

APPENDIX D BEST MANAGEMENT PRACTICES

The planning and execution of Proposed Project and Federal Energy Regulatory Commission (FERC) Staff Alternative Settlement Agreement (SA) articles that involve site preparation and construction activities to be undertaken by the California Department of Water Resources (DWR) would include the adoption of numerous Best Management Practices (BMPs) designed to avoid or mitigate short-term effects typically associated with such activities. The BMPs to be adopted as part of the Proposed Project are presented here in Appendix D.

**(From the California Stormwater BMP Handbook, Construction, by California Stormwater Quality Association,
[HTTP://WWW.CABMPHANDBOOKS.COM/CONSTRUCTION.ASP](http://www.cabmphandbooks.com/construction.asp))**

Selection and implementation of BMPs is based on the pollution risks associated with the construction activity. The pollution prevention objectives of BMPs are defined by a review of information gathered during the assessment of the site and planned activities. Once defined, BMP objectives are developed and BMPs selected. The BMP objectives for construction projects are as follows:

- Control of Erosion, and Discharge of Sediment:
 - Minimize Disturbed Areas: Only clear land which will be actively under construction in the near term, minimize new land disturbance during the rainy season, and avoid clearing and disturbing sensitive areas (e.g., steep slopes and natural watercourses) and other areas where site improvements will not be constructed.
 - Stabilize Disturbed Areas: Provide temporary stabilization of disturbed soils whenever active construction is not occurring on a portion of the site. Provide permanent stabilization during finish grade and landscape the site.
 - Protect Slopes and Channels: Safely convey runoff from the top of the slope and stabilize disturbed slopes as quickly as possible. Avoid disturbing natural channels. Stabilize temporary and permanent channel crossings as quickly as possible and ensure that increases in runoff velocity caused by the project do not erode the channel.
 - Control Site Perimeter: Delineate site perimeter to prevent disturbing areas outside the project limits. Divert upstream run-on safely around or through the construction project. Runoff from the project site should be free of excessive sediments and other constituents.
 - Retain Sediment: Retain sediment-laden waters from disturbed, active areas within the site.

- **Manage Non-Stormwater Discharges and Materials:**
 - Practice Good Housekeeping: Perform activities in a manner to keep potential pollutants from coming into contact with stormwater or being transported off site to eliminate or avoid exposure.
 - Contain Materials and Wastes: Store construction, building, and waste materials in designated areas protected from rainfall and contact with stormwater runoff. Dispose of all construction waste in designated areas, and keep stormwater from flowing onto or off of these areas. Prevent spills and clean up spilled materials.

ADDITIONAL GENERAL GUIDELINES

- Pre-construction surveys for sensitive species and environmental permitting/documentation will be done prior to commencement of work.
- No intentional harassment, killing, or collection of plants or animals at or around the work site will occur.
- No firearms are allowed on construction site, except for those used by peace officers, DFG [California Department of Fish and Game]wardens or State Park rangers.
- No pets will be allowed.
- All persons will stay within the boundaries of the work site.
- No other off-road travel or work will be permitted; all vehicles must be confined to existing roads or areas designated for vehicles.
- All trash, including food-related trash and cigarette butts, will be properly disposed of and removed by the workers daily.
- Always choose the site preparation method that creates the least soil disturbance, remains effective and safe, and accomplishes project goals.
- General timing restrictions will be employed to protect environmental resources.

GENERAL GUIDELINES FOR CONTROL OF RUNOFF & SEDIMENT FROM GROUND DISTURBANCE

General Guidelines when Removing Vegetation

- Disturbance of vegetation shall be kept to a minimum. Trees will be flagged and avoided during construction.
- Provide for rapid revegetation of all denuded areas through natural processes supplemented by artificial revegetation where necessary.

- Maintenance of existing woody vegetation:
 - Preservation of existing vegetation shall be provided prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas identified on the plan as those to be preserved.
 - Mark areas to be preserved with temporary fencing, such as orange polypropylene that is stabilized against UV [ultraviolet] light, and is at least 3 feet tall.
 - Fence posts shall be wood or metal and spacing and depth shall be adequate to completely support the fence in an upright position.
 - Minimize disturbed areas by locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours and reduce cutting and filling.
 - Consider the impact of grade changes to existing vegetation and the root zone.
 - Keep equipment away from trees to prevent trunk and root damage.
 - Construction materials, equipment storage, and parking areas shall be located where they will not cause root compaction.
 - All workers shall be instructed to honor protective devices. No heavy equipment, vehicular traffic, or storage piles of any construction material shall be permitted within the dripline of any tree to be retained. No toxic or construction materials (including paint, acids, nails, gypsum board, chemicals, fuels, or lubricants) shall be stored within 15 meters (50 feet) of the drip line of any retained trees, nor disposed of in any way which would injure vegetation.

General Guidelines to Minimize Surface Erosion and Stabilize Material

Surface erosion measures:

- Erosion control measures involving revegetation (seeding and fertilization) should be planned and implemented as soon as practicable following disturbance.
- An integrated system of collection, control, and dispersal of surface runoff is very important to prevent erosion. Mechanical measures include construction of ditches, slash windrows, straw bale dams, sediment barriers, erosion netting and fabrics, terraces, benching, riprap, and tackifiers.
- Be aware of ongoing conditions of weather, soil conditions, and water movement and how these conditions may affect runoff and erosion.
- Employ regular inspections and maintenance of erosion control features.

Stabilization measures. A combination of practices that promote the reestablishment of vegetation on exposed slopes, provides physical protections to exposed surfaces, prevents the downslope movement of soil, and controls drainage.

- Employ regular inspections and maintenance of erosion control features.
- Measures to reestablish vegetation on exposed soils are usually accomplished by seeding suitable herbaceous vegetation in conjunction with mulching and fertilization. Treatments may include tree seedling planting, sprigging, or bioengineering.
- Measures to physically protect the soil surface from erosion or modify the topography to minimize erosion include the use of gravel on the road surface and use of mulches, riprap, erosion mats, and terracing on cuts, fills, and ditches as appropriate. Temporary waterbars in areas of uncompleted roads and trails can be effectively utilized to reduce sedimentation.
- Measures which physically inhibit the transport of sediments to streams include the use of slash filter windrows on or below the fill slopes, baled straw in ditches or below fillslopes, silt fences, and catch basins in culvert inlets.
- Measures that reduce the amount of solid disturbance in or near streams include immediate placement of large culverts in live streams prior to crossing stream with rock embankment during road construction. Temporary pipes should not be installed unless sedimentation can be minimized during installation, use and removal.

Specifics for Erosion Control and Stabilization

Erosion Control BMPs—source control practices that protect the soil surface and prevent soil particles from being detached by rainfall, flowing water, or wind. Erosion control consists of preparing the soil surface and implementing one or more of the following BMPs to the disturbed soil areas. See Section 3.1 of:

http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

- Scheduling
- Preservation of Existing Vegetation
- Hydraulic Mulch
- Hydroseeding
- Soil Binders
- Straw Mulch
- Geotextiles or Mats

- Wood Mulching
- Earth Dikes and Drainage Swales
- Velocity Dissipation Devices
- Slope Drains
- Streambank Stabilization
- Polyacrylamide

Sediment Control BMPs—include any practice that traps soil particles after they have been detached and moved by rain, flowing water, or wind. Sediment Control measures are usually passive systems that rely on filtering or settling the particles out of the water or wind that is transporting them. See Section 3.2 of:

http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

- Silt fence
- Sediment basin
- Sediment trap
- Check dam
- Fiber rolls
- Gravel bag berm
- Street sweeping and vacuuming
- Sandbag barrier
- Straw bale barrier
- Storm drain inlet protection
- Chemical treatment

Wind Erosion Control—consists of applying water or other dust palliatives to prevent or alleviate dust nuisance. See Section 3.3 of:

http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

Non-Stormwater Management BMPs—source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source or eliminating off-site discharge. These BMPs are also referred to as “good housekeeping practices” which involve keeping a clean, orderly construction site. See Section 4.1 of:

http://www.cabmphandbooks.com/Documents/Construction/Section_4.pdf

- Water conservation practices
- Dewatering
- Paving and grinding operations
- Temporary stream crossings
- Clean water diversion
- Illicit connection/discharge
- Potable water/irrigation
- Vehicle and equipment cleaning, fueling and maintenance
- Pile driving operations
- Concrete curing and finishing
- Material and equipment use
- Demolition adjacent to water
- Temporary batch plants

Waste Management and Materials Pollution Control BMPs—source controls to prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with stormwater. These, like the non-stormwater management BMPs, are “good housekeeping practices” which involve keeping a clean, orderly construction site. See Section 4.2 of:

http://www.cabmphandbooks.com/Documents/Construction/Section_4.pdf

- Materials delivery and storage
- Material use
- Stockpile management
- Spill prevention and control
- Waste management
 - Solid waste
 - Hazardous waste
 - Contaminated soil

- Concrete waste
- Sanitary/septic waste

General Practices for Toxic or Hazardous Spills

- Locate service and refueling sites well away from wetlands and stream channels.
- Any chemical spills will be cleaned up and reported immediately.
- Wash chemical containers and clean equipment in special areas designated for these uses.
- Keep chemicals away from surface water when mixing.
- Latrines, vaults, or pit toilets for camps will be located a minimum of 100 feet from all perennial lakes and streams.
- Minor oil spills can be prevented by:
 - Collecting used oil, oil filters, and grease tubes
 - Requiring equipment operators to carry absorbent pads
 - Providing containment and cleanup for portable fuel tanks including hose and nozzle
 - Following approved disposal methods for waste products
 - Regular checks for and prompt repair of leaks
 - Developing Spill Prevention Control and Countermeasure Plans

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