
Lahontan Regional Water Quality Control Board

April 9, 2021

WDID 6A292009002

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Board Order R6T-2021-0016 Granting Clean Water Act Section 401 Water Quality Certification and Basin Plan Prohibition Exemption, and Adoption of Mitigated Negative Declaration, Lacey Meadows Restoration Project, Sierra and Nevada Counties

Lahontan Regional Water Quality Control Board (Water Board) staff has received a complete Clean Water Act (CWA) section 401 Water Quality Certification (WQC) application and application filing fee from Truckee River Watershed Council (Applicant) for the Lacey Meadows Restoration Project (Project) in Sierra and Nevada Counties. The application was received on February 18, 2021 and deemed complete on February 23, 2021. This WQC hereby assigns this Project Waste Discharge Identification (WDID) No. 6A292009002. Please use this reference number in all future correspondence regarding this Project.

Any person aggrieved by this action of the Water Board may petition the State Water Resources Control Board (State Water Board) to reconsider this WQC in accordance with Water Code section 13320 and California Code of Regulations (CCR), title 23, sections 2050 and 3867. The State Water Board must receive the petition within thirty (30) days after the date of this WQC, by 5:00 p.m. on the thirtieth day except if the thirtieth day following the date of this WQC falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at the [Water Quality Petitions](http://www.waterboards.ca.gov/public_notices/petitions/water_quality/) page: (http://www.waterboards.ca.gov/public_notices/petitions/water_quality/) or will be provided upon request.

PROJECT INFORMATION

Project details are listed in the following tables.

General Project Information

Category	Data
Applicant	Beth Christman Truckee River Watershed Council P.O. Box 8568 Truckee, CA 96162 bchristman@truckeeriverwc.org 530-550-8760 x1#
Agent	Not applicable
Project Name	Lacey Meadow Restoration Project.
Project Purpose and Description	<p>The purpose of the Project is to restore impacts to Upper Lacey Meadow and Lower Lacey Meadow caused by historic uses. Upper Lacey Meadow has been reduced from approximately 99 acres to 72 acres due to impacts including channel modification and diversions. Lacey Creek is incised through Lower Lacey Meadow due to knickpoint erosion and headcut migration associated with rapid and large anthropogenic fluctuations in Webber Lake water levels.</p> <p>The Project will mitigate these impacts by re-establishing natural meadow processes and function by correcting incision and re-engaging natural channels. Project construction will include installation of instream features including debris jams, log and boulder structures, and engineered riffles, installation of buried log grade control structures, placement of channel fill, removal of historic levees and push-up dams, and drainage improvements to Webber Lake Road.</p> <p>Temporary impacts associated with the Project construction will include designated access routes through the meadow, diversion and dewatering systems to facilitate in-stream work, and creek crossings. Temporary impacts will be restored to pre-Project conditions.</p> <p>Enclosure 1 is a site location map; Enclosures 2 and 3 show activities proposed in Upper Lacey Meadow and Lower Lacey Meadow, respectively.</p>
Project Type	Ecological Aquatic / Stream / Habitat Restoration
Project Address or other Locating Information	Webber Lake Road, Sierraville. From Interstate 80 in Truckee, CA travel north on Highway 89 approximately 14 miles; turn left (west) on Jackson Meadows Road (FS 07) and go approximately 8.5 miles; turn left (south) at the sign for Webber Lake; veer right at the first fork and follow signs to Lacey Meadows. From the Lacey Valley Trailhead, Lower Lacey Meadow is about 0.25 miles and Upper Lacey Meadow is about 1.5 miles.

Category	Data
Project Location Latitude/Longitude	39.4654 N, 120.42653W
Hydrologic Unit(s)	Little Truckee River Hydrologic Unit (636)
Total Project Size	17.38 acres
Receiving Water(s) Name	Lacey Creek, Upper Lacey Meadow, Lower Lacey Meadow
Water Body Type(s)	Stream, meadow
Beneficial Uses	<p>The Lahontan Basin Plan does not list specific beneficial uses for Lacey Creek or Lacey Meadows. The beneficial uses for “minor surface waters” of the Little Truckee River Hydrologic Unit are: Municipal and Domestic Supply (MUN), Agriculture (AGR), Ground Water Recharge (GWR), Freshwater replenishment (FRSH), Water Contact Recreation (REC-1), Noncontact Water Recreation (REC-2), Commercial and Sportfishing (COMM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), and Rare, Threatened, or Endangered Species (RARE),</p> <p>The beneficial uses for “minor wetlands” of the Little Truckee River Hydrologic Unit include those listed above along with Preservation of Biological Habitats of Special Significance (BIOL), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and Development (SPWN), Water Quality Enhancement (WQE) and Flood Peak Attenuation / Flood Water Storage (FLD).</p>
Potential Water Quality Impacts	Project construction could result in discharges of sediment to Lacey Creek or its tributaries, or Lacey meadows. Additionally, accidental releases of fuels and lubricants could result in exceedances of the toxicity water quality objective.
Federal Permit(s)	The Applicant has applied for U.S. Army Corps of Engineers (USACE) authorization to proceed under Nationwide Permit 27 pursuant to CWA section 404.

Category	Data
Non-Compensatory Mitigation	<p>The primary Project-related potential water quality impact is discharge of suspended sediment to Lacey Creek and its tributaries during construction. The Applicant proposes Project construction for late summer and fall to take advantage of seasonal low flows in Lacey Creek and dry weather. The Applicant expects to complete each Project phase in one field season. The Project design includes engineered construction entrances, identified access routes, equipment limitation zones, and areas of hand work to protect vegetation and minimize clearing and off-road disturbance.</p> <p>This WQC requires that the Applicant develop and submit two Project plans that describe controls to avoid or reduce direct or indirect impacts to water quality during Project construction. The plans consist of a Stormwater Pollution Prevention Plan (SWPPP), and a Diversion and Dewatering Plan (DDP). A SWPPP addresses pollutants and their sources associated with construction activities. The Project SWPPP will establish best management practices (BMPs) to reduce or eliminate pollutants in stormwater discharges. The SWPPP will describe appropriate construction BMPs for work areas, access routes, staging areas, and fueling and maintenance areas. The SWPPP will include a construction monitoring program to assess SWPPP compliance, and a Rain Event Action Plan (REAP) to describe actions before, during, and after significant precipitation events.</p> <p>The Project DDP will describe how in-stream work areas will be de-watered and how the diverted water will be conveyed around the work areas. The diversion and dewatering of Lacey Creek will allow the Applicant to construct in-stream features in a relatively dry setting to help protect water quality during construction.</p> <p>The Application specifies that construction of new channel and new in-stream features be conducted prior to abandoning the old channel and introducing water to the new channel, so that these elements can be built in a relatively dry setting.</p> <p>This WQC requires the Applicant to develop and submit a water quality monitoring plan to assess potential water quality impacts associated with dewatering and diversion and certain in-stream construction activities.</p> <p>The Applicant submitted a draft restoration plan for construction-related temporary impacts. The Applicant submitted a draft assessment plan to evaluate restoration progress. This WQC requires the Applicant to submit final restoration and restoration assessment plans for Lahontan Water Board staff review.</p>

Category	Data
Compensatory Mitigation	Compensatory mitigation for the temporary impacts associated with Project construction will be the re-establishment of 105 acres of wetland and 8,200 linear feet of stream channel, and the enhancement of another 50 acres of wetland. The Project will improve the COLD, GWR, WILD, RARE, and SPWN, beneficial uses for Upper and Lower Lacey meadows and Lacey Creek. The Project will result in improved hydrology, groundwater storage, vegetation, and habitat diversity. Project-related short-term impacts, such as access routes and staging areas, will be restored to pre-Project conditions in accordance with the Project's restoration plan.
Application Fee and Fee Code	\$551 – Fee Code 85
Fees Received	\$551
Estimated Annual Fee ¹	\$276 (Annual fee assessed each fiscal year or portion of a fiscal year during which discharges occur until the Water Board issues a Notice of Project Completion Letter to the Applicant).
¹ The actual Annual Fee will be calculated using the fee schedule in effect at the time the annual fee is assessed per California Code of Regulations, Title 23, section 2200(a)(3).	

Impacts of Fill and Excavation to Waters of the State

Water-body Type	Temporary Impacts			Permanent Physical Loss of Area			Permanent Degradation of Ecological Conditions		
Units	Acres	Cubic Yards	Linear Feet	Acres	Cubic Yards	Linear Feet	Acres	Cubic Yards	Linear Feet
Lake									
Riparian Zone	1.14	316	1867						
Stream Channel	2.6	4435	5882						
Wetland	1.9	136	4717						

Mitigation for Temporary Impacts

Aquatic Resource Type	Units	Establishment	Re-establishment	Rehabilitation	Enhancement	Preservation
Lake	Acres					
Riparian Zone	Acres					
	Linear Feet					

Stream Channel	Acres		1.88			
	Linear Feet		8200			
Wetland	Acres		105		50	

WATER QUALITY CONTROL PLAN WASTE DISCHARGE PROHIBITIONS

Implementation of the Project will potentially result in temporary construction impacts and discharges of sediment and earthen materials. The Water Board has adopted a Water Quality Control Plan (Basin Plan), which, in Chapter 4.1, specifies the following waste discharge prohibitions. Quoted text from the Basin Plan is noted in open and closed quotes.

1. "The discharge of waste that causes violation of any narrative or numeric water quality objective contained in this Plan is prohibited."

The Water Quality Control Plan for the Lahontan Region (Basin Plan) contains the following water quality objective for turbidity in Section 3, page 3-6:

"Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent."

2. "The discharge, attributable to human activities, of any waste or deleterious material to surface waters of the Truckee River HU or Little Truckee River HU is prohibited."
3. "The discharge or threatened discharge attributable to human activities, of waste to lands within the 100-year floodplain of the Truckee River, Little Truckee River and their tributaries is prohibited."

BASIN PLAN PROHIBITION EXEMPTION CRITERIA AND FINDINGS

For waste earthen materials discharged because of restoration projects, the Basin Plan specifies that the Water Board' Executive Officer may grant exemptions to Basin Plan prohibitions, provided the following specific exemption criteria are satisfied. Exemption criteria are noted using open and closed quotes.

- a. "The project will eliminate, reduce or mitigate existing sources of soil erosion, water pollution, and/or impairment of beneficial uses of water, and..."

The Project aims to restore the natural geomorphic processes and ecological function of Lacey Creek and Upper Lacey and Lower Lacey meadows. Currently Lacey Creek in Lower Lacey meadow is incised and actively eroding, and in Upper Lacey Meadow the creek has been modified and disconnected from its historic flow paths through the meadow. This restoration Project will restore stream channel form, hydrologic functions, and increase the total area of wet meadow habitat.

- b. "There is no feasible alternative to the project that would comply with the Basin Plan prohibitions, and..."

The Project's goal is to restore stream channel and wetland features to reestablish a natural, resilient, and self-sustaining system, with primary Project goal of returning Lacey Creek to Lacey meadows. Therefore, the Project requires in- and near-stream work that could potentially result in discharges of earthen materials that would not comply with Basin Plan prohibitions. To accomplish the Project's goals, there is no reasonable alternative that would avoid or reduce the extent of encroachment in the stream channel and meadow. The Applicant will minimize impacts from construction by limiting access and work season, and by implementing erosion control measures.

- c. "All applicable and practicable control and mitigation measures have been incorporated into the project to minimize land disturbance, soil erosion, discharges of turbid water, and other potential adverse impacts to water quality and beneficial uses to the minimum necessary to complete the project."

Project design includes designated and carefully- selected access routes and the use of best management practices to protect sensitive soils along these access routes. As a condition of this WQC, the Applicant will be required to obtain coverage under the State Water Resources Control Board's National Pollutant Discharge Elimination System Construction Stormwater General Permit (CGP). As part of the CGP process, the Applicant will be required to develop and implement a stormwater pollution prevention plan (SWPPP) for the Project. The SWPPP will include temporary water quality protection measures such as silt barriers around access, staging, and stockpile areas; provisions for covering construction materials in the event of storm events; and designated access routes and equipment limitation areas. The SWPPP will also describe spill contingency measures and best management practices required of the construction contractor to minimize potential construction equipment related discharges. The implementation of the SWPPP will minimize discharges of turbid water during construction and protect water quality and beneficial uses.

Also, as a condition of this WQC, the Applicant will be required to develop a diversion and dewatering plan (DDP) to protect water quality in Lacey Creek construction areas where the creek needs to be locally dewatered for in-stream work. The DDP will describe how the stream will be captured and how the captured water will be routed and discharged downstream of work areas. It will also describe diversion removal and re-introduction of the stream to new or restored channels.

All disturbance associated with Project work will be restored and revegetated. Temporary access routes and staging areas will be restored to meet pre-Project conditions. As a condition of this WQC, the Applicant will be required to submit a final Restoration Plan. Measures may include biotechnical streambank stabilization, wetland plantings and revegetation, vegetation maintenance, post-construction monitoring, and adaptive management.

This WQC requires a final Restoration Assessment Plan prior to starting the Project. This plan will describe monitoring and adaptive management strategies to assess post-construction project stability, identify areas of concern, and develop and implement mitigation measures if necessary.

EXEMPTION GRANTED

As demonstrated above, the Project meets the conditions in the Basin Plan for granting an exemption. The exemption covers the activities required to restore Lacey Creek, and Upper and Lower Lacey meadows as described in the Application. A draft notice of exemption was distributed through an interested-persons mailing list, allowing at least 10 days for comments to be submitted. The comment period ended on March 14, 2021 and no exemption-related comments were received during the comment period.

ALLOWED TURBIDITY INCREASES

This WQC permits short-term increases in turbidity up to 20 NTU above background for installation and decommissioning of in-stream facilities such as coffer dams and dewatering discharge points. This WQC permits short-duration increases in turbidity up to 50 NTU above background for re-wetting of the constructed stream channel.

If turbidity monitoring shows increases in turbidity above allowed levels, the discharger must cease operations or implement corrective actions to reduce Project-related turbidity releases to the levels allowed by this WQC. This WQC requires the Applicant to submit a water quality monitoring plan, prior to each work season to in-part assess compliance with this allowed turbidity increase.

CEQA COMPLIANCE

On January 5, 2021, the Water Board provided notice of intent to adopt the *Lacey Meadows Initial Study/Mitigated Negative Declaration* (MND), State Clearinghouse Number 2021010001. Lahontan Water Board staff received two comments on the IS-MND during a 30-day public comment period. One comment voiced support for the Project. The second comment identified local permitting requirements for certain activities and discussed several issues (e.g. Sierra Historical Society outreach signage suggestions) not applicable to the Project's environmental impact analysis requirements under CEQA. Water Board staff responded to the second comment letter explaining that the WQC requires the Applicant to obtain all necessary permits; and that based on all received comments, further analysis of the Project's environmental impacts is not needed. The Water Board received additional comments outside the CEQA 30-day comment period. The Water Board responded to the additional comments.

Lahontan Water Board staff requested consultation pursuant to AB 52 (Chapter 532, Statutes of 2014) with Native American Tribes. The only tribe registered with the Lahontan Water Board for the Project area is the United Auburn Indian Community of the Auburn Rancheria. On September 16, 2020, Lahontan Water Board sent a letter to the United Auburn Indian Community of the Auburn Rancheria, informing them of the proposed project and inquiring whether the tribe

wished to consult with Lahontan regarding Tribal Cultural Resources. The letter requested a response by October 15, 2020. Lahontan Water Board staff did not receive a response from the United Auburn Indian Community of the Auburn Rancheria.

The MND reflects the Water Board's independent judgement and analysis as Lead Agency pursuant to CEQA. The Water Board's Executive Officer adopts the MND through the issuance of this WQC, determining that the actions analyzed in the MND with mitigation measures will not have a significant effect on the environment. Mitigation monitoring will be required through issuance of this WQC (Enclosure 4, and Additional Condition 2.h). The Water Board will file a Notice of Determination (Enclosure 5) with the State Clearinghouse.

CALIFORNIA ECOATLAS

It has been determined through regional, state, and national studies that tracking of mitigation/restoration projects must be improved to better assess the performance of these projects, following monitoring periods that last several years. In addition, to effectively carry out the State's Wetlands Conservation Policy of no net loss to wetlands, the State needs to closely track both aquatic habitat losses and mitigation/restoration project success. Therefore, the Applicant is required to provide Project information related to impacts and mitigation/restoration measures (see Additional Conditions of this WQC) to EcoAtlas using the [Project Tracker website](http://ptrack.ecoatlas.org) (<http://ptrack.ecoatlas.org>). Instructions and how to request a username and password can also be found at the Project Tracker website.

More information about the Water Board's [Clean Water Act \(CWA\) Section 401](http://www.waterboards.ca.gov/lahtontan/water_issues/programs/clean_water_act_401/index.shtml) requirements can be found at: (http://www.waterboards.ca.gov/lahtontan/water_issues/programs/clean_water_act_401/index.shtml). More information about EcoAtlas can be found at: www.ecoatlas.org.

SECTION 401 WATER QUALITY CERTIFICATION

Authority

CWA section 401 (33 U.S.C §1341) requires that any applicant for a federal license or permit, who plans to conduct any activity that may result in discharge of dredged or fill materials to waters of the U.S., must provide the permitting agency a certification from the state that the discharge will be in compliance with applicable water quality standards of the state in which the discharge will originate. The Applicant submitted a complete application and the fees required for WQC under CWA section 401 for the Project. The Applicant has applied for USACE authorization to proceed under Nationwide Permit No. 27 pursuant to CWA section 404. CCR, title 23, section 3831(e) grants the Water Board Executive Officer the authority to grant or deny WQC for projects in accordance with CWA section 401. The Project qualifies for such WQC.

Standard Conditions

The following standard conditions are requirements of this WQC:

1. This WQC action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Water Code section 13330 and CCR, title 23, section 3867 through section 3869.
2. This WQC action is not intended and must not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license unless the pertinent WQC application was filed pursuant to CCR title 23, section 3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The WQC is conditioned upon total payment of the full fee required under CCR title 23, section 3833, unless otherwise stated in writing by the certifying agency.
4. Neither Project construction activities nor operation of the Project may cause a violation of the *Water Quality Control Plan for the Lahontan Region* (Basin Plan), may cause a condition or threatened condition of pollution or nuisance, or cause any other violation of the California Water Code (CWC) .
5. The Project must be constructed and operated in accordance with that described in the WQC application and supporting documentation that was submitted to the Water Board. Deviation from the Project constitutes a violation of the conditions upon which this WQC was granted. Any significant changes to this Project that would have a significant or material effect on the findings, conclusions, or conditions of this WQC, including Project operation, must be submitted to the Executive Officer for prior review and written approval.
6. This WQC is subject to the acquisition of all local, regional, state, and federal permits and approvals as required by law. Failure to meet any conditions contained herein or any conditions contained in any other permit or approval issued by the state of California or any subdivision thereof may result in the revocation of this WQC and civil or criminal liability.
7. The Water Board may add to or modify the conditions of this WQC as appropriate to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the CWC or section 303 of the CWA, or as appropriate to coordinate the operations of this Project with other projects where coordination of operations is reasonably necessary to achieve water quality standards or protect the beneficial uses of water. Notwithstanding any more specific conditions in this WQC, the Project must be constructed and operated in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to the CWC or section 303 of the CWA.
8. This WQC does not authorize any act which results in the taking of a threatened or endangered species or any act which is now prohibited, or becomes prohibited in the future, under the California Endangered Species Act (Fish and Game Code sections 2050, et seq.) or the federal Endangered Species Act (16 USC sections 1531, et seq.). If a "take" will result from any act authorized under this WQC, the Applicant

must obtain authorization for the take prior to construction or operation of the Project. The Applicant is responsible for meeting all applicable requirements of the Endangered Species Act for the Project authorized under this WQC.

Additional Conditions

Pursuant to CCR title 23, the following additional conditions are requirements of this WQC:

1. Within thirty (30) days from the date of issuance of this Order for WQC, the Applicant is required to upload Project information (all information fields required by EcoAtlas), including a Project map (either using upload or draw polygon features) to the following website: <http://ptrack.ecoatlas.org/>. Amendments to and monitoring reports associated with the Project must be updated on EcoAtlas (using the "Files and Links" tab under "Projects" in EcoAtlas) in addition to any other reporting required as part of this WQC.
2. Reporting Requirements
 - a) No later than May 1, 2022 and at least 30 days prior to any construction activities, the Applicant shall provide the following for Water Board staff review and acceptance:
 - i. Final design plans with a written summary of material changes relative to the 65% percent design plans submitted with the complete application for this WQC.
 - ii. Proof of USACE verification of wetland delineation report.
 - b) By November 1, 2021, the Applicant shall submit a Restoration Plan for Water Board staff review and acceptance. The Restoration Plan shall describe the design, implementation, assessment, and maintenance for restoring temporary impacts to pre-Project conditions.
 - c) By November 1, 2021, the Applicant shall submit a Restoration Assessment Plan for Water Board staff review and acceptance. The Restoration Assessment Plan shall describe Project objectives consistent with the Application, performance standards to assess attainment of objectives, protocols for condition assessment, and assessment schedule. Given that environmental restoration objectives may take a decade or longer to be achieved, please recommend interim conditions to support the Project's WQC termination and describe how these conditions will demonstrate long-term protection of water quality and beneficial uses, and be assessed by the monitoring program.
 - d) The Applicant shall submit a water quality monitoring and reporting plan at least two weeks prior to the start of each construction season, for Water Board staff review and acceptance. At a minimum, the work plan shall

describe upstream and downstream turbidity monitoring. The plan can be combined with the DDP (see Additional Condition 2.f).

- e) The Applicant shall submit a SWPPP that meets the requirements of the State Water Boards' NPDES General Construction Stormwater Permit by May 1 of the first year of construction, for Water Board staff review and acceptance. The SWPPP may be modified for subsequent years operations to only address relevant Project elements and exclude completed Project elements. Modified SWPPPs shall be submitted by May 1 of each construction season for Water Board staff review and acceptance.
- f) The Applicant shall submit a DDP at least two weeks prior to the start of each construction season that includes diversion and dewatering activities, for Water Board staff review and acceptance. The DDP shall include descriptions of the installation and decommissioning sequences of the diversion system components, how accumulated water in the work areas (groundwater seepage, stormwater or leakage through diversion structures) will be accommodated, energy dissipation and sediment control structure at the diversion discharge point, and consideration of potential backwater effects upstream of the diversion and upstream of the discharge point.
- g) The Applicant shall submit a written Project update by September 15 of each construction season verifying that work is on schedule as detailed in that season's work plan schedule. If the Project is not on schedule, a contingency plan should be submitted for Water Board staff review and acceptance. The contingency plan could include a schedule of actions to complete the Project phase or describe how the Project will be stabilized for the winter.
- h) The Applicant shall submit a construction report by January 31 of each year following construction activities for Water Board staff review; the anticipated dues dates are January 31, 2023 for Phase 1 and January 31, 2024 for phase 2. The construction report shall describe the prior season's activities. Please include as-built plans and a summary of any activities that deviated from those described in the work plan for the relevant Project phase. The construction reports shall include results of mitigation monitoring (Enclosure 4) and describe activities and monitoring results from implementation of the accepted Restoration Plan (item 2.b, above) where appropriate.
- i) The Applicant shall submit the results of an effectiveness monitoring survey by August 15 of the year following the start of construction and annually thereafter until Project completion for Water Board staff review. Effectiveness monitoring is a visual assessment of the Project to assess the effectiveness of the Project in preventing sediment discharge and protecting water quality over the winter, and to identify sediment delivery locations that may have developed during the winter. Effectiveness monitoring shall be conducted after peak spring runoff or by July 15. If sediment discharge or water quality concerns are identified, they should be clearly described in the survey results,

and the survey results shall include a plan and timeline to address the discharge or concerns.

- j) The Applicant shall submit an annual monitoring report by January 31 following the first growing season after Project implementation and annually thereafter until Project completion. The report shall include monitoring results consistent with the Water Board staff-accepted Restoration and Restoration Assessment plans (see items 2.b and 2.c above) and describe progress toward meeting desired conditions. This report can be combined with the construction report.
 - k) Within one year of Project implementation being complete and Project monitoring results indicating successful restoration, the Applicant shall submit a Project Completion Report (PCR). The PCR shall summarize the Project objectives and WQC completion goals, construction details, monitoring results, and shall appropriately reference previously submitted reports. The PCR shall certify that pertinent reports have been uploaded to EcoAtlas.org as outlined in Additional Condition 1.
- 3. This WQC does not authorize emergency repair activities. The Applicant is required to apply for separate authorization to perform emergency repairs should that be necessary.
 - 4. Construction equipment vehicles and equipment must be monitored for leaks, and proper BMPs must be implemented should leaks be detected, or the vehicles/equipment must be removed from service, if necessary, to protect water quality.
 - 5. Debris, cement, concrete (or wash water therefrom), oil or other petroleum products (e.g. asphalt grindings) must not be allowed to enter or be placed where they may be washed from the Project site by rainfall or runoff into waters of the state. When operations are completed, any excess material must be removed from Project work areas and any areas adjacent to the work area where such material may be transported into waters of the state.
 - 6. The Applicant must immediately notify Water Board staff by email and telephone whenever an adverse condition occurs as a result of this discharge. Such a condition includes, but is not limited to, a violation of the conditions of this WQC, a significant spill of petroleum products or toxic chemicals, or damage to control facilities that would cause noncompliance. A written notification of the adverse condition must be provided to the Water Board within two weeks of occurrence. The written notification must identify the adverse condition, describe the actions completed or necessary to remedy the condition, and specify a timetable, subject to any modifications by Water Board staff, for the remedial actions, if not already accomplished.
 - 7. An "Annual Fee" will be assessed each year this WQC remains in "Active" status. The actual Annual Fee will be calculated using the fee schedule in

effect at the time the annual fee is assessed per California Code of Regulations, title 23, section 2200(a)(3). The Annual Fee will apply each fiscal year or portion of fiscal year until the Applicant submits a Project Completion Report (see Additional Condition No. X above) and Water Board staff issues a Notice of Project Complete Letter to the Applicant.

8. An emergency spill kit must always be at the Project site during the Project.
9. The Applicant must permit Water Board staff or its authorized representative upon presentation of credentials:
 - i. Entry onto Project premises, including all areas on which wetland fill or wetland mitigation is located or in which records are kept.
 - ii. Access to copy any record required to be kept under the terms and conditions of this WQC.
 - iii. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this WQC.
 - iv. Sampling of any discharge or surface water covered by this WQC.
10. The Applicant must prevent the introduction or spread of noxious/invasive organisms within the Project and staging areas. The control measures may include the treatment of onsite infestations, the cleaning of all equipment and gear that has been in an infested site, the use of weed-free erosion control materials (including straw), and the use of weed-free seeds and plant material for revegetation of disturbed areas.
11. The Applicant must maintain at the Project site a copy of this WQC and a copy of the complete WQC application provided to the Water Board to be available at all times to site operating personnel and agencies.
12. The Applicant is responsible for informing any contractors of the specific conditions contained in this WQC.

Enforcement

In the event of any violation or threatened violation of the conditions of this WQC, the violation or threatened violation must be subject to any remedies, penalties, process or sanctions as provided for under state law. For purposes of CWA section 401(d), the applicability of any state law authorizing remedies, penalties, process or sanctions for the violation or threatened violation constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this WQC.

In response to a suspected violation of any condition of this WQC, the State Water Board or the Water Board may require the holder of any permit or license subject to this WQC to furnish, under penalty of perjury, any technical or monitoring report the State Water Board or Water Board deems appropriate, provided that the burden, including

costs, of the reports must be a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

In response to any violation of the conditions of this WQC, the Water Board may add to or modify the conditions of this WQC as appropriate to ensure compliance.

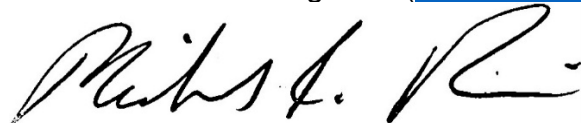
Section 401 Water Quality Certification Requirements Granted

I hereby issue this WQC certifying that any discharge from the referenced Project will comply with the applicable provisions of CWA sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards), and with other applicable requirements of state law. This discharge is also regulated under State Water Board Order No. 2003-0017-DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification" which requires compliance with all conditions of this WQC. A copy of State Water Board Order No. 2003-0017-DWQ is enclosed for your reference (Enclosure 6).

Except insofar as may be modified by any preceding conditions, all WQC actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with the Applicant's Project description and the terms specified in this WQC, and (b) compliance with all applicable requirements of the Basin Plan.

Electronic document submittal is required. Please send all future correspondence regarding this Project to the Water Board's email address at lahontan@waterboards.ca.gov and include your WDID No. and Project/Facility Name in the subject line.

We look forward to working with you in your efforts to protect water quality. If you have any questions regarding this matter, please contact Tom Gavigan, Engineering Geologist, (tom.gavigan@waterboards.ca.gov) or Doug Cushman, Senior Water Resource Control Engineer (douglas.cushman@waterboards.ca.gov).

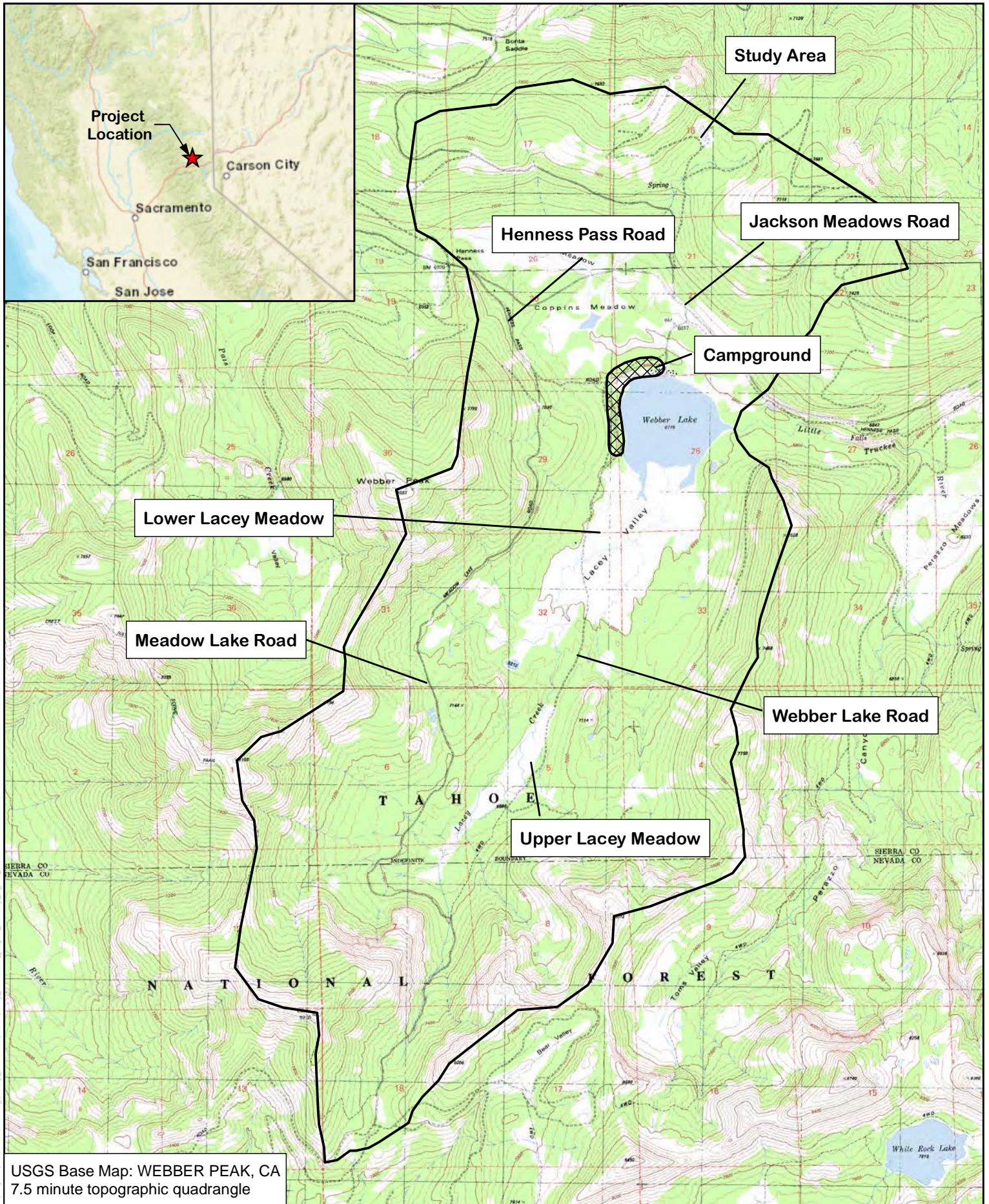


MICHAEL R. PLAZIAK, PG
EXECUTIVE OFFICER

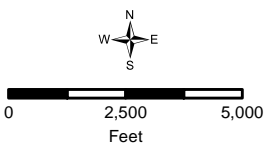
Enclosures: (1) Site Plan
(2) Upper Lacey Meadow Activities Map
(3) Lower Lacey Meadow Activities Map
(4) Mitigation Monitoring and Reporting Program
(5) CEQA Notice of Determination
(6) SWRCB Order No. 2003-0017-DWQ

cc list: See Next Page

cc: Gene Whitehouse, UAIC of the Auburn Rancheria
Sarah West, USACE
Amy Kennedy, CDFW
Joe Morgan, USEPA
Sam Ziegler, USEPA
Jonathan Fisher, Tahoe National Forest
Quentin Youngblood, Tahoe National Forest
John Svahn, Truckee Donner Land Trust
Tim Beals, Sierra County
Brandon Pangman, Sierra County
Darrel Cruz, Washoe Tribe of Nevada and California
Adriana Renteria, State Water Board Tribal Liaison
Moises Moreno-Rivera, State Water Board Assistant Tribal Liaison
Elizabeth Beryt, State Water Board Office of Chief Counsel
Elizabeth Payne, Division of Water Quality
Sierra Valley Resource Conservation District
Doug Cushman, Lahontan Water Board
Tom Gavigan, Lahontan Water Board

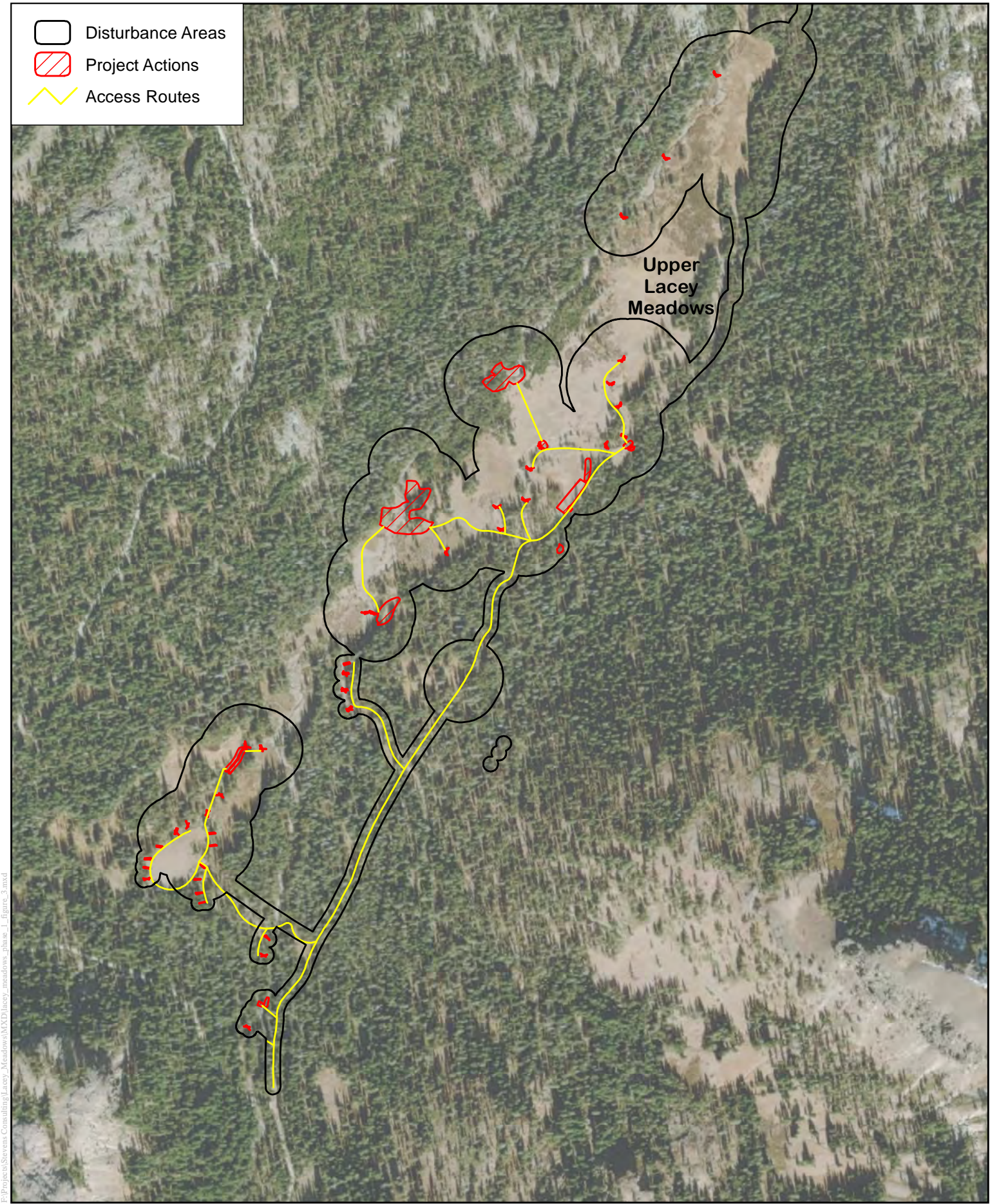





Source Data: USGS (2020)
Map Date: 12/22/2020



ENCLOSURE 1

Lacey Meadows Restoration Project - Project Vicinity
Sierra & Nevada County, CA

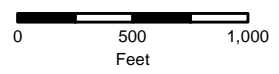


-  Disturbance Areas
-  Project Actions
-  Access Routes

Upper
Lacey
Meadows

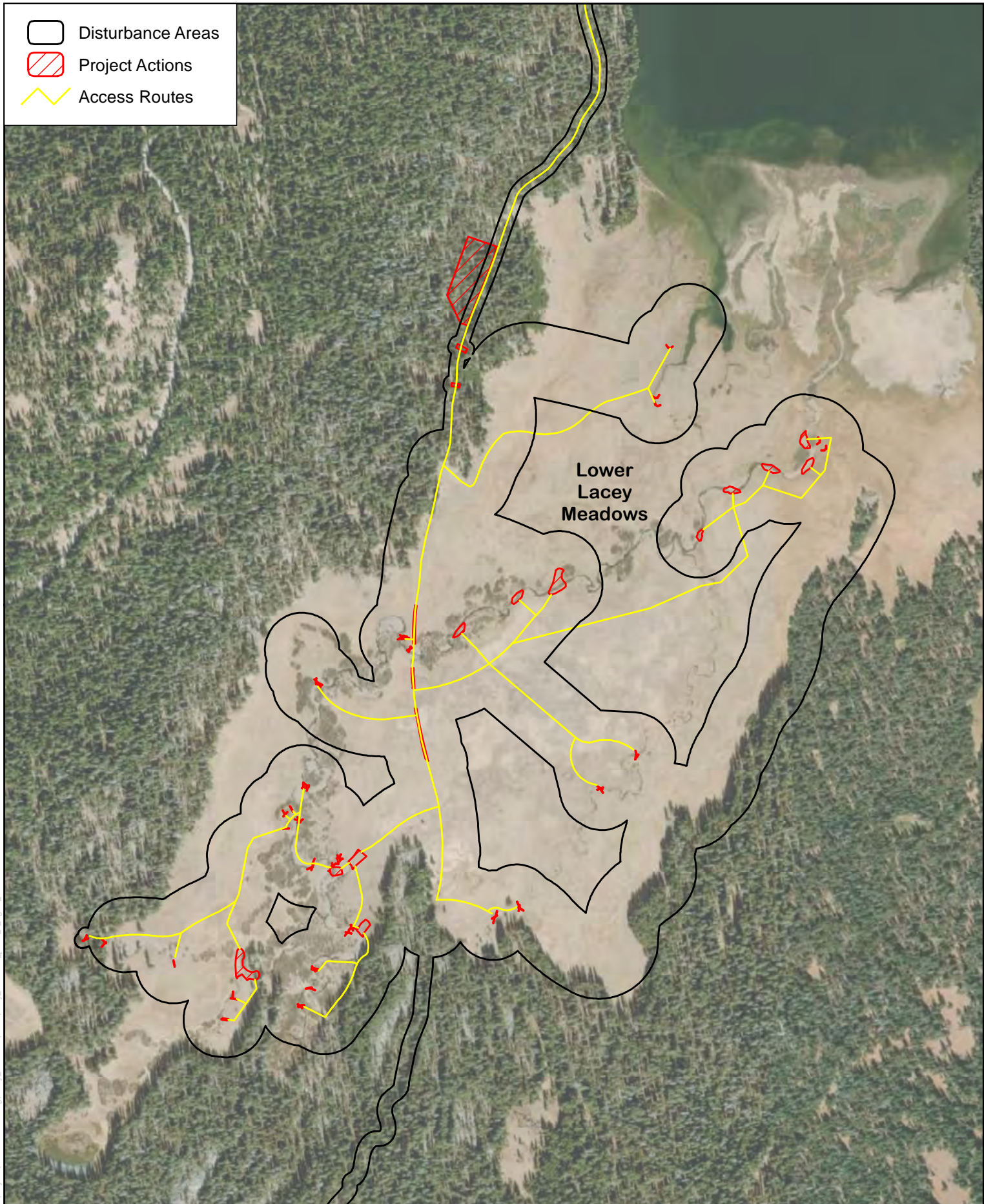
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Map Date: 10/29/2020 Aerial
Source Data: ESRI 2019



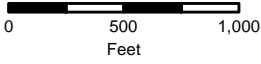
ENCLOSURE 2
Lacey Meadows Restoration Project
Upper Lacey Meadow

Sierra & Nevada County, CA



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Map Date: 10/29/2020 Aerial
Source Data: ESRI 2019



ENCLOSURE 3
Lacey Meadows Restoration Project
Lower Lacey Meadow

Sierra & Nevada County, CA

ENCLOSURE 4
Lacey Meadows Restoration Project
Mitigation Monitoring and Reporting Program

Mitigation Title	Mitigation Measure Description	Timing	Monitoring and/or Reporting	Documentation	Success Standard	Date Completed
AQ-1	Construction Equipment Must Meet CARB Emission Standards	Prior to construction	Ensure that the proposed project complies with California Air Resources Board (CARB) emissions standards for diesel construction equipment	Contractor submits list of equipment to TRWC	CARB standards met	
AQ-2	Dust and Emissions Control Plan approved by Northern Sierra Air Quality Management District (NSAQMD)	Prior to construction	Dust control plan followed during construction	NSAQMD plan approval (typically via e-mail)	Dust control plan approved, standards met during construction	
BIO-1	Provide worker environmental awareness training – biological resources	Start of construction	Record attendance at training	Sign-in sheet	Training completed prior to construction	
BIO-2	Collect and remove refuse, ensure onsite disposal containers are wildlife/bear proof	During construction	Daily site inspection	Document in SWPPP weekly inspection reports	Refuse is properly disposed of	
BIO-3	Minimize vegetation disturbance	During construction	Monitor construction activities to ensure disturbance is confined to minimum necessary	Photo-documentation of construction limits	Vegetation disturbance is minimized	
BIO-4	Revegetate areas of ground disturbance	Post-construction	Ensure disturbed areas temporarily stabilized and	Photo-documentation	Disturbed areas restored to pre-existing conditions	

			<p>revegetation plan followed for long-term stability</p> <p>of site stabilization</p> <p>Construction as-builts</p> <p>Annual permit reports to Lahontan</p>	within five years after restoration	
BIO-5	Inspect and clean construction equipment	During construction	<p>Ensure construction equipment is inspected when mobilized to site. Equipment must be cleaned prior to mobilization to the project site to prevent spread of weeds.</p>	<p>Photo-documentation of equipment after mobilization</p>	<p>Equipment mobilized to site is clean</p>
BIO-6	Observe Special-Status Wildlife work windows (see IS/MND for details)	Prior to construction	<p>Time construction to avoid sensitive periods, if not feasible, then follow BIO-7 and BIO-8</p>	<p>Construction schedule</p>	<p>Document construction timing</p>
BIO-7	Conduct special-status wildlife pre-construction surveys if construction activities overlap with special-status species sensitive timing (see IS/MND for details)	Prior to construction	<p>Ensure surveys are completed for appropriate species if construction activities overlap with sensitive time periods</p>	<p>Memo report submitted by consultant to TRWC</p>	<p>Document survey results</p>
BIO-8	Establish and observe special-status wildlife avoidance buffers, if sensitive species are found during surveys. Buffer size is species specific and will be determined by a	Prior to and during construction	<p>If sensitive species are found in the project area, ensure buffers are clearly marked and observed during construction</p>	<p>Confirmation from appropriate agency on buffer size</p>	<p>Document buffer locations</p>

	qualified biologist in coordination with CDFW, USFWS, and/or USFS.			Photo-documentation of buffers		
BIO-9	Conduct surveys for special status plants	Prior to construction	Ensure special status plant surveys are completed for the disturbance area	Memo report submitted by consultant to TRWC	Document survey results	
BIO-10	Avoid special-status plant species, or develop protection and implementation plan if impacts are unavoidable	Prior to construction	Ensure plants are avoided, if not feasible then ensure protection plan followed	Avoidance or mitigation plan Photo-documentation of mitigation measures	Document avoidance and protection activities successfully completed	
BIO-11	Obtain all required environmental permits	Prior to construction	Obtain permits and keep copies of permits on-site during construction	Issued permits	Meet permit requirements during construction	
BIO-12	Relocate native fishes from areas to be dewatered	Prior to construction	Ensure fish are captured and relocated by a qualified biologist, document number and species of fish moved, and relocation sites	Fish relocation memo report	Fish are relocated without mortality or injury.	
CUL-1	Provide cultural resource sensitivity training	Prior to construction	Record attendance at training	Sign-in sheet	Training completed prior to construction	
CUL-2	Erect fencing around known cultural resource sites	Prior to and during construction	Ensure protective fencing is erected prior to construction and maintained during construction	Photo-documentation of fencing	Impacts to cultural sites are avoided	
CUL-3	Inadvertent discovery of historic or archaeological resources during construction	During construction	Halt work until resource can be evaluated by project archaeologist, and	Memo report submitted by project	Impacts to newly discovered cultural sites are avoided or mitigated	

			mitigation plan developed. Report finding to LRWQCB	archaeologist to TRWC		
CUL-4	Discovery of human remains	During construction	Halt work and reporting finding to county coroner. If remains determined to be Native America, coroner will contact the NAHC	Memo report submitted by project archaeologist to TRWC	Human remains reported to county coroner	
GEO-1	Obtain coverage under and comply with the Construction General Permit and obtain Clean Water Act Section 401 Water Quality Certification	Prior to and during construction	Ensure permit conditions are met during construction, complete annual reporting as required by permits	Issued permits	Avoid impacts to water quality by following permit conditions	
HAZ-1	Prepare and follow spill plans, spill notification, and spill containment procedures	Prior to and during construction	Ensure contractor prepares safety plan for all products and chemicals and submits to TRWC prior to construction, ensure plan is followed during construction	Spill plan submitted by contractor to TRWC	Spills are avoided, or if they occur properly reported and contained to prevent water quality impacts	
HAZ-2	Follow proper procedures for fueling construction equipment	During construction	Ensure fueling takes place off site or in areas away from sensitive habitat. Inspect equipment for leaks.	Weekly SWPPP inspection reports	Water quality impacts from fueling are avoided	
HAZ-3	Proper disposal of chemical waste	During construction	Ensure chemical waste is properly collected and disposed of, following state and federal guidelines	Weekly SWPPP inspection reports	Water quality impacts from chemical waste are avoided	

HAZ-4	Proper remediation of contaminated soil	During construction	Ensure that any contaminated soil/groundwater is encountered during or caused by construction, develop remediation plan in conjunction with qualified professional and appropriate agencies	Remediation plan developed by consultant and submitted to TRWC	Contaminated soil/groundwater appropriately treated	
NSE-1	Limit noise impacts from construction by limiting construction hours to 7:00 AM – 7:00 PM on weekdays for Phase II construction (Lower meadow), coordinate with landowner if further restrictions needed to avoid impacts to campground	During construction	Ensure that construction hour limitations are followed	Construction schedule submitted by contractor to TRWC and approved by TDLT	Noise impacts to campground avoided	
WF-1	Fire suppression and control measures implemented to reduce risk of wildfire	Prior to and during construction	Ensure fire prevention plan followed	Fire prevention plan submitted by contractor to TRWC	Wildfire is avoided	

ENCLOSURE 5

Notice of Determination

Appendix D

To:

☐ Office of Planning and Research
U.S. Mail: *Street Address:*
 P.O. Box 3044 1400 Tenth St., Rm 113
 Sacramento, CA 95812-3044 Sacramento, CA 95814

☐ County Clerk

County of: _____
 Address: _____

From:

Public Agency: _____
 Address: _____

Contact: _____

Phone: _____

Lead Agency (if different from above): _____

Address: _____

Contact: _____

Phone: _____

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): _____

Project Title: _____

Project Applicant: _____

Project Location (include county): _____, Sierra and Nevada Counties

Project Description: _____

This is to advise that the _____ has approved the above
 (☐ Lead Agency or ☐ Responsible Agency)

described project on April 9, 2021 and has made the following determinations regarding the above
 (date)
 described project.

1. The project [☐ will ☐ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☐ were ☐ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☐ was ☐ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☐ was not] adopted for this project.
6. Findings [☐ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:

Signature (Public Agency): Michael Plaziak Title: _____

Date: _____ Date Received for filing at OPR: _____

ENCLOSURE 6

STATE WATER RESOURCES CONTROL BOARD

WATER QUALITY ORDER NO. 2003 - 0017 - DWQ

STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR DREDGED OR FILL DISCHARGES THAT HAVE RECEIVED STATE WATER QUALITY CERTIFICATION (GENERAL WDRs)

The State Water Resources Control Board (SWRCB) finds that:

1. Discharges eligible for coverage under these General WDRs are discharges of dredged or fill material that have received State Water Quality Certification (Certification) pursuant to federal Clean Water Act (CWA) section 401.
2. Discharges of dredged or fill material are commonly associated with port development, stream channelization, utility crossing land development, transportation water resource, and flood control projects. Other activities, such as land clearing, may also involve discharges of dredged or fill materials (e.g., soil) into waters of the United States.
3. CWA section 404 establishes a permit program under which the U.S. Army Corps of Engineers (ACOE) regulates the discharge of dredged or fill material into waters of the United States.
4. CWA section 401 requires every applicant for a federal permit or license for an activity that may result in a discharge of pollutants to a water of the United States (including permits under section 404) to obtain Certification that the proposed activity will comply with State water quality standards. In California, Certifications are issued by the Regional Water Quality Control Boards (RWQCB) or for multi-Region discharges, the SWRCB, in accordance with the requirements of California Code of Regulations (CCR) section 3830 et seq. The SWRCB's water quality regulations do not authorize the SWRCB or RWQCBs to waive certification, and therefore, these General WDRs do not apply to any discharge authorized by federal license or permit that was issued based on a determination by the issuing agency that certification has been waived. Certifications are issued by the RWQCB or SWRCB before the ACOE may issue CWA section 404 permits. Any conditions set forth in a Certification become conditions of the federal permit or license if and when it is ultimately issued.
5. Article 4, of Chapter 4 of Division 7 of the California Water Code (CWC), commencing with section 13260(a), requires that any person discharging or proposing to discharge waste, other than to a community sewer system, that could affect the quality of the waters of the State,¹ file a report of waste discharge (ROWD). Pursuant to Article 4, the RWQCBs are required to prescribe waste discharge requirements (WDRs) for any proposed or existing discharge unless WDRs are waived pursuant to CWC section 13269. These General WDRs fulfill the requirements of Article 4 for proposed dredge or fill discharges to waters of the United States that are regulated under the State's CWA section 401 authority.

¹ "Waters of the State" as defined in CWC Section 13050(e)

6. These General WDRs require compliance with all conditions of Certification orders to ensure that water quality standards are met.
7. The U.S. Supreme Court decision of *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (the SWANCC decision) called into question the extent to which certain “isolated” waters are subject to federal jurisdiction. The SWRCB believes that a Certification is a valid and enforceable order of the SWRCB or RWQCBs irrespective of whether the water body in question is subsequently determined not to be federally jurisdictional. Nonetheless, it is the intent of the SWRCB that all Certification conditions be incorporated into these General WDRs and enforceable hereunder even if the federal permit is subsequently deemed invalid because the water is not deemed subject to federal jurisdiction.
8. The beneficial uses for the waters of the State include, but are not limited to, domestic and municipal supply, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish, wildlife, and other aquatic resources.
9. Projects covered by these General WDRs shall be assessed a fee pursuant to Title 23, CCR section 3833.
10. These General WDRs are exempt from the California Environmental Quality Act (CEQA) because (a) they are not a “project” within the meaning of CEQA, since a “project” results in a direct or indirect physical change in the environment (Title 14, CCR section 15378); and (b) the term “project” does not mean each separate governmental approval (Title 14, CCR section 15378(c)). These WDRs do not authorize any specific project. They recognize that dredge and fill discharges that need a federal license or permit must be regulated under CWA section 401 Certification, pursuant to CWA section 401 and Title 23, CCR section 3855, et seq. Certification and issuance of waste discharge requirements are overlapping regulatory processes, which are both administered by the SWRCB and RWQCBs. Each project subject to Certification requires independent compliance with CEQA and is regulated through the Certification process in the context of its specific characteristics. Any effects on the environment will therefore be as a result of the certification process, not from these General WDRs. (Title 14, CCR section 15061(b)(3)).
11. Potential dischargers and other known interested parties have been notified of the intent to adopt these General WDRs by public hearing notice.
12. All comments pertaining to the proposed discharges have been heard and considered at the November 4, 2003 SWRCB Workshop Session.
13. The RWQCBs retain discretion to impose individual or general WDRs or waivers of WDRs in lieu of these General WDRs whenever they deem it appropriate. Furthermore, these General WDRs are not intended to supersede any existing WDRs or waivers of WDRs issued by a RWQCB.

IT IS HEREBY ORDERED that WDRs are issued to all persons proposing to discharge dredged or fill material to waters of the United States where such discharge is also subject to the water quality certification requirements of CWA section 401 of the federal Clean Water Act (Title 33 United States Code section 1341), and such certification has been issued by the applicable RWQCB or the SWRCB, unless the applicable RWQCB notifies the applicant that its discharge will be regulated through WDRs or waivers of WDRs issued by the RWQCB. In order to meet the provisions contained in Division 7 of CWC and regulations adopted thereunder, dischargers shall comply with the following:

1. Dischargers shall implement all the terms and conditions of the applicable CWA section 401 Certification issued for the discharge. This provision shall apply irrespective of whether the federal license or permit for which the Certification was obtained is subsequently deemed invalid because the water body subject to the discharge has been deemed outside of federal jurisdiction.
2. Dischargers are prohibited from discharging dredged or fill material to waters of the United States without first obtaining Certification from the applicable RWQCB or SWRCB.

CERTIFICATION


The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on November 19, 2003.

AYE: Arthur G. Baggett, Jr.
 Peter S. Silva
 Richard Katz
 Gary M. Carlton
 Nancy H. Sutley

NO: None.

ABSENT: None.

ABSTAIN: None.


Debbie Irvin
Clerk to the Board

STORMWATER POLLUTION PREVENTION PLAN

for

Lower Lacey Meadow Restoration Project

Risk Level II

September 2023

Legally Responsible Person (LRP):

Truckee River Watershed Council
10418 Donner Pass Road, #B
Truckee, California 96162
Lisa Wallace
530.550.8760

Prepared for:

Beth Christman
Truckee River Watershed Council
PO Box 8568
Truckee, California 96162

Project Location:

Latitude: 39° 27' 17" N, Longitude: 120° 25' 52" W
Off Webber Lake Road, 0.9 miles northwest from the intersection of Meadow Lake Road and Webber Lake Road.

SWPPP Prepared by:

Balance Hydrologics, Inc
12020 Donner Pass Road, Suite B1
Truckee, California 96161
Benjamin Trustman

Estimated Project Dates:

Start of Construction – August 2024
End of Construction – October 2024

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QUALIFIED SWPPP DEVELOPER

Project Name: Lower Lacey Meadow Restoration Project

"This Stormwater Pollution Prevention Plan and Appendices were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Orders No. 2009-009-DWQ as amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

Qualified SWPPP Developer/Practitioner (QSD/QSP)

Benjamin Trustman, CPSWQ, QSD/QSP
Balance Hydrologics, Inc.
12020 Donner Pass Road, Unit B1
Truckee, California, 96161

Signature: _____

Date: 7/7/22

QSD Certification #: 27783

LEGALLY RESPONSIBLE PERSON

Project Name: Lower Lacey Meadow Restoration Project

"I certify under penalty of law that this document and all Attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations."

Legally Responsible Person (LRP)

Lisa Wallace
Truckee River Watershed Council
PO Box 8568
Truckee, California 96162

Signature: _____

Date: _____

AMENDMENTS

Amendment and Revision Instructions

All amendments to the SWPPP shall be prepared and certified by the QSD, uploaded to SMARTS, and distributed to SWPPP recipients within 30 calendar days.

SWPPP recipients shall insert new or amended SWPPP content and the updated SWPPP Amendment Log of the SWPPP. Additionally, the recipient shall insert the Amendment Notification Card (below) into the appropriate section of the SWPPP to identify that it has been amended and notify the reader that the section has been amended.

<p style="text-align: center;"><u>Amendment Notification</u></p> <p style="text-align: center;"><i>This section of the SWPPP has been amended.</i></p> <p style="text-align: center;"><i>Please refer to Attachment A for amended SWPPP content.</i></p>
<p>Section Amended:</p> <p>Amendment Date:</p> <p>Amendment Number:</p> <p>Approved by (QSD):</p> <p>Description:</p>

Amendment Log

Project Name: Lower Lacey Meadow Restoration Project

WDID:

Amendment Number	Date	SWPPP Section Amended	Amendment Description	Prepared By:

ACRONYMS

BMP	Best Management Practice
COC	Chain of Custody
CSMP	Construction Site Monitoring Program
DSA	Disturbed Soil Area
Engr	Engineering
NOI	Notice of Intent
NONC	Notice of Noncompliance
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PRD	Permit Registration Documents
QA/QC	Quality Assurance / Quality Control
QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Practitioner
REAP	Rain Event Action Plan
RUSLE	Revised Universal Soil Loss Equation
RWQCB	Regional Water Quality Control Board
SMARTS	Stormwater Multiple Application and Report Tracking System
SR	State Route
SWRCB	California State Water Resources Control Board
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Daily Maximum Load
TNF	Tahoe National Forest
USFS	United States Forest Service
WDID	Waste Discharge Identification

1 SWPPP REQUIREMENTS

1.1 Introduction

Lacey Creek is a headwater stream that drains a 9.3 square mile area upstream of Webber Lake in the Webber Lake watershed on the east side of the Sierra Nevada crest and is the hydrologic support for Upper and Lower Lacey Meadows. The watershed ranges between 8,336 feet elevation and 6,785 feet elevation at Webber Lake. Lacey Creek is a tributary to the Little Truckee River and the Truckee River. The Project includes approximately 3.5 miles of Lacey Creek through both the Upper and Lower Lacey Meadows.

Lower Lacey Meadows is alluvium derived from glacial and fluvial erosion and deposition. Lacey Creek appears to have undergone period(s) of incision, as evidenced by relatively low width/depth ratios, exposed roots along banks, and absence of overbank flows. The Project developer is the Truckee River Watershed Council (TRWC). The Project work areas on the Site Map are in **Appendix A**.

This Stormwater Pollution Prevention Plan (SWPPP) complies with California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit) Order No. 2009-0009-DWQ issued by the State Water Resources Control Board (State Water Board). Therefore, following the General Permit, Section XIV, this SWPPP is designed to:

- Address pollutants and their sources, including sources of sediment-associated with construction, construction site erosion, and other activities associated with construction activity;
- Eliminate, control, or treat all stormwater discharges, where not otherwise required under a Regional Water Quality Control Board (Regional Water Board) permit;
- Establish site BMPs that are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard;
- Provide accurate calculations and complete design details, as well as BMP, controls for site run-on;

- Describe stabilization BMPs to reduce or eliminate pollutants after construction is completed; and
- Identify all effluent discharge locations, sampling and analysis strategy and protocols, and a sampling schedule for discharges from the identified discharge locations.

1.2 Permit Registration Documents

Required Permit Registration Documents (PRDs) shall be submitted to the State Water Board via the Stormwater Multi-Application and Report Tracking System (SMARTS) by the Legally Responsible Person (LRP) or authorized personnel (i.e., Approved Signatory) under the direction of the LRP. The project-specific PRDs include:

- Notice of Intent (NOI);
- Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination);
- Site Map;
- Annual Fee;
- Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal); and
- SWPPP.

Site Maps can be found in **Appendix A** and Engineering Plans in **Appendix B**. In addition, a copy of the submitted PRDs shall be in **Appendix C**, along with the confirmation of the Waste Discharge Identification (WDID).

1.3 SWPPP Availability and Implementation

The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal Inspector. When a crew member retains the original SWPPP in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be with the field crew, and the original SWPPP shall be made available via a request by radio/telephone. (CGP Section XIV.C)

The SWPPP shall be implemented concurrently with the start of ground-disturbing activities.

1.4 Reporting

1.4.1 SWPPP AMENDMENTS

This SWPPP will be amended whenever there is a change in construction site conditions or SWPPP implementation protocols that may affect the discharge of pollutants to surface waters, groundwater, or a municipal storm drain system. This SWPPP will be maintained to reflect the actual site conditions for the duration of the Project, including keeping disturbed soil area (DSA) maps current as the Project progresses, changes to Project schedule or risk level, or when deemed necessary by the QSD.

Changes in BMP implementation features or activities shall be documented and included as amendments to the SWPPP. An amendment log will be maintained in **Appendix D** that summarizes all changes to the SWPPP for the duration of the Project.

The following items shall be included in each amendment:

- Who requested the amendment;
- The location of the proposed change;
- The reason for the change;
- The original BMP proposed, if any; and
- The new BMP was proposed.

The QSD has determined that the changes listed in

Table 1-1 can be field-determined by the QSP. The QSD shall make all other changes as formal amendments to the SWPPP.

Table 1-1 List of Changes to be Field Determined

Candidate changes for field location or determination by QSP⁽¹⁾
Increase the quantity of an Erosion or Sediment Control Measure
Relocate/Add stockpiles or stored materials
Relocate the water storage and water transfer location
Changes to access points (entrance/exits)
Change the type of Erosion or Sediment Control Measures
Changes to the location of erosion or sediment controls
Minor changes to the schedule or phases
Changes in construction materials
<i>(1) Any field changes not identified for field location or field determination by QSP must be approved by QSD</i>

1.4.2 RETENTION OF RECORDS

This SWPPP and any amendments will be kept on-site during construction and made available upon request of a representative of the Regional Water Board or any local stormwater management agency which receives the stormwater discharge. This SWPPP will also be posted on SMARTS for access by the general public. This SWPPP and supporting documents shall be retained for a minimum of three years.

1.4.3 REQUIRED NON-COMPLIANCE REPORTING

If a General Permit discharge violation occurs, the QSP shall immediately notify the LRP. The LRP shall include information on the violation with the Annual Report. Corrective measures will be implemented immediately following identification of the discharge or written notice of non-compliance from the Regional Water Board. Discharges and corrective actions must be documented and include the following items:

- The date, time, location, nature of the operation, and type of unauthorized discharge.
- The cause or nature of the notice or order.

- The control measures (BMPs) are deployed before the discharge event or before receiving notice or order.
- The date of deployment and type of control measures (BMPs) deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence.

Reporting requirements for Numeric Action Levels (NALs) exceedances are discussed in **Section 7.7.2**.

1.4.4 ANNUAL REPORT

The General Permit requires that permittees prepare, certify, and electronically submit an Annual Report no later than September 1st of each year. Reporting requirements are identified in Section XVI of the General Permit. Annual reports will be filed in SMARTS and accordance with the information required by the online forms.

1.4.5 CHANGES TO PERMIT COVERAGE

The General Permit allows for the reduction or increase of the total acreage covered under the General Permit when: a portion of the project is complete, and conditions for termination of coverage have been met; when a different entity purchases ownership of a part of the project; or when new acreage is added to the project.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in the total disturbed area if a change in permit-covered acreage is to be sought. The SWPPP shall be modified appropriately, logged at the front of the SWPPP, and certification of SWPPP amendments is to be kept in **Appendix D**. Updated PRDs submitted electronically via SMARTS can be found in **Appendix C**.

1.4.6 NOTICE OF TERMINATION

A Notice of Termination (NOT) must be submitted electronically by the LRP via SMARTS to terminate coverage under the General Permit. The NOT must include a final Site Map and representative photographs of the Project that demonstrate final stabilization. The NOT will be submitted within 90 days of completion of construction. The RWQCB will consider a construction site complete when the conditions of the General Permit, Section II.D, have been met.

2 PROJECT INFORMATION

2.1 Project and Site Description

2.1.1 SITE DESCRIPTION

The Lacey Meadows watershed is located just east of the crest of the Sierra Nevada Range in the Sierra Nevada Geomorphic Province, roughly 16 miles northwest of Truckee, California (Figure 1) or identified using the Public Land Survey System (PLSS) as T19N, R14E, Sections 27-31, T18N, R14E, Sections 4 through 8, and T18N, R13E, Sections 1 and 12. Elevations in the watershed range from approximately 8,336 feet in the headwaters to 6,785 feet at Webber Lake. Lacey Creek flows through two meadows to Webber Lake, a natural lake with a dammed outlet. The Webber Lake outflow is the headwaters of the Little Truckee River, a tributary to the Truckee River.

2.1.2 EXISTING CONDITIONS

Upper and Lower Lacey Meadows are montane meadows with montane riparian scrub, dry montane meadow, and montane wetland shrub.

Lacey Meadows experiences cold and snowy/wet winters and warm, dry summers. Temperatures can range from below zero degrees Fahrenheit in the winter to above 75 degrees in the summer. Mean annual precipitation at Webber Lake is approximately 37 inches, while the highest elevations in the watershed receive over 50 inches. Precipitation falls mainly as snow between October and April, with occasional afternoon thunderstorms during the summer months. Snow depths can exceed 120 inches in most winters, with high-elevation snow cover lingering well into the summer months of July and August (Hastings et al., 2013).

Land uses in and surrounding the project site are characterized primarily by recreational activities. Truckee Donner Land Trust (TDLT) operates a campground at the north end of Webber Lake, which provides 46 developed campsites available from summer into early fall. In addition, boating and fishing are popular on Webber Lake; 6 miles of hiking trails connect Lower Lacey Meadow and Upper Lacey Meadow. Aside from recreational activities, the project site is within the USFS Tahoe National Forest's (TNF's) Webber Lake grazing allotment and grazed by sheep seasonally (roughly July through September) under a lease agreement between TDLT and a commercial sheep producer.

Lacey Creek discharges to Webber Lake, a natural feature regulated by a low-head dam. Recreational water rights allowed for an additional 36 acre-feet to be stored for the month of June, and release of those waters in early July likely resulted in a rapid draw down of the lake levels by nearly 1 to 2 feet. Rapid and large fluctuations in lake levels promoted base level changes for the outlet of Lacey Creek, often resulting in a change in shoreline location of almost 0.4 miles. Base level changes in an alluvial system such as Lacey Creek have resulted in knickpoint erosion and headcut migration. Lake level fluctuations were exacerbated by the use of removeable fish screens, which often accumulated debris. While the fish screens are no longer in use, observed leakage under the dam continues to influence the lake level fluctuations to a larger degree than under natural conditions (Hastings and Kulchawik, 2021).

2.1.3 EXISTING DRAINAGE

The Project is in a low-gradient montane valley at roughly 6,800 feet elevation. The watershed area of the project is approximately 9.3 square miles. Mean annual precipitation is on the order of 37 inches, with most precipitation falling as snow and rain during winter storms. Summers are generally dry with intermittent thunderstorms.

Surface drainage flows overland in forested or meadow vegetation towards the Lacey Creek, which drains to the northeast. General drainage patterns can be seen from the existing site topography, as shown in Appendix B's Engineering Plans.

2.1.4 GEOLOGY, SOILS, CHANNEL AND WETLAND FORM, AND GROUNDWATER

The uplands above Lacey Meadows are characterized by highly erosive pyroclastic volcanic rocks, including tuffs, mudflows, and andesitic rocks. Hillslope rilling, gullying, and landslides are common. Easily friable or erodible geology in the upper watershed and steep headwater channels provides abundant sediment to the stream corridor. In a high sediment supply system, Lacey Creek forms alluvial fans as it enters both the Upper and Lower Meadows.

Further downstream, the Upper and Lower Lacey Meadows are alluvium-filled valleys derived from glacial and fluvial erosion and deposition. Lacey Creek has undergone periods of incision, as evidenced by relatively low width/depth ratios, exposed roots along banks, and absence of overbank flows. Glacial moraines (i.e., unconsolidated deposits ranging from sand to boulders) are present in each meadow and influence channel patterns, slope, and vegetation.

2.1.5 PROJECT DESCRIPTION

TRWC proposes to re-establish a multi-threaded seasonal wetland and swale system in Lacey Meadows by raising the bed of the main channel, thereby blocking drainage paths, raising seasonal water surface elevations, and forcing more frequent inundation of abandoned swales and seasonal wetlands. As presented in the Design Basis Report (Hastings and Kulchawik, 2021), the objectives of the overall Lacey Meadows Restoration Project are as follows:

- Restore functioning meadow hydrology
- Restore healthy meadow soils,
- Restore healthy meadow plant species,
- Restore healthy meadow habitats.

The selected restoration approach intends to redistribute seasonal flows to spread across a greater area than the existing channel corridor. In addition, encouraging aggradation of the channel and rewetting historical remnant channel features will offset the effects of channelization, flow capture, and incision. The following design elements are shown in the attached Restoration Design Plans (**Appendix B**).

Instream Wood Structures. The use of instream wood and wood-based structures are employed to encourage aggradation of the incised channel. Sediment aggradation is intended to increase the frequency of overbank flow, enhance groundwater levels, and rewet meadow habitats at strategic locations where remnant channels exist. The instream wood structures are minimally engineered, meaning they do not include cabling, large ballast boulders, or other mechanical anchoring that is not natural to the system. The structures will be secured by stakes or log posts driven into the channel bed, embedding logs into the bed and banks, bracing against existing bank vegetation and/or pinning by adjacent logs.

Bundles

Bundles will include pieces of tress less than 9-inches in diameter and include branches. The bundles will measure between 8- and 16-feet in length, 18-inches to 24-inches in diameter and secured using natural fiber twine. Bundles will be placed in the channel

and secured using 6- to 9-inch diameter stakes, driven a minimum of 3 feet into the channel bed.

Small Log Jams

Small log jams include 1 to 2 key logs, typically with a diameter between 12 and 18 inches and rootwad intact. Rootwads will be embedded or partially buried in the banks to mimic a fallen tree from a nearby channel bank. Additional smaller trees and logs are included to create a channel-spanning structure. The structure is finished by packing branches and slash to fill gaps to the maximum extent possible. Finally, willow stakes cut to a minimum of 2.5 feet in length will be installed along both sides of the debris jam to encourage bank root strength.

Large Log Jams

Large log jams include a minimum of 2 key logs, typically with a diameter greater than 18 inches and rootwad intact. Additional smaller trees and logs are included to create a channel-spanning structure. The structure is also packed with smaller branches and slash.

Staked Jams

Staked jams are channel-spanning features with post rows securing vegetation debris. Debris is a mixture of nearby willow and pine branches. These features will typically be constructed in series (2 to 4 in a channel segment). These structures are intended to fail under high-flow events to minimize bank scour or channel diversion. Failure includes the removal of some or all of the posts and debris by higher flows.

Staked Large Channel Jams

Staked large channel jams are channel-spanning features with post rows securing vegetation debris. Debris is a mixture of nearby willow and pine branches. These structures will have riverbed material upstream and downstream pushed into the structure to fill any spaces in the debris. Fifteen structures in series will be constructed on Lacey Creek at the downstream end near Webber Lake. These structures are intended to fail under high-flow events to minimize bank scour or channel diversion. Failure includes the removal of some or all of the posts and debris by higher flows.

Pilot Channels. Multiple active channels once characterized both Upper and Lower Lacey Meadows as evidenced by remnant channels. Grading of pilot channels is proposed in two locations where there is an opportunity to direct a portion of the flow into remnant channels. The pilot channels utilize the constructed large log jams to aid in diverting flow while minimizing disturbances. Salvaged sod and willow clumps will be placed over the grading area and covered with erosion control blanket.

Webber Lake Road Improvements. The following road improvements will be constructed where shown in Plans:

Road Fill

Portions of Webber Lake Road through the lower meadow have receded into the meadow creating primary flow paths and disrupting existing meadow flow paths. Portions of Webber Lake Road that are impeding existing meadow flow paths will be filled with material sourced on site.

Drainage Improvements

Two water bars will be constructed to control flow crossing Webber Lake Road in areas where the road has degraded.

2.1.6 DEVELOPED CONDITION

The project will improve more natural and diffuse drainage patterns, thereby reducing erosion. In addition, all temporary access roads and staging areas will be restored to their pre-project condition.

2.2 Permits and Governing Documents

In addition to the General Permit, the following documents have been accounted for while preparing this SWPPP:

- Lahontan Regional Water Board requirements;
- National Historic Preservation Act/Requirements of the State Historic Preservation Office;
- Clean Water Act Section 401 Water Quality Certifications;

- U.S. Army Corps of Engineers 404 Permits;
- CA Department of Fish and Game 1600 Streambed Alteration Agreement;
- Sierra County Grading Permit;
- National Environmental Protection Act Documents; and
- California Environmental Quality Act Documents.

2.3 Stormwater Run-On from Offsite Areas

The origin of run-on includes ephemeral surface waters within the Project areas. Because the Project has restoration elements within the active channel, construction will occur at times of low flow and include temporary BMPs to minimize impacts to the waterway. The contractor will submit a dewatering and diversion plan before implementation. The QSD and Engineer will approve the addition of suggested BMP's before implementing dewatering and diversion.

2.4 Risk Level Determination

The Project was determined to be a Risk Level II using the Risk Determination Worksheet (SWRCB, 2012). The risk level is determined using a matrix of Sediment Risk and Receiving Water Risk. Using the individual method or RUSLE, the estimated watershed erosion for the project is less than 7.7 tons/acre, well within the 'low' site Sediment Risk category (< 15 tons/acre). The Receiving Water Risk was determined to be 'high' as the Little Truckee River is identified in the Lahontan Basin Plan as a stream with Spawn, Cold, and Migratory beneficial uses (LRWQCB, 1995). Additionally, the Little Truckee River drains into the Truckee River, a 303(d)-listed impaired water body with a TMDL for suspended sediment concentration. A copy of the Project Risk Determination Worksheet submitted to SMARTS with the PRDs is included in **Appendix E**.

Risk Level II sites are subject to both the narrative effluent limitations and numeric effluent standards. The narrative effluent limitations require stormwater discharges associated with construction activity to minimize or prevent pollutants in stormwater and authorized non-stormwater through the use of controls, structures, and best management practices. In addition, discharges from Risk Level II sites are subject to NALs for pH and turbidity shown in **Table 2-1**. Therefore, this SWPPP has been prepared to address Risk Level II requirements (General Permit Attachment D).

Table 2-1 Numeric Action Levels

Parameter	Unit	Numeric Action Level Daily Average
pH	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	NTU	10% above background (general operations not related to in-stream work) 20 NTU above background (during install/decommissioning of in-stream facilities) 50 NTU above background (for rewetting of constructed channels)

2.5 Construction Schedule

Construction is planned for July thru October 2024. The schedule's modification or extension (start and end dates) may affect risk determination and permit requirements. The LRP shall contact the QSD if the schedule changes during construction to address the potential impact to the SWPPP. The estimated schedule for planned work can be found in **Appendix F**.

Construction of debris jams will require work within the stream. Therefore, localized diversion of the low flows around some work areas in the project site will be needed. Construction access routes are designed to minimize land disturbance to the extent practicable.

2.6 Potential Construction Activity and Pollutant Sources

Construction activities that have the potential to contribute sediment to stormwater runoff include:

- Clearing and grubbing;
- Stream diversion, dewatering, and rewatering;
- Excavation and grading in and near wet meadows, channels, and secondary channels;
- Soil storage and import;
- Onsite material handling, sorting, and staging; and

- Inappropriate application of water for dust control or irrigation.

Construction activities that have the potential to contribute pollutants other than sediment to stormwater runoff include:

- Equipment and vehicle malfunctions and leaks have the potential to contribute oil, grease, fuel, hydraulic fluid, and coolants;
- Inappropriate application of water for dust control or irrigation has the potential to contribute excess nutrients to stormwater runoff; and
- Inappropriate storage of general litter/trash could contribute pollutants to stormwater runoff.

The scheduled activities and associated pollutants were used to select the Best Management Practices for the project. Location of anticipated pollutants and associated BMPs are shown on the Site Map in **Appendix A**.

For sampling requirements for non-visible pollutants associated with construction activity, please refer to **Section 7.7.1**. For a complete list of onsite pollutants, refer to the Material Safety Data Sheets (MSDS), retained onsite.

Table 2-2 contains a list of construction-related water quality threats and corresponding BMPs which should be used to protect water quality during construction. This table is not a complete list of all potential water quality threats or BMPs. Technical notes for installation, monitoring, and maintenance of each BMP are in **Appendix H**.

Table 2-2 Construction activities that pose water quality threats and applicable BMPs

Construction Activity	BMP Name	BMP#
Clear and Grub Operations	Scheduling	EC-1
	Preservation of Existing Vegetation	EC-2
	Water Conservation Practices	NS-1
Dewatering and Diversion	Scheduling	EC-1
	Sediment Trap	SC-3
	Gravel Bag Berms	SC-6
	Coffer Dam	-
General Litter and Waste	Solid Waste Management	WM-5
	Hazardous Waste Management	WM-6
	Sanitary/ Septic Waste Management	WM-9
Grading Operations	Scheduling	EC-1
	Preservation of Existing Vegetation	EC-2
	Soil Preparation / Roughening	EC-15
	Fiber Rolls	SC-5
	Wind Erosion Control	WE-1
	Water Conservation Practices	NS-1
Revegetation Materials and Operations	Scheduling	EC-1
	Hydroseeding	EC-4
	Straw Mulch	EC-6
	Wood Mulching	EC-8
	Water Conservation Practices	NS-1
	Potable Water/Irrigation	NS-7
	Stockpile Management	WM-3
Soil Import/Export Operations	Scheduling	EC-1
	Fiber Rolls	SC-5
	Wind Erosion Control	WE-1
	Material Delivery and Storage	WM-1
Stockpiling	Fiber Rolls	SC-5
	Wind Erosion Control	WE-1
	Material Use	WM-2
	Stockpile Management	WM-3
Vehicle Maintenance, Fueling, and Spills	Scheduling	EC-1
	Water Conservation Practices	NS-1
	Vehicle and Equipment Cleaning	NS-8
	Vehicle and Equipment Fueling	NS-9
	Vehicle and Equipment Maintenance	NS-10
	Material Use	WM-2
	Spill Prevention and Control	WM-4

2.7 Identification of Non-Stormwater Discharges

Non-stormwater discharges consist of discharges that do not originate from precipitation events. The General Permit provides allowances for specified non-stormwater discharges that do not cause erosion or carry other pollutants.

Non-stormwater discharges are prohibited into storm drainage systems or waterways, not authorized under the General Permit and listed in the SWPPP or authorized under a separate NPDES permit.

Non-stormwater discharges will be managed with the stormwater and non-stormwater BMPs described in **Section 3** of this SWPPP.

Activities at this site that may result in unauthorized non-stormwater discharges include:

- Vehicle and equipment cleaning, fueling, and maintenance operations;
- Vehicle and equipment wash water, including concrete washout water;
- Runoff from dust control applications or dust palliatives;
- Sanitary and septic wastes; and
- Chemical leaks and spills of any kind, including but not limited to petroleum, oil, etc.

To ensure that unauthorized discharges are eliminated, steps will be taken, including implementing appropriate BMPs, controlled, disposed, or treated on-site.

Discharges of construction materials and wastes, such as fuel or paint, resulting from dumping, spills, or direct contact with rainwater or stormwater runoff, are prohibited.

2.8 Required Site Map Information

The Project's Site Map(s) showing Project location, surface water boundaries, geographic features, construction site perimeter, and general topography, and other requirements identified in Attachment B of the General Permit are included in **Appendix A**.

3 BEST MANAGEMENT PRACTICES

3.1 Schedule for BMP Implementation

BMPs shall be implemented before work on a project site begins and shall remain in place for the duration of the work.

Work in or adjacent to the waterways will be scheduled during low flow periods to minimize impact and sediment supply to the waterway.

3.2 Site Management BMPs

3.2.1 SITE PLANNING

Site planning integrates a range of specific BMPs to effectively anticipate, map and manage the flow of construction activities and materials on the construction site to maximize water quality protection. Throughout the entire construction process, thoughtful site planning is required to create and maintain a safe, efficient, and low-impact construction site. See Factsheet EC-1 Scheduling for guidance on how to help organize the site and maximize means to prevent pollution.

3.2.2 PRESERVATION OF VEGETATION

Protecting existing vegetation minimizes the potential of damaging existing trees, shrubs, and grasses that are intended to remain onsite after construction. Some small trees and shrubs will be removed in the restoration areas of this Project. Refer to EC-2 under Site Management BMPs in **Appendix H** for specific details and guidance on protecting vegetation during construction.

3.2.3 WEED PREVENTION AND MANAGEMENT

The Contractor shall be responsible for preventing the introduction and spread of weeds. At a minimum, the following shall be implemented.

- On-site materials for BMP's will be used whenever possible.
- Imported BMP straw or pine needle materials shall be certified weed-free (California noxious and agricultural), if applicable for the County.

- Any sand, gravel, or fill material brought on-site shall be clean, debris-free, and devoid of invasive plant parts or seeds (some source verification is required). Do not borrow fill from weed-infested stockpiles, road shoulders, or ditch lines.
- The Engineer's Representative shall inspect fill material sources (including but not limited to surrounding topsoil piles, gravel/sand piles, or borrow pits). If it is determined the materials are contaminated with weed materials, the material shall be rejected and removed from the site at the Contractor's expense.
- All equipment entering the project area will be cleaned and free of weed materials (i.e., stems, flowers, seeds, etc.) before and after entering the project area or loading and project materials.
- Staging and storage areas will be maintained weed-free during the entire construction period.
- Before entering and leaving the project site, soil and plant materials will be removed from tools, vehicles, equipment, clothing, boots, and gear at a designated and approved cleaning area (Refer to inspection Checklist E in Cal-IPC Prevention of the Spread of Weeds: Best Management Practices for Land Managers, 3rd Edition.)
- A cleaning area for tools, equipment, and vehicles shall be designated that is easily accessible for monitoring and control, located away from waterways, areas of sensitive habitats or species, near areas already infested with invasive plants, contained with silt fences or soil berms, and be paved or have sealed surfaces to avoid re-accumulation of soil and plant material on cleaned vehicles and equipment.

As part of maintenance, the Engineer's Representative shall perform follow-up inspections at sites where erosion control materials have been used so that any invasive plant introductions are identified early and treated.

3.3 Erosion and Sediment Control BMPs

Erosion and sediment control are source control measures designed to prevent soil particles from being detached and transported in stormwater runoff. Erosion and Sediment Control BMPs protect the soil surface from erosion by covering and binding soil particles. Erosion and Sediment Control BMPs will be used as the first line of defense to protect against sediment discharges.

3.3.1 EROSION CONTROL

Erosion control, also referred to as soil stabilization, consists of source control measures designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Erosion control BMPs protect the soil surface by covering and binding soil particles.

The Truckee River Watershed Council will use native vegetation for erosion control and revegetation of the Project Site. Vegetation provides protective cover for disturbed soil, and the propagated material can be used as a BMP measure for soil stabilization and erosion control.

The following measures will be implemented on this project to achieve effective temporary and permanent soil stabilization:

- Soil disturbance and compaction will be minimized to the greatest extent possible.
- Existing vegetation will be protected and preserved to the greatest extent possible.
- Construction activities will be scheduled so that existing vegetation is left undisturbed immediately before grading or excavation.
- Soil stabilization BMPs will be deployed as soon as operationally feasible following soil disturbance.
- All disturbed soil areas (DSAs) outside the channel will be stabilized with propagated materials, durable mulch materials (such as wood chips or pine needles), erosion control fabric, or Bonded Fiber Matrix within 14 days of cessation of disturbing soil activities. Soil stabilization measures will be re-applied as necessary to maintain effectiveness.
- Disturbed areas within the channel shall be stabilized based on the specified channel treatments identified in the Engineering Plans (**Appendix B**).
- Sufficient soil stabilization materials (such as wood chips or pine needles) will be maintained on-site to enable rapid implementation in conformance with the requirements described in this SWPPP. Application areas include active and non-active regions that require winterization before October 15th.

- If a temporary irrigation system is installed (Contractor's option), the configuration and operation of the temporary irrigation system used for plant establishment will be closely monitored and adjusted such that irrigation water does not cause runoff, excessive ponding, or erosion anywhere onsite.
- Stockpiles of erodible materials (such as soil or sand) will be watered and/or covered during windy conditions to prevent wind erosion.
- The entire site will be winterized each season before the October 15th grading deadline.
- All grading and soil disturbance will cease once the site has been winterized.
- After construction, all DSAs will be permanently stabilized using treatments described in the project plans.

Selected erosion control BMPs for this project include:

- EC-1 Scheduling
- EC-2 Preservation of Existing Vegetation
- EC-3 Hydraulic Mulch
- EC-4 Hydroseeding
- EC-6 Straw Mulch
- EC-8 Wood Mulching
- EC-10 Velocity Dissipation Devices
- EC-15 Soil Preparation/Roughening
- EC-16 Non-Vegetative Stabilization

Refer to the BMP technical notes in **Appendix H** and the Engineering Plans in **Appendix B** for specific details and guidance.

3.3.1.1 Wood Chip Mulch

Wood chip mulch will be the primary method of temporary soil stabilization on this project. Wood chips will be applied to DSAs and shallow slopes at a depth of 1-inch or 85% coverage to provide adequate protection.

3.3.1.2 Pine Needle Mulch

Pine needles are particularly effective at stabilizing moderate to steep slopes since their interlocking structure helps them resist movement by water and gravity. However, they are not as durable as wood chips and should not be used in areas expected to be re-disturbed by vehicles or heavy equipment.

3.3.1.3 Hydraulically Applied Mulch

If necessary, hydraulically applied mulch may provide temporary stabilization of DSAs, steep slopes, and stockpiles. This project's hydraulically applied mulch shall consist only of wood fiber mulch applied with a water-resistant bonding agent.

3.3.2 SEDIMENT CONTROL

Sediment controls are structural measures intended to complement and enhance erosion control measures to prevent sediment discharges from construction areas. Sediment controls are designed to intercept, filter, and settle out soil particles that the force of water has mobilized. Sediment Control measures will be inspected at a minimum daily basis and before any rain event.

The following measures will be implemented on this Project to achieve sediment control objectives:

- Before any soil disturbing activities, temporary sediment controls will be implemented along the down-gradient perimeter of disturbed soil areas.
- Linear sediment controls will be installed along the toe of slopes, the face of slopes, and at grade breaks on disturbed slopes as necessary to prevent the downslope transport of sediment. Placement and spacing of linear sediment controls will be specified in the field based on site-specific conditions and construction operations but shall meet the following minimum requirements.

Critical Slope/Sheet flow Length Combinations

(General Permit 2009-0009-DWQ, Attachment D, Section E.4)

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

- Fiber rolls, such as pine needles wattles (or equivalent linear sediment controls), will be placed along temporary construction access roads wherever surface runoff can discharge from the road prism and when the access road is within 10 feet of the river channel. Sediment controls shall be placed perpendicular to the flow direction and weighted or staked so 100% contact between the fiber roll and ground surface can be maintained during runoff events.
- Sediment control BMPs will be inspected, maintained, and replaced to function according to technical specifications throughout the active construction season.
- A 20% overage of wattles, gravel bags, and plastic sheeting will be maintained on-site for the project's duration to implement temporary sediment controls in the event of predicted rain and for rapid response to failures or emergencies.

Locations and suggested sediment control BMPs for this Project are shown on the Site Maps in **Appendix A**.

Selected temporary sediment control BMPs appropriate for this Project are listed below:

- SE-3 Sediment Trap
- SE-5 Fiber Rolls (Pine Needle Wattles)
- SE-6 Gravel Bag Berm

Refer to the BMP technical notes in **Appendix H** and the Engineering Plans in **Appendix B** for specific details and guidance.

3.3.2.1 Sediment Trap

A sediment trap may be used at the dewatering and diversion pipe outlet to help sediment settle out before being discharged to the river channel.

3.3.2.2 *Fiber Rolls or Pine Needle Wattles*

Fiber rolls, such as pine needle wattles, will be installed between areas of soil disturbance and waterway to limit sediment transport. In addition, fiber rolls will be installed along access roads where the waterway is within 10 feet, and there is a positive flow direction or gradient towards the waterway. Fiber rolls have been limited to these areas due to natural vegetation acting as a buffer, limiting sediment to the waterway. Fiber rolls are a temporary BMP and will be removed once the grading site has been stabilized and the completion of construction. Refer to SE-5 for fiber roll installation.

3.3.2.3 *Gravel Bag Berms*

Gravel bags can be placed as linear control BMPs where fiber rolls cannot provide adequate protection, like uneven terrain. Refer to SE-6 for additional information. Sandbags will not be used at this site.

3.3.3 WIND EROSION CONTROL

The wind erosion BMP is to control dust generated by construction activities from grading areas and roadways. Water will be applied to DSAs and unpaved roads to prevent dust and wind erosion. Water application rates will be regulated as necessary such that no runoff or pooling occurs. Refer to WE-1 for wind erosion control guidance.

3.4 Non-Stormwater Controls and Waste and Materials Management

3.4.1 NON-STORMWATER CONTROLS

Non-stormwater discharges are prohibited into storm drainage systems or waterways, not authorized under the General Permit. Non-stormwater discharges for which the local Regional Water Board requires a separate NPDES permit are prohibited unless covered under the separate NPDES permit that has been obtained for the discharge. The selection of non-stormwater BMPs is based on the list of construction activities with a potential for non-stormwater discharges identified in **Section 2.7** of this SWPPP.

The following non-stormwater control BMPs will be implemented to control sediment on the construction site. Fact Sheets for temporary non-stormwater control BMPs are provided in **Appendix H**.

- NS-1 Water Conservation Practices
- NS-6 Illicit Connection/Discharge
- NS-7 Potable Water/Irrigation
- NS-8 Vehicle and Equipment Cleaning
- NS-9 Vehicle and Equipment Fueling
- NS-10 Vehicle and Equipment Maintenance

3.4.1.1 Vehicle and Equipment Operations

Several types of vehicles and equipment may be used on-site throughout the project, including excavators, loaders, rollers, trucks and trailers, backhoes, generators, and compressors. Vehicle cleaning will not be performed on-site. Self-propelled vehicles will be fueled off-site, if practical. Fuel trucks, each equipped with absorbent spill clean-up materials, can be used for on-site fueling at the staging areas. All vehicle maintenance and mobile fueling operations will be conducted at least 50 feet away from operational inlets and drainage facilities and on a level graded area. Drip pans will be used for all mobile fueling. Fueling trucks shall be taken off-site for overnight storage, or if a fueling truck is parked and remains onsite overnight, it shall be parked on level grade and protected with berms and dikes to prevent run-on, runoff, and contain spills. Drip pans or absorbent pads will be used for all vehicle and equipment maintenance activities that involve grease, oil, solvents, or other vehicle fluids. Drip pans or absorbent pads will be used for overnight/long-term storage of on-site vehicles and equipment with minor fluid leaks that cannot be repaired the same day.

3.4.2 DIVERSION AND DEWATERING

Construction during low flow conditions will limit the diversion and dewatering required for the Project. However, the project includes work in the Lacey Creek channel such that diversion and dewatering may be necessary.

The contractor is required to submit a dewatering and diversion plan for approval by the Engineer's Representative no later than 10 days before mobilization. The purpose of the dewatering and diversion plan is to outline the contractor's proposed strategy and methods for managing all surface water and groundwater encountered throughout

the construction period within the work area. The contractor shall furnish all materials and labor to execute the dewatering and diversion plan.

As part of the dewatering and diversion plan, the contractor is required to supply specifications for temporary cofferdams, temporary diversion dams, diversion channel linings, pumps, and diversion pipes. Products shall be selected to prevent erosion of temporary channels and turbidity increases to Lacey Creek. In addition, an energy dissipation feature shall be used at the outlets of any diversion pipes.

The contractor shall pump incidental groundwater encountered during excavation. Pumped water must be sprayed or dispersed onto overbank areas. The pumped water shall be monitored throughout construction to avoid flow that could lead to the formation of rills.

The contractor submitted plan shall provide the initial direction of installation of the BMP for the stream channel diversion, but field adjustments will be required to confirm the locations. Field adjustments can be made based on the specific site requirements, constructability, and surface water levels. Any changes to locations or methods shall be done with the approval of the Engineer's Representative and the QSP. In addition, the selection of a discharge location of the diversion pipe to minimize erosion will be field verified by the QSP.

Stream Diversions are a temporary BMP and will be removed once the grading site has been stabilized and the completion of construction.

3.4.3 WASTE MANAGEMENT AND MATERIAL POLLUTION CONTROL

All chemicals stored on-site will be stored in a designated staging area in a manner that prevents any spillage or leakage and prevents exposure to precipitation or surface run-on. Such methods include storing chemicals in locked containers or covered, water-tight containers on pallets with secondary containment. Sanitary facilities will be located at least 50 feet away from any surface flow paths, placed on drip pans, and regularly serviced per the manufacturer's specifications. All dumpsters and other waste disposal containers will be routinely checked for leaks and covered before and during rain events. Specific BMPs applicable to waste management and storage at this site include:

- WM-1 Material Delivery and Storage

- WM-2 Material Use
- WM-3 Stockpile Management
- WM-4 Spill Prevention and Control
- WM-5 Solid Waste Management
- WM-6 Hazardous Waste Management
- WM-9 Sanitary Waste Management

Refer to the Waste Management BMPs in **Appendix H** for specific implementation guidance on proper management and storage of waste materials.

4 BMP INSPECTION, MAINTENANCE, AND RAIN EVENT ACTION PLAN

4.1 BMP Inspection and Maintenance

The General Permit requires routine weekly inspections of BMPs and inspections before, during, and after qualifying rain events. A BMP inspection checklist must be filled out for inspections and maintained on-site with the SWPPP. The inspection checklist includes the necessary information covered in **Section 7.6**. Blank visual monitoring and BMP Inspection checklist are in **Appendix I**. Completed checklists shall be kept in the CSMP Records Section.

BMPs will undergo regular maintenance to ensure proper and effective functionality. If necessary, corrective actions will occur within 72 hours of identified deficiencies, and the QSD shall prepare associated amendments to the SWPPP.

Specific details for maintenance, inspection, and repair of Construction Site BMPs can be found in the BMP Factsheets in **Appendix H**. Weekly inspections will continue until construction is concluded and a NOT has been submitted and processed.

4.2 Rain Event Action Plans

The Rain Event Action Plan (REAP) is a written document designed to be used as a planning tool by the QSP to protect exposed portions of project sites and ensure that the discharger has adequate materials, staff, and time to implement erosion and sediment control measures. These measures intend to reduce the amount of sediment and other pollutants generated during a rain event. It is the responsibility of the QSP to be aware of the precipitation forecast and obtain and print copies of forecasted precipitation from NOAA's National Weather Service Forecast Office.

The SWPPP includes REAP templates, but the QSP will need to customize them for each rain event. Site-specific REAP templates for each applicable project phase can be found in **Appendix J**. The QSP shall maintain a paper copy of completed REAPs in compliance with the record retention requirements **Section 1.4.2** of this SWPPP. Completed REAPs shall be kept in CSMP Records Section.

The QSP will develop an event-specific REAP 48 hours before a precipitation event forecast to have a 50% or greater chance of producing precipitation in the Project area. The REAP will be onsite and be implemented 24 hours in advance of any the predicted precipitation event.

At a minimum, the REAP will include the following site and phase-specific information:

- Site Address;
- Calculated Risk Level (2 or 3);
- Site Stormwater Manager Information including the name, company, and 24-hour emergency telephone number;
- Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number;
- Stormwater Sampling Agent information including the name, company, and 24-hour emergency telephone number;
- Activities associated with each construction phase;
- Trades active on the construction site during each construction phase;
- Trade contractor information; and
- Recommended actions for each project phase.

5 TRAINING

Appendix L identifies the QSPs for the Project. In addition, periodic training of job-site personnel will be included to promote stormwater management awareness specific for this Project as part of routine Project meetings (e.g., daily/weekly tailgate safety meetings) or task-specific training as needed.

The QSP shall be responsible for providing this information at the meetings and subsequently completing the training logs shown in **Appendix K**, which identifies the site-specific stormwater topics covered and the names of site personnel who attended the meeting. Tasks may be delegated to trained employees by the QSP as long as adequate supervision and oversight are provided. Training shall correspond to the specific tasks including, SWPPP implementation, BMP inspection and maintenance, and record-keeping.

Documentation of training activities (formal and informal) will be retained in SWPPP **Appendix K**.

6 RESPONSIBLE PARTIES AND OPERATORS

6.1 Responsible Parties

Approved Signatories who are responsible for SWPPP implementation and have authority to sign permit-related documents are listed below. Written authorizations from the LRP for these individuals are provided in **Appendix L**. The Approved Signatories assigned to this Project are:

Name	Title	Phone Number
Lisa Wallace	Executive Director	530.550.8760 x 2#
Beth Christman	Director of Restoration Programs	530.550.8760 x 1#

QSPs identified for the Project are specified in **Appendix L**. The QSP shall have primary responsibility and significant authority for the implementation, maintenance, and inspection/monitoring of SWPPP requirements. The QSP will be available at all times throughout the Project. Duties of the QSP include but are not limited to:

- Implementing all elements of the General Permit and SWPPP, including but not limited to:
 - Ensuring all BMPs are implemented, inspected, and properly maintained;
 - Performing non-stormwater and stormwater visual observations and inspections;
 - Performing non-stormwater and storm sampling and analysis, as required; and
 - Performing routine inspections and observations.
- Implementing non-stormwater management and materials and waste management activities such as monitoring discharges; general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than stormwater are discharged in quantities which will have an adverse effect on receiving waters; etc.

- The QSP may delegate these inspections and activities to an appropriately trained employee to ensure adequacy and adequate deployment.
- Ensure the elimination of unauthorized discharges.
- The QSPs shall be assigned authority by the LRP to mobilize crews to make immediate repairs to the control measures.
- Coordinate with the Contractor(s) to assure all of the necessary corrections/repairs are immediately implemented and that the Project complies with the SWPPP, the General Permit, and approved plans at all times.
- Notifying the LRP or Authorized Signatory immediately of off-site discharges or other non-compliance events.

6.2 Contractor List

Name:

Title:

Company:

Address:

Phone Number:

Number (24/7):

7 CONSTRUCTION SITE MONITORING PROGRAM

7.1 Purpose

This Construction Site Monitoring Program was developed to address the following objectives:

- To demonstrate that the Project complies with the Discharge Prohibitions and Numeric Action Limits of the Construction General Permit;
- To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
- To determine whether immediate corrective actions, additional Best Management Practices (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges; and
- To determine whether BMPs included in the SWPPP and REAP effectively prevent or reduce pollutants in stormwater discharges and authorized non-stormwater discharges.

7.2 Applicability of Permit Requirements

This Project is a Risk Level II Project. The General Permit identifies the following types of monitoring as being applicable for Risk Level II projects:

- Visual inspections of Best Management Practices (BMPs);
- Visual monitoring of the site related to qualifying storm events;
- Visual monitoring of the site for non-stormwater discharges;
- Sampling and analysis of construction site runoff for pH and turbidity;
- Sampling and analysis of construction site runoff for non-visible pollutants when applicable; and
- Sample and analysis of non-stormwater discharges when applicable.

7.3 Weather and Rain Event Tracking

A qualifying rain event triggers visual monitoring, inspections, and sampling requirements of the General Permit. The General Permit defines a qualifying rain event as any event that produces 0.5-inches of precipitation. A minimum of 48 hours of no precipitation distinguishes separate qualifying storm events. An equivalent qualifying snow event is assumed to be 5-inches or more of snowfall, based on a snow to rain ratio of 10:1.

7.3.1 WEATHER TRACKING

The QSP should consult the National Oceanographic and Atmospheric Administration (NOAA) for the weather forecasts daily. The closest NOAA weather service office is located in Reno, Nevada. Forecasts can be obtained at <https://www.weather.gov>. Weather reports should be printed and attached to the BMP inspection form or REAP.

7.3.2 RAIN GAGES

The QSP shall install a rain gage onsite to track rain amounts during construction. Rain gages will remain onsite until all construction is concluded and a NOT has been processed.

7.4 Monitoring Locations

Monitoring locations are shown on the Site Maps in **Appendix A**. Monitoring locations are described in **Sections 7.6 and 7.7**.

Whenever changes in the construction site might affect the access or validity of sampling locations, the sampling locations shall be revised accordingly. All such revisions will be noted, and the SWPPP amended. However, temporary changes that result in a one-time additional sampling location do not require a SWPPP amendment.

7.5 Safety and Monitoring Exemptions

This Project is not required to collect samples or conduct visual observations (inspections) under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

- The site is inaccessible due to snow cover.

Scheduled site business hours are **Monday – Friday, 7 AM – 5 PM.**

Suppose monitoring (visual monitoring or sample collection) of the Project is unsafe because of the dangerous conditions noted above. In that case, the QSP shall document the conditions for why an exception to performing the monitoring was necessary.

7.6 Visual Monitoring

Visual monitoring includes observations and inspections. Inspections of BMPs are required to identify and record BMPs that need maintenance to operate effectively, that has failed, or that could fail to function as intended. In addition, visual observations of the site are to observe stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources.

Table 7-1 identifies the required frequency of visual observations and inspections.

Table 7-1 Summary of Visual Monitoring and Inspections

Type of Inspection	Frequency
<i>Routine Inspections</i>	
BMP Inspections	Weekly ¹
BMP Inspections – Tracking Control	Daily
BMP Inspections- Sediment Controls	Daily
Non-Stormwater Discharge Observations	Quarterly during business hours
<i>Rain Event-Triggered Inspections</i>	
Site Inspections Before a Qualifying Event	Within 48 hours of a qualifying event ²
BMP Inspections During an Extended Storm Event	Every 24 hours of a rain event ³
Site Inspections Following a Qualifying Event	Within 48 hours of a qualifying event ²
¹ Most BMPs must be inspected weekly; those identified below must be inspected more frequently. ² Inspections are required during scheduled site operating hours. ³ Inspections are required during scheduled site operating hours regardless of precipitation on any given day.	

7.6.1 ROUTINE OBSERVATIONS AND INSPECTIONS

Routine site inspections and visual monitoring are necessary to ensure that the project complies with the Construction General Permit requirements.

7.6.1.1 Routine BMP Inspections

Inspections of BMPs are conducted to identify and record:

- BMPs that are properly installed;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to function as intended.

7.6.1.2 *Non-Stormwater Discharge Observations*

Each drainage area will be inspected for any indications of prior unauthorized and authorized non-stormwater discharges. Inspections will record:

- Presence or evidence of any non-stormwater discharge (authorized or unauthorized);
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
- Source of discharge.

7.6.2 RAIN-EVENT TRIGGERED OBSERVATIONS AND INSPECTIONS

Visual observations of the site and inspections of BMPs are required before a qualifying rain event, following a qualifying rain event, and every 24 hours during a qualifying rain event. Pre-rain inspections will be conducted after consulting NOAA and determining that a precipitation event with a 50% or greater probability of precipitation has been forecast.

7.6.2.1 *Visual Observations Prior to a Forecasted Qualifying Rain Event*

Within 48-hours before a qualifying event, a stormwater visual monitoring site inspection will include observations of the following locations:

- Stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources; and
- BMPs to determine if they have been appropriately implemented.

Consistent with guidance from the State Water Resources Control Board, pre-rain BMP inspections and visual monitoring will be triggered by a NOAA forecast that indicates a probability of precipitation of 50% or more in the project area.

7.6.2.2 *BMP Inspections During an Extended Storm Event*

During an extended rain event, storm continuing for multiple days, BMP inspections will be conducted to identify and record:

- BMPs that are properly installed;

- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to function as intended.

If the construction site is not accessible during the precipitation event, the visual inspections will be performed at all relevant outfalls, discharge points, downstream locations. The reason why the construction site could not be inspected and the location attempted for inspection shall be well documented on the inspection checklist. In addition, the assessments should record any projected maintenance activities.

7.6.2.3 Visual Observations Following a Qualifying Rain Event

Within 48 hours following a qualifying rain event (0.5-inches of rain or 5-inches of snow), a stormwater visual monitoring site inspection is required to observe:

- Stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs to determine if they have been properly designed, implemented, and effective;
- Need for additional BMPs;
- Any stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard; and
- Discharge of stored or contained rainwater.

7.6.3 VISUAL MONITORING PROCEDURES

Visual monitoring shall be conducted by the QSP or staff trained by and under the supervision of the QSP.

The site visual monitoring personnel's name(s) and contact number(s) are listed below, and their training qualifications are provided in **Appendix K**.

Assigned inspector: Benjamin Trustman, QSP **Contact phone:** 510.704.1000 ext. 228

Alternate inspector: Peter Kulchawik **Contact phone:** 510.704.1000 ext. 218

Stormwater observations will be documented on the *Visual Monitoring and BMP Inspection Form (Appendix I)*. Any photographs used to document observations will be referenced on the stormwater site inspection report and maintained with the Monitoring Records.

The QSP shall submit the inspections reports weekly or after completing a storm event to the LRP or representative. The QSP shall conduct visual observations (inspections) during business hours only. Should the inspection find that corrective actions are required, the QSP shall submit the inspection report to the LRP or Representative within 24 hours of the inspection.

The completed reports will be kept in the onsite copy of the SWPPP.

7.6.4 VISUAL MONITORING FOLLOW-UP AND REPORTING

Correction of deficiencies identified by the observations or inspections, including required repairs or maintenance of BMPs, shall be initiated and completed as soon as possible.

If identified deficiencies require design changes, including additional BMPs, the changes will be initiated within 72 hours of identification and completed as soon as possible. When design changes to BMPs are required, the SWPPP will be amended to reflect the changes.

Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on the *Inspection Field Log Sheet*, or *BMP Inspection Report* submitted to the QSP and kept with the SWPPP.

The QSP will submit copies of the completed *Inspection Field Log Sheet* or *BMP Inspection Report* with the corrective actions within two (2) days of the inspection to the LRP or representative.

Results of visual monitoring must be summarized and reported in the Annual Report.

7.6.5 VISUAL MONITORING LOCATIONS

The inspections and observations identified in **Section 7.6.1** and **Section 7.6.2** will be conducted at the locations specified in this section.

BMP locations are shown on the Site Maps in SWPPP **Appendix A**.

Monitoring will occur at all active construction sites.

7.7 Water Quality Sampling and Analysis

7.7.1 SAMPLING AND ANALYSIS PLAN FOR NON-STORMWATER/NON-VISIBLE POLLUTANTS

7.7.1.1 *Potential Non-Visible Pollutants*

The following is a list of construction materials used and activities performed which have the potential to contribute pollutants other than sediment to stormwater runoff:

- Vehicle fluids including oil, grease, fuel, hydraulic fluid, and coolants;
- Vehicle fuels, including gasoline and diesel; and
- Raw landscaping materials and wastes, including topsoil.

7.7.1.2 *Potential Non-Stormwater Pollutants*

Sampling of non-stormwater discharges will be conducted when an authorized or unauthorized non-stormwater discharge is observed at the Project site. In addition, if non-stormwater discharges run-on to the Project site from offsite locations, which can potentially contribute to a violation of a NAL, the run-on will also be sampled.

The following authorized non-stormwater discharges identified in **Section 2.7** can be discharged from the Project site.

- Flows through Lacey Creek; and
- Tributaries or sheet flow to Lacey Creek.

In addition to the above-authorized stormwater discharges, some construction activities have the potential to result in an unplanned (unauthorized) non-stormwater discharge if BMPs fail. These activities include:

- Runoff from equipment at channel access points (when equipment is driving through water); and
- Runoff from equipment during instream work (when water is still present).

7.7.1.3 Sample Collection Criteria

Sampling for non-stormwater/non-visible pollutants will be conducted if a breach, malfunction, leakage, or spill is identified that has the potential to result in the discharge of a non-visible pollutant or the discharge of a non-visible pollutant is already occurring. Sampling will be conducted using the collection and handling methods below and analyzed for the specific non-visible contaminants that may have been transported by stormwater to the discharge point(s) for the applicable drainage area. Additionally, samples will also be collected of stormwater runoff that has not come into contact with the pollutants of concern and analyzed for comparison with the non-visible pollutant discharge sample.

7.7.1.4 Sample Collection Procedures

Discharge samples will be collected at designated sampling locations or other discharge locations (as appropriate) for observed breaches, malfunctions, leakages, spills, or other operations that triggered the sampling event. Grab samples will be collected and preserved following the methods summarized in **Table 7-2** and **Table 7-3**. Sampling will only be conducted by staff trained in the sampling collection, handling, and documentation procedures below.

Samples will be collected by placing a sample container directly into a stream of water downgradient and near the potential non-visible pollutant discharge location. This sample container will be used to collect the water, which will be transferred to laboratory bottles for analysis. An up-gradient and uncontaminated sample will be collected before the down-gradient sample to minimize cross-contamination. In each location, the sampling personnel will collect the water up-gradient of where they are standing. Once the sample containers are full, the sample will be transferred into bottles provided by the laboratory for analysis.

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Table 7-3 Sample Collection Specifications and Typical Analysis for Monitoring Typical Construction-Related Stormwater Discharges

Constituent	Analytical Method	Minimum Sample Volume	Sample Bottle Type	Sample Preservation
Total Dissolved Solids	EPA 160.1	2 x 250 mL	Polypropylene	Store at 4°C
Total Suspended Solids	EPA 160.2	2 x 250 mL	Polypropylene	Store at 4°C
Total Settleable Solids	SM 2540 F	2 x 250 mL	Polypropylene	Store at 4°C
Total Kjeldahl Nitrogen	EPA 351.2	2 x 250 mL	Polypropylene	Store at 4°C
Nitrite	EPA 354.1	2 x 250 mL	Polypropylene	Store at 4°C
Total Phosphorus	EPA 365.3	2 x 250 mL	Polypropylene	Store at 4°C
Total Nitrogen	Calculated	2 x 250 mL	Polypropylene	Store at 4°C
Nitrate/Nitrite	EPA 353.1	2 x 250 mL	Polypropylene	Store at 4°C
Turbidity	EPA 180.1	250 mL	Polypropylene	Store at 4°C
Dissolved Oxygen	SM 4500-O G	100 mL	Polypropylene	Store at 4°C, 8 hour hold time
Oil and Grease	EPA 1664	500 mL	Glass-Amber	Store at 4°C, H ₂ SO ₄

To maintain sample integrity and prevent cross-contamination, sampling collection personnel will:

- Wear a clean pair of surgical gloves before the collection and handling of each sample at each location;
- Protect the inside of the sample bottle from contamination by not allowing it to come into contact with any material other than the water sample;
- Discard sample bottles or sample lids that have been dropped onto the ground before sample collection;
- Avoid leaving the cooler lid open for an extended period once samples are placed inside;
- Avoid sampling near a running vehicle where exhaust fumes may impact the sample;
- Avoid touching the exposed end of a sampling tube, if applicable;

- Prevent rainwater from dripping from rain gear or other surfaces into sample bottles;
- Avoid eating, smoking, or drinking during sample collection;
- Avoid sneezing or coughing in the direction of an open sample bottle; and
- Minimize the exposure of the samples to direct sunlight, as sunlight may cause biochemical transformation of the sample to take place.

7.7.1.5 Sample Handling Procedures

Immediately following collection, sample bottles for laboratory analytical testing will be capped, labeled, and documented on a Chain of Custody form provided by the analytical laboratory. Samples will be sealed in a re-sealable storage bag, placed in an ice-chilled cooler at as near to 4 degrees Celsius as practicable, and delivered to a California state-certified laboratory within the holding times listed above in **Table 7-2** for the constituents sampled.

7.7.1.6 Sample Documentation Procedures

All original data documented on sample bottle identification labels, Chain of Custody forms, Effluent Sampling and Measurement Field Logs, and Visual Inspection Checklists will be recorded using waterproof ink. These will be considered accountable documents. If an error is made on an accountable document, the individual will make corrections by lining through the mistake and entering the correct information. The erroneous information will not be obliterated. All revisions will be initialed and dated. Sampling and analysis activities will be documented in the following manner:

- **Sample Bottle Identification Labels:** Sampling personnel will attach an identification label to each sample bottle. At a minimum, the following information will be recorded on the label, as appropriate:
 - Project name;
 - A unique location and sample identification number;
 - Quality assurance/quality control (QA/QC) samples shall be identified similarly using a unique location and sample identification number or designation;
 - Collection date/time (no time applied to QA/QC samples); and

- Analysis constituent.
- **Chain of Custody (COC) forms:** All samples to be analyzed by a laboratory will be accompanied by a COC form provided by the laboratory. Only the sample collectors will sign the COC form over to the lab. COC procedures will be strictly adhered to for QA/QC purposes.
- **Effluent Sampling and Measurement Field Log (Appendix N):**
 - Names of sampling personnel;
 - Sampling date;
 - Separate times for samples and QA/QC samples recorded to the nearest minute;
 - A unique location and sample identification number;
 - Analysis constituent(s);
 - Weather conditions (including precipitation amount);
 - Sampling measurements and results; and
 - Other pertinent data and observations.
- **Visual Inspection Checklists:** When sampling is conducted, it will be noted on the Visual Inspection Checklist that samples for non-visible pollutants were collected during a rain event.

7.7.1.7 Data Evaluation and Reporting

The QSP shall complete an evaluation of the water quality sample analytical results.

Runoff/downgradient results shall be compared with the associated upgradient/unaffected results and any associated run-on results. Should the runoff/downgradient sample show an increased level of the tested analyte relative to the unaffected background sample, which cannot be explained by run-on results, the BMPs, site conditions, and surrounding influences will be assessed to determine the probable cause for the increase.

The site and data evaluation will determine appropriate BMP repair or modification to mitigate discharges of non-visible pollutant concentrations. Any revisions to the BMPs will be recorded as an amendment to the SWPPP.

The General Permit prohibits the discharge of stormwater that contains hazardous substances equal to or above reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4. Any non-stormwater discharge results that indicate the presence of a hazardous substance above established reportable quantities will be immediately reported to the Regional Water Board and other agencies as required by 40 C.F.R. §§ 117.3 and 302.4.

Results of non-visible pollutant monitoring shall be reported in the Annual Report.

7.7.2 SAMPLING AND ANALYSIS PLAN FOR pH AND TURBIDITY IN STORMWATER RUNOFF DISCHARGES

Sampling and analysis of runoff for pH and turbidity are required for this Project during qualifying storm events. This Plan describes the strategy for monitoring turbidity and pH levels of stormwater runoff discharges from the Project site and run-on that may contribute to an exceedance of a Numeric Action Level (NAL).

Samples for turbidity will be collected from all drainage areas with disturbed soil areas, and samples for pH will be collected from all drainage areas with a high risk of pH altering discharge. A sample will be collected during qualifying events, storms generating 0.5-inches or more of rainfall. An equivalent qualifying snow event is assumed to be 5-inches or more of snowfall, based on a snow to rain ratio of 10:1.

7.7.2.1 *Sample Collection Criteria*

Stormwater runoff samples shall be collected for turbidity from each day of a qualifying rain event, during scheduled site business hours, that results in a discharge from the Project. At a minimum, turbidity samples will be collected from each site discharge location draining a disturbed area. A minimum of one sample will be collected per day of discharge during a qualifying event. Samples should be representative of the total discharge from the Project each day of discharge during the qualifying event.

Stored or collected water from a qualifying storm event when discharged shall be tested for turbidity and pH (when applicable). Stored or collected water from a qualifying event may be sampled at the point it is released from the storage or containment area or at the site discharge location.

Run-on samples shall be collected whenever the QSP identifies that run-on has the potential to contribute to an exceedance of a NAL.

7.7.2.2 Sampling Locations

Sampling locations are based on the Project runoff discharge locations and locations where run-on enters the sites; accessibility for sampling; and personnel safety. Planned pH and turbidity sampling locations are shown on the Site Maps in **Appendix A** and include the locations identified in **Table 7-4**.

Six (6) sampling locations on the Project have been identified for the collection of runoff samples. Table 7-4 also provides an estimate of the total project drainage area that drains through each of the sampling locations. The total drainage area at ML_01 is 5.2 square miles and captures the watershed area upstream of any construction disturbances. ML_02 is the downstream end of the project and captures the entire 9.3 square mile watershed.

Table 7-4 Turbidity and pH Runoff Sample Locations

Location No.	Location	Percentage of Project Area
ML_01*	Upstream of lower meadow	0%
ML_06	Davies Creek downstream of construction area	100%

*Site background sample site located upstream from construction.

Stations are approximate based on Engineering Plans.

7.7.2.3 Sample Collection Procedures

Samples of discharge shall be collected at the designated sampling locations shown on the Site Maps in **Appendix A**. Run-on samples shall be collected as needed within close proximity of the point of run-on to the Project.

Only personnel trained in water quality sampling and measurements working under the direction of the QSP shall collect samples.

An adequate stock of monitoring supplies and equipment for monitoring turbidity and pH will be available prior to a sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain

or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained for the Project will include, but are not limited to, meters, extra batteries; clean powder-free nitrile gloves, sample collection equipment, appropriate sample containers, paper towels, personal rain gear, and *Effluent Sampling Field Log Sheets* and COC forms.

The QSP will obtain and maintain the field testing instruments for analyzing samples by contractor sampling personnel.

Samples shall be analyzed for the constituents indicated in **Table 7-5**.

Table 7-5 Sample Collection and Analysis for Monitoring Turbidity and pH

Parameter	Test Method	Minimum Sample Volume ⁽¹⁾	Sample Collection Container Type	Detection Limit (minimum)
Turbidity	Field meter/probe with calibrated portable instrument	500 mL	Polypropylene or Glass (Do not collect in meter sample cells)	1 NTU
pH	Field meter/probe with calibrated portable instrument or calibrated pH test kit	100 mL	Polypropylene	0.2 pH units
Notes: ¹ Minimum sample volume recommended. Specific volume requirements will vary by instrument; check instrument manufacturer instructions. L – Liter mL – Milliliter NTU – Nephelometric Turbidity Unit				

Samples collected for field analysis, collection, analysis and equipment calibration shall be in accordance with the instrument manufacturer's specifications.

Immediately following collection, samples shall be tested in accordance with the instrument manufacturer's instructions and results recorded on the *Effluent Sampling Field Log Sheet*.

The instrument(s) listed in **Table 7-6** or equivalent will be used to analyze the following constituents:

Table 7-6 Turbidity and pH Instruments

Instrument (Manufacturer and Model)	Constituent
ExStik PH100, YSI Pro 10, or Hanna pH meters	pH
Hach 2100P portable turbidimeter or Hanna Meter 93703	Turbidity

The pH meter will be calibrated using a three-point calibration with pH 4, 7, and 10 standards at least once per month. A calibration check should be performed prior to each sampling event. Allowable drift is ± 0.2 . If the calibration check reveals that pH meter needs calibration, calibration shall be performed before any samples are collected. Meter calibration will be documented on the calibration log which is kept with each meter.

Stormwater pH readings will be collected by either: 1) submerging the electrode end of the meter directly in the flow of the water being sampled, or 2) collecting stormwater in the small plastic container (kept with the pH meter) and submerging the electrode end of the meter directly in the collected water. Allow the meter to equilibrate for at least 30 seconds before recording pH to the nearest 0.1 pH unit. Make sure to replace the cap on the electrode and that the sponge inside the cap is moist (with pH 4 solution).

The turbidimeter will be calibrated at least once every three months (per manufacturer's recommendations), using the standard calibration instructions for the meter. A calibration check will be performed prior to each sampling event. Allowable drift is ± 2 NTUs. If calibration check indicates that meter needs calibration, calibration shall be performed before any samples are collected. Meter calibration will be documented on the calibration log which is kept with each meter.

Stormwater samples for turbidity will be collected using a separate container, and then transferred to the sample cell for reading. The sample cell should be wiped with a clean, lint-free cloth before each use. If settling particles are visible in the sample cell, take one reading before settling and one reading after settling, then average the two readings. If the sample reading is outside of the calibration standard limits, recalibrate with a different standard.

The QSP may authorize alternate equipment provided that the equipment meets the Construction General Permit's requirements.

7.7.2.4 Data Evaluation and Reporting

Immediately upon completing the measurements for the sampling event, the QSP shall evaluate the sampling results.

Numeric Action Levels

This Project is subject to NALs for pH and turbidity (**Table 7-7**). Compliance with the NAL for pH and turbidity is based on a daily average. Upon receiving the field log sheets, the QSP shall immediately calculate the arithmetic average of the turbidity samples, and the logarithmic average of the pH samples¹ to determine if the NALs, shown in the table below, have been exceeded.

Table 7-7 Numeric Action Levels

Parameter	Unit	Numeric Action Level Daily Average
pH	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	NTU	10% above background (general operations not related to in-stream work) 20 NTU above background (during install/decommissioning of in-stream facilities) 50 NTU above background (for rewetting of constructed channels)

The QSP shall within 2 days of the sample collection submit copies of the completed *Effluent Sampling Field Log Sheets* to LPR or Representative.

¹ Daily average pH values must be calculated through the logarithmic method. In order to calculate an average, you must: (1) Convert the pH measurements from logarithms to real numbers; (2) Take the average of the real numbers; and (3) Convert the average of the real numbers back to a logarithm.

In the event that the pH or turbidity NAL is exceeded, the QSP shall immediately notify LRP, Owner and/or Representative and investigate the cause of the exceedance and identify corrective actions.

Exceedances of NALs shall be electronically reported to the State Water Board by LRP or Representative through the SMARTs system within ten (10) days of the conclusion of the storm event. If requested by the Regional Board, a NAL Exceedance report will be submitted. The NAL Exceedance Report must contain the following information:

- Analytical method(s), method reporting unit(s), and MDL(s) of each parameter;
- Date, place, time of sampling, visual observation, and/or measurements, including precipitation; and
- Description of the current BMPs associated with the sample that exceeded the NAL and the proposed corrective actions taken.

7.7.3 TRAINING OF SAMPLING PERSONNEL

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program (SWAMP) 2008 Quality Assurance Program Plan. Training records of designated contractor sampling personnel are provided in **Appendix K**.

7.7.4 STORMWATER SAMPLE COLLECTION AND HANDLING

Sampling, generally field testing, for pH and turbidity will occur daily during qualifying storm events. Sampling for other constituents will occur on an as needed basis to monitor water quality. For potential non-visible pollutants and non-stormwater pollutants, see **Section 7.7.1**.

7.7.4.1 Sample Collection

Stormwater samples shall be collected at the designated sampling locations shown on the Site Maps (**Appendix A**) and listed in the preceding sections. Samples shall be collected, maintained and shipped in accordance with the SWAMP 2008 Quality Assurance Program Plan.

Stormwater grab samples shall be collected and preserved in accordance with the methods identified in preceding sections.

All sampling personnel shall follow the same protocols to maintain sample integrity and prevent cross-contamination sample collection as presented in **Section 7.7.1** for non-stormwater pollutants.

The most important aspect of grab sampling is to collect a sample that represents the entire runoff stream. Typically, samples are collected by dipping the collection container in the runoff flow paths and streams as noted below or the use of a depth integrated sampler (like a DH-48).

- For small streams and flow paths, simply dip the bottle facing upstream until full.
- For larger stream that can be safely accessed, collect a sample in the middle of the flow stream by directly dipping the mouth of the bottle. Once again making sure that the opening of the bottle is facing upstream as to avoid any contamination by the sampler.
- For larger streams that cannot be safely waded, pole-samplers may be needed to safely access the representative flow.
- Avoid collecting samples from ponded, sluggish or stagnant water.
- Avoid collecting samples directly downstream from a bridge as the samples can be affected by the bridge structure or runoff from the road surface.

Note, that depending upon the specific analytical test, some containers may contain preservatives. These containers should **never** be dipped into the stream but filled indirectly from the collection container.

7.7.4.2 Sample Handling

Turbidity and pH measurements must be conducted immediately. Do not store turbidity or pH samples for later measurement.

Samples for laboratory analysis must be handled as follows. Immediately following sample collection:

- Cap sample containers;
- Complete sample container labels;
- Sealed containers in a re-sealable storage bag;

- Place sample containers into an ice-chilled cooler;
- Document sample information on the *Effluent Sampling Field Log Sheet*; and
- Complete the COC.

All samples for laboratory analysis must be maintained between at roughly 4 degrees Celsius during delivery to the laboratory. Samples must be kept on ice, or refrigerated, from sample collection through delivery to the laboratory. Place samples to be shipped inside coolers with ice. Make sure the sample bottles are well packaged to prevent breakage and secure cooler lids with packaging tape.

Ship samples that will be laboratory analyzed to the analytical laboratory right away. Hold times are measured from the time the sample is collected to the time the sample is analyzed. The General Permit requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory).

Laboratory Name: Western Environmental Testing Laboratory (WETLAB)
Address: 475 E. Greg St. #119
City, State Zip: Sparks, NV 89431
Telephone Number: 775.355.0202
Point of Contact: Logan Greenwood

7.7.4.3 Sample Documentation Procedures

All original data documented on sample bottle identification labels, *Effluent Sampling Field Log Sheet*, and COCs shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the *Effluent Sampling Field Log Sheet*.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location.

Field Log Sheets: Sampling personnel shall complete the *Effluent Sampling Field Log Sheet* for each sampling event, as appropriate.

Chain of Custody: Sampling personnel shall complete the COC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the COC when the sample(s) is turned over to the testing laboratory or courier.

7.8 Active Treatment System Monitoring

An Active Treatment System (ATS) will not be used for this Project. This Project does not require a project specific Sampling and Analysis Plan for an ATS because deployment of an ATS is not planned.

7.9 Bioassessment Monitoring

This Project is not subject to bioassessment monitoring because it is not a Risk Level 3 project.

7.10 Quality Assurance and Quality Control

Basic quality assurance and quality control (QA/QC) requirements

An effective Quality Assurance and Quality Control (QA/QC) plan shall be implemented as part of the CSMP to ensure that analytical data can be used with confidence. QA/QC procedures to be initiated include the following:

- Field logs;
- Clean sampling techniques;
- COCs;
- QA/QC Samples; and
- Data verification.

Each of these procedures is discussed in more detail in the following sections.

7.10.1 FIELD LOGS

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). Field measurements for pH and turbidity should also be recorded in the field log. A Visual Monitoring BMP Inspection Log, an Effluent Sampling and Measurement Field Log Sheets are included in **Appendix I** and **Appendix N**.

7.10.2 CLEAN SAMPLING TECHNIQUES

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in **Section 7.7**, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

7.10.3 CHAIN OF CUSTODY

The sample COC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample COC procedures include the following:

- Proper labeling of samples;
- Use of COC forms for all samples; and
- Prompt sample delivery to the analytical laboratory.

Analytical laboratories usually provide COC forms to be filled out for sample containers. A template COC is included in **Appendix O**.

7.10.4 QA/QC SAMPLES

QA/QC samples provide an indication of the accuracy and precision of the sample collection; sample handling; field measurements; and analytical laboratory methods. The following types of QA/QC will be conducted for this Project:

- Field Duplicates at a frequency of 1 duplicate per storm event.
(Required for all sampling plans with field measurements or laboratory analysis)
- Equipment Blanks at a frequency of 1 duplicate per sampling event.
(Only needed if equipment used to collect samples could add the pollutants to sample)

7.10.4.1 Field Duplicates

Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples shall be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected shall be randomly selected from the discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as close in time as possible to the original sample. Duplicate samples shall not influence any evaluations or conclusion.

7.10.4.2 Equipment Blanks

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when:

- New equipment is used;
- Equipment that has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or
- Whenever a new lot of filters is used when sampling metals.

7.10.5 DATA VERIFICATION

After results are received from the analytical laboratory, the QSP shall verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified as soon as the data reports are received. Data verification shall include:

- Check the COC and laboratory reports.
Make sure all requested analyses were performed, and all samples are accounted for in the reports.

- Check laboratory reports to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- Check data for outlier values and follow up with the laboratory.
Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP should especially note data that is an order of magnitude or more different than similar locations or is inconsistent with previous data from the same location.
- Check laboratory QA/QC results.
EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP shall evaluate the reported QA/QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA/QC checks are outside acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.
- Check the data set for outlier values and, accordingly, confirm results and re-analyze samples where appropriate.
Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.

Field data including inspections and observations must be verified as soon as the field logs are received, typically at the end of the sampling event. Field data verification shall include:

- Check field logs to make sure all required measurements were completed and appropriately documented;
- Check reported values that appear out of the typical range or inconsistent; Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling;
- Verify equipment calibrations;
- Review observations noted on the field logs; and

- Review notations of any errors and actions taken to correct the equipment or recording errors.

7.11 Records Retention

All records of stormwater monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least three years from date of submittal or longer if required by the Regional Water Board.

Results of visual monitoring, field measurements, and laboratory analyses must be kept in the SWPPP along with COCs, and other documentation related to the monitoring.

Records are to be kept onsite while construction is ongoing. Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and/or measurements, including precipitation;
- The individual(s) who performed the inspections, sampling, visual observation, and/or field measurements;
- The date and approximate time of field measurements and laboratory analyses;
- The individual(s) who performed the laboratory analyses;
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used;
- QA/QC records and results;
- Calibration records;
- Visual observation and sample collection exemption records; and
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections and NAL Exceedance Reports.

8 REFERENCES

California Regional Water Quality Control Board Lahontan Region, 1995, Water quality control plan for the Lahontan region north and south basins, p. 28

CASQA, 2012, *Stormwater BMP handbook portal: construction*, November 2012, www.casqa.org

Hastings, B. and Kulchawik, P., 2021 Design Basis Report Lacey Meadows Restoration Design: Balance Hydrologics consulting report prepared for Truckee River Watershed Council and Truckee Donner Land Trust, 46 p.

Hastings, B., Shaw, D., Wacker, M., Loffland, H., and Lindstrom, S., 2013, Lacey Meadows assessment, Sierra and Nevada Counties, California, Balance Hydrologics consulting report prepared for Truckee River Watershed Council, Truckee, California, 183 p. + appendices.

State Water Resources Control Board (2012). Order 2012-0006-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

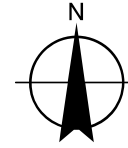
CONSTRUCTION SITE MANAGEMENT PROGRAM RECORDS

<Place copies of CSMP recoded here>

APPENDIX A: SITE MAPS

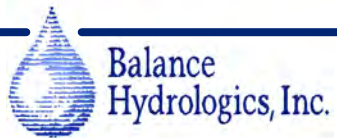
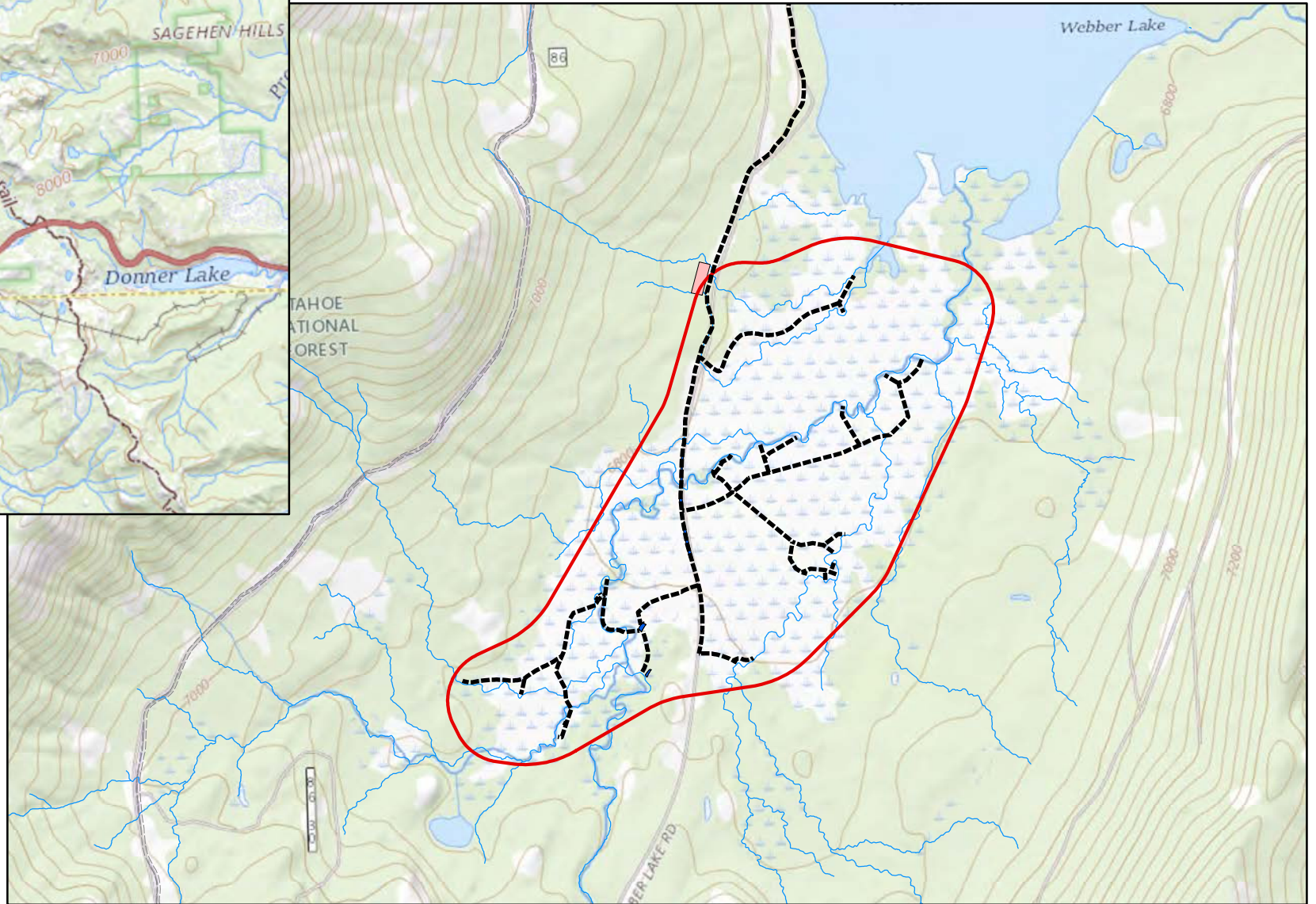


0 2 4 Miles



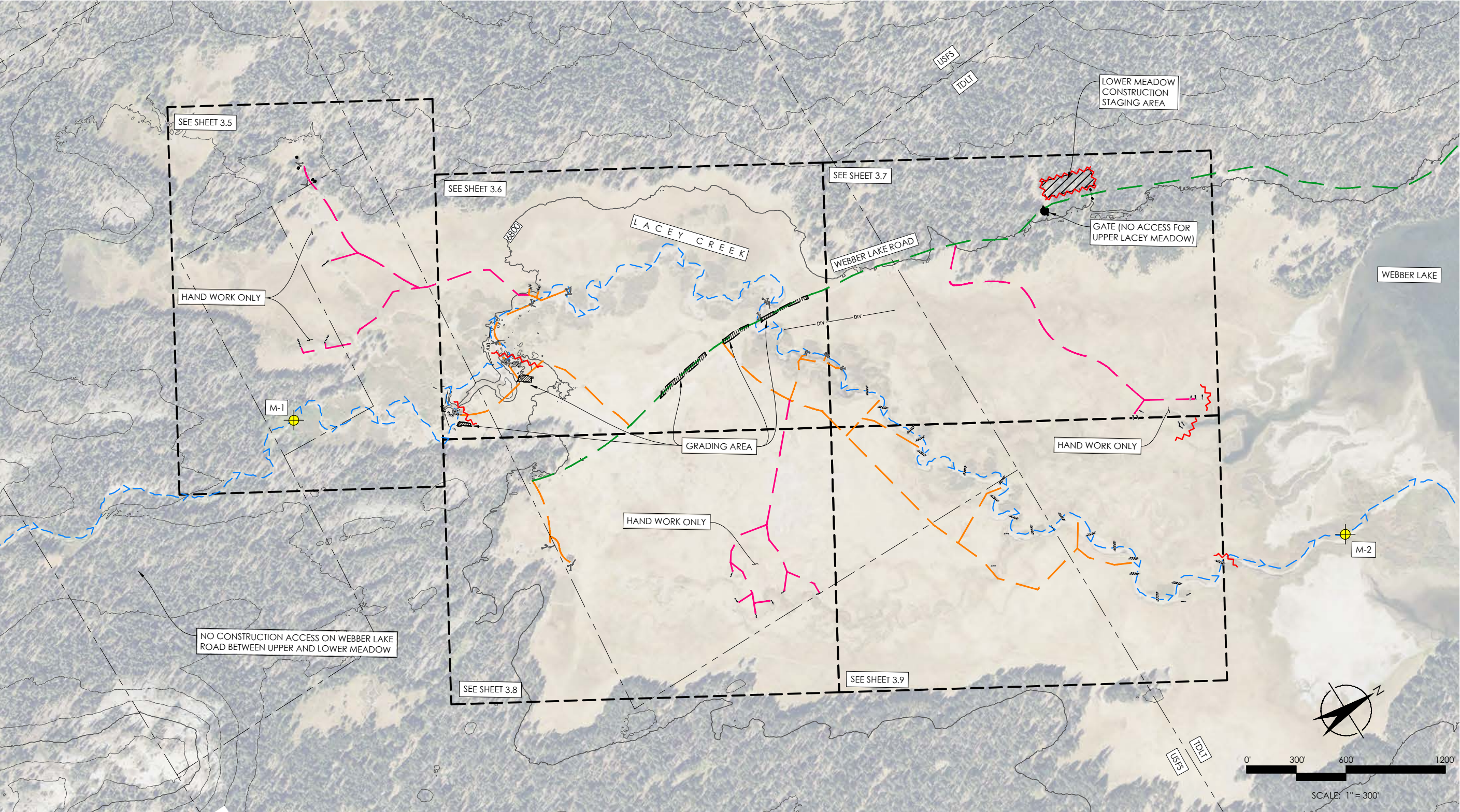
0 1,000 2,000 4,000 Feet

- Access Routes
- Project Area
- Staging Area
- Grading Extents
- Creeks



Appendix A-1 Lower Lacey Meadow Restoration Project Location Map Sierra County, California

Basemap source: ESRI and the GIS user community



LEGEND:

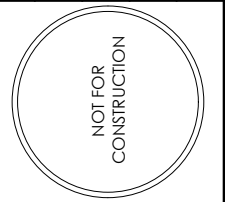
	40' CONTOUR		PROPOSED CONSTRUCTION STAGING AREA
	EXISTING CHANNEL		PROPOSED GRADING AREA
	COUNTY BOUNDARY		FIBER ROLL/WATTLE
	PROPERTY BOUNDARY		GRAVEL BAG
	TEMPORARY CONSTRUCTION ACCESS ROUTE WITH EQUIPMENT LIMITATIONS		LOG WITH ROOTWAD
	TEMPORARY CONSTRUCTION ACCESS ROUTE WITH NO EQUIPMENT LIMITATIONS		LOG
	FOOT ACCESS ONLY		MONITORING LOCATION
	DIVERSION		

NOTES:

- BMPs for temporary construction access routes with equipment restrictions will be determined in field on an individual basis. Meadow mats may be necessary per direction of the engineer's representative and TRWC.
- CONSTRUCTION ACCESS ROUTES ARE CLASSIFIED AS FOLLOWS:
 - 2.1. ROUTES WITH EQUIPMENT LIMITATIONS
 - 2.1.1. TRACKED EQUIPMENT ONLY IS ALLOWED. TRIPS BETWEEN WORK AREAS AND WEBBER LAKE ROAD ARE ALLOWED FOR RE-FUELING AND MAINTENANCE ONLY. MINIMIZE TRIPS ACROSS MEADOW SURFACES TO THE MAXIMUM EXTENT POSSIBLE.
 - 2.1.2. LIMITED HAULING IS REQUIRED TO TRANSPORT MATERIAL BETWEEN PILOT CHANNEL 1 AND PILOT CHANNEL 2; THIS IS THE ONLY EXCEPTION FOR WHERE RUBBER TIRED EQUIPMENT IS ALLOWED ON ROUTES WITH EQUIPMENT LIMITATIONS, HOWEVER, THE CONTRACTOR IS ENCOURAGED TO USE ALTERNATIVE, LOW GROUND PRESSURE EQUIPMENT FOR HAULING.
 - 2.1.3. NO WORK TRUCKS, BUGGIES, ATVs, OR OTHER SMALL RUBBER TIRED EQUIPMENT IS ALLOWED.

- 2.1.4. WATER TRUCKS AND WATER TRUCK DRIVERS ARE NOT PERMITTED, PREFERABLY FROM ALL PORTIONS OF THE CONSTRUCTION SITE.
- 2.2. ROUTES WITH NO EQUIPMENT LIMITATIONS
- 2.3. ROUTES WITH EQUIPMENT PROHIBITIONS (FOOT TRAVEL AND HAND TOOLS ONLY; LIMITED TRIPS BY TRACKED EQUIPMENT FOR MATERIALS TRANSPORT ALLOWED WITH APPROVAL FROM THE ENGINEER'S REPRESENTATIVE).
- 2.4. EXISTING WEBBER LAKE ROAD IS THE ONLY CONSTRUCTION ACCESS ROUTES WITH NO EQUIPMENT LIMITATIONS.

DESIGNED BY	DATE	BY	SUBMITTALS / REVISIONS
BKH	-	DE	SWPPP
DRAWN BY			
CHECKED BY			
IN CHARGE			
PK			
DATE			



BMP PLAN
LOWER LACEY MEADOW
RESTORATION DESIGN
SIERRA AND NEVADA COUNTIES, CALIFORNIA

PROJECT NUMBER
218199
SCALE (AT 22" X 34")
1" = 300'
APPENDIX

APPENDIX B: PROJECT ENGINEERING PLANS

APPENDIX C: PERMIT REGISTRATION DOCUMENTS

Permit Registration Documents included in this Appendix

	Permit Registration Document
	Notice of Intent
	Risk Assessment
	Certification
	Post Construction Water Balance
	Copy of Annual Fee Receipt
	ATS Design Documents
Y	Site Map, see Appendix A

APPENDIX D: SWPPP AMENDMENT CERTIFICATIONS

SWPPP Amendment No. _____

Project Name: _____

Project Number: _____

Date: _____

SWPPP Section
Amended: _____

Amendment
Description: _____

Qualified SWPPP Developer's Certification of the

Stormwater Pollution Prevention Plan Amendment

"This Stormwater Pollution Prevention Plan and appendices were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Order No. 2009-009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

QSD's Signature

Date

QSD Name

QSD Certificate Number

APPENDIX E: RISK LEVEL DETERMINATION CALCULATIONS

	A	B	C
1	Sediment Risk Factor Worksheet		Entry
2	A) R Factor - Rainfall runoff erosivity		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites		
5	R Factor Value		8.07
6	B) K Factor (weighted average, by area, for all site soils) - Soil erodability		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx		
9	K Factor Value		0.17
10	C) LS Factor (weighted average, by area, for all slopes)		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	LS Factor Value		5.56
14			
15	Watershed Erosion Estimate (=RxKxLS) in tons/acre		7.627764
16	Site Sediment Risk Factor		Low
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet		Entry	Score
A. Watershed Characteristics		yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment (For help with impaired waterbodies please visit the link below) or has a USEPA approved TMDL implementation plan for sediment ?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml OR		yes	High
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml			

Combined Risk Level Matrix

		<u>Sediment Risk</u>		
		Low	Medium	High
<u>Receiving Water Risk</u>	Low	Level 1	Level 2	
	High	Level 2		Level 3

Project Sediment Risk: Low
Project RW Risk: High
Project Combined Risk: Level 2

APPENDIX F: CONSTRUCTION SCHEDULE

APPENDIX G: SUBMITTED CHANGES TO PRDS

Log of Updated PRDs

The General Permit allows for the reduction or increase of the total acreage covered under the General Permit when a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in total disturbed area if a change in permit covered acreage is to be sought. The SWPPP shall be modified appropriately, with revisions and amendments recorded in Appendix C. Updated PRDs submitted electronically via SMARTS can be found in this Appendix.

This appendix includes all of the following updated PRDs (check all that apply):

- ☐ Revised Notice of Intent (NOI);
- ☐ Revised Site Map;
- ☐ Revised Risk Assessment;
- ☐ New landowner's information (name, address, phone number, email address); and
- ☐ New signed certification statement.

Legally Responsible Person [if organization]

Signature of [Authorized Representative of]
Legally Responsible Person or Approved
Signatory

Name of [Authorized Representative of] Legally
Responsible Person or Approved Signatory

Date

Telephone Number

APPENDIX H: TEMPORARY BMP TECHNICAL NOTES

Best Management Practices (BMPs) Factsheets

Erosion Control

- EC-1 Scheduling
- EC-2 Preservation of Existing Vegetation
- EC-4 Hydroseeding
- EC-6 Straw Mulch
- EC-8 Wood Mulching
- EC-15 Soil Preparation/Roughening

Sediment Control

- SE-3 Sediment Trap
- SE-5 Fiber Rolls
- SE-6 Gravel Bag Berms

Wind Erosion Controls

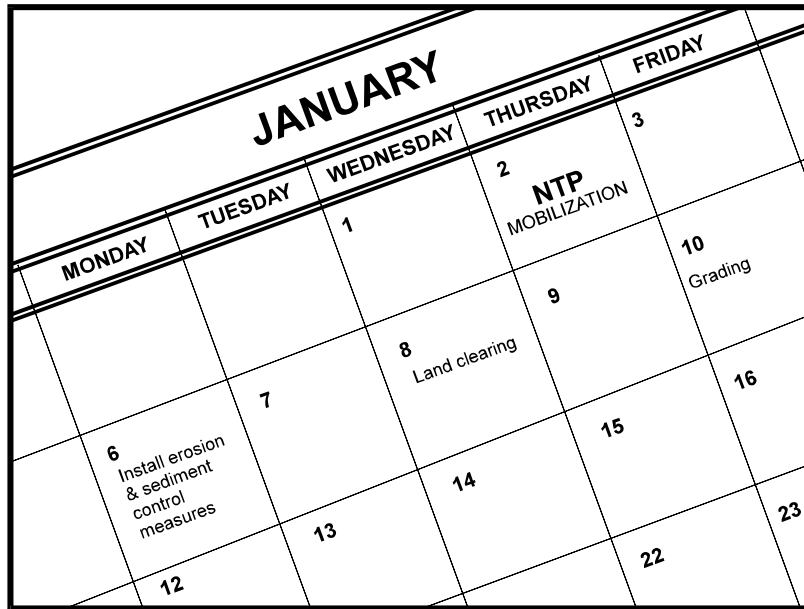
- WE-1 Wind Erosion Control

Non-Stormwater Management

- NS-1 Water Conservation Management
- NS-7 Potable Water/Irrigation
- NS-8 Vehicle and Equipment Cleaning
- NS-9 Vehicle and Equipment Fueling
- NS-10 Vehicle and Equipment Maintenance

Waste Management & Materials Pollution Control

- WM-2 Material Use
- WM-3 Stockpile Management
- WM-4 Spill Prevention Control
- WM-5 Solid Waste Management
- WM-6 Hazardous Waste Management
- WM-9 Sanitary/Septic Waste Management



Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	<input checked="" type="checkbox"/>
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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to soil disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
 - Erosion control BMPs
 - Sediment control BMPs
 - Tracking control BMPs
 - Wind erosion control BMPs
 - Non-stormwater BMPs
 - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
 - Sequence trenching activities so that most open portions are closed before new trenching begins.
 - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
 - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year-round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year-round and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the **project's defined seeding window**.
- Avoid soil disturbance during periods with high wind velocities.

Costs

Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost effectiveness of scheduling techniques

should be compared with the other less effective erosion and sedimentation controls to achieve a cost-effective balance.

Inspection and Maintenance

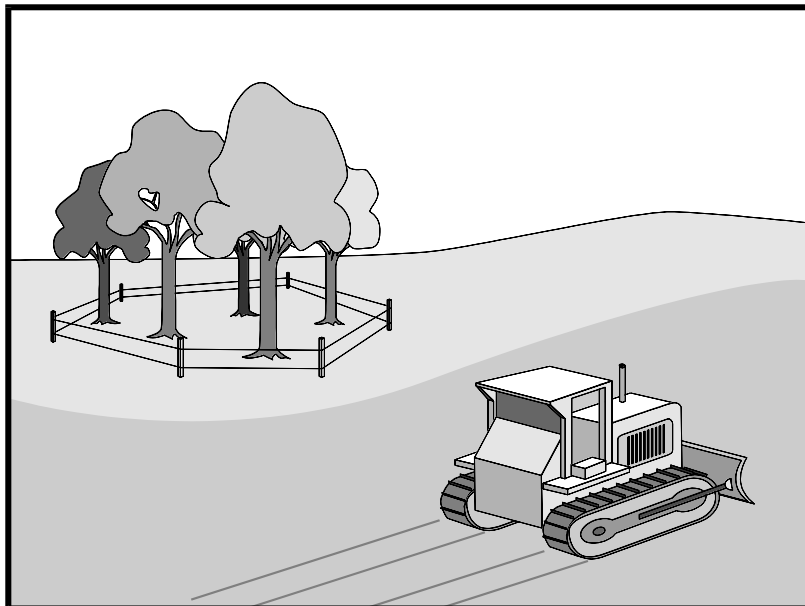
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

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-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

Preservation of Existing Vegetation EC-2



Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.
- Protecting existing vegetation buffers and swales.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Preservation of Existing Vegetation EC-2

Limitations

- Requires forward planning by the owner/developer, contractor, and design staff.
- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

Implementation

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable **existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area** around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

Timing

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

Design and Layout

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.
 - Orange colored plastic mesh fencing works well.
 - Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.
- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

Preservation of Existing Vegetation EC-2

- Consider pruning or mowing vegetation instead of removing it to allow for regrowth.
- If possible, retain vegetation buffer around the site and adjacent waterways.

Costs

There is little cost associated with preserving existing vegetation if properly planned during the project design, and these costs may be offset by aesthetic benefits that enhance property values. During construction, the cost for preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of \$10,000 per tree.

Inspection and Maintenance

During construction, the limits of disturbance should remain clearly marked at all times. Irrigation or maintenance of existing vegetation should be described in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below should be followed:

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a tree's root zone by punching holes 12 in. deep with an iron bar and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization:

Preservation of Existing Vegetation EC-2

- Fertilize trees in the late fall or early spring. Although to note, many native species do not require fertilization.
- Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.
- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

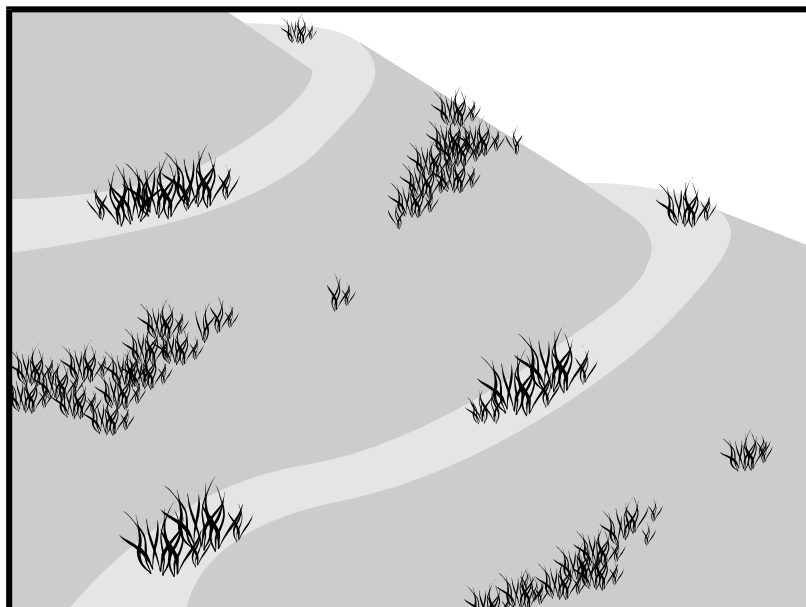
References

County of Sacramento Tree Preservation Ordinance, September 1981.

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

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

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



Description and Purpose

Hydroseeding typically consists of applying a mixture of a hydraulic mulch, seed, and water with the possible addition of tackifier, compost, mycorrhizae inoculant, fertilizer, and/or soil conditioner, to temporarily protect exposed soils from erosion by water and wind. Hydraulic seeding, or hydroseeding, is simply the method by which temporary or permanent seed is applied to the soil surface and temporary erosion control is established by means of the mulch component.

Suitable Applications

Hydroseeding is suitable for disturbed areas requiring temporary protection until permanent stabilization is established, for disturbed areas that will be re-disturbed following an extended period of inactivity, or to apply permanent stabilization measures. Hydroseeding without mulch or other cover (e.g., EC-7, Geotextiles and Mats) is not a stand-alone erosion control BMP and should be combined with additional measures until vegetation establishment.

Typical applications for hydroseeding include:

- Disturbed soil/graded areas where permanent stabilization or continued earthwork is not anticipated prior to seed germination.
- Cleared and graded areas exposed to seasonal rains or temporary irrigation.
- To vegetate swales and earthen berms.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

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

Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-5 Soil Binders
- EC-6 Straw Mulch
- EC-7 Geotextiles and Mats
- EC-8 Wood Mulching
- EC-14 Compost Blanket
- EC-16 Non-Vegetative Stabilization

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- Areas not subject to heavy wear by construction equipment or high traffic.

Limitations

- Availability of hydroseeding equipment may be limited just prior to the rainy season and prior to storms due to high demand.
- Hydraulic seed should be applied with hydraulic mulch or a stand-alone hydroseed application should be followed by one of the following:
 - Straw mulch (see Straw Mulch EC-6)
 - Rolled erosion control products (see Geotextiles and Mats EC-7)
 - Application of Compost Blanket (see Compost Blanket EC-14)

Hydraulic seed may be used alone only on small flat surfaces when there is sufficient time in the season to ensure adequate vegetation establishment and coverage to provide adequate erosion control.

- Hydraulic seed without mulch does not provide immediate erosion control.
- Temporary seeding may not be appropriate for steep slopes (i.e., slopes readily prone to rill erosion or without sufficient topsoil).
- Temporary seeding may not be appropriate in dry periods without supplemental irrigation.
- Temporary vegetation may have to be removed before permanent vegetation is applied.
- Temporary vegetation may not be appropriate for short term inactivity (i.e., less than 3-6 months).
- Vegetation may not establish when hydroseed is applied to very compact soils.
- Mulch may inhibit germination when applied at high rates.
- This BMP consists of a mixture of several constituents (e.g., fibers/mulches, tackifiers, and other chemical constituents), some of which may be proprietary and may come pre-mixed by the manufacturer. The water quality impacts of these constituents are relatively unknown, and some may have water quality impacts due to their chemical makeup. Additionally, these constituents may require non-visible pollutant monitoring. Refer to specific chemical properties identified in the product's Safety Data Sheet (SDS), although, note that not all **SDS's provide ecological information**; products should be evaluated for project-specific implementation by the QSD. Refer to fact sheet EC-05, Soil Binders, for further guidance on selecting soil binders.

Implementation

In order to select appropriate hydraulic seed mixtures, an evaluation of site conditions should be performed with respect to:

- Soil conditions
- Site topography and exposure (sun/wind)
- Season and climate
- Vegetation types
- Maintenance requirements
- Sensitive adjacent areas
- Water availability
- Plans for permanent vegetation

The local office of the U.S.D.A. Natural Resources Conservation Service (NRCS), Resource Conservation Districts and Agricultural Extension Service can provide information on appropriate seed mixes.

The following steps should be followed for implementation:

- Where appropriate or feasible, soil should be prepared to receive the seed by disking or otherwise scarifying (See EC-15, Soil Preparation) the surface to eliminate crust, improve air and water infiltration and create a more favorable environment for germination and growth.
- Avoid use of hydraulic seed in areas where the BMP would be incompatible with future earthwork activities.
- Hydraulic seed can be applied using a multiple step or one step process.
 - In a multiple step process, hydraulic seed is applied first, followed by mulch or a Rolled Erosion Control Product (RECP).
 - In the one step process, hydraulic seed is applied with hydraulic mulch in a hydraulic matrix. When the one step process is used to apply the mixture of fiber, seed, etc., the seed rate should be increased to compensate for all seeds not having direct contact with the soil.
- All hydraulically seeded areas should have mulch, or alternate erosion control cover to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow.
- All seeds should be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag should be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. The container should be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained. All legume seed should be pellet inoculated. Inoculant sources should be species specific and should be applied at a rate of 2 lb of inoculant per 100 lb seed.
- Commercial fertilizer should conform to the requirements of the California Food and Agricultural Code, which can be found at: http://www.leginfo.ca.gov/.html/fac_table_of_contents.html. Fertilizer should be pelleted or granular form.
- Follow up applications should be made as needed to cover areas of poor coverage or germination/vegetation establishment and to maintain adequate soil protection.
- Avoid over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

Costs

Average cost for installation and maintenance may vary from as low as \$2,400 per acre for flat slopes and stable soils, to \$5,200 per acre for moderate to steep slopes and/or erosive soils. Cost of seed mixtures vary based on types of required vegetation.

BMP	Installed Cost per Acre
Hydraulic Seed	\$2,400-\$5,200

Source: Cost information received from individual product manufacturers solicited by Geosyntec Consultants (2004). Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.

Inspection and Maintenance

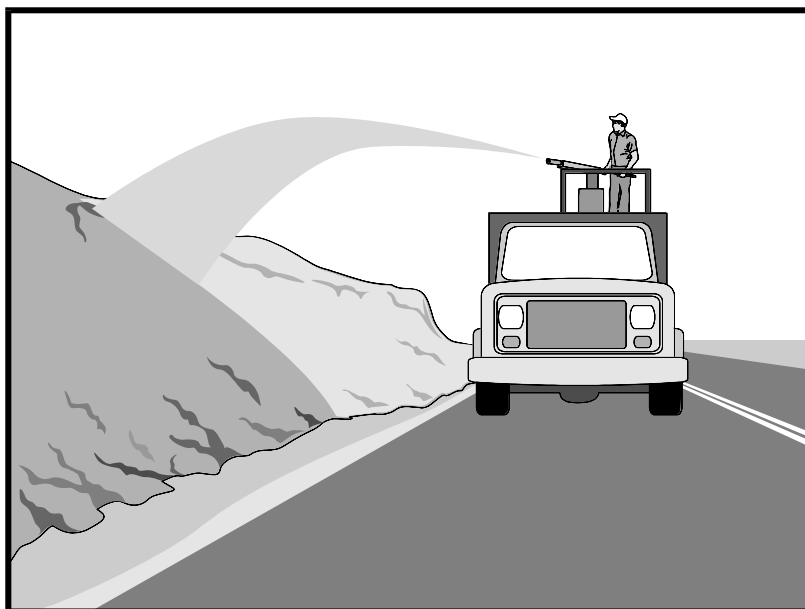
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Areas where erosion is evident should be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.
- Where seeds fail to germinate, or they germinate and die, the area must be re-seeded, fertilized, and mulched within the planting season, using not less than half the original application rates.
- Irrigation systems, if applicable, should be inspected daily while in use to identify system malfunctions and line breaks. When line breaks are detected, the system must be shut down immediately and breaks repaired before the system is put back into operation.
- Irrigation systems should be inspected for complete coverage and adjusted as needed to maintain complete coverage.

References

Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

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

Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transportation (Caltrans), November 1999.



Description and Purpose

Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil with a studded roller or crimper or anchoring it with a tackifier or stabilizing emulsion. Straw mulch protects the soil surface from the impact of rain drops, preventing soil particles from becoming dislodged.

Suitable Applications

Straw mulch is suitable for disturbed areas requiring temporary protection until permanent stabilization is established. Straw mulch can be specified for the following applications:

- As a stand-alone BMP on disturbed areas until soils can be prepared for permanent vegetation. The longevity of straw mulch is typically less than six months.
- Applied in combination with temporary seeding strategies
- Applied in combination with permanent seeding strategies to enhance plant establishment and final soil stabilization
- Applied around containerized plantings to control erosion until the plants become established to provide permanent stabilization

Limitations

Availability of straw and straw blowing equipment may be limited just prior to the rainy season and prior to storms due to high demand.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

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

Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-4 Hydroseeding
- EC-5 Soil Binders
- EC-7 Geotextiles and Mats
- EC-8 Wood Mulching
- EC-14 Compost Blanket

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- There is a potential for introduction of weed seed and unwanted plant material if weed-free agricultural straw is not specified.
- Straw mulch applied by hand is more time intensive and potentially costly.
- Wind may limit application of straw and blow straw into undesired locations.
- May have to be removed prior to permanent seeding or prior to further earthwork.
- **“Punching” of straw does not work in sandy soils, necessitating the use of tackifiers.**
- Potential fugitive dust control issues associated with straw applications can occur. Application of a stabilizing emulsion or a water stream at the same time straw is being blown can reduce this problem.
- Use of plastic netting should be avoided in areas where wildlife may be entrapped and may be prohibited for projects in certain areas with sensitive wildlife species, especially reptiles and amphibians.

Implementation

- Straw should be derived from weed-free wheat, rice, or barley. Where required by the plans, specifications, permits, or environmental documents, native grass straw should be used.
- Use tackifier to anchor straw mulch to the soil on slopes.
- Crimping, punch roller-type rollers, or track walking may also be used to incorporate straw mulch into the soil on slopes. Track walking can be used where other methods are impractical.
- Avoid placing straw onto roads, sidewalks, drainage channels, sound walls, existing vegetation, etc.
- Straw mulch with tackifier should not be applied during or immediately before rainfall.
- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

Application Procedures

- When using a tackifier to anchor the straw mulch, roughen embankment or fill areas by rolling with a crimping or punching-type roller or by track walking before placing the straw mulch. Track walking should only be used where rolling is impractical.
- Apply straw at a rate of between 3,000 and 4,000 lb./acre, either by machine or by hand distribution and provide 100% ground cover. A lighter application is used for flat surfaces and a heavier application is used for slopes.
- Evenly distribute straw mulch on the soil surface.
- Anchoring straw mulch to the soil surface by "punching" it into the soil mechanically (incorporating) can be used in lieu of a tackifier.

- Methods for holding the straw mulch in place depend upon the slope steepness, accessibility, soil conditions, and longevity.
 - A tackifier acts to glue the straw fibers together and to the soil surface. The tackifier should be selected based on longevity and ability to hold the fibers in place. A tackifier is typically applied at a rate of 125 lb./acre. In windy conditions, the rates are typically 180 lb./acre.
 - On very small areas, a spade or shovel can be used to punch in straw mulch.
 - On slopes with soils that are stable enough and of sufficient gradient to safely support construction equipment without contributing to compaction and instability problems, straw can be "punched" into the ground using a knife blade roller or a straight bladed coulter, known commercially as a "crimper."

Costs

Average annual cost for installation and maintenance is included in the table below. Application by hand is more time intensive and potentially more costly.

BMP	Unit Cost per Acre
Straw mulch, crimped or punched	\$3,150-\$6,900
Straw mulch with tackifier	\$2,300-\$6,200

Source: Cost information received from individual product suppliers solicited by Geosyntec Consultants (2004). Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.

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.
- Areas where erosion is evident should be repaired and BMPs re-applied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require re-application of BMPs.
- The key consideration in inspection and maintenance is that the straw needs to last long enough to achieve erosion control objectives. Straw mulch as a stand-alone BMP is temporary and is not suited for long-term erosion control.
- Maintain an unbroken, temporary mulched ground cover while disturbed soil areas are inactive. Repair any damaged ground cover and re-mulch exposed areas.
- Reapplication of straw mulch and tackifier may be required to maintain effective soil stabilization over disturbed areas and slopes.

References

Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

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

Controlling Erosion of Construction Sites, Agricultural Information Bulletin #347, U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service – SCS).

Guides for Erosion and Sediment Control in California, USDA Soils Conservation Service, January 1991.

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

Soil Erosion by Water, Agricultural Information Bulletin #513, U.S. Department of Agriculture, Soil Conservation Service.

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

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

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



Description and Purpose

Wood mulching consists of applying a mixture of shredded wood mulch or bark to disturbed soils. The primary function of wood mulching is to reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff.

Suitable Applications

Wood mulching is suitable for disturbed soil areas requiring temporary protection until permanent stabilization is established. Wood mulch may also be used for final stabilization; generally, used in a landscape setting or areas that will have pedestrian traffic.

Limitations

- Best suited to flat areas or gentle slopes or 5:1 (H:V) or flatter. Not suitable for use on slopes steeper than 3:1 (H:V). For slopes steeper than 3:1, consider the use of Compost Blankets (EC-14).
- Wood mulch may introduce unwanted species if it contains seed, although it may also be used to prevent weed growth if it is seed-free.
- Not suitable for areas exposed to concentrated flows.
- If used for temporary stabilization, wood mulch may need to be removed prior to further earthwork.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-4 Hydroseeding
- EC-5 Soil Binders
- EC-6 Straw Mulch
- EC-7 Geotextiles and Mats

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Implementation

Mulch Selection

There are many types of mulches. Selection of the appropriate type of mulch should be based on the type of application, site conditions, and compatibility with planned or future uses.

Application Procedures

Prior to application, after existing vegetation has been removed, roughen embankment and fill areas by rolling with a device such as a punching type roller or by track walking. The construction application procedures for mulches vary significantly depending upon the type of mulching method specified. Two methods are highlighted here:

- **Green Material:** This type of mulch is produced by the recycling of vegetation trimmings such as grass, shredded shrubs, and trees. Chipped brush from on-site vegetation clearing activities may be used (this may require stockpiling and reapplying after earthwork is complete). Methods of application are generally by hand although pneumatic methods are available.
 - Green material can be used as a temporary ground cover with or without seeding.
 - The green material should be evenly distributed on site to a depth of not more than 2 in.
- **Shredded Wood:** Suitable for ground cover in ornamental or revegetated plantings.
 - Shredded wood/bark is conditionally suitable. See note under limitations.
 - Distribute by hand or use pneumatic methods.
 - Evenly distribute the mulch across the soil surface to a depth of 2 to 3 in.
- Avoid mulch placement onto roads, sidewalks, drainage channels, existing vegetation, etc.

Costs

Assuming a 2-in. layer of wholesale landscaping-grade wood mulch, the average one-time cost for installation may range from \$15,000 – \$23,000 per acre¹. Costs can increase if the source is not close to the project site.

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.
- Areas where erosion is evident shall be repaired and BMPs reapplied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require reapplication of BMPs.

¹ Costs based on estimates provided by the California Department of Transportation's *Soil Stabilization BMP Research for Erosion and Sediment Controls Cost Survey Technical Memorandum*, CTSW-TM-07-172.35.1, July 2007 (available at: http://www.dot.ca.gov/hq/LandArch/16_la_design/guidance/estimating/Soil_Stabilization_Pricing.pdf) and adjusted for inflation from 1997 to 2016.

- Regardless of the mulching technique selected, the key consideration in inspection and maintenance is that the mulch needs to last long enough to achieve erosion control objectives. If the mulch is applied as a stand-alone erosion control method over disturbed areas (without seed), it should last the length of time the site will remain barren or until final re-grading and revegetation.
- Where vegetation is not the ultimate cover, such as ornamental and landscape applications of bark or wood chips, inspection and maintenance should focus on longevity and integrity of the mulch.
- Reapply mulch when bare earth becomes visible.

References

Controlling Erosion of Construction Sites Agriculture Information Bulletin #347, U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (formerly Soil Conservation Service – SCS).

Guides for Erosion and Sediment Control in California, USDA Soils Conservation Service, January 1991.

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

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

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Soil Erosion by Water Agricultural Information Bulletin #513, U.S. Department of Agriculture, Soil Conservation Service.

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http://www.dot.ca.gov/hq/LandArch/16_la_design/guidance/estimating/Soil_Stabilization_Pricing.pdf.

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



D

Soil Preparation/Roughening involves assessment and preparation of surface soils for BMP installation. This can include soil testing (for seed base, soil characteristics, or nutrients), as well as roughening surface soils by mechanical methods (including sheepsfoot rolling, track walking, scarifying, stair stepping, and imprinting) to prepare soil for additional BMPs, or to break up sheet flow. Soil Preparation can also involve tilling topsoil to prepare a seed bed and/or incorporation of soil amendments, to enhance vegetative establishment.

Suitable Applications

Soil preparation: Soil preparation is essential to proper vegetative establishment. In particular, soil preparation (i.e. tilling, raking, and amendment) is suitable for use in combination with any soil stabilization method, including Rolled Erosion Control Products (RECPs) or sod. Soil preparation should not be confused with roughening.

Roughening: Soil roughening is generally referred to as track walking (sometimes called imprinting) a slope, where treads from heavy equipment run parallel to the contours of the slope and act as mini terraces. Soil preparation is most effective when used in combination with erosion controls. Soil Roughening is suitable for use as a complementary process for controlling erosion on a site. Roughening is not intended to be used as a stand-alone BMP, and should be used with perimeter controls, additional erosion control measures, grade breaks, and vegetative establishment for maximum effectiveness. Roughening is intended to only affect surface soils and should not compromise slope stability or overall compaction. Suitable applications for soil roughening include:

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-5 Soil Binders
- EC-7 Geotextiles and Mats

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- Along any disturbed slopes, including temporary stockpiles, sediment basins, or compacted soil diversion berms and swales.
- Roughening should be used in combination with hydraulically applied stabilization methods, compost blanket, or straw mulch; but should not be used in combination with RECPs or sod because roughening is intended to leave terraces on the slope.

Limitations

- Preparation and roughening must take place prior to installing other erosion controls (such as hydraulically applied stabilizers) or sediment controls (such as fiber rolls) on the faces of slopes.
- In such cases where slope preparation is minimal, erosion control/revegetation BMPs that do not require extensive soil preparation - such as hydraulic mulching and seeding applications - should be employed.
- Consideration should be given to the type of erosion control BMP that follows surface preparation, as some BMPs are not designed to be installed over various types of tillage/roughening, i.e., RECPs should not be used with soil roughening due to a “bridging” effect, which suspends the blanket above the seed bed.
- Surface roughness has an effect on the amount of mulch material that needs to be applied, which shows up as a general increase in mulch material due to an increase in surface area (Topographic Index -see EC-3 Hydraulic Mulch).

Implementation

- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

General

A roughened surface can significantly reduce erosion. Based on tests done at the San Diego State Erosion Research Laboratory, various roughening techniques on slopes can result in a 12 - 76% reduction in the erosion rate versus smooth slopes.

Materials

Minimal materials are required unless amendments and/or seed are added to the soil. The majority of soil roughening/preparation can be done with equipment that is on hand at a normal construction site, such as bull dozers and compaction equipment.

Installation Guidelines

Soil Preparation

- Where appropriate or feasible, soil should be prepared to receive the seed by disking or otherwise scarifying the surface to eliminate crust, improve air and water infiltration and create a more favorable environment for germination and growth.
- Based upon soil testing conducted, apply additional soil amendments (e.g., fertilizers, additional seed) to the soil to help with germination. Follow EC-4, Hydroseeding, when selecting and applying seed and fertilizers.

Cut Slope Roughening:

- Stair-step grade or groove the cut slopes that are steeper than 3:1.
- Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair-step grading.
- Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the "step" in toward the vertical wall.
- Do not make individual vertical cuts more than 2 ft. (0.6 m) high in soft materials or more than 3 ft. (0.9 m) high in rocky materials.
- Groove the slope using machinery to create a series of ridges and depressions that run across the slope, on the contour.

Fill Slope Roughening:

- Place on fill slopes with a gradient steeper than 3:1 in lifts not to exceed 8 in. (0.2 m), and make sure each lift is properly compacted.
- Ensure that the face of the slope consists of loose, uncompacted fill 4-6 in. (0.1-0.2 m) deep.
- Use grooving or tracking to roughen the face of the slopes, if necessary.
- Do not blade or scrape the final slope face.

Roughening for Slopes to be Mowed:

- Slopes that require mowing activities should not be steeper than 3:1.
- Roughen these areas to shallow grooves by track walking, scarifying, sheepfoot rolling, or imprinting.
- Make grooves close together (less than 10 in.), and not less than 1 in. deep, and perpendicular to the direction of runoff (i.e., parallel to the slope contours).
- Excessive roughness is undesirable where mowing is planned.

Roughening with Tracked Machinery:

- Limit roughening with tracked machinery to soils with a sandy textural component to avoid undue compaction of the soil surface.
- Operate tracked machinery up and down the slope to leave horizontal depressions in the soil. Do not back-blade during the final grading operation.
- Seed and mulch roughened areas as soon as possible to obtain optimum seed germination and growth.

Costs

Costs are based on the additional labor of tracking or preparation of the slope plus the cost of any required soil amendment materials.

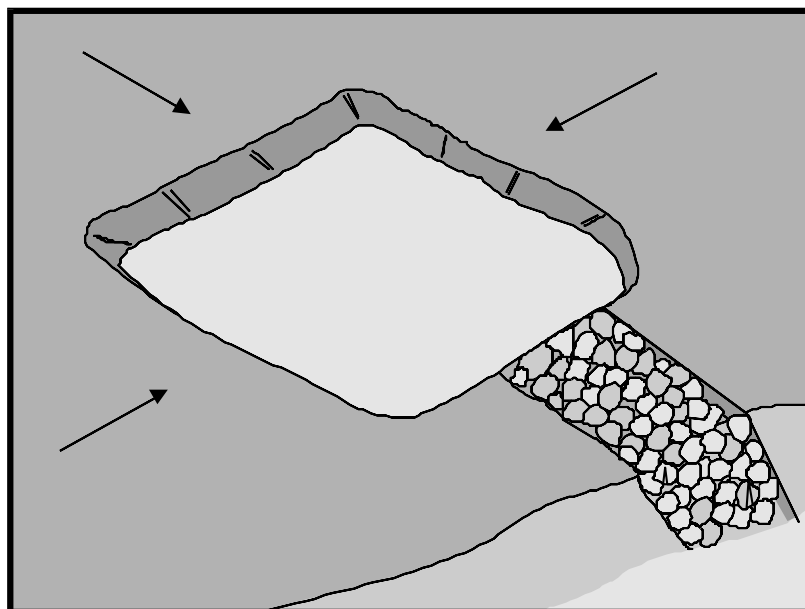
Inspection and Maintenance

- 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.
- Check the seeded slopes for signs of erosion such as rills and gullies. Fill these areas slightly above the original grade, then reseed and mulch as soon as possible.
- Inspect BMPs weekly during normal operations, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

References

Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

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



Description and Purpose

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out or before the runoff is discharged by gravity flow. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

Trap design guidance provided in this fact sheet is not intended to guarantee compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. Therefore, optimally designed and maintained sediment traps should be used in conjunction with a comprehensive system of BMPs.

Suitable Applications

Sediment traps should be considered for use:

- At the perimeter of the site at locations where sediment-laden runoff is discharged offsite.
- At multiple locations within the project site where sediment control is needed.
- Around or upslope from storm drain inlet protection measures.
- Sediment traps may be used on construction projects where the drainage area is less than 5 acres. Traps would be

Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-2 Sediment Basin (for larger areas)

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placed where sediment-laden stormwater may enter a storm drain or watercourse. SE-2, Sediment Basins, must be used for drainage areas greater than 5 acres.

- As a supplemental control, sediment traps provide additional protection for a water body or for reducing sediment before it enters a drainage system.

Limitations

- Requires large surface areas to permit infiltration and settling of sediment.
- Not appropriate for drainage areas greater than 5 acres.
- Only removes large and medium sized particles and requires upstream erosion control.
- Attractive and dangerous to children, requiring protective fencing.
- Conducive to vector production.
- Should not be located in live streams.

Implementation

Design

A sediment trap is a small temporary ponding area, usually with a gravel outlet, formed by excavation or by construction of an earthen embankment. Its purpose is to collect and store sediment from sites cleared or graded during construction. It is intended for use on small drainage areas with no unusual drainage features and projected for a quick build-out time. It should help in removing coarse sediment from runoff. The trap is a temporary measure with a design life of approximately six months to one year and is to be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 5 acres, refer to SE-2, Sediment Basins, or subdivide the catchment area into smaller drainage basins.

Sediment usually must be removed from the trap after each rainfall event. The SWPPP should detail how this sediment is to be disposed, such as in fill areas onsite, or removal to an approved offsite dump. Sediment traps used as perimeter controls should be installed before any land disturbance takes place in the drainage area.

Sediment traps are usually small enough that a failure of the structure would not result in a loss of life, damage to home or buildings, or interruption in the use of public roads or utilities. However, sediment traps are attractive to children and can be dangerous. The following recommendations should be implemented to reduce risks:

- Install continuous fencing around the sediment trap or pond. Consult local ordinances regarding requirements for maintaining health and safety.
- Restrict basin side slopes to 3:1 or flatter.

Sediment trap size depends on the type of soil, size of the drainage area, and desired sediment removal efficiency (see SE-2, Sediment Basin). As a rule of thumb, the larger the basin volume

the greater the sediment removal efficiency. Sizing criteria are typically established under the local grading ordinance or equivalent. The runoff volume from a 2-year storm is a common design criterion for a sediment trap. The sizing criteria below assume that this runoff volume is 0.042 acre-ft/acre (0.5 in. of runoff). While the climatic, topographic, and soil type extremes make it difficult to establish a statewide standard, the following criteria should trap moderate to high amounts of sediment in most areas of California:

- Locate sediment traps as near as practical to areas producing the sediment.
- Trap should be situated according to the following criteria: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where failure would not cause loss of life or property damage, and (3) to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area.
- Trap should be sized to accommodate a settling zone and sediment storage zone with recommended minimum volumes of 67 yd³/acre and 33 yd³/acre of contributing drainage area, respectively, based on 0.5 in. of runoff volume over a 24-hour period. In many cases, the size of an individual trap is limited by available space. Multiple traps or additional volume may be required to accommodate specific rainfall, soil, and site conditions.
- Traps with an impounding levee greater than 4.5 ft tall, measured from the lowest point to the impounding area to the highest point of the levee, and traps capable of impounding more than 35,000 ft³, should be designed by a Registered Civil Engineer. The design should include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the trap outlet and bypass structures.
- The outlet pipe or open spillway must be designed to convey anticipated peak flows.
- Use rock or vegetation to protect the trap outlets against erosion.
- Fencing should be provided to prevent unauthorized entry.

Installation

Sediment traps can be constructed by excavating a depression in the ground or creating an impoundment with a small embankment. Sediment traps should be installed outside the area being graded and should be built prior to the start of the grading activities or removal of vegetation. To minimize the area disturbed by them, sediment traps should be installed in natural depressions or in small swales or drainage ways. The following steps must be followed during installation:

- The area under the embankment must be cleared, grubbed, and stripped of any vegetation and root mat. The pool area should be cleared.
- The fill material for the embankment must be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment may be compacted by traversing with equipment while it is being constructed.
- All cut-and-fill slopes should be 3:1 or flatter.
- When a riser is used, all pipe joints must be watertight.

- When a riser is used, at least the top two-thirds of the riser should be perforated with 0.5 in. diameter holes spaced 8 in. vertically and 10 to 12 in. horizontally. See SE-2, Sediment Basin.
- When an earth or stone outlet is used, the outlet crest elevation should be at least 1 ft below the top of the embankment.
- When crushed stone outlet is used, the crushed stone used in the outlet should meet AASHTO M43, size No. 2 or 24, or its equivalent such as MSHA No. 2. Gravel meeting the above gradation may be used if crushed stone is not available.

Costs

Average annual cost per installation is \$15 ft² and plus additional costs for the design and maintenance.

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.
- Inspect outlet area for erosion and stabilize if required.
- Inspect trap banks for seepage and structural soundness, repair as needed.
- Inspect outlet structure and spillway for any damage or obstructions. Repair damage and remove obstructions as needed.
- Inspect fencing for damage and repair as needed.
- Inspect the sediment trap for area of standing water during every visit. Corrective measures should be taken if the BMP does not dewater completely in 96 hours or less to prevent vector production.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the trap capacity. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed of at an appropriate location.
- Remove vegetation from the sediment trap when first detected to prevent pools of standing water and subsequent vector production.
- BMPs that require dewatering shall be continuously attended while dewatering takes place. Dewatering BMPs per NS-2 shall be implemented at all times during dewatering activities.

References

Brown, W., and T. Schueler. The Economics of Stormwater BMPs in the Mid-Atlantic Region. Prepared for Chesapeake Research Consortium, Edgewater, MD, by the Center for Watershed Protection, Ellicott City, MD, 1997.

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National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

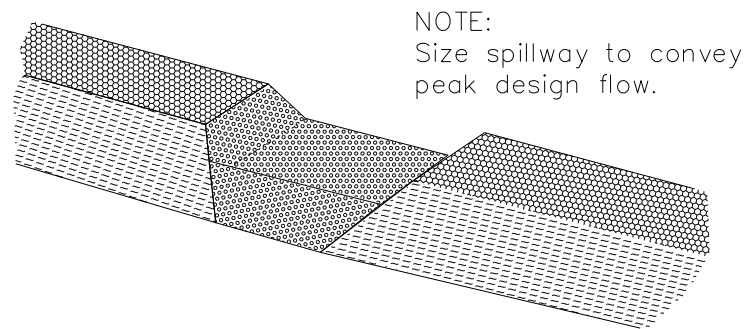
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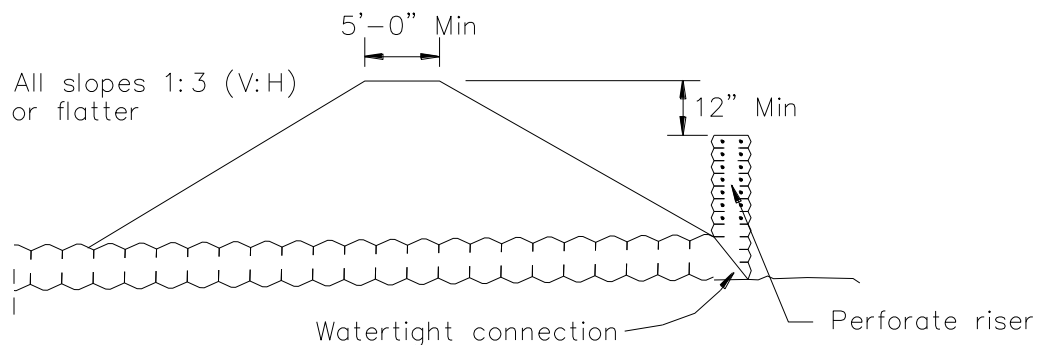
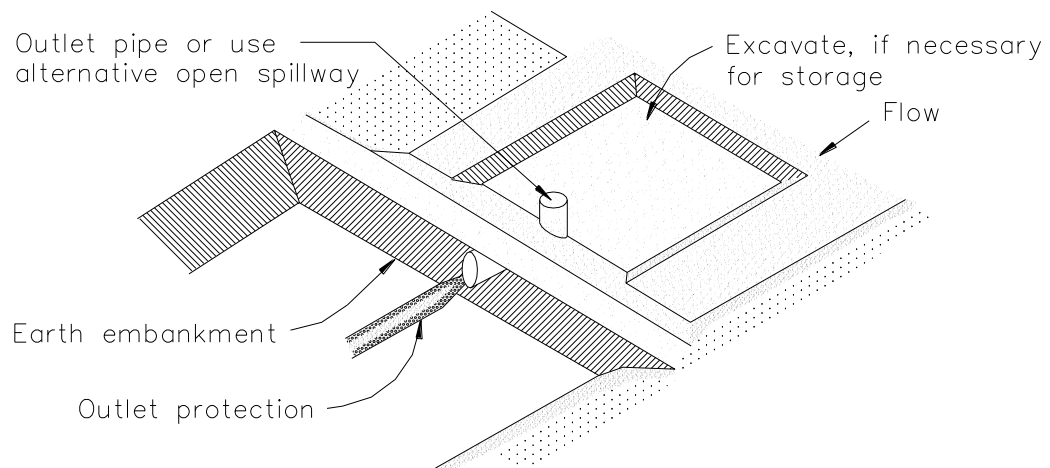
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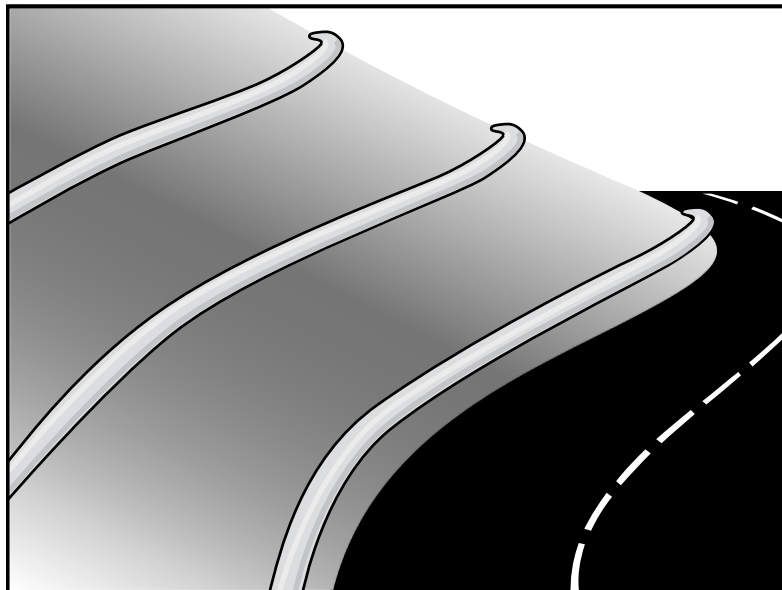
NOTE:
Size spillway to convey
peak design flow.

TYPICAL OPEN SPILLWAY



EMBANKMENT SECTION THRU RISER

TYPICAL SEDIMENT TRAP
NOT TO SCALE



Description and Purpose

A fiber roll (also known as wattles or logs) consists of straw, coir, curled wood fiber, or other biodegradable materials bound into a tight tubular roll wrapped by plastic netting, which can be photodegradable, or natural fiber, such as jute, cotton, or sisal. Additionally, gravel core fiber rolls are available, which contain an imbedded ballast material such as gravel or sand for additional weight when staking the rolls are not feasible (such as use as inlet protection). When fiber rolls are placed at the toe and on the face of slopes along the contours, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff (through sedimentation). By interrupting the length of a slope, fiber rolls can also reduce sheet and rill erosion until vegetation is established.

Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- At the end of a downward slope where it transitions to a steeper slope.
- Along the perimeter of a project.
- As check dams in unlined ditches with minimal grade.
- Down-slope of exposed soil areas.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- SE-1 Silt Fence
- SE-6 Gravel Bag Berm
- SE-8 Sandbag Barrier
- SE-12 Manufactured Linear Sediment Controls
- SE-14 Biofilter Bags

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- At operational storm drains as a form of inlet protection.
- Around temporary stockpiles.

Limitations

- Fiber rolls should be used in conjunction with erosion control, such as hydroseed, RECPs, etc.
- Only biodegradable fiber rolls containing no plastic can remain on a site applying for a Notice of Termination due to plastic pollution and wildlife concerns (State Water Board, 2016). Fiber rolls containing plastic that are used on a site must be disposed of for final stabilization.
- Fiber rolls are not effective unless trenched in and staked. If not properly staked and trenched in, fiber rolls will not work as intended and could be transported by high flows.
- Not intended for use in high flow situations (i.e., for concentrated flows).
- Difficult to move once saturated.
- Fiber rolls have a limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.
- Rolls typically function for 12-24 months, depending upon local conditions and roll material.

Implementation

Fiber Roll Materials

- Fiber rolls should be prefabricated.
- Fiber rolls may come manufactured containing polyacrylamide (PAM), a flocculating agent within the roll. Fiber rolls impregnated with PAM provide additional sediment removal capabilities and should be used in areas with fine, clayey or silty soils to provide additional sediment removal capabilities. Monitoring may be required for these installations.
- Fiber rolls are made from weed-free rice straw, flax, curled wood fiber, or coir bound into a tight tubular roll by netting or natural fiber (see *Limitations* above regarding plastic netting).
- Typical fiber rolls vary in diameter from 6 in. to 20 in. Larger diameter rolls are available as well. The larger the roll, the higher the sediment retention capacity.
- Typical fiber rolls lengths are 4, 10, 20 and 25 ft., although other lengths are likely available.

Installation

- Locate fiber rolls on level contours spaced as follows:
 - Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.

- Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).
- Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).
- Prepare the slope before beginning installation.
- Dig small trenches across the slope on the contour. The trench depth should be ¼ to 1/3 of the thickness of the roll, and the width should equal the roll diameter, in order to provide area to backfill the trench.
- It is critical that rolls are installed perpendicular to water movement, and parallel to the slope contour.
- Start building trenches and installing rolls from the bottom of the slope and work up.
- It is recommended that pilot holes be driven through the fiber roll. Use a straight bar to drive holes through the roll and into the soil for the wooden stakes.
- Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.
- Stake fiber rolls into the trench.
 - Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.
 - Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.
- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.
- See typical fiber roll installation details at the end of this fact sheet.

Removal

- Fiber rolls can be left in place or removed depending on the type of fiber roll and application (temporary vs. permanent installation). Fiber rolls encased with plastic netting or containing any plastic material will need to be removed from the site for final stabilization. Fiber rolls used in a permanent application are to be encased with a non-plastic material and are left in place. Removal of a fiber roll used in a permanent application can result in greater disturbance; therefore, during the BMP planning phase, the areas where fiber rolls will be used on final slopes, only fiber rolls wrapped in non-plastic material should be selected.
- Temporary installations should only be removed when up gradient areas are stabilized per General Permit requirements, and/or pollutant sources no longer present a hazard. But they should also be removed before vegetation becomes too mature so that the removal process does not disturb more soil and vegetation than is necessary.

Costs

Material costs for straw fiber rolls range from \$26 - \$38 per 25-ft. roll¹ and curled wood fiber rolls range from \$30 - \$40 per roll².

Material costs for PAM impregnated fiber rolls range between \$9.00-\$12.00 per linear foot, based upon vendor research¹.

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.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-third the designated sediment storage depth.
- If fiber rolls are used for erosion control, such as in a check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.
- Repair any rills or gullies promptly.

References

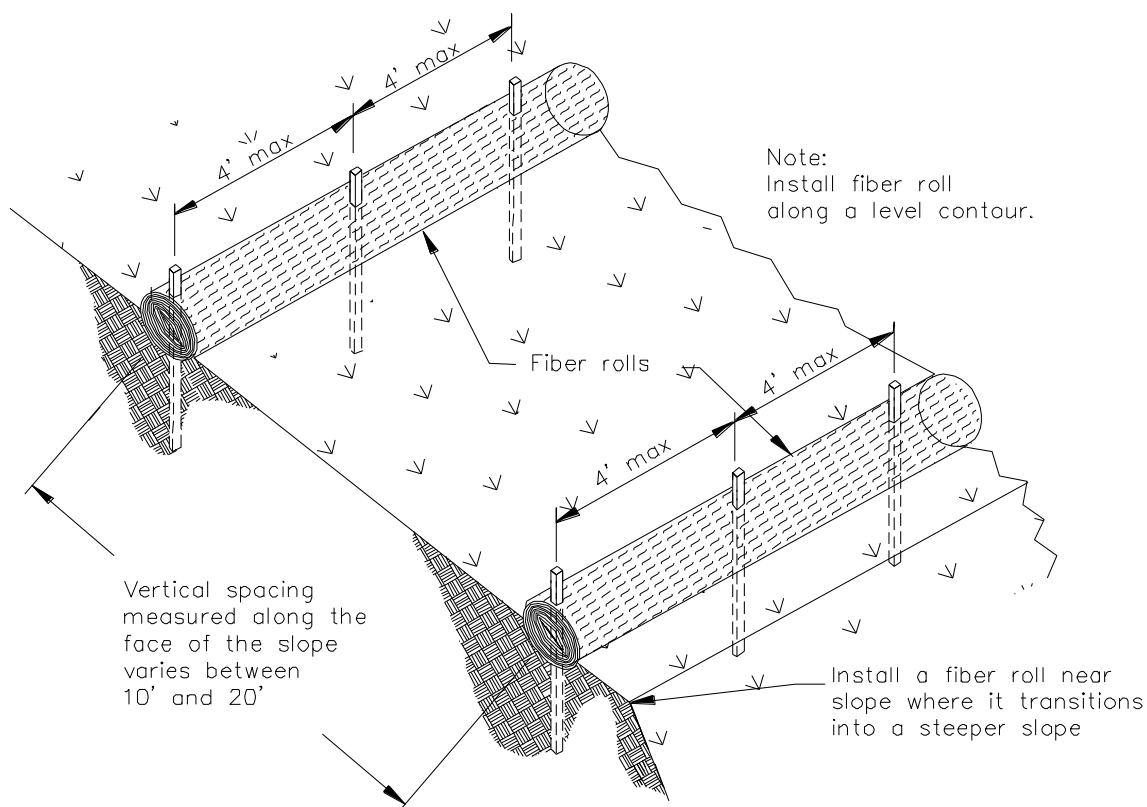
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Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

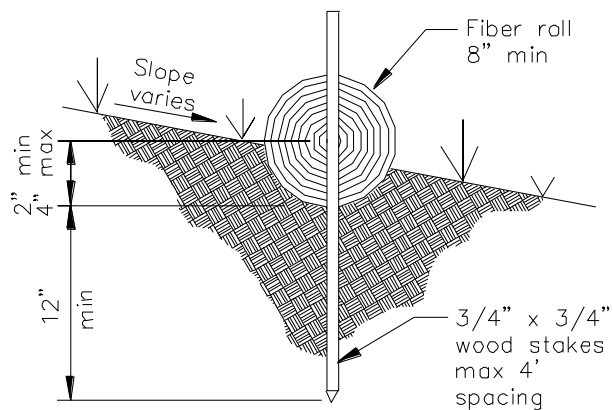
¹ Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.

² Costs estimated based on vendor query by Tetra Tech, Inc. 2016.



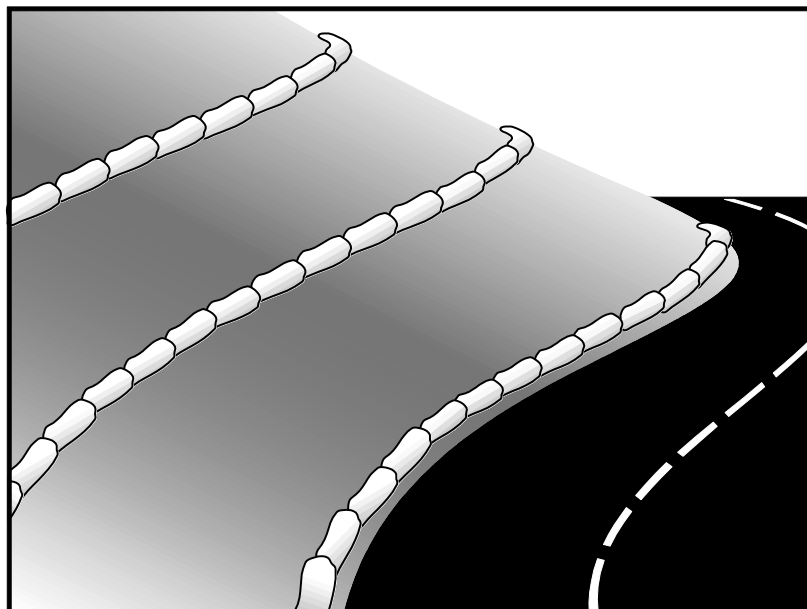
TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.



Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing erosion.

Suitable Applications

Gravel bag berms may be suitable:

- As a linear sediment control measure:
 - Below the toe of slopes and erodible slopes
 - As sediment traps at culvert/pipe outlets
 - Below other small cleared areas
 - Along the perimeter of a site
 - Down slope of exposed soil areas
 - Around temporary stockpiles and spoil areas
 - Parallel to a roadway to keep sediment off paved areas
 - Along streams and channels
- As a linear erosion control measure:
 - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- SE-1 Silt Fence
- SE-5 Fiber Roll
- SE-8 Sandbag Barrier
- SE-12 Temporary Silt Dike
- SE-14 Biofilter Bags

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- At the top of slopes to divert runoff away from disturbed slopes.
- As chevrons (small check dams) across mildly sloped construction roads. For use check dam use in channels, see SE-4, Check Dams.

Limitations

- Gravel berms may be difficult to remove.
- Removal problems limit their usefulness in landscaped areas.
- Gravel bag berm may not be appropriate for drainage areas greater than 5 acres.
- Runoff will pond upstream of the berm, possibly causing flooding if sufficient space does not exist.
- Degraded gravel bags may rupture when removed, spilling contents.
- Installation can be labor intensive.
- Durability of gravel bags is somewhat limited, and bags may need to be replaced when installation is required for longer than 6 months.
- Easily damaged by construction equipment.
- When used to detain concentrated flows, maintenance requirements increase.

Implementation

General

A gravel bag berm consists of a row of open graded gravel-filled bags placed on a level contour. When appropriately placed, a gravel bag berm intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding allows sediment to settle. The open graded gravel in the bags is porous, which allows the ponded runoff to flow slowly through the bags, releasing the runoff as sheet flows. Gravel bag berms also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils. Gravel bag berms are similar to sand bag barriers but are more porous. Generally, gravel bag berms should be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.

Design and Layout

- Locate gravel bag berms on level contours.
- When used for slope interruption, the following slope/sheet flow length combinations apply:
 - Slope inclination of 4:1 (H:V) or flatter: Gravel bags should be placed at a maximum interval of 20 ft, with the first row near the slope toe.
 - Slope inclination between 4:1 and 2:1 (H:V): Gravel bags should be placed at a maximum interval of 15 ft. (a closer spacing is more effective), with the first row near the slope toe.

Slope inclination 2:1 (H:V) or greater: Gravel bags should be placed at a maximum interval of 10 ft. (a closer spacing is more effective), with the first row near the slope toe.

- Turn the ends of the gravel bag barriers up slope to prevent runoff from going around the berm.
- Allow sufficient space up slope from the gravel bag berm to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, gravel bag barriers should be set back from the slope toe to facilitate cleaning. Where specific site conditions do not allow for a set-back, the gravel bag barrier may be constructed on the toe of the slope. To prevent flows behind the barrier, bags can be placed perpendicular to a berm to serve as cross barriers.
- Drainage area should not exceed 5 acres.
- In Non-Traffic Areas:
 - Height = 18 in. maximum
 - Top width = 24 in. minimum for three or more-layer construction
 - Top width = 12 in. minimum for one- or two-layer construction
 - Side slopes = 2:1 (H:V) or flatter
- In Construction Traffic Areas:
 - Height = 12 in. maximum
 - Top width = 24 in. minimum for three or more-layer construction.
 - Top width = 12 in. minimum for one- or two-layer construction.
 - Side slopes = 2:1 (H:V) or flatter.
- Butt ends of bags tightly.
- On multiple row, or multiple layer construction, overlap butt joints of adjacent row and row beneath.
- Use a pyramid approach when stacking bags.

Materials

- **Bag Material:** Bags should be woven polypropylene, polyethylene or polyamide fabric or burlap, minimum unit weight of 4 ounces/yd², Mullen burst strength exceeding 300 lb/in² in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355.

- **Bag Size:** Each gravel-filled bag should have a length of 18 in., width of 12 in., thickness of 3 in., and mass of approximately 33 lbs. Bag dimensions are nominal and may vary based on locally available materials.
- **Fill Material:** Fill material should be 0.5 to 1 in. Crushed rock, clean and free from clay, organic matter, and other deleterious material, or other suitable open graded, non-cohesive, porous gravel.

Costs

Material costs for gravel bags are average and are dependent upon material availability. \$3.20-\$3.80 per filled gravel bag is standard based upon vendor research (Adjusted for inflation, 2016 dollars, by Tetra Tech, Inc.).

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.
- Gravel bags exposed to sunlight will need to be replaced every two to three months due to degrading of the bags.
- Reshape or replace gravel bags as needed.
- Repair washouts or other damage as needed.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Remove gravel bag berms when no longer needed and recycle gravel fill whenever possible and properly dispose of bag material. Remove sediment accumulation and clean, re-grade, and stabilize the area.

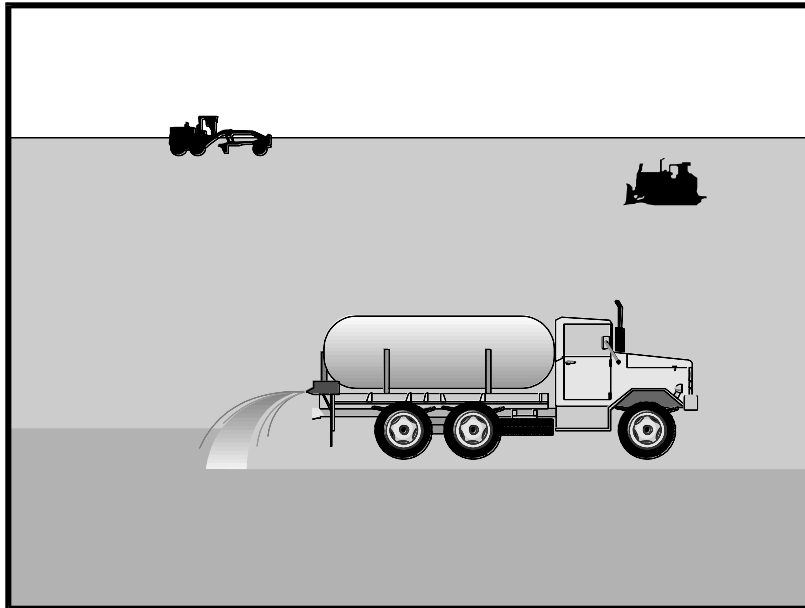
References

Handbook of Steel Drainage and Highway Construction, American Iron and Steel Institute, 1983.

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

Stormwater Pollution Plan Handbook, First Edition, State of California, Department of Transportation Division of New Technology, Materials and Research, October 1992.

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



Description and Purpose

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

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

Suitable Applications

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

Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

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

Potential Alternatives

EC-5 Soil Binders

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

Limitations

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

Implementation

Dust Control Practices

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

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

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

Additional preventive measures include:

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

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

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

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

Costs

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

Inspection and Maintenance

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

References

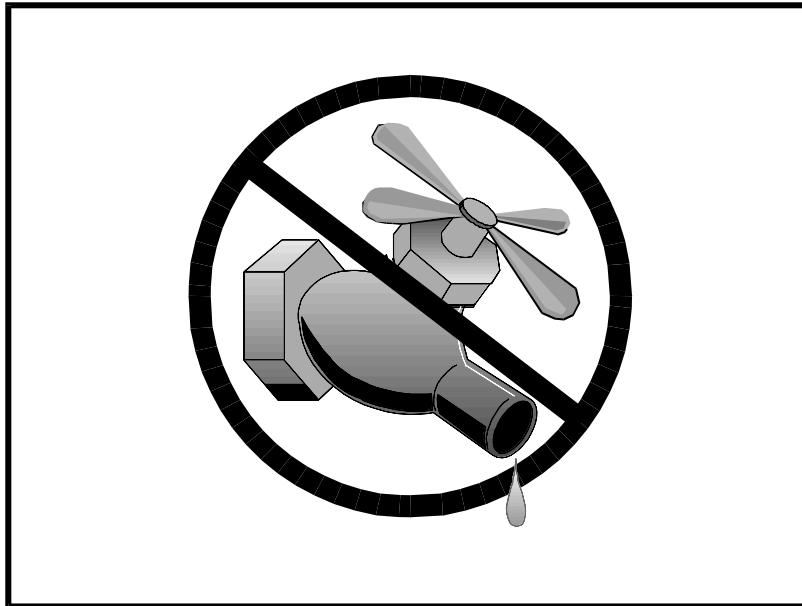
Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

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

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

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

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



Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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- Direct construction water runoff to areas where it can soak into the ground or be collected and used.
- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

Costs

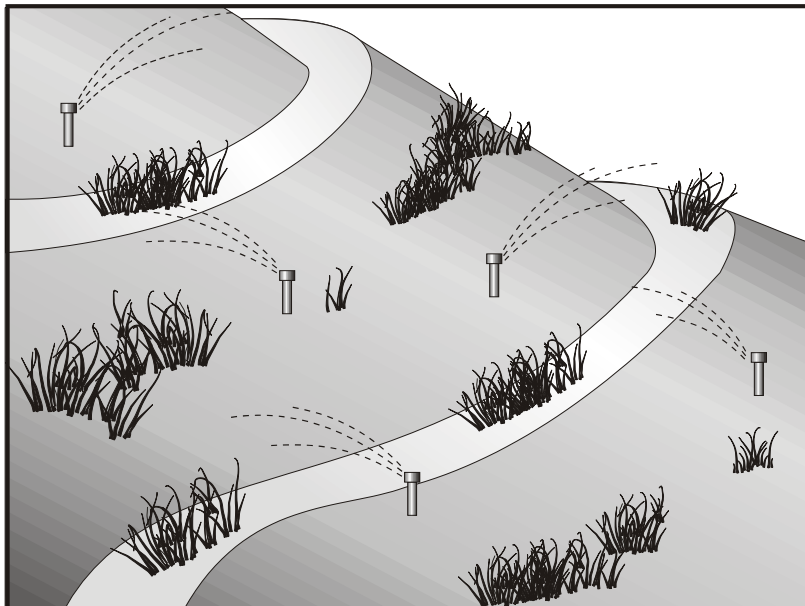
The cost is small to none compared to the benefits of conserving water.

Inspection and Maintenance

- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- 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 are occurring.
- Repair water equipment as needed to prevent unintended discharges.
 - Water trucks
 - Water reservoirs (water buffalos)
 - Irrigation systems
 - Hydrant connections

References

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



Description and Purpose

Potable Water/Irrigation consists of practices and procedures to manage the discharge of potential pollutants generated during discharges from irrigation water lines, landscape irrigation, lawn or garden watering, planned and unplanned discharges from potable water sources, water line flushing, and hydrant flushing.

Suitable Applications

Implement this BMP whenever potable water or irrigation water discharges occur at or enter a construction site.

Limitations

None identified.

Implementation

- Direct water from offsite sources around or through a construction site, where feasible, in a way that minimizes contact with the construction site.
- Discharges from water line flushing should be reused for landscaping purposes where feasible.
- Shut off the water source to broken lines, sprinklers, or valves as soon as possible to prevent excess water flow.
- Protect downstream stormwater drainage systems and watercourses from water pumped or bailed from trenches excavated to repair water lines.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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- Inspect irrigated areas within the construction limits for excess watering. Adjust watering times and schedules to ensure that the appropriate amount of water is being used and to minimize runoff. Consider factors such as soil structure, grade, time of year, and type of plant material in determining the proper amounts of water for a specific area.

Costs

Cost to manage potable water and irrigation are low and generally considered to be a normal part of related activities.

Inspection and Maintenance

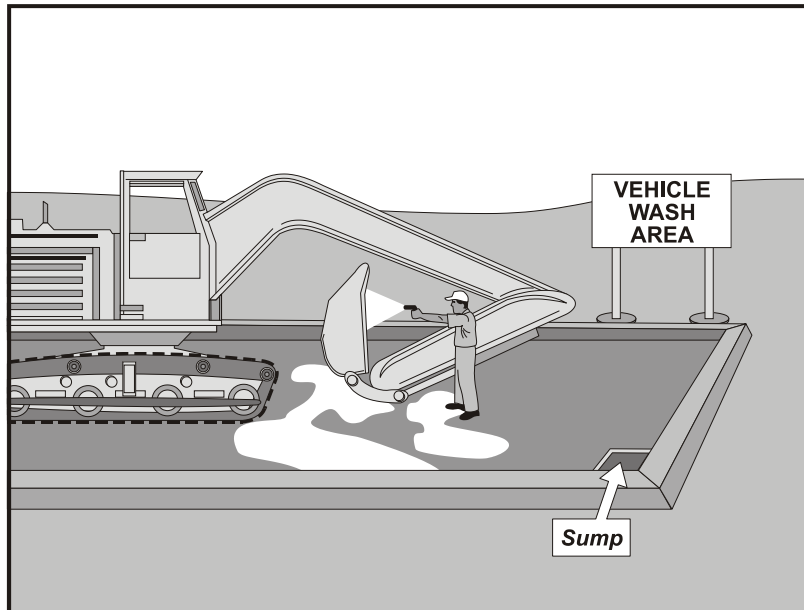
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at 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.
- Repair broken water lines as soon as possible.
- Inspect irrigated areas regularly for signs of erosion and/or discharge.

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 Practices, EPA 832-R-92005; USEPA, April 1992.



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:

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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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 runoff 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.

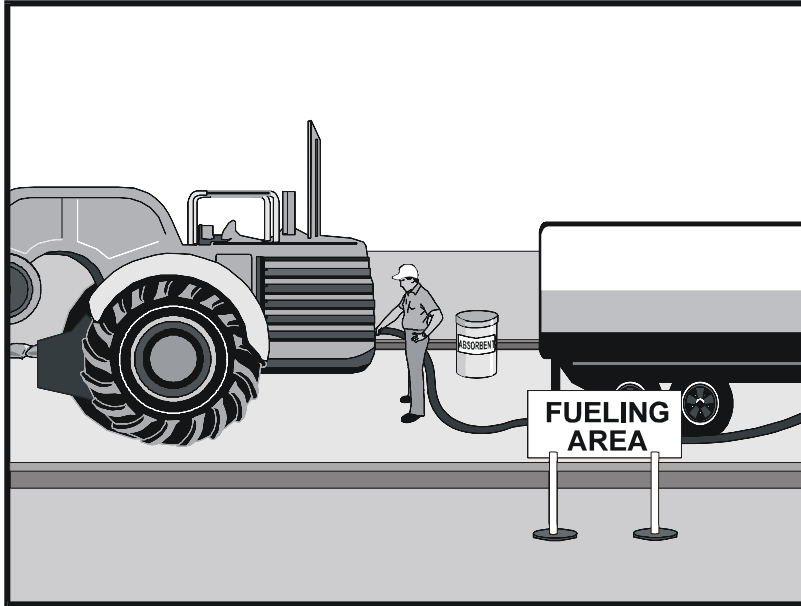
Inspection and Maintenance

- 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.



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.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☐ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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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 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 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

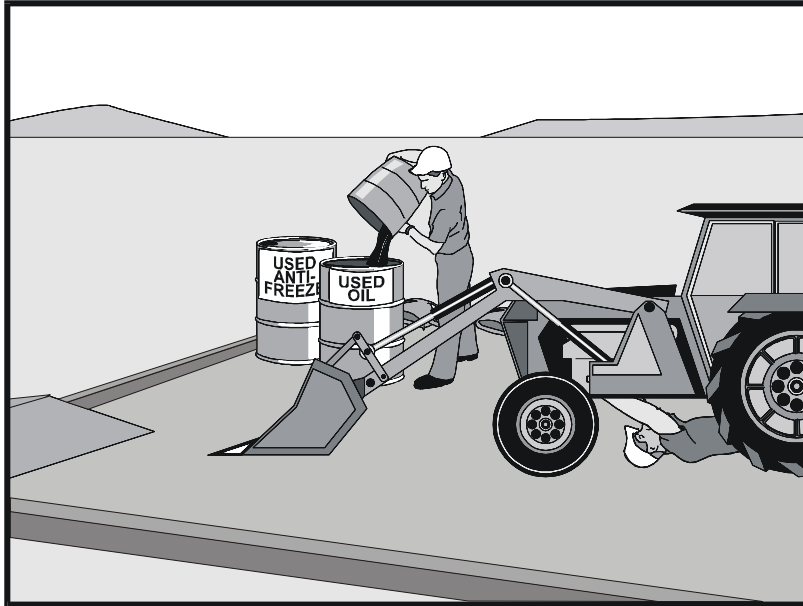
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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



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,

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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Vehicle & Equipment Maintenance NS-10

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 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.

Vehicle & Equipment Maintenance NS-10

- 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.

Vehicle & Equipment Maintenance NS-10

Inspection and Maintenance

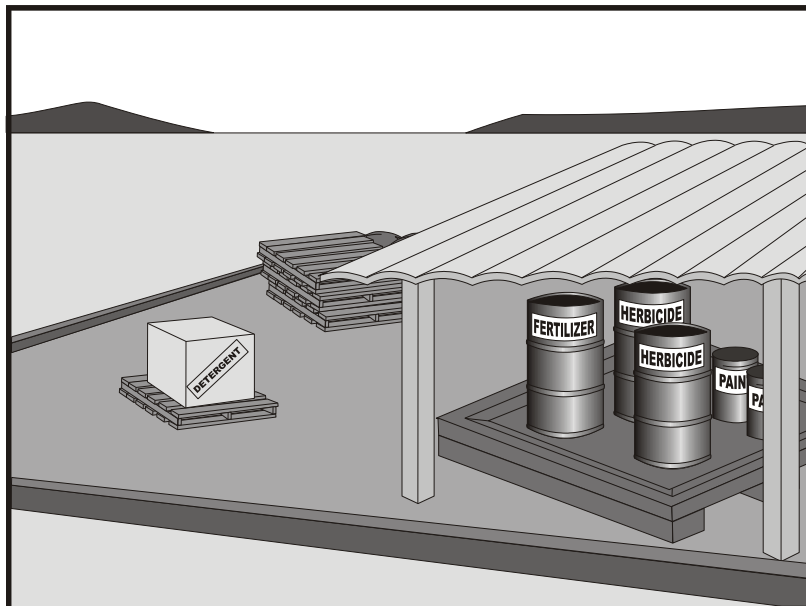
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at 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.



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	<input checked="" type="checkbox"/>

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

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

Potential Alternatives

None

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

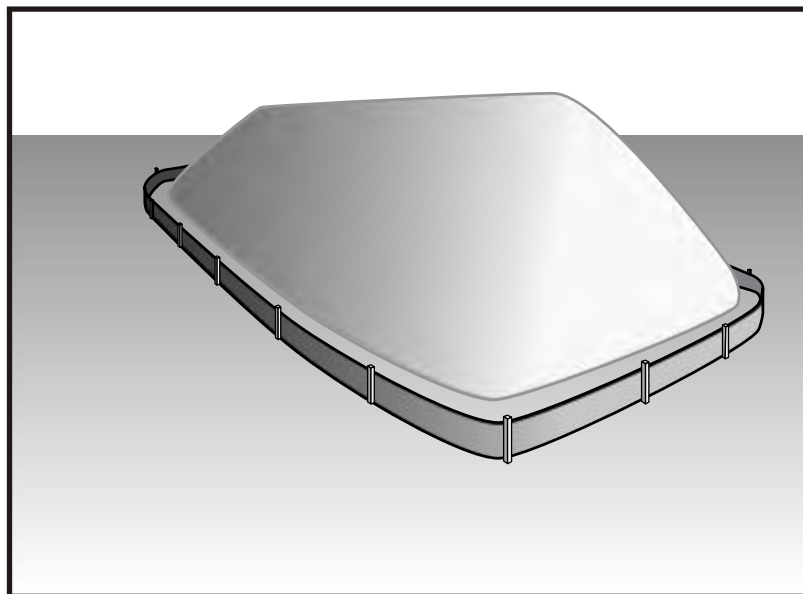
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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

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.



Description and Purpose

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

Suitable Applications

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

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

Implementation

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

Treat Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

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

Potential Alternatives

None

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

Protection of Non-Active Stockpiles

A stockpile is considered non-active if it either is not used for 14 days or if it is scheduled not to be used for 14 days or more. Stockpiles need to be protected immediately if they are not scheduled to be used within 14 days. Non-active stockpiles of the identified materials should be protected as follows:

Soil stockpiles

- Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Temporary vegetation should be considered for topsoil piles that will be stockpiled for extended periods.

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

- Stockpiles should be covered and protected with a temporary perimeter sediment barrier at all times.

Stockpiles of “cold mix”

- Cold mix stockpiles should be placed on and covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Stockpiles of fly ash, stucco, hydrated lime

- Stockpiles of materials that may raise the pH of runoff (i.e., basic materials) should be covered with plastic and surrounded by a berm.

Stockpiles/Storage of treated wood

- Treated wood should be covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Protection of Active Stockpiles

A stockpile is active when it is being used or is scheduled to be used within 14 days of the previous use. Active stockpiles of the identified materials should be protected as follows:

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

Costs

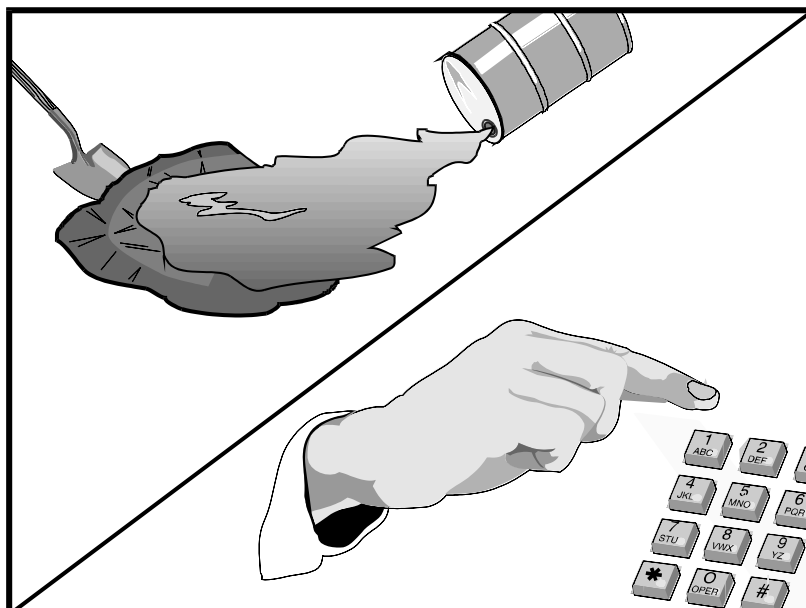
For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

Inspection and Maintenance

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

References

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



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

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
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WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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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 runoff 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 runoff 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 runoff 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.

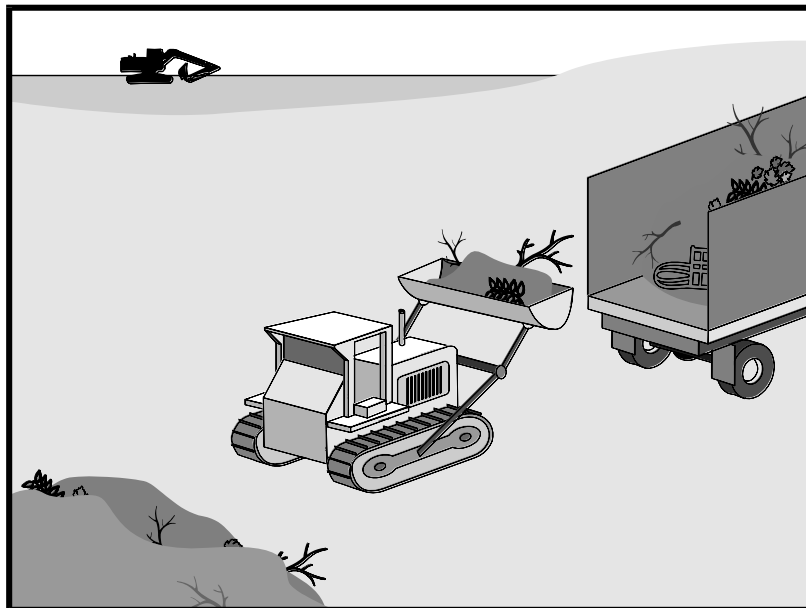
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

References

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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.



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

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	<input checked="" type="checkbox"/>

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

Potential Alternatives

None

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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 runoff 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

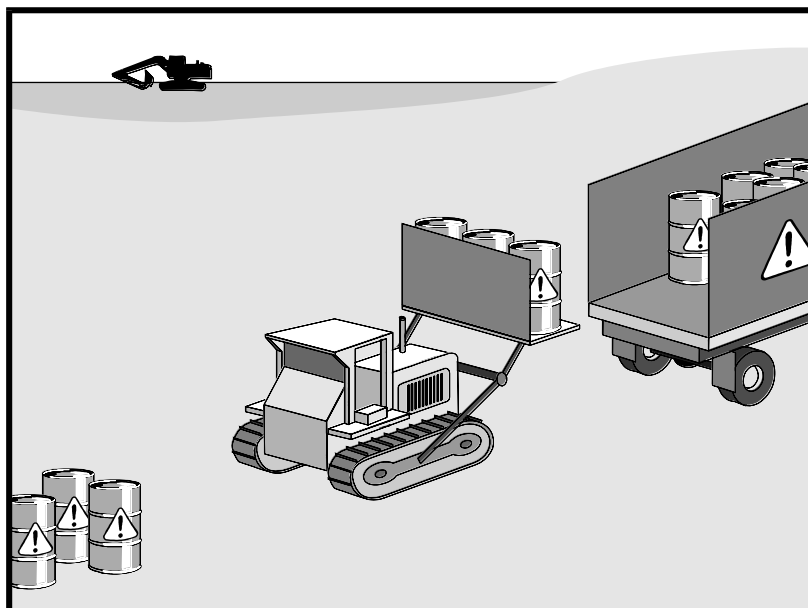
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at 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.



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
- Concrete Curing Compounds
- Palliatives
- Septic Wastes
- Stains
- Wood Preservatives
- Asphalt Products
- Pesticides
- Acids
- Paints
- Solvents
- 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	<input checked="" type="checkbox"/>

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

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

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

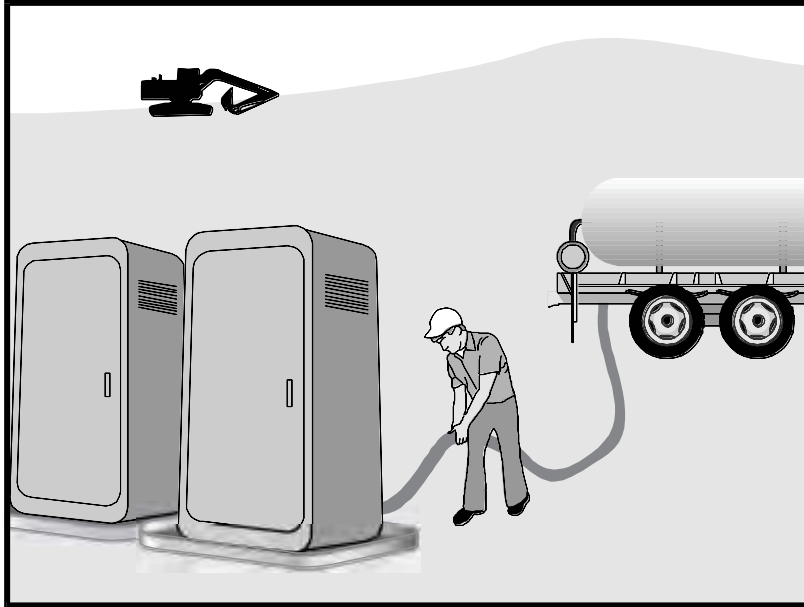
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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.

Sanitary/Septic Waste Management WM-9



Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

None identified.

Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

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	<input checked="" type="checkbox"/>

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

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

Potential Alternatives

None

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Sanitary/Septic Waste Management WM-9

- Temporary sanitary facilities must be equipped with containment to prevent discharge of pollutants to the stormwater drainage system of the receiving water.
- Consider safety as well as environmental implications before placing temporary sanitary facilities.
- Wastewater should not be discharged or buried within the project site.
- Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an onsite disposal system (OSDS), such as a septic system, local health agency requirements must be followed.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.
- If a spill does occur from a temporary sanitary facility, follow federal, state and local regulations for containment and clean-up.

Education

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and septic waste.
- Hold regular meetings to discuss and reinforce the use of sanitary facilities (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

Costs

All of the above are low cost measures.

Sanitary/Septic Waste Management WM-9

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.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.
- If spills or leaks from sanitary or septic facilities occur that are not contained and discharge from the site, 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.

References

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.

APPENDIX I: VISUAL MONITORING/BMP INSPECTION FORM

SWPPP Visual Monitoring/BMP Inspection Report

Project Name	
Project Location	
WDID#	
General Contractor	
24/7 Contact Person Info	
Inspector Name	
Title/Company	
Date of Inspection	
Time of Inspection	
Type of Inspection (circle one)	Daily Weekly Storm Post-Storm
Current Weather	
Precipitation Since Last Inspection	
Cumulative Precip. (storm total)	
Inspector's Signature	

SWPPP Compliance Action Items

ID#	SWPPP Non-Compliance Item	Location and BMP Plan Sheet #	Corrective Action Required	To be Completed By: Date/Time	Completion Date/Time and Signature

NOTES (include stages of construction currently in progress)

Erosion and Sediment Control BMPs

- ☐ **Disturbed soil areas** are stabilized with wood chips, pine needles or gravel. No signs of rills, gullies.
- ☐ **Wattles** are installed, maintained and functioning per specifications (e.g. in full contact with soil surface, minimum 6" freeboard, deposited sediment removed, etc).
- ☐ **Silt fence** is installed, maintained and functioning per specifications (e.g. trenched into soil, upright, firmly attached to wire backing, staked every 6 ft, no tears in filter fabric, deposited sediment removed, etc).
- ☐ **Gravel bag check dams** are installed, maintained and functioning per specifications (e.g. oriented perpendicular to flow path and free of sediment).

Describe observations, any non-compliance issues and immediate corrective actions taken:

Site Management BMPs

- ☐ **Track-off controls** are in place and effective at preventing track-off from construction vehicles. No track-off observed anywhere onsite.
- ☐ **Concrete washouts** are less than 75% full and placed in designated locations. No concrete leaks or spills observed. Washouts are covered with plastic sheeting if chance of rain in forecast.
- ☐ **Drain inlets** are free of accumulated debris/sediment. Filter socks are cleaned out or replaced weekly.
- ☐ **Stormwater outlet protection** features (e.g. rock aprons) are free of accumulated sediment, providing soil coverage, no evidence of erosion or scouring.
- ☐ **Vegetation/tree protection** is in place and effective in all areas of active construction.
- ☐ **Spill kits** are onsite and accessible to contain and clean up any chemical and hazardous material spills (e.g. fertilizers, fuels, lubricants, paints, adhesives, etc.). *If a spill occurs, contain the spill and contact IERS (530.581.4377) immediately to report spills and clean-up/containment actions.*
- ☐ **Stockpiles** of erodible materials are located in designated areas (on BMP plans), completely contained with perimeter sediment control barriers (e.g. wattles weighted with gravel bags), and covered with plastic sheeting if chance of rain in 48 hour forecast exceeds 50%.
- ☐ **Sweeping** – all roads, parking areas and other impervious surfaces are free of accumulated sediment, sand or other debris. No track-off anywhere on project site.

Describe observations, any non-compliance issues and immediate corrective actions taken:

Housekeeping BMPs

- ☐ **Spill prevention** – all chemicals and hazardous materials (e.g. fertilizers, fuels, lubricants, paints, adhesives, etc.) are stored in spill-proof containers.
- ☐ **Temporary sanitary facilities** are located away from drainage paths, regularly emptied/replaced, and fully containing all sanitary waste.
- ☐ **Solid waste mgmt** – Construction site is free of trash and litter. Garbage dumpsters/cans are covered, located away from drainage paths, regularly emptied/replaced, and fully containing all solid waste.

Describe observations, any non-compliance issues and immediate corrective actions taken:

Attach inspection photos, a printout of the weather forecast from the NOAA website, and a copy of the BMP or DSA maps (if applicable) to this report.

APPENDIX J: RAIN EVENT ACTION PLAN (REAP) TEMPLATE

Rain Event Action Plan (REAP)

Date:		WDID Number:	
Date Rain Predicted to Occur:		Predicted % chance of rain:	
Site Information:			
Site Name, City and Zip Code		Project Risk Level: <input type="checkbox"/> Risk Level 2 <input type="checkbox"/> Risk Level 3	
Site Stormwater Manager Information:			
Name, Company, Emergency Phone Number (24/7)			
Erosion and Sediment Control Contractor – Labor Force contracted for the site:			
Name, Company, Emergency Phone Number (24/7)			
Stormwater Sampling Agent:			
Name, Company, Emergency Phone Number (24/7)			
Current Phase of Construction <i>Check ALL the boxes below that apply to your site.</i>			
<input type="checkbox"/> Grading and Land Development	<input type="checkbox"/> Vertical Construction	<input type="checkbox"/> Inactive Site	
<input type="checkbox"/> Streets and Utilities	<input type="checkbox"/> Final Landscaping and Site Stabilization	<input type="checkbox"/> Other:	
Activities Associated with Current Phase(s) <i>Check ALL the boxes below that apply to your site (some apply to all Phases).</i>			
<u>Grading and Land Development:</u>			
<input type="checkbox"/> Demolition	<input type="checkbox"/> Vegetation Removal	<input type="checkbox"/> Vegetation Salvage-Harvest	
<input type="checkbox"/> Rough Grade	<input type="checkbox"/> Finish Grade	<input type="checkbox"/> Blasting	
<input type="checkbox"/> Soil Amendment(s):	<input type="checkbox"/> Excavation (_____ ft)	<input type="checkbox"/> Soils Testing	
<input type="checkbox"/> Rock Crushing	<input type="checkbox"/> Erosion and Sediment Control	<input type="checkbox"/> Surveying	
<input type="checkbox"/> Equip. Maintenance/Fueling	<input type="checkbox"/> Material Delivery and Storage	<input type="checkbox"/> Other:	
<u>Streets and Utilities:</u>			
<input type="checkbox"/> Finish Grade	<input type="checkbox"/> Utility Install: water-sewer-gas	<input type="checkbox"/> Paving Operations	
<input type="checkbox"/> Equip. Maintenance/Fueling	<input type="checkbox"/> Storm Drain Installation	<input type="checkbox"/> Material Delivery & Storage	
<input type="checkbox"/> Curb and Gutter/Concrete Pour	<input type="checkbox"/> Masonry	<input type="checkbox"/> Other:	
<u>Vertical Construction:</u>			
<input type="checkbox"/> Framing	<input type="checkbox"/> Carpentry	<input type="checkbox"/> Concrete/Forms/Foundation	
<input type="checkbox"/> Masonry	<input type="checkbox"/> Electrical	<input type="checkbox"/> Painting	
<input type="checkbox"/> Drywall/Interior Walls	<input type="checkbox"/> Plumbing	<input type="checkbox"/> Stucco	
<input type="checkbox"/> Equip. Maintenance/Fueling	<input type="checkbox"/> HVAC	<input type="checkbox"/> Tile	
<input type="checkbox"/> Exterior Siding	<input type="checkbox"/> Insulation	<input type="checkbox"/> Landscaping & Irrigation	
<input type="checkbox"/> Flooring	<input type="checkbox"/> Roofing	<input type="checkbox"/> Other:	
<u>Final Landscaping & Site Stabilization:</u>			
<input type="checkbox"/> Stabilization	<input type="checkbox"/> Vegetation Establishment	<input type="checkbox"/> E&S Control BMP Removal	
<input type="checkbox"/> Finish Grade	<input type="checkbox"/> Storage Yard/ Material Removal	<input type="checkbox"/> Landscape Installation	
<input type="checkbox"/> Painting and Touch-Up	<input type="checkbox"/> Irrigation System Testing	<input type="checkbox"/> Other:	
<input type="checkbox"/> Drainage Inlet Stencils	<input type="checkbox"/> Inlet Filtration	<input type="checkbox"/> Perm. Water Quality Ponds	
<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	<input type="checkbox"/> Other:	
<u>Inactive Construction Site:</u>			
<input type="checkbox"/> E & S Control Device Installation	<input type="checkbox"/> Routine Site Inspection	<input type="checkbox"/> Trash Removal	
<input type="checkbox"/> E & S Control Device Maintenance	<input type="checkbox"/> Street Sweeping	<input type="checkbox"/> Other:	

Rain Event Action Plan (REAP)

Date:		WDID Number:	
-------	--	--------------	--

Trades Active on Site during Current Phase(s)

Check ALL the boxes below that apply to your site

- | | | |
|--|---|---|
| <input type="checkbox"/> Storm Drain Improvement | <input type="checkbox"/> Grading Contractor | <input type="checkbox"/> Surveyor- Soil Technician |
| <input type="checkbox"/> Street Improvements | <input type="checkbox"/> Water Pipe Installation | <input type="checkbox"/> Sanitary Station Provider |
| <input type="checkbox"/> Material Delivery | <input type="checkbox"/> Sewer Pipe Installation | <input type="checkbox"/> Electrical |
| <input type="checkbox"/> Trenching | <input type="checkbox"/> Gas Pipe Installation | <input type="checkbox"/> Carpentry |
| <input type="checkbox"/> Concrete Pouring | <input type="checkbox"/> Electrical Installation | <input type="checkbox"/> Plumbing |
| <input type="checkbox"/> Foundation | <input type="checkbox"/> Communication Installation | <input type="checkbox"/> Masonry |
| <input type="checkbox"/> Demolition | <input type="checkbox"/> Erosion and Sediment Control | <input type="checkbox"/> Water, Sewer, Electric Utilities |
| <input type="checkbox"/> Material Delivery | <input type="checkbox"/> Equipment Fueling/Maintenance | <input type="checkbox"/> Rock Products |
| <input type="checkbox"/> Tile Work- Flooring | <input type="checkbox"/> Utilities, e.g., Sewer, Electric | <input type="checkbox"/> Painters |
| <input type="checkbox"/> Drywall | <input type="checkbox"/> Roofers | <input type="checkbox"/> Carpenters |
| <input type="checkbox"/> HVAC installers | <input type="checkbox"/> Stucco | <input type="checkbox"/> Pest Control: e.g., termite prevention |
| <input type="checkbox"/> Exterior Siding | <input type="checkbox"/> Masons | <input type="checkbox"/> Water Feature Installation |
| <input type="checkbox"/> Insulation | <input type="checkbox"/> Landscapers | <input type="checkbox"/> Utility Line Testers |
| <input type="checkbox"/> Fireproofing | <input type="checkbox"/> Riggers | <input type="checkbox"/> Irrigation System Installation |
| <input type="checkbox"/> Steel Systems | <input type="checkbox"/> Utility Line Testers | <input type="checkbox"/> Other: |

Trade Contractor Information Provided

Check ALL the boxes below that apply to your site.

- | | | |
|---|--|--|
| <input type="checkbox"/> Educational Material Handout | <input type="checkbox"/> Tailgate Meetings | <input type="checkbox"/> Training Workshop |
| <input type="checkbox"/> Contractual Language | <input type="checkbox"/> Fines and Penalties | <input type="checkbox"/> Signage |
| <input type="checkbox"/> Other: | <input type="checkbox"/> Other: | <input type="checkbox"/> Other: |

Continued on next page.

Rain Event Action Plan (REAP)

Date of REAP

WDID Number:

Date Rain Predicted to Occur:

Predicted % chance of rain:

Predicted Rain Event Triggered Actions

Below is a list of suggested actions and items to review for this project. Each active Trade should check all material storage areas, stockpiles, waste management areas, vehicle and equipment storage and maintenance, areas of active soil disturbance, and areas of active work to ensure the proper implementation of BMPs. Project-wide BMPs should be checked and cross-referenced to the BMP progress map.

Trade or Activity	Suggested action(s) to perform / item(s) to review prior to rain event
<input type="checkbox"/> Information & Scheduling	<input type="checkbox"/> Inform trade supervisors of predicted rain <input type="checkbox"/> Check scheduled activities and reschedule as needed <input type="checkbox"/> Alert erosion/sediment control provider <input type="checkbox"/> Alert sample collection contractor (if applicable) <input type="checkbox"/> Schedule staff for extended rain inspections <input type="checkbox"/> Check Erosion and Sediment Control (ESC) material stock <input type="checkbox"/> Review BMP progress map <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Material storage areas	<input type="checkbox"/> Material under cover or in sheds (ex: treated woods and metals) <input type="checkbox"/> Perimeter control around stockpiles <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Waste management areas	<input type="checkbox"/> Dumpsters closed <input type="checkbox"/> Drain holes plugged <input type="checkbox"/> Recycling bins covered <input type="checkbox"/> Sanitary stations bermed and protected from tipping <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Trade operations	<input type="checkbox"/> Exterior operations shut down for event (e.g., no concrete pours or paving) <input type="checkbox"/> Soil treatments (e.g., fertilizer) ceased within 24 hours of event <input type="checkbox"/> Materials and equipment (ex: tools) properly stored and covered <input type="checkbox"/> Waste and debris disposed in covered dumpsters or removed from site <input type="checkbox"/> Trenches and excavations protected <input type="checkbox"/> Perimeter controls around disturbed areas <input type="checkbox"/> Fueling and repair areas covered and bermed <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Site ESC BMPs	<input type="checkbox"/> Adequate capacity in sediment basins and traps <input type="checkbox"/> Site perimeter controls in place <input type="checkbox"/> Catch basin and drop inlet protection in place and cleaned <input type="checkbox"/> Temporary erosion controls deployed <input type="checkbox"/> Temporary perimeter controls deployed around disturbed areas and stockpiles <input type="checkbox"/> Roads swept; site ingress and egress points stabilized <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Concrete rinse out area	<input type="checkbox"/> Adequate capacity for rain <input type="checkbox"/> Wash-out bins covered <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
<input type="checkbox"/> Spill and drips	<input type="checkbox"/> All incident spills and drips, including paint, stucco, fuel, and oil cleaned <input type="checkbox"/> Drip pans emptied <input type="checkbox"/> Other: _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____

Continued on next page.

☐ Other / Discussion /
Diagrams

<input type="checkbox"/>	
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<input type="checkbox"/>	
<input type="checkbox"/>	

Attach a printout of the weather forecast from the NOAA website to the REAP.

I certify under penalty of law that this Rain Event Action Plan (REAP) will be performed in accordance with the General Permit by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date: _____

Qualified SWPPP Practitioner (Use ink please)

APPENDIX K: SWPPP TRAINING OUTLINE AND TRAINING REPORTING FORM

Trained Contractor Personnel Log

Stormwater Management Training Log and Documentation

Project Name: _____

WDID #: _____

Stormwater Management Topic: (check as appropriate)

☐ Erosion Control

☐ Sediment Control

☐ Wind Erosion Control

☐ Tracking Control

☐ Non-Stormwater Management
Control

☐ Waste Management and Materials Pollution

☐ Stormwater Sampling

Specific Training Objective: _____

Location: _____

Date: _____

Instructor: _____

Telephone: _____

Course Length (hours): _____

APPENDIX L: RESPONSIBLE PARTIES

Authorization of Approved Signatories

Project Name: _____

WDID #: _____

Name of Personnel	Project Role	Company	Signature	Date

LRP's Signature

Date

LRP Name and Title

Telephone Number

Identification of QSP

Project Name: _____

WDID #: _____

The following are QSPs associated with this project

Name of Personnel ⁽¹⁾	Company	Date

(1) If additional QSPs are required on the job site add additional lines and include information here

Authorization of Data Submitters

Project Name: _____

WDID #: _____

Name of Personnel	Project Role	Company	Signature	Date

Approved Signatory's Signature

Date

Approved Signatory

Telephone Number

Name and Title

APPENDIX M: CONTRACTORS AND SUBCONTRACTORS

APPENDIX N: EFFLUENT SAMPLING AND MEASUREMENT FIELD LOG
TEMPLATE

Effluent Sampling and Measurement Field Log

Project Name	
Project Location	
WDID#	
Sampler Name	
Title/Company	
Sampling Date	
Sampling Start Time/Stop Time	
Sampling Event Type (circle one)	<div style="display: inline-block; width: 45%;">Stormwater</div> <div style="display: inline-block; width: 45%;">Non-stormwater</div>
	<div style="display: inline-block; width: 45%;">Non-visible pollutant</div> <div style="display: inline-block; width: 45%;">Post-NEL exceedance</div>
Current Weather	
Sampler's Signature	

Field Meter Calibration

pH Meter #	Date of Last Calibration	Turbidity Meter #	Date of Last Calibration	Turbidity Meter Field Calibration Check
				.01 ____ 20 ____ 100 ____ 800 ____

Field pH and Turbidity Measurements

Sample Location ID	pH	Turbidity	Time

Grab Sampling

Sample Location ID	O&G	Other (specify)	Time

Sampling Notes

APPENDIX O: CHAIN OF CUSTODY (COC) TEMPLATE

Chain of Custody

P.O. #

Lab Federal Tax ID:

Lab Use
Only

Laboratory
Contact
Address

phone:
fax:
E-Mail
web:

CLIENT: Ben Trustman
Company Balance Hydrologics
Contact Chelsea Neill
Address 1 12020 Donner Pass Rd
Address 2 Unit B1
City, St, Zip Truckee, CA 96161

Copy of report sent to:
Company
Contact
Address 1
Address 2
City, St, Zip

Tel. (530) 550-9776 x 228 E-Mail: cneill@balancehydro.com
fax (510) 813-8844 www.

Turbidity and SSC

TSS

Cold Room
Shelf #
Group #
Account #
Client #

SAMPLE Identification	Date Sampled	Compost CODE	Water CODE	Soil CODE	Plant CODE	Remed. CODE	Fuel CODE	CODE	CODE	CODE	Sample Condition
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											

Special Instructions:

RELEASING	RECEIVING	Date	Time		
Releasing Signature 1 X	Receiving Signature 1				
Releasing Signature 2	Receiving Signature 2				
Releasing Signature 3	Receiving Signature 3				

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
NORTH CENTRAL REGION
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CA 95670



STREAMBED ALTERATION AGREEMENT
EPIMS NOTIFICATION No. SIE-19150-R2
LACEY CREEK

TRUCKEE RIVER WATERSHED COUNCIL
LACEY MEADOW RESTORATION

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and Truckee River Watershed Council (Permittee) as represented by Beth Christman.

RECITALS

WHEREAS, pursuant to Fish and Game Code section 1602, Permittee notified CDFW on September 28, 2021 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to Fish and Game Code section 1603, CDFW has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in this Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed this Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with this Agreement.

PROJECT LOCATION

The project is located at Lacey Creek a tributary to Webber Lake, in the County of Sierra, State of California; Latitude 39.465400, Longitude -120.426533. Exhibit A shows the project location.

PROJECT DESCRIPTION

The project is limited to the placement of instream structures, placement of buried log grade control structures, engineered riffles, minor grading to re-engage historic stream flow paths in Upper Lacey Meadow and Lower Lacey Meadow, and removal and replacement of undersized or non-functioning culverts with ford crossings.

Three different concepts of instream wood structures: (1) bundles, (2) small log jams, and (3) large log jams will be utilized for restoration activities:

- 1) Bundles will include trees less than 12-inches in diameter, with branches remaining in place. The bundles would measure between 8- and 16-feet in length, 18-inches to 24-inches in width and secured using natural fiber twine. Bundles will be placed in the channel and secured using 3-inch diameter stakes, driven a minimum of 1.5 feet into the channel bed. Bundles will be primarily used in the smaller channels or tributaries to Lacey Creek.
- 2) Small log jams include a minimum of 2 key logs, typically characterized by a minimum diameter of 16-inches with rootwads intact. Rootwads will be embedded or partially buried in the banks to mimic channel bank tree-fall. Additional smaller trees or logs will be included to create a channel-spanning structure. Finally, the structure will be packed with branches and slash harvested from smaller trees. Small log jams will be used in Lacey Creek, in combination with large log jams located upstream and downstream.
- 3) Large log jams include a minimum of 2 key logs, typically with a minimum diameter of 18-inches with rootwads intact. Additional smaller trees or logs will be included to create a channel-spanning structure. The structure will also be packed with smaller branches and slash harvested from smaller trees. Large log jams are appropriate for Lacey Creek where flow diversion is required to return flows to historical channels. These structures are beneficial when they can be anchored against existing live, bankside trees.

Buried grade control structures will be composed of logs and placed upstream of existing head cuts and to facilitate transitions to reconnected historic channel segments.

Engineered riffles will be composed of rounded river rock, slightly larger than existing rock, and used to augment existing riffles (height and volume). Some riffle rock material may be sourced from the existing channel in the Upper Meadow during channel relocation.

Specific restoration activities can be found in the Lower Lacey Meadows 100% engineering design plan (**Exhibit B**) and Upper Lacey Meadows 95% engineering design plan (**Exhibit C**).

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: Willow flycatcher (*Empidonax traillii*), Greater Sandhill Crane (*Grus canadensis*), Bald Eagle (*Haliaeetus leucocephalus*), cutthroat trout (*Oncorhynchus clarkii henshawi*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*).

The adverse effects the project could have on the fish or wildlife resources identified above include: loss of foraging, nesting, and shelter habitat; disruption to wildlife; disturbance of nesting due to increased human activity, noise, and vibrations; direct

mortality or injury to individual plants, animals, and aquatic species caused by construction activities; impediment to migration of aquatic species during construction; direct loss of resources for aquatic organisms; introduction of sedimentation or other pollutants into the watercourse; short-term release of contaminants (e.g., incidental from construction); loss of natural bed or bank; change in contour of bed, channel or bank; degradation of channel; loss of bank stability during construction; increase of bank erosion during construction; disturbance from project activity; diversion of flow water from, or around, activity site; and dewatering.

Specifically, the project will temporarily impact 1,867 linear feet and 1.14 acres of riparian willow scrub shrub, 4,459 linear feet and 1.83 acres of wet meadow, and 258 linear feet and 0.06 acres of wetland seep.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make this Agreement, any extensions and amendments to this Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to CDFW personnel, or personnel from another state, federal, or local agency upon request.
- 1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of this Agreement and any extensions and amendments to this Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.
- 1.3 Notification of Conflicting Provisions. Permittee shall notify CDFW if Permittee determines or learns that a provision in this Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, CDFW shall work with the Permittee to resolve any conflict.
- 1.4 Project Site Entry. Permittee agrees that CDFW personnel may enter the project site at any time to verify compliance with this Agreement.
- 1.5 No Trespass. To the extent that any provisions of this Agreement provide for activities that require the Permittee to traverse another owner's property, such provisions are agreed to with the understanding that the Permittee possesses the legal right to so traverse. In the absence of such right, any such provision is void.
- 1.6 Notification of Project Modification. Permittee agrees to notify CDFW of any modifications made to the project plans submitted to CDFW.

- 1.7 Change of Conditions and Need to Cease Operations. If conditions arise, or change, in such a manner as to be considered deleterious to the stream or wildlife, operations shall cease until corrective measures approved by CDFW are taken.
- 1.8 Does Not Authorize "Take". This Agreement does not authorize "take" of any California Endangered Species Act (CESA) listed species. Take is defined in Fish and Game Code section 86, as hunt, pursue, catch, capture or kill or attempt to hunt, pursue, catch, capture, or kill. If there is potential for take of any listed species to occur, Permittee shall consult with CDFW and demonstrate compliance with CESA.
- 1.9 CEQA Compliance. Permittee shall implement and adhere to the mitigation measures in the Mitigated Negative Declaration (SCH No. 2021010001) adopted by the Lahontan Regional Water Quality Control Board as lead agency for the project pursuant to the CEQA (Pub. Resources Code, § 21000 et seq.). If the results of focused or pre-commencement surveys indicate that additional impacts may result from project activities that were not analyzed in the CEQA document, then the Permittee should comply with CEQA before the project commences.

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

- 2.1 Work Period. Project activities covered under this Agreement shall be confined to the period between August 1 to October 31 of the same calendar year during the term of this Agreement. *Revegetation, restoration and erosion control work is not confined to this time period.*
- 2.2 Work Period Modification. If the Permittee needs more time to complete the project activity, the work may be permitted outside of the work period and extended on a day-to-day basis (or for some other set period of time) by a CDFW representative who reviewed the project, or if unavailable, through contact with the Regional office (see Contact Information). The Permittee shall submit a written request for a work period variance to CDFW. The work period variance request shall: 1) describe the extent of work already completed; 2) detail the activities that remain to be completed; 3) detail the time required to complete each of the remaining activities; and 4) provide photographs of both the current work completed and the proposed site for continued work. Work period variances are issued at the discretion of CDFW. CDFW will review the written request to work outside of the established work period. CDFW will have ten (10) calendar days to review the proposed work period variance. CDFW reserves the right to require additional measures to protect fish and wildlife resources as a condition for granting the variance.
- 2.3 Final Plan Submittal. At least 30 business days prior to the start of construction on Upper Lacey Meadow, Permittee shall submit 100% final plan designs for the ford crossing culvert replacement located in Upper Lacey Meadow to CDFW for review

and approval. Final plan designs shall be submitted in digital file format (PDF) to CDFW identified in the contact information section of this Agreement. If final plan designs differ from the information within this Agreement (i.e., project description, project impacts, etc.) the Permittee shall review the Amendment section of this Agreement and consult with CDFW on the appropriate course of action.

- 2.4 Work Period in Low Rainfall / Dry Weather Only. The work period within Lacey Creek and Lacey Meadow shall be restricted to periods of low rainfall (less than ¼-inch per 24 hour period) and periods of dry weather (with less than a 50% chance of rain). Permittee shall monitor the National Weather Service (NWS) 72-hour forecast for the project area. No work shall occur during a dry-out period of 24 hours after the above referenced wet weather. Weather forecasts shall be provided upon request by the CDFW. *All erosion control measures shall be initiated prior to all storm events. Revegetation and erosion control work is not confined to this work period.*
- 2.5 Demarcate Work Area and Access Boundaries. Permittee shall demarcate the outer perimeter of the work area with stakes, flagging, ribbon, or equivalent to provide visual orientation of project work limits. Temporary fencing shall be used to demarcate environmentally sensitive areas to prevent damage to adjacent habitat. All forms of markings shall be in place prior to and during periods of operation. All persons employed or otherwise working on the project site shall be instructed by Permittee or a Designated Biologist about the restrictions that the fencing and demarcation represents. Demarcation of the work area shall consider and avoid vegetation to the greatest extent possible. Vegetation shall not be removed or damaged beyond the work area without prior consultation and approval of a CDFW representative or otherwise allowed in this Agreement.
- 2.6 Vegetation Removal. Disturbance or removal of vegetation shall be kept to the minimum necessary to complete project related activities. Except for tree removal already described in the project description, no native trees with a trunk diameter at breast height (DBH) in excess of four (4) inches shall be removed or damaged without prior consultation and approval of a CDFW representative. Where native trees or woody riparian vegetation split into several trunks close to ground level, the DBH shall be measured for each trunk and calculated as one tree. Vegetation marked for protection may only be trimmed with hand tools to the extent necessary to gain access to the work sites.
- 2.7 Vegetation Removal Methods. Hand tools (e.g., trimmer, chain saw, etc.) shall be used to trim vegetation to the extent necessary to gain access to the work site(s); larger equipment shall not be used for vegetation removal unless already described in the project description.

Biological Resources

- 2.8 Leave Wildlife Unharmed. If any wildlife is encountered during the course of construction, said wildlife shall be allowed to leave the construction area unharmed.
- 2.9 Special-Status Species encountered during work. If the Permittee encounters any special-status species during project activities, work shall be suspended, CDFW notified, and conservation measures shall be developed in agreement with CDFW prior to re-initiating the activity. If during project activities, the Permittee encounters any species listed pursuant to the California Endangered Species Act (CESA), work shall be suspended, and CDFW notified. Work may not re-initiate until the Permittee has consulted with CDFW and can demonstrate compliance with CESA.
- 2.10 Nesting Bird Survey. If project-related activities are scheduled between February 1 to August 31 (the typical nesting season), a focused survey for nests shall be conducted by a Designated Biologist no greater than fifteen (15) calendar days prior to the beginning of Project-related activities. The Designated Biologist shall survey a minimum radius of 500-foot (for migratory birds) and 1/2-mile (for raptors) around the Project area that can be accessed by Permittee. The results of the survey shall be provided to CDFW upon completion. If no active nests are found, project activities may proceed as scheduled.
- 2.10.1 Active Nests. If an active nest is found, active nests should be avoided, and a no disturbance or destruction buffer shall be determined and established by a Designated Biologist. The buffer shall be kept in place until after the breeding nesting season or the Designated Biologist confirms the young have fledged, are foraging independently, and the nest is no longer active for the season. The extent of these buffers shall be determined by the Designated Biologist and will depend on the species present, the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers.
- 2.10.2 Project Delay. If a lapse in project-related work of fourteen (14) calendar days or longer occurs, the Designated Biologist shall complete another focused survey before Project work can be reinitiated.
- 2.10.3 Permittee Responsibility. It is the Permittee's responsibility to comply with Fish and Game Code Sections 3503, 3503.5, and 3513, regardless of the time of year. This Agreement does not authorize take of birds, their nests, or their eggs.
- 2.11 Invasive Species. Permittee shall conduct project activities in a manner that prevents the introduction, transfer, and spread of aquatic, riparian, and terrestrial invasive species from one work site and/or water body to another. Prior to entering the project area, Permittee shall inspect equipment for invasive species and, if any

signs of invasive species are found, the equipment shall be cleaned to remove those species. All visible soil/mud, plant materials, and animal remnants on equipment will be removed prior to entering and exiting the work site and/or between each use in different water bodies. Permittee shall notify CDFW immediately if an invasive species not previously known to occur within the work site is discovered during work activities by contacting CDFW's Invasive Species Program by email at Invasives@wildlife.ca.gov.

Wildlife Protection Measures

- 2.12 Fish Relocation Plan. Permittee shall prepare and implement a Fish Relocation Plan to limit the number of fish that may be entrained and/or stranded during construction. The plan shall include, at minimum: 1) a list of fish species that may be encountered, 2) descriptions of the proposed methods and equipment to be used to prevent fish stranding, 3) the proposed timing of fish relocation activities, and 4) the qualifications of the Designated Biologist(s) implementing the plan. Permittee shall submit the Fish Relocation Plan to CDFW **no less than ten (10) business days** prior to planned dewatering. Permittee shall obtain CDFW's written approval of the Fish Relocation Plan prior to starting project activities. This measure does not allow for the take or relocation of any state listed species.
- 2.13 Stranded Aquatic Life and Scientific Collection. The Designated Biologist shall check daily for stranded aquatic life as the water level in the dewatered area drops. All reasonable efforts shall be made to capture and move all stranded aquatic life observed in the dewatered area. Capture methods may include fish landing nets, dip nets, buckets, and by hand. Captured aquatic life shall be released immediately in suitable habitat unaffected by project activities. An account of the species and quantity of aquatic organisms that are captured, handled, and/or moved shall be reported to CDFW in the Mandatory Wildlife Report spreadsheet form (DFW 1379a) available at the following website: <https://wildlife.ca.gov/Licensing/Scientific-Collecting#53949794-reporting>. This condition does not allow for the take or disturbance of any state listed species, candidate species, or fully protected species. This condition also does not allow for the take or disturbance of a state species of special concern unless approved in a relocation plan per Measure 2.11 of this Agreement.

Revegetation and Restoration

- 2.14 Seeding. Permittee shall restore all exposed/disturbed areas and access points within the project area, by seeding with a locally native grass mix, unless otherwise agreed upon with CDFW. Revegetation shall be completed as soon as possible after construction activities.
- 2.15 Native Plant Materials. Revegetation shall include only local plant materials native to the project area, unless otherwise approved by CDFW in writing.
- 2.16 Willow Pole/Stake Cutting Revegetation. When using willow poles for revegetation, willow material shall be from locally harvested pole cutting material, collected

within 1-mile from the project site. No more than one third (1/3) of the cutting material shall be collected from any one individual. Willow pole cuttings shall be no less than 1-inch in diameter at the base of the pole. At least two thirds (2/3) of each willow pole cutting shall be planted in soil, without voids and air pockets. Willow pole cuttings shall be planted the same day they are harvested.

- 2.17 Prohibited Plant Species. Permittee shall not plant, seed or otherwise introduce invasive non-native plant species. Prohibited invasive non-native plant species include those identified in the California Exotic Pest Plant Council's database, which is accessible at: <http://www.cal-ipc.org>.

Erosion Control/Stabilization

- 2.18 Erosion Control. Permittee shall actively implement best management practices (BMPs) to minimize turbidity and siltation and prevent erosion and the discharge of sediment where it may pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat during project activities. Precautions shall include, but are not limited to: pre-construction planning to identify site specific turbidity and siltation minimization measures; best management erosion control practices during project activity; and settling, filtering, or otherwise treating silty and turbid water prior to discharge into a stream or storm drain. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches.
- 2.18.1 Monitoring. BMPs shall be monitored daily and repaired if necessary to ensure maximum erosion and sediment control.
- 2.18.2 Materials. All fiber rolls, straw wattles, and/or hay bales utilized within and adjacent to the project site shall be free of non-native plant materials. Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Products with plastic monofilament or cross joints in the netting that are bound/stitched (such as found in straw wattles/fiber rolls and some erosion control blankets), which may cause entrapment of wildlife, shall not be allowed.
- 2.18.3 Implementation. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. Upon the CDFW's determination that turbidity/siltation levels resulting from project-related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective CDFW-approved control

devices are installed or abatement procedures are initiated.

- 2.19 Prohibition Against Use of Plastic Netting in Erosion Control Measures. Permittee shall not use temporary or permanent erosion control devices containing plastic netting, including photo- or bio-degradable plastic netting. These items are commonly found in straw wattles (fiber rolls) and erosion control blankets.
- 2.20 Site Restoration. All areas and access points exposed or disturbed during project activities shall be restored using conditions as set forth in the *Revegetation and Restoration* section above. Seeded areas shall be covered with broadcast straw, hydro-mulch, and/or erosion control blankets.
- 2.21 Stream Diversion. When a temporary dam or other artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain aquatic life below the dam pursuant to Fish & G. Code § 5937. Any temporary dam or other artificial obstruction constructed shall only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which will cause little or no siltation. Stream diversions shall be removed prior to the winter period. This measure does not allow for the take or disturbance of any species protected under CESA.

Avoid/Minimize Effects of Equipment

- 2.22 Heavy Equipment Maintenance. Any equipment or vehicles driven and/or operated shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat. If maintenance or refueling of vehicles or equipment must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses to prevent the runoff of storm water and the runoff of spills. Place drip pans or absorbent materials under vehicles and equipment when not in use. Equipment shall be stored in areas that any possible contamination from the equipment would not pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat.
- 2.23 Minimize Vehicle Parking. Vehicles may enter and exit the work area as necessary for project activities, but may not be parked overnight within ten (10) feet of the drip line of any trees; nor shall vehicles be parked where mechanical fluid leaks may potentially pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat.
- 2.24 Building Material Storage. Project building material and/or construction equipment shall not be placed where materials could pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat, or where they may cover aquatic or riparian vegetation.

- 2.25 Decontamination of Project Equipment. Permittee shall decontaminate all tools, waders and boots, and other equipment that will enter the water prior to entering and exiting the project site to avoid the introduction and transfer of organisms. Permittee shall decontaminate project gear and equipment utilizing one of three methods: drying, using a hot water soak, or freezing, as appropriate to the type of gear or equipment. For all methods, Permittee shall begin the decontamination process by thoroughly scrubbing equipment, paying close attention to small crevices such as boot laces, seams, net corners, etc., with a stiff-bristled brush to remove all organisms. To decontaminate by drying, Permittee shall allow equipment to dry thoroughly (i.e., until there is a complete absence of water), preferably in the sun, for a minimum of 48 hours. To decontaminate using a hot water soak, Permittee shall immerse equipment in 140 degrees Fahrenheit or hotter water and soak for a minimum of 5 minutes. To decontaminate by freezing, Permittee shall place equipment in a freezer 32 degrees Fahrenheit or colder for a minimum of eight (8) hours. Repeat decontamination is required only if the equipment/clothing is removed from the site, used within a different waterbody, and returned to the project site.
- 2.26 Decontamination Sites. Permittee shall perform decontamination of vehicles, watercraft, and other project gear and equipment in a designated location where runoff can be contained and not allowed to pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat.
- 2.27 Stationary Equipment Leaks. Stationary equipment such as motors, pumps, generators, and welders shall be positioned over drip pans and secondary containment, as necessary. Stationary equipment shall have suitable containment to handle any spill/leak. Equipment shall be stored in areas that any possible contamination from the equipment would not pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat.
- 2.28 Equipment Maintenance and Fueling. No equipment maintenance or fueling shall be done where petroleum products or other pollutants from the equipment may pass into waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat.
- 2.29 Staging and Storage Areas. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents shall be located more than 150 feet from waters of the state (Fish & G. Code § 89.1), the stream bed, bank, or channel (including but not limited to dry, ponded, flowing, or wetland areas), drainages, lakes, other sensitive habitat, unless otherwise approved by CDFW in writing. All equipment and fuel stored on site shall be properly contained and protected from rain.

3. Reporting Measures

Permittee shall meet each reporting requirement described below.

- 3.1 Notification of Project Initiation. The Permittee shall notify the CDFW two (2) calendar days prior to beginning work for each construction season. Notification shall be submitted as instructed in Contact Information section below. Email submittal is preferred.
- 3.2 Notification of Project Completion. Upon completion of the project activities described in this Agreement, the project activities shall be digitally photographed. Photographs shall be submitted to CDFW within fifteen (15) calendar days of project completion. Photographs and project completion notification shall be submitted as instructed in Contact Information section below. Email submittal is preferred.
- 3.3 Notification to the California Natural Diversity Database. If any special-status species are observed during project implementation, the Permittee shall submit the California Natural Diversity Data Base (CNDDB) Online Field Survey Form electronically at <https://www.wildlife.ca.gov/data/CNDDB/submitting-data> within five (5) working days of the sightings, and provide a copy of the form, survey map and/or report to the CDFW's Regional office as instructed in Contact Information section below.
- 3.4 Restoration Monitoring Reports. After completion of the restoration activities, the area of restoration shall be monitored for a minimum of three years. Each year for three years after restoration, a monitoring report shall be submitted to CDFW for review. The report shall include the success of natural revegetation establishment, survival, percent cover, and height of both tree and shrub species. The number by species of plants replaced, an overview of the revegetation effort, and the method used to assess these parameters shall also be included. The report shall include photos from designated photo stations and other relevant information such as: a summary of invasive species control, methods used to remove non-native plants, and a list of wildlife observed on site.

CONTACT INFORMATION

Any communication that Permittee or CDFW submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or CDFW specifies by written notice to the other.

To Permittee:

Beth Christman
Truckee River Watershed Council
P.O. Box 8568
Truckee, CA 96162

Phone: (530) 550-8760 x 1
Email: bchristman@truckeeriverwc.org

To CDFW:

Department of Fish and Wildlife
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
Attn: Lake and Streambed Alteration Program
EPIMS Notification No. SAC-
Phone: (916) 358-2885
Fax: (916) 358-2912
Email: R2LSA@wildlife.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of this Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that this Agreement authorizes.

This Agreement does not constitute CDFW's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

CDFW may suspend or revoke in its entirety this Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with this Agreement.

Before CDFW suspends or revokes this Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before CDFW suspends or revokes this Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused CDFW to issue the notice.

ENFORCEMENT

Nothing in this Agreement precludes CDFW from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking this Agreement.

Nothing in this Agreement limits or otherwise affects CDFW's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with, from obtaining any other permits or authorizations that might be required under, other federal, state, or local laws or regulations before beginning the project or an activity related to it. For example, if the project causes take of a species listed as threatened or endangered under the Endangered Species Act (ESA), such take will be unlawful under the ESA absent a permit or other form of authorization from the U.S. Fish and Wildlife Service or National Marine Fisheries Service.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the Fish and Game Code including, but not limited to, Fish and Game Code sections 2050 *et seq.* (threatened and endangered species), section 3503 (bird nests and eggs), section 3503.5 (birds of prey), section 5650 (water pollution), section 5652 (refuse disposal into water), section 5901 (fish passage), section 5937 (sufficient water for fish), and section 5948 (obstruction of stream).

Nothing in this Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

CDFW may amend this Agreement at any time during its term if CDFW determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend this Agreement at any time during its term, provided the amendment is mutually agreed to in writing by CDFW and Permittee. To request an amendment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of this Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter CDFW approves the transfer or assignment in writing.

The transfer or assignment of this Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form

and include with the completed form payment of the minor amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with Fish and Game Code section 1605, subdivision (b), Permittee may request one extension of this Agreement, provided the request is made prior to the expiration of this Agreement's term. To request an extension, Permittee shall submit to CDFW a completed CDFW "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). CDFW shall process the extension request in accordance with Fish and Game Code section 1605, subdivisions (b) through (e).

If Permittee fails to submit a request to extend this Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project this Agreement covers (Fish & G. Code § 1605, subd. (f)).

EFFECTIVE DATE

This Agreement becomes effective on the date of CDFW's signature, which shall be: 1) after Permittee's signature; 2) after CDFW complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable Fish and Game Code section 711.4 filing fee listed at <https://www.wildlife.ca.gov/Conservation/CEQA/Fees>.

TERM

This Agreement shall **expire five (5) years** from the date signed by CDFW. All provisions in this Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after this Agreement expires or is terminated, as Fish and Game Code section 1605, subdivision (a)(2) requires.

EXHIBITS

The documents listed below are included as exhibits to this Agreement and incorporated herein by reference.

- A. Exhibit A. Project Location
- B. Exhibit B. Lower Lacey Meadow Design Plans
- C. Exhibit C. Upper Lacey Meadows Design Plans

AUTHORITY

If the person signing this Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project this Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify CDFW in accordance with Fish and Game Code section 1602.

CONCURRENCE

Through the electronic signature by the permittee or permittee's representative as evidenced by the attached concurrence from CDFW's Environmental Permit Information Management System (EPIMS), the permittee accepts and agrees to comply with all provisions contained herein.

The EPIMS concurrence page containing electronic signatures must be attached to this agreement to be valid.

Exhibit A: Project Location

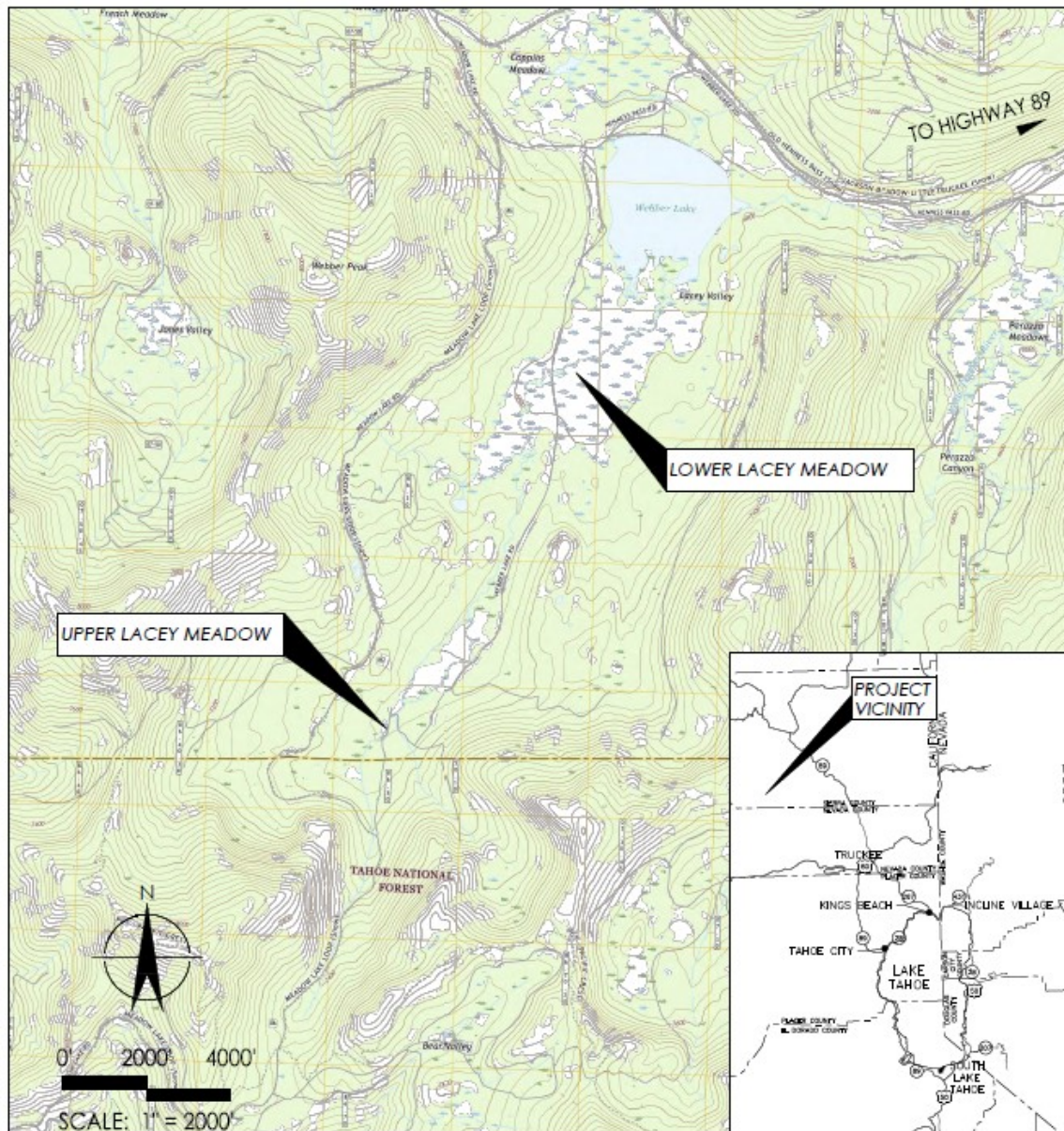


Exhibit B: Lower Lacey Meadows Design Plans

Exhibit B: Upper Lacey Meadows Design Plans



California Department of
Fish and Wildlife

Permit Details

Permit: EPIMS-SIE-19150-R2 - Lacey Meadows Restoration - 2021

Status: Underway
Region: Region 2
Permittee Organization: Truckee River Watershed Council
CDFW Contact: Region 2 CDFW

Standard Agreement

Signature Page

This Standard Agreement is being issued to:

TRUCKEE RIVER WATERSHED COUNCIL

**Final Standard
Agreement:***

EPIMS-SIE-19150-R2_Cover_Letter.pdf
Open and print the attached PDF file.

Exhibits

Exhibits 1	
Document Description:	Exhibit B Updated Lower Meadow 100% Design
Document:	Exhibit B Updated Lower Mead 100 12-01-21.pdf
Exhibits 2	
Document Description:	Exhibit C Updated Upper Meadow 95% Design
Document:	Exhibit C Updated Upper Mead 95_2021-09-29.pdf
Exhibits 3	
Document Description:	final agreement
Document:	EPIMS-SIE-19150-R2_Final_Agreement_Version 1.pdf
Exhibits 4	
Document Description:	Cover letter
Document:	EPIMS-SIE-19150-R2_Cover_Letter.pdf

Concurrence

I am the applicant or I have the authority to sign for the applicant. By my signature, I accept and agree to comply with all the provisions contained herein.

**Final Agreement Effective
Date:** 03/23/2022

**Permittee Electronic
Signature:** Beth Christman
First and Last Name

Date Signed: 02/09/2022

Department of Fish and Wildlife

**CDFW Electronic
Signature:** Jennifer Garcia

**CDFW Representative
Title:** Environmental Program Manager

Date Signed: 03/23/2022

Acting for:



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

August 16, 2022

Regulatory Division (SPK-2021-00118)

Truckee River Watershed Council
Attn: Ms. Beth Christman
P.O. Box 8568
Truckee, California 96162-8568
bchristman@truckeeriverwc.org

Dear Ms. Christman:

We are responding to your June 18, 2021, pre-construction notification for a Department of the Army (DA) permit for the Lacey Meadows Restoration project. The approximately 420-acre project site is located on Lacey Creek at Latitude 39.4654°, Longitude -120.425633°, within Sierra and Nevada Counties, California.

Based on the information you provided to this office, the Lacey Meadows Restoration project involves the discharge of dredged and/or fill material into 4.78 acres (12,466 linear feet) of waters of the United States (WOUS) for the construction of a meadow and stream restoration project, subject to Section 404 of the Clean Water Act. The specific activities that require DA authorization are in-channel placement of wood and rock debris jams, rock riffles, incised channel fills, and minor grading. These activities would not result in any adverse permanent effects to stream or wet meadow aquatic resources, however there would result be temporary effects to approximately 4.78 acres (12,466) linear feet of intermittent stream and wet meadow. It is estimated that this project would result in a net gain of approximately 3,500 linear feet of stream channel to Upper Lacey Creek, approximately 4,700 linear feet of stream channel to Lower Lacey Creek, approximately 27 acres of wet meadow to Upper Lacey Meadow, approximately 78 acres of wet meadow to Lower Lacey Meadow, and approximately 50 acres of existing wet meadow in Lower Lacey Meadow would be enhanced. The proposed activities would be conducted in accordance with the *Design Basis Report, Lacey Meadows Restoration Design, Sierra and Nevada Counties, California*, plans dated August 2020, prepared by Balance Hydrologics. (Enclosure 1).

We have determined that activities in WOUS associated with the project are authorized by Nationwide Permit Number (NWP) 27, *Aquatic Habitat Restoration, Establishment, and Enhancement Activities*. You must comply with all terms and conditions of the NWP and applicable regional conditions. Enclosed is information about the NWP terms and conditions (Enclosure 2). You should pay particular attention to General Conditions 2, 3, 4, 6, 7, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 25, 29, and 30.

In addition, your work must comply with the following special conditions:

1. This Prior Corps permit does not authorize you to take an endangered species, in particular Sierra Nevada Yellow Legged Frog (*Rana sierrae*) and Lahontan Cutthroat Trout (*Oncorhynchus clarkii henshawi*). In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (USFWS) BO (2022-0063166, dated July 26, 2022), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this Corps verification is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached BO, which terms and conditions are incorporated by reference in this verification. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps verification. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

2. Prior to initiation of construction activities in WOUS authorized by this verification, you shall notify this office in writing of the anticipated start date for the work. No later than 10 calendar days following completion of construction activities in WOUS authorized by this verification, you shall notify this office in writing that construction activities have been completed.

3. You shall comply with all terms and conditions of the enclosed April 9, 2021, Section 401 Water Quality Certification (*WDID 6A292009002*) (Enclosure 3).

4. Prior to initiation of any construction activities in WOUS authorized by this verification, you shall employ mitigation measures and construction best management practices (BMPs) as identified in the June 1, 2022, *Phase 1 Archaeological Inventory Report for the Lacey Meadows Restoration Project*, prepared by DZC, which is hereby incorporated by reference as a condition of this verification.

Within 30 days after completion of the authorized work, you must sign the enclosed Compliance Certification and return it to this office (Enclosure 5).

This verification is valid until March 14, 2026, when the existing NWP are scheduled to be modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date the NWP is modified, reissued, or revoked, you will have 12 months from the date of the modification, reissuance or revocation to complete the activity under the present terms and conditions. Failure to comply with the general and regional conditions of this NWP, or the project-specific special conditions of this authorization, may result in the suspension or revocation of your authorization.

We would appreciate your feedback on this permit action including your interaction with our staff and processes. For more information about our program or to complete our Regulatory Program national customer service survey, visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Please refer to identification number SPK-2021-00118 in any correspondence concerning this project. If you have any questions, please contact Chris Katopothis at 310 Hemsted Drive, Suite 310, Redding, CA 96002-0935, by email at chris.katopothis@usace.army.mil, or telephone at (530) 223-9537.

Sincerely,

Matthew J. Roberts
Lead Project Manager
CA North Section

Enclosures

cc: (w/o encls)

Lahontan Regional Water Quality Control Board, lahontan@waterboards.ca.gov

Ms. Elizabeth Menchaca, United States Fish and Wildlife Service,
elizabeth_menchaca@fws.gov

Mr. Darrel Cruz, Tribal Historic Preservation Officer, Washoe Tribe of Nevada and California, darrel.cruz@washoetribe.us

COMPLIANCE CERTIFICATION

Permit File Name: Lacey Meadows Restoration

Action ID: SPK-2021-00118

Nationwide Permit Number: 27, *Aquatic Habitat Restoration, Establishment, and Enhancement Activities*

Permittee: Truckee River Watershed Council
Attn: Ms. Beth Christman
P.O. Box 8568
Truckee, California 96162-8568

County: Sierra County

Date of Verification: August 16, 2022

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Sacramento District
SPKRegulatoryMailbox@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the U.S. Army Corps of Engineers.

* * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

Permittee Signature

Date



United States
Department of
Agriculture

Forest
Service

Sierraville
Ranger
District

P.O. Box 95
Sierraville, CA
96126
530 994-3401
530 994-3521 TDD
530 994-3143 FAX

File Code: 1950

Date: November 12, 2021

Route To: Project File

Subject: Lacey Meadows Restoration Project

To: Letter To The File

This letter documents actions to be implemented as part of the implementation of the Lacey Meadows Restoration Project Road on National Forest System Lands in the SE1/4 of T16N R14E Section 6. These actions compliment the actions identified within the Lacey Meadows Restoration Project Initial Study/Negative Declaration on private lands. The restoration activities planned on both private and National Forest System lands are intended to; 1) restore the meadow hydrology, 2) restore meadow plant species, 3) restore meadow soils, and 4) restore meadow health. The proposed activities are intended to meet overall project objectives through the attenuation of sediment entering the meadow system and restoring the natural planform of Lacey Creek. The total areage aligned with ground disturnace is approximately 1.09 acres, with 2,850 ft² of disturbance in the Lower Meadow and the remaining 44,500 ft² disturbance in the Upper Meadow. The table below resrepresents the indivual actions on National Forest System lands.

Table 1. Total Impacts on TNF Land – Lacey Meadows Restoration

Action/Activity	Number of Items	Area/structure	Total (ft ²)
Log jam 1 – hand bundle	1	50 ft ²	50
Log jam 2- small log jam	7	300 ft ²	2,100
Log jam 3 – large log jam	1	1,000 ft ²	1,000
Levee removal (~100 cy)	1	1,000 ft ²	1,000
Riffle construction (Levee fill placement)	1	1,000 ft ²	1,000
Excavate low flow channel			16,000
Excavate for high flow channel	1		4,800
Place buried logs at high flow channel			1,000
Access routes	1,360 linear feet	15 ft wide	20,400
Total Square feet			47,350
TOTAL acres			1.09



I have discussed implementation of the proposed restorative actions with District Staff (wildlife, fisheries, botany, wildlife, fuels, archaeology, and watershed) and there is no information which would yield potential significant direct, indirect and cumulative adverse effects. In addition, there are no archaeological, or cultural resources aligned within the project area footprint.

Actions to achieve these objectives include the following mitigation measures:

- If any federally listed species or Forest Service sensitive species are detected, the District Wildlife Biologist, District Fisheries Biologist, and/or District Botanist will be notified, and mitigation measures will be implemented as necessary and appropriate.
- Project activities are subject to the requirements of the Project Activity Level (PAL) system. For PAL's of D or EV, variances are required for the use of chainsaws and other heavy equipment. In the event, PAL's are recorded of D or EV, the Forest Service may grant a variance for work to continue subject to specific mitigation measures.

The TDLT Webber Timber Harvest Plan (THP # 2-18-00130-SIE) has provided a baseline of additional natural resource inventory data of which overlaps the above project on both private lands and National Forest System lands. The implementation of this segment of restorative actions on National Forest System lands through the CEQA Initial Study – Mitigated Negative Declaration is deemed appurtenant in support of the above listed actions. In addition, a review of the above actions, has determined that they are consistent with the goals and objectives of the Tahoe National Forest Land & Resource Management Plan.

This letter documents my decision to implement this work.


QUENTIN L. YOUNGBLOOD
District Ranger