This document refers to state and federal regulations related to PCBs that are legally complex and may be subject to varying interpretations, in some cases due to variable, site-specific characteristics. The regulatory information in this document is presented as background information only and does not replace or supplant the requirements of federal or California law and regulations, including but not limited to the Toxic Substances Control Act or the PCBs regulations at 40 CFR Part 761.

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1.0 BACKGROUND

In April 2007, the State Water Resources Control Board awarded the Association of Bay Area Governments/San Francisco Estuary Partnership (SFEP) a Proposition 50 Coastal Nonpoint Source Pollution grant known as the "Taking Action for Clean Water" project to further implementation of several Bay Area Total Maximum Daily Loads (TMDLs). One of the Taking Action for Clean Water projects is the PCBs in Caulk project, which proposes a model management process to keep polychlorinated biphenyls (PCBs) in historic building materials, specifically uncontained materials like sealants and caulking, out of urban runoff as partial implementation of the TMDL for PCBs in San Francisco Bay (TMDL adopted by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) on February 13, 2008.)

After the California bond project freeze in 2008-2009, the grant was transferred to the Clean Water State Revolving Fund under the American Recovery and Reinvestment Act of 2009 (ARRA). In October 2009, the Regional Water Board adopted the Municipal Regional National Pollutant Discharge Elimination System Permit for Stormwater (hereafter MRP), which includes Provision C.12.b.ii (3) requiring that permittees to "develop/select BMPs to reduce or prevent discharges of PCBs during demolition/remodeling." SFEP contracted with Larry Walker Associates (LWA), Geosyntec, and TDC Environmental, LLC to assist in the development of a process to manage PCBs in caulk during building demolition or remodeling (i.e., the PCBs in Caulk project).

The purpose of this report is to summarize information on Best Management Practices (BMPs) that could be employed to control the release of PCBs from demolition and remodeling projects that could ultimately be mobilized by rainfall and stormwater runoff. For this report, Geosyntec researched BMPs related to managing wastes and hazardous materials during building demolition and/or remodeling. For an eligible building undergoing demolition/remodeling, the owner and contractor would be responsible for ensuring BMPs are properly selected and implemented, including BMPs that protect worker safety.

A companion project conducted by the San Francisco Estuary Institute (SFEI) and supported by these grant funds sampled PCBs in caulk in 25 sealant samples taken from buildings in the Bay Area and based on these and other data, estimated the stock of PCBs contained in building sealants, and the current loadings of PCBs from demolition and remodeling sources in the portions of the San Francisco Bay Area covered by the MRP (Klosterhaus et al. 2011). Significant information gaps leave considerable uncertainty in these estimates.

2.0 BEST MANAGEMENT PRACTICES

The United States Environmental Protection Agency (EPA) recommends that demolition and remodeling contractors implement a series of BMPs that capture PCBs-containing dust that may be mobilized when caulk is removed during building remodeling or demolition.[1] Such BMPs

[1] Steps to Safe Renovations and Repair Activities (EPA 2010a). Also note that EPA has an ongoing program evaluating the effectiveness of BMPs that can be accessed at http://www.epa.gov/pcbsincaulk and a web site where frequently asked questions regarding PCBs in caulk are answered (http://www.epa.gov/pcbsincaulk/caulk-faqs.pdf)

focus on reducing exposure via the air pathway to protect human health. Although the objective of the PCBs in Caulk project is to protect water quality, the BMPs that address human health by limiting the mobilization of PCBs into the atmosphere are also likely to be effective in reducing PCBs deposition on the ground during dry weather and thereby effective in reducing PCBs concentrations in rainfall and runoff. Additionally, several BMPs that are routinely implemented on construction projects for erosion control, sediment control, and waste management practices will reduce the mobilization of PCBs that could result from wind and water erosion.

Figure 1 shows a typical sequencing of various categories of BMPs that the owner/contractor should consider when conducting remodeling and demolition of buildings that contain PCBs in caulk.[2] The BMP categories are rather fundamental and it is envisioned that most projects would involve most, if not all, BMP categories. The actual selection of specific BMPs within each category will vary depending on the nature of the project, site conditions, and local permitting requirements.

The BMP categories are organized as follows:

1. Building Occupant Notification
2. Worker Training
3. Personal Protective Equipment (PPE)
4. Work Area Containment
5. Tools and Equipment
6. Demolition
7. Site Erosion and Sediment Controls
8. Work Area Housekeeping and End of Project
9. Transport and Disposal

2.1 BMP Category 1: Building Occupant Notification

This BMP is primarily designed for the protection of human health during demolition and remodeling projects. However, the BMP can help to limit unauthorized access to the work zones, and therefore limit unintentional tracking of contaminated dust from the site to where it may enter receiving waters.

Human exposure and the potential for the release of PCBs to the environment may be limited through effective communication with parties that may be in proximity to building demolition or remodeling. For example, EPA recommends that the owner/contractor continually inform the affected groups of:

- The goals, types, and duration of the demolition/remodeling activities;

[2] For the purposes of the model implementation process the threshold of 1 mg/kg (also referred to as 1 part per million) was selected to trigger the PCBs runoff prevention measures. At the current time there is not enough information to determine where to place the cut-off for significant sources of PCBs. This threshold was selected because it is easily achievable by the current analytical methods. The 1 mg/kg threshold should be re-evaluated as additional information becomes available.

- Health and safety aspects of the project; and
- Site access requirements and limitations.

Clear communication with all affected groups (e.g., building occupants, workers, building owners, and community members) is necessary to create a safe working environment.

2.2 BMP Category 2: Worker Training

Worker training is intended to promote proper handling and disposal of PCBs-contaminated materials, thus limiting the potential for these materials to contaminate surface waters.

Workers exposed to or handling materials that are known to be California Hazardous Waste are required to be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER) per Title 8 California Code of Regulations (CCR) 5192. The California Department of Toxic Substances Control (DTSC) soluble threshold limit concentration (STLC) for PCBs is 5 mg/L and the total threshold limit concentration (TTLC) is 50 mg/kg (Title 22 CCR 66261.24). Wastes designated for disposal with characterized PCBs concentrations at or above these thresholds receive a designation of California Hazardous Waste.

Site-specific training includes:

- Discussion of potential PCBs presence in caulk, and human health and ecological consequences of exposure
- Identification of personnel and alternates responsible for site safety and health;
- How to identify safety, health, and other hazards present on the site;
- Proper use of Personal Protective Equipment (PPE);
- Work practices that minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements, including recognition of signs and symptoms of overexposure to hazards; and
- Review of the site safety and health plan.

For sites that do not have PCBs concentrations above the DTSC thresholds, the federal Occupational Safety and Health Administration (OSHA) Act states that employees are entitled to receive information and training about hazards, methods to prevent harm, and the OSHA standards that apply to their workplace in a language that the employee can understand. Similar requirements are stipulated in 29 Code of Federal Regulations (CFR) 1910.1200, the Hazard Communication Program, which is applicable to all facilities regardless of hazard designation. OSHA training materials also describe worker rights (http://www.osha.gov/dte/index.html) and training for worker safety BMPs. Cal/OSHA's enforcement unit conducts inspections of California workplaces in response to complaints about an occupational safety and health hazard.

2.3 BMP Category 3: Personal Protective Equipment

Personal protective equipment (PPE) is intended to protect human health during renovation and demolition projects. Applied correctly, PPE limits the transport and spread of contamination of PCBs from clothing and other materials that would otherwise be carried offsite by workers. The

OSHA PPE standard requires the employer to assess the hazards of the work site and requires that employees use appropriate PPE. The employer must also complete a written certification of hazard assessment. Documented policies, training, and enforcement by employers should be in place to reinforce PPE use by all employees whenever it is required by virtue of hazards in the workplace. Appropriate PPE may range from chemically resistant gloves used during initial inspections to *Tyvek*® suits and respirators during dust generating activities. EPA recommends the following PPE for sites contaminated with PCBs (EPA 2010a):

- Chemical-resistant gloves;
- *Tyvek*® disposable coveralls and shoe covers;
- Safety glasses or protective goggles; and
- Respiratory protection.

2.4 BMP Category 4: Work Area Containment

Work area containment is intended to prevent the spread of contaminated dust outside of the controlled work zone. Contaminated dust may spread by wind or water erosion. This BMP, when used correctly, limits the areas contaminated by dust containing PCBs.

When working on a demolition or remodeling of a structure that has been determined to have PCBs-containing caulk, appropriate controls are needed to minimize spreading dust during the remodeling and/or demolition activities. At a minimum, separate potential PCBs-containing caulk work areas from non-PCBs-containing caulk work areas. Also it is important to phase the work, especially for demolition projects, such that PCBs removal work is completed and the area is cleared of contaminated wastes prior to continuing other demolition or remodeling work. This minimizes the potential for PCBs to contaminate other materials and protects workers from prolonged exposure.

Whenever work activities may generate dust containing hazardous materials, control the work area by constructing a containment area. Plastic sheeting should be applied to the floor, walls, or other applicable surfaces to prevent contamination of the building interior, exterior, and surrounding areas from dust generated by the work. The containment area should be constructed so that all dust or debris generated by the work remains within the area enclosed by the plastic sheeting. Additional containment measures include applying a vacuum to the enclosed area during work to create negative air pressure and collect dust that is generated. The size of the containment area and dust controls used will vary depending on the size of the demolition/remodeling project, the methods used, and the amount of dust and debris that will be generated as a result of the demolition/remodeling activities.

EPA specifically recommends the following techniques for setting up containment areas (EPA 2010a):

- Use mobile scaffolding to provide a convenient frame for supporting the enclosure.
- Attach heavy plastic sheeting to scaffolding to create an enclosure around the work area.
- Use two-by-fours attached to sheeting to create an entrance/exit to the enclosure.
- Use heavy plastic sheeting to cover the ground within the enclosure. Secure with tape.

- Construct a decontamination area just outside of the enclosure by placing heavy plastic sheeting on the ground. This area is used to remove personal protective equipment and to clean equipment used in the enclosure.

For locations where constructing a containment area is infeasible, the following techniques should be used to capture dust and debris.

- Cover the ground and plants with heavy plastic sheeting to catch debris. The covering should extend at least 10 feet out from the building. Secure the covering to the exterior wall with a wood strip, staples, or tape.
- Close windows and doors within 20 feet of the work area to keep dust and debris from getting into other parts of the building undergoing demolition or remodeling. Occupants and workers in adjacent buildings should be notified, and windows in adjacent buildings should be closed as well.
- Seal off any vents or air exchange systems into the building that are located within the work area.
- Move or cover any play areas within 20 feet of the work area.
- When working on, or above, the second story, extend the sheeting farther out from the base of the building and to each side of the area where materials are being disturbed, to prevent debris from falling beyond the existing 10-foot covering.
- To prevent the spread of debris when work is close to a sidewalk, street or property boundary, or the building is more than three stories high, cover scaffolding sides with plastic sheeting.
- Avoid working in high winds, if possible. Otherwise, take special precautions to keep the work area contained when the wind is strong enough to move dust and debris. For example, a wind screen can be constructed of plastic at the edge of the ground-cover plastic to keep dust and debris from migrating.
- Avoid working during heavy rainfall events, if possible, or otherwise ensure that containment integrity will not be compromised during heavy rainfall and runoff.

After constructing an effective containment area, make sure to control the spread of dust outside the work area.

- Put all necessary tools and supplies on the protective sheeting in the work area before beginning work to avoid stepping off the protective sheeting before the work is complete.
- Remove or vacuum off *Tyvek*® suits when exiting the work area so the dust stays inside the work area.
- Before stepping off the plastic sheeting, remove disposable shoe covers, and wipe or vacuum shoes, especially the soles. A large disposable tack pad placed on the floor can help to clean the soles of shoes.
- Change out of work clothing before going home, and launder non-disposable protective clothing that may be contaminated with PCBs dust at an appropriately permitted industrial laundry facility that has a treatment system and conducts monitoring of the discharge to the sanitary sewer.

2.5 BMP Category 5: Tools and Equipment

Select appropriate tools for removal of caulk containing PCBs, and surrounding materials that may contain PCBs, that minimize the potential for dust generation.

EPA recommends the following tool use practices (EPA 2010b):

- Select tools and work methods that generate the lowest possible dust volume. Remember that scraping, drilling, cutting, and grinding create dust. Workers can breathe in this dust, or as the dust settles, it can expose building occupants to contaminants.
- If tools or work methods produce high heat (temperatures exceeding 212°F), gases containing PCBs may be released into the air. This increases the risk that workers or building occupants may breathe in PCBs gases. More comprehensive protective measures are necessary for methods that generate moderate to heavy amounts of dust or heat.
- Use tools that generate the least amount of dust and can still get the job done. Detailed information on tools can be found in Summary of Tools and Methods for Caulk Removal. (EPA 2010b)
- Manual tools, such as utility knives, chisels, and scrapers generate lower volumes of fine dust and less heat, but are primarily used for smaller joint lengths or when the joints are difficult to access.
    - Electromechanical tools, such as oscillating knives, jigsaws, and rotary cutting tools, have ergonomic advantages over most manual methods, as they are better suited for projects with many joints and for semi-soft to hard and brittle caulk. Moreover, such tools may be appropriate for removing concrete or other materials that may be contaminated by virtue of being in contact with caulk containing PCBs. However, these types of tools generate higher volumes of dust and more heat, which requires more protective containment measures than required when using manual tools. Jigsaws and saber saws also lead to dust emissions, especially in the case of brittle caulk; furthermore, elastic compounds may gum up the saw blade.
    - Work area containment (BMP Category 4) must be used when grinding electromechanical tools are in use due to dust generation caused by these tools. Examples of these tools include angle grinders, masonry groove cutters, circular saws, and slot mills. High-Efficiency Particulate Air (HEPA) vacuum attachments should also be used to contain the dust generated. This is especially important when PCBs-containing materials could be present.
- For larger projects, use wet sanders and misters to control the dust created during sanding, drilling, and cutting.

2.6 BMP Category 6: Demolition BMPs

Demolition BMPs address demolition activities such as razing (leveling a building skeleton to rubble). Demolition activities should only occur after hazardous materials such as asbestos, lead and PCBs have been removed from the building (EPA Asbestos Demolition, 2009) (EPA 2009a). Potable water sprayed in the area where excavators are razing parts of a building limits the generation of dust and its subsequent transport by wind. Wetting activities should be designed to

avoid runoff. Runoff generated must be contained and properly managed. Proper management includes characterization of wastewater and proper disposal. PCBs-contaminated wastewater has limited disposal options. Discharge of PCBs-contaminated wastewater to the sanitary sewer is prohibited unless specifically authorized by the receiving wastewater agency. Runoff from wetting the area that is not contaminated with PCBs must be managed as a non-storm discharge, and appropriate BMPs must be implemented (e.g., Water Conservation Practices, BMP NS-1; CASQA 2009).

In some jurisdictions, a BMP plan describing how dust is managed during demolition is required. For example, the City of San Francisco Health Code contains a dust control requirement making the movement of any "fugitive dust" across property boundaries a violation of San Francisco Health Code, Article 22.B. Applicants for projects over a half acre in size are required to submit a map showing the location of the project and clearly identifying all surrounding sensitive receptors[3] and particularly noting those within 1,000 feet of the project. If sensitive receptors are determined to be within 1,000 feet of the project, a site-specific dust control plan must be produced.

Dust control plans produced under the San Francisco Health Code, Article 22.B focus on wetting of demolished material to limit dust production to meet the requirement of San Francisco's Health code and address any concerns regarding an inspection of the Bay Area Air Quality Management District (Mactec 2008).

2.7 BMP Category 7: Site Erosion and Sediment Controls

Demolition material that is temporarily stored on-site prior to removal must be managed to limit exposure to wind and water. In many respects, such management calls for traditional erosion and sediment control BMPs that, for example, are described at the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook Portal: Construction (November 2009 and subsequent updates). The handbook organizes BMP fact sheets in terms of erosion control (EC), sediment control (SE), tracking control (TC), wind erosion control (WE), non-stormwater management and materials management control (NS), and waste management and materials pollution control (WM). Although there are many BMPs that might apply depending on local site conditions and constraints, the following are those measures from the CASQA handbook that are most relevant to renovation and demolition of buildings where PCBs may be present:

- Wind Erosion Control (WE-1)
- Stabilized Construction Entrance/Exit (TC-1)
- Stockpile Management (WM-3)
- Hazardous Waste Management (WM-6)
- Contaminated Soil Management (WM-7)
- Concrete Waste Management (WM-8)

[3] Sensitive Receptor is defined as residence, school, childcare center, hospital or other health-care facility, or group living quarters.

- Demolition Adjacent to Water (NS-15)
- Paving and Grinding Operations (NS-3)

These fact sheets are provided, courtesy of CASQA, in Appendix A.

2.8 BMP Category 8: Work Area Housekeeping and End-of-Project Activities

Work area housekeeping is important to maintain control of potentially contaminated areas and to limit further contamination. In addition to daily housekeeping controls, thorough cleaning should occur once the project is complete. Activities related to these BMPs are described below.

EPA specifically recommends the following cleaning activities in their guidance titled Steps to Safe Renovations and Repair Activities (EPA 2010a):

- The work area should be left clean at the end of every day and especially at the end of the job. The area should be as free of dust and debris as possible. The following cleaning supplies, tools, and equipment are available in hardware or garden supply stores:
    - Heavy-duty plastic bags
    - HEPA vacuum with attachments
    - Masking tape, duct tape, or painters tape
    - Misting bottle or pump sprayer
    - Disposable wet-cleaning wipes or hand towels
    - Detergent or general-purpose cleaner
    - Mop and disposable mop heads
    - Two buckets or one two-sided bucket with a wringer
    - Shovel and rake

On a daily basis, contractors should:

- Pick up as you go. Put trash in heavy-duty plastic bags.
- Use covered and lined trash containers, and remove material from site on regular basis.
- Vacuum the work area with a HEPA vacuum cleaner frequently during the day and at the end of the day.
- Clean tools at the end of the day.
- Dispose of or clean off your personal protective equipment.
- Note that wastewater produced during the job from mopping, wet cleaning, cleaning of equipment, or misting is considered a process wastewater and must be managed as a hazardous waste or discharged to a sanitary sewer system provided that the receiving wastewater agency has authorized the discharge and the applicable standards are met.
- Continue to separate the work area from the rest of the building and remind occupants to stay out of the area.

When the job is complete, contractors should:

- Make sure all trash and debris, including building components, are disposed of consistent with disposal requirements outlined in BMP Category 9.
- Vacuum any exposed surfaces, including walls and ceilings, with a HEPA vacuum cleaner.
- Consider misting dusty sections of the plastic sheeting with water before taking them down. This will keep dust from becoming airborne again.
- Remove plastic sheeting carefully, fold it with the dirty side in, tape it shut, and properly dispose of it.
- Vacuum all surfaces again with a HEPA vacuum cleaner.
- Scrub the work area with a general-purpose cleaner on a wet rag or mop until dust and debris are removed.
- Visually inspect your work to ensure that no dust or debris is present.
- Re-clean the area thoroughly if you find dust or debris.

2.9 BMP Category 9: Transport and Disposal

The transport and disposal of PCBs-containing waste generated from demolition or remodeling projects are regulated by both EPA and DTSC as discussed below.

Transport BMPs

Demolition or remodeling material that is considered California Hazardous Waste[4] must be properly transported in accordance with the California Health and Safety Code and disposed of under CCR Title 22.

In California, it is against the law for any person (unless specifically exempted in the regulations) to transport hazardous wastes, unless the person holds a valid registration issued by the DTSC. A current list of registered hazardous waste transporters is available in the Registered Hazardous Waste Transporter Database (California Department of Toxics Substances Control 2007a).

Hazardous waste transporter requirements for the State of California are contained in Article 13 of the California Health and Safety Code. Specific requirements for transporters regarding training, registration, insurance, and manifesting/record keeping are summarized in a DTSC fact sheet entitled "Hazardous Waste Transporter Requirements" (California Department of Toxics Substances Control 2007b).

Disposal BMPs

The generator of the waste is responsible for disposing of PCBs caulk and any other PCBs wastes in accordance with the Federal disposal requirements in 40 CFR 761 as well as California hazardous waste requirements. The generator must determine the type of waste and arrange for

[4] Waste that exceeds the DTSC threshold limit concentrations for PCBs: soluble threshold limit concentrations (STLC) 5 mg/L, and the total threshold limit concentration (TTLC) 50 mg/kg (Title 22 CCR 66261.24).

disposal at an appropriately permitted waste disposal facility. Permitted facilities, including commercial offsite hazardous waste facilities, are listed in DTSC's Envirostor database http://www.envirostor.dtsc.ca.gov/public/commercial_offsite.asp.

The general disposal requirement depends on the type of waste material, concentration of PCBs in the waste material, and the subsequent classification of the waste as shown in Table 1. The types of waste fall into one of the three following general categories discussed below.

PCBs Containing Caulk and Other Materials in Contact with Caulk

The actual caulk containing PCBs (referred to as "bulk product waste" in federal regulations) and may include the concrete or other materials that have become contaminated by being in contact with the PCB containing caulk. Disposal of this waste is governed under the Federal PCBs regulations, and if the PCBs concentration is greater than or equal to 50 mg/kg, as California Hazardous Waste.

Solid Waste Generated as Part of Clean Up Process

Solid waste (other than that identified above) that has become contaminated with PCBs prior to or during the demolition and renovation project, as part of decontamination activities, including soils, rags, gloves, booties or other disposable personal protective equipment. Solid wastes in this category may be considered Federal PCBs remediation waste or Federal PCBs decontamination waste and if the PCBs concentration is equal to or greater than 50 mg/kg California Hazardous Waste.

Liquid Waste Generated as Part of Clean Up Process

Liquid wastes generated as part of decontamination activities, including equipment cleaning. Wastewater produced from mopping, wet cleaning, or misting must be considered process waste water and disposal is governed by the Federal PCBs regulations, California Hazardous Waste regulations, and local wastewater treatment plant requirements (if discharge to sanitary sewer is an option.) Liquid wastes with PCBs concentrations equal to or greater than 5 mg/L must be disposed of as a California Hazardous Waste. Liquid wastes that are greater than or equal to 3 µg/L may be considered Federal PCBs decontamination waste and must be disposed of at an appropriate waste management facility. If the concentration of PCBs in liquid is less than or equal to 3 µg/L, it may be acceptable to discharge the wastewater to a sanitary sewer system provided that the receiving wastewater agency has authorized the discharge and the applicable standards are met. It is never acceptable to discharge wastewater to the ground or storm drainage system.

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Table 1. Simplified Summary of PCBs Disposal Framework[1]

Material	PCBs Concentration[2]	Regulatory Classifications	General Disposal Approach
PCBs-Containing Caulk (may include surrounding materials where the PCBs have penetrated)	Caulk concentration ≥50 mg/kg Waste concentration ≥50 mg/kg[3]	Federal PCBs Bulk Product Waste AND California Hazardous Waste	California disposal as hazardous waste. Disposal out of state depends on receiving state's requirements and landfill acceptance criteria.
	Caulk concentration ≥50 mg/kg Waste concentration <50 mg/kg	Federal PCBs Bulk Product Waste	Disposal depends primarily on landfill acceptance criteria. Federal law allows these wastes to be disposed in an ordinary landfill with prior notification.
	Caulk concentration <50 mg/kg Waste concentration <50 mg/kg	Solid Waste	Disposal depends on primarily on landfill acceptance criteria. Federal law allows these wastes to be disposed in an ordinary landfill with prior notification.
Solid waste from clean-up of PCBs in caulk, such as building materials, soil, and paper	Waste concentration ≥50 mg/kg	Federal PCBs Remediation Waste or PCBs Decontamination Waste AND California Hazardous Waste	Toxic Substance Control Act (TSCA)-approved landfill or hazardous waste landfill.
	Solid waste concentration <50 mg/kg	Federal PCBs Remediation Waste and PCBs Decontamination Waste	Disposal depends on landfill acceptance criteria.

Continued

Table 1. Simplified Summary of PCBs Disposal Framework[1]

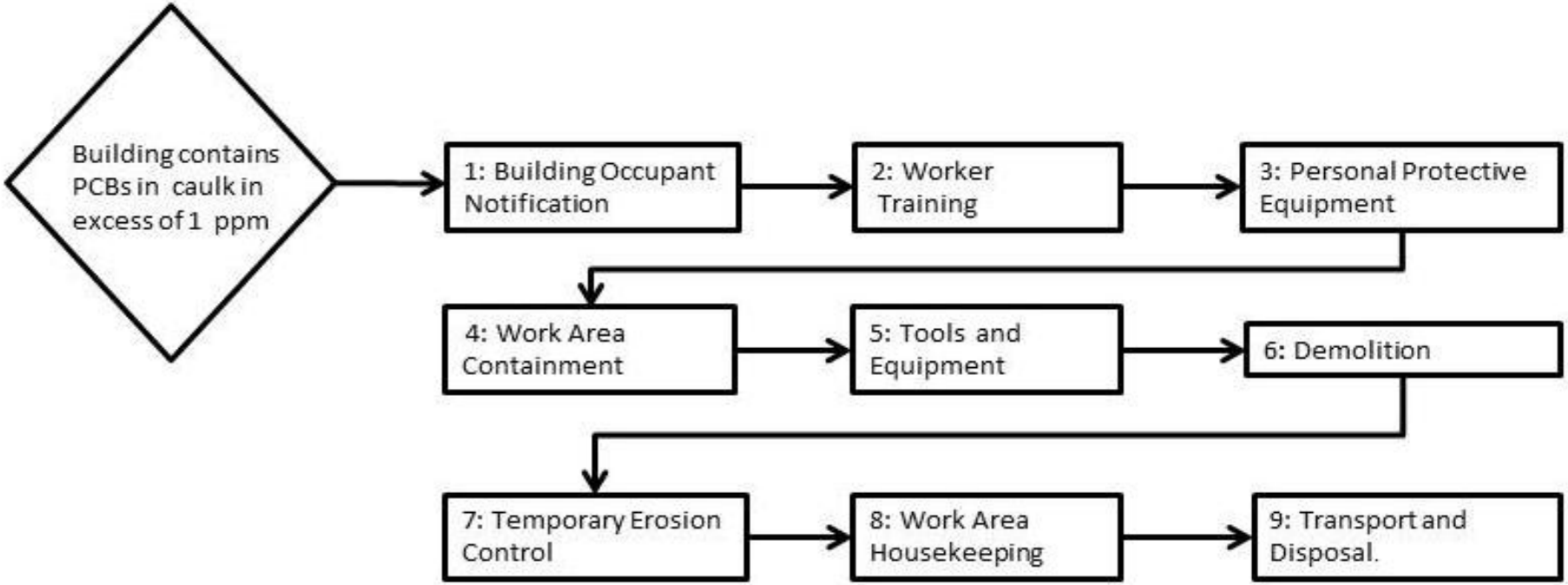
Material	PCBs Concentration[2]	Regulatory Classifications	General Disposal Approach
Liquid waste from clean-up of PCBs in caulk, such as solutions used to clean equipment or surfaces	Liquid waste concentration ≥5 mg/L	Federal PCBs Remediation Waste or PCBs Decontamination Waste AND California Hazardous Waste	Toxic Substance Control Act (TSCA)-approved waste disposal facility or hazardous waste disposal facility.
	Non-aqueous liquid waste concentration <5 mg/L	California Hazardous Waste or Non-hazardous waste depending on composition.	Disposal depends on regulatory status and waste management facility acceptance criteria.
	Aqueous waste concentration <5 mg/L and ≥3 µg/L	Non-hazardous liquid waste	Disposal depends on waste management facility acceptance criteria. Wastewater treatment plants unlikely to authorize sewer discharge. Disposal to storm drains, gutters, or other outdoor locations is never allowed.
	Aqueous waste concentration <3 µg/L	Depends on local wastewater treatment plant	Consult 40 CFR 761 and local wastewater treatment plant to determine if wastewater may be discharged to sewer system. Wastewater treatment plant authorization must be obtained prior to any discharge. Disposal to storm drains, gutters, or other outdoor locations is never allowed.

1 This simplified summary should not be used for compliance purposes. It does not describe all disposal requirements or all disposal options available for all specific wastes. Persons seeking to determine appropriate waste handling, storage, and disposal of PCBs waste should consult 40 CFR 761, CCR Title 22, and regulatory agencies.

2 The law prohibits dilution of wastes with clean solids or liquids to reduce concentrations below regulatory thresholds.

3 California hazardous waste thresholds also include a soluble waste concentration, which is not fully reflected in this table for solid waste.

Figure 1: Typical Sequencing of Categories of Best Management Practices



Appendix A: CASQA Construction BMP Fact Sheets

CASQA DISCLAIMER

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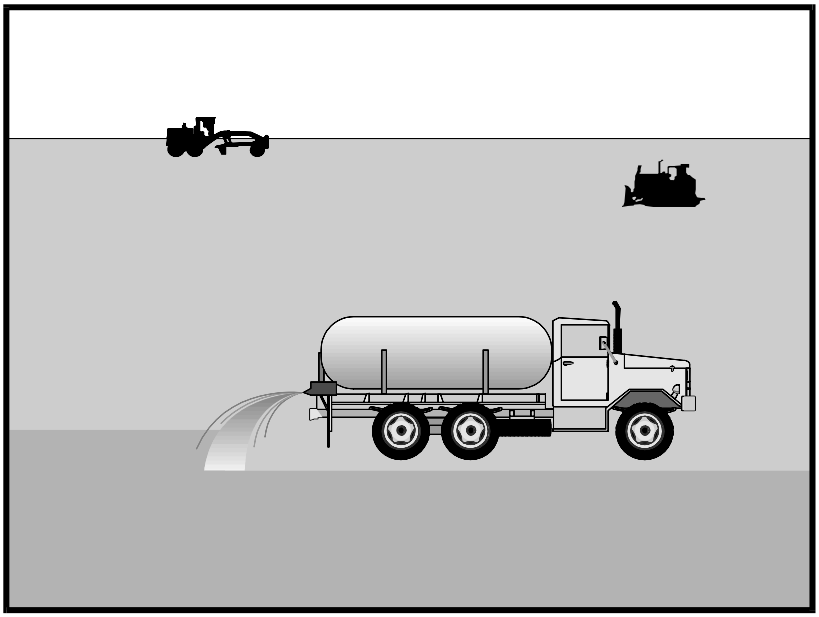
Wind Erosion Control WE-1



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

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- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period (generally less than a few hours) and should be applied daily (or more often) to be effective.
- Over watering may cause erosion and track-out.
- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Chemical dust suppression agents may have potential environmental impacts. Selected chemical dust control agents should be environmentally benign.
- Effectiveness of controls depends on soil, temperature, humidity, wind velocity and traffic.
- Chemical dust suppression agents should not be used within 100 feet of wetlands or water bodies.
- Chemically treated subgrades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.
- If the soil surface has minimal natural moisture, the affected area may need to be pre-wetted so that chemical dust control agents can uniformly penetrate the soil surface.

Implementation

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table presents dust control practices that can be applied to varying site conditions that could potentially cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph or less, and controlling the number and activity of vehicles on a site at any given time.

Chemical dust suppressants include: mulch and fiber based dust palliatives (e.g. paper mulch with gypsum binder), salts and brines (e.g. calcium chloride, magnesium chloride), non-petroleum based organics (e.g. vegetable oil, lignosulfonate), petroleum based organics (e.g. asphalt emulsion, dust oils, petroleum resins), synthetic polymers (e.g. polyvinyl acetate, vinyls, acrylic), clay additives (e.g. bentonite, montimorillonite) and electrochemical products (e.g. enzymes, ionic products).

Site Condition	Dust Control Practices							
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Temporary Gravel Construction Entrances/Equipment Wash Down	Synthetic Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	x	x	x	x	x			x
Disturbed Areas Subject to Traffic			x	x	x	x		x
Material Stockpiles		x	x	x			x	x
Demolition			x			x	x	
Clearing/ Excavation			x	x				x
Truck Traffic on Unpaved Roads			x	x	x	x	x	
Tracking					x	x		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (see EC-1, Scheduling).
- Quickly treat exposed soils using water, mulching, chemical dust suppressants, or stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Restrict construction traffic to stabilized roadways within the project site, as practicable.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.
- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality

Control Board (RWQCB) requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."

- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and wheel wash areas.
- Stabilize inactive areas of construction sites using temporary vegetation or chemical stabilization methods.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater and should meet all applicable regulatory requirements.

Costs

Installation costs for water and chemical dust suppression vary based on the method used and the length of effectiveness. Annual costs may be high since some of these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Check areas protected to ensure coverage.
- Most water-based dust control measures require frequent application, often daily or even multiple times per day. Obtain vendor or independent information on longevity of chemical dust suppressants.

References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

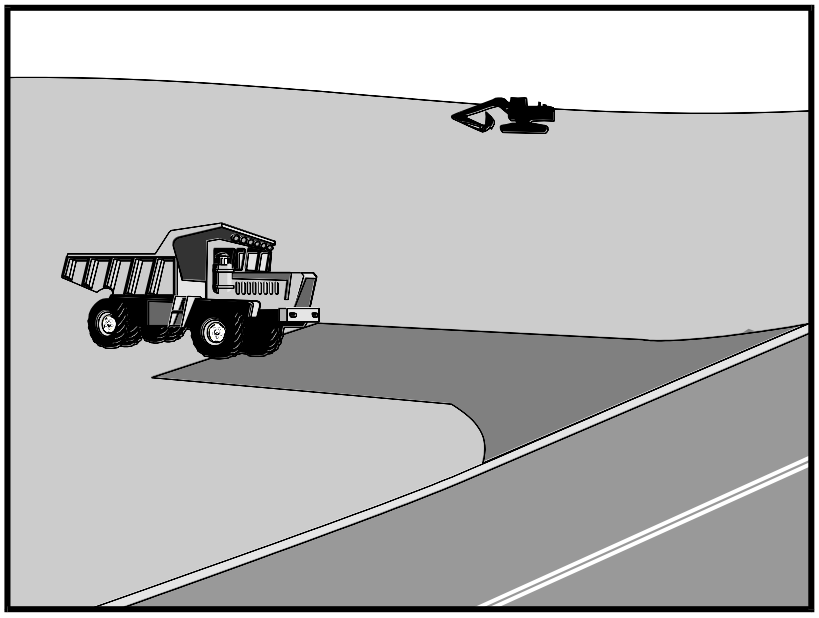
California Air Pollution Control Laws, California Air Resources Board, updated annually.

Construction Manual, Chapter 4, Section 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative", California Department of Transportation (Caltrans), July 2001.

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stabilized Construction Entrance/Exit TC-1



Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Implementation

General

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft or maximum site will allow, and 10 ft minimum width or to accommodate traffic.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.

Stabilized Construction Entrance/Exit TC-1

- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from $1,200 to $4,800 each, averaging $2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from $1,200 - $6,000 each, averaging $3,600 per entrance.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

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

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

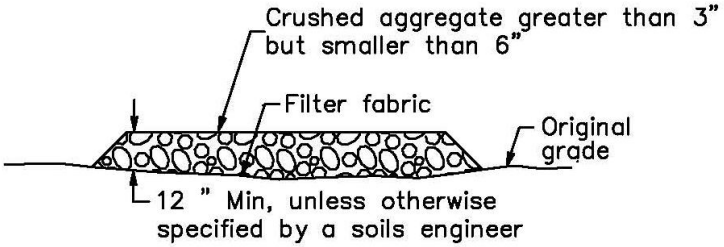
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

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

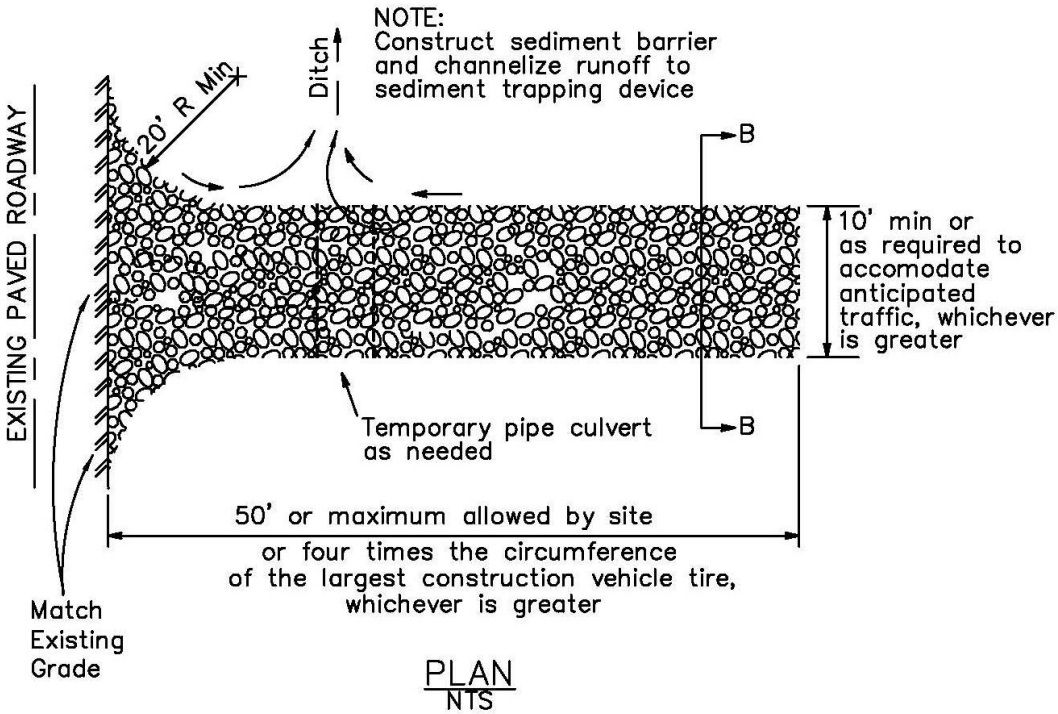
Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

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

Stabilized Construction Entrance/Exit TC-1

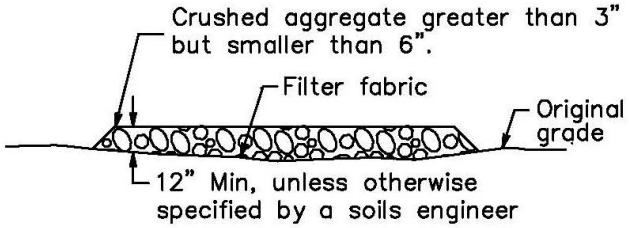


SECTION B–B
NTS



PLAN
NTS

Stabilized Construction Entrance/Exit TC-1



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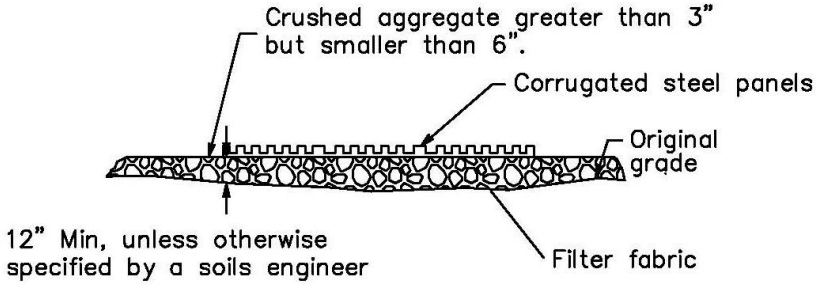
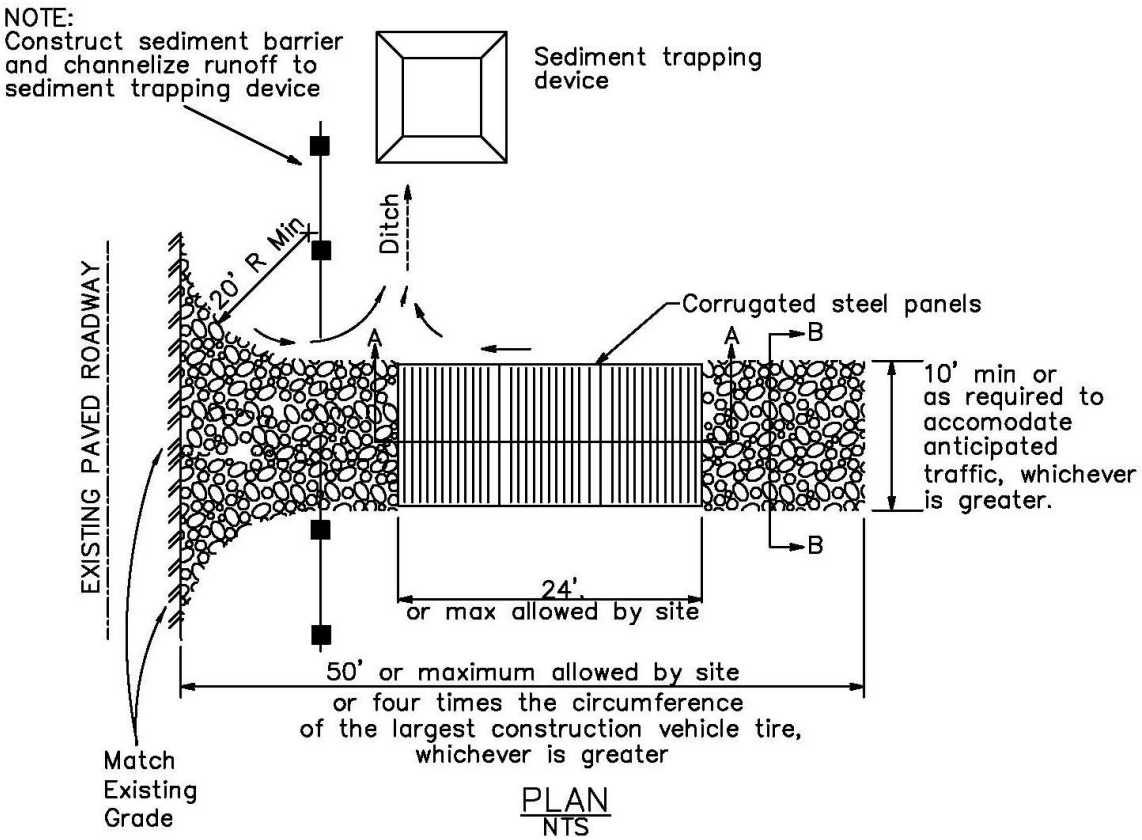
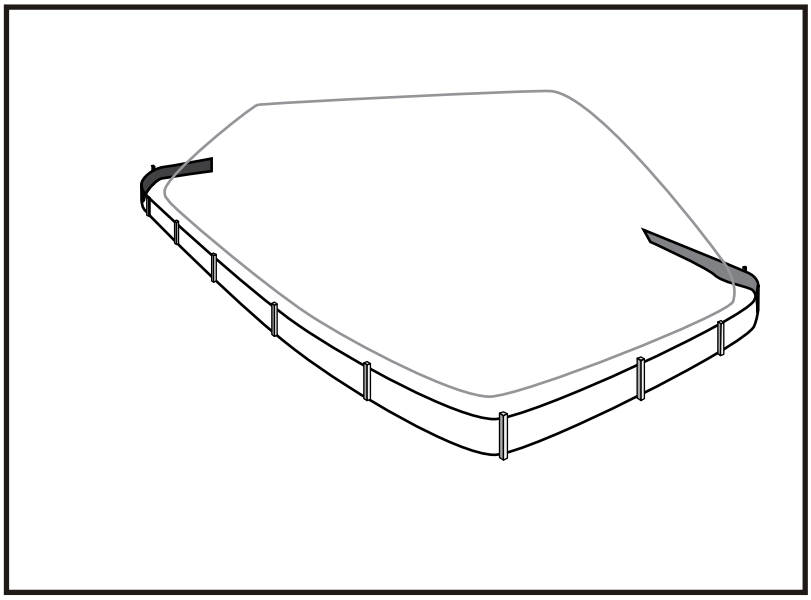


SECTION A–A
NOT TO SCALE



PLAN
NTS

Stockpile Management WM-3



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of plastic materials should be avoided when feasible and photodegradable plastics should not be used.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- All stockpiles are required to be protected immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater run-on using temporary perimeter sediment barriers such as compost berms (SE-13), temporary silt dikes (SE-12), fiber rolls (SE-5), silt fences (SE-1), sandbags (SE-8), gravel bags (SE-6), or biofilter bags (SE-14). Refer to the individual fact sheet for each of these controls for installation information.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.
- Ensure that stockpile coverings are installed securely to protect from wind and rain.
- Some plastic covers withstand weather and sunlight better than others. Select cover materials or methods based on anticipated duration of use.

Protection of Non-Active Stockpiles

Non-active stockpiles of the identified materials should be protected further as follows:

Soil stockpiles

- Cover and project soil stockpiles with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Consider temporary vegetation for topsoil piles that will be stockpiled for extended periods.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- Provide covers and protect these stockpiles with a temporary perimeter sediment barrier at all times.

Stockpiles of "cold mix"

- Cover cold mix stockpiles and place them on plastic sheeting (or comparable material) and surround the stockpiles with a berm all times.

Stockpiles of fly ash, stucco, hydrated lime

- Cover stockpiles of materials that may raise the pH of runoff (i.e., basic materials) with plastic and surround the stockpiles with a berm at all times.

Stockpiles/Storage of wood (Pressure treated with chromated copper arsenate or ammoniacal copper zinc arsenate)

- Cover treated wood with plastic sheeting (or comparable material) and surround with a berm at all times.

Protection of Active Stockpiles

Active stockpiles of the identified materials should be protected as follows:

- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" and treated wood, and basic materials should be placed on and covered with plastic sheeting or comparable material and surrounded by a berm prior to the onset of precipitation.
- The downstream perimeter of an active stockpile should be protected with a linear sediment barrier or berm and runoff should be diverted around or away from the stockpile on the upstream perimeter.

Costs

For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

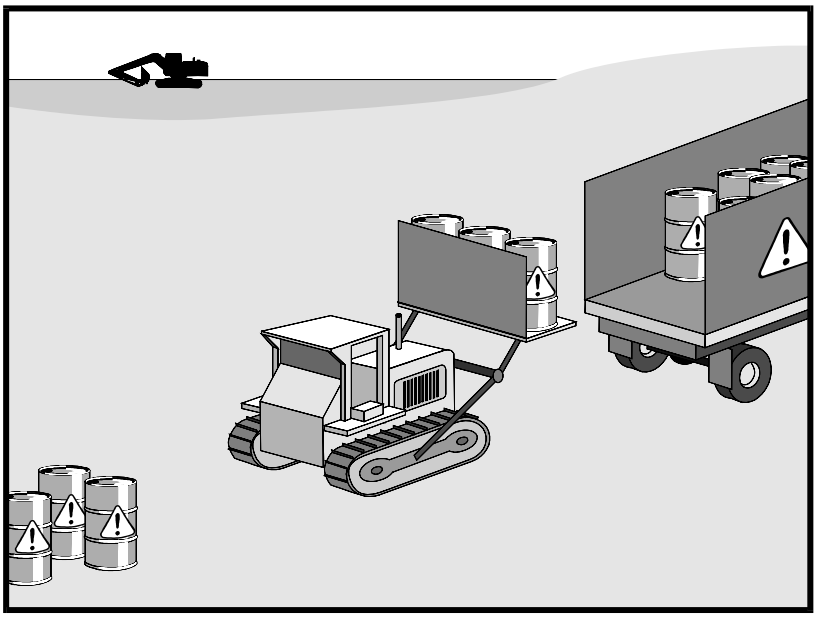
Inspection and Maintenance

- Stockpiles must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- It may be necessary to inspect stockpiles covered with plastic sheeting more frequently during certain conditions (for example, high winds or extreme heat).
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
- Sediment shall be removed when it reaches one-third of the barrier height.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Hazardous Waste Management WM-6



Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Hazardous waste management practices are implemented on construction projects that generate waste from the use of:

- Petroleum Products
- Asphalt Products
- Concrete Curing Compounds
- Pesticides
- Palliatives
- Acids
- Septic Wastes
- Paints
- Stains
- Solvents
- Wood Preservatives
- Roofing Tar
- Any materials deemed a hazardous waste in California, Title 22 Division 4.5, or listed in 40 CFR Parts 110, 117, 261, or 302

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

In addition, sites with existing structures may contain wastes, which must be disposed of in accordance with federal, state, and local regulations. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints
- Asbestos
- PCBs (particularly in older transformers)

Limitations

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Nothing in this BMP relieves the contractor from responsibility for compliance with federal, state, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.
- This BMP does not cover aerially deposited lead (ADL) soils. For ADL soils refer to WM-7, Contaminated Soil Management.

Implementation

The following steps will help reduce stormwater pollution from hazardous wastes:

Material Use

- Wastes should be stored in sealed containers constructed of a suitable material and should be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179.
- All hazardous waste should be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.
- Waste containers should be stored in temporary containment facilities that should comply with the following requirements:
  - Temporary containment facility should provide for a spill containment volume equal to 1.5 times the volume of all containers able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest tank within its boundary, whichever is greater.
  - Temporary containment facility should be impervious to the materials stored there for a minimum contact time of 72 hours.
  - Temporary containment facilities should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be placed into drums after each rainfall. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. Non-hazardous liquids should be sent to an approved disposal site.
  - Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.

- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.

- Throughout the rainy season, temporary containment facilities should be covered during non-working days, and prior to rain events. Covered facilities may include use of plastic tarps for small facilities or constructed roofs with overhangs.

- Drums should not be overfilled and wastes should not be mixed.

- Unless watertight, containers of dry waste should be stored on pallets.

- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application. Allow time for infiltration and avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.

- Paint brushes and equipment for water and oil based paints should be cleaned within a contained area and should not be allowed to contaminate site soils, watercourses, or drainage systems. Waste paints, thinners, solvents, residues, and sludges that cannot be recycled or reused should be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths should be disposed of as solid waste.

- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and reuse thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.

- The following actions should be taken with respect to temporary contaminant:

  - Ensure that adequate hazardous waste storage volume is available.

  - Ensure that hazardous waste collection containers are conveniently located.

  - Designate hazardous waste storage areas onsite away from storm drains or watercourses and away from moving vehicles and equipment to prevent accidental spills.

  - Minimize production or generation of hazardous materials and hazardous waste on the job site.

  - Use containment berms in fueling and maintenance areas and where the potential for spills is high.

  - Segregate potentially hazardous waste from non-hazardous construction site debris.

  - Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.

- Clearly label all hazardous waste containers with the waste being stored and the date of accumulation.
- Place hazardous waste containers in secondary containment.
- Do not allow potentially hazardous waste materials to accumulate on the ground.
- Do not mix wastes.
- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.

Waste Recycling Disposal

- Select designated hazardous waste collection areas onsite.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes, this can cause chemical reactions, making recycling impossible and complicating disposal.
- Recycle any useful materials such as used oil or water-based paint.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g., excess oil-based paint and sludge) is collected, removed, and disposed of only at authorized disposal areas.

Disposal Procedures

- Waste should be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility utilizing properly completed Uniform Hazardous Waste Manifest forms.
- A Department of Health Services certified laboratory should sample waste to determine the appropriate disposal facility.
- Properly dispose of rainwater in secondary containment that may have mixed with hazardous waste.
- Attention is directed to "Hazardous Material", "Contaminated Material", and "Aerially Deposited Lead" of the contract documents regarding the handling and disposal of hazardous materials.

Education

- Educate employees and subcontractors on hazardous waste storage and disposal procedures.
- Educate employees and subcontractors on potential dangers to humans and the environment from hazardous wastes.
- Instruct employees and subcontractors on safety procedures for common construction site hazardous wastes.
- Instruct employees and subcontractors in identification of hazardous and solid waste.
- Hold regular meetings to discuss and reinforce hazardous waste management procedures (incorporate into regular safety meetings).
- The contractor's superintendent or representative should oversee and enforce proper hazardous waste management procedures and practices.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events..
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Hazardous waste should be regularly collected.
- A foreman or construction supervisor should monitor onsite hazardous waste storage and disposal procedures.
- Waste storage areas should be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

- Hazardous spills should be cleaned up and reported in conformance with the applicable Material Safety Data Sheet (MSDS) and the instructions posted at the project site.
- The National Response Center, at (800) 424-8802, should be notified of spills of federal reportable quantities in conformance with the requirements in 40 CFR parts 110, 117, and 302. Also notify the Governors Office of Emergency Services Warning Center at (916) 845-8911.
- A copy of the hazardous waste manifests should be provided.

References

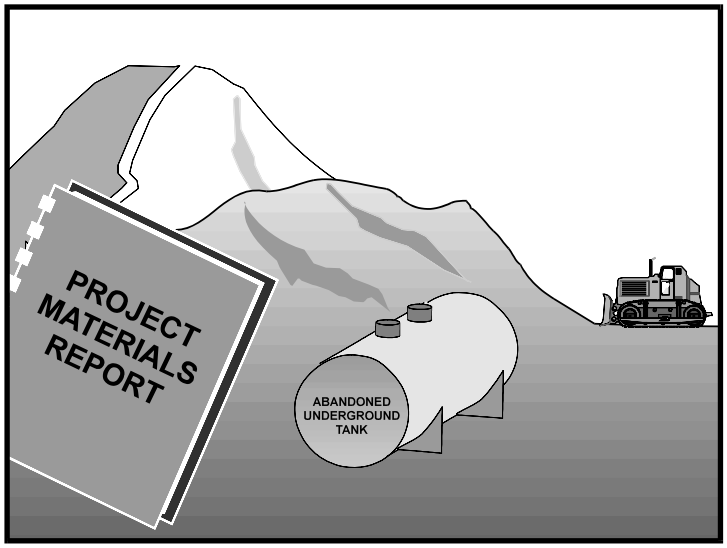
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

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

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Contaminated Soil Management WM-7



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable 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, aerial deposition, past use and leaks from underground storage tanks.

Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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plans, specifications, and SWPPP. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil highlight the need for contractors to confirm a site assessment is completed before earth moving begins.

The following steps will help reduce stormwater pollution from contaminated soil:

- Conduct thorough, pre-construction inspections of the site and review documents related to the site. If inspection or reviews indicated presence of contaminated soils, develop a plan before starting work.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills. Contaminated soil can be expensive to treat and dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- 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
  - Contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
  - Suspected soils should be tested at a certified laboratory.

Education

- Have employees and subcontractors complete a safety training program which meets 29 CFR 1910.120 and 8 CCR 5192 covering the potential hazards as identified, prior to performing any excavation work at the locations containing material classified as hazardous.
- 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 should result in no visible dust.
- Caution should be exercised to prevent spillage of lead containing material during transport.

- Quality should be monitored during excavation of soils contaminated with lead.

Handling Procedures for Contaminated Soils

- Minimize onsite storage. Contaminated soil should be disposed of properly in accordance with all applicable regulations. All hazardous waste storage will comply with the requirements in Title 22, CCR, Sections 66265.250 to 66265.260.
- Test suspected soils at an approved certified laboratory.
- Work with the local regulatory agencies to develop options for treatment or disposal if the soil is contaminated.
- Avoid temporary stockpiling of contaminated soils or hazardous material.
- Take the following precautions if temporary stockpiling is necessary:
  - Cover the stockpile with plastic sheeting or tarps.
  - Install a berm around the stockpile to prevent runoff from leaving the area.
  - Do not stockpile in or near storm drains or watercourses.
- Remove contaminated material and hazardous material on exteriors of transport vehicles and place either into the current transport vehicle or into 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 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.
- Excavate, transport, and dispose of contaminated material and hazardous material 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 that have jurisdiction over such work.
- To determine if it contains hazardous substances, arrange to have tested, any liquid or sludge found in the underground tank prior to its removal.
- 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 or sludge found within the tank, and all contaminated substances and hazardous substances removed during the tank removal and transported to disposal facilities permitted to accept such waste.

Water Control

- All necessary precautions and preventive measures should be taken 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, should be discharged to clean, closed top, watertight transportable holding tanks, treated, and disposed of in accordance with federal, state, and local laws.

Costs

Prevention of leaks and spills is inexpensive. Treatment or disposal of contaminated soil can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Arrange for contractor's Water Pollution Control Manager, foreman, and/or construction supervisor to monitor onsite 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.

- Implement WM-4, Spill Prevention and Control, to prevent leaks and spills as much as possible.

References

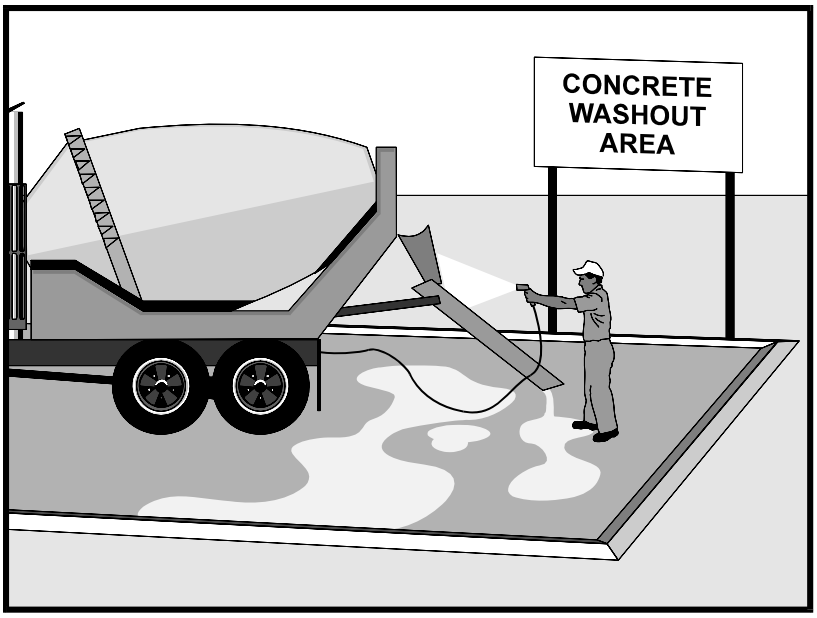
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

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

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Concrete Waste Management WM-8



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Prevent the discharge of pollutants to stormwater from concrete waste by conducting washout onsite or offsite in a designated area, and by employee and subcontractor training.

The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows and raising pH to levels outside the accepted range.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Slurries containing portland cement concrete (PCC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.

- Concrete trucks and other concrete-coated equipment are washed onsite.
- Mortar-mixing stations exist.
- Stucco mixing and spraying .
- See also NS-8, Vehicle and Equipment Cleaning.

Limitations

- Offsite washout of concrete wastes may not always be possible.
- Multiple washouts may be needed to assure adequate capacity and to allow for evaporation.

Implementation

The following steps will help reduce stormwater pollution from concrete wastes:

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Store dry and wet materials under cover, away from drainage areas. Refer to WM-1, Material Delivery and Storage for more information.
- Avoid mixing excess amounts of concrete.
- Perform washout of concrete trucks in designated areas only, where washout will not reach stormwater.
- Do not wash out concrete trucks into storm drains, open ditches, streets, streams or onto the ground. Trucks should always be washed out into designated facilities.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- For onsite washout:
  - On larger sites, it is recommended to locate washout areas at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
  - Washout wastes into the temporary washout where the concrete can set, be broken up, and then disposed properly.
  - Washout should be lined so there is no discharge into the underlying soil.
- 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.
- See typical concrete washout installation details at the end of this fact sheet.

Education

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.

- Arrange for contractor's superintendent or representative to oversee and enforce concrete waste management procedures.
- Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.

Concrete Demolition Wastes

- Stockpile concrete demolition waste in accordance with BMP WM-3, Stockpile Management.
- Dispose of or recycle hardened concrete waste in accordance with applicable federal, state or local regulations.

Concrete Slurry Wastes

- PCC and AC waste should not be allowed to enter storm drains or watercourses.
- PCC and AC waste should be collected and disposed of or placed in a temporary concrete washout facility (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below).
- A foreman or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.
- Saw-cut concrete slurry should not be allowed to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine or by sweeping. Saw cutting residue should not be allowed to flow across the pavement and should not be left on the surface of the pavement. See also NS-3, Paving and Grinding Operations; and WM-10, Liquid Waste Management.
- Concrete slurry residue should be disposed in a temporary washout facility (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below) and allowed to dry. Dispose of dry slurry residue in accordance with WM-5, Solid Waste Management.

Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures

- Temporary concrete washout facilities should be located a minimum of 50 ft from storm drain inlets, open drainage facilities, and watercourses. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
- Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.

- Temporary washout facilities should have a temporary pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
- Temporary washout facilities should be lined to prevent discharge to the underlying ground or surrounding area.
- Washout of concrete trucks should be performed in designated areas only.
- Only concrete from mixer truck chutes should be washed into concrete wash out.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of or recycled offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per WM-5, Solid Waste Management. Dispose of or recycle hardened concrete on a regular basis.
- Temporary Concrete Washout Facility (Type Above Grade)
  - Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft; however, smaller sites or jobs may only need a smaller washout facility. With any washout, always maintain a sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
  - Materials used to construct the washout area should conform to the provisions detailed in their respective BMPs (e.g., SE-8 Sandbag Barrier).
  - Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
  - Alternatively, portable removable containers can be used as above grade concrete washouts. Also called a “roll-off”; this concrete washout facility should be properly sealed to prevent leakage, and should be removed from the site and replaced when the container reaches 75% capacity.
- Temporary Concrete Washout Facility (Type Below Grade)
  - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
  - Lath and flagging should be commercial type.
  - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

- The base of a washout facility should be free of rock or debris that may damage a plastic liner.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and properly disposed or recycled in accordance with federal, state or local regulations. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and properly disposed or recycled in accordance with federal, state or local regulations..

- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

Costs

All of the above are low cost measures. Roll-0ff concrete washout facilities can be more costly than other measures due to removal and replacement; however, provide a cleaner alternative to traditional washouts. The type of washout facility, size, and availability of materials will determine the cost of the washout.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

- Temporary concrete washout facilities should be maintained to provide adequate holding capacity with a minimum freeboard of 4 in. for above grade facilities and 12 in. for below grade facilities. Maintaining temporary concrete washout facilities should include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials should be removed and properly disposed or recycled in accordance with federal, state or local regulations.

- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.

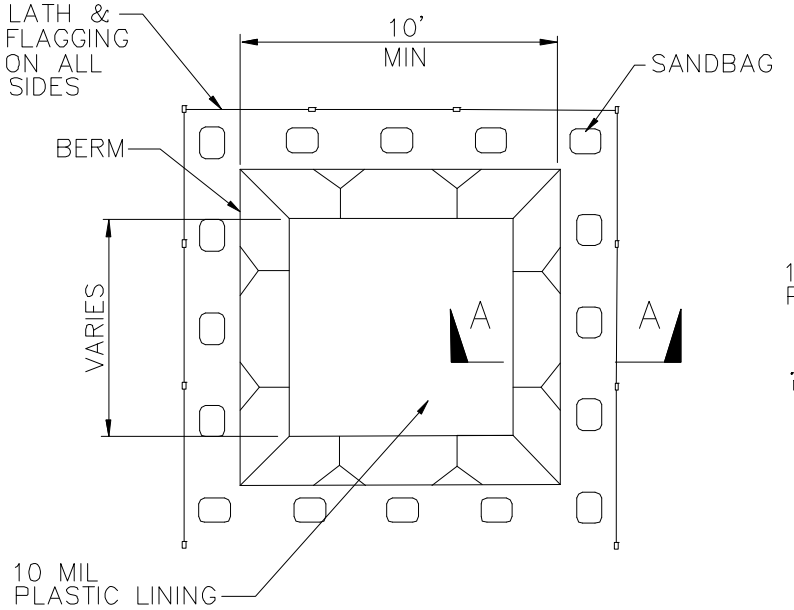
- Inspect washout facilities for damage (e.g. torn liner, evidence of leaks, signage, etc.). Repair all identified damage.

References

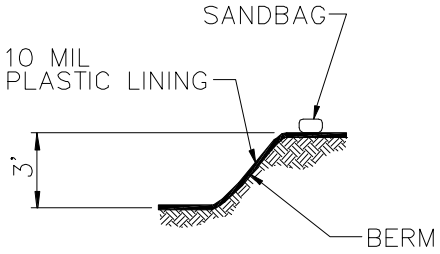
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000, Updated March 2003.

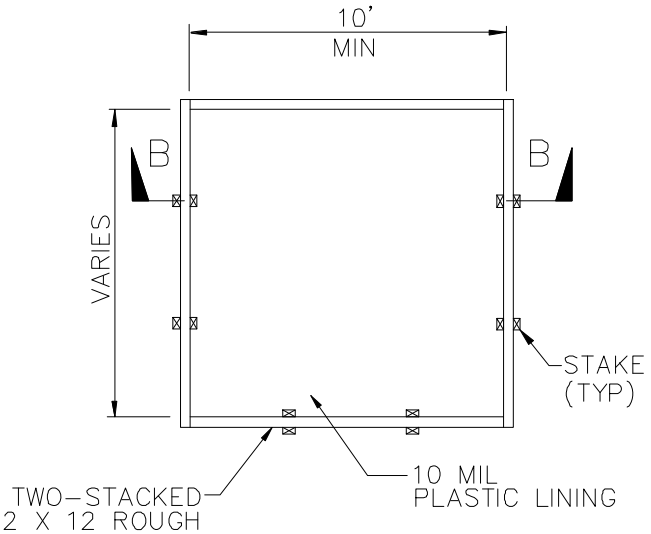
Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



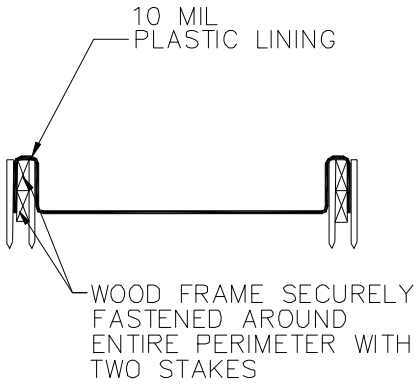
PLAN
NOT TO SCALE
TYPE "BELOW GRADE"



SECTION A–A
NOT TO SCALE



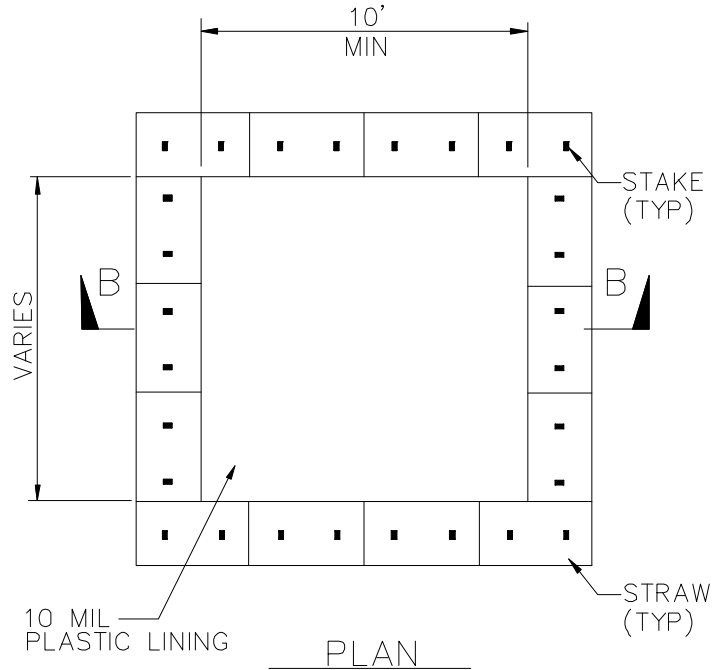
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"



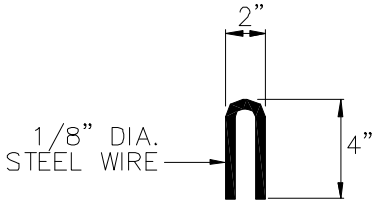
SECTION B–B
NOT TO SCALE

NOTES

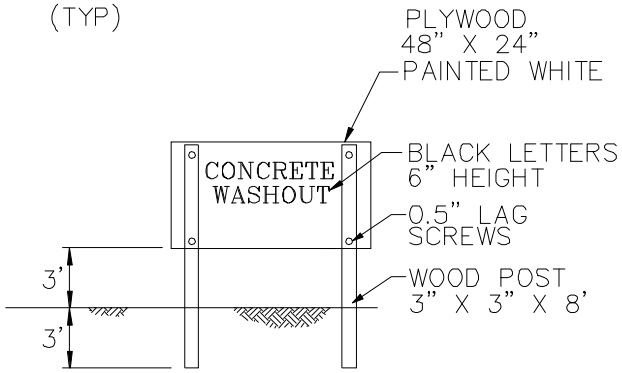
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



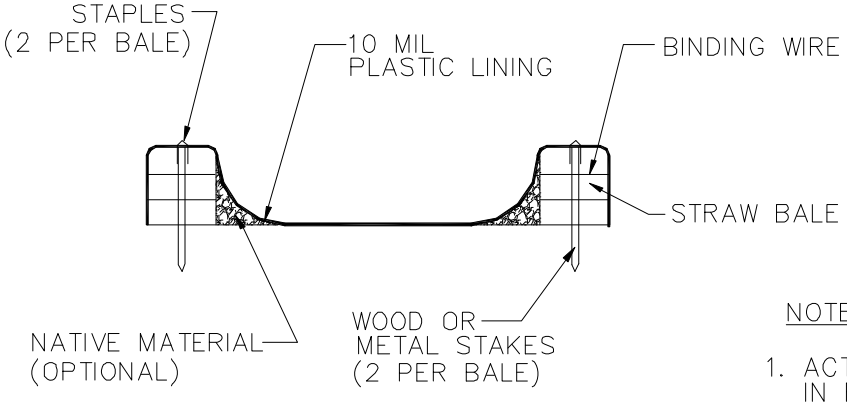
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"
WITH STRAW BALES



STAPLE DETAIL



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)



SECTION B–B
NOT TO SCALE

NOTES

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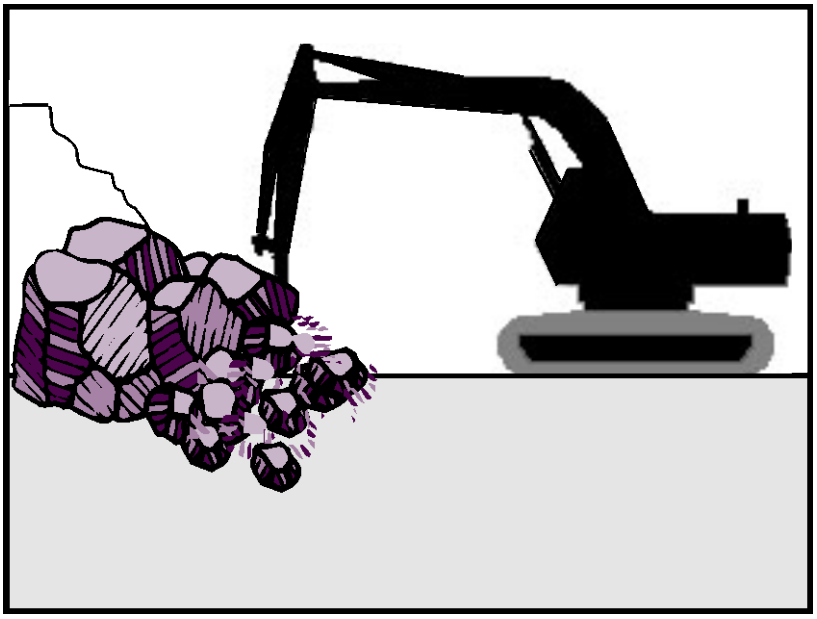
Demolition Adjacent to Water NS-15



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Procedures to protect water bodies from debris and wastes associated with structure demolition or removal over or adjacent to watercourses.

Suitable Applications

Full bridge demolition and removal, partial bridge removal (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

None identified.

Implementation

- Refer to 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 owner.
- Stockpile accumulated debris and waste generated during demolition away from watercourses and in accordance with WM-3, Stockpile Management.
- Ensure safe passage of wildlife, as necessary.

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- Discharges to waterways shall be reported to the Regional Water Quality Control Board immediately upon discovery. A written discharge notification must follow within 7 days. Follow the spill reporting procedures in the SWPPP.

- For structures containing hazardous materials, i.e., lead paint or asbestos, refer to BMP WM-6, Hazardous Waste Management. For demolition work involving soil excavation around lead-painted structures, refer to WM-7, Contaminated Soil Management.

Costs

Cost may vary according to the combination of practices implemented.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.

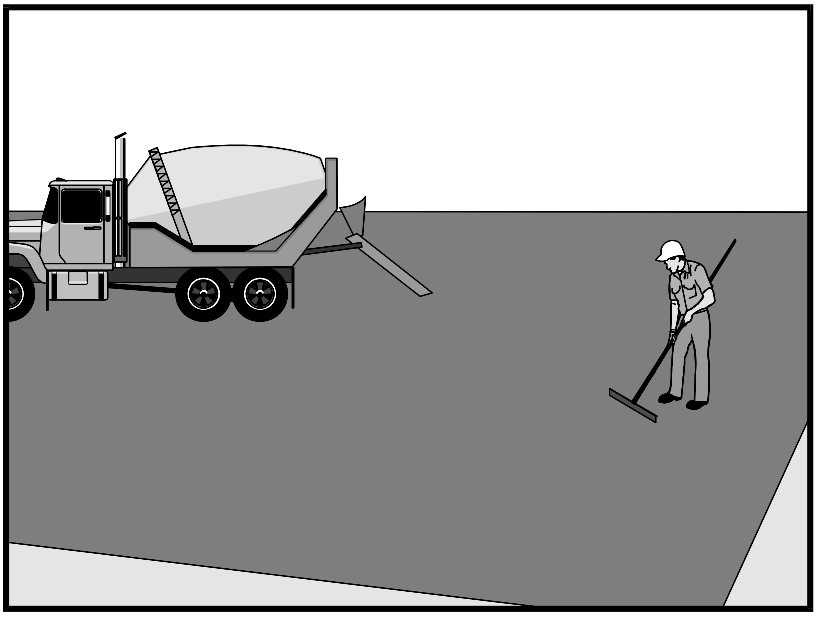
- Any debris-catching devices shall be emptied regularly. Collected debris shall be removed and stored away from the watercourse and protected from runon and runoff.

References

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

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Paving and Grinding Operations NS-3



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☒

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for pH and turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials associated with paving and grinding operations, including mortar, concrete, and cement and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.
- Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

Implementation

General

- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is forecasted.
- Train employees and sub-contractors in pollution prevention and reduction.
- Store materials away from drainage courses to prevent stormwater runon (see WM-1, Material Delivery and Storage).
- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or to trap and filter sediment.
- Stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses. These materials should be stored consistent with WM-3, Stockpile Management.
- Disposal of PCC (Portland cement concrete) and AC (asphalt concrete) waste should be in conformance with WM-8, Concrete Waste Management.

Saw Cutting, Grinding, and Pavement Removal

- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, uncompacted or loose AC, tack coats, equipment cleaners, or unrelated paving materials:
  - AC grindings, pieces, or chunks used in embankments or shoulder backing should not be allowed to enter any storm drains or watercourses. Install inlet protection and perimeter controls until area is stabilized (i.e. cutting, grinding or other removal activities are complete and loose material has been properly removed and disposed of)or permanent controls are in place. Examples of temporary perimeter controls can be found in EC-9, Earth Dikes and Drainage Swales; SE-1, Silt Fence; SE-5, Fiber Rolls, or SE-13 Compost Socks and Berms
  - Collect and remove all broken asphalt and recycle when practical. Old or spilled asphalt should be recycled or disposed of properly.
- Do not allow saw-cut slurry to enter storm drains or watercourses. Residue from grinding operations should be picked up by a vacuum attachment to the grinding machine, or by sweeping, should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. See also WM-8, Concrete Waste Management, and WM-10, Liquid Waste Management.
- Pavement removal activities should not be conducted in the rain.
- Collect removed pavement material by mechanical or manual methods. This material may be recycled for use as shoulder backing or base material.

- If removed pavement material cannot be recycled, transport the material back to an approved storage site.

Asphaltic Concrete Paving

- If paving involves asphaltic cement concrete, follow these steps:

  - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks. Vacuum or sweep loose sand and gravel and properly dispose of this waste by referring to WM-5, Solid Waste Management.

  - Old asphalt should be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

Portland Cement Concrete Paving

- Do not wash sweepings from exposed aggregate concrete into a storm drain system. Collect waste materials by dry methods, such as sweeping or shoveling, and return to aggregate base stockpile or dispose of properly. Allow aggregate rinse to settle. Then, either allow rinse water to dry in a temporary pit as described in WM-8, Concrete Waste Management, or pump the water to the sanitary sewer if authorized by the local wastewater authority.

Sealing Operations

- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate should not be allowed to enter any storm drain or water courses. Apply temporary perimeter controls until structure is stabilized (i.e. all sealing operations are complete and cured and loose materials have been properly removed and disposed).

- Inlet protection (SE-10, Storm Drain Inlet Protection) should be used during application of seal coat, tack coat, slurry seal, and fog seal.

- Seal coat, tack coat, slurry seal, or fog seal should not be applied if rainfall is predicted to occur during the application or curing period.

Paving Equipment

- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials and dispose of in accordance with the applicable regulations. See NS-10, Vehicle and Equipment Maintenance, WM-4, Spill Prevention and Control, and WM-10, Liquid Waste Management.

- Substances used to coat asphalt transport trucks and asphalt spreading equipment should not contain soap and should be non-foaming and non-toxic.

- Paving equipment parked onsite should be parked over plastic to prevent soil contamination.

- Clean asphalt coated equipment offsite whenever possible. When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in WM-5, Solid Waste Management. Any cleaning onsite should follow NS-8, Vehicle and Equipment Cleaning.

Thermoplastic Striping

- Thermoplastic striper and pre-heater equipment shutoff valves should be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering drain inlets, the stormwater drainage system, or watercourses.
- Pre-heaters should be filled carefully to prevent splashing or spilling of hot thermoplastic. Leave six inches of space at the top of the pre-heater container when filling thermoplastic to allow room for material to move.
- Do not pre-heat, transfer, or load thermoplastic near drain inlets or watercourses.
- Clean truck beds daily of loose debris and melted thermoplastic. When possible, recycle thermoplastic material.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near drain inlets, the stormwater drainage system, or watercourses.
- Melting tanks should be loaded with care and not filled to beyond six inches from the top to leave room for splashing.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- On large-scale projects, use mechanical or manual methods to collect excess bituminous material from the roadway after removal of markers.

Costs

- All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of paving and grinding operations.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Sample stormwater runoff required by the General Permit.
- Keep ample supplies of drip pans or absorbent materials onsite.
- Inspect and maintain machinery regularly to minimize leaks and drips.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Hot Mix Asphalt-Paving Handbook AC 150/5370-14, Appendix I, U.S. Army Corps of Engineers, July 1991.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.