Port of San Francisco

Port-wide Maintenance Manual

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PORT OF SAN FRANCISCO

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1. Purpose

This Maintenance Manual (Manual) describes the operations of the Port of San Francisco (Port) and its contractors, under its reissuance of the five-year Port Maintenance Program (2021-2026 Maintenance Program). It documents the maintenance and repair activities to be performed and best management practices (BMPs) being implemented to protect water quality and avoid environmental impacts in conducting the Program, including means, methods and materials being used.

This Manual, originally prepared for the 2016-2021 Maintenance Program, has been updated to support the Port's application for reissuance of the San Francisco Bay Regional Water Quality Control Board Clean Water Act (CWA) Section 401 and Water Quality Certification (Order R2-2016-0039), and the US Army Corps of Engineers Regional General Permit No. 2015-00016S (USACE RGP22) for the Port's 2021-2026 Maintenance Program. The scope of activities and RGP22 permit conditions are generally consistent with those described in USACE Nationwide Permit 3.

The Maintenance Program work described in this manual is generally limited to activities covered by the Port's CEQA Categorical Exemption Determination filed by the San Francisco Planning Department on March 18, 2016 and the Bay Conservation and Development Commission (BCDC) Permit No. M1977.017.19 for repair, rehabilitation, restoration, replacement and/or removal of any previously authorized, currently serviceable structure or fill.

The 2021-2026 Maintenance Program activities would be performed in accordance with procedures that have been determined by the USACE and National Marine Fisheries Service to be "not likely to adversely affect" special status species and habitats[1],[2]. These maintenance activities are limited to reconfiguration or removal of existing facilities;

The scope of maintenance work proposed for authorization by the general maintenance permits is limited to:

- The structure or fill [to be altered] is not to be put to uses differing from those specified or contemplated in the original construction. Minor deviations, including those due to changes in materials, techniques, standards, or regulatory requirements, are authorized;
- The repair, rehabilitation or replacement of structures or fill destroyed or damaged by discrete events (such as storms, floods, fire, etc.) is commenced or is under contract to commence within two years of the damaging event (unless this two-year limit is waived by the USACE District Engineer);

[1] NMFS, 2016; "Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Port of San Francisco's Regional General Permit for Waterfront Maintenance and Repair Activities (Corps File No. 2015-00016S)". February 3, 2016.

[2] NMFS, 2018. "Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the U.S. Army Corps of Engineers 2018 NLAA Program (SPN 2013-00187 and SPK-2013-00451)". September 5, 2018.

- No temporary fill material is placed in a manner that will be eroded by normal or expected high flow; and
- Temporary fill is removed in its entirety and the affected area returned to pre-construction elevations (and revegetated, as appropriate).

The following activities are not proposed in the Port Maintenance program:

1. Projects that would enlarge the net footprint of over-water structures by more than 20% of existing area over water;

2. Maintenance or restoration projects outside of the Port Maintenance Area of for which maintenance and monitoring is performed under project-specific approvals (e.g., wetlands located at Pier 94 and Heron's Head Park); work in areas that are identified by local, State, or federal agencies as impacted by hazardous waste, subject to voluntary cleanup agreement or regulatory order or regulated as solid waste disposal sites.

2. Responsibilities and Lines of Authority

The Port Maintenance and Engineering Divisions, including the Deputy Directors and Superintendents, are responsible for planning and implementing maintenance and repair work that is the subject of this Manual. Port Planning and Environmental staff play a supportive role to ensure that all work is in accordance with the procedures described in this Manual and in compliance with applicable Port and other regulatory permit requirements and conditions. Port staff charged with responsibility for conducting work in accordance with this Manual and related permits and authorizations include:

DIVISION / Position	FUNCTION
MAINTENANCE	
Deputy Director	Port's primary point of contact for Port Maintenance Division. Manages staff responsible for Port-wide maintenance, restoration, and repair activities.
Port Health & Safety Officer and Industrial Hygienist	Ensures that activities are implemented according to OSHA standards and other environmental health and safety requirements.
Superintendents	Manage the various trades or "shops" (e.g., pile-workers, plumbers, divers, crane operators, laborers, electricians, welders, carpenters, roofers, etc.) who perform Port-wide maintenance work. Superintendents are responsible for understanding the requirements and best management practices that apply to the shops under their supervision, and for ensuring that individual shop Supervisors and line staff have the training and resources required to conduct their work safely and in compliance with environmental and other project specifications.
PLANNING & ENVIRONMENT	
Deputy Director	Manages Port staff responsible for environmental planning, compliance reporting. and permit review in support of Maintenance, Engineering, and Maritime Division projects.
Assistant Deputy Director	Coordination and planning for CEQA, BCDC and regulatory agency reviews and approvals. Assist Port Environmental Planners with project evaluation and coordination.
Historic Resources Planner	Ensures maintenance and restoration activities in compliance with Secretary of Interior Standards for Historic Rehabilitation.
Environmental Planners/Scientists	Coordination and planning for CEQA and BCDC reviews and approvals. Support Engineering, Maintenance and

DIVISION / Position	FUNCTION
	Maritime Division projects including evaluation of general work program, project and site-specific conditions to identify applicable permits, environmental conditions and requirements; obtain environmental permits and approvals; assist in training Port staff regarding environmental regulatory requirements and environmental protection measures; provide oversight and assistance to ensure compliance with permit conditions; and support staff in reporting maintenance work and completed activities.
ENGINEERING	
Deputy Director, Chief Harbor Engineer	Manages Port's Engineering Division staff responsible for Facilities and Utilities Management, Construction and Contracts Management, Project Management, and the Building Permits Group. Oversees Engineers responsible for design, permitting and implementation of Port construction, maintenance, and rehabilitation projects.
Chief Building Inspector	Manages Port's Building Permit Group, responsible for reviewing and issuing Building and Encroachment permits in compliance with applicable Port Building Code and other regulatory requirements. Manages building inspectors documenting project construction activities and compliance with project permits.
Building Inspectors and Construction Managers	Ensure construction performed per project plans and specifications; inspect, document and report on Port construction, maintenance, repair, and rehabilitation projects.

3. Port Overview

The Port of San Francisco is a public enterprise agency of the City and County of San Francisco. The Port's jurisdiction spans 7 1/2 miles of San Francisco urban and industrial waterfront adjacent to San Francisco Bay (the Bay) which the Port develops, markets, leases, administers, manages, and maintains. Its 7 ½ mile jurisdiction extends along the waterfront from Hyde Street Pier on the north (Latitude: 37.48.32.64N, Longitude: 122.25.36.70W) to India Basin on the south (Latitude: 37.44.14.36N, Longitude: 122.21.59.09W; **Figure 1 Port of SF Jurisdiction**). This land includes some of the region's most popular open spaces and attractions, two National Register Historic Districts, hundreds of small businesses, nearby housing, and maritime and industrial uses. The Port's jurisdiction also includes important regional and citywide assets, including transportation networks like BART and Muni, critical utilities including drinking, storm drain and wastewater, and key emergency response facilities. All Port properties are subject to tidelands trust restrictions overseen by the State Lands Commission.

Port facilities require routine maintenance and repair of its aging shoreline infrastructure and navigational equipment. Continuing a program of maintenance and repair activities are necessary to maintain current Port facilities and uses to comply with Port Building Code requirements, maintain public safety, and/or keep facilities in a state of good repair. It is anticipated that routine maintenance activities will keep the Port's facilities operational while improving water quality and protecting beneficial uses

Under the 2016 Maintenance Program permits, the Maintenance Area extending 7.5 miles from Hyde Street to India Basin area is all waters of the State and subject to the Regional Water Board Order R2-2016-0039. The 2016 USACE RGP22 permit considered the 3.5 miles of the Port's Southern Waterfront (from Pier 40 to Pier 96) as navigable waters of the U.S., including under piers and wharves, and subject to Section 10 of the Rivers and Harbors Act. Those portions of the Northern and Central Waterfront outside of bulkheads and piers were considered navigable.

H.R.33, the Water Resources Development Act of 2020, issued December 21, 2020, declares all of the bulkheaded and filled area within Port jurisdiction to be non-navigable and further authorizes the US Army Corps of Engineers to issue permits for work in non-navigable waters within Port jurisdiction. Consistent with this legislation, the Port seeks USACE authorization to conduct the Port's 2021-2026 Maintenance Program activities by amendment to RGP-22 to apply the Port's entire 7 ½ miles of facilities declared non-navigable **(Figure 2 – Port Jurisdiction)**. The Port additionally seeks amendment of Order R2-2016-0039 to authorize implementation of the 2021-2026 Maintenance Program to provide 401 Water Quality Certification for the same area.

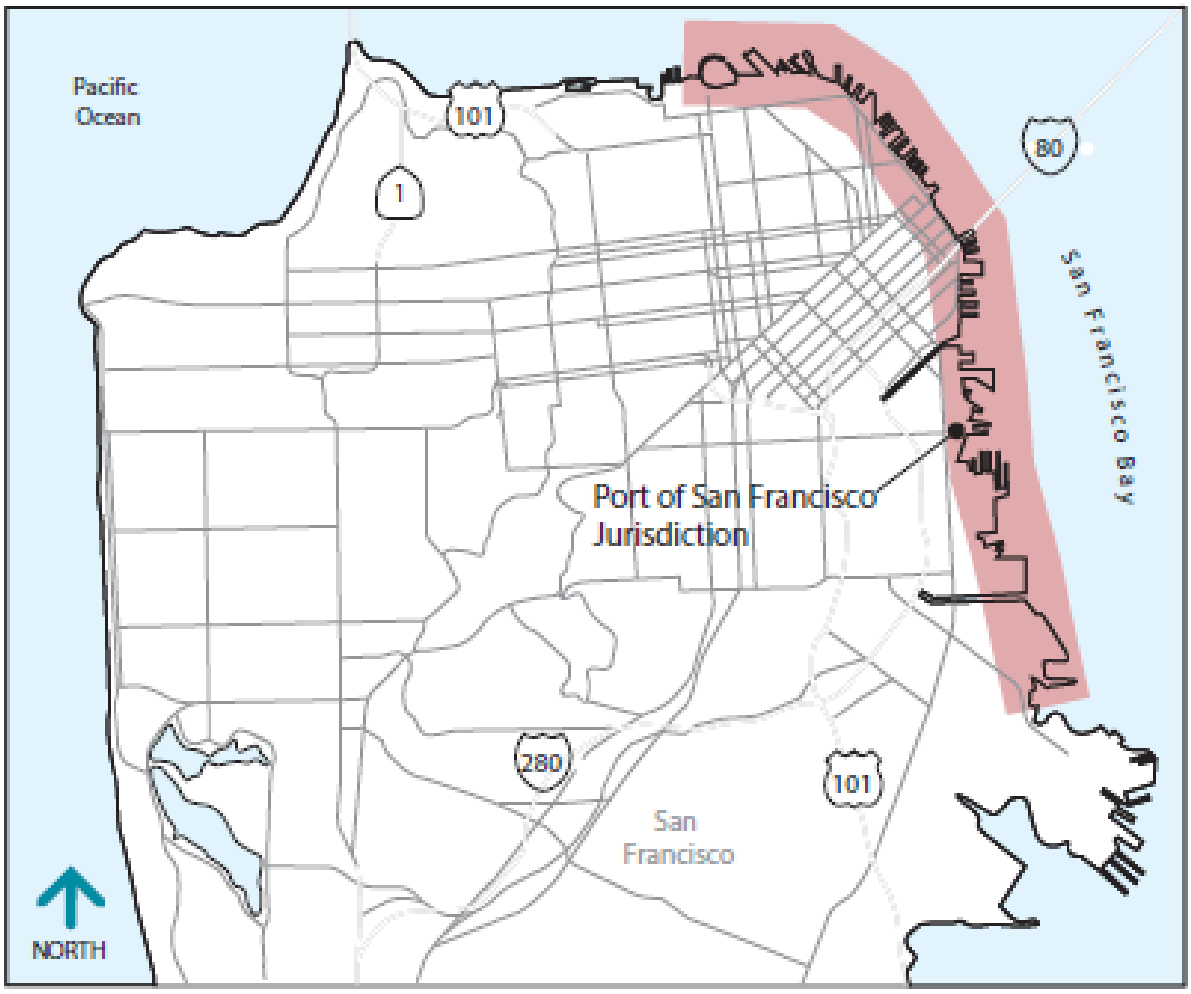


Figure 1 ⇧N

Vicinity Map

Figure 2

Port of S.F. Jurisdiction/Maintenance Area

4. Maintenance Activities

This section describes the procedures and activity-specific measures to avoid or minimize environmental impacts and protect water quality that are incorporated into the Port's standard procedures, identified in this section as BMPs. **Table 1** provides a list of general and activity specific BMPs that are part of the Port's routine maintenance project activities and are referenced by BMP # in this Manual. **Appendix A** provides activity-specific BMP guidance from the California Stormwater Quality Association (CASQA), also referenced in the text below by CASQA's alphanumeric BMP identifier.

4.1 Removal of Dilapidated Piles, Pier Decks and Structures

Removal of dilapidated structures and debris is generally conducted using marine based equipment located on barges, with debris placed on a separate material barge with runoff and debris containment along its perimeter. When demolition and removal is performed on or adjacent to a barge or pier deck, Port staff constructs a containment basin of steel and/or durable plastic sheeting with sidewalls supported by hay bales or other structures on the materials barge. Wood piles, deck elements and other debris are placed within the containment basin to prevent debris and sediment from entering the water (CASQA BMP NS15 and **BMP #6)**.

4.1.1 Removal of Piles: Piles will be removed using marine equipment as described below. Containment boom will be placed around the work area and sorbent boom will be available. When the pile in question is accessible with vibratory extraction equipment, that is the preferred method for removal. Timber pilings are particularly prone to breaking at the mudline due to damage from marine borers and vessel impacts. In some cases, removal with a vibratory hammer is not possible because the friction between the pile and surrounding sediment can result in the pile breaking below the mudline as it is removed.

Vibratory extraction: Vibratory extraction is a common method for removing both steel and timber piling. A vibratory hammer is a large mechanical device (weighing 5-16 tons) that is suspended from a crane by a cable and positioned on the top of a pile. As the pile is vibrated, the vibration loosens the pile from the surrounding sediment. The pile is then unseated from the sediments by engaging the hammer and slowly lifting up on the hammer with the aid of the crane. Once the pile is unseated from the sediments, the hammer is shut off, and the crane will continue to pull the pile from the sediment and placed on a barge. Vibratory extraction takes approximately 15 to 30 minutes per pile depending on pile length and sediment condition (**BMP #1**, **BMP #10**).

Direct pull: To pull piles directly from the sediment, the pile is wrapped with a rigging strap, choker cable or chain attached at the top to a crane. The crane pulls the pile directly upward, removing the pile from the sediment. Because timber piles being removed are typically in a severely degraded condition, those removed by direct pull generally break between the waterline and mudline or a few feet below the mudline as the friction from contact with deeper sediment exceeds the structural integrity of the pile. Crane operators are trained to remove piles from

sediment slowly to minimize breakage above the mudline and sediment disturbance and turbidity (**BMP #10**).

Clamshell or Excavator with Grapple: Broken pile stubs and damaged piles that cannot be removed by vibratory extraction or direct pull are removed with a clamshell bucket or long reach excavator typically equipped with a Kriptoclaw grapple. The clamshell bucket is lowered from a crane and the steel jaws grasp the pile stub as the crane pulls up. Similarly, the long reach excavator will be lowered from the equipment barge or deck and the grapple grasps the pile stubs or broken pile at or below mudline. The broken piling and stubs are loaded onto a materials barge, transferred to an upland material processing area for size reduction and off-site disposal.

Pile Cutting: In some cases (depending on access, location, etc.), timber piles may be cut below the mudline and the resulting hole backfilled with the surrounding clean sediment. When cutting timber piles, priority is placed on both worker safety and minimizing sediment disturbance. If the entire pile cannot be removed, the pile may be cut to remove as much of the pile as possible from the water column and shallow sediment. In deep sub tidal areas, if the piling is broken off below mud line greater than one foot, the piling may remain in place. In intertidal and shallow sub tidal areas, the Port endeavors to cut piles at least two feet below the mud line if it is accidentally broken off above the mudline during removal.

If a pile breaks near or above the sediment surface during pile removal, the pile may be cut by clamshell or excavator with grapple as described above, or manually cut by a diver using an underwater chainsaw at or below the mudline. Piles cut by clamshell, excavator grapple or manually by divers, shall be cut at the lowest practical tide condition and at slack water. This is intended to reduce turbidity due to reduced flow and short water column through which pile must be withdrawn (**BMP #10**).

If piles are in an area that cannot be accessed for removal by vibratory, chain or excavator (e.g., replacing individual piles through an existing deck) then the pile may be cut at the mud line by a diver using a hydraulic underwater chainsaw. If manual cutting by a diver working underwater is required, removing the pile below the mudline is not recommended because it increases sediment disturbance and poses increased risk to divers. To access the pile below the mudline, a diver must use air or water to jet the sediment surface, which generates significant turbidity, extending a substantial distance from the pile, and poses a serious safety hazard to the diver because jetting can rapidly and forcefully dislodge large, sharp, and unseen objects propelled forcefully in the immediate vicinity of the worker.

Extracted piles removed by any method are placed safely and expeditiously into a containment area to avoid dropping adhered sediment in the water. Sediments spilled on work surfaces are contained and disposed with at an appropriate upland disposal site. Holes remaining after piling removal are left to fill in through natural sediment settlement and deposition. Extracted piles with attached sediment are not shaken, hosed off, or hung overwater to drip; such piles are moved expeditiously to a contained area prior removing adhered material using appropriate methods.

4.1.2 Removal of Pier Decks: Pier decks will typically be removed using an excavator mounted on a derrick barge or using a land-based excavator. Where asphalt-paved decks are removed, the asphalt will be removed from the pier deck prior to demolition of underlying wood structure to minimize potential for debris to fall to the water (**BMP #6**). In some cases, where there is severe deterioration it is not safe to bring construction equipment onto the pier deck to remove asphalt. During these activities, Port crews or contractors follow debris capture measures as described in Section 5.2: Debris Capture and Containment.

To remove asphalt decking, the asphalt is saw-cut to required depth. A jack hammer may be used as necessary to break up asphalt into manageable pieces. Asphalt is removed with backhoe/loader or bobcat and placed into a container. Asphalt (as well as concrete and metal) are segregated and recycled to the extent feasible. Material that is determined by the field crew and/or the environmental department as unsuitable for recycling will be disposed at an approved facility. The remaining deck is swept and/or vacuumed using a trailer-mounted vactor to remove fines and small pieces of asphalt debris (**BMP #6, #7**). Where there are rail tracks in asphalt decks, the track is cut into manageable lengths, removed using a barge mounted crane and placed on a debris barge or removed by a forklift on the deck, and transported by flatbed truck to an approved recycling facility.

During demolition and removal of wood decking and supporting substructure, wood elements are cut into manageable pieces, removed using a barge mounted crane, placed on a debris barge, or removed by forklift on the deck, and placed into a container or dump truck for disposal at an appropriate off-site disposal facility. During these activities, Port crews or contractors follow debris capture measures as described in Section 5.2 Debris Capture and Containment.

***4.1.3 Removal of Structure and Debris*:** Submerged debris removal work is based on site conditions and typically scheduled at lowest practical tide condition and at slack water. Debris will be removed using land-based or barge mounted crane or long reach excavator equipped with a Kriptoclaw grapple. The machines will pick up debris carefully so as not to scrape or grade the shoreline (**BMP #5**). Equipment operators will place the debris on a materials barge with runoff and debris containment along its perimeter (**CASQA BMP NS14**). Debris will be placed onto material barges and disposed directly or moved to a storage yard for confirmation of recycling or disposal requirements.

In accordance with local requirements[3], concrete, asphalt and metal debris will be recycled to the extent feasible (at least 75%). Material that is unsuitable for recycling will be disposed of at an approved facility.

4.1.4 Debris Disposal: Port Maintenance and its contractors will handle and dispose of all piles, decking and debris in accordance with project specifications, permits and waste disposal requirements. Piles, wood deck elements, and other construction or demolition debris are segregated by waste type, placed in labeled bins or in containment areas at the job site, at the Port's maintenance yard, or contractor material rehandling facility. Piling and wood deck elements are typically cut by

[3] San Francisco Environment Code Chapter 14 – Construction and Demolition Debris Recovery Ordinance

chainsaw into 4' lengths. All sawdust and cuttings shall be contained in the containment area. Cut up piling, wood, sediment, plastic sheeting from containment area, and other debris from demolition will be packed into a labeled container and disposed at an approved off-site recycling or solid waste disposal facility (**BMP #6**).

Treated Wood Waste (TWW) resulting from the demolition of piles and decking will be managed in accordance with Alternative Management Standards and requirements developed by the Department pf Toxic Substances Control[4]. DTSC requirements include preventing ground contact of the TWW materials, preventing exposure to the public and managing proper documentation throughout the disposal process. TWW is segregated from other debris and stored on the ground on blocks, concrete surfaces or in labeled containers. TWW is disposed at a solid waste facility specifically licensed to accept TWW. The Port maintains TWW project records including a TWW generator form, landfill acceptance forms, and disposal manifests.

4.1.5 Abatement Prior to Demolition: Before demolition of any structures, the Port conducts a health, safety, and environmental review to determine whether any of the structure elements require abatement prior to demolition. Typical items of concern are asbestos and lead paints. When these items are identified, the structure is abated and identified hazardous material is removed prior to demolition.

4.2 Repair of Wharves, Piers, and Related Structures

The maintenance, repair and reconfiguration of existing piers, aprons/decks, wharves, fenders, dolphins, whalers, and under-pier structures such as joists, stringers, pipelines, and utilities (including electrical, water, sewer and storm drain lines) attached to pier decks and Port structures, and minor coring of pier decks to install related structures will occur as needed. These maintenance activities are limited to removal or repair/reconfiguration of existing facilities; the activities specified in this Maintenance Manual do not include new construction, which would be subject to project-specific requirements. Much of the repair/replacement work involves structures that are over and not in jurisdictional waters. Therefore, the only potential discharge of fill would be accidental release of construction-related material.

Repair of wharves, piers and related structures will be conducted using either land-based or marine-based equipment as described in Section 4.1 with respect to demolition and removal. Under-pier pipelines and utilities will be repaired and maintained by Port plumbers, divers, and/or electricians working in small skiffs or work boats using manual tools. Work on under-pier utilities, including water, sewer, and electrical lines, is performed in accordance with the Port's lock-out/tag-out program, which specifies that flow to the pipeline will be shut off at the source before the start of work to prevent release from the utility line. Due to the height constraints of working under piers, work hours for under-pier work are limited by tide stage: the boat must be close enough to the underside of the pier to reach the pipelines, but not dangerously close.

[4] Department of Toxic Substances Control Alternative Management Standards. 2008, 2021.

Repair of damaged storm drain pipe within and under piers may include replacement of tidal influence backflow prevention valves at storm drain outfalls along the seawall or piers.

Materials used for pier maintenance and repair will include energy-absorbing fendering (typically wood, composite, or plastic), wood framing, asphalt, steel, and concrete. Pier decking will generally be repaired/replaced with the same material as existing (mostly wood, usually with concrete or asphalt surface) although alternative materials (e.g., concrete formed decking) may be used where the size or configuration of the repair allows (**BMP #11**).

4.3 Dock Replacement

Docking facilities will be repaired, maintained, and replaced using marine based equipment as is used for other tasks. Dock modules are generally fabricated off site before being placed on a barge and towed to the location where they will be installed. The sections will then be assembled, moved into place, and bolted around the piles. Specific installation methods depend on float type, framing system (structural internal members), location of pile hoops, and equipment availability among other factors.

Gangways will be placed into position and attached with the aid of a barge-mounted crane. Gangways may be installed perpendicular or parallel to the pier or seawall. For the perpendicular connection, a simple drop link hinge connection to the pier or seawall is used. A parallel connection typically requires an external platform measuring approximately five feet square. In most cases the abutment connections can be installed from the landside. At pier locations, this platform will be designed as a cantilevered connection to the pier face with sufficient strength to support the gangway for both dead and live loads.

Floating docks and gangways will be made of concrete, aluminum, or lighter-duty timber pre-cast sections. Light-transmitting materials or construction to reduce over-water shading will be used or considered whenever feasible to prevent inhibiting growth of submerged vegetation (**BMP #11**).

4.4 Pile Repair/Replacement

The majority of existing bearing and fender piles for which the maintenance and repair is proposed are polyvinyl chloride (PVC wrapped, preservative-treated (typically ACZA or similar) Douglas fir or concrete. Wrapped, treated Douglas fir piles can last over thirty years in salt water and are capable of absorbing ship impact energy without breaking. The Port periodically inspects, repairs, or replaces piles or pile wraps as required. Wherever feasible, such as when a substantial contiguous area of pier deck and associated piles requires replacement, the Port will use alternative materials to treated wood (i.e., steel, concrete, or composite) piles where appropriate. However, when a limited number of piles require replacement without removal of the associated deck and substructure, in-kind replacement of dilapidated wood piles with piles of the same material is the most feasible repair. Port concrete pile repairs include removing areas of spalling concrete (chip hammer or water pressure), replacing deteriorated rebar, and coating the repaired pile area with shotcrete or concrete poured within form work.

Piles to be replaced will be removed as described in Section 4.1 above. New piles will be driven using either a land-based or barge-mounted pile driver. A vibratory hammer will be used to the greatest extent possible to minimize hydroacoustic impacts (**BMP #1**). An impact hammer may be needed to finish pile driving and achieve the final required depth. The impact hammer (3,000 lbs. or less) will be equipped with a 12" x 12" thick wooden cushion block and would employ a "soft start" technique (**BMP #1**), which allows fish and marine mammals to leave the area before hydroacoustic impacts increase. Using the "soft start" technique, pile worker initiate noise from vibratory hammers for 15 seconds at reduced energy, followed by a 1-minute waiting period. This procedure is repeated two additional times. If an impact hammer is to be used, pile workers apply an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting period, then repeat two subsequent 3-strike sets.

Existing piles and other wooden structures requiring replacement may not be replaced with creosote-treated material. Materials used in wood pile replacement and repair include wood piles (typically 12-inch diameter), pile wrap composed of PVC, wood pile stubs and cylindrical steel connectors. After installation of wood piles, divers attach a high-density polyethylene wrap around the pile to protect the pile from impact or other physical damage, reduce ongoing exposure of chemically treated wood surface to the environment, protect the piles from boring marine organisms, and prolong the useful life of the pile (**BMP #11**). When installing pile-wrap, divers may use a vacuum eductor which extracts sediment from around the base of the pile at low velocity to minimize sediment disturbance while enabling pile-wrap to be installed below the mudline.

4.5 Sheet Pile Repair

Sheetpiles extending beneath wharves and related structures will be repaired and maintained using marine based equipment as is used for other maintenance tasks. The specific condition of the sheetpile will be generally assessed using marine-based equipment, and any necessary repairs will be conducted in a manner to minimize or capture any debris.

4.6 Bank Stabilization/Repair

Banks, seawalls, and other shoreline protection will be maintained using either land-based equipment, such as excavators and front-end loaders, or marine equipment, either a barge mounted excavator or derrick barge. Bank stabilization and seawall materials generally include wood, riprap, sheetpile, and concrete. When maintaining existing armored embankments, work will be done during low tide to the greatest extent possible to minimize potential for sediment discharge to bay water (**BMP #5**).

4.7 Bulkhead and Breakwater Repair

Structural repairs and maintenance to baffle walls ,bulkheads and breakwaters will be performed using marine-based equipment. Materials will include wood framing, reinforcing steel, and concrete.

4.8 Repair or Replacement of Bollards, Cranes, and Equipment

Maintenance of existing equipment and cranes is generally accomplished using standard tools and work performed from the pier apron or barge deck.

4.9 Restoration of Navigational Aids and Regulatory Markers

The Maintenance Program may include repair, replacement or installation of new navigational aids and markers using marine-based equipment. These are generally floating devices composed of materials that will not disintegrate such as concrete, steel, plastic, or closed cell foam encapsulated sun resistant polyethylene (**BMP #11**). The Port is generally responsible for navigational aids located in Port jurisdiction. Navigational aids located in the Central Basin typically fall under the jurisdiction of the Federal Government.

4.10 Repair of Fencing and Related Structures

Fencing repair, replacement and maintenance will be performed from the land by the appropriate craft (e.g., laborers, ironworkers) using pneumatic and welding tools. Fences are composed of wood, aluminum, or steel.

5. General Best Management Practices (BMPs)

This section describes general BMPs that are implemented in all Port maintenance activities in addition to task-specific measures.

5.1 Seasonal Restrictions

Activities that have potential to create significant underwater noise (e.g., driving steel piles with impact hammer) or create turbidity or disturb the seabed for a duration generally more than three days (e.g., bank stabilization and bulkhead, dikes, and breakwater repair) will only be conducted during the designated work windows from June 1-November 30.

If any in-water work is performed during the Pacific herring spawning or hatching season (December 1 – February 28), a CDFW approved herring monitor may be required to monitor the project site daily at times when in-water construction activity is taking place. In the event that the on-site monitor detects herring spawning at, or within 200 meters of in-water construction activity, the in-water construction activity will be shut down for a minimum of 14 days, or until the monitor determines that the hatch has been completed and larval herring have left the site. The in-water or other construction activity may resume thereafter.

If any work poses potential to disturb nesting birds protected by the Migratory Bird Treaty Act during nesting season (generally April through August), Port staff or qualified consultant will inspect the work area for nesting activity and work will be scheduled to avoid potential to impact active nests.

5.2 Debris Capture and Containment

Have spill kits and cleanup materials available at all locations of pile driving (**CASQA BMP NS-11**). During work in or over water, in which there is the likelihood of small to medium-sized debris being generated, Port staff or contractors will deploy a floating debris boom around the work area to capture floating debris. Crew in a small work boat navigate around the work site removing fallen debris from the water and collecting material contained within the floating boom. The work boat carries absorbent pads to contain any oil sheens and may also deploy oil-absorbent boom within the debris boom as needed. Debris and any used absorbent are collected, contained, and disposed at an appropriate off-site facility. (**CASQA BMP NS-15**).

5.3 Solid Waste Management

Solid waste generated by maintenance and repair activities includes construction and demolition debris, concrete rubble, timber, asphalt, and general waste. Port operations are governed by the City and County of San Francisco Environmental Code, which requires collection and segregation of construction and demolition debris in order to achieve a minimum of 75% diversion from landfill disposal to re-use or recycling. Port staff will collect solid waste and litter at the work site and contain it in covered containers that are removed from the work site on a regular basis to prevent accumulation of debris (**CASQA BMP WM-5**). Waste management contractors typically remove

solid waste from the jobsite directly and are retained prior to beginning a project when possible. Dumpsters or other waste containers are transported back to the Port's maintenance yard for consolidation and subsequent transport for recycling or disposal. Waste containers are never cleaned out at the work site; such equipment is cleaned at a dedicated wash rack, connected to the municipal sewer system, at the Port's central maintenance facility.

5.4 Hazardous Materials

5.4.1 Hazardous Materials Used in Maintenance: The Port has developed a comprehensive Hazard Communication Program which includes container labeling and other forms of warning, Material Safety Data Sheets, and employee training. A copy of the Port's Hazard Communication Program is provided as **Appendix B**. Best Management Practices for materials use and storage are also specified by **CASQA WM1 & WM2** in **Appendix A**.

In conducting routine maintenance activities Port staff use paints, solvents, sealants, adhesives, fuel, and oil. Diesel fuel for the pile-driver engines is contained within a double-walled fuel tank; additional fuel for diesel-powered equipment is stored in a secondarily contained 55-gallon drum on the pile-driving barge. Port staff is trained in the proper use of materials used in the course of their work. The Port's Industrial Hygienist maintains Material Safety Data Sheets for all materials used or stored at the Port's maintenance facility or used at work sites on Port property. (**CASQA BMP NS14**).

Small quantities of hazardous materials needed for a particular task are transported to/from the work site in original containers or in "secondary containers" and used within the work day. Secondary containers used to transfer smaller amounts of material to a job site must be labeled with an extra copy of the manufacturers' label or with a properly filled out generic label that provides sufficient information to ensure proper identification and handling of the material as described in the Hazard Communication Program.

Where hazardous materials are being used near water, Port staff will keep absorbent pads and a spill kit readily accessible (**CASQA BMP NS14**). Unused hazardous material is returned to the Port's maintenance facility for future use or disposed of in accordance with instructions on the container. Empty containers will be disposed of properly according to the instructions on the container.

Tools and equipment used to apply and transport hazardous materials during the course of maintenance at work sites Port-side will only be drained back into the original container or at the Port's central maintenance facility. With the exception of barge and deck-mounted cranes (see 4.8 – Fueling) Port vehicles and equipment are fueled, serviced, and washed at the City and County of San Francisco Central Shop, at the Port's maintenance facility, or at a commercial service provider (**CASQA BMPs NS8 & NS9**). Such activities are not performed at work sites where Port staff are conducting the repair and maintenance activities that are the subject of this manual and proposed for authorization under Port-wide general permits.

5.4.2 Hazardous Waste: Hazardous waste that may be generated by maintenance activities include used oil, waste paint, creosote-treated wood debris. Hazardous waste will be identified, labeled,

handled, stored, and disposed of in accordance with all Federal, State, and local regulations. (**CASQA BMPs WM6**).

5.5 Treated Wood

The Port implements applicable standards and guidelines for use of preservative-treated wood in salt water to reduce the release of wood preservative to water (**BMP #11**). Avoiding wood that has had preservative applied in excess of the retention rate for the type of wood and preservative compound is the best way to reduce discharge of chemical preservative into the environment. The Port purchases wood that is treated with the minimum amount of preservative recommended by industry standards[5] for the type of wood and setting (e.g., Douglas fir, immersed in or used in structures above salt water).

The Port also follows NMFS guidance regarding use of treated wood[6], including ensuring that to the greatest extent possible treated wood is not cut over water and that cutting and application of preservative to exposed cuts is done indoors or well away from water before wood is taken to the over water area for installation to minimize the potential for dropping sawdust or preservative into water (**BMP #11**). In the event that cutting treated wood over water cannot be avoided, Port staff position a drip pan or other containment to capture any sawdust, wood chips, or drips from applied preservative.

As detailed in Section 4.4.1 above, TWW resulting from the demolition of piles and/or decking will be managed in accordance with Alternative Management Standards developed by the DTSC. TWW will be handled and disposed of at a solid waste facility specifically licensed to accept TWW.

The Port follows safety training and use of proper PPE when handling TWW. Per the DTSC requirements, TWW materials will be segregated from other materials and stored on the ground on blocks, concrete surfaces or in labeled containers. TWW is disposed at authorized permitted disposal facility. The Port maintains TWW project records including a TWW generator form, landfill acceptance forms, and disposal manifests. The Port prevent ground contact of the

5.6 Spill Prevention & Response

In addition to the Hazard Communication Program training, Port Maintenance staff working in the field are trained on hazardous waste storage and disposal procedures (CASQA BMP WM6) and annually to perform limited emergency spill response at Port-operated facilities. Most are certified as 24-hour Oil Spill Technicians under the Hazardous Waste Operations standard specified by 29CFR1910.120(q)(6)(iii), with annual 8-hour refresher training. A copy of the Port's Maintenance Facility, Hazardous Materials Emergency Response Plan is provided as **Appendix C**.

[5] American Wood Protection Association. User Specification for Treated Wood. 2016

[6] NOAA Fisheries SWR – Treated Wood Guidelines – October 2009

5.7 Stormwater Compliance

All Port Maintenance employees are trained annually on stormwater pollution prevention, including the following topics:

- Allowed non-stormwater discharges: fire hydrant flushing, condensate from refrigeration, air conditioning and compressors, irrigation, and landscape water.
- Illicit discharges: wash water from vehicle or equipment cleaning, paint, fuel or automotive fluids, trash, dirt.
- General BMPs that apply to Port-wide maintenance activities.

The general stormwater BMPs that Port staff are trained to implement wherever they are working include:

General Housekeeping : Employees inspect the work site for good housekeeping and ensure that BMPs are in place (e.g., containment boom is secure and in good condition, materials, and equipment properly stored) at the beginning and end of each day.

Solid Waste Management: Place trash and debris in proper containers. Keep trash bin lids closed. Regularly dispose of waste. (CASQA BMP WM5)

Materials Management: Store materials indoors / under cover to the extent possible to prevent contact with stormwater. Store any material with the potential for leaks in secondary containment. Ensure that material is correctly labelled. (CASQA BMP NS14 & WM1)

Maintain Equipment/Tools: Keep equipment / tools clean and avoid excessive build-up of oil and grease. Inspect equipment / tools regularly for leaks and perform repairs promptly.

Vehicle and Equipment Washing: Wash vehicles and equipment only at the Pier 50 designated washing area only – the drain in this area drains to an oil / water separator and the sewer. Vehicles may also be washed at a commercial car wash. (CASQA BMPs NS8)

Protect Storm Drains: Wherever there is potential for material to enter a catch basin, storm drain inlet or drains to the bay. Keep materials set back from storm drains and areas adjacent to water.

***Clean Spills Immediately*:** Thoroughly clean up spills using dry cleaning methods (absorbent / kitty litter). Clean up used absorbent promptly. Keep a spill kit in your work vehicle for easy access. Never hose down spills or leaks.

End of Day Clean Up: At the end of the day or when activities are over, conduct a general clean-up to remove debris, trash, and inspect for spills.

Rain Event Preparation: Inspect your work area, equipment, and tools prior to storms. Verify that materials / equipment / tools are covered or stored indoors to minimize exposure to rainwater to the extent possible. Check to see if there are any pollutants that can be washed into the bay.

5.8 Fueling

Port vehicles and construction equipment (e.g., excavator, pavement roller, generators, lawn mower) are generally fueled and maintained off-site, either at the City and County of San Francisco's central fueling and maintenance facilities, or within the Port's Maintenance facilities at Pier 50 or Pier 80. The Port's primary maintenance facility includes an indoor automotive shop, covered outdoor parking, and dedicated wash rack with connection to the City's combined sewer system. (**CASQA BMPs NS9 & NS10**)

Diesel-powered portable generators, air compressors, and mobile equipment are fueled by the Port's fuel truck, which carries a collapsible polyethylene spill containment pool, which is placed beneath the connection during fueling. All Port vehicles carry small spill response kits with petroleum-absorbent pads and litter, smaller drip pans, etc. (**CASQA BMP NS9**).

Pile Driver #1 is on a barge-mounted crane, with a 1,000-gallon diesel tank that fuels air compressors and a hydraulic compressor that power crane operations (e.g., winch, hoists, pile-driving hammer). There are also fixed cranes on the pier decks at Pier 80 and 96. These pieces of equipment are fueled by a contracted delivery services that operates in accordance with 33 CFR 154 and California Department of Fish and Wildlife – Office of Spill Prevention and Response regulations for small marine fueling facilities.

The Port's Pile Driver 4 has a diesel engine that is supplied from a 55-gallon drum, which is fully enclosed in plastic secondary containment within a 20-ft shipping container and secured to the pile-driving barge. The 55-gallon drum that serves at the fuel tank is filled off site, not near or over water. (**CASQA BMPs NS9 & NS14**).

Protect hammers and other hydraulic attachments from run-on and runoff by placing them on plywood and/or covering them with plastic or a comparable material prior to the onset of rain. All pile-driving barges to carry spill response kits with petroleum-absorbent pads and litter, smaller drip pans, etc. (**CASQA BMP NS11**).

5.9 Training

Prior to the start of each project, field personnel conduct a tailgate safety meeting to identify all potential hazards both to themselves and to the environment and develop appropriate site-specific strategies to mitigate any associated risks. In addition to the training curriculum outlined in the Hazardous Materials Management Guide, Port staff may receive specialized training when complex or unusual projects necessitate additional preparation.

5.10 Invasive Species Control

The predominant invasive marine algal species of concern in San Francisco Bay is *Undaria pinnatifida* (*Undaria*), also known as Asian Kelp, or Wakame. *Undaria* is a fouling species and can be transported around through the movement of underwater infrastructure to which it has attached. If it spreads further within the bay *Undaria* poses a risk of altering the existing algae complexes that

support the marine communities of the San Francisco Bay. *Undaria* is not yet widely spread throughout the San Francisco Bay, but it has been found at Pier 40 South Beach Harbor and on floats at Pier 3 and China Basin. Careful manual removal and containment of *Undaria* before it is disturbed for dislodged by maintenance or construction activity can reduce the risk of dispersion and proliferation[7].

Before removing or moving any piles, floats, or other predominantly submerged structures, Port staff will examine the area for presence of *Undaria* and if present remove Undaria as follows (**BMP #4**):

- A diver carefully places a small (e.g., 2-gallon) plastic bag around the algae until the bag is nearly flush with the structure. Using a hand-held scraping tool (e.g., putty knife), the diver removes the algae from its base, where it is attached to the structure, capturing all algae in the bag.
- The bag is tightly closed and brought to the surface and contained for disposal.
- Equipment used in the water during *Undaria* removal will be thoroughly rinsed with fresh water between uses at different locations. Rinse water will not be allowed to drain to the bay.

Port maintenance work does not generally involve re-use of materials that have been used elsewhere. However, before any existing infrastructure (e.g., floating docks, moorings, mooring floats, and anchor lines) from other parts of the bay or elsewhere might be installed within Port jurisdiction, the Port would require it to be cleaned off-site using high pressure washers or steam cleaners, with all wastewater and material from cleaning being captured to prevent it from re-entering the Bay.

[7] URS, 2011

6. References

American Wood Protection Association, 2016. User Specification for Treated Wood. 2016.

Bay Conservation and Development Commission Port General Maintenance. Permit No. M1977.017.17 (Amended through May 2017).

California Stormwater Quality Association, 2019. Stormwater Best Management Practice Online Handbook – Construction. December 2019.

City of San Francisco. Construction and Demolition Debris Waste Reduction and Recycling Ordinance, Ordinance No. 13315.

Department of Toxic Substances Control, 2008. Alternative Management Standards for Treated Wood Waste – R-2005-04. July 21, 2008.

National Marine Fisheries Service, 2018. Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the U.S. Army Corps of Engineers 2018 NLAA Program (SPN 2013-00187 and SPK-2013-00451). September 5, 2018.

National Marine Fisheries Service, 2016. Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Port of San Francisco's Regional General Permit for Waterfront Maintenance and Repair Activities (Corps File No. 2015-00016S). February 3, 2016.

National Marine Fisheries Service, 2009. The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest, and Southwest Regions NOAA Fisheries - Southwest Region. October 12, 2009.

Port of San Francisco, 2016. San Francisco Stormwater Management Requirements and Design Guidelines. May 26, 2016

San Francisco Regional Water Quality Control Board. 2016. Order R2-2016-0039, Waste Discharge Requirements and Water Quality Certification for Port of San Francisco Maintenance Program, San Francisco, CA. September 22, 2016.

URS, 2011. Invasive Species Control Plan, 34th America's Cup and James R. Herman Cruise Terminal and Northeast Wharf Plaza" November 2, 2011.

U. S. Army Corps of Engineer. 2016. Regional General Permit No. 2015-00016S for Port of San Francisco's Waterfront Maintenance and Repair Activities. December 15, 2016.

Table 1: Summary of Avoidance & Minimization Measures and Best Management Practices

RESOURCE CONCERN	KEY AVOIDANCE & MINIMIZATION MEASURES/BMPS
Biological Resources	
BMP #1: Noise Impacts from Pile Driving	Where feasible: • use of a vibratory hammer • impact hammer driving of wood piles limited to one hammer and less than 20 piles per day • 12 x 12" cushion block used between impact hammer and pile • "soft-start" technique
BMP #2: Shading	The Port anticipates that the proposed work will reduce the area of over-water structures. Existing over-water structures will be replaced/repaired, with no expansion or minimal expansion in footprint; other deteriorating structures may be removed permanently. Therefore, no BMPs or A&M measures for shading are proposed.
BMP #3: Invasive Species	The proposed maintenance and repair program will allow existing uses to continue but will not enable new navigation that poses potential for introduction of invasive species.
Fill Placement and Sediment Removal	
BMP #4: Fill Placement	Fill quantities will be the minimum necessary to achieve the project purpose. The Port anticipates a net removal of fill. The Port will maintain records of additions and removal of fill, to track net quantities and ensure this goal is met over the life of the RGP. If net increase is observed at end of RGP period, Port will negotiate appropriate compensatory mitigation with agencies.
BMP #5: Sediment Removal/Substrate Disturbance	Sediment removal quantities will be the minimum necessary to achieve the project purpose. When practicable and feasible, debris removal in the tidal zone will be done during low tides and the machines will pick up debris, not excavate, scrape, or grade the shoreline.

RESOURCE CONCERN	KEY AVOIDANCE & MINIMIZATION MEASURES/BMPS
Water and Sediment Quality	
BMP #6: Debris	Debris containment booms, floating debris screens, and/or absorbent booms will be positioned beneath and alongside work areas when necessary . During construction, the barges performing the work will be moored in a position to capture and contain the debris generated during any sub-structure or in-water work. Care will be taken to minimize debris falling into the water. In the event that debris does reach the bay, personnel in workboats will immediately retrieve the debris for proper handling and disposal. For small-scale over-water repairs and maintenance, tarps, tubs and/or vacuums will be used as appropriate to catch sawdust, debris, and drips. All construction material, wastes, debris, sediment, rubbish, trash, fencing, etc., will be removed from the site on a regular basis during work and at project completion. Debris will be transported to an authorized disposal area.
BMP #7: Stormwater	Minimal ground disturbance is anticipated since the proposed activities focus on maintenance and repair of existing hard-surfaced structures. Where ground disturbance is necessary, construction crews will reduce the footprint of disturbance to the minimum necessary to complete the project. Construction material that could wash or blow away will be covered every night and during any rainfall event. Construction materials will be stored in an area that does not freely drain to the Bay, free from standing water and wet soil, and protected from rain. If necessary, materials will be stored on skids or support timbers to keep them off the ground. Adequate erosion control supplies (sand bags, wattles, etc.) shall be kept on site and used to ensure materials are kept out of water bodies.
BMP #8: Spill Prevention and Response	Fueling and maintenance of vehicles and equipment will be conducted offsite, in designated areas away from the water (e.g. at the Port's Pier 50 Maintenance Facility) with the exception of barge-mounted and fixed cranes. Fueling locations will be inspected after fueling to document that no spills have occurred. Any spills will be cleaned up immediately and reported in accordance with existing Port standard operating procedures for spill reporting. All Port vehicles carry spill response supplies. Fueling cranes on barges or fixed to pier decks over water will be performed using proper fuel transfer procedures as specified by federal regulations for fuel transfer. Land-based equipment will be fueled by mobile trucks with secondary containment or at the Port's maintenance facility.

RESOURCE CONCERN	KEY AVOIDANCE & MINIMIZATION MEASURES/BMPS
BMP #8: Spill Prevention and Response (Continued)	Well-maintained equipment will be used to perform construction work, and, except in the case of a failure or breakdown, equipment maintenance will be performed off site. Repair crews will check heavy equipment daily for leaks, and not use equipment until any leak is fixed. If leaks or spills are encountered, the source of the leak will be identified, leaked material will be cleaned up, and the cleaning materials will be collected and will be properly disposed. All hazardous material shall be stored upland in storage trailers and/or shipping containers designed to provide adequate containment. Short-term laydown of hazardous materials for immediate use shall be permitted with the same anti-spill precautions. Petroleum products, chemicals, fresh cement, saw water, or concrete or water contaminated by the aforementioned shall not be allowed to enter the water.
BMP #9: Treated Wood	No replacement piles or other wood structures treated with creosote will be used. Any chemically treated wood piles will be wrapped with an impact resistant biologically inert substance. Treated wood products will be visually inspected upon arrival at the work site. Materials with visible residues or bleeding will be rejected. Wood products treated with an ammoniacal preservative (e.g., AZCA) will be rejected if there is a noticeable odor. Cleaning and maintenance activities that can remove particles of treated wood (such as power washing, sanding, and aggressive scrubbing) will be minimized. The Port will consider feasible alternatives to treated-wood piles for large repair projects (>100 piles) or where significant contiguous area of pile-supported structure is also being replaced. Cutting stations will be equipped with large tarps to capture debris and will be located well away from the water to minimize wind transport of sawdust. If preservative treatments, water repellents or other coatings are applied at the work site (e.g., on cuts and boreholes), the treatment will be applied at the cutting station and allowed to dry or cure before the structure is moved to the over-water area. If cutting or boring of treated wood or touch-up preservative applications must be performed over water, tarps, plastic tubs, or similar devices will be used to catch sawdust, debris, and drips. Preservatives will not be applied in the rain, and any excess preservative will be wiped off. Any debris that falls in the water will be promptly removed and handled as described above under “Debris” and “Stormwater”.

RESOURCE CONCERN	KEY AVOIDANCE & MINIMIZATION MEASURES/BMPS
BMP #10: Sediment Quality/Turbidity	Piles will be removed by direct pull or vibratory hammer, where possible. Piles that cannot be pulled will be cut two feet below the mudline to the extent feasible. Piles will be removed at the lowest practical tide condition. Disturbance of sediment will be minimized to the extent feasible during activities such as removal of piles and debris or minor excavation in conjunction with maintenance/repair of existing structures. Silt curtains are not generally warranted nor are they routinely used during Port maintenance activities because the existing procedures and small scale of the activities performed under the authorization for portwide maintenance do not generate significant turbidity. Absorbent pads will be available for use in the event that petroleum sheen develops during sediment-disturbing activities. Existing sediment quality data in areas planned for pile removal or sediment excavation will be reviewed prior to conducting work to assess risks of mobilizing or exposing contaminated sediments Existing piles in areas with known elevated contaminant levels will be cut instead of pulled; cut piles will be capped as warranted.
BMP #11: Materials	Chemically treated wood piles will be wrapped with an impact resistant and biologically inert wrap. Floating devices will be composed of materials that will not disintegrate, including concrete, steel, plastics, or closed cell foam encapsulated sun resistant polyethylene. Most existing decking, and hence most replacement decking, will be composed of wood. However, the use of light-transmitting materials or measures will be used or considered whenever feasible.

APPENDIX A

SELECTED STORMWATER BEST MANAGEMENT PRACTICES

From: California Stormwater Quality Association BMP Online Handbook – Construction 2019

NS8 – Vehicle and Equipment Cleaning

NS9 – Vehicle and Equipment Fueling

NS10 - Vehicle and Equipment Maintenance

NS11- Pile Driving Operations

NS14 - Material Over Water

NS15 - Demolition Adjacent to Water

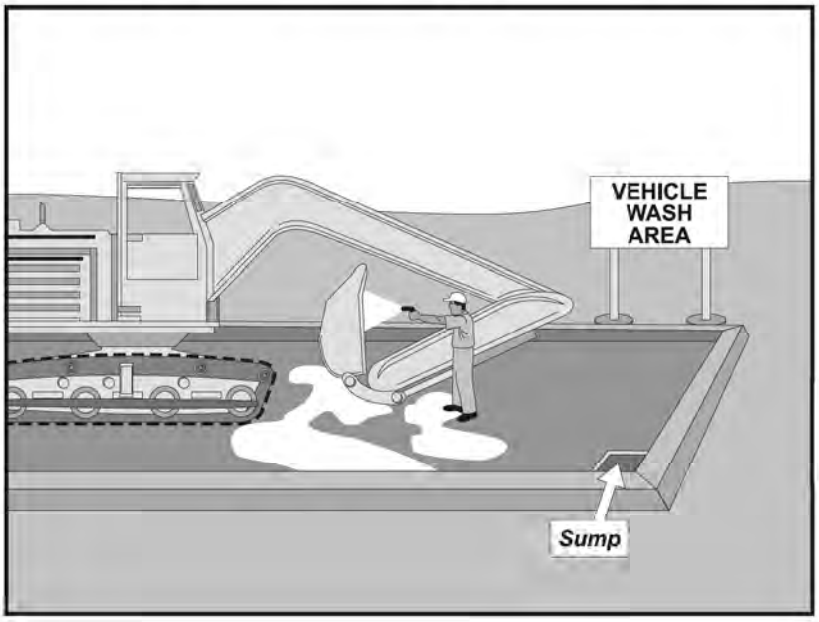
WM1- Material Delivery and Storage

WM2 - Material Use

WM5 - Solid Waste Management

WM6 – Hazardous Waste Management

Vehicle and Equipment Cleaning NS-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 Objective**

☒ **Secondary Objective**

Targeted Constituents

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

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

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- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runon and runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

Inspection and Maintenance

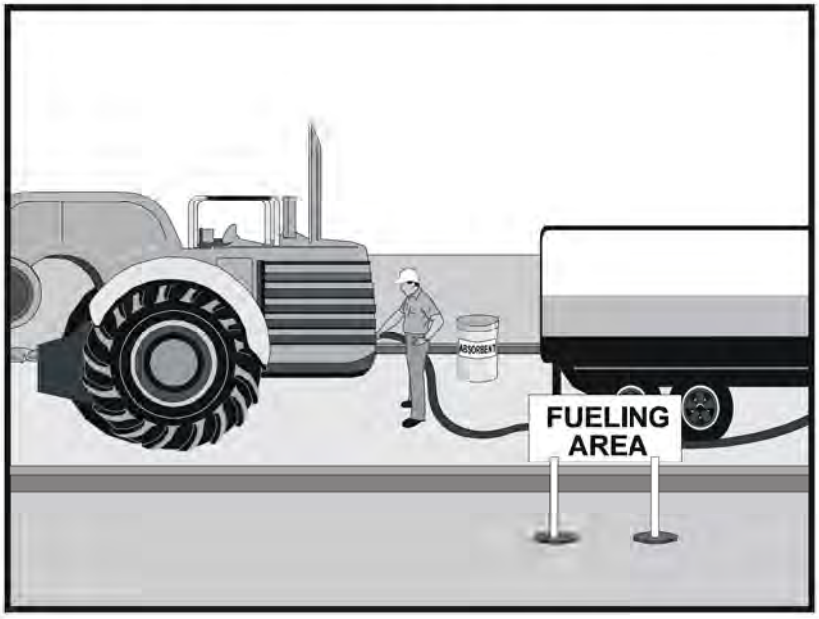
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at 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 discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

References

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

Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.

Vehicle and Equipment Fueling NS-9



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Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/ Exit.

Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage "topping-off" of fuel tanks.

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- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runon and runoff and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runon, runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Costs

- All of the above measures are low cost except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.

Inspection and Maintenance

- 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.
- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately, or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.

- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

References

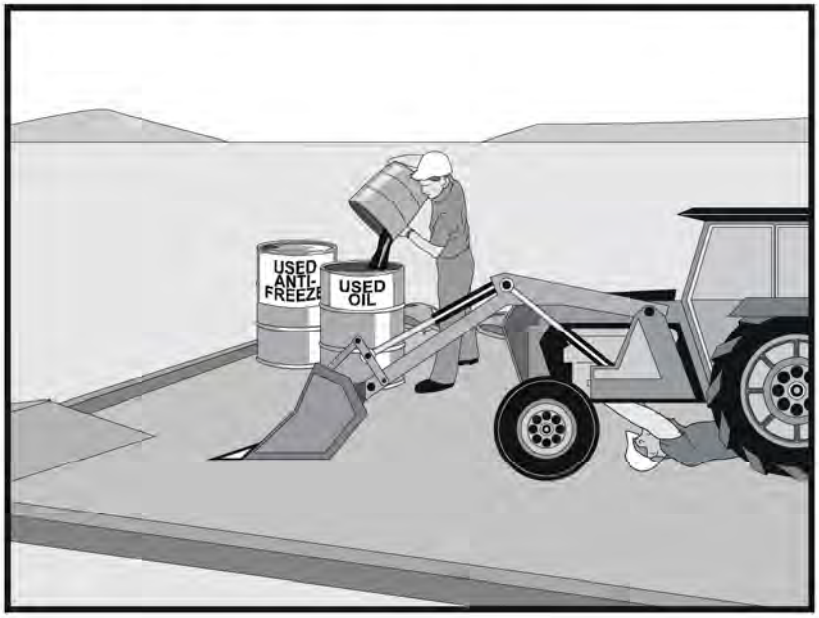
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

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

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

Vehicle & Equipment Maintenance NS-10



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☒ **Secondary Objective**

Targeted Constituents

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

Potential Alternatives

None

Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a "dry and clean site". The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8,

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Vehicle and Equipment Cleaning, and NS-9, Vehicle and Equipment Fueling.

Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runon and runoff and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.

- Repair leaks of fluids and oil immediately.

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

Safer Alternative Products

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an "environmentally friendly" label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The "chlor" term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling and Disposal

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like,-trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site.

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Costs

All of the above are low cost measures. Higher costs are incurred to setup and maintain onsite maintenance areas.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect 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 discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately, or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

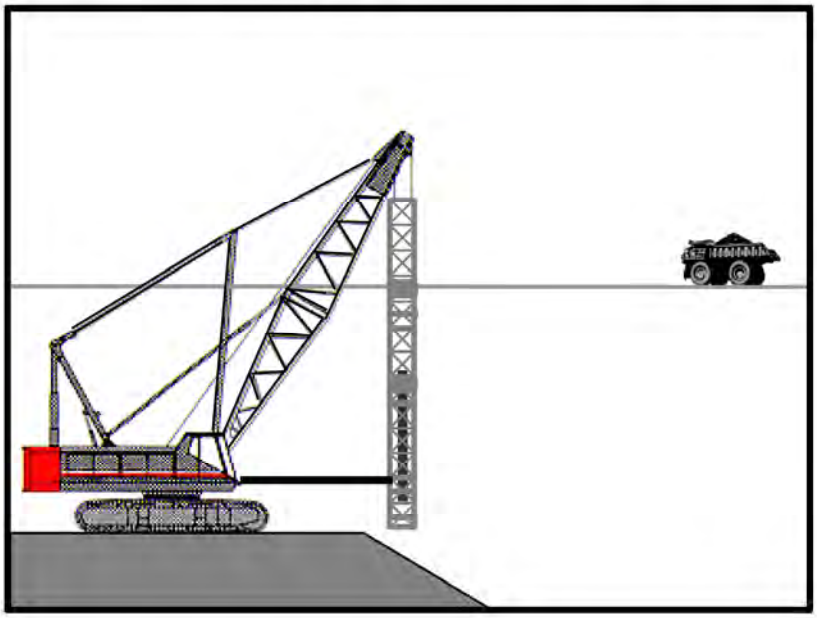
References

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

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

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

Pile Driving Operations NS-11



Description and Purpose

The construction and retrofit of bridges and retaining walls often include driving piles for foundation support and shoring operations. Driven piles are typically constructed of precast concrete, steel, or timber. Driven sheet piles are also used for shoring and cofferdam construction. Proper control and use of equipment, materials, and waste products from pile driving operations will reduce or eliminate the discharge of potential pollutants to the storm drain system, watercourses, and waters of the United States.

Suitable Applications

These procedures apply to all construction sites near or adjacent to a watercourse or groundwater where permanent and temporary pile driving (impact and vibratory) takes place, including operations using pile shells as well as construction of cast-in-steel-shell and cast-in-drilled-hole piles.

Limitations

None identified.

Implementation

- Use drip pans or absorbent pads during vehicle and equipment operation, maintenance, cleaning, fueling, and storage. Refer to NS-8, Vehicle and Equipment Cleaning, NS-9, Vehicle and Equipment Fueling, and NS-10, Vehicle and Equipment Maintenance.

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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- Have spill kits and cleanup materials available at all locations of pile driving. Refer to WM-4, Spill Prevention and Control.
- Equipment that is stored or in use in streambeds, or on docks, barges, or other structures over water bodies should be kept leak free.
- Park equipment over plastic sheeting or equivalent where possible. Plastic is not a substitute for drip pans or absorbent pads. The storage or use of equipment in streambeds or other bodies of water must comply with all applicable permits.
- Implement other BMPs as applicable, such as NS-2, Dewatering Operations, WM-5, Solid Waste Management, WM-6, Hazardous Waste Management, and WM-10, Liquid Waste Management.
- When not in use, store pile-driving equipment away from concentrated flows of stormwater, drainage courses, and inlets. Protect hammers and other hydraulic attachments from runon and runoff by placing them on plywood and covering them with plastic or a comparable material prior to the onset of rain.
- Use less hazardous products, e.g., vegetable oil, when practicable.

Costs

All of the above measures can be low cost.

Inspection and Maintenance

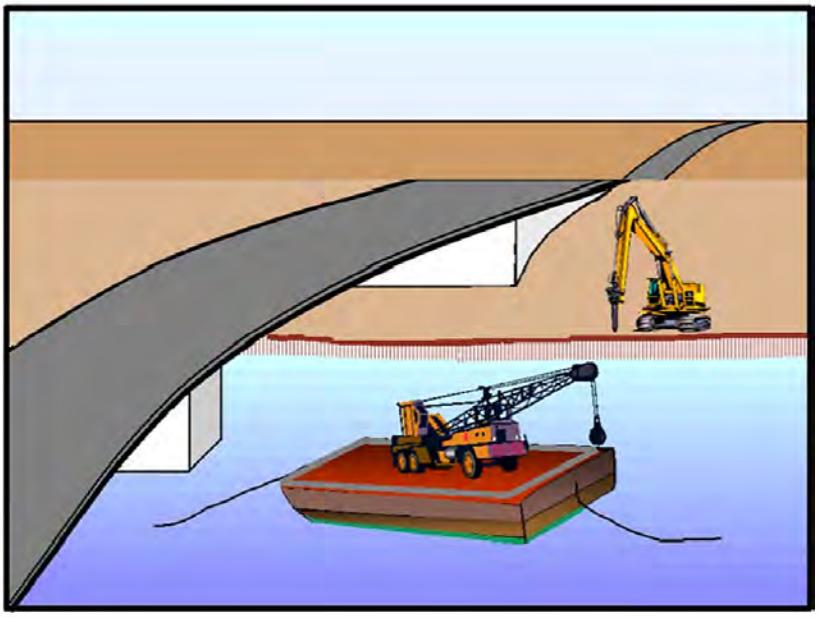
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at 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 discharges daily while non-stormwater discharges occur.
- Inspect equipment every day at startup and repair equipment as needed (i.e., worn or damaged hoses, fittings, and gaskets). Recheck equipment at shift changes or at the end of the day and scheduled repairs as needed.

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.

Material Over Water NS-14



Categories

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Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

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

Potential Alternatives

None

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Description and Purpose

Procedures for the proper use, storage, and disposal of materials and equipment on barges, boats, temporary construction pads, or similar locations that minimize or eliminate the discharge of potential pollutants to a watercourse.

Suitable Applications

Applies where materials and equipment are used on barges, boats, docks, and other platforms over or adjacent to a watercourse including waters of the United States. These procedures should be implemented for construction materials and wastes (solid and liquid), soil or dredging materials, or any other materials that may cause or contribute to exceedances of water quality standards.

Limitations

Dredge and fill activities are regulated by the US Army Corps of Engineers and Regional Boards under Section 404/401 of the Clean Water Act.

Implementation

- Refer to WM-1, Material Delivery and Storage and WM-4, Spill Prevention and Control.
- Use drip pans and absorbent materials for equipment and vehicles and ensure that an adequate supply of spill clean up materials is available.
- Drip pans should be placed under all vehicles and equipment placed on docks, barges, or other structures over

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water bodies when the vehicle or equipment is expected to be idle for more than 1 hour.

- Maintain equipment in accordance with NS-10, Vehicle and Equipment Maintenance. If a leaking line cannot be repaired, remove equipment from over the water.
- Provide watertight curbs or toe boards to contain spills and prevent materials, tools, and debris from leaving the barge, platform, dock, etc.
- Secure all materials to prevent discharges to receiving waters via wind.
- Identify types of spill control measures to be employed, including the storage of such materials and equipment. Ensure that staff is trained regarding the use of the materials, deployment and access of control measures, and reporting measures.
- In case of spills, contact the local Regional Board as soon as possible but within 48 hours.
- Refer to WM-5, Solid Waste Management (non-hazardous) and WM-6, Hazardous Waste Management. Ensure the timely and proper removal of accumulated wastes
- Comply with all necessary permits required for construction within or near the watercourse, such as Regional Water Quality Control Board, U.S. Army Corps of Engineers, Department of Fish and Game or and other local permitting.
- Discharges to waterways should 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 contained in SWPPP.

Costs

These measures are generally of low to moderate cost. Exceptions are areas for temporary storage of materials, engine fluids, or wastewater pump out.

Inspection and Maintenance

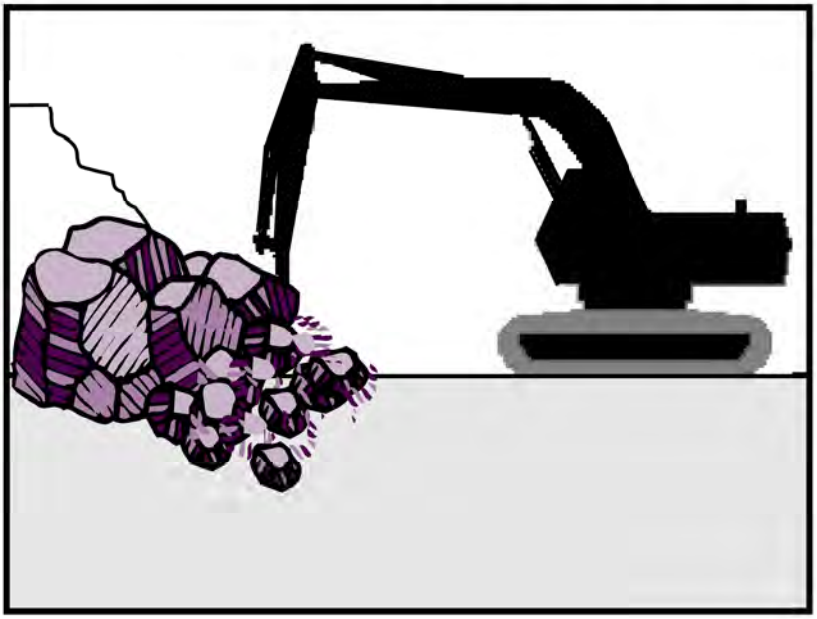
- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at 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.
- Ensure that employees and subcontractors implement the appropriate measures for storage and use of materials and equipment.
- Inspect and maintain all associated BMPs and perimeter controls to ensure continuous protection of the water courses, including waters of the United States.

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.

Demolition Adjacent to Water NS-15



Categories		
EC	Erosion Control	
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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.

- 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.

- Asphalt and concrete components
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

Implementation

The following steps should be taken to minimize risk:

- Chemicals must be stored in water tight containers with appropriate secondary containment or in a storage shed.
- When a material storage area is located on bare soil, the area should be lined and bermed.
- Use containment pallets or other practical and available solutions, such as storing materials within newly constructed buildings or garages, to meet material storage requirements.
- Stack erodible landscape material on pallets and cover when not in use.
- Contain all fertilizers and other landscape materials when not in use.
- Temporary storage areas should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be available on-site for all materials stored that have the potential to effect water quality.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located away from waterways, if possible.
  - Avoid transport near drainage paths or waterways.
  - Surround with earth berms or other appropriate containment BMP. See EC-9, Earth Dikes and Drainage Swales.
  - Place in an area that will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.

- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Keep ample spill cleanup supplies appropriate for the materials being stored. Ensure that cleanup supplies are in a conspicuous, labeled area.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove and dispose of materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25-year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be covered prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or completely enclosed storage sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous wastes.

Material Delivery Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.
- If spills or leaks of materials occur that are not contained and could discharge to surface waters, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

Cost

- The largest cost of implementation may be in the construction of a materials storage area that is covered and provides secondary containment.

Inspection and Maintenance

- 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.
- Keep storage areas clean and well organized, including a current list of all materials onsite.
- Inspect labels on containers for legibility and accuracy.

- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

References

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

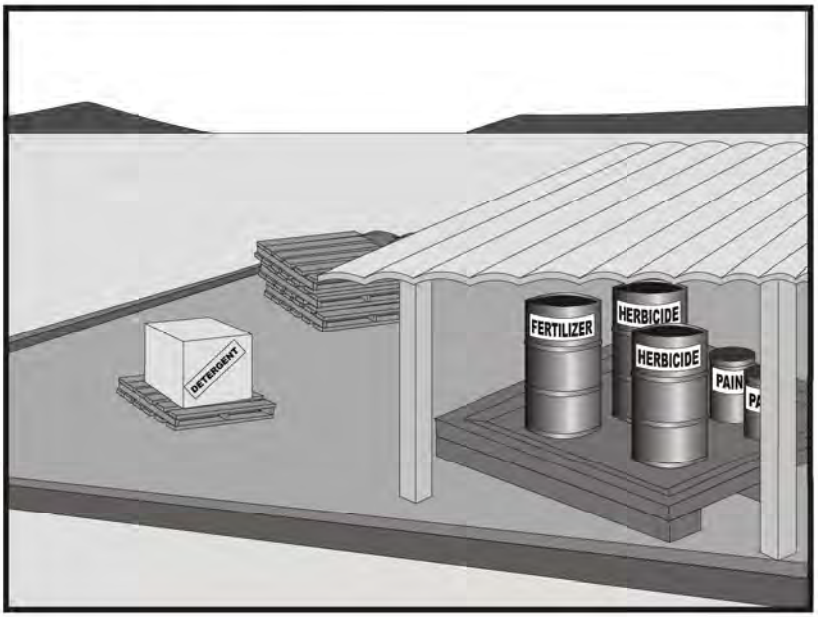
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

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

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

Material Use

WM-2



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

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Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

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Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- The preferred method of termiticide application is soil injection near the existing or proposed structure foundation/slab; however, if not feasible, soil drench application of termiticides should follow EPA label guidelines and the following recommendations (most of which are applicable to most pesticide applications):
  - Do not treat soil that is water-saturated or frozen.
  - Application shall not commence within 24-hours of a predicted precipitation event with a 40% or greater probability. Weather tracking must be performed on a daily basis prior to termiticide application and during the period of termiticide application.
  - Do not allow treatment chemicals to runoff from the target area. Apply proper quantity to prevent excess runoff. Provide containment for and divert stormwater from application areas using berms or diversion ditches during application.
  - Dry season: Do not apply within 10 feet of storm drains. Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds).
  - Wet season: Do not apply within 50 feet of storm drains or aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds) unless a vegetative buffer is present (if so, refer to dry season requirements).
  - Do not make on-grade applications when sustained wind speeds are above 10 mph (at application site) at nozzle end height.
  - Cover treatment site prior to a rain event in order to prevent run-off of the pesticide into non-target areas. The treated area should be limited to a size that can be backfilled and/or covered by the end of the work shift. Backfilling or covering of the treated area shall be done by the end of the same work shift in which the application is made.
  - The applicator must either cover the soil him/herself or provide written notification of the above requirement to the contractor on site and to the person commissioning the

application (if different than the contractor). If notice is provided to the contractor or the person commissioning the application, then they are responsible under the Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) to ensure that: 1) if the concrete slab cannot be poured over the treated soil within 24 hours of application, the treated soil is covered with a waterproof covering (such as polyethylene sheeting), and 2) the treated soil is covered if precipitation is predicted to occur before the concrete slab is scheduled to be poured.

- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydraulic application. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals before predicted rainfall.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted or contain for proper disposal off site. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.
- Document the location, time, chemicals applied, and applicator's name and qualifications.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.
- Discontinue use of erodible landscape material within 2 days prior to a forecasted rain event and materials should be covered and/or bermed.

- Provide containment for material use areas such as masons' areas or paint mixing/preparation areas to prevent materials/pollutants from entering stormwater.

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.
- 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.
- Ensure employees and subcontractors throughout the job are using appropriate practices.

References

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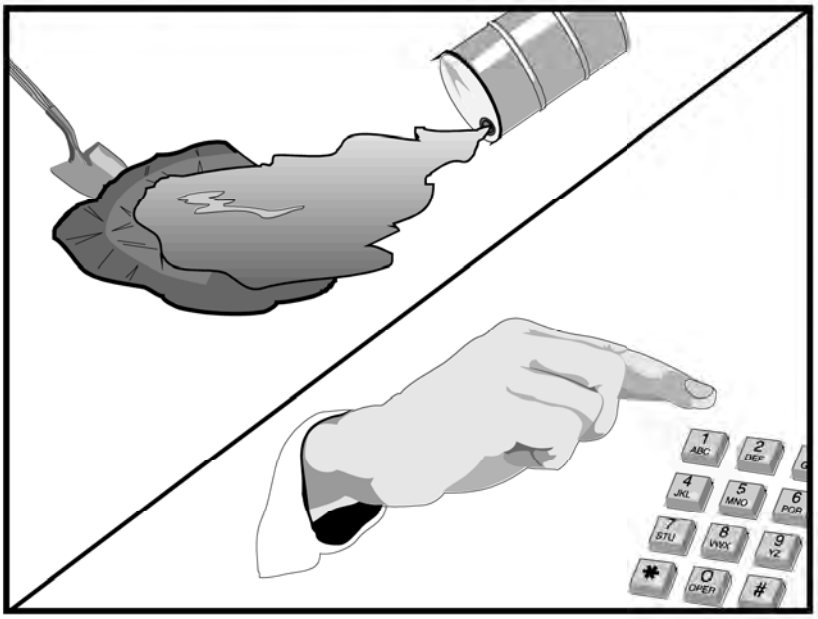
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Comments on Risk Assessments Risk Reduction Options for Cypermethrin: Docket No. OPP–2005–0293; California Stormwater Quality Association (CASQA) letter to USEPA, 2006.Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products, EPA-HQ-OPP-2008-0331-0021; USEPA, 2008.

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

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

Spill Prevention and Control WM-4



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

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

Potential Alternatives

None

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Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

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- Fuels
- Lubricants
- Other petroleum distillates

Limitations

- In some cases, it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

Implementation

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.
- Do not bury or wash spills with water.

- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spill's contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

Reporting

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Regularly inspect onsite vehicles and equipment for leaks and repair immediately
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur onsite, use designate areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Costs

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

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect 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.
- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

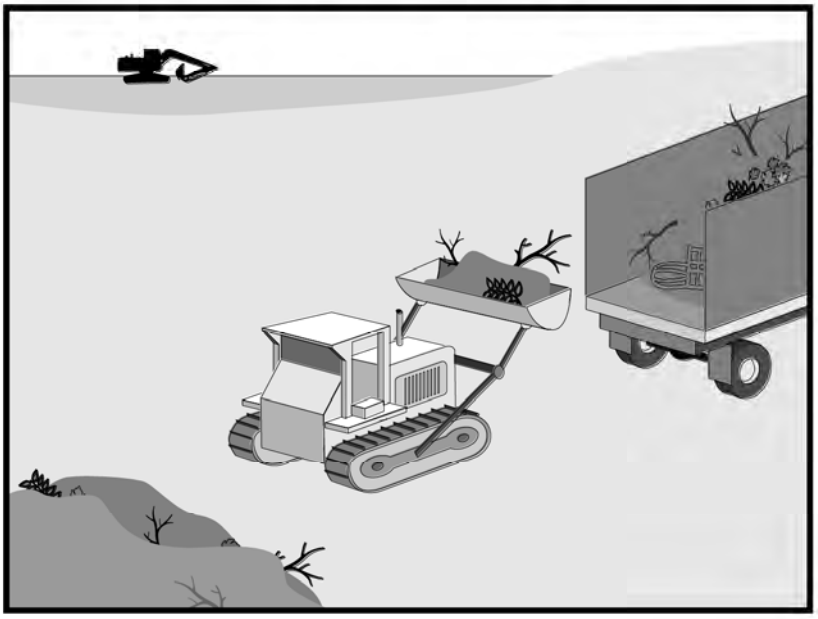
References

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

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

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

Solid Waste Management WM-5



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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Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

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- Highway planting wastes, including vegetative material, plant containers, and packaging materials

Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Cover waste containers at the end of each work day and when it is raining.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection, Storage, and Disposal

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runon should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.

- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect 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
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

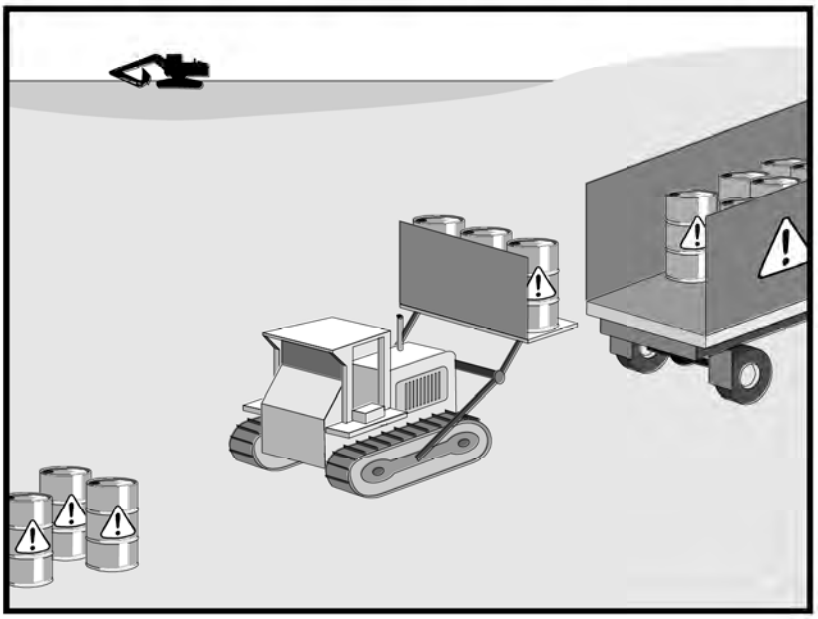
References

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

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

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

Hazardous Waste Management WM-6



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

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

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

Limitations

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

Implementation

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

Material Use

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

  - Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
  - Throughout the rainy season, temporary containment facilities should be covered during non-working days, and prior to rain events. Covered facilities may include use of plastic tarps for small facilities or constructed roofs with overhangs.

- Drums should not be overfilled, and wastes should not be mixed.
- Unless watertight, containers of dry waste should be stored on pallets.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application. Allow time for infiltration and avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.
- Paint brushes and equipment for water and oil-based paints should be cleaned within a contained area and should not be allowed to contaminate site soils, watercourses, or drainage systems. Waste paints, thinners, solvents, residues, and sludges that cannot be recycled or reused should be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths should be disposed of as solid waste.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and reuse thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.
- The following actions should be taken with respect to temporary contaminant:
  - Ensure that adequate hazardous waste storage volume is available.
  - Ensure that hazardous waste collection containers are conveniently located.
  - Designate hazardous waste storage areas onsite away from storm drains or watercourses and away from moving vehicles and equipment to prevent accidental spills.
  - Minimize production or generation of hazardous materials and hazardous waste on the job site.
  - Use containment berms in fueling and maintenance areas and where the potential for spills is high.
  - Segregate potentially hazardous waste from non-hazardous construction site debris.
  - Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.

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

Waste Recycling Disposal

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

Disposal Procedures

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

Education

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

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect 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.

Appendix B

Port of San Francisco

Hazard Communication Program, Updated March 2021

HAZARDOUS COMMUNICATION PROGRAM

Prepared by:

Health and Safety
Maintenance Division

Revised March 2021

TABLE OF CONTENTS

I. INTRODUCTION

A. The Port of San Francisco (Port) has developed a Hazard Communication Program which includes container labeling and other forms of warning, Safety Data Sheets (SDS) and employee training. In addition to Hazardous Communication training, all employees working in the field are certified as 24-hour Oil Spill Technicians under the HAZWOPER 29CFR1910.120(q)(6)(iii) standard.

B. The program ensures employees will be informed about hazardous substances to which they are exposed on a routine basis or during reasonably foreseeable emergencies.

C. The program meets the requirements set forth by Section 5194, California Code of Regulations, Title 8 (Hazard Communication).

D. This written program outlines how each required element will be carried out, as well as the responsibilities of supervisors and employees in implementing the program.

II. SCOPE OF PROGRAM AND DEFINITIONS

A. This program includes all Port employees who work with hazardous substances.

   a. A Hazardous Substance presents a physical or health hazard or is included on the List of Hazardous Substances prepared by the Director of Industrial Relations.

   b. Health Hazards include cancer-causing materials, toxic agents, reproductive toxins, irritants, corrosives, sensitizers, and toxins, which act on the kidneys, brain and nervous systems, liver or blood forming organs of the body. Agents which damage the lungs, skin, eyes or mucous membranes are also included.

   c. Physical Hazards include combustible or flammable materials, compressed gases, explosives, organic peroxides, oxidizers, pyrophorics, unstable or water reactive materials.

Precise definitions of these substances are found in Appendix A of the standard.

B. Consumer and Office Products

   a. Consumer products are covered by the Consumer Products Safety Commission and the Hazard Communication Program does not apply under conditions of normal use. Unusual circumstances where these products are used in hazardous conditions are covered, however,

   b. The standard also exempts office products such as pencils, pens, typewriter ribbons and other articles. Similarly, occasional use of a copy machine would not be covered. However, a copy machine operator who works with photocopying chemicals on a regular basis would be covered under the conditions of the standard.

III. ACCESSIBILITY OF WRITTEN PROGRAM

Copies of this Program are available to any employee upon request to the Health and Safety Section (H&S). Copies will be distributed to all supervisors and will be made available to all employees at each work center. A copy is available on the Port's Intranet site (PortWeb).

IV. PROGRAM RESPONSIBILITIES

A. Port H&S administer the Hazard Communication Program. H&S staff will obtain and review Safety Data Sheets (SDS) as described below and will determine which employees are to be included in the program.

   The section will also develop the training program for employees who work with hazardous substances. In addition, the section will provide guidelines regarding container labeling. H&S will be available for consultation in developing Codes of Safe Practices for operations involving hazardous substances.

B. Supervisors are responsible for the identification of hazardous substances in their work centers and will provide an inventory of all such materials. The supervisors will ensure that their employees are properly trained in safe work practices and that they are provided with protective equipment for all operations involving hazardous substances. Supervisors will be responsible for developing Codes of Safe Practices for all operations involving hazardous substances.

C. Employees are responsible for informing themselves regarding the hazard of substances used in their work centers. Each employee will review the relevant SDS, safe practices and labels prior to beginning work with a hazardous substance. All employees are responsible for wearing protective gear when required. Employees are also responsible for using fans, fume extractors or other engineering controls, as directed by their supervisor.

D. Employees will follow all safe work practices as taught in Hazardous Material Training, as well as emergency protocols. All unusual situations or unexpected hazards will be reported to supervisors as soon as possible.

V. HAZARD DETERMINATION

A. H&S has the primary responsibility for determining what products constitute hazardous substances and which employees should be included in the Hazard Communication Program.

B. The hazard determination conducted by the manufacturer as described in the Hazard Communication Standard will be used as presented on the SDS. Port staff will conduct no independent hazard determination of substances used by employees.

VI. LABELING OF HAZARDOUS SUBSTANCES

A. All containers of hazardous substances that are used or stored at the Port must have a legible label, prominently displayed, which contains the following information:

   a. Identity of the hazardous substance

   b. Appropriate hazard warnings (including both physical and health hazards)

   c. The name and address of the manufacturer

   The Port will accept manufacturers' labels which meet these requirements.

B. This label must provide enough information to allow the user to match the product with the appropriate SDS.

C. Stationary containers, such as dip tanks or above ground storage tanks, must also be clearly labeled with the information above.

D. In addition, containers used to transfer smaller amounts of material to a job site, for example, gasoline, must be labeled with an extra copy of the manufacturers' label or with a properly filled out generic label. These containers are known as "secondary" containers.

E. Responsibility for ensuring all containers have labels displaying the required information has been assigned to:

   a. the Senior Storekeeper for any material which passes through the storeroom at Pier 50.

   b. work center supervisors to ensure that labels are not removed or defaced and that unlabeled materials are promptly identified.

   c. employees, who are not permitted to use unlabeled or improperly labeled materials. Missing or inadequate labels should be reported to supervisors in a timely manner.

F. Any material obtained outside the normal City purchasing routine must have a label and SDS which meets the requirements of the Hazard Communication Standard. Monthly inspections of hazardous materials to ensure that labels are present and complete are required and are the responsibility of all supervisors.

G. All improperly labeled products shall be returned to the storeroom for proper identification. H&S will advise or assist in the proper labeling of all hazardous materials.

H. No Port employee should remove or deface existing labels on incoming containers of hazardous substances, unless the container is immediately marked with the required information.

VII. SAFETY DATA SHEETS

A. An SDS is written or printed material concerning a hazardous substance, which is prepared in accordance with the Hazard Communication Standard, 8 CAC 5194 (g).

B. It is the policy of the Port of San Francisco that all employees working with hazardous substances shall be provided with written information regarding the physical or health hazards associated with these substances. As SDSs are the primary means of communicating this information, the Port will obtain an SDS for each hazardous substance used by employees.

C. A full set of SDS will be kept at the following locations:

   a. Health and Safety, Pier 1

   b. Storeroom, Pier 50.

   Partial sets of SDS will be kept in all shops. The partial sets will contain only the MSDSs for materials used in a particular shop. All SDS sets will be available during regular working hours.

D. Codes of Safe Practices deigned to augment the information contained on the SDS will be made available during each work shift to employees when they are in their work areas.

E. Supervisors are responsible for obtaining SDSs from vendors for their own work area. For all supplies ordered, supervisors should check the partial or complete sets of SDS to see if the Port has an SDS for at the desired product. If no SDS is on file, the supervisor will notify the Senior Storekeeper at Pier 50.

   a. If an SDS is not available, the Storekeeper will request an SDS from the manufacturer.

   b. If there is no response from the manufacturer, the Storekeeper will notify H&S. EH&S will notify Cal-OSHA if necessary. If no SDS can be obtained, the product will be properly disposed.

   c. H&S will be forwarded the original of all SDS obtained.

   d. The Storekeeper will hold chemicals for which an SDS was requested on “will call”. The H&S will send a copy of the SDS to the requestor. When the requestor presents the SDS to the Storekeeper or Supply Supervisor, the product will be released.

F. H&S will review all SDS for accuracy, assign a number, file the original, and distribute copies to the SDS sets for updating.

G. If an SDS is provided, but does not contain all the required information, the

   a. H&S will contact the manufacturer directly.

H. The H&S will update the automated inventory of SDS periodically, based on supervisor's inventories of the materials located in their shops. Full and partial sets of SDS will be updated accordingly.

I. Employees will consider use and disposal impact when making chemical purchasing decisions. Employees will use a less toxic alternative whenever possible.

VIII. TOXICS EDUCATION AND TRAINING

A. The Toxics Control Management Program of the Department of Public Health has developed and implemented a training program for city employees who work with hazardous substances. The Port of San Francisco participates in the training program, The Port H&S staff will oversee make-up, annual refresher and new employees/transfer sessions to ensure all personnel who are in the Hazard Communication Program receive training.

B. The Toxics Control Management Program of the Department of Public Health developed curricula to be presented to city employees provides training in Hazard Communication, Hazardous Waste and Hazardous Materials. Classes are presented to groups of employees as follows:

Supervisor Class Outline

Session I.	Hazard Communication	3 hrs.
Session II.	Hazardous Waste	2 hrs.
Session III.	Emergency Response	2 hrs.
Session IV.	Communication and Resources	3 hrs.

Line Workers Class Outline

Session I.	Hazard Communication Regulations	3 hrs.
Session II.	Hazardous Waste and Emergency Response	2 hrs.

C. Port staff who were unable to attend one or more of the required Toxics training classes attended make-up sessions at other City departments.

D. H&S will develop a training program for Port employees on specific substances or classes of substances used in individual work areas. This training will include information regarding the physical and health hazards of such substances, including measures employees can take to protect themselves from such hazard. Standard operating procedures and emergency response plans will be reviewed.

The Toxic Control Management Program will continue to provide assistance to H&S in development of the training program. H&S will coordinate its training effort with the citywide program currently in effect.

E. Record-Keeping

Documentation of training class attendance will be kept by the Personnel office for review by interested parties.

IX. INVENTORY OF HAZARDOUS SUBSTANCES

H&S has prepared a Hazardous Materials Inventory list of all hazardous substances used by Port employees.

Appropriate Safety Data Sheets may be referenced for this inventory.

X. NON-ROUTINE TASKS/UNLABELED PIPES

A. Employees may be required to perform non-routine tasks which may include handling hazardous substances. Prior to beginning work on such projects, employees will be provided with information from their supervisor regarding potential hazards. This information will include standard operating procedures.

B. These procedures will cover a description of the work to be performed, the materials involved, and the hazards associated with the operation. The employees will be provided with appropriate protective gear and training. Emergency and safety measures will be clearly communicated to employees prior to beginning work.

C. Non-routine tasks which may involve exposure to hazardous substances may include the following:

1) high energy materials or electrical systems
2) highly toxic materials
3) high pressure or high vacuum vessels
4) fast moving or high-powered machinery
5) molten materials
6) high location, underwater or confined spaces

D. Prior to beginning work on unlabeled pipes, employees will be informed as to the material contained in the pipe. The specific hazards associated with the material will be discussed by the employee and his or her supervisor, and the Safety Data Sheet for the material will be reviewed.

XI. CONTRACTORS

A. Contractor employers with employee work on Port property will be informed about hazardous substances in the proximity or to which they will be exposed while performing their work.

Appendix C

Port of San Francisco

Hazardous Materials Emergency Response Plan, Updated March 2021

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HAZARDOUS MATERIAL
EMERGENCY RESPONSE PLAN

PIER 50D, MAINTENANCE SHOPS

Facility ID #	**21813**
Business Name	**CCSF/Port/Maintenance**
Street Address	**Pier 50, Shed D**

Prepared by:

Health and Safety Section
Maintenance Division

Updated March 2021

TABLE OF CONTENTS

I. INTRODUCTION

The Port of San Francisco will operate and maintain its Maintenance facility at Pier 50D in a way that reduces the possibility of accidents. To achieve this goal, every employee shall become familiar with the proper use, storage, and handling of hazardous materials and shall follow appropriate work practices. **In the event of an accidental release of a hazardous material, employees will follow the procedures outlined in this plan.**

II. EMERGENCY COORDINATORS

The Primary Emergency Coordinator is responsible for coordinating all emergency response actions at the facility. He/she is familiar with the operations of the business and has full access to the facility. In addition, he/she has the authority to make decisions during an emergency and will be available on a 24-hour basis. The Secondary Emergency Coordinator will work in conjunction with the Primary Emergency Coordinator or on his/her behalf.

The Emergency Coordinator will be responsible for notifying the hospital (listed in Section II of this plan) as often as is needed of any special medicine, equipment, or decontamination procedures that will be required to treat injuries and illnesses caused by the hazardous materials/wastes used at this business. Health and Safety will assist with this task by meeting with the clinic director and/or providing inventory information to the clinic.

Spilled hazardous materials and dirty absorbents may be considered hazardous waste. Hazardous waste cannot be thrown out with regular trash. Hazardous waste must be removed by a licensed hazardous waste transporter/contractor. The Emergency Coordinator will contact Health and Safety to arrange for removal of hazardous waste produced as a result of a spill or leak.

The Primary Emergency Coordinator is:

Tim Felton
Deputy Director, Maintenance
(415) 597-7922 (desk)
(415) 819-7560 (cell)
24-Hour Phone: (415) 274-0400

The Secondary Emergency Coordinators are:

Mike Wetzel
Superintendent of Harbor Maintenance
(415) 597-7907 (desk)
(415) 819-0259 (cell)
24-Hour Phone: (415) 274-0400

Oscar Wallace
Superintendent of Harbor Maintenance
(415) 597-7908 (desk)
(415) 919-7723 (Cell)
24-Hour Phone: (415) 274-0400

Emergency Coordinators may call upon the Health and Safety staff to assist them in responding to spills and to make required notifications.

George Bibbins (415) 205-8317 (cell)
Karen Taylor (415) 274-0579 (desk)

III. TELEPHONE DIRECTORY

A. Fire, Police, Medical, or Hazardous Materials Emergency: **911**

B. Hospital/Clinic:

SFGH Occupational Health Services
1001 Potrero Ave., Building 9
(415) 206-8998

After Hours:
Any Emergency Room

C. Hazardous Waste Hauler/Emergency Clean-up Contractor used by business:

The Port has contracts with Environmental Logistics, Clean Harbors and Silverado for hazardous waste hauling. For emergency response and clean-up operations outside of the scope of that contract, the Department of Public Works and the Department of Public Health have contracts. The Health and Safety Section will arrange for these services when needed.

D. Business Person/Position who will report spills/leaks of Hazardous Materials/Wastes

The law requires the business owner/designee to make oral and written reports of hazardous materials/hazardous wastes spills and leaks. After an uncontrolled spill or leak of a hazardous material/waste (i.e., a release that leaves the Pier 50D facility, reaches the bay or storm drain, and/or cannot be managed with existing personnel and equipment):

George Bibbins, Senior Industrial Hygienist, Health and Safety (or his designee)

WILL CALL:	S. F. Department of Public Health	(415) 252-3900
	California Office of Emergency Services	(800) 852-7550
	National Response Center	(800) 424-8802
WILL CALL:	S.F. Public Utilities Commission	(415) 695-2020
	When hazardous materials/waste spills/leaks into a sewer	
WILL CALL:	Department of Fish & Wildlife, OSPR	(916) 445-0045 or (916) 358-1300
	U.S. Coast Guard, Marine Safety Office	(510) 437-3073
	When oil spills to the bay	
WILL CALL:	Cal. Office of Emergency Services	(800) 852-7550
	When oil is released from a Port-owned vessel	
WILL WRITE REPORT TO:	Department of Toxics Substance Control	(800) 852-7550
	700 Heinz St Berkeley, CA 94704	
	Within 15 days of a hazardous waste spill/leak	
	Bay Area Air Quality Management District	(800) 792-0836

MAY CONTACT:

California Fish and Game	(707) 944-5512
California Highway Patrol	(707) 648-5550
CalTrans	(415) 923-4444
Environmental Protection Agency	(415) 744-2000
Poison Control Center	(415) 476-6600

IV. METHOD OF ALERTING EMPLOYEES AND OTHERS WITHIN THE FACILITY

When there is an emergency at the site, employees and other people within the facility will be alerted by voice or telephone.

There is also an audible fire and evacuation alarm in the building. The fire alarm is part of the sprinkler system and will sound if a flow or tampering is detected in the system and the fire department will be notified. In addition, there is a pull box located in the front of the building (near door to laborer's break room). When this is pulled the alarm is sounded, it also notifies a monitoring company. The evacuation alarm is a local "air raid" style alarm that is activated from to push button stations located at the front and middle of the building. This does not notify any emergency services. This is to evacuate Pier 50 D in a fire or non-fire emergency.

Unaccompanied visitors will be informed of the business's emergency alarm system upon entry to building.

V. METHOD OF ALERTING NEIGHBORS

When a hazardous material/waste accident at the business site may affect neighbors, the Emergency Coordinator (or his designee) will alert them by telephone or in person. The nearest neighbors are*:*

Tenant	**Facility**	**Phone**
California Sealift Terminals/MARAD ships	Pier 50 Face & Berth D	904-215-3336
SFCC Police Department	Pier 50, Shed A	415-553-1096
Coco, Dennis M (storage)	Pier 50, Shed A	650-738-5760
Diamond Freight System, Inc.	Pier 50, Shed A	415-537-9590
Habitat for Humanity (storage)	Pier 50, Shed A	415-406-1555
San Francisco Museum & Historical Society (storage)	Pier 50, Shed A	415-775-1111
CB2 Builders, Inc	Pier 50, Shed A	415-402-0360
Smail Hadjout	Pier 50, Shed A	415-378-3710
Bauer Intelligent Transportation, Inc.	Pier 50, Shed A	415-522-1212
Trish's Dishes, Inc.	Pier 50, Shed A	415-981-4318
Waterloo Beverages, LLC	Pier 50, Shed A	415-368-1948
Ferry Plaza Wine Merchant	Pier 50, Shed A	415-391-9400
A.S.F. Electric	Pier 50, Shed A	650-755-9032
Z Collection Inc.	Pier 50, Shed A	415-397-4119
Portco, Inc	Pier 50, Shed A	415-771-5200
BCCI Construction Co.(storage)	Pier 50, Shed B	415-995-6025
California Drywall Co. (storage)	Pier 50, Shed B	408-292-7500

Skyline Commercial Interiors, Inc.	Pier 50, Shed B	415-908-2502
Distillery 209 Ltd.	Pier 50, Shed B	415-695-0110
Sian, Kuldip Singh	Pier 50, Shed B	415-546-7110
Fine Line Group, Inc. (storage)	Pier 50, Shed B	415-777-4070
Principal Builders Inc. (storage)	Pier 50, Shed B	415-434-1500
Huckleberry Investment Corporation	Pier 50, Shed B	415-391-6060
Adina for Life, Inc	Pier 50, Shed B	415-543-4300
SFPD	Pier 50, Shed B	415-553-1096
Dawson-Clinton General Contractors, Inc.	Pier 50, Shed B	415-359-9991
Shelterbelt Builders, Inc	Pier 50, Shed B	510-841-0911
Avi Corporation	Pier 50, Shed B	415-440-3322
Overstreet Associates, Inc.	Pier 50, Shed B	510-828-3602
Maritol Enterprises, LLC	Pier 50, Shed B	415-722-9843
Weststar Marine Services	Pier 50, Shed C & Apron	415-495-3191
Bauer Intelligent Transportation, Inc.	Pier 50, Shed C	415-522-1212

VI. PROCEDURES FOR SHUTTING OFF GAS, ELECTRICITY, AND WATER

Natural Gas is usually shut off at a valve near the meter. If the valve stem is aligned with the piping, the valve is open, if crossways to the piping, the valve is closed. The gas shutoff valve is located to the right side of the front entrance's main rollup door.

All electricity is shut off at the main electrical service box. This box is often close to the meter. Individual circuits can be shut off at panel boxes. The shutoff may be by switch or breaker. Switch positions are marked "On" or "Off" next to the switch handle. The main power for the building is **high voltage**. The shut off locations is in the paint shop, with additional panels in the carpenter's shop and the ironworker shop.

Water can be turned off at the main water valve. The main water valve is located to the right side of the front entrance's main rollup door. Water can also be shut off at the street (between Pier 50 Shed B and 401 Terry Francois).

The fire sprinkler system valve is in front of the building.

Situations when	gas ⇩	electricity ⇩	and water should be shut off ⇩
Earthquake:	if leaking	if lines damaged	if major leak
Fire:	yes	Yes	no
Flood:	if leaking	Yes	if causing
Other:	if leaking	if arcing	repairs

After a problem where gas and/or electricity, and/or water has been turned off; care must be taken when the utility is turned back on.

The Plumbing Supervisor, or other person designated by the Emergency Coordinator, shall be responsible for turning off or on gas and water, as necessary.

The Electrical Supervisor, or other person designated by the Emergency Coordinator, shall be responsible for turning off or on electricity as necessary.

In the event that incident control is being exercised by an INCIDENT COMMANDER, then authority to restore utilities and to shut off fire suppression system must come from the INCIDENT COMMANDER.

VII. FACILITY EVACUATION PROCEDURE

In the event of an emergency at or near the facility, people within the facility shall leave the building using the exits on the north, east or west sides of the building and report to the North Parking Area/Utility Yard, Pier 50D.

Each shop supervisor shall account for his or her employees and provide information to the Emergency Coordinator.

Evacuation maps are posted at strategic locations within the facility.

During an earthquake it is best to duck, cover, and hold before evacuation. The best places in the facility are under desks and tables.

The areas that are most easily damaged during an earthquake and must be inspected or isolated immediately after an earthquake (before employees return into the building) are: walls, ceilings, roof, floors, foundation, structural framing, and parapets. The Port's Engineering Division is responsible for performing a rapid structural assessment, in accordance with ATC-20 guidelines, following earthquakes or other disasters.

VIII. SAFETY INFORMATION, MEDICAL DUTIES, AND RESCUES

Safety Data Sheets (SDS) for hazardous materials used at the facility must be accessible in areas where employees may review them. MSDS are kept in binders in each shop, in an accessible and readily apparent area.

Only trained individuals should perform rescues, first aid or CPR. Many Port employees are trained in First Aid and CPR. **When rescue is necessary and when injuries are beyond basic first aid, call 911.**

IX. SPILLS & LEAKS OF HAZARDOUS MATERIALS

Spills and leaks of hazardous materials can damage facilities, injure workers, and harm the environment. It is best to prevent spills and leaks by taking precautions.

For the purposes of this categorization, a **process** can be a piece of equipment such as a forklift or emergency generator; an unattended activity such as water treatment; any of a huge variety of employee activities such as cleaning, painting, welding, roofing, auto repairing, contracting (e.g., building), etc.; and general processes such as photography, laundry, or laboratory. A facility may have a single process or multiple processes. For each **process** where hazardous materials are used at your facility, list the **hazardous materials used** and determine the **category** for each material. The container label and MSDS will usually give/indicate an appropriate **category.**

Spill Response Procedures (Precautions and Control/Clean-Up Procedures) for the following **categories** of hazardous materials are found in this Emergency Response Plan.

Category	***Examples***
Compressed Gases – Flammable	Acetylene, propane, butane
Compressed Gases - Non-Flammable	Oxygen, air, carbon dioxide, nitrogen, helium, or argon
Liquids – Flammable	Gasoline, methanol, ethanol, ethers, acetone, lacquers
Liquids – Combustible	Diesel fuel, kerosene, lubricating oils, oil paints, antifreeze
Other Liquids	Solvents/Poisons/Carcinogens (TCE, methylene chloride, latex paint, pesticides, herbicides, and liquid hazardous materials not listed in other categories)
Other Solids	Poisons/Carcinogens: (e.g., pesticides, herbicides, tar and mastics, welding rods, sand or rock dust with silica warning on container (usually bag) label, and solids with danger, toxic, poison, or carcinogen warnings on the label)
Corrosive Chemicals (Corrosives)	Liquids/solids/solutions such as acids, bases, salts, most water treatment chemicals; and solids such as cement, redi-mix, grout, stucco
Oxidizing Chemicals (Oxidizers)	Peroxides, nitric acid

PROCESS	**HAZARDOUS MATERIALS USED**	**CATEGORY**
Painting	Paints, solvents	Liquids – Flammable, Liquids – Combustible, Other Liquids
Welding, cutting, soldering	Welding rods, flux, compressed gases	Other Solids, Compressed Gasses – Flammable, Compressed Gasses – Non-Flammable
Using power tools	Fuels, lubricants	Liquids – Flammable, Liquids – Combustible, Other Liquids
Clearing clogged drains or sewer lines; treating grease traps	Concentrated acids and bases, solvents	Corrosive Chemicals
Patching holes in concrete	Cement	Corrosive Chemicals
Roof patching	Solvents, cleaners, cement, asphalt, adhesives	Liquids – Flammable, Liquids – Combustible, Other Liquids, Other Solids
Reshaping and repairing metal parts	Epoxies, sealants, lubricants, cutting fluids	Liquids – Flammable, Liquids – Combustible, Other Liquids
Cleaning parts, cleaning metal to be welded	Solvents, acids	Liquids – Combustible, Other Liquids, Corrosive Chemicals

PROCESS	HAZARDOUS MATERIALS USED	CATEGORY
Maintain and repair engines and mechanical parts	Lubricants, antifreeze, solvents, batteries	Liquids – Combustible, Other Liquids, Corrosive Chemicals
Repairing piers	Wood preservative	Liquids – Combustible
Applying pesticides and herbicides	Pesticides, herbicides	Other Liquids
Patching pavement	Asphalt	Liquids – Combustible, Other Solids
Cleaning and descaling boilers	Caustics	Corrosive Chemicals

Precautions and Control/Clean-Up Procedure for Spills/Leaks of COMPRESSED GASES – FLAMMABLE

Flammable compressed gases (fuels) include propane, butane, MAPP and acetylene that are contained in compressed gas cylinders. There may be little in the way of information or warnings on the cylinder so Material Safety Data Sheets need to be present.

Special precautions for flammable compressed gases are:
Store away from oxidizing compressed gases such as oxygen.
Store away from heat, flame, direct sunlight, or possible electric arcs. Secure compressed gas cylinders in carts, to walls, etc so they remain upright. Compressed gas cylinders should be connected to a manifold or regulator or have a cylinder cap in place.

Protective equipment for flammable compressed gas leaks:
- Safety Glasses/Goggles, Gloves, Boots
- Combustion gas/oxygen meter (available from H&S office)

Spill control equipment for flammable compressed gas leaks:
- "Intrinsically safe" fan
- Cones and barrier tape

Control procedure for flammable compressed gases leaks:
- ***Turn off compressed gas cylinder valve if safe to do so. Flammable compressed gases can explode from arcs of static electricity.***
- Evacuate area and deny area access
- Call 911 if unable to stop leak.

Decontamination procedure for flammable compressed gases leaks:
- Aerate leak area prior to reentry
- Check area with combustible gas meter

Disposal procedure for flammable compressed gases leaks: None.

Employees should not clean up a flammable compressed gas leak if:
They have not been trained or are scared to do so; or
- There is a source of ignition (electric, static electricity, heat, flame).
- There are other threatening materials released besides flammable compressed gas.
- There is a fire that threatens the cleanup area or scares the employee(s).
- There has been an earthquake and the building has not been structurally evaluated.

In such cases employees should:
- Call for help from other employees
- Warn others
- Phone 911

Precautions and Control/Clean-Up Procedure for Spills/Leaks of COMPRESSED GASES - NON-FLAMMABLE

Non-flammable gases include: Oxygen, nitrogen, helium, argon, carbon dioxide that are stored at high pressure and contained in compressed gas cylinders. There may be little in the way of information or warnings on the cylinder so Material Safety Data Sheets need to be present.

Special precautions for non-flammable compressed gases are:

- Store away from flammable gases (fuels) such as acetylene, and other flammable or combustible materials.
- Store away from heat, open flame, or direct sunlight. Secure compressed gas cylinders in carts, to walls, etc so they remain upright. Compressed gas cylinders should be connected to a manifold or regulator or have a cylinder cap in place.

Personal protective equipment for non-flammable compressed gas leaks:

- Safety Glasses/Goggles, Gloves, Boots

Spill control equipment for non-flammable compressed gas leaks:

- Fan
- Combustion gas/oxygen meter (available from H&S office)

Control procedure for non-flammable compressed gases leaks:

- Turn off compressed gas cylinder valve if safe to do so.
- Evacuate area

Decontamination procedure for non-flammable compressed gas leaks:

- Aerate leak area
- Check oxygen level with gas meter

Disposal procedure for non-flammable compressed gas leaks: None.

Employees should not clean up a non-flammable compressed gas leak if:
They have not been trained or are scared to do so.

- There are other threatening materials released besides non-flammable compressed gases.
- There is a fire that threatens the cleanup area or scares the employee(s).
- There has been an earthquake and the building has not been structurally evaluated.

In such cases employees should:

- Call for help from other employees
- Warn others
- Phone 911

Precautions and Control/Clean-Up Procedures for Spills/Leaks of
LIQUIDS – FLAMMABLE

(Flammable liquids have flash points up to approximately 140^{o} F)

Flammable liquid chemicals include: Methanol, alcohols, gasoline, solvents, mineral spirits, acetone.

Special precautions for flammable liquids are:

Note: Flammable storage containers must comply with OSHA 29CFR1910.106 and NFPA Code 30.

- Store away from oxidizers, heat, flame, direct sunlight, and electric arcs.
- Store in flammable cabinets (when >10 gallons in use).
- To reduce static buildup, ground all large dispensing containers and bond to receiving container
- Keep lids and caps tightly closed
- Keep containers labeled.
- Dispose of or double contain (overpack) any material that appears to be leaking or is not sound.

Protective equipment for flammable liquid spills/leaks:

- Goggles and neoprene gloves are mandatory.
- Boots
- Combustible gas/oxygen meter (available from H&S office)

Spill control equipment for flammable liquid spills/leaks:

- Absorbent (sand/clay/kitty litter). Do not use cellulose absorbents such as sawdust.
- Plastic or non-sparking shovel and broom
- Metal container
- "Intrinsically safe" fan
- Barrier tape and cones
- Pigs, pillows, mats, dams
- Hydrophobic mops

Control procedure for flammable liquids spills/leaks:

- Note: Many flammable liquids can ignite from static electricity
- Shut off equipment and sources of ignition
- Dike perimeter of spill; only if safe to do so. DO NOT INHALE VAPORS.
- Cover all spill/leak material with absorbent
- Ventilate spill/leak
- Evacuate area
- Deny area access

Decontamination procedure for flammable liquids spills/leaks:

- Put contaminated rags in metal container with tight fitting lid
- Put contaminated absorbent into a metal container
- Scrub/rinse contaminated area w/soap-water
- Wash any spill on skin

Disposal procedure for flammable liquid spills/leaks:

- Dispose of flammable liquid waste and contaminated materials as hazardous waste.

Employees should not clean up flammable liquid spills/leaks if:

- ***They have not been trained or are scared to do so***
- Absorbent or container is not available.
- There is a source of ignition (electric, static electricity, heat, flame)
- There is possibility of electric shock
- There are other threatening materials besides flammable liquids
- There is a fire that threatens the cleanup area or scares the employee(s)
- There was an earthquake, and the building has not been structurally evaluated

In such cases employees should:

- Call for help from other employees
- Warn others.
- Call 911

Precautions, Control, & Clean-Up Procedures for Spills/Leaks of
LIQUIDS – COMBUSTIBLE

Combustible liquids have flash points between 140^{o} and 200^{o} F (approximately)

Combustible liquid chemicals include: Lubricating and hydraulic oils; brake, power steering, and transmission fluids; diesel fuels; kerosene; many cleaners and solvents; most undiluted radiator coolant; many greases; Copernate; and paint thinner. Combustible container label and Material Safety Data Sheets state material is a "combustible liquid".

Special precautions for combustible liquids are:

- Store away from oxidizers, heat, flame, and electric arcs.
- Treat heated combustible liquids as if they are flammable liquids.
- Keep containers labeled
- Keep lids and caps tightly closed
- Double contain (overpack container) materials if leakage is detected

Personal protective equipment for combustible liquids spills/leaks:

- Safety Glasses/Goggles, Neoprene or Nitrile Gloves, Boots

Spill control equipment for combustible liquids spills/leaks:

- Floor sweep absorbent (sand/clay/kitty litter) or a hydrophobic mop. DO NOT use cellulose absorbents such as sawdust.
- Shovel and broom
- Fan
- Labeled metal container with tight fitting lid (for rags or for absorbent)
- Barrier tape and cones
- Pigs, pillows, mats, & dams

Control procedure for combustible liquid spills/leaks:

- ***Shut off equipment and sources of ignition, upright container***
- ***Dike perimeter of spill. DO NOT INHALE VAPORS.***
- Cover all spill/leak material with absorbent
- Ventilate spill/leak area
- Evacuate area
- Deny area access

Decontamination procedure for combustible liquids spills/leaks:

- Put contaminated rags and absorbent in metal container with tight fitting lid
- Scrub/rinse contaminated area w/compatible detergent/water.
- Wash any spill on skin

Disposal procedure for combustible liquids spills/leaks:

- Recycle combustibles, where possible
- Dispose of combustible waste and contaminated materials as hazardous waste

Employees should not clean up combustible liquid's spills/leaks if:

- ***They have not been trained or are scared to do so or if absorbent//container are not available.***
- There is a source of ignition (electric, heat, flame, static)
- There is possibility of electric shock
- There are other threatening materials besides combustible liquids
- There is a fire that threatens the cleanup area or scares the employee(s)
- There was an earthquake, and the building has not been structurally evaluated.

In such cases employees should:

- Call for help from other employees
- Warn other employees/others
- Phone 911

Precautions and Control/Clean-Up Procedures for Spills/Leaks of OTHER LIQUIDS (SOLVENTS, POISONS, CARCINOGENS, etc.)

Other liquid chemicals include: Solvents such as TCE, methylene chloride; liquid pesticides and herbicides; latex paint; cleaners/surfactants, and other hazardous liquids not listed in other categories. Material Safety Data Sheets need to be present.

Special precautions for other liquids are:

- ***This is a broad category of materials that can cause acute or chronic illness depending upon the material and the exposure. Good housekeeping is essential for preventing exposure through skin, eyes, mouth, and lungs.***
- Keep containers labeled
- Keep lids and caps tightly closed
- Double contain materials if practical
- Dispose of any material that appears to be leaking or whose container is not completely sound
- Do not inhale vapors

Personal protective equipment for other liquids spills/leaks:

- Goggles/Safety glasses, Gloves, Boots

Spill control equipment for other liquid spills/leaks:

- Floor sweep absorbent (sand/clay/kitty litter).
- Shovel and broom
- Container
- Fan
- Barrier tape and cones
- Pigs, pillows, mats, & dams

Control procedure for other liquid spills/leaks:

- DO NOT INHALE VAPORS.
- Upright the container
- Apply absorbent
- Dike perimeter of spill
- Cover all spill/leak material
- Ventilate spill/leak area
- Evacuate area
- Deny area access

Decontamination procedure for other liquids spills/leaks:

- Put (shovel) contaminated absorbent into a container.
- Scrub/rinse contaminated area w/soap-water.
- Wash any spill on skin

Disposal procedure for other liquid spills/leaks:

- Small amounts of contaminated absorbent can undergo evaporation if there is a safe place to do it
- Other waste is likely hazardous waste and must be disposed of accordingly

Employees should not clean up other liquid spills/leaks if:

- ***They have not been trained or are scared to do so or if absorbent or container is not available***
- There is possibility of electric shock
- There are other threatening materials released besides other liquids
- There is a fire that threatens the cleanup area or scares the employee(s)
- There has been an earthquake and the building has not been structurally evaluated

In such cases employees should:

- Call for help from other employees
- Warn other employees/others
- Phone 911

Precautions and Control/Clean-Up Procedures for Spills/Leaks of OTHER SOLIDS (POISONS, CARCINOGENS, etc)

Other solid chemicals include: Solid pesticides and herbicides; tar and mastics; welding rods, sand or rock dust in containers carrying a silica warning; chemicals with "poison", "carcinogen" "toxic", "danger", or "irritant" on the label or on the Material Safety Data Sheet and other hazardous solids not listed in other categories.

Special precautions for other solids are:

- ***This is a broad category of materials that can cause acute or chronic illness depending upon the material and the exposure.***
- ***Good housekeeping is essential for preventing exposure through skin, eyes, mouth, and lungs.***
- Keep containers labeled (check periodically)
- Keep lids and caps tightly closed
- Double contain materials if possible
- Dispose of any material that appears to be leaking or whose container is not completely sound

Personal protective equipment for other solids spills/leaks:

- Goggles/Safety glasses, Gloves, Boots

Spill control equipment for other solids spills/leaks:

- Shovel and broom
- Metal container
- Barrier tape and cones
- Broom

Control procedure for other solids spills/leaks:

- Upright container
- Ventilate spill/leak area, if necessary and it can be done without creating dust
- Evacuate area
- Deny area access

Decontamination procedure for other solids spills/leaks:

- Put (shovel) contaminated solid into a container
- Scrub/rinse contaminated area w/soap-water
- Wash any spill on skin

Disposal procedure for other solids spills/leaks:

- Some solid waste is hazardous waste and must be disposed of accordingly.

Employees should not clean up other solids' spills/leaks if:
They have not been trained or are scared to do so or if absorbent or container is not available

- There is possibility of electric shock
- There are other threatening materials released besides other solids
- There is a fire that threatens the cleanup area or scares the employee(s)
- There has been an earthquake and the building has not been structurally evaluated

In such cases employees should:

- Call for help from other employees
- Warn other employees/others
- Phone 911

Precautions and Control/Clean-Up Procedures for Spills/Leaks of CORROSIVE CHEMICALS

Corrosive chemicals include: Acids (pH less than 2) such as muriatic acid, sulfuric (battery) acid, phosphoric acid, fluxes. Or bases (caustics, pH greater than 12.5) such as sodium hydroxide, potassium hydroxide, and ammonium hydroxide, water treatment chemicals, and drain cleaners. Corrosive container labels and Material Safety Data Sheets are required to state "corrosive".

Special precautions for corrosives are:

- ***CORROSIVES HAVE SEVERE EYE DAMAGE POTENTIAL***
- Both eye and skin protection is required.
- An eyewash capable of running for 15 minutes must be within 10 seconds of corrosive handling/storage
- Periodically test eyewash/shower
- Provide secondary containment or corrosive cabinets for corrosives
- It is best to not wear contact lenses
- Periodically check neutralizer supply
- Maintain separate storage areas for "acidic" and "basic" corrosive materials

Personal protective equipment for corrosives spills/leaks:

- Chemical Goggles (no vents), Face shield, Gloves, Apron, Boots

Spill control equipment for corrosive spills/leaks:

- Neutralizer
- Absorbent (sand/clay/kitty liter)
- Pads, pigs, etc.
- Plastic shovel and broom
- Plastic container or bags
- Barrier tape/cones to deny access

Control procedure for corrosive spills/leaks:

- Stop source if possible
- Apply neutralizer/absorbent as needed
- Put neutralized contaminated absorbent into a labeled plastic container
- Barrier tape spill area if tracking could spread the spill/leak.

Decontamination procedure for corrosives spills/leaks:

- Wash shovel with water
- Wash contaminated area with water and dry with paper towels or similar
- Wash hands and any splashes on cloths with water and dry.

Disposal procedure for corrosives spills/leaks:

- Mostly dry, near neutral neutralized contaminated corrosive materials can be put to garbage
- Strong acid (< pH = 2) or strong base (>pH = 12.5) is hazardous waste.
- Inform the SF Public Utilities Commission Bureau of Environmental Regulation and Management at 695-7310 if a corrosive spill/leak has gone down sewer drain.

Employees should not clean up a corrosive spill/leak if:

- ***They have not been trained or are scared to do so or equipment is not available.***
- There is possibility of electric shock
- There are other threatening materials released besides corrosives
- There is a fire that threatens the cleanup area or scares the employee(s)
- There has been an earthquake and the building has not been structurally evaluated.

In such cases employees should:

- Call for help from other employees
- Warn others
- Phone 911

Precautions and Control/Clean-Up Procedures for Spills/Leaks of OXIDIZING CHEMICALS

Oxidizing chemicals include: Oxidizing chemicals can exist in solid form as well as solutions. Inorganic acids such as nitric acid; hydrogen peroxide** and peroxides, and salts such as any nitrate, Oxidizer container labels and Material Safety Data Sheets state "oxidizer".
*** Hydrogen peroxide at less than or equal 30% is classified as an oxidizer. Above 30% hydrogen peroxide should be treated as a shock sensitive.*

Special precautions for oxidizers are:
- Keep oxidizers away from eyes and skin
- Oxidizing chemicals can react violently with many other materials
- Store oxidizers by themselves (not alphabetically with other chemicals)
- Do not store oxidizers near reducing agents (fuels, flammable compressed gases, flammable liquids, combustible liquids, solvents, plastic, paper, sawdust, or wood)

Personal protective equipment for oxidizers spills/leaks:
- Goggles, Gloves, Apron, Boots

Spill control equipment for oxidizers spills/leaks:
- ***Do NOT use straw or plastic brooms. Do NOT use regular or hydrophilic mops.***
- Absorbent (non-organic) such as sand/clay/kitty litter
- Metal shovel
- Metal container
- Barrier tape and cones

Control procedure for oxidizers spills/leaks:
- ***Unless suggested by MSDS, DO NOT neutralize oxidizing agents with reducing agents. Doing so can cause rapid heat buildup, fire, or even explosion.***
- Apply absorbent if needed ***(DO not use cellulose or other organic absorbents such as saw dust***
- Put neutralized contaminated absorbent into a metal container
- Deny area access.

Decontamination procedure for oxidizer spills/leaks:
- Wash shovel with water
- Ensure metal container does not leak
- Wash contaminated area with water and dry with paper towels or similar
- Wash hands and any splashes with water and dry

Disposal procedure for oxidizer spills/leaks:
- Oxidizer waste is hazardous waste and must be disposed of accordingly.
- Small amounts of dilute oxidizer waste can be flushed to the sewer (e.g., bleach)

Employees should not clean up an oxidizer spill/leak if:
- ***They have not been trained to do so or are scared to do so or absorbent is not available.***
- There is possibility of electric shock
- There are other threatening materials released/present besides oxidizers
- There is a possibility that the oxidizers may cause a fire, or a fire already threatens the cleanup area
- There has been an earthquake and the building has not been structurally evaluated.

In such cases employees should:
- Call for help from other employees.
- Warn others.
- Phone 911.