

**PINE RIDGE ROCK
PRODUCT MINE
(#UTR271707)**

4776 E 2600 N
PO BOX 1108
EDEN, UT 84310

801-745-3150 – OFFICE

1 INDUSTRIAL ENVIRONMENTAL SUMMARY

1.1 Summary

Pine Ridge Rock Products has a Small Mine Reclamation Contract entered into with the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining. This permit allows us to conduct mining operations under Notice of Intention (NOI) File No. S/057/0010. We have recently completed Phase I (132.46 acres) of the Class III Cultural Resources Inventory required by UDOGM as the final condition to complete our permit application. We are anticipating a complete report to be submitted by SWCA to UDOGM on June 22, 2015. The project consists of gathering and excavating large boulders, gravel and road base for landscaping and road construction purposes. The boulders and gravel exist on the ground surface and others are excavated and loaded onto a truck and transferred to our stock pile yard or delivered to customers and clients. The project area is bordered by undeveloped mountainous area.

1.2 Project Description

The project site consists of landscape boulder, gravel and road base retrieval areas, with less than 9 acres of disturbed area in a total site area of 820 acres. Surface boulders lying on the ground are still being picked and loaded on a truck along now with excavated boulders, gravel and road base. Excavation of boulders is currently taking place in 2 active areas (see map). The existing vegetation (mules ear, sagebrush, pinyon, river birch and meadow grasses) will be disturbed as the boulders are removed; however our reclamation obligations as a company is secured in lieu of a surety bond (copy available for review). Potential sources of pollution that might affect the quality of storm water discharge are sediment transportation from disturbed ground and equipment used on site.

1.3 Existing Site Conditions

The current project area is located in Sections 28 and 33, Township 8 North, Range 1 East in Cache County.

1.4 Adjacent Areas

No changes

1.5 Critical Areas

No changes

1.6 Soils

No changes

1.7 Erosion Problem Areas

No changes

1.8 Phasing

Site use is anticipated to be year round, excluding all major Holidays and Sundays. Hours of Operation will be limited to normal daylight working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday.

1.9 Schedule

See 1.8 Phasing

1.10 Financial/Ownership Responsibilities

Remains the same.

1.11 Engineering Calculations

A (mobile) vehicle tracking pad is available at the mine.

**Storm Water Pollution Prevention Plan
for Industrial Storm Water Management
Pine Ridge Excavation & Landscapes, LLC**

STATE OF UTAH, DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY
195 North 1950 West, P.O. BOX 144870, SALT LAKE CITY, UTAH 84114-4870

A. Facility/Operator Information

1. Name: Pine Ridge Excavation & Landscapes, LLC 2. Phone: (801) 745-3150
3. Mailing Address a. Street: PO Box 1108
b. City: Eden c. State: UT d. Zip Code: 84310

B. Facility/Site Location Information

1. Facility Name: Pine Ridge Rock Products Mine
2. a. Street Address: 4776 E 2600 N
b. City: Eden c. County: Weber
d. State: UT e. Zip Code: 84310
3. Is the facility located on Indian Lands? Yes 0 No X
4. a. Latitude: 41 o 23' 37.53" b. Longitude: 111 o 51' 11.08"
5. a. Was the facility or site previously covered under a UPDES storm water permit? Yes X No 0
b. If yes, enter UPDES Permit number: UTR300000
6. a. SIC/Activity Codes: Primary: 1411 Secondary (if applicable): 1442

C. Contact Information/Responsible Parties

1. **Facility Operator:** R. Dan Lockwood
2. a. Street Address: 4776 E 2600 N PO Box 1108
b. City: Eden c. County: Weber
d. State: UT e. Zip Code: 84310
3. Telephone Number: (801) 745-3150
4. **Facility Owner:** Rebecca Lockwood
5. a. Street Address: 4776 E 2600 N PO Box 1108
b. City: Eden c. County: Weber
d. State: UT e. Zip Code: 84310
3. Telephone Number: (801) 430-4421

D. Storm Water Pollution Prevention Team

Name and Title

Responsibility

R. Dan Lockwood/ Facility Operator - Development of SWPPP, training, implementing and maintaining stormwater control measures, taking corrective action where necessary to address permit violations or to improve the performance of control measures, and modifying the SWPPP to reflect changes made to the control measures.

LeeAnn Scovel/ Compliance Administrator - Assist in development of SWPPP, training, maintaining records and modifying of SWPPP to reflect changes made to control measures.

Jesse Turner/ Lead Operator - Assist in development of SWPPP, training and maintaining records.

E. Industrial Activity and Associated Pollutants

See SWPPP Worksheet attached.

F. Site Map

*See Attachment

G. Spills and Leaks

| Date | Description | Outfalls |
|------|-------------|----------|
| N/A | N/A | N/A |
| | | |
| | | |
| | | |

H. Non-Storm Water Discharges

| Date | Outfall | Method (e.g., visual, smoke test, die test) | Evaluator | Observations | Date Corrected |
|------|---------|---|-----------|--------------|-------------------|
| N/A | | | | | |
| | | | | | |

I. Storm Water Discharge Monitoring Report

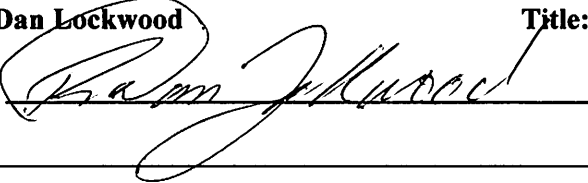
Attached is DWQ's Storm Water Discharge Monitoring Report.

J. Employee Training

| Date | Trainer | Topic(s) | Attendees |
|--------|-----------------------------------|--|---|
| 7/2015 | R. Dan Lockwood, LeeAnn Scovel | Purpose of a SWPPP, Spill Prevention/Response, Good Housekeeping, Material Management Practices, Taking Corrective action and Improving the Performance of Control Measures, Documentation and Record Keeping. | Jesse Turner, Weston Christensen, Corey Meyrick, George Winsor II, Mitchell Pickett, Daniel Edward, Doug Scovel, Jed Hamblin, Tommy Keating, Cort Lockwood, Jordan Grill, Joe Luna, Marshall McGonegal, Shane Sweeney, Alice Czappa |
| | | | |
| | | | |

K. SWPPP Certification and Certification of Evaluation of Non-Storm Water Discharges

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 gathered and evaluated the information submitted. I certify under penalty of law that the storm water drainage system in this SWPPP has been tested or evaluated for the presence of non-storm water discharges either by me, or under my direction and supervision. And at the time this plan was completed no unauthorized discharges were present. Based on my inquiry of the person(s) 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 or imprisonment for knowing violations.

Name: R. Dan Lockwood**Title: Facility Operator****Signature:**

Date: 6-01-15

Pine Ridge Excavation & Landscapes LLC
Pine Ridge Rock Products Mine

Stormwater Pollution Prevention Team

R. Dan Lockwood (Facility Operator) - Develop SWPPP, SWPPP updates, monitoring, specific BMP maintenance/implementation, yearly/monthly/daily inspections; training

Jesse Turner (Lead Equipment Operator) - Assist in developing SWPPP, SWPPP updates, monitoring, specific BMP maintenance/implementation, yearly/monthly/daily inspections, training

LeeAnn Scovel (Compliance Administrator) - Assist in developing SWPPP, SWPPP updates, monitoring, specific BMP maintenance/implementation, recording/documenting inspections, training

Updated: 5/1/2015

**Storm Water Pollution Prevention Worksheet
Pine Ridge Rock Products Mine**

| Potential Pollutant Sources/Outfall # (activities/materials/physical features) | Pollutants | Runoff Potential (Yes/No) | BMPs to Eliminate/Reduce Pollutants | BMPs to Manage Runoff | Site Inspections |
|---|--|---------------------------|---|--|---|
| Examples: loading/unloading operations; outdoor storage; outdoor processing; significant dust or particulate generating processes; areas with high potential for soil erosion, etc. | Identify pollutant parameter(s). Examples: Total Suspended Solids (TSS)= dirt/sand; Total Dissolved Solids (TDS)= salt/fuels/solvents, etc. | | List of Treatment and Pollution Prevention BMPs used to eliminate or reduce pollutants. Examples: minimize exposure, good housekeeping, maintenance, spill prevention and response, etc. PREVENTIVE PROCEDURES | List of Treatment and Pollution Prevention BMPs used to divert, infiltrate, or reuse runoff. Examples: vegetative swales and practices, reuse of storm water, inlet controls (soil/water separators), etc. TREATMENT PRACTICES | List of dates when measures and controls were inspected (required at least once/year). List problems found during inspection. Identify corrective measures and implementation date. |
| SITE PREPARATION: | | | | | |
| Road construction (haul and access roads), removal of overburden, removal of waste rock to expose the mineral body. | Dust, total suspended solids (TSS), total dissolved solids (TDS) | Yes | Install temporary dikes, curbs and berms for diversions, perform all necessary maintenance and repairs, keep as much vegetation as possible | Water roadways on windy days, keep vegetation and seed as necessary, allow natural vegetation along roadsides to remain | Inspections: |
| MINERAL EXTRACTION: Excavation, soil erosion | Dust, TSS | Yes | Install dikes, curbs, berms, operate only during good weather conditions. Water roadways on windy days, keep as much vegetation as possible and seed as necessary to minimize exposed soil | Water roadways on windy days, keep as much vegetation as possible and seed as necessary, use swales | Inspections: |
| MINERAL PROCESSING ACTIVITIES: | | | | | |
| Rock sorting, raw material storage, waste rock storage, raw material loading/unloading, material transportation | Dust, TSS, TDS, diesel/gas fuel, oil, lime | Yes | Install dikes, curbs, berms for discharge diversions, stabilize and recontour (if necessary) piles, vegetate piles as possible and needed | Water roadways on windy days, utilize mobile maintenance vehicle & spill kits, spill response, use swales | Inspections: |
| EQUIPMENT/VEHICLE MAINTENANCE: | | | | | |
| Fueling, parts cleaning, waste disposal of oil and gas filters, batteries, coolants, degreasers, fluid replacement | Diesel/gas fuel, oil, heavy metals, acid/alkaline wastes, arsenic, lead, cadmium, chromium, benzene, TCA, TCE, PAHs, anti-freeze, acetylene | Yes | Practice good housekeeping by utilizing mobile vehicle to fuel and maintain equipment & vehicles, utilize spill kits/drip pans, eliminate or reduce the number and amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials, use absorbents for dry cleanup whenever possible, prohibit hosing down area where practice would result in discharge of pollutants, clean in a centralized | Utilize spill kit for spill of pollutants immediately, empty and clean drip pans and containers, dispose of greasy rags, oil filters, batteries, spent coolant, and degreasers properly, use absorbents for dry cleanup whenever possible, recycle materials, do all cleaning in a centralized area, collect fluid when leaks occur and dispose of properly, | Inspections: |
| | hydraulic fluid, oxygen, motor oil | | station so the solvents stay in one area., check vehicles/equipments closely for leaks, perform inspection and preventive maintenance, train employees on proper waste control and disposal, inspect fueling area to detect problems, train personnel on proper fueling procedures | | |
| RECLAMATION ACTIVITIES: Site preparation for stabilization, fertilizers | Dust, TSS, TDS, nitrogen, phosphorus | Yes | Use pesticides, herbicides, fertilizers, and other chemicals only when needed and follow instructions on the label, replace containers that are leaking, corroded, or otherwise deteriorating, keep an accurate up-to-date inventory of materials, instill a surety bond to secure all reclamation responsibilities, train personnel on proper storm water management practices | Reclaim sites as needed with documentation, utilize pesticides, herbicides, fertilizers and other chemicals that are best suited (environmentally friendly), utilize seeds that are natural to the area and not invasive, use swales | As needed: Notice and completion of reclamation work will be submitted to UDOGM |
| OUTDOOR STORAGE: | Oxygen, acetylene, hydraulic fluid, diesel, unleaded fuel, anti-freeze, motor oil | Yes | Utilize mobile vehicle (maintenance truck) to store all equipment and materials, minimize exposure by designating a storage area- as needed, practice and implement good housekeeping, spill prevention and response, protect stored material by completely covering them at all times | Utilize mobile vehicle to transport materials (pollutants) onto and off of the mine daily, attend spills immediately, personnel training on proper handling of storage, monitor safety of storage area and containers | Inspections: |
| WASTE MANAGEMENT: | Trash/debris containers, porta potties | Yes | Practice good housekeeping, drums, barrels, tanks and similar containers must be sealed, non-leaking and in good condition, utilize a trash container with a lid, service porta-potties as needed by professionals, | Reuse or recycle fluids and parts when possible, dispose waste properly, monitor condition and restore trash/storage containers as needed | Inspections: Observations on a daily basis, otherwise weekly, quarterly and yearly |

STATE OF UTAH, DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY

195 North 1950 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870 (801)536-4300

NOI

Notice of Intent (NOI) for Coverage Under the UPDES General Multi-Sector Storm Water Permit for Discharges Associated with Industrial Activity, Permit No. UTR271707
INSTRUCTIONS ON BACK PAGE

Submission of this Notice of Intent constitutes notice that the party identified in Section I of this form intends to be authorized by a UPDES permit issued for storm water discharges associated with industrial activity in the State of Utah. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM. A different NOI form is provided for construction activities.

I. FACILITY OPERATOR INFORMATION

Issued Date 07/09/2015

Expiration Date 12/31/2017

Name: Pine Ridge Excavation & Landscapes, LLC

Phone: 801-745-3150

Address: 4776 E 2600 N PO BOX 1108

Status of Owner/Operator: PRIVATE

City: EDEN

State: UT

Zip: 84310-9535

Facility Contact Person: R. Dan Lockwood

Phone: 435-994-2061

Facility Contact Person Title: Manager

II. FACILITY SITE/LOCATION INFORMATION

Is the facility located
in Indian Country?
(Y or N) N

Name: Pine Ridge Rock Products

Address: 4776 E 2600 N PO BOX 1108

County: WEBER

City: EDEN

State: UT

Zip: 84310-9535

Latitude: 41.393611

Longitude: 111.853056

Quarter:

Section: 28, 33

Township: T8N

Range: R1E

Site Contact Person: R. Dan Lockwood

Phone: 435-994-2061

Site Contact Person Title: Manager

III. SITE ACTIVITY INFORMATION

Name of Municipality which Operates the Storm Sewer System: Weber County

Receiving Water Body(s): Cache Valley Creek null

Is there existing quantitative storm water discharge data? Yes No

Is the facility required to do analytical monitoring? (See permit conditions Part V. and Sector monitoring requirements.) Yes No

Is the facility required to do visual monitoring? (See permit conditions near the end of applicable Sector(s); Appendix A to AD) Yes No

Is the facility required to submit monitoring data or retain it on site? Submit Retain on site

Is This a New Facility, or is it an Existing Facility? New Existing

If This is an Existing Facility, and the Start-up Date was After Oct. 1992, Please Fill in the Start-up Month:

Month: 11

Year: 2010

SIC or Designated Activity Code: Primary: 1411

2nd: 1442

3rd:

4th:

If You Have Other Existing UPDES Permits, Enter Permit #'s:

IV. SECTOR IDENTIFICATION: The General Multi-Sector Permit covers all industrial activity that is required by law to be covered by a storm water permit. On the following pages the sectors are listed with a description of the industrial activity that is covered by that sector. Please check each sector that covers industrial activities which occur at your site. The sector covered in Appendix AD is the catch-all sector and should only be used if positively no other sector covers your industrial activity. If you should select AD, please call the Storm Water Coordinator at DWQ to discuss the need for choosing Sector AD (Non-Classified Facilities).

A. Timber Products Facilities – establishments [generally classified under Standard Industrial Classification (SIC) Major Group 24] that are engaged in cutting timber and pulpwood, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, and plywood and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in wood preserving or in manufacturing finished articles made entirely of wood or related materials, except for wood kitchen cabinet manufacturers (SIC Code 2434), which are addressed under sector W.

B. Paper and Allied Products Manufacturing Facilities – facilities engaged in the manufacture of pulps from wood and other cellulose fibers and from rags; the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes and envelopes; and establishments primarily engaged in manufacturing bags of plastic film and sheet. These facilities are commonly identified by Standard Industrial Classification (SIC) Major Group 26.

C. Chemical and Allied Products Manufacturing Facilities – 1) Basic industrial inorganic chemicals (including SIC 281), 2) Plastic materials and synthetic resins, synthetic rubbers, and cellulosic and other humanmade fibers, except glass (including SIC 282), 3) Soap and other detergents and in producing glycerin from vegetable and animal fats and oils; specialty cleaning, polishing, and sanitation preparations; surface active preparations used as emulsifiers, wetting agents, and finishing agents, including sulfonated oils; and perfumes, cosmetics, and other toilet preparations (including SIC 284), 4) Paints (in paste and ready-mixed form); varnishes; lacquers; enamels and shellac; putties, wood fillers, and sealers; paint and varnish removers; paint brush cleaners; and allied paint products (including SIC 285), 5) Industrial organic chemicals (including SIC 286), 6) Nitrogenous and phosphatic basic fertilizers, mixed fertilizer, pesticides, and other agricultural chemicals (including SIC 287), 7) Industrial and household adhesives, glues, caulking compounds, sealants, and linoleum, tile, and rubber cements from vegetable, animal, or synthetic plastics materials; explosives; printing ink, including gravure ink, screen process ink, and lithographic; miscellaneous chemical preparations, such as fatty acids, essential oils, gelatin (except vegetable), sizes, bluing, laundry sours, writing and stamp pad ink, industrial compounds, such as boiler and heat insulating compounds, metal, oil, and water treatment compounds, waterproofing compounds, and chemical supplies for foundries (including facilities with SIC 289), 8) Ink and paints, including china painting enamels, india ink, drawing ink, platinum paints for burnt wood or leather work, paints for china painting, artists' paints and artists' water colors (SIC 3952, limited to those listed; for others see sector Y.), 9) Medicinal chemicals and pharmaceutical products, including the grading grinding and milling of botanicals (including SIC 283).

D. Asphalt Paving, Roofing Materials, and Lubricant Manufacturing Facilities – 1) facilities engaged in manufacturing asphalt paving and roofing materials, including those facilities commonly identified by Standard Industrial Classification (SIC) codes 2951 and 2952, 2) portable asphalt plant facilities (also commonly identified by SIC code 2951), 3) facilities engaged in manufacturing lubricating oils and greases, including those facilities classified as SIC code 2992. **Not covered** are: 1) petroleum refining facilities, including those that manufacture asphalt or asphalt products and that are classified as SIC code 2911 (see sector I.), 2) oil recycling facilities (see sector N.), and 3) fats and oils rendering (see sector U.).

E. Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities – manufacturing flat, pressed, or blown glass or glass containers; manufacturing hydraulic cement; manufacturing clay products including tile and brick; manufacturing of pottery and porcelain electrical supplies; manufacturing concrete products; manufacturing gypsum products; nonclay refractories; and grinding or otherwise treating minerals and earths. This section generally includes the following types of manufacturing operations: flat glass, (SIC code 3211); glass containers, (SIC code 3221); pressed and blown glass, not elsewhere classified, (SIC code 3229); glass products made of purchased glass (SIC code 3231) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water; hydraulic cement, (SIC code 3241); brick and structural clay tile, (SIC code 3251); ceramic wall and floor tile, (SIC code 3253); clay refractories, (SIC code 3255); structural clay products not elsewhere classified (SIC code 3259); vitreous china plumbing fixtures, and china and earthen ware fittings and bathroom accessories (SIC code 3261); vitreous china table and kitchen articles (SIC code 3262); fine earthenware table and kitchen articles (SIC code 3263); porcelain electrical supplies, (SIC code 3264); pottery products, (SIC code 3269); concrete block and brick, (SIC code 3271); concrete products, except block and brick (SIC code 3272); ready-mix concrete, (SIC code 3273); lime (SIC code 3274); gypsum products, (SIC code 3275); cut stone and stone products (SIC code 3281); abrasive products (SIC code 3291); asbestos products (SIC code 3292); minerals and earths, ground or otherwise treated, (SIC code 3295); mineral wool (SIC code 3296); nonclay refractories, (SIC code 3297); and nonmetallic mineral products not elsewhere classified (SIC code 3299).

F. Primary Metals Facilities – coking operations, sintering plants, blast furnaces, smelting operations, rolling mills, casting operations, heat treating, extruding, drawing, or forging of all types of ferrous and nonferrous metals, scrap, and ore. Coverage includes the following types of facilities: 1) Steel works, blast furnaces, and rolling and finishing mills including: steel wiredrawing and steel nails and spikes; cold-rolled steel sheet, strip, and bars; and steel pipes and tubes (SIC code 331), 2) Iron and steel foundries, including: gray and ductile iron, malleable iron, steel investment, and steel foundries not elsewhere classified (SIC code 332), 3) Primary smelting and refining of nonferrous metals, including: primary smelting and refining of copper, and primary production of aluminum (SIC code 333), 4) Secondary smelting and refining of nonferrous metals (SIC code 334), 5) Rolling, drawing, and extruding of nonferrous metals, including: rolling, drawing, and extruding of copper; rolling, drawing, and extruding of nonferrous metals, except copper and aluminum; and drawing and insulating of nonferrous wire (SIC code 335), 6) Nonferrous foundries (castings), including: aluminum die-castings, nonferrous die-castings, except aluminum, aluminum foundries, copper foundries, and nonferrous foundries, except copper and aluminum (SIC code 336), 7) Miscellaneous primary metal products, not elsewhere classified, including: metal heat treating, and primary metal products, not elsewhere classified (SIC code 339).

G. Metal Mines (Ore Mining and Dressing) – active and inactive metal mining and ore dressing facilities [Standard Industrial Classification (SIC) Major Group 10] if the storm water has come into contact with, or is contaminated by, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the operation. SIC Major Group 10 includes establishments primarily engaged in mining, developing mines, or exploring for metallic minerals (ores) and also includes all ore dressing and beneficiating operations, whether performed at mills operated in conjunction with the mines served or at mills, such as custom mills, operated separately. For the purposes of this part of the permit, the term "metal mining" includes all ore mining and/or dressing and beneficiating operations, whether performed at mills operated in conjunction with the mines served or at mills, such as custom mills, operated separately. All storm water discharges from inactive metal mining facilities and the storm water discharges from the following areas of active, and temporarily inactive, metal mining facilities are the only discharges covered by this section of the permit: topsoil piles; offsite haul/access roads if off active area; onsite haul roads if not constructed of waste rock or if spent ore and mine water is not used for dust control; runoff from tailings dams/dikes when not constructed of waste rock/tailings and no process fluids are present; concentration building, if no contact with material piles; mill site, if no contact with material piles; chemical storage area; docking facility, if no excessive contact with waste product; explosive storage; reclaimed areas released from reclamation bonds prior to December 17, 1990; and partially/inadequately reclaimed areas or areas not released from reclamation bonds. **Not covered** are: 1) active metal mining facilities that are subject to the effluent limitation guidelines for the Ore Mining and Dressing Point Source Point Source Category (40 CFR Part 440). Coverage under this permit does not include adit drainage or contaminated springs or seeps at active facilities, temporarily inactive facilities, or inactive facilities. Also see permit conditions, Limitations on Coverage, Part I.B.3. 2) Storm water discharges associated with an industrial activity that the *Executive Secretary* has determined to be, or may reasonably be expected to be, contributing to a violation of a water quality standard, 3) Storm water discharges associated with industrial activity from inactive mining operations occurring on Federal lands where an operator cannot be identified.

H. Coal Mines and Coal Mine-Related Facilities – coal mining-related areas (SIC Major Group 12) if they are not subject to effluent limitations guidelines under *40 CFR Part 434*. **Not covered** are: inactive mining activities occurring on Federal lands where an operator cannot be identified.

I. Oil and Gas Extraction Facilities – oil and gas facilities listed under Standard Industrial Classification (SIC) Major Group 13 which are required to be permitted under *UAC R317-8-3.9(2)(a)3*. These include oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with any overburden raw material, intermediate products, finished products, by-products or waste products located on the site of such operations. Industries in SIC Major Group 13 include the extraction and production of crude oil, natural gas, oil sands and shale; the production of hydrocarbon liquids and natural gas from coal; and associated oil field service, supply and repair industries. This section also covers petroleum refineries listed under SIC code 2911. Contaminated storm water discharges from petroleum refining or drilling operations that are subject to nationally established BAT or BPT guidelines found at *40 CFR 419* and *435* respectively are not included. [Note that areas eligible for coverage at petroleum refineries will be very limited because the term "contaminated runoff", as defined under *40 CFR 419.11*, includes "... runoff which comes into contact with any raw material, intermediate product, finished product, by-product or waste product located on petroleum refinery property". Areas at petroleum refineries which may be eligible for permit coverage, provided discharges from these areas are not co-mingled with "contaminated runoff", include: vehicle and equipment storage, maintenance and refueling areas. Most areas at refineries will not be eligible for coverage including: raw material, intermediate product, by-product, waste material, chemical, and material storage areas; loading and unloading areas; transmission pipelines, and, processing areas.] **Not covered** are: inactive oil and gas operations occurring on Federal lands where an operator cannot be identified are not covered by this permit.

- J. Mineral Mining and Processing Facilities – active and inactive mineral mining and processing facilities (generally identified by Standard Industrial Classification (SIC) Major Group 14). Not covered are: 1) facilities associated with industrial activity which are subject to an existing effluent limitation guideline (*40 CFR Part 436*), 2) inactive mineral mining activities occurring on Federal lands where an operator cannot be identified are not eligible for coverage under this permit.
- K. Hazardous Waste Treatment Storage or Disposal Facilities – facilities that treat, store, or dispose of hazardous wastes, including those that are operating under interim status or a permit under subtitle C of RCRA. [Disposal facilities that have been properly closed and capped, and have no significant materials exposed to storm water, are considered inactive and do not require permits (*UAC R317-8-3.9(6)(c)*).]
- L. Landfills and Land Application Sites – waste disposal at landfills, land application sites, and open dumps that receive or have received industrial wastes. Open dumps are solid waste disposal units that are not in compliance with State/Federal criteria established under RCRA Subtitle D. Not covered are: inactive landfills, land application sites, and open dumps occurring on Federal lands where an operator cannot be identified.
- M. Automobile Salvage Yards – facilities engaged in dismantling or wrecking used motor vehicles for parts recycling or resale and for scrap (SIC Code 5015).
- N. Scrap Recycling and Waste Recycling Facilities – facilities that are engaged in the processing, reclaiming and wholesale distribution of scrap and waste materials such as ferrous and nonferrous metals, paper, plastic, cardboard, glass, animal hides (these types of activities are typically identified as SIC code 5093). Facilities that are engaged in reclaiming and recycling liquid wastes such as used oil, antifreeze, mineral spirits, and industrial solvents (also identified as SIC code 5093) are also covered under this section. Separate permit requirements have been established for recycling facilities that only receive source-separated recyclable materials primarily from non-industrial and residential sources (also identified as SIC 5093) (e.g., common consumer products including paper, newspaper, glass, cardboard, plastic containers, aluminum and tin cans). This includes recycling facilities commonly referred to as material recovery facilities (MRF).
- O. Steam Electric Power Generating Facilities – steam electric power generating facilities, including coal handling areas. Non-storm water discharges subject to effluent limitations guidelines are not covered by this permit. Storm water discharges from coal pile runoff subject to numeric limitations are eligible for coverage under this permit, but are subject to the limitations established by *40 CFR 423*. Not covered are: ancillary facilities such as fleet centers, gas turbine stations, and substations that are not contiguous to a steam electric power generating facility are not covered by this permit. Heat capture co-generation facilities are not covered by this permit; however, dual fuel co-generation facilities are included.
- P. Vehicle Maintenance or Equipment Cleaning areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, the United States Postal Service, or Railroad Transportation Facilities – ground transportation facilities and rail transportation facilities (generally identified by Standard Industrial Classification (SIC) codes 40, 41, 42, 43, and 5171), that have vehicle and equipment maintenance shops (vehicle and equipment rehabilitation, mechanical repairs, painting, fueling and lubrication) and/or equipment cleaning operations are eligible for coverage under this section. Also covered under this section are facilities found under SIC code 4221-4225 (public warehousing and storage) that do not have vehicle and equipment maintenance shops and/or equipment cleaning operations but have areas (exclusive of access roads and rail lines) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products or industrial machinery are exposed to storm water.
- Q. Vehicle Maintenance Areas and Equipment Cleaning Areas of Water Transportation Facilities – water transportation facilities that have vehicle (vessel) maintenance shops and/or equipment cleaning operations. The water transportation industry includes facilities engaged in foreign or domestic transport of freight or passengers in deep sea or inland waters; marine cargo handling operations; ferry operations; towing and tugboat services; and marinas (facilities commonly identified by SIC code Major Group 44).
- R. Ship or Boat Building and Repair Yards – facilities engaged in ship building and repairing and boat building and repairing (SIC code 373).
- S. Vehicle Maintenance Areas, Equipment Cleaning Areas or Airport Deicing Operations located at Air Transportation Facilities – establishments and/or facilities including airports, air terminals, air carriers, flying fields, and establishments engaged in servicing or maintaining airports and/or aircraft (generally classified under Standard Industrial Classification (SIC) code 45) which have vehicle maintenance shops, material handling facilities, equipment cleaning operations or airport and/or aircraft deicing/anti-icing operations. For the purpose of this permit, the term "deicing" is defined as the process to remove frost, snow, or ice and "anti-icing" is the process which prevents the accumulation of frost, snow, or ice. Only those portions of the facility or establishment that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or deicing/anti-icing operations are addressed under this section.
- T. Wastewater Treatment Works – treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility with a design flow of 1.0 MGD or more, or required to have an approved pretreatment program under *40 CFR Part 403*.
- U. Food and Kindred Products Facilities – food and kindred products processing facilities (commonly identified by Standard Industrial Classification (SIC) code 20), including: meat products; dairy products; canned, frozen and preserved fruits, vegetables, and food specialties; grain mill products; bakery products; sugar and confectionery products; fats and oils; beverages; and miscellaneous food preparations and kindred products and tobacco products manufacturing (SIC Code 21), except for storm water discharges identified under paragraph I.B.3. where industrial plant yards; material handling sites; refuse sites; sites used for application or disposal of process wastewaters; sites used for storage and maintenance of material handling equipment; sites used for residential treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; and storage areas for raw material and intermediate and finished products are exposed to storm water and areas where industrial activity has taken place in the past and significant materials remain. For the purposes of this paragraph, material handling activities include the storage, loading, and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product, or waste product.
- V. Textile Mills, Apparel and other Fabric Product Manufacturing Facilities – Textile Mill Products, of and regarding facilities and establishments engaged in the preparation of fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage, the manufacturing of broad woven fabrics, narrow woven fabrics, knit fabrics, and carpets and rugs from yarn; processes involved in the dyeing and finishing of fibers, yarn fabrics, and knit apparel; the integrated manufacturing of knit apparel and other finished articles of yarn; the manufacturing of felt goods (wool), lace goods, nonwoven fabrics; miscellaneous textiles, and other apparel products (generally described by SIC codes 22 and 23). This section also covers facilities engaged in manufacturing finished leather and artificial leather products (SIC 31, except 3111).
- W. Furniture and Fixture Manufacturing Facilities – facilities involved in the manufacturing of: wood kitchen cabinets (generally described by SIC code 2434); household furniture (generally described by SIC code 251); office furniture (generally described by SIC code 252); public buildings and related furniture (generally described by SIC code 253); partitions, shelving, lockers, and office and store fixtures (generally described by SIC code 254); and miscellaneous furniture and fixtures (generally described by SIC code 259).
- X. Printing and Publishing Facilities – newspaper, periodical, and book publishing or publishing and printing (SIC Codes 2711-2731); book printing (SIC Code 2732); miscellaneous publishing (SIC Code 2741); commercial printing, lithographic (SIC Code 2752); commercial printing, gravure (SIC Code 2754); commercial printing, not elsewhere classified (SIC Code 2759); manifold business forms, greeting cards, bankbooks, looseleaf binders and devices, bookbinding and related work, and typesetting (SIC Codes 2761-2791); and, plate making and related services (SIC Code 2796).
- Y. Rubber and Miscellaneous Plastic Product Manufacturing Facilities – rubber and miscellaneous plastic products manufacturing facilities (SIC major group 30) and miscellaneous manufacturing industries, except jewelry, silverware, and plated ware (SIC major group 39, except 391).
- Z. Leather Tanning and Finishing Facilities – leather tanning, currying and finishing (commonly identified by Standard Industrial Classification (SIC) code 3111). Discharges from facilities that make fertilizer solely from leather scraps and leather dust are also covered under this section.
- AA. Facilities That Manufacture Metal Products including Jewelry, Silverware and Plated Ware -- fabricated metals industry listed below, except for electrical related industries: fabricated metal products, except machinery and transportation equipment, SIC 34, and jewelry, silverware, and plated ware (SIC Code 391).

AB. Facilities That Manufacture Transportation Equipment, Industrial or Commercial Machinery – transportation equipment, industrial or commercial machinery manufacturing facilities (commonly described by SIC Major Group 35 except SIC 357, and SIC Major Group 37, except SIC 373). Common activities include: industrial plant yards; material handling sites; refuse sites; sites used for application or disposal of process wastewaters; sites used for storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas for raw material and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water.

AC. Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods – facilities that manufacture: electronic and other electrical equipment and components, except computer equipment (SIC major group 36); measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks (SIC major group 38) and computer and office equipment (SIC code 357).

AD. Non-Classified Facilities – facilities that meet the definition of storm water associated with industrial activity (*UAC R317-8-3.9(6)(c) & (d)*), except for construction activities as defined under *UAC R317-8-3.9(6)(d)10.*) but, can not be classified in another industrial sector (i.e., sectors A to AC), and are not excluded from permit coverage elsewhere in this permit; or, the *Executive Secretary* has designated as needing a storm water permit under *UAC R317-8-3.9(1)(a)5*. Should conditions at a facility covered by this section change and industrial activities in another section(s) contained in sectors A to AC apply, the facility shall comply with any and all applicable monitoring and pollution prevention plan requirements of the other section(s) in addition to those contained in this section. The monitoring and pollution prevention plan terms and conditions of this permit are additive for industrial activities being conducted at the same industrial facility (co-located industrial activities). The operator of the facility shall determine which monitoring and pollution prevention plan section(s) of this permit (if any) are applicable to the facility.

V. CERTIFICATION: 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 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.

Print Name: Pine Ridge Excavation & Landscapes, LLC

Signature: 

Position Title: Manager

Email Address: dan@pineridgeutah.com

Date: 7/09/15

Amount of Permit Fee Enclosed: \$ 150.00

WHO MUST FILE A NOTICE OF INTENT (NOI) FORM

State law at UAC R317-8-3.9 prohibits point source discharges of storm water associated with industrial activity to a water body(ies) of the State without a Utah Pollutant Discharge Elimination System (UPDES) permit. The operator of an industrial activity that has such a storm water discharge must submit a NOI to obtain coverage under the UPDES Multi-Sector Storm Water General Permit. If you have questions about whether you need a permit under the UPDES Storm Water program, contact (801) 536-4300.



Utah Department of Environmental Quality

195 North 1950 West
Salt Lake City, Utah 84114-4820
Attn: DAQ, Fugitive Dust Control Plan

Fugitive Dust Control Plan Application

Applicants have the option to complete the online dust control plan on the DEQ Online Services webpage or to submit a hard copy application.

Activities regulated by R307-309 may not commence before obtaining approval of the fugitive dust control plan. Therefore, online filing is encouraged because it provides instant approval.

Blank spaces must be completed for the application to be processed. If not applicable, enter N/A.

1. Applicant Information

Name: Pine Ridge Rock Products
Address: 4776 E 2600 N PO BOX 1108 Eden, UT 84310
Phone: 435-994-2061
Email: leeann@pineridgeutah.com
Applicant Type: Facility/Project Manager

2. Project Information

Project Name: Pine Ridge Rock Products
Address: 4776 E 2600 N PO BOX 1108 ALPINE, UT 84310
County: WEBER
Directions: 3300 East in Liberty; head north 5 miles from 4100 North
Acreage: 820.0
Latitude: 41.393611
Longitude: 111.853056

3. Point of Contact

Name: LeeAnn Scovel
Company Name: Pine Ridge Excavation & Landscapes, LLC
Address: 4776 E 2600 N PO BOX 1108 Eden, UT 84310
Phone: 801-745-3150
Fax:
Cell: 808-779-4525

4. On-site Superintendent/Supervisor/Foreman Contact

Name: Jesse Turner
Company Name: Pine Ridge Excavation & Landscapes, LLC
On-Site Phone: 435-592-5847
Cell: 435-592-5847

5. By signing this permit application I certify that:

A. I am authorized, on behalf of the individual or company listed in Section 1, as Applicant, to apply for a Fugitive Dust Control Plan and to commit to all of the terms and conditions of the requested plan.

B. Construction activities will be limited to lands that the applicant either owns or is authorized to use for construction activities.

C. The applicant accepts responsibility for assuring that all contractors, subcontractors, and all other persons on the construction site covered by this plan, comply with the terms and conditions of the Fugitive Dust Control Plan.

D. I understand that any false material statement, representation or certification made in this application may invalidate the plan or cause me to be subject to enforcement action pursuant to Utah Code Ann. 19-2-115.

E. Failure to comply with fugitive dust rules may result in compliance action and penalties up to \$10,000 per violation/day.

Date: 07/15/2015

Printed Name: Pine Ridge Rock Products

Title: Facility/Project Manager

Company Name: Pine Ridge Excavation & Landscapes, LLC

Dust Plan Number: 6659

Dust Suppressants

| | Check All that Apply |
|----------|--|
| | Clay additives. |
| | Calcium chloride. |
| | Lime (calcium oxide). |
| X | Magnesium chloride. |
| | Organic non-petroleum products, (ligninsulfonate, tall (pine) oil, and vegetable derivatives). |
| | Synthetic polymers (for example; polyvinyl acetate and vinyl acrylic). |

FUGITIVE DUST CONTROL PLAN

PROJECT ACTIVITIES CHECKLIST INSTRUCTIONS:

PLACE A CHECK MARK NEXT TO EVERY ACTIVITY THAT WILL BE CONDUCTED ON THIS SITE, FOR EACH CHECKED ACTIVITY, COMPLETE THE CORRESPONDING CONTROL MEASURES/BEST MANAGEMENT PRACTICE (BMP) SELECTION PAGE. WHEN COMPLETED, YOU WILL HAVE THE OPTION TO PRINT THE ENTIRE PLAN.

| | Project Activity | Check All that Apply |
|----|--|----------------------|
| 01 | Backfilling area previously excavated or trenched. | X |
| 02 | Blasting soil & rock - drilling and blasting. | |
| 03 | Clearing for site preparation and vacant land cleanup. | |
| 04 | Clearing forms, foundations, slab clearing and cleaning of forms, foundations and slabs prior to pouring concrete. | |
| 05 | Crushing of construction and demolition debris, rock and soil. | X |
| 06 | Cut and fill soils for site grade preparation. | X |
| 07 | Demolition - Implosive demolition of a structure, using explosives. | |
| 08 | Demolition - mechanical/manual demolition of walls, stucco, concrete, freestanding structures, buildings and other structures. | |
| 09 | Disturbed soil throughout project including between structures. THIS ACTIVITY MUST BE SELECTED FOR ALL PROJECTS. | X |
| 10 | Disturbed land - long term stabilization and erosion control of large tracts of disturbed land that will not have continuing activity for more than 30 days. | |
| 11 | Hauling materials. | X |
| 12 | Paving/subgrade preparation for paving streets, parking lots, etc. | |
| 13 | Sawing/cutting material, concrete, asphalt, block or pipe. | |
| 14 | Screening of rock, soil or construction debris. | X |
| 15 | Staging areas, equipment storage, vehicle parking lots, and material storage areas. | X |
| 16 | Stockpiles materials (storage), other soils, rock or debris, for future use or export. | X |
| 17 | Tailings piles, ponds and erosion control. | |

| | | |
|----|---|---|
| 18 | Trackout prevention and cleanup of mud, silt and soil tracked out onto paved roads. | X |
| 19 | Traffic - unpaved routes and parking, construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas. | X |
| 20 | Trenching with track or wheel mounted excavator, shovel, backhoe or trencher. | |
| 21 | Truck loading with materials including construction and demolition debris, rock and soil. | X |

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5**MAKE AT LEAST ONE SELECTION FROM EACH SECTION.****Stabilize backfill material when not actively handling.**

- | | |
|---|---|
| <input checked="" type="checkbox"/> 01-01 | Water backfill material to maintain moisture or to form crust. |
| <input type="checkbox"/> 01-02 | Apply and maintain a chemical stabilizer to backfill material to form crust. |
| <input checked="" type="checkbox"/> 01-03 | Cover (natural or synthetic) or enclose backfill material when not actively handling. |

Stabilize backfill material during handling.

- | | |
|---|---|
| <input checked="" type="checkbox"/> 01-04 | Empty loader bucket slowly and minimize drop height from loader bucket. |
| <input checked="" type="checkbox"/> 01-05 | Dedicate water truck or large hose to backfilling equipment and apply water as needed. |
| <input type="checkbox"/> 01-06 | Mix moist soil with dry soil until the optimum moisture is reached. |
| <input type="checkbox"/> 01-07 | Apply and mix water into the backfill material until optimum moisture is reached. |
| <input type="checkbox"/> 01-08 | Apply and mix water and chemical solution into the backfill material until optimum moisture is reached. |

Stabilize soil at completion of backfilling activity.

- | | |
|---|--|
| <input checked="" type="checkbox"/> 01-09 | Apply water and maintain disturbed soils in a stable condition. |
| <input type="checkbox"/> 01-10 | Apply and maintain a chemical stabilizer on disturbed soils to form a crust. |

Stabilize material while using pipe padder equipment.

- | | |
|---|--|
| <input type="checkbox"/> 01-11 | Mix moist soil with dry soil until the optimum moisture is reached. |
| <input checked="" type="checkbox"/> 01-12 | Dedicate water truck or large hose to equipment and apply water as needed. |
| <input checked="" type="checkbox"/> 01-13 | Not Applicable |

If you have crushers and screening on site, you may be subject to the federal requirements contained in New Source Performance Standards Subpart OOO. It is advised that you read this subpart to determine if these requirements apply to you. Please note that Subpart OOO is NOT included in this Dust Control Plan submission. The link to Subpart OOO is listed below:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=4bb7745b4e567b604ad681bc2a46eec2&rqn=div6&view=text&node=40:6.0.1.1.1.80&idno=40>

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Stabilize surface soils where support equipment and vehicles will operate.

| | |
|---|---|
| <input checked="" type="checkbox"/> 05-01 | Pre-water and maintain surface soils in a stabilized condition. |
| <input type="checkbox"/> 05-02 | Apply and maintain a chemical stabilizer to surface soils. |
| <input type="checkbox"/> 05-03 | Pave operational area(s). |

Stabilize material before crushing.

| | |
|---|--|
| <input checked="" type="checkbox"/> 05-04 | Pre-water material. |
| <input type="checkbox"/> 05-05 | Test material to determine moisture content and silt loading, crush only material that is at optimum moisture content. |

Stabilize material during crushing.

| | |
|---|--|
| <input checked="" type="checkbox"/> 05-06 | Apply water to stabilize material so as to maintain compliance with opacity standards and permit conditions. |
| <input checked="" type="checkbox"/> 05-07 | Monitor opacity. Make adjustments to maintain compliance with opacity standards and permit conditions. |
| <input type="checkbox"/> 05-08 | Install wind break or use enclosure. |

Stabilize material after crushing.

| | |
|---|---|
| <input checked="" type="checkbox"/> 05-09 | Water crushed material immediately following crushing. |
| <input type="checkbox"/> 05-10 | Apply and maintain a chemical stabilizer to crushed material. |
| <input type="checkbox"/> 05-11 | Maintain in enclosure |

△ 05-12

Minimize height of stockpile.

Traffic.

_ 05-13

Minimize vehicle miles.

_ 05-14

Reduce truck traffic.

X 05-15

Reduce truck speed.

Transfer height.

X 05-16

Minimize transfer and drop point height.

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Stabilize surface soils where support equipment and vehicles will operate.

06-01

Pre-water and maintain surface soils in a stabilized condition.

06-02

Apply and maintain a chemical stabilizer to surface soils.

Pre-water soils.

06-03

Dig a test hole to depth of cut or equipment penetration to determine if soils are moist at depth. Continue to pre-water if not moist to depth of cut.

Stabilize soil during cut activities.

06-04

Apply water to depth of cut prior to subsequent cuts.

Stabilize soil after cut and fill activities.

06-05

Water disturbed soils to maintain moisture.

06-06

Apply and maintain a chemical stabilizer on disturbed soils to form crust following fill and compaction.

06-07

Apply cover (natural or synthetic).

**Disturbed soil throughout project including between structures. THIS
ACTIVITY MUST BE SELECTED FOR ALL PROJECTS.**

BMP 09

**GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN
R307-309-5**

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Limit disturbance of soils where possible.

09-01

Limit disturbance of soils with the use of fencing, barriers, barricades, and/or wind barriers.

09-02

Limit vehicle mileage and reduce speed.

Stabilize and maintain stability of all disturbed soil throughout construction site.

09-03

Apply water to stabilize disturbed soils. Soil moisture must be maintained such that soils can be worked without generating fugitive dust.

09-04

Apply and maintain a chemical stabilizer.

09-05

Use wind breaks.

09-06

Apply cover (natural or synthetic).

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Limit visible dust opacity from vehicular operations.

- | | |
|---|---|
| <input checked="" type="checkbox"/> 11-01 | Apply and maintain water/chemical suppressant to operational areas and haul routes. |
| <input checked="" type="checkbox"/> 11-02 | Limit vehicle mileage and speed. |

Stabilize materials during transport on site.

- | | |
|---|--|
| <input type="checkbox"/> 11-03 | Use tarps or other suitable enclosures on haul trucks. |
| <input checked="" type="checkbox"/> 11-04 | Apply water prior to transport. |

Clean wheels and undercarriage of haul trucks prior to leaving construction site.

- | | |
|---|---------------------------|
| <input checked="" type="checkbox"/> 11-05 | Clean wheels. |
| <input checked="" type="checkbox"/> 11-06 | Sweep or water haul road. |

If you have crushers and screens on site, you may be subject to the federal requirements contained in New Source Performance Standards Subpart 000. It is advised that you read this subpart to determine if these requirements apply to you. Please note that Subpart 000 is NOT included in this Dust Control Plan submission. The link to Subpart 000 is listed below:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=4bb7745b4e567b604ad681bc2a46eec2&rgn=div6&view=text&node=40:6.0.1.1.1.80&idno=40>

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Stabilize surface soils where support equipment and vehicles will operate.

- | | |
|---|---|
| <input checked="" type="checkbox"/> 14-01 | Pre-water and maintain surface soils in a stabilized condition. |
| <input type="checkbox"/> 14-02 | Apply and maintain a chemical stabilizer on surface soils. |
| <input type="checkbox"/> 14-03 | Pave operational area(s). |

Pre-treat material prior to screening.

- | | |
|---|---------------------------------------|
| <input checked="" type="checkbox"/> 14-04 | Apply a dust suppressant to material. |
|---|---------------------------------------|

Stabilize material during screening.

- | | |
|---|---|
| <input checked="" type="checkbox"/> 14-05 | Dedicate water source to screening operation and apply water as needed to prevent dust. |
| <input type="checkbox"/> 14-06 | Install wind barrier upwind of screen as high as the drop point. |

Stabilize material and surrounding area immediately after screening.

- | | |
|---|---|
| <input checked="" type="checkbox"/> 14-07 | Apply water to stabilize screened material and surrounding area. |
| <input type="checkbox"/> 14-08 | Apply and maintain a chemical stabilizer to stabilize screened material and surrounding area. |
| <input checked="" type="checkbox"/> 14-09 | Minimize storage pile height. |

Transfer height.

- | | |
|--------------------------------|---|
| <input type="checkbox"/> 14-10 | Drop material through the screen slowly and minimize drop height. |
|--------------------------------|---|

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Limit visible dust opacity from vehicular operations.

15-01

Limit vehicle mileage and speed.

15-02

Apply water on all vehicle traffic areas in the staging areas and unpaved access routes.

Stabilize staging area soils during use.

15-03

Pre-water and maintain surface soils in a stabilized condition.

15-04

Apply and maintain a chemical stabilizer to surface soils.

Stabilize staging area soils at project completion.

15-05

Apply a chemical stabilizer.

15-06

Apply screened or washed aggregate.

15-07

Use wind breaks.

15-08

Pave.

15-09

Completed project will cover staging area with buildings, paving, and/or landscaping.

15-10

Apply water to form adequate crust and prevent access.

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Stabilize surface soils where support equipment and vehicles will operate.

| | |
|---|---|
| <input checked="" type="checkbox"/> 16-01 | Pre-water and maintain surface soils in a stabilized condition. |
| <input type="checkbox"/> 16-02 | Apply and maintain a chemical stabilizer on surface soils. |
| <input type="checkbox"/> 16-03 | Pave area. |

Stabilize stockpile materials during handling.

| | |
|---|--|
| <input checked="" type="checkbox"/> 16-04 | Remove material from the downwind side of the stockpile, when safe to do so. |
| <input checked="" type="checkbox"/> 16-05 | Reduce height. |
| <input type="checkbox"/> 16-06 | Create wind screen |

Stabilize stockpiles after handling.

| | |
|---|---|
| <input checked="" type="checkbox"/> 16-07 | Water stockpiles to form a crust immediately. |
| <input type="checkbox"/> 16-08 | Apply and maintain a chemical stabilizer to all outer surfaces of the stockpiles. |
| <input type="checkbox"/> 16-09 | Provide and maintain wind barriers on 3 sides of the pile. |
| <input type="checkbox"/> 16-10 | Apply a cover (natural or synthetic) |
| <input type="checkbox"/> 16-11 | Wind screen. |
| <input checked="" type="checkbox"/> 16-12 | Avoid steep sides to prevent material sloughing. |
| <input checked="" type="checkbox"/> 16-13 | Reduce height. |

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION FROM EACH SECTION.

Prevent dust from trackout.

| | |
|---|---|
| <input type="checkbox"/> 18-01 | Clean trackout at the end of the work shift from paved surfaces to maintain dust control |
| <input type="checkbox"/> 18-02 | Maintain dust control during working hours and clean trackout from paved surfaces at the end of the work shift/day. |
| <input checked="" type="checkbox"/> 18-03 | Install gravel pad(s), clean, well-graded gravel or crushed rock. Minimum dimensions must be 30 feet wide by 3 inches deep, and, at minimum, 50' or the length of the longest haul truck, whichever is greater. Re-screen, wash or apply additional rock in gravel pad to maintain effectiveness. |
| <input type="checkbox"/> 18-04 | Install wheel shakers. Clean wheel shakers on a regular basis to maintain effectiveness. |
| <input type="checkbox"/> 18-05 | Install wheel washers. Maintain wheel washers on a regular basis to maintain effectiveness. |
| <input type="checkbox"/> 18-06 | Motorized vehicles will only operate on paved surfaces. |
| <input type="checkbox"/> 18-07 | Install cattle guard before paved road entrance. |

All exiting traffic must be routed over selected trackout control device(s).

| | |
|---|---|
| <input checked="" type="checkbox"/> 18-08 | Clearly establish and enforce traffic patterns to route traffic over selected trackout control device(s). |
| <input type="checkbox"/> 18-09 | Limit site accessibility to routes with trackout control devices in place by installing effective barriers on unprotected routes. |

Traffic - unpaved routes and parking, construction related traffic on unpaved interior and/or access roads and unpaved employee/worker parking areas.

BMP 19

GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN R307-309-5

MAKE AT LEAST ONE SELECTION.

Stabilize surface soils where support equipment and vehicles will operate.

| | |
|---|--|
| <input checked="" type="checkbox"/> 19-01 | Limit vehicle mileage and speeds. |
| <input checked="" type="checkbox"/> 19-02 | Apply and maintain water on surface soils. |
| <input type="checkbox"/> 19-03 | Apply and maintain chemical stabilizers on surface soils. |
| <input checked="" type="checkbox"/> 19-04 | Apply and maintain gravel on surface soils. |
| <input type="checkbox"/> 19-05 | Supplement chemical stabilizers, water or aggregate applications as necessary. |
| <input type="checkbox"/> 19-06 | Apply recycled asphalt (RAP) to surface soils. |

**Truck loading with materials including construction and demolition debris,
rock and soil.**

BMP 21

**GENERAL REQUIREMENT: ALL ACTIVITIES MUST MEET OPACITY REQUIREMENTS IN
R307-309-5**

MAKE AT LEAST ONE SELECTION.

| | |
|---|--|
| <input checked="" type="checkbox"/> 21-01 | Pre-water and maintain surface soils in a stabilized condition where loaders, support equipment and vehicles will operate. |
| <input type="checkbox"/> 21-02 | Apply and maintain a chemical stabilizer on surface soils where loaders, support equipment and vehicles will operate. |
| <input checked="" type="checkbox"/> 21-03 | Empty loader bucket slowly and keep loader bucket close to the truck to minimize the drop height while dumping. |

Previously filed Stormwater Permits and Fugitive Dust Plans:

Industrial Permit Renewals be Advised

For NOIs renewed before December 31st, the end date of the NOI will remain December 31st of the current year until January 1st of the next year. At that time, the NOI for your renewed permit will be updated to reflect the new coverage period. If you have any questions, please contact our support team at 801-983-0275

Storm Water Permits

| Permit # | Type | Facility Name | Status | Print | Terminate | Renew | NOT |
|-----------|------------|--------------------------|--------|-------|---------------------|--------------|-----|
| UTR271707 | Industrial | Pine Ridge Rock Products | Active | Print | Request Termination | Renew Permit | |

Fugitive Dust Control Plans

| Permit number | Project Name | Company Name | Print |
|---------------|--------------------------|---|-------|
| 6659 | Pine Ridge Rock Products | Pine Ridge Excavation & Landscapes, LLC | Print |

STORM WATER DISCHARGE MONITORING REPORT
(For additional forms copy this form or contact the DWQ)

- Complete after Storms
- Keep for PR records
* See pg. 5 for visual reports

IDENTIFICATION & LOCATION

Name _____

Permit No. UT _____

Mailing Address:

Site Location (_____

Monitoring Period:

From: Month _____ Day _____ Year _____

To: Month _____ Day _____ Year _____

Total Storm Water Discharge Points _____

Number assigned to this Discharge Point _____

INDUSTRY SECTOR(S)

Industrial Activities or Industry Sector(s) Drained by this Discharge:

- A. Timber Products Facilities
- B. Paper and allied Products Manufacturing Facilities.
- C. Chemical and allied Products Manufacturing Facilities.
- D. Asphalt paving, Roofing materials, and Lubricant Manufacturing Facilities.
- E. Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities.
- F. Primary Metals Facilities.
- G. Metal Mines (Ore Mining and Dressing).
- H. Coal Mines and Coal Mine-Related Facilities.
- I. Oil or Gas Extraction Facilities.
- J. Mineral Mining and Processing Facilities.
- K. Hazardous Waste Treatment Storage or Disposal Facilities.
- L. Landfills and Land Application Sites.
- M. Automobile Salvage Yards.
- N. Scrap Recycling and Waste Recycling Facilities.
- O. Steam Electric Power Generating Facilities.
- P. Motor Freight transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, the United States Postal Service, or Railroad Transportation Facilities.
- Q. Vehicle Maintenance Areas and Equipment Cleaning Areas of Water Transportation Facilities.
- R. Ship or Boat Building and Repair Yards.
- S. Vehicle Maintenance Areas, Equipment Cleaning Areas or Airport Deicing Operations located at Air Transportation Facilities.
- T. Wastewater Treatment Works.
- U. Food and Kindred Products Facilities.
- V. Textile Mills, Apparel and Other Fabric Product Manufacturing Facilities.
- W. Furniture and fixture manufacturing Facilities.
- X. Printing and Publishing Facilities.
- Y. Rubber and Miscellaneous Plastic Product Manufacturing Facilities.
- Z. Leather Tanning and Finishing Facilities
- AA. Facilities That Manufacture Metal Products including Jewelry, Silverware and Plated Ware..
- AB. Facilities That Manufacture Transportation Equipment, Industrial or Commercial Machinery.
- AC. Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods.
- AD. Non-Classified Facilities

ANALYTICAL MONITORING DATA (For sectors where it is required)

Storm Event: *All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. This data must be submitted to the Division of Water Quality.*

| | |
|--|----------------|
| Please circle if there has been no discharge of Storm Water during this reporting period. (If none please explain in comment section) | • No Discharge |
|--|----------------|

| | | | |
|--|---------------|------------|-------------|
| Date of Storm Event | Month | Day | Year |
| Duration of Storm Event | Hours | | |
| Rain Fall Measurement | Inches | | |
| Time elapsed Between Recorded & Previous Storm Event | Days | | |
| Estimated Total Volume of Discharge <i>(Include units; gal., etc.)</i> | | | |

Sample Type: *Data shall be reported for a grab sample taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.*

| Parameter | Effluent Limit <i>(If Applicable)</i> | Concentration <i>(Concentration quantity, for example -14.2)</i> | Units <i>(Example – mg/L)</i> |
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INFORMATION

Adverse Weather Waiver. When a discharger is unable to collect samples within a specified sampling period due to adverse climatic conditions, the discharger shall collect a substitute sample from a separate qualifying event in the next period and submit the data along with data for the routine sample in that period. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

Exemption to Monitoring Requirements. (Does not apply to sector S or any Visual Monitoring Requirements.) As an alternative to monitoring an outfall, an annual certification may be made that material handling equipment or activities; raw or waste materials; intermediate, final or by-products; industrial machinery or operations; and significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and will not be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan, and submitted to the DWQ in accordance with Part V.B of the permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under reporting requirements in the sector. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations.

When to Monitor and Report. Samples must be collected and analyzed at least once during each three month monitoring period. Monitoring results must be submitted annually. See Reporting for dates.

More Frequent Monitoring. If sampling is conducted more frequently than semi-annually, all sampling results must be submitted. A separate SWDMR is required for each storm event sampled.

How to Report. A separate SWDMR form is required for each storm event and for each outfall sampled. SWDMRs must be signed and mailed to the Division of Water Quality, and must be postmarked by the date specified under Monitoring Periods and Reporting Deadlines. The permittee should retain a copy. The address and phone number for questions or to mail the SWDMR is:

Department of Environmental Quality
Division of Water Quality
Attention: Industrial Storm Water Program
Coordinator

PO Box 144870
Salt Lake City, UT 84114-4870

801.536.4300

Substantially Identical Discharges. If there is a reason to believe that the discharges from two or more outfalls are substantially identical, one of the outfalls may be monitored and that data submitted for all substantially identical outfalls. A description of the location of the outfalls, an explanation of why the outfalls have substantially identical discharges, and the size of the drainage area and runoff coefficient must be submitted as an attachment to the SWDMR.

VISUAL MONITORING REQUIREMENTS

Sample and Data Collection: Visual examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well-lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch of rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for the life of the permit.

| | | | |
|--|--|------------|-------------|
| Date of Examination | Month | Day | Year |
| Time of Examination | | | |
| Total Storm Water Discharge Points _____ | Number Assigned to this Discharge Point _____ | | |
| Examination Personnel | | | |
| Probable Source of Observed Storm Water Contamination | | | |

COLOR (Circle the one that apply):

1. Identification of Color:

Black Dark Grey Medium Grey Light Grey Dark Chocolate Brown Medium Brown
Light Brown Tan Yellow Green Other _____

2. Intensity of Color: Very Intense Prominent Moderately Perceptible Hardly Perceptible

Comments: _____

CLARITY (Circle the right one):

Totally Opaque Slightly Translucent Translucent Nearly Transparent Transparent

ODOR (Circle the ones that apply):

Diesel Gasoline Petroleum Solvent Musty Sewage Chlorine
Rotten Egg Sulfur No Odor Noxious Other _____

Comments: _____

**STORM WATER POLLUTION PREVENTION PLAN
FOR CONSTRUCTION**

FOR

***PINE RIDGE EXCAVATION & LANDSCAPE
UPPER SITE***

Prepared for

Pine Ridge Excavation & Landscape

OCTOBER 2010

Prepared by

*Hansen and Associates
538 N. Main*

*10-5-6
SWPPP*

WEBER COUNTY ENGINEERING

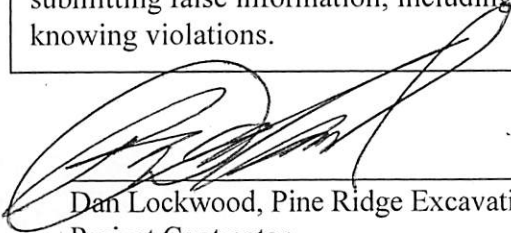
Plan Received 11/10/2010

Plan Reviewed 11/29/2010 *rs*

Plan Approved 11/24/2010 *w/corro*

Storm Water Pollution Prevention Plan for Construction Activities

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 gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information 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.



 Dan Lockwood, Pine Ridge Excavation
 Project Contractor

Steven R. McFarland
 Steven R. McFarland, PE
 Civil Engineer



SITE CONTACT INFORMATION

| SITE OWNER | PHONE/FAX/MOBILE | ADDRESS |
|--|--|---|
| <i>Pine Ridge Excavation & Landscape</i> | Phone: (435) 994-2061 | 3080 East 4100 North Liberty, UT 84310 |
| PROJECT CONTRACTOR | | |
| <i>Pine Ridge Excavation & Landscape</i> | Phone: (435) 994-2061 Fax: (801) 745-9527 | 3080 East 4100 North Liberty, UT 84310 |
| PROJECT EROSION LEAD | 24-HOUR CONTACT | |
| <i>Dan Lockwood</i> | Phone: (435) 994-2061 | 3080 East 4100 North Liberty, UT 84310 |

Revision Schedule

This storm water pollution prevention plan (SWPPP) should be revised and updated to address changes in site conditions, new or revised government regulations, and additional on-site storm water pollution controls.

All revisions to the SWPPP must be documented on the SWPPP Revision Documentation Form, which should include the information shown below. The authorized facility representative who approves the SWPPP should be an individual at or near the top of the facility's management organization, such as the president, vice president, construction manager, site supervisor, or environmental manager. The signature of this representative attests that the SWPPP revision information is true and accurate. Previous authors and facility representatives are not responsible for the revisions.

SWPPP Revision Documentation Form

| Number | Date | Author | Company Representative Signature |
|--------|------|--------|----------------------------------|
| 0 | | | |
| 1 | | | |
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Record of Activities

The following records of activities shall be maintained as part of the SWPPP:

- a. Dates when major grading activities occur;
- b. Dates when construction activities temporarily or permanently cease on a portion of or all of the site; and
- c. Dates when stabilization measures are initiated.

All above activities must be documented in the SWPPP using the form below. If additional sheets are needed, they shall be placed in the SWPPP.

SWPPP Record of Activities Form

| Activity | Date | Author | Company Representative Signature |
|----------|------|--------|----------------------------------|
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ABBREVIATIONS

BMP – BEST MANAGEMENT PRACTICES

**NPDES – NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM**

**NRCS – NATURAL RESOURCES CONSERVATION
SERVICE**

**SWPPP – STORM WATER POLLUTION PREVENTION
PLAN**

1 CONSTRUCTION ENVIRONMENTAL SUMMARY

1.1 Summary

2p

The project consists of gathering large boulders from the ground surface for landscaping purposes. The boulders are existing on the ground surface and are picked up and loaded onto a truck and shipped to a stock pile yard. No digging is involved or seiment being moved around in any manner. The project area is bordered by undeveloped mountainous area. Historic flows migrate south to Cache Valley Creek which ultimately flows to Pineview Reservoir. This *Storm Water Pollution Prevention Plan* details all of the protective environmental measures, which will be employed during construction of the project.

1.2 Project Description

The project site consists of a landscape boulder retrieval area, with approximately 8 acres of disturbed area in a total site area of approximately 800 acres. No excavation is taking place, the boulders are lying on the ground and are being picked up and loaded on a truck. The existing vegetation will be disturbed as the boulders are moved. Potential sources of pollution that might affect the quality of storm water discharge are sediment transportation from disturbed ground and equipment used on site.

1.3 Existing Site Conditions

The existing conditions of the site slopes to the south and west from approximately flat to 14%. Existing vegetation consists of sage brush and other native vegetation. The nearest water course, Cache Valley Creek, is downhill from the disturbed areas. Drainage from the site will continue to drain as historically. Grading of the site is not expected to change from existing.

1.4 Adjacent Areas

Runoff from adjacent areas upstream of the site will remain as historic. Runoff adjacent and lateral or downstream of the site will also remain as historical.

1.5 Critical Areas

No areas are considered critical. Threatened and endangered species may be identified at a later date. Other Laws and Requirements are not applicable.

1.6 Soils

The project site crosses four soil groups. Soil characteristics and erodibility for each group are listed below.

Yeates Hollow very stony loam (YcD) soil group is a stony loam with 32.6% clays, 34.3% sands, and 33.3% silts. The depth to any restrictive layer is 140 cm. The Kw factor for the soil is 0.1 on a scale of 0.02 to 0.69 with larger numbers being more susceptible to erosion. The wind erosion factor is 0 tons per acre per year.

Scave Cobbly Silt Loam (SKE) soil group is a silty loam with 30.7% clays, 31.2% sands, and 38.2% silts. The depth to any restrictive layer exceeds 200 cm which means they have not been determined. The Kw factor for the soil is 0.2 on a scale of 0.02 to 0.69 with larger numbers being more susceptible to erosion. The wind erosion factor is 38 tons per acre per year.

Smarts Loam (SfG) soil group is a gravelly loam with 27.8% clays, 37.0% sands, and 34.20% silts. The depth to any restrictive layer exceeds 200 cm which means they have not been determined. The Kw factor for the soil is 0.24 on a scale of 0.02 to 0.69 with larger numbers being more susceptible to erosion. The wind erosion factor is 48 tons per acre per year.

Yeates Hoolow-Smarts complex (YdG) soil group is a stony loam with 33.2% clays, 34.1% sands, and 33.1% silts. The depth to any restrictive layer is 107 cm. The Kw factor for the soil is 0.05 on a scale of 0.02 to 0.69 with larger numbers being more susceptible to erosion. The wind erosion factor is 0 tons per acre per year.

1.7 Erosion Problem Areas

The area near the creek will be protected and maintained. Properly stabilized soils should not be an erosion problem. There are no signs of existing erosion problems along the project area.

1.8 Construction Phasing

Site use is anticipated to begin in November 2010. Continued use would last 5-6 months. Construction hours will be limited to the normal daylight working hours of 7:00 a.m. to 7:00 p.m., Monday through Friday. Actual construction work is identified below.

1.9 Construction Schedule

Project Activities

- Continued loading and removal of boulders for the length of the project.

Project Completion Schedule:

(Future dates are estimates and subject to change)

| | |
|----------|---------------|
| Begin | November 2010 |
| Complete | April 2011 |

1.10 Financial/Ownership Responsibilities

Pine Ridge Excavation & Landscape is financially responsible for the implementation of this Stormwater Pollution Prevention Plan. They will provide all BMP installation, modification, inspections and upkeep for the duration of the project. They are also responsible for posting a sign or other notice near the main entrance of the site. Sign must include a copy of the NOI, name and phone number of contact person, and the location of the SWPPP. SWPPP must be accessible to EPA, State, or local agency officials. If the SWPPP is not able to be retained onsite, it shall be in close proximity to the site and made available.

1.11 Engineering Calculations

No detention pond will be utilized in this project. No grading, cut or fill proposed. Other BMP's will be employed to further mitigate sediment conveyance. These BMP's include a vehicle tracking pad and shall be installed prior to operation.

2 INTRODUCTION

2.1 Storm Water Pollution Prevention Plan Requirements

This Storm Water Pollution Prevention Plan (SWPPP) was developed consistent with the requirements of the ~~National~~ ^{WTA} Pollutant Discharge Elimination System ^u (NPDES) General Storm Water Permit for Construction Activities (see Appendix B for a copy of the general permit). This SWPPP meets the requirements of Special Condition S9 of the general permit. The primary consideration determining the adequacy of the SWPPP is compliance with State Surface Water Quality Standards (Chapter R317-2 – see Appendix B).

The Plan, properly implemented, should result in the discharge of water to the environment without the violation of Water Quality Standards.

2.2 Purpose

The purpose of this SWPPP is to:

- Describe best management practices (BMPs) to minimize erosion and sediment runoff at the site
- Identify, reduce, eliminate, or prevent the pollution of storm water
- Prevent violations of surface water quality or groundwater quality standards

2.3 SWPPP Organization

This plan consists of a detailed narrative section and the appendices, which contain illustrations, maps, and drawings. The narrative section includes descriptions of potential pollution problems associated with site features, and then discusses the selection of specific pollution prevention BMPs to reduce or eliminate the threat of causing pollution during the actual construction project. The illustrations, maps, and drawings in the appendices show the site location, topography, sensitive environmental receptors, placement of BMPs, and BMP specifications and performance expectations.

The narrative section of this plan is organized in numbered sections around the 12 required elements of a SWPPP listed below:

1. Mark project clearing limits
2. Establishing the construction entrance(s)
3. Storm water detention
4. Selection and installation of sediment controls
5. Soil stabilization
6. Slope protection
7. Drain inlet protection
8. Storm water outlet protection
9. Chemical spill prevention and response
10. Site Storm water Treatment
11. BMP maintenance
12. Project management

In the narrative section, each of the above elements will be discussed in relation to the specific conditions at the development. BMPs for each element will be screened, resulting in selection of those BMPs deemed most appropriate for use. Specifications and engineering drawings of the selected BMPs are referenced at the end of each section and can be found in Appendix C.

3 CLEARING LIMITS

3.1 Site Plans

Figure 1 is a topographic map of the site showing all natural drainages associated with the area. Figure 2 is the Storm Water Site Map showing any surface water in the area and showing placement of all relevant storm water BMPs such as the vehicle tracking pad.

3.2 Marking Clearing Limits

Prior to beginning additional earth-disturbing activities, including clearing and grading, all clearing limits, easements, setbacks, sensitive areas and their buffers, trees and drainage courses will be clearly marked to prevent environmental damage both on and off site.

3.3 Special Consideration

Special consideration will be given to treatment of storm water near and/or entering creeks and ditches.

3.4 Selected BMPs

- BMP EC-2: Preservation of Existing Vegetation
- BMP SE-1: Silt Fence

4 CONSTRUCTION ACCESS

4.1 Site Access

Access to the construction site would use existing dirt road Avon Drive. No new roads will be required to access the project construction site. Only infrequent occasional heavy truck traffic would occur on existing roads for the project.

Construction access for the project will be limited to one access point onto Avon Drive. A vehicle tracking pad to vibrate any mud on the trucks prior to entrance to the roadways will be provided at the site. For offsite sweeping, see section 4.2 below.

4.2 Street Cleaning

If sediment is accidentally transported on to the street it will be removed from the street surface on a daily basis. Sediment will be shoveled and/or swept from the street and disposed of in a manner, which prevents contamination with storm water or surface water (e.g., covered soil stockpile).

4.3 Wheel Wash

A wheel wash is not required for this due to the limited development and the limited infrastructure required.

4.4 Selected BMPs

- BMP TC-1: Stabilized Construction Entrance/Exit

5 STORM WATER DETENTION

5.1 Primary Storm Water Detention System

No detention pond or system is designed for this project.

5.2 Run-on Bypass

Not applicable.

5.3 Selected BMPs

- Not applicable

6 SEDIMENT CONTROLS

6.1 Site Sediment Control System

If needed, silt fences, wind erosion control, and other BMPs intended to trap sediment on site will be constructed as one of the first steps in grading. These BMPs will be installed before other land-disturbing activities take place. Off-site accumulation of sediment must be removed as necessary.

6.2 Selected BMPs

- BMP SE-1: Silt Fence
- BMP WE-1: Wind Erosion Control
- BMP TC-1: Stabilized Construction Entrance/Exit

7 SOIL STABILIZATION

This section describes the stabilization and structural BMPs that will be implemented to minimize erosion and transport of sediment from the project site into receiving waters.

7.1 Soil Stabilization

Stabilization BMPs to be implemented at this site include:

- **Soil Covering.** All exposed soils will be stabilized by the 14th day excepting for conditions of snow cover or frozen ground. Under such conditions stabilization will occur as soon as practical. All slopes as well as drainage ditches, swales, and exposed flat surfaces will be reseeded as deemed necessary by the erosion and sediment control lead. Virtually all exposed soils will be stabilized to protect surface water quality. Areas of the project, which have not been properly stabilized by vegetation by the onset of the wet season, will be covered with transparent plastic sheeting to prevent sediment transport. Loose straw and mulch covers are not to be used as they may be washed into drainage structures.
- **Stockpile Covering.** If soil stockpiles are used, all temporary soil stockpiles, not including rock piles, will be covered with plastic. Long-term stockpiles will be compacted and hydroseeded prior to the onset of wet weather.
- **Polymer Soil Treatment.** Smaller areas of the site may be actively worked throughout the wet season to support the removal of landscape boulders. These smaller areas of exposed soils may be temporarily stabilized with the application of a granular anionic polyacrylamide (PAM). PAM may be applied as an aqueous solution (0.5 pounds per 1,000 gallons of water) or as a granular solid evenly dispersed over the surface of soils using a seed spreader (3 to 5 pounds of PAM per acre).
- **Maintenance of Existing Vegetation.** Existing and new vegetation will be maintained to the maximum extent practicable to prevent the contamination of storm water with sediment. Vegetated areas beginning to show signs of erosion or soil transport will be addressed and the clean runoff conveyed to a storm water drainage ditch.

- **Outlet Protection.** Adequate energy dissipation, erosion control, and soil stabilization measures (e.g., rock or other energy dissipation techniques) will be provided for all point source discharges of storm water, including run-on discharges and outlets from onsite discharges.

7.2 Structural BMPs

Structural BMPs. Structural BMPs are practices designed to divert flows from exposed soil, store storm water runoff, and limit runoff and the discharge of pollutants from exposed areas of the project. The goal of structural BMPs on this project is to protect receiving water downstream of the site from turbid water, phosphorus, sediment, oil, and other contaminants, which may mobilize in storm water flows.

- **Temporarily Modified Catchment Structures.** Swales may have to be modified on a temporary basis so that dirty water can be intercepted before leaving the site. This may be done in several different ways generally resulting in temporarily blocking an outlet structure and installing a pump to transfer the storm water inflow to a settling, infiltration, or treatment system. Automatic float level controllers built into the pump prevent the pump from running dry and conserve power use.
- **Drainage Swales, Ditches, and Check Dams.** If needed, swales and ditches will be used on a permanent and temporary basis to convey storm water in a way that minimizes the potential for contamination by sediment. Because some sediment will always be present in storm water, check dams will be used in swales and ditches to reduce the velocity of the water and allow some settling of larger particles.
- **Temporary Slope Drains.** In some cases unstable slopes will be temporarily covered with plastic to prevent erosion and to protect water quality. When soil is disturbed downstream of the covered slope the slope drainage must be conveyed around the soil to prevent erosion. This can be done by collecting the slope runoff at the toe of the slope and piping it directly to the nearest drain. Solid-wall flexible drainpipe and sandbags are commonly used to create temporary slope drains.
- **Sedimentation Swales and Ponds.** Temporary and permanent swales and small detention ponds will be used as necessary to reduce the velocity of runoff and enhance particle settling.
- **Infiltration/Dispersal Systems.** On sites with substantial areas of vegetation and/or porous soils, it may be advantageous to install an infiltration/dispersal system for the disposal of site storm water. This system is

comprised of a pump, conveyance piping, and dispersal piping. It is best to follow topographical contours when installing the dispersal piping to avoid ponding and channeling. Dirty water should be allowed to gravity settle at least 24 hours before dispersal to avoid clogging the infiltration area with sediment. Also, observe the dispersal area frequently when discharging water to prevent over-saturation of soils.

7.3 Selected BMPs

- BMP EC-3: Hydraulic Mulch
- BMP EC-4: Hydroseeding
- BMP EC-7: Geotextiles and Mats
- BMP EC-10: Velocity Dissipation Devices
- BMP EC-12: Polyacrylamide
- BMP WM-3: Stock Pile Management

8 SLOPE PROTECTION

8.1 General Practices

No cut and fill slopes on this project have been designed nor will be constructed. Soil types have been analyzed and considered for their potential to erode. In addition if needed, then slope runoff velocities will be reduced by terracing, creating diversions, and surface contouring, including track hoe tracking.

8.2 Suggested BMPs

- BMP SE-1: Silt Fence

9 DRAIN INLET PROTECTION

9.1 Existing Storm Drains

No existing storm drain inlets are in proximity to the project.

9.2 Newly Constructed Storm Drains

No new storm drain inlets are to be constructed with the project.

9.3 Suggested BMP

- Not applicable

10 STORM WATER OUTLET PROTECTION

10.1 Treatment System Outlet to Stream

All storm drain outlets made operable during construction will be protected to prevent storm water from exiting without first being filtered or treated to remove sediment.

10.2 Street Drainage to Stream

Storm water will be cleaned of sediment and other pollutants and drained from the site. At the point where road runoff enters the swales, outlet protection will be provided using riprap channel lining or other armoring material to prevent erosion of the swales.

10.3 Bypass Drainage to Stream

Not applicable.

10.4 Suggested BMPs

- BMP EC-10: Velocity Dissipation Devices

11 SPILL PREVENTION AND RESPONSE

Consistent with the general permit requirements, all potential pollutants other than sediment will be handled and disposed of in a manner that does not cause contamination of storm water. Non-sediment pollutants that may be present during construction activities include:

- Petroleum products including fuel, lubricants, hydraulic fluids, and form oils
- Polymer used for soil stabilization
- Water treatment chemicals (coagulant, acid, sodium bicarbonate)
- Concrete
- Paints
- Fertilizers

These materials, and other materials used during construction with the potential to impact storm water, will be stored, managed, used, and disposed of in a manner that minimizes the potential for releases to the environment and especially into storm water.

Emergency contacts for the project will be posted at the project office and are included at the end of this section.

11.1 General Materials Handling Practices

The following general practices will be used throughout the project to reduce the potential for spills.

- Potential pollutants will be stored and used in a manner consistent with the manufacturer's instructions in a secure location. To the extent practicable, material storage areas should not be located near storm drain inlets and should be equipped with covers, roofs, or secondary containment as needed to prevent storm water from contacting stored materials. Chemicals that are not compatible (such as sodium bicarbonate and hydrochloric acid) shall be stored in segregated areas so that spilled materials cannot combine and react.
- Materials disposal will be in accordance with the manufacturer's instructions and applicable local, state, and federal regulations.

- Materials no longer required for construction will be removed from the site as soon as practicable.
- Adequate garbage, construction waste, and sanitary waste handling and disposal facilities will be provided to the extent necessary to keep the site clear of obstruction and BMPs clear and functional. Portable toilets will be located away from waterways and storm drain inlets.

None of the above are proposed for this project.

11.2 Specific Materials Handling Practices

- All pollutants, including waste materials and demolition debris, that occur on-site during construction will be handled in a way that does not contaminate storm water.
- All chemicals including liquid products, petroleum products, water treatment chemicals, and wastes stored on site will be covered and contained and protected from vandalism.
- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants, will be conducted under cover during wet weather and on an impervious surface to prevent the release of contaminants onto the ground. Materials spilled during maintenance operations will be cleaned up immediately and properly disposed of.
- Application of agricultural chemicals, including fertilizers and pesticides, will be conducted in a manner and at application rates that will not result in loss of chemical to storm water runoff. Manufacturers' recommendations will be followed for application rates and procedures.
- pH-modifying sources will be managed to prevent contamination of runoff and storm water collected on site. The most common sources of pH-modifying materials are bulk cement, cement kiln dust (CKD), fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, and concrete pumping and mixer washout waters.

11.3 Spill Response

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize their migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on site and prevent their release into receiving waters.

If a spill of pollutants threatens storm water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The site superintendent will be notified immediately when a spill, or the threat of a spill, is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping Erosion Sediment Control (ESC) facilities and entering the receiving waters, facility personnel will respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing materials and equipment for spill response and cleanup will be maintained at the site. Each spill kit may contain:
 - Oil absorbent pads (one bale)
 - Oil absorbent booms (40 feet)
 - 55-gallon drums (2)
 - 9-mil plastic bags (10)
 - Personal protective equipment including gloves and goggles
- If an oil sheen is observed on surface water (e.g., settling ponds, Retention pond, swales), absorbent pads and/or booms will be applied to contain and remove the oil. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- The site superintendent, or his designee, will be responsible for completing the spill reporting form and for reporting the spill to the appropriate state or local agency (see Forms at the end of this section).
- Facility personnel with primary responsibility for spill response and cleanup will receive training from the site superintendent. This training will include

identifying the location of spill kits and other spill response equipment and the use of spill response materials.

- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

11.4 Notification

There are no proposed water surfaces. If the contractor observes oil on the ground, then removal of oil is required. If it appears to be a spill then make the appropriate notification(s) consistent with the following procedures:

- Any spill of oil which 1) violates water quality standards, 2) produces a “sheen” on a surface water, or 3) causes a sludge or emulsion must be reported immediately by telephone to the National Response Center Hotline at (800) 424-8802.
- Any oil, hazardous substance, or hazardous waste release which exceeds the reportable quantity must be reported immediately by telephone to the National Response Center Hotline at (800) 424-8802.
- Any spill of oil or hazardous substance to waters of the state must be reported immediately by telephone to the Utah Division of Water Quality at (801)538-6146 or (801)536-4123(after hours).
- Any release of a hazardous substance that may be a threat to human health or the environment must be reported to the Utah Division of Solid and Hazardous Waste at (801)538-6170 immediately upon discovery.

11.5 Suggested BMPs

- BMP NS-2: Dewatering Operations
- BMP NS-8: Vehicle and Equipment Cleaning
- BMP WM-3: Stockpile Management

12 STORM WATER TREATMENT

12.1 Storm Water Collection System

During all phases of construction and grading the contractor will provide storm water collection and conveyance systems to collect and direct sediment contaminated water to temporary sediment traps as needed to prevent offsite discharge of sediment laden storm water. Construction will occur in phases as much as practicable to avoid unnecessarily exposing vegetated areas of the site. Clean storm water, generated from stabilized and undisturbed portions of the site, will be collected and conveyed to stabilized discharge areas whenever necessary to avoid contact with disturbed portions of the site. All conveyance and collection systems will be constructed consistent with National, State, County and local BMP requirements.

12.2 Temporary Sediment Traps

If needed during construction, sediment contaminated storm water will be conveyed to temporary sediment traps, as designed by the erosion control lead. The sediment traps will gravity-settle large particles down to silt size particles.

13 BMP MAINTENANCE

All temporary and permanent erosion and sediment control BMPs will be maintained and repaired as needed to assure continued performance of their intended function. All maintenance and repair will be conducted in accordance with BMPs. Recommended BMP maintenance requirements are listed in Tables 1 and 2 included in this section. Following Tables 1 and 2 is a BMP Inspection Checklist for use in routine inspections of the construction site. Inspection frequency is to be once every 14 days and within 24 hours of the end of a storm event 0.5 inches or greater. BMP maintenance shall be addressed as soon as possible if indicated by the inspection. If control measures need to be modified they must be so before the next storm event if practicable. Sediment must be removed from sediment traps or ponds when capacity reaches 50%. Inspection records are to be maintained for at least 3 years past the permit termination.

All temporary erosion and sediment control BMPs will be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment will be removed or stabilized on site. Disturbed soil areas resulting from removal of BMPs or vegetation will be permanently stabilized as soon as possible.

14 PROJECT MANAGEMENT

Implementation and management of the environmental aspects of this project under the SWPPP are the responsibilities of Pine Ridge Excavation & Landscape and their assigned sub-contractors for their assigned project scope. Communication between all parties performing work on the site is essential for proper implementation of the SWPPP. The contractor should all be familiar with the SWPPP and his responsibilities under the plan. To help delegate these responsibilities the following outline has been provided:

14.1 Phasing of Construction

The project is planned for one phase. Boulder loading and hauling will take place at and from the project site.

14.2 Seasonal Work

While not seasonal, some construction activities may need to be postponed if scheduled during ongoing storm events. Activities such as grading and trenching in areas directly adjacent to the drainage basin during rainstorms could easily result in sediment-contaminated storm water reaching the stream. This work would therefore be performed within a window of dry weather predicted on the basis of weather reports.

14.3 Training

Hansen & Associates will provide onsite training to key personnel responsible for compliance with the SWPPP if needed. The contractor's superintendent and project manager will be familiarized with the major elements of the plan. Construction workers and others at the site will be given appropriate training information at the conclusion of site safety meetings or on an as-needed basis.

14.4 Pre-construction Conference

Not applicable.

14.5 Coordination with Utilities and other Contractors

The prime contractor providing services on the project which may cause storm water pollution shall be given a copy of the SWPPP and appropriate training regarding storm water pollution prevention.

14.6 Subcontractor Oversight

Subcontractor oversight to ensure compliance with the SWPPP will be provided by the prime contractor's superintendent or project manager. Informal, on-the-job tailgate training will be the first level of communication followed by onsite observation of training compliance. Non-compliance with SWPPP policies will trigger a more intensive training session to correct the problem(s). Chronic non-compliance with SWPPP policies may require the intervention of local and/or state regulatory personnel.

14.7 Monitoring/Reporting

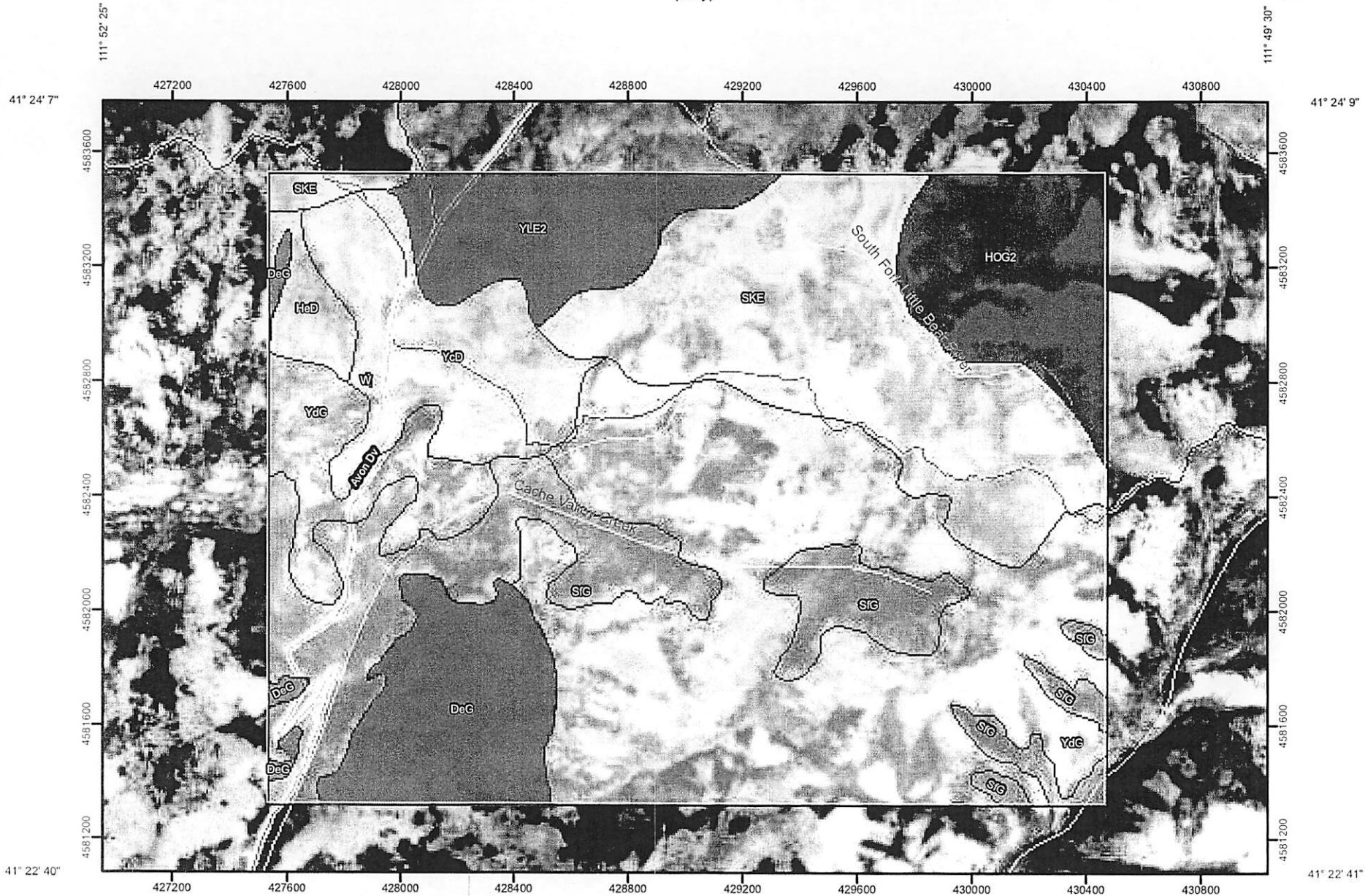
Water quality conditions at the site will be monitored by a qualified technician and water quality reports submitted to the proper regulatory authorities on a regular basis. Additional reports such as erosion and sediment control inspections will be the responsibility of the prime contractor or a designated consultant. Spill reports will be completed and submitted by the prime contractor on the project.

14.8 SWPPP Update

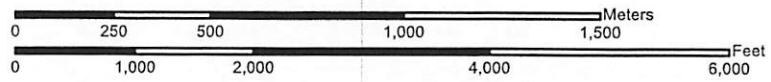
The SWPPP shall be updated as necessary by Pine Ridge Excavation & Landscape.

APPENDIX A
NRCS SHEETS

Percent Clay—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County (Clay)




Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.



Percent Clay—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County
(Clay)

MAP LEGEND


Area of Interest (AOI)


 Area of Interest (AOI)


Soils


 Soil Map Units


Soil Ratings

 ≤ 17.5

 > 17.5 AND ≤ 27.8

 > 27.8 AND ≤ 30.7

 > 30.7 AND ≤ 33.2

 > 33.2 AND ≤ 38.1

Not rated or not available

Political Features

 Cities

Water Features

 Oceans

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

MAP INFORMATION

Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cache Valley Area, Parts of Cache and Box Elder Counties, Utah
Survey Area Data: Version 5, Aug 26, 2009

Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County
Survey Area Data: Version 5, Feb 26, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 9/8/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Percent Clay

| Percent Clay— Summary by Map Unit — Cache Valley Area, Parts of Cache and Box Elder Counties, Utah | | | | |
|--|--|------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (percent) | Acres in AOI | Percent of AOI |
| HOG2 | HOSKIN-SCOUT ASSOCIATION, ERODED | 17.5 | 121.6 | 7.6% |
| SKE | SCAVE COBBLY SILT LOAM, 10 TO 30 PERCENT SLOPES | 30.7 | 295.4 | 18.4% |
| YLE2 | YEATES HOLLOW COBBLY SILTY CLAY LOAM, 3 TO 30 PERCENT SLOPES, ERODED | 36.8 | 103.7 | 6.5% |
| Subtotals for Soil Survey Area | | | 520.7 | 32.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

| Percent Clay— Summary by Map Unit — Morgan Area, Utah - Morgan County and Part of Weber County | | | | |
|--|--|------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (percent) | Acres in AOI | Percent of AOI |
| DeG | Durfee stony loam, 30 to 70 percent slopes | 38.1 | 126.0 | 7.9% |
| HeD | Henefer loam, 6 to 15 percent slopes | 29.9 | 25.0 | 1.6% |
| SfG | Smarts loam, 40 to 60 percent slopes | 27.8 | 224.3 | 14.0% |
| W | Water | | 0.3 | 0.0% |
| YcD | Yeates Hollow very stony loam, 10 to 30 percent slopes | 32.6 | 131.2 | 8.2% |
| YdG | Yeates Hollow-Smarts complex, 30 to 70 percent slopes | 33.2 | 575.0 | 35.9% |
| Subtotals for Soil Survey Area | | | 1,081.8 | 67.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

Description

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Most of the material is in one of three groups of clay minerals or a mixture of these clay minerals. The groups are kaolinite, smectite, and hydrous mica, the best known member of which is illite.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

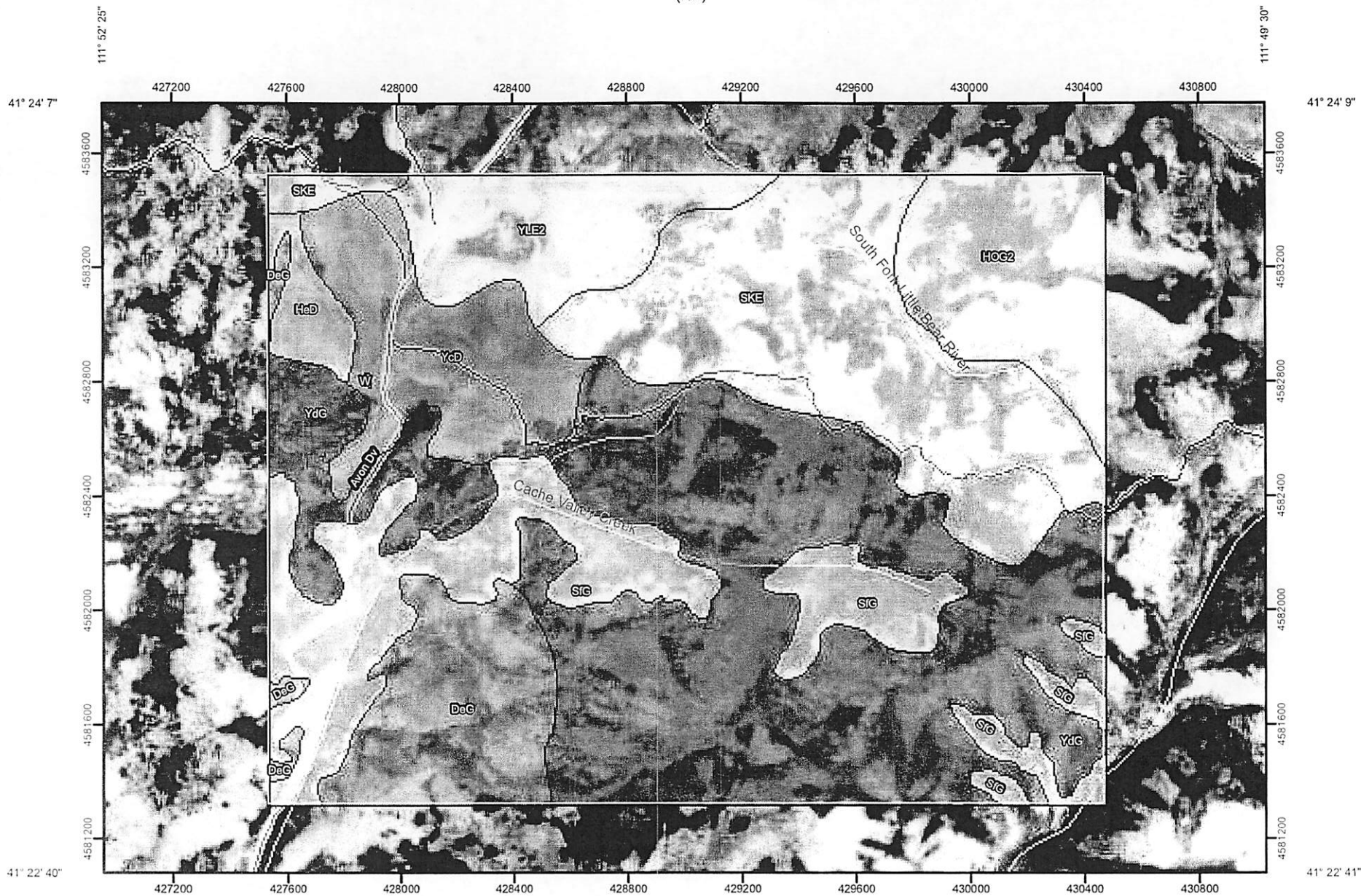
Layer Options: Depth Range

Top Depth: 1

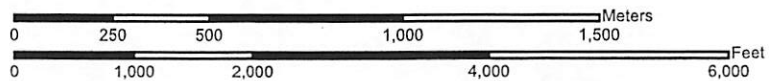
Bottom Depth: 60

Units of Measure: Inches
























K Factor, Whole Soil—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County (Kw)



Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.



MAP LEGEND

| | | | |
|---|----------------------------|---|---------------------|
| Area of Interest (AOI) | |  | Rails |
|  | Area of Interest (AOI) |  | Interstate Highways |
| Soils | |  | US Routes |
|  | Soil Map Units |  | Major Roads |
| Soil Ratings | |  | Local Roads |
|  | .02 | | |
|  | .05 | | |
|  | .10 | | |
|  | .15 | | |
|  | .17 | | |
|  | .20 | | |
|  | .24 | | |
|  | .28 | | |
|  | .32 | | |
|  | .37 | | |
|  | .43 | | |
|  | .49 | | |
|  | .55 | | |
|  | .64 | | |
| | Not rated or not available | | |
| Political Features | | | |
|  | Cities | | |
| Water Features | | | |
|  | Oceans | | |
| | Streams and Canals | | |
| Transportation | | | |

MAP INFORMATION

Map Scale: 1:19,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cache Valley Area, Parts of Cache and Box Elder Counties, Utah
Survey Area Data: Version 5, Aug 26, 2009

Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County
Survey Area Data: Version 5, Feb 26, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 9/8/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

K Factor, Whole Soil

| K Factor, Whole Soil— Summary by Map Unit — Cache Valley Area, Parts of Cache and Box Elder Counties, Utah | | | | |
|--|--|--------|----------------|----------------|
| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
| HOG2 | HOSKIN-SCOUT ASSOCIATION, ERODED | .17 | 121.6 | 7.6% |
| SKE | SCAVE COBBLY SILT LOAM, 10 TO 30 PERCENT SLOPES | .17 | 295.4 | 18.4% |
| YLE2 | YEATES HOLLOW COBBLY SILTY CLAY LOAM, 3 TO 30 PERCENT SLOPES, ERODED | .20 | 103.7 | 6.5% |
| Subtotals for Soil Survey Area | | | 520.7 | 32.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

| K Factor, Whole Soil— Summary by Map Unit — Morgan Area, Utah - Morgan County and Part of Weber County | | | | |
|--|--|--------|----------------|----------------|
| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
| DeG | Durfee stony loam, 30 to 70 percent slopes | .10 | 126.0 | 7.9% |
| HeD | Henefer loam, 6 to 15 percent slopes | .32 | 25.0 | 1.6% |
| SfG | Smarts loam, 40 to 60 percent slopes | .24 | 224.3 | 14.0% |
| W | Water | | 0.3 | 0.0% |
| YcD | Yeates Hollow very stony loam, 10 to 30 percent slopes | .10 | 131.2 | 8.2% |
| YdG | Yeates Hollow-Smarts complex, 30 to 70 percent slopes | .05 | 575.0 | 35.9% |
| Subtotals for Soil Survey Area | | | 1,081.8 | 67.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

Description

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Rating Options

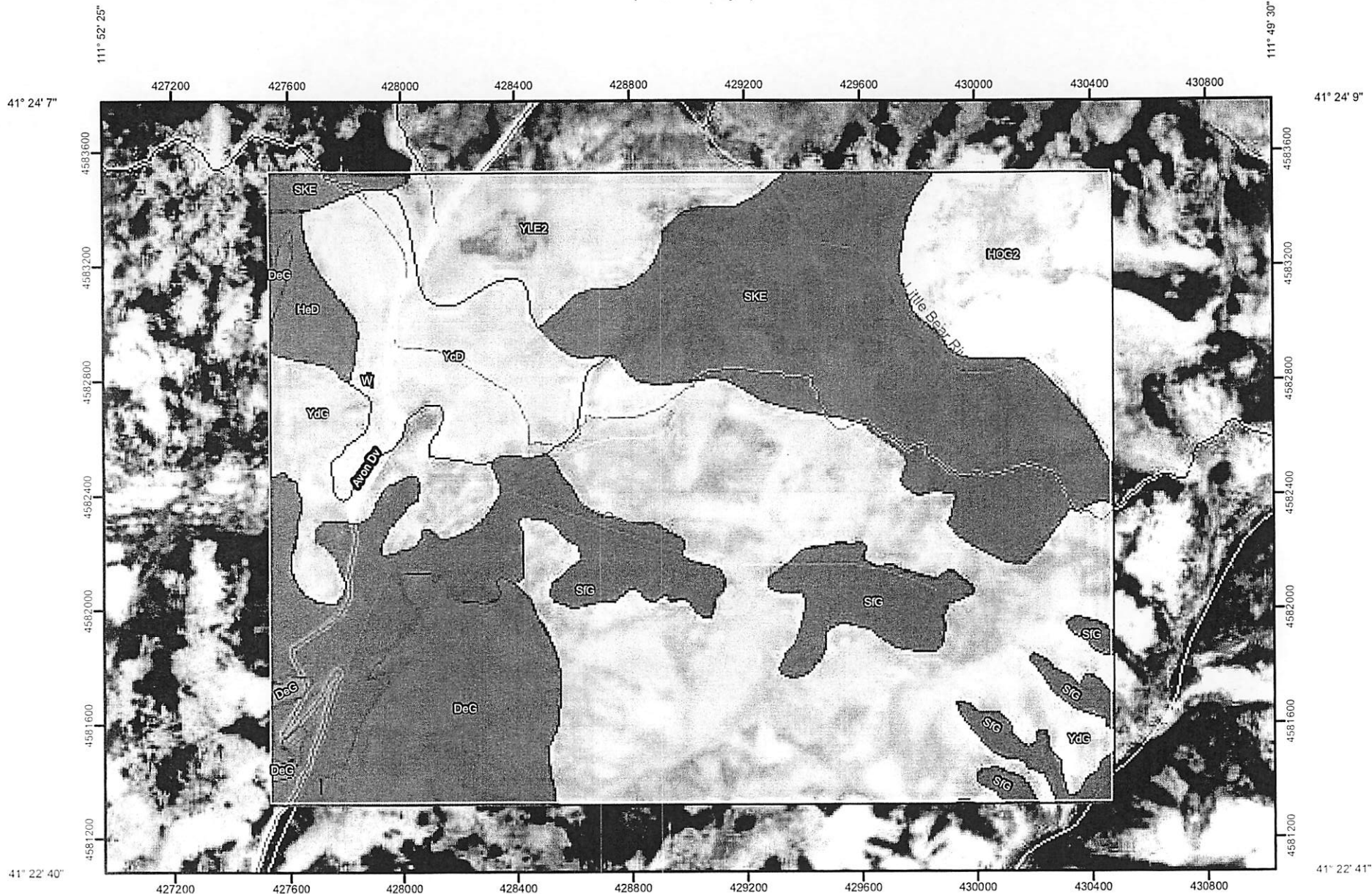
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

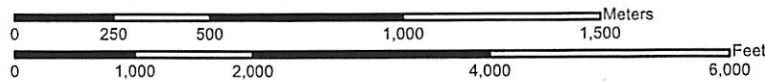
Tie-break Rule: Higher

Layer Options: Surface Layer

Depth to Any Soil Restrictive Layer—Cache Valley Area, Parts of Cache and Box Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County (Restrictive Layer)




Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.



Depth to Any Soil Restrictive Layer—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County (Restrictive Layer)

MAP LEGEND







Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units


Soil Ratings


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200

Political Features


 Cities


Water Features


 Oceans


 Streams and Canals


Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

MAP INFORMATION

Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cache Valley Area, Parts of Cache and Box Elder Counties, Utah
 Survey Area Data: Version 5, Aug 26, 2009

Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County
 Survey Area Data: Version 5, Feb 26, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 9/8/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Any Soil Restrictive Layer

| Depth to Any Soil Restrictive Layer— Summary by Map Unit — Cache Valley Area, Parts of Cache and Box Elder Counties, Utah | | | | |
|---|--|----------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (centimeters) | Acres in AOI | Percent of AOI |
| HOG2 | HOSKIN-SCOUT ASSOCIATION, ERODED | 71 | 121.6 | 7.6% |
| SKE | SCAVE COBBLY SILT LOAM, 10 TO 30 PERCENT SLOPES | >200 | 295.4 | 18.4% |
| YLE2 | YEATES HOLLOW COBBLY SILTY CLAY LOAM, 3 TO 30 PERCENT SLOPES, ERODED | 117 | 103.7 | 6.5% |
| Subtotals for Soil Survey Area | | | 520.7 | 32.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

| Depth to Any Soil Restrictive Layer— Summary by Map Unit — Morgan Area, Utah - Morgan County and Part of Weber County | | | | |
|---|--|----------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (centimeters) | Acres in AOI | Percent of AOI |
| DeG | Durfee stony loam, 30 to 70 percent slopes | >200 | 126.0 | 7.9% |
| HeD | Henefer loam, 6 to 15 percent slopes | >200 | 25.0 | 1.6% |
| SfG | Smarts loam, 40 to 60 percent slopes | >200 | 224.3 | 14.0% |
| W | Water | >200 | 0.3 | 0.0% |
| YcD | Yeates Hollow very stony loam, 10 to 30 percent slopes | 140 | 131.2 | 8.2% |
| YdG | Yeates Hollow-Smarts complex, 30 to 70 percent slopes | 107 | 575.0 | 35.9% |
| Subtotals for Soil Survey Area | | | 1,081.8 | 67.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

Description

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "> 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

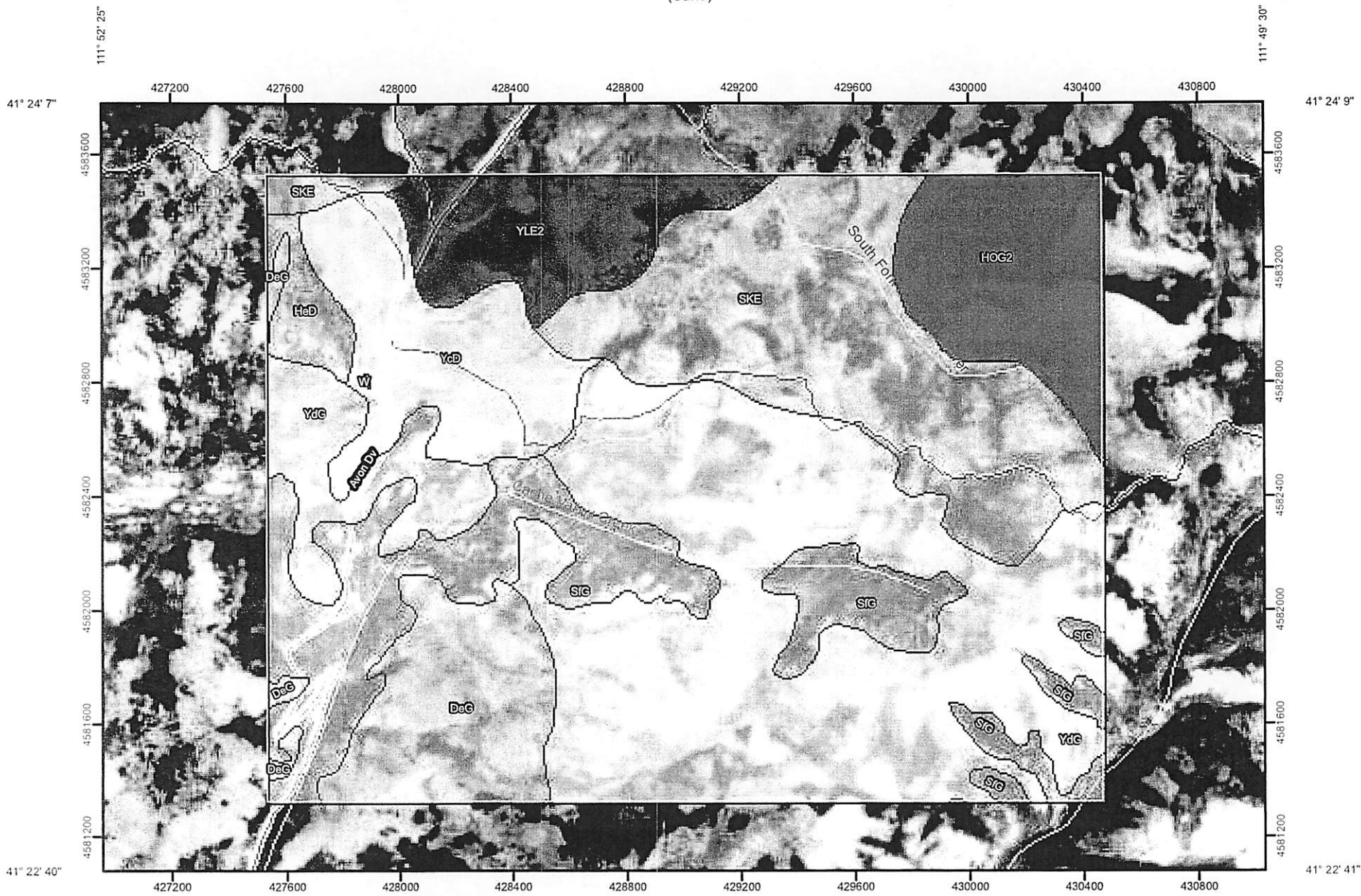
Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

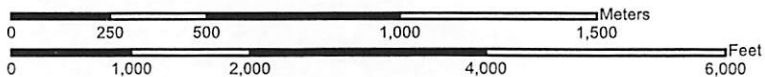
Tie-break Rule: Lower

Interpret Nulls as Zero: No

Percent Sand—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County (Sand)




Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.



Percent Sand—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County
(Sand)

MAP LEGEND

Area of Interest (AOI)


 Area of Interest (AOI)


Soils


 Soil Map Units


Soil Ratings

 ≤ 27.4

 > 27.4 AND ≤ 31.2

 > 31.2 AND ≤ 34.3

 > 34.3 AND ≤ 37

 > 37 AND ≤ 42.2

Not rated or not available

Political Features

 Cities

Water Features

 Oceans

 Streams and Canals


Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

MAP INFORMATION

Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cache Valley Area, Parts of Cache and Box Elder Counties, Utah

Survey Area Data: Version 5, Aug 26, 2009

Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County

Survey Area Data: Version 5, Feb 26, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 9/8/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Percent Sand

| Percent Sand— Summary by Map Unit — Cache Valley Area, Parts of Cache and Box Elder Counties, Utah | | | | |
|--|--|------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (percent) | Acres in AOI | Percent of AOI |
| HOG2 | HOSKIN-SCOUT ASSOCIATION, ERODED | 42.2 | 121.6 | 7.6% |
| SKE | SCAVE COBBLY SILT LOAM, 10 TO 30 PERCENT SLOPES | 31.2 | 295.4 | 18.4% |
| YLE2 | YEATES HOLLOW COBBLY SILTY CLAY LOAM, 3 TO 30 PERCENT SLOPES, ERODED | 27.4 | 103.7 | 6.5% |
| Subtotals for Soil Survey Area | | | 520.7 | 32.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

| Percent Sand— Summary by Map Unit — Morgan Area, Utah - Morgan County and Part of Weber County | | | | |
|--|--|------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (percent) | Acres in AOI | Percent of AOI |
| DeG | Durfee stony loam, 30 to 70 percent slopes | 30.6 | 126.0 | 7.9% |
| HeD | Henefer loam, 6 to 15 percent slopes | 36.0 | 25.0 | 1.6% |
| SfG | Smarts loam, 40 to 60 percent slopes | 37.0 | 224.3 | 14.0% |
| W | Water | | 0.3 | 0.0% |
| YcD | Yeates Hollow very stony loam, 10 to 30 percent slopes | 34.3 | 131.2 | 8.2% |
| YdG | Yeates Hollow-Smarts complex, 30 to 70 percent slopes | 34.1 | 575.0 | 35.9% |
| Subtotals for Soil Survey Area | | | 1,081.8 | 67.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

Description

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the database, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

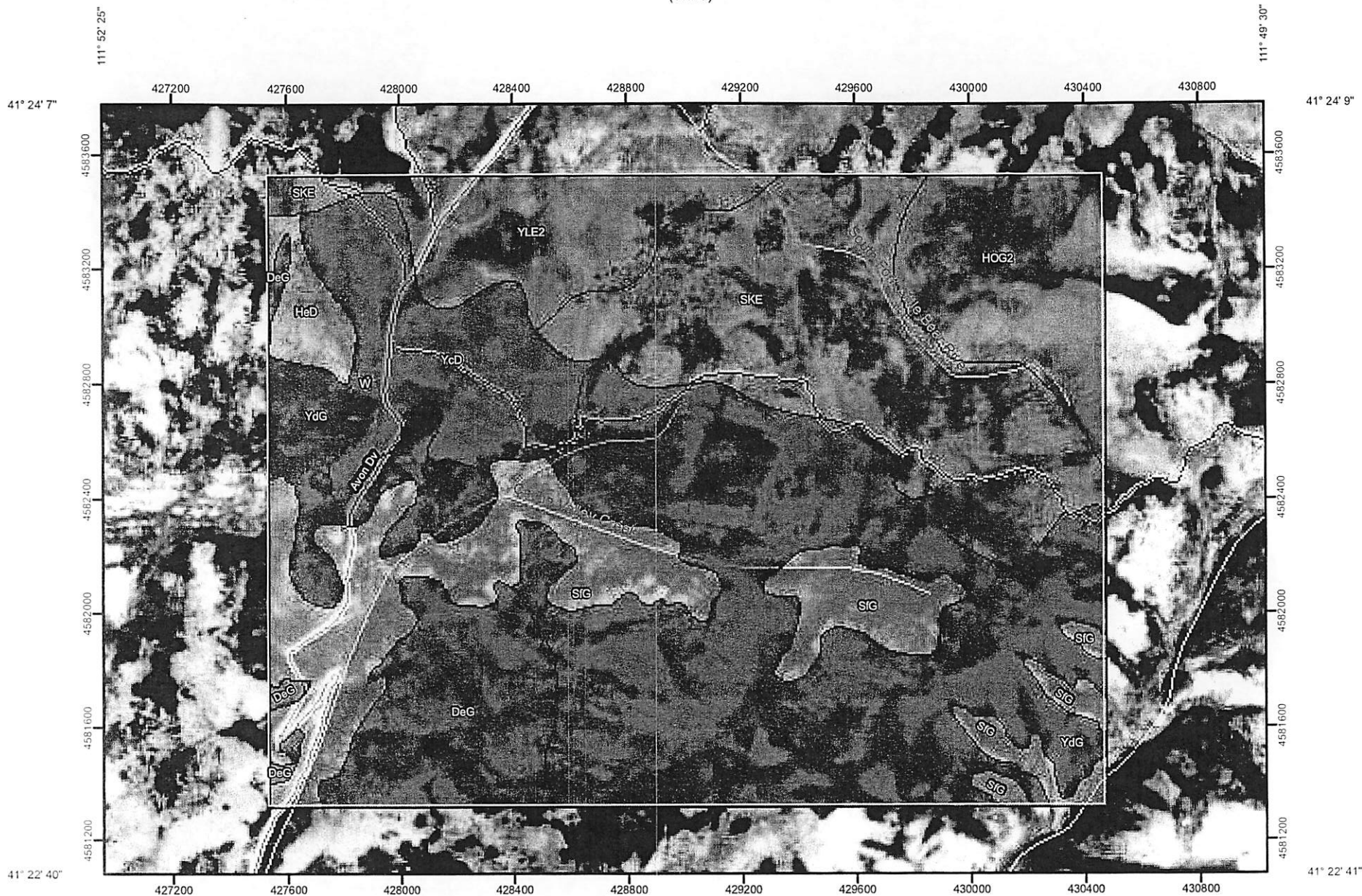
Layer Options: Depth Range

Top Depth: 0

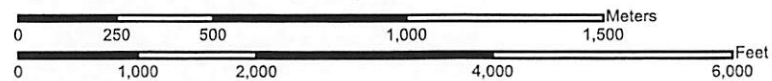
Bottom Depth: 60

Units of Measure: Inches

Wind Erodibility Index—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County (Wind)
























Map Scale: 1:19,300 if printed on A size (8.5" x 11") sheet.



Wind Erodibility Index—Cache Valley Area, Parts of Cache and Box Elder Counties, Utah; and Morgan Area, Utah - Morgan County and Part of Weber County
(Wind)

MAP LEGEND

- Area of Interest (AOI)**
 Area of Interest (AOI)
- Soils**
 Soil Map Units
- Soil Ratings**
- | | |
|---|-----|
|  | 0 |
|  | 38 |
|  | 48 |
|  | 56 |
|  | 86 |
|  | 134 |
|  | 160 |
|  | 180 |
|  | 220 |
|  | 250 |
|  | 310 |
- Not rated or not available
- Political Features**
 Cities
- Water Features**
 Oceans
 Streams and Canals
- Transportation**
 Rails
 Interstate Highways
 US Routes
-  Major Roads
 Local Roads

MAP INFORMATION

Map Scale: 1:19,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cache Valley Area, Parts of Cache and Box Elder Counties, Utah
 Survey Area Data: Version 5, Aug 26, 2009

Soil Survey Area: Morgan Area, Utah - Morgan County and Part of Weber County
 Survey Area Data: Version 5, Feb 26, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 9/8/1993

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Wind Erodibility Index

| Wind Erodibility Index— Summary by Map Unit — Cache Valley Area, Parts of Cache and Box Elder Counties, Utah | | | | |
|--|--|---------------------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (tons per acre per year) | Acres in AOI | Percent of AOI |
| HOG2 | HOSKIN-SCOUT ASSOCIATION, ERODED | 38 | 121.6 | 7.6% |
| SKE | SCAVE COBBLY SILT LOAM, 10 TO 30 PERCENT SLOPES | 38 | 295.4 | 18.4% |
| YLE2 | YEATES HOLLOW COBBLY SILTY CLAY LOAM, 3 TO 30 PERCENT SLOPES, ERODED | 38 | 103.7 | 6.5% |
| Subtotals for Soil Survey Area | | | 520.7 | 32.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

| Wind Erodibility Index— Summary by Map Unit — Morgan Area, Utah - Morgan County and Part of Weber County | | | | |
|--|--|---------------------------------|----------------|----------------|
| Map unit symbol | Map unit name | Rating (tons per acre per year) | Acres in AOI | Percent of AOI |
| DeG | Durfee stony loam, 30 to 70 percent slopes | 0 | 126.0 | 7.9% |
| HeD | Henefer loam, 6 to 15 percent slopes | 48 | 25.0 | 1.6% |
| SfG | Smarts loam, 40 to 60 percent slopes | 48 | 224.3 | 14.0% |
| W | Water | | 0.3 | 0.0% |
| YcD | Yeates Hollow very stony loam, 10 to 30 percent slopes | 0 | 131.2 | 8.2% |
| YdG | Yeates Hollow-Smarts complex, 30 to 70 percent slopes | 0 | 575.0 | 35.9% |
| Subtotals for Soil Survey Area | | | 1,081.8 | 67.5% |
| Totals for Area of Interest | | | 1,602.5 | 100.0% |

Description

The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Rating Options

Units of Measure: tons per acre per year

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B

**NPDES STORM WATER PERMIT, AND
STATE WATER QUALITY STANDARDS**

PINE RIDGE CAPITAL LLC (12/09)
PH. (801) 745-9527
3080 E 4100 N
LIBERTY, UT 84310

GOLDENWEST
CREDIT UNION
5025 S. ADAMS AVENUE
OGDEN, UT 84403
97-7761/3243

1228

11/5/2010

TO THE
ORDER OF

State of Utah. division of water quality

\$ **100.00

One Hundred and 00/100*****

DOLLARS

State of Utah. division of water quality

MEMO

SWPPP Permit fee NOI

Rebecca J. ...
AUTHORIZED SIGNATURE

⑈001228⑈ ⑆324377613⑆ 190002192690⑈

PINE RIDGE CAPITAL LLC

1228

State of Utah. division of water quality

11/5/2010

permit fee for SWPPP for "upper site" of rock yard

100.00

Pine Ridge golden we SWPPP Permit fee NOI

100.00

STATE OF UTAH, DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY
195 North 1950 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870 (801)536-4300

NOI

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under the UPDES General Permit No. UTR300000. **SEE REVERSE FOR INSTRUCTIONS**

Submission of this Notice of Intent constitutes notice that the party(s) identified in Section I of this form intends to be authorized by UPDES General Permit No. UTR300000 issued for storm water discharges associated with construction activity in the State of Utah. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. **ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.**

Is this NOI seeking continuation for previously expired permit coverage at the same site? Y N
If yes, what is the number of the previous permit coverage? Permit No. UTR _____

I. OPERATOR INFORMATION Date NOI is received at DWQ _____ (to be completed by DWQ)

Name (Main operator): Pine Ridge Excavation Phone: 801 745 9527
Address: 3080 E 4100 N Status of Owner/Operator: LLC
City: Liberty State: UT Zip: 84310
Contact Person: R. Dan Lockwood Phone: 435 984 2061

Name (1st Co-permittee): _____ Phone: _____
Address: _____ Status of Owner/Operator: _____
City: _____ State: _____ Zip: _____
Contact Person: _____ Phone: _____

Name (2nd Co-permittee): _____ Phone: _____
Address: _____ Status of Owner/Operator: _____
City: _____ State: _____ Zip: _____
Contact Person: _____ Phone: _____

Name (3rd Co-permittee): _____ Phone: _____
Address: _____ Status of Owner/Operator: _____
City: _____ State: _____ Zip: _____
Contact Person: _____ Phone: _____

Please copy this form if you have more co-permittees than what is allowed on this form.

II. FACILITY SITE / LOCATION INFORMATION

Name: Pine Ridge Excavation "upper site"
Project No. (if any): _____
Address: Alpine Divide County: Wasatch
City: _____ State: _____ Zip: _____
Latitude: 41 393 Longitude: 111 851

Is the facility located in Indian Country?
Y N

Method (check one): USGS Topo Map, Scale _____ EPA Web site GPS Other _____

III. SITE ACTIVITY INFORMATION

Municipal Separate Storm Sewer System (MS4) Operator Name: Weber County

Receiving Water Body: CACHE VALLEY CREEK (this is known this is a guess)

Estimate of distance to the nearest water body? 900 ft. miles. (circle one)

List the Number of any other UPDES permits at the site: 0

IV. TYPE OF CONSTRUCTION (Check all that apply)

1. Residential 2. Commercial 3. Industrial 4. Road 5. Bridge 6. Utility

7. Contouring, Landscaping 8. Other (Please list)

V. BEST MANAGEMENT PRACTICES

Identify proposed Best Management Practices (BMPs) to reduce pollutants in storm water discharges: (Check all that apply)

1. Silt Fences 2. Sediment Pond 3. Seeding/Preservation of Vegetation 4. Mulching/Geotextiles

5. Check Dams 6. Structural Controls (Berms, Ditches, etc.)

7. Other (Please list) STABILIZED CONSTRUCTION ENTRANCE

VI. ADDITIONAL INFORMATION REQUIRED

A storm water pollution prevention plan has been prepared for this site and is to the best of my knowledge in Compliance with State and/or Local Sediment and Erosion Plans and Requirements. Y N
(A pollution prevention plan is required to be on hand before submittal of the NOI.)

Project Start Date: NOV 4, 2010 Completion Date: JUNE 30, 2013 (All coverage's issued under this NOI will terminate on June 30, 2013)

VII. CERTIFICATION: I certify under penalty of law that I have read and understand the Part 1 eligibility requirements for coverage under the general permit for storm water discharges from construction activities. I further certify that to the best of my knowledge, all discharges and BMPs that have been scheduled and detailed in a pollution prevention plan will satisfy requirements of Part 1, and Part 3 of this permit. I understand that continued coverage under this storm water general permit is contingent upon maintaining eligibility as provided for in Part 1.

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

Print Name (of responsible person for the main operator from first page):

Date:

[Signature]

NOV 4, 2010

Signature:

Print Name (of responsible person for the 1st co-permittee from first page):

Date:

Signature:

Print Name (of responsible person for the 2nd co-permittee from first page):

Date:

Signature:

Print Name (of responsible person for 3rd co-permittee from first page):

Date:

Signature:

Amount of Permit Fee Enclosed: \$100.00

**STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY**

**Authorization to Discharge Under the
Utah Pollutant Discharge Elimination System**

**Storm Water General Permit for
Construction Activities
Permit No. UTR300000**

This Permit is issued in compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004, as amended (the "Act") and the federal Water Pollution Control Act (33 U.S.C. §§ 1251 *et. seq.*, as amended to date), and the rules and Regulations made pursuant to those statutes.

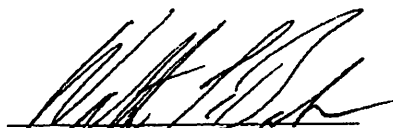
This Permit authorizes storm water discharges to waters of the State of Utah resulting from construction activities, including construction support activities, anywhere within the State of Utah as provided in Parts 1.4 and 1.5 of this Permit. This authorization is conditioned upon a discharger meeting the eligibility requirements in Part 1.2.2 of this Permit, including preparation of a Storm Water Pollution Prevention Plan prior to filing a Notice of Intent ("NOI") to discharge under this General Permit. A discharger is not covered by this Permit if the discharger submits an NOI but has not met these conditions.

This authorization is subject to the authority of the Utah Water Quality Board or the Executive Secretary of the Utah Water Quality Board to reopen this Permit (*see* Part 5.15 of this Permit), or to require a discharger to obtain an individual permit or use an alternative general permit (*see* Part 2.3 of this Permit). The issuance of a discharge permit authorization under this general Permit does not relieve Permittees of other duties and responsibilities under the Act or rules made under that Act. Significant terms used in this Permit are defined in Part 6 of this Permit.

This Permit shall become effective on July 1, 2008.

This Permit and the authorization to discharge shall expire at midnight, June 30, 2013, except as described in Part 2.4 of this Permit.

Signed this 26th day of June, 2008.



Walter L. Baker, P.E.
Executive Secretary,
Utah Water Quality Board

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PART 1: PERMIT SCOPE AND COVERAGE

- 1.1 Persons required to obtain authorization for discharge. No person may conduct construction activities that disturb an area greater than or equal to one acre without authorization for storm water discharge from the Executive Secretary. (See Utah Admin. Code Sections R317-8-3.9(6)(d)(10) and R317-8-3.9(6)(e)(1).) In addition, no person may conduct construction activities that disturb an area smaller than one acre if the disturbance is part of a larger common plan of development or sale that will ultimately disturb an area greater than or equal to one acre. *Id.* See Part 6.5 of this Permit for a definition of “construction activities.”
- 1.2 Permit Area and Eligibility.
- 1.2.1. Construction activities located within the State of Utah, except for Indian Country (see Part 6.16 of this Permit for a definition of “Indian Country”) may be eligible to be covered under this Permit.
- 1.2.2. Eligibility for authorization to discharge under this Permit is conditioned upon:
- Preparation of a Storm Water Pollution Prevention Plan (“SWPPP”) (see Part 3 of this permit) prior to submission of a Notice of Intent (“NOI”);
 - Submission of a complete and accurate Notice of Intent to be covered by this Permit (see Part 1.8 of this Permit); and
 - Payment of applicable fees.
- 1.3 Authorization to Discharge. This Permit authorizes discharges of storm water from construction activities that disturb an area greater than or equal to one acre, and from construction activities that disturb an area smaller than one acre if the disturbance is part of a larger common plan of development or sale that will ultimately disturb an area greater than or equal to one acre. This authorization is subject to all of the terms and conditions of this Permit, including the requirement that the discharger must submit a Notice of Intent (“NOI”), and the prohibitions on discharges specified in Part 1.6.
- 1.4 Allowable Storm Water Discharges. Subject to compliance with the terms and conditions of this Permit, a Permittee is authorized to discharge pollutants in:
- Storm water associated with construction activity as that term is defined in Part 6.5 of this Permit (but see Part 1.4.3 of this Permit for limitations on discharges from construction support activities);
 - Storm water discharges designated by the Executive Secretary as needing a storm water permit under R317-8-3.9(6)(e)(2);
 - Discharges from construction support activities as that term is defined in Part 6.6 of this Permit, provided:
 - The support activity is directly related to the construction site required to have UPDES permit coverage for discharges of storm water associated with construction activity;
 - The support activity is not a commercial operation serving multiple unrelated construction projects by different owners/operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and
 - Appropriate controls and measures are identified in a Storm Water Pollution

- Prevention Plan (SWPPP) covering the discharges from the support activity areas; and
- 1.4.4. Discharges composed of allowable discharges listed in Part 1.4 and 1.5 of this Permit commingled with a discharge authorized by a different UPDES permit and/or a discharge that does not require UPDES permit authorization.
- 1.5. Allowable Non-storm Water Discharges. A Permittee is authorized to make the following non-storm water discharges, provided the non-storm water component of the discharge is in compliance with Part 3.5.5 of this Permit:
- 1.5.1. Discharges from fire-fighting activities;
 - 1.5.2. Fire hydrant flushings;
 - 1.5.3. Waters used to wash vehicles where detergents are not used;
 - 1.5.4. Water used to control dust in accordance with Part 3.5.2(c)(2);
 - 1.5.5. Potable water including uncontaminated water line flushings;
 - 1.5.6. Routine external building wash down that does not use detergents;
 - 1.5.7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
 - 1.5.8. Uncontaminated air conditioning or compressor condensate;
 - 1.5.9. Uncontaminated ground water or spring water;
 - 1.5.10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
 - 1.5.11. Landscape and other irrigation drainage.
- 1.6. Discharges not allowed under this Permit. Notwithstanding any other language in this Permit, the following storm water discharges are not authorized by this Permit:
- 1.6.1. Discharges from Construction Activities within Indian Country. This Permit does not cover discharges within Indian Country as that term is defined in Part 6.16 of this Permit;¹
 - 1.6.2. Post Construction Discharges. Storm water discharges that originate from the site after construction activities have been completed and the site has undergone final stabilization;
 - 1.6.3. Discharges Mixed with Non-storm Water. Discharges that are mixed with sources of non-storm water other than discharges which are identified in Part 1.5 of this Permit and in compliance with Part 3.5.5 (non-storm water discharges) of this Permit;
 - 1.6.4. Discharges Covered by Another Permit. Storm water discharges associated with construction activity for which an individual permit has been issued, or for which the owner/operator is required to or may obtain coverage under an individual permit or an alternative general permit (*see* Part 2.3 of this Permit), including a general

¹ The State of Utah, *Division of Water Quality*, does not have permit authority for Indian Country. Storm water permits for Indian Country within the State must be acquired through EPA Region VIII, except for facilities on the Navajo Reservation or on the Goshute Reservation which must acquire storm water permits through EPA Region IX.

- permit issued for areas regulated by a qualified municipal Separate Storm Sewer System Program;
- 1.6.5. Discharges Threatening Water Quality. Storm water discharges from construction activities that cause or have the reasonable potential to cause a violation of a water quality standard. See Part 2.2 of this Permit;
 - 1.6.6. Discharges from commercial construction support and related activities. Storm water discharges from construction support activities unless they are included within the definition in Part 6.6 of this permit;
 - 1.6.7. Spills. This Permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill; and
 - 1.6.8. Discharges that result from violations of this Permit.
- 1.7 Authorization to Discharge Date.
- 1.7.1. This permit is effective as of July 1, 2008 and is effective for five years, expiring at 11:59 p.m. on June 30, 2013.
 - 1.7.2. Unless notified by the Executive Secretary to the contrary, a discharger is authorized for coverage under this Permit and may begin construction activities immediately after preparing a SWPPP for the construction activities (see Part 1.2.2(a) of this Permit), and after submitting an NOI and permit fee (see Part 1.2.2(b) and (c) of this Permit). The date of submission of the NOI or a permit fee shall be the date of its receipt by the Executive Secretary, or the date the NOI or permit fee are submitted electronically using the website for the Utah Division of Water Quality. Any NOIs mailed to the Executive Secretary shall be mailed to the address specified in Part 5.11 of this Permit.
 - 1.7.3. The Executive Secretary may, with written notice (including electronic notice) delay authorization to verify an applicant's eligibility or resolve other concerns. In these instances, a discharger is not authorized for coverage under this permit until it receives notice from the Executive Secretary.
- 1.8 Notice of Intent
- 1.8.1. A person who wishes to submit an NOI must use the NOI form provided by the Executive Secretary (or a copy thereof), or submit an NOI electronically (see (<https://secure.utah.gov/stormwater/>)).
 - 1.8.2. All questions in an NOI form provided by the Executive Secretary or answered in the course of submitting an NOI electronically must be answered completely and accurately.
 - 1.8.3. The NOI, whether on the form provided by the Executive Secretary or submitted electronically, must include a certification statement, and must be signed and dated by an authorized representative as specified in Part 5.16 of this Permit.
- 1.9 Coverage before June 30, 2010. Permittee's that previously received authorization to discharge under the October 1, 2002 General Permit (2002 General Permit) and still have active coverage shall without submission of an NOI continue coverage under UTR200000 until June 30, 2010 at which time, or before if desired, the Permittee shall, by submission of an NOI (either on-line www.waterquality.utah.gov/updes/stormwatercon.htm or by paper submission) obtain coverage under this Permit (UTR300000).

- 1.10 Late Notifications. Persons are not prohibited from submitting NOIs after initiating clearing, grading, excavation activities, or other construction activities. When a late NOI is submitted, authorization for discharges occurs consistent with Subpart 2.1. The Agency reserves the right to take enforcement action for any un-permitted discharges that occur between the commencement of construction and discharge authorization.

**PART 2. SPECIAL CONDITIONS, MANAGEMENT PRACTICES,
RESPONSIBILITIES, AND OTHER NON-NUMERIC LIMITATIONS**

2.1 Releases in excess of Reportable Quantities. The discharge of hazardous substances or oil in the storm water discharge(s) from a site shall be prevented or minimized in accordance with the applicable SWPPP for the site. This Permit does not relieve the Permittee of the reporting requirements of 40 CFR part 117, 40 CFR 110, and 40 CFR part 302. Where a release containing a hazardous substance in an amount equal to or in excess of a reportable quantity established under either 40 CFR 117, 40 CFR 110, or 40 CFR 302, occurs during a 24 hour period:

- 2.1.1. The Permittee is required to notify the National Response Center (NRC) (800-424-8802) in accordance with the requirements of 40 CFR 117, 40 CFR 110, and 40 CFR 302 and the Division of Water Quality (DWQ) (801-538-6146) or the 24 hour DWQ answering service at 801-536-4123 as soon as he or she has knowledge of the discharge;
- 2.1.2. The Permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, the measures taken and/or planned to be taken to cleanup the release, and steps to be taken to minimize the chance of future occurrences to the Executive Secretary; and
- 2.1.3. The SWPPP required under Part 3 of this Permit must be modified within 14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the SWPPP must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the SWPPP must be modified where appropriate.

2.2 Discharge Compliance with Water Quality Standards and TMDL requirements. Storm water discharges from construction activities that cause or have the reasonable potential to cause a violation of a water quality standard or a violation of Total Maximum Daily Load ("TMDL") requirements are not authorized by this Permit. If there is a TMDL requirement for the receiving water, that requirement, rather than a water quality standard, will govern. If a discharge that would otherwise be covered by this Permit causes a violation or if there is a reasonable potential a discharge will cause a violation, the Permittee will take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard or a TMDL requirement, and shall document these actions in the SWPPP.

If the Executive Secretary determines that construction activities have caused or have the reasonable potential to cause a violation of a water quality standard or a TMDL requirement, the discharger will be notified by the Executive Secretary of additional requirements for treatment or handling of the discharge to ensure future discharges do not cause or contribute to the violation. The Permittee will document these requirements in the SWPPP. The Executive Secretary may authorize continued coverage under this Permit after appropriate controls and implementation procedures, designed to bring the discharges

into compliance with water quality standards or TMDL requirements, have been included in the SWPPP.

Alternatively, the Executive Secretary may notify the Permittee that an individual permit application is necessary (see Part 2.3 of this Permit).

If violations remain or re-occur, then coverage under this Permit may be terminated by the Executive Secretary and an alternative permit may be issued or denied. Compliance with this requirement does not preclude any enforcement activity as provided by the Water Quality Act for the underlying violation.

2.3 Requiring an Individual Permit or an Alternative General Permit.

- 2.3.1. The Executive Secretary may require any person authorized by this Permit to apply for and/or obtain either an individual UPDES permit or an alternative UPDES general permit. Any interested person may petition the Executive Secretary to take action under this paragraph. Where the Executive Secretary requires a discharger authorized to discharge under this Permit to apply for an individual UPDES permit, the Executive Secretary shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form or reference to the application requirements, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of issuance or denial of the individual UPDES permit or the alternative general permit as it applies to the individual Permittee, coverage under this general Permit shall automatically terminate. Applications shall be submitted to the address of the Division of Water Quality shown in Part 5.11 of this Permit. The Executive Secretary may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual UPDES permit application as required by the Executive Secretary under this paragraph, then the applicability of this Permit to the individual UPDES permittee is automatically terminated at the end of the day specified for application submittal.
- 2.3.2. Any discharger authorized by this Permit may request to be excluded from the coverage of this Permit by applying for an individual permit. In such cases, the discharger shall submit an individual application in accordance with the requirements of Utah Administrative Code ("UAC") R317-8-3.9(2)(b)2 with reasons supporting the request, to the Executive Secretary at the address for the Division of Water Quality in Part 5.11 of this Permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the Permittee are adequate to support the request.
- 2.3.3. When an individual UPDES permit is issued to a discharger who would otherwise be subject to this Permit, or the discharger is authorized to discharge under an alternative UPDES general permit, the applicability of this Permit to the individual UPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization for coverage under the alternative general permit, whichever the case may be. When an individual UPDES permit is denied to a discharger otherwise subject to this Permit or the discharger is denied for coverage under an alternative UPDES general permit, the applicability of this Permit to the

PART 3. STORM WATER POLLUTION PREVENTION PLANS

- 3.1. **SWPPP required.** A Storm Water Pollution Prevention Plan ("SWPPP") shall be developed for each construction project covered by this Permit prior to submission of an NOI. A SWPPP shall be prepared in accordance with good engineering practices. It is recommended that the plan be signed by a Professional Engineer (P.E.) registered in the State. The SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site, shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges associated with construction activity at the construction site and to assure compliance with the terms and conditions of this Permit, and shall otherwise meet the requirements of this Permit. As a condition of this Permit, Permittees must implement the SWPPP as written or modified from commencement of construction until final stabilization is complete and an NOT has been submitted. (This provision is not intended to address the potential liability of a Permittee or other current or former operator or owner in the event of a discharge of pollution from the property of an individual homeowner.)
- 3.2. **SWPPP Location, Availability, Revision, and Signature.**
- 3.2.1. **SWPPP Location.** A copy of the SWPPP, including a copy of the Permit, the NOI, and any amendments to the SWPPP, shall be retained on-site at the site which generates the storm water discharge in accordance with this Part 3.2 and with Part 5.10 of this Permit. If the site is inactive or does not have an onsite location adequate to store the copy of the SWPPP, reasonable local access to a copy of the SWPPP during normal working hours (e.g., at a local library or government building), must be provided and the location of the SWPPP, along with a contact phone number, shall be posted on site at a publicly-accessible location. For linear construction projects, such as pipelines, the posted notice shall be located at a publicly accessible location near the active part of the construction project.
- 3.2.2. **SWPPP Availability.** The Permittee shall make the copy of the SWPPP that is kept on-site or kept locally available for review upon request to the Executive Secretary; EPA; other local agencies approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or to the operators of a municipal separate storm sewer receiving discharges from the site. The Permittee need not provide a free copy of the SWPPP to these entities upon request, but if it chooses not to do so, it shall keep two copies of the SWPPP, in its entirety, and shall allow these entities to borrow one to make a copy at their own expense.
- 3.2.3. **Original SWPPP.** If requested by the Executive Secretary, the original SWPPP, including any previous versions requested, shall be provided to the Executive Secretary within five working days of the request. The original provided shall be signed in accordance with Part 5.16 of this Permit.
- 3.2.4. **SWPPP Availability to the Public.** The Permittee shall also make a copy of the SWPPP available to the public to review at reasonable times during regular business hours. Advance notice by the public of the desire to view the SWPPP may be required, not to exceed two working days. The Permittee need not provide a free copy of the SWPPP to members of the public, but if it chooses not to do so, it shall

keep two copies of the SWPPP, in its entirety, and shall allow members of the public to borrow one to make a copy at their own expense.

- 3.2.5. **Compelled Revisions.** The Executive Secretary, or an authorized representative of the Executive Secretary, may notify the Permittee (co-Permittees) at any time that the SWPPP does not meet one or more of the minimum requirements of this Part 3. Such notification shall identify those provisions of the Permit which are not being met by the SWPPP, and identify which provisions of the SWPPP require modifications in order to meet the minimum requirements of this Part 3. Within 7 days of such notification from the Executive Secretary, (or as otherwise provided by the Executive Secretary), or authorized representative, the Permittee shall make the required changes to the SWPPP and shall submit to the Executive Secretary a written certification that the changes have been made. The Executive Secretary may take appropriate enforcement action for the period of time the Permittee was operating under a SWPPP that did not meet the minimum requirements of the Permit.
- 3.2.6. All SWPPPs must be signed and certified in accordance with Part 5.16 of this Permit.
- 3.3. **Keeping SWPPPs Current.**
- 3.3.1. The Permittee shall amend the SWPPP whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the discharge of pollutants to the waters of the State and which has not otherwise been addressed in the SWPPP.
- 3.3.2. The Permittee shall amend the SWPPP whenever inspections or investigations by site operators, local, state, or federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under Part 3.5.1 of this Permit, or is otherwise not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity.
- 3.3.3. The Permittee shall amend the SWPPP whenever a new owner/operator becomes responsible for implementing all or part of the SWPPP, as further described in Part 3.4 and Part 4.3 of this Permit.
- 3.3.4. The following records of activities shall be maintained as part of the SWPPP:
- a. Dates when major grading activities occur;
 - b. Dates when construction activities temporarily or permanently cease on a portion of or all of the site; and
 - c. Dates when stabilization measures are initiated.
- 3.3.5. Once an area has been finally stabilized, the Permittee may identify this area in the SWPPP and no further SWPPP or inspection requirements shall apply to that area.
- 3.4. **More than one Permittee.** A SWPPP may identify more than one Permittee and may specify the responsibilities of each Permittee by task, area, and/or timing. Permittees may coordinate and prepare more than one SWPPP to accomplish this. However, in the event there is a requirement under the SWPPP for which responsibility is ambiguous or is not included in the SWPPP(s), each Permittee shall be responsible for implementation of that requirement. Each Permittee is also responsible for assuring that its activities do not render another Permittee's controls ineffective.

3.5. Contents of SWPPP. The SWPPP shall include the following items:

3.5.1. Site Description. Each SWPPP shall provide a description of pollutant sources and other information as indicated:

- a. A description of the nature of the construction activity;
- b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. grubbing, excavation, grading, utilities, and infrastructure installation);
- c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities, including areas for construction support;
- d. An estimate of the runoff coefficient of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;
- e. A general location map (e.g. portion of a city or county map or similar scale) and a site map indicating:
 - 1) drainage patterns and approximate slopes anticipated after major grading activities;
 - 2) construction boundaries and a description of existing vegetation prior to grading activities;
 - 3) areas of soil disturbance, and areas of no disturbance;
 - 4) the location of major structures and nonstructural controls identified in the SWPPP;
 - 5) Locations of areas used for construction support;
 - 6) the location of areas where stabilization practices are expected to occur;
 - 7) the location of surface waters (including wetlands); and
 - 8) locations where storm water is discharged or will discharge to a surface water;
- f. A description of any discharge associated with industrial activity other than construction at the site (including storm water discharges from dedicated portable asphalt plants and dedicated portable concrete plants), whether or not those discharges are covered by the Permit; and the location of that activity;
- g. The name of the receiving water(s), and aerial extent of wetland acreage at the site; and
- h. A copy of this Permit.

3.5.2. Controls. The SWPPP shall employ best management practices to control pollutants in storm water discharges. Each plan shall include a description of appropriate controls and measures that will be implemented during construction activity and while the site is unstabilized. The plan must clearly describe for each major activity identified in Part 3.5.1(b) appropriate control measures and the timing during the construction process that the measures will be implemented. The description and implementation of controls shall address the following minimum components:

- a. Erosion and Sediment Controls.
 - 1) Short and Long Term Goals and Criteria:
 - A) The construction-phase erosion and sediment controls should be designed to retain sediment on site to the maximum extent

- practicable.
- B) All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, incorrectly, or is ineffective the Permittee must replace or modify the control for site situations.
 - C) If sediments escape the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize the possibility of offsite impacts such as fugitive sediments washing into storm sewers by the next rain or posing a safety hazard to users of public streets.
 - D) Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.
 - E) Litter, construction debris, and construction chemicals exposed to storm water shall be picked up prior to anticipated storm events (e.g. forecasted by local weather reports), or otherwise prevented from becoming a pollutant source for storm water discharges (e.g. screening outfalls, picked up daily, etc.).
 - F) Offsite material storage areas (also including overburden and stockpiles of dirt, etc.) used solely by the Permitted project are considered a part of the project and, unless a Permittee submits a separate NOI for such areas or they are subject to a separate UPDES permit, they shall be addressed in the SWPPP.
- 2) **Stabilization Practices.** A description of existing interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. SWPPPs should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geo-textiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Use of impervious surfaces for stabilization should be avoided. Except as provided in paragraphs (A) and (B) below (Parts 3.5.2(a)(2)(A) and (B)), stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
- A) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable.
 - B) Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of the site.
- 3) **Structural Practices.** The permittee shall provide a description of

structural practices that divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Placement of structural practices in floodplains should be avoided to the degree attainable. The installation of these devices may be subject to Section 404 of the federal Clean Water Act ("CWA").

- A) 10 Acre Sediment Basin Requirement. Where attainable, for common drainage locations that serve areas with 10 or more acres disturbed at one time, the Permittee shall provide a temporary (or permanent) sediment basin that provides storage for a 10 year, 24 hour storm event, a calculated volume of runoff for disturbed acres drained, or equivalent control measures, until final stabilization of the site. Where calculations are not performed, a sediment basin providing 3,600 cubic feet of storage per acre drained (a 1 inch storm event), or equivalent control measures, shall be provided where attainable until final stabilization of the site. The required sizing of the sediment basin does not include flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is attainable, factors such as site soils, slope, and available area on site shall be considered. For drainage locations which serve 10 or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps (with comparable storage) must be used; or
- (i) at a minimum, equivalent controls in silt fences, vegetative buffer strips, sod, mulch, geo-textiles, stepped check dams, pipe slope drains or other sediment or erosion controls are required for all erodible areas, down slope boundaries of the construction area and side slope boundaries deemed appropriate as dictated by individual site conditions; or
 - (ii) it can be shown that site meteorological conditions do not warrant equivalent storage during the time period the 10-acres are destabilized (little or no chance of precipitation for the period of surface destabilization).
- B) Less Than 10 Acre BMP Requirement. For drainage locations serving less than 10 acres, sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for

3,600 cubic feet of storage per acre drained is provided.

- b. **Storm Water Management.** Description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA. This Permit only addresses the installation of storm water management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed and the site has undergone final stabilization. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site. However, post-construction storm water BMPs that discharge pollutants from point sources once construction is completed, may in themselves, need authorization under a separate UPDES permit and are likely regulated under local municipal requirements.
- 1) Such measures may include:
 - A) storm water detention structures (including wet ponds);
 - B) storm water retention structures;
 - C) flow-attenuation by use of open vegetated swales and natural depressions;
 - D) infiltration of runoff onsite; and
 - E) sequential systems (which combine several practices).
 - 2) The SWPPP shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.
 - 3) Storm water velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel for the purpose of providing a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected. The objective is to minimize significant changes in the hydrological regime of the receiving water.
- c. **Other Controls.**
- 1) **Waste Disposal.** No solid materials, including building materials, shall be discharged to waters of the State, except as authorized by a federal CWA Section 404 permits.
 - 2) **Off-site Tracking.** Off-site vehicle tracking of sediments and the generation of dust shall be minimized.
 - 3) **Septic, Waste, and Sanitary Sewer Disposal.** The SWPPP shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.
 - 4) **Exposure to Construction Materials.** The SWPPP shall include a narrative description of practices to reduce pollutants from construction related materials which are stored onsite including an inventory of construction materials (including waste materials), storage practices to minimize exposure of the materials to storm water, and spill prevention and

- response.
- 5) **Support Areas.** A description of pollutant sources from areas other than construction (including storm water discharges from dedicated portable asphalt plants and dedicated portable concrete plants), and a description of controls and measures that will be implemented at those sites.
- d. **Other Laws and Requirements.**
- 1) **Local Storm Water Control Requirements.** This Permit does not relieve the Permittee from compliance with other laws effecting erosion and sediment control or requirements for the permanent storm water system. Where applicable, compliance efforts to these requirements should be reflected in the SWPPP.
 - 2) **Threatened or Endangered Species & Historic Properties.** This Permit does not relieve the Permittee from compliance with Federal or State laws pertaining to threatened or endangered species or historic properties. Where applicable compliance efforts to these laws should be reflected in the SWPPP.
 - 3) **Variance of Permit Requirements.** Dischargers seeking alternative permit requirements shall submit an individual UPDES permit application in accordance with applicable law to the address indicated in Part 5.11 of this Permit, along with a description of why requirements in this Permit should not be applicable as a condition of a UPDES permit.
- 3.5.3. **Maintenance.** All vegetation, erosion and sediment control measures and other protective measures identified in the SWPPP shall be maintained in effective operating condition. A description of procedures to ensure the timely maintenance of these measures shall be identified in the SWPPP. Maintenance needs identified in inspections or by other means shall be accomplished before the next anticipated storm event, or as necessary to maintain the continued effectiveness of storm water controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable.
- 3.5.4. **Inspections.**
- a. Inspections must be conducted in accordance with one of the two schedules listed below. The Permittee shall specify in its SWPPP which schedule it will be following.
 - 1) At least once every 7 calendar days; or
 - 2) At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
 - b. Inspection frequency may be reduced to at least once every month if:
 - 1) The entire site is temporarily stabilized; or
 - 2) Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen).
 - c. The inspection requirement is waived until one month before thawing conditions are expected to result in a discharge if all of the following requirements are met:
 - 1) The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month);

- 2) Land disturbance activities have been suspended; and
 - 3) The beginning and ending dates of the waiver period are documented in the SWPPP.
- d. Inspections must be conducted by qualified personnel (provided by the operator or cooperatively by multiple operators). "Qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity.
- e. Inspections must include all areas of the site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors must look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Sedimentation and erosion control measures identified in the SWPPP must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.
- f. Inspections at construction sites involving utility line installation, pipeline construction, and other long, narrow, linear construction may be more limited if the areas described in Part 3.5.4(e) of this Permit are not reasonably accessible or could cause additional disturbance of soils and increase the potential for erosion. In these circumstances, controls must be inspected at the same frequency as other construction projects, but personnel may instead inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. In the absence of evidence to the contrary, the conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.
- g. For each inspection required above, the inspector must complete an inspection report. At a minimum, the inspection report must include:
- 1) The inspection date;
 - 2) Names, titles, and qualifications of personnel making the inspection;
 - 3) Weather information for the period since the last inspection (or since commencement of construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each storm event (in inches), and whether any discharges occurred;
 - 4) Weather information and a description of any discharges occurring at the time of the inspection;
 - 5) Location(s) of discharges of sediment or other pollutants from the site;

- 6) Location(s) of BMPs that need to be maintained;
 - 7) Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
 - 8) Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
 - 9) Corrective action required including any changes to the SWPPP necessary and implementation dates.
- h. A record of each inspection and of any actions taken in accordance with this Part 3 must be retained as part of the SWPPP for at least three years from the date that permit coverage expires or is terminated. The inspection reports must identify any incidents of non-compliance with the permit conditions. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the construction project or site is in compliance with the SWPPP and this permit. The report must be signed in accordance with Part 5.16 of this Permit.

3.5.5. Non-Storm Water Discharges. Except for flows from fire fighting activities, sources of non-storm water listed in Part 1.5 of this Permit that are combined with storm water discharges associated with industrial activity must be identified in the SWPPP. The SWPPP shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

PART 4 . TERMINATION/CHANGES IN OWNER/OPERATOR FOR SITE

- 4.1. **Termination of Coverage:** Permittees may or shall (as specified) terminate coverage under this Permit under the following conditions:
- 4.1.1. **Completion of construction activities and site stabilization:** Permittees shall terminate coverage under this Permit by submitting a Notice of Termination (“NOT”) within thirty days after completion of all construction activities, completion of final stabilization of all areas of the site as defined in Part 6.15. The NOT shall be submitted on the form specified by the Executive Secretary.
- 4.1.2. **Partial completion of construction activities and site stabilization:** A Permittee who, as specified in Part 3.4 of this Permit, is identified in the SWPPP as responsible for a specific area may terminate coverage under this Permit by submitting an NOT within thirty days after completion, for that area, of all construction activities, completion of final stabilization of all areas for which the Permittee was responsible and that were disturbed. The NOT shall be submitted on the form specified by the Executive Secretary, and the Permittee shall indicate on the form that it is a partial NOT.
- 4.1.3. **New responsible owner/operator:** A Permittee may terminate its coverage under this Permit by submitting an NOT if another party (or parties) assumes responsibility for all remaining SWPPP requirements. Termination of the Permittee’s responsibilities under the SWPPP will not be final until the other party (or parties) submits an NOI. If the new responsible owner/operator fails to submit an NOI, the Permittee may complete termination by demonstrating to the Executive Secretary that it has entered into contracts that obligate the new owner/operator to undertake all remaining responsibilities under the SWPPP.
- 4.2. **Conditions for Submitting an NOT:** A Permittee may not submit an NOT unless it meets the requirements specified in Part 4.1. Appropriate enforcement actions may be taken if an NOT is submitted without these requirements having been met, and the Permittee may also continue to be responsible for any Permit violations.
- 4.3. **Updating the SWPPP:** If an NOT is submitted under Part 4.1.2 or 4.1.3, the SWPPP shall be updated by the remaining Permittee(s) to meet the requirements of Part 3.4 of the Permit.

PART 5. STANDARD PERMIT CONDITIONS

5.1. Duty to Comply.

5.1.1. The Permittee must comply with all conditions of this Permit. Any Permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

5.1.2. Penalties for Violations of Permit Conditions.

a. Violations. The Act provides that any person who violates the Act, Utah wastewater rules, or conditions of a permit issued under the Act is subject to a fine of \$10,000 per day.

b. Willful or Gross Negligence. The Act provides that any person who discharges a pollutant to waters of the State as a result of criminal negligence or who intentionally discharges is criminally liable and is subject to imprisonment and a fine of up to \$50,000 per day. Utah Code Ann. § 19-5-115.

c. False Statements. The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act, the rules, or this Permit, or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for 6 months, or by both. Utah Code Ann. § 19-5-115(4).

5.2. Duty to Reapply. If a Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, it must apply for and obtain a new permit except as provided in Part 2.4 of this Permit.

5.3. Need to halt or reduce activity not a defense. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

5.4. Duty to Mitigate. The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit which has a reasonable likelihood of adversely affecting human health or the environment.

5.5. Duty to Provide Information. The Permittee shall furnish to the Executive Secretary or an authorized representative, within a reasonable time, any information which is requested to determine compliance with this Permit. The Permittee must also furnish to the Executive Secretary or an authorized representative copies of records to be kept by this Permit.

5.6. Other Information. When the Permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Executive Secretary, he or she shall promptly submit such facts or information.

- 5.7. Oil and Hazardous Substance Liability. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under the "Act".
- 5.8. Property Rights. The issuance of this Permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- 5.9. Severability. The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit shall not be affected thereby.
- 5.10. Record Retention.
- 5.10.1. The Permittee shall retain copies of SWPPPs and all reports required by this Permit, and records of all data used to complete the Notice of Intent to be covered by this Permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Executive Secretary at any time.
- 5.10.2. After final stabilization of the construction site is complete, the SWPPP is no longer required to be maintained on site, but may be maintained by the Permittee(s) at its primary headquarters. Access to the SWPPP will continue as described in Part 3.2, however.
- 5.11. Addresses. All written correspondence under this permit shall be directed to the Division of Water Quality at the following address:
- Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870
- 5.12. State Laws.
- 5.12.1. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Utah Code Ann. § 19-5-117.
- 5.12.2. No condition of this Permit shall release the Permittee from any responsibility or requirements under other environmental statutes or regulations.
- 5.13. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions

of this Permit and with the requirements of SWPPPs. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a Permittee only when necessary to achieve compliance with the conditions of the Permit.

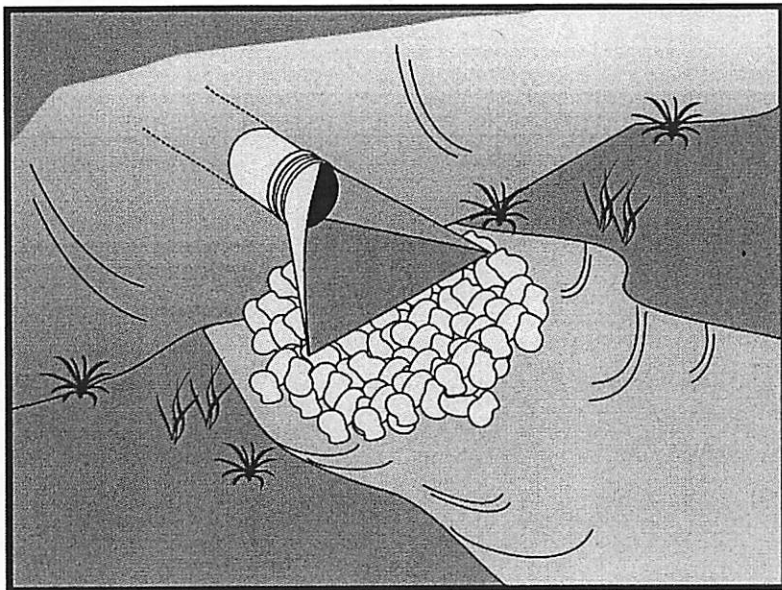
- 5.14. Inspection and Entry. The Permittee shall allow, upon presentation of credentials, the Executive Secretary or an authorized representative:
- 5.14.1. To enter upon the Permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this Permit;
 - 5.14.2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this Permit;
 - 5.14.3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
 - 5.14.4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by law, any substances or parameters at any location.
- 5.15. Reopener Clause.
- 5.15.1. Reopener Due to Water Quality Impacts. If there is evidence indicating that the storm water discharges authorized by this Permit cause, have the reasonable potential to cause or contribute to, a violation of a water quality standard, the discharger may be required to obtain an individual permit or an alternative general permit in accordance with Part 2.3 of this Permit or the Permit may be modified to include different limitations and/or requirements.
 - 5.15.2. Reopener Guidelines. Permit modification or revocation will be conducted according to UAC R317-8-5.6 and UAC R317-8-6.2.
 - 5.15.3. Permit Actions. This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Permit condition.
- 5.16. Signatory Requirements.
- 5.16.1. All Notices of Intent, SWPPPs, reports, certifications or information submitted to the Executive Secretary, or that this Permit requires be maintained by the Permittee, shall be signed as follows:
 - a. All Notices of Intent shall be signed as follows:
 - 1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25,000,000 (in second-quarter 1980 dollars) if authority to sign

- 6.12. "EPA" means the United States Environmental Protection Agency.
- 6.13. "Eligible" means qualified for authorization to discharge storm water under this general permit.
- 6.14. "Executive Secretary" means Executive Secretary of the Utah Water Quality Board.
- 6.15. "Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geo-textiles) have been employed. In some parts of the country, background native vegetation will cover less than 100% of the ground (e.g. arid areas). Establishing at least 70% of the natural cover of native vegetation meets the vegetative cover criteria for final stabilization. For example, if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization. For individual lots in residential construction, final stabilization means that either the homebuilder has completed final stabilization as specified above, or the homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and has obligated the homeowner, by contract, to complete the requirements for final stabilization within two years.
- 6.16. "Indian Country" is defined as in 40 CFR §122.2 to mean:
1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
 2. All dependent Indian communities within the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
 3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.
- 6.17. "Municipal Separate Storm Sewer System" refers to all separate storm sewers that are owned or operated by the United States, a State, city, town, county, district, association, or other public body having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer districts, flood control districts or drainage districts, or similar entity that discharges to waters of the State.
- 6.18. "NOI" means notice of intent to be covered by this Permit.
- 6.19. "NOT" means notice of termination.
- 6.20. "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system,

vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

- 6.21. "Runoff coefficient" means the fraction of total rainfall that will appear at conveyance as runoff.
- 6.22. "Site" means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.
- 6.23. "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.
- 6.24. "Storm water discharge associated with industrial activity" is defined in the Utah Administrative Code (UAC) R317-8-3.9(6)(c) & (d) and incorporated here by reference. Most relevant to this Permit is UAC R317-8-3.9(6)(d)10, which relates to construction activity including clearing, grading and excavation activities.
- 6.25. SWPPP means Storm Water Pollution Prevention Plan, referring to the plan required in Part 3 of this Permit.
- 6.26. "Total Maximum Daily Load" or "TMDL" means the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.
- 6.27. Waters of the State means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion thereof, except that bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, shall not be considered to be waters of the state (UAC R317-1-1.31).

APPENDIX C
STANDARDS AND SPECIFICATIONS
FOR SELECTED BMPs



Description and Purpose

Outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble, which is placed at the outlet of a pipe or channel to prevent scour of the soil caused by concentrated, high velocity flows.

Suitable Applications

Whenever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This includes temporary diversion structures to divert runoff during construction.

- These devices may be used at the following locations:
 - Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits, or channels.
 - Outlets located at the bottom of mild to steep slopes.
 - Discharge outlets that carry continuous flows of water.
 - Outlets subject to short, intense flows of water, such as flash floods.
 - Points where lined conveyances discharge to unlined conveyances

Limitations

- Large storms or high flows can wash away the rock outlet protection and leave the area susceptible to erosion.

Objectives

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

Legend:

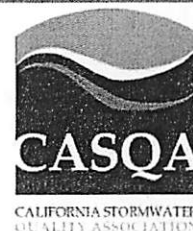
- Primary Objective
- Secondary Objective

Targeted Constituents

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

Potential Alternatives

None



- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.
- Grouted riprap may break up in areas of freeze and thaw.
- If there is not adequate drainage, and water builds up behind grouted riprap, it may cause the grouted riprap to break up due to the resulting hydrostatic pressure.

Implementation

General

Outlet protection is needed where discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the immediate downstream reach. This practice protects the outlet from developing small eroded pools (plunge pools), and protects against gully erosion resulting from scouring at a culvert mouth.

Design and Layout

As with most channel design projects, depth of flow, roughness, gradient, side slopes, discharge rate, and velocity should be considered in the outlet design. Compliance to local and state regulations should also be considered while working in environmentally sensitive streambeds. General recommendations for rock size and length of outlet protection mat are shown in the rock outlet protection figure in this BMP and should be considered minimums. The apron length and rock size gradation are determined using a combination of the discharge pipe diameter and estimate discharge rate: Select the longest apron length and largest rock size suggested by the pipe size and discharge rate. Where flows are conveyed in open channels such as ditches and swales, use the estimated discharge rate for selecting the apron length and rock size. Flows should be same as the culvert or channel design flow but never the less than the peak 5 year flow for temporary structures planned for one rainy season, or the 10 year peak flow for temporary structures planned for two or three rainy seasons.

- There are many types of energy dissipaters, with rock being the one that is represented in the attached figure.
- Best results are obtained when sound, durable, and angular rock is used.
- Install riprap, grouted riprap, or concrete apron at selected outlet. Riprap aprons are best suited for temporary use during construction. Grouted or wired tied rock riprap can minimize maintenance requirements.
- Rock outlet protection is usually less expensive and easier to install than concrete aprons or energy dissipaters. It also serves to trap sediment and reduce flow velocities.
- Carefully place riprap to avoid damaging the filter fabric.
 - Stone 4 in. to 6 in. may be carefully dumped onto filter fabric from a height not to exceed 12 in.
 - Stone 8 in. to 12 in. must be hand placed onto filter fabric, or the filter fabric may be covered with 4 in. of gravel and the 8 in. to 12 in. rock may be dumped from a height not to exceed 16 in.

- Stone greater than 12 in. shall only be dumped onto filter fabric protected with a layer of gravel with a thickness equal to one half the D_{50} rock size, and the dump height limited to twice the depth of the gravel protection layer thickness.
- For proper operation of apron: Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in upper section of apron.
- Outlets on slopes steeper than 10 percent should have additional protection.

Costs

Costs are low if material is readily available. If material is imported, costs will be higher. Average installed cost is \$150 per device.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Inspect BMPs subjected to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspect apron for displacement of the riprap and damage to the underlying fabric. Repair fabric and replace riprap that has washed away. If riprap continues to wash away, consider using larger material.
- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes or underlying filter fabric immediately.
- Temporary devices should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

References

County of Sacramento Improvement Standards, Sacramento County, May 1989.

Erosion and Sediment Control Handbook, S.J. Goldman, K. Jackson, T.A. Bursztynsky, P.E., McGraw Hill Book Company, 1986.

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

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

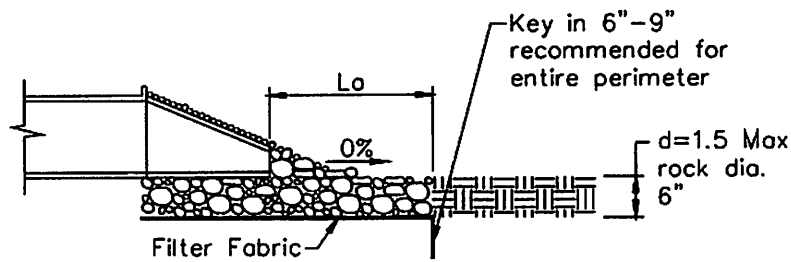
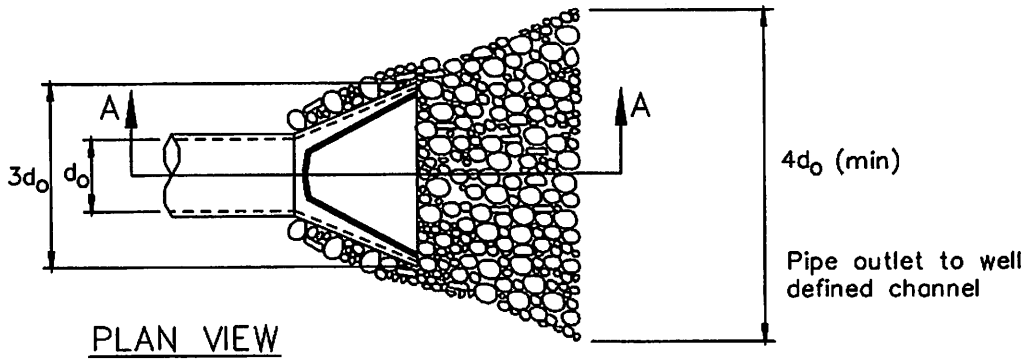
Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, state of California Department of Transportation (Caltrans), November 2000.

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.

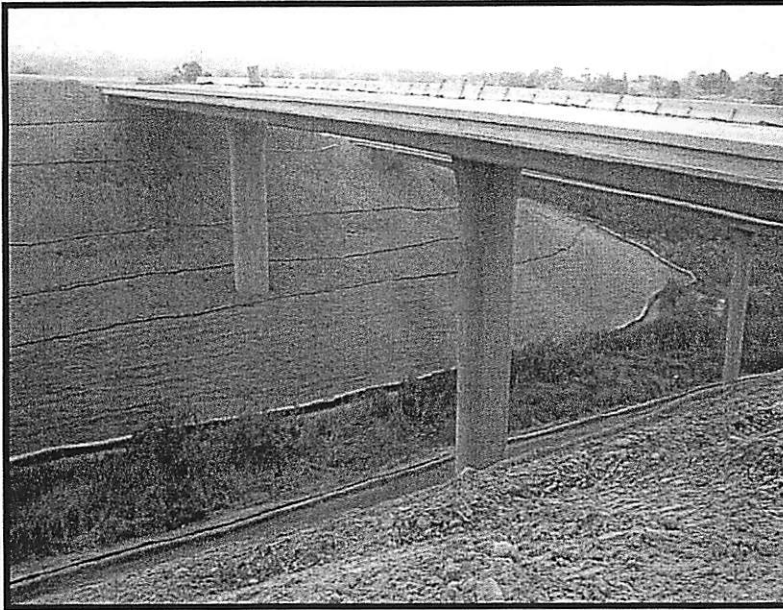
EC-10

Velocity Dissipation Devices



| Pipe Diameter inches | Discharge ft ³ /s | Apron Length, L _a ft | Rip Rap D ₅₀ Diameter Min inches |
|-------------------------|---------------------------------|------------------------------------|---|
| 12 | 5 | 10 | 4 |
| | 10 | 13 | 6 |
| 18 | 10 | 10 | 6 |
| | 20 | 16 | 8 |
| | 30 | 23 | 12 |
| | 40 | 26 | 16 |
| 24 | 30 | 16 | 8 |
| | 40 | 26 | 8 |
| | 50 | 26 | 12 |
| | 60 | 30 | 16 |

For larger or higher flows consult a Registered Civil Engineer
 Source: USDA - SCS



Description and Purpose

Stream channels, streambanks, and associated riparian areas are dynamic and sensitive ecosystems that respond to changes in land use activity. Streambank and channel disturbance resulting from construction activities can increase the stream's sediment load, which can cause channel erosion or sedimentation and have adverse effects on the biotic system. BMPs can reduce the discharge of sediment and other pollutants to minimize the impact of construction activities on watercourses. Streams on the 303(d) list and listed for sediment may require numerous measures to prevent any increases in sediment load to the stream.

Suitable Applications

These procedures typically apply to all construction projects that disturb or occur within stream channels and their associated riparian areas.

Limitations

Specific permit requirements or mitigation measures such as Regional Water Quality Control Board (RWQCB) 401 Certification, U.S. Army Corps of Engineers 404 permit and approval by California Department of Fish and Game supercede the guidance in this BMP.

- If numerical based water quality standards are mentioned in any of these and other related permits, testing and sampling may be required. Streams listed as 303(d) impaired for sediment, silt, or turbidity, are required to conduct sampling

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | <input checked="" type="checkbox"/> |
| SE | Sediment Control | <input checked="" type="checkbox"/> |
| TR | 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

Combination of erosion and sediment controls.



to verify that there is no net increase in sediment load due to construction activities.

Implementation***Planning***

- Proper planning, design, and construction techniques can minimize impacts normally associated with in stream construction activities. Poor planning can adversely affect soil, fish, wildlife resources, land uses, or land users. Planning should take into account: scheduling; avoidance of in-stream construction; minimizing disturbance area and construction time period; using pre-disturbed areas; selecting crossing location; and selecting equipment.

Scheduling

- Construction activities should be scheduled according to the relative sensitivity of the environmental concerns and in accordance with EC-1, Scheduling. Scheduling considerations will be different when working near perennial streams vs. ephemeral streams and are as follows.
- When in-stream construction is conducted in a perennial stream, work should optimally be performed during the rainy season. This is because in the summer, any sediment-containing water that is discharged into the watercourse will cause a large change in both water clarity and water chemistry. During the rainy season, there is typically more and faster flowing water in the stream so discharges are diluted faster. However, should in-stream work be scheduled for summer, establishing an isolation area, or diverting the stream, will significantly decrease the amount of sediment stirred up by construction work. Construction work near perennial streams should optimally be performed during the dry season (see below).
- When working in or near ephemeral streams, work should be performed during the dry season. By their very nature, ephemeral streams are usually dry in the summer, and therefore, in-stream construction activities will not cause significant water quality problems. However, when tying up the site at the end of the project, wash any fines (see Washing Fines) that accumulated in the channel back into the bed material, to decrease pollution from the first rainstorm of the season.
- When working near ephemeral or perennial streams, erosion and sediment controls (see silt fences, straw bale barriers, etc.) should be implemented to keep sediment out of stream channel.

Minimize Disturbance

- Minimize disturbance through: selection of the narrowest crossing location; limiting the number of equipment trips across a stream during construction; and, minimizing the number and size of work areas (equipment staging areas and spoil storage areas). Place work areas at least 50 ft from stream channel. Field reconnaissance should be conducted during the planning stage to identify work areas.

Use of Pre-Disturbed Areas

- Locate project sites and work areas in areas disturbed by prior construction or other activity when possible.

Selection of Project Site

- Avoid steep and unstable banks, highly erodible or saturated soils, or highly fractured rock.
- Select project site that minimizes disturbance to aquatic species or habitat.

Equipment Selection

- Select equipment that reduces the amount of pressure exerted on the ground surface, and therefore, reduces erosion potential and/or use overhead or aerial access for transporting equipment across drainage channels. Use equipment that exerts ground pressures of less than 5 or 6 lb/in², where possible. Low ground pressure equipment includes: wide or high flotation tires (34 to 72 in. wide); dual tires; bogie axle systems; tracked machines; lightweight equipment; and, central tire inflation systems.

Streambank Stabilization

Preservation of Existing Vegetation

- Preserve existing vegetation in accordance with EC-2, Preservation of Existing Vegetation. In a streambank environment, preservation of existing vegetation provides the following benefits.

Water Quality Protection

- Vegetated buffers on slopes trap sediment and promote groundwater recharge. The buffer width needed to maintain water quality ranges from 15 to 100 ft. On gradual slopes, most of the filtering occurs within the first 30 ft. Steeper slopes require a greater width of vegetative buffer to provide water quality benefits.

Streambank Stabilization

- The root system of riparian vegetation stabilizes streambanks by increasing tensile strength in the soil. The presence of vegetation modifies the moisture condition of slopes (infiltration, evapo transpiration, interception) and increases bank stability.

Riparian Habitat

- Buffers of diverse riparian vegetation provide food and shelter for riparian and aquatic organisms. Minimizing impacts to fisheries habitat is a major concern when working near streams and rivers. Riparian vegetation provides shade, shelter, organic matter (leaf detritus and large woody debris), and other nutrients that are necessary for fish and other aquatic organisms. Buffer widths for habitat concerns are typically wider than those recommended for water quality concerns (100 to 1500 ft).
- When working near watercourses, it is important to understand the work site's placement in the watershed. Riparian vegetation in headwater streams has a greater impact on overall water quality than vegetation in downstream reaches. Preserving existing vegetation upstream is necessary to maintain water quality, minimize bank failure, and maximize riparian habitat, downstream of the work site.

Limitations

- Local county and municipal ordinances regarding width, extent and type of vegetative buffer required may exceed the specifications provided here; these ordinances should be investigated prior to construction.

Streambank Stabilization Specific Installation

- As a general rule, the width of a buffer strip between a road and the stream is recommended to be 50 ft plus four times the percent slope of the land, measured between the road and the top of stream bank.

Hydraulic Mulch

- Apply hydraulic mulch on disturbed streambanks above mean high water level in accordance with EC-3, Hydraulic Mulch to provide temporary soil stabilization.

Limitations

- Do not place hydraulic mulch or tackifiers below the mean high water level, as these materials could wash into the channel and impact water quality or possibly cause eutrophication (eutrophication is an algal bloom caused by excessively high nutrient levels in the water).

Hydroseeding

- Hydroseed disturbed streambanks in accordance with EC-4, Hydroseeding.

Limitations

- Do not place tackifiers or fertilizers below the mean high water level, as these materials could wash into the channel and impact water quality or possibly cause eutrophication.

Soil Binders

- Apply soil binders to disturbed streambanks in accordance with EC-5, Soil Binders.

Limitations

- Do not place soil binders below the mean high water level. Soil binder must be environmentally benign and non-toxic to aquatic organisms.

Straw Mulch

- Apply straw mulch to disturbed streambanks in accordance with EC-6, Straw Mulch.

Limitations

- Do not place straw mulch below the mean high water level, as this material could wash into the channel and impact water quality or possibly cause eutrophication.

Geotextiles and Mats

- Install geotextiles and mats as described in EC-7, Geotextiles and Mats, to stabilize disturbed channels and streambanks. Not all applications should be in the channel, for example, certain geotextile netting may snag fish gills and are not appropriate in fish bearing streams. Geotextile fabrics that are not biodegradable are not appropriate for in stream use. Additionally, geotextile fabric or blankets placed in channels must be adequate to sustain anticipated hydraulic forces.

Earth Dikes, Drainage Swales, and Lined Ditches

- Convey, intercept, or divert runoff from disturbed streambanks using EC-9, Earth Dikes and Drainage Swales.

Limitations

- Do not place earth dikes in watercourses, as these structures are only suited for intercepting sheet flow, and should not be used to intercept concentrated flow.
- Appropriately sized velocity dissipation devices (EC-10) must be placed at outlets to minimize erosion and scour.

Velocity Dissipation Devices

- Place velocity dissipation devices at outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits or channels in accordance with EC-10, Velocity Dissipation Devices.

Slope Drains

- Use slope drains to intercept and direct surface runoff or groundwater into a stabilized watercourse, trapping device or stabilized area in accordance with EC-11, Slope Drains.

Limitations

- Appropriately sized outlet protection and velocity dissipation devices (EC-10) must be placed at outlets to minimize erosion and scour.

Streambank Sediment Control

Silt Fences

- Install silt fences in accordance with SE-1, Silt Fence, to control sediment. Silt fences should only be installed where sediment laden water can pond, thus allowing the sediment to settle out.

Fiber Rolls

- Install fiber rolls in accordance with SE-5, Fiber Rolls, along contour of slopes above the high water level to intercept runoff, reduce flow velocity, release the runoff as sheet flow and provide removal of sediment from the runoff. In a stream environment, fiber rolls should be used in conjunction with other sediment control methods such as SE-1, Silt Fence or SE-9 Straw Bale Barrier. Install silt fence, straw bale barrier, or other erosion control method along toe of slope above the high water level.

Gravel Bag Berm

- A gravel bag berm or barrier can be utilized to intercept and slow the flow of sediment laden sheet flow runoff in accordance with SE-6, Gravel Bag Berm. In a stream environment gravel bag barriers can allow sediment to settle from runoff before water leaves the construction site and can be used to isolate the work area from the live stream.

Limitations

- Gravel bag barriers are not recommended as a perimeter sediment control practice around streams.

Straw Bale Barrier

- Install straw bale barriers in accordance with SE-9, Straw Bale Barrier, to control sediment. Straw bale barriers should only be installed where sediment laden water can pond, thus allowing the sediment to settle out. Install a silt fence in accordance with SE-1, Silt Fence,

on down slope side of straw bale barrier closest to stream channel to provide added sediment control.

Rock Filter*Description and Purpose*

Rock filters are temporary erosion control barriers composed of rock that is anchored in place. Rock filters detain the sediment laden runoff, retain the sediment, and release the water as sheet flow at a reduced velocity. Typical rock filter installations are illustrated at the end of this BMP.

Applications

- Near the toe of slopes that may be subject to flow and rill erosion.

Limitations

- Inappropriate for contributing drainage areas greater than 5 acres.
- Requires sufficient space for ponded water.
- Ineffective for diverting runoff because filters allow water to slowly seep through.
- Rock filter berms are difficult to remove when construction is complete.
- Unsuitable in developed areas or locations where aesthetics is a concern.

Specifications

- Rock: open graded rock, 0.75 to 5 in. for concentrated flow applications.
- Woven wire sheathing: 1 in. diameter, hexagonal mesh, galvanized 20gauge (used with rock filters in areas of concentrated flow).
- In construction traffic areas, maximum rock berm heights should be 12 in. Berms should be constructed every 300 ft on slopes less than 5%, every 200 ft on slopes between 5% and 10%, and every 100 ft on slopes greater than 10%.

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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Reshape berms as needed and replace lost or dislodged rock, and filter fabric.
- 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 barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.

K-rail

Description and Purpose

This is temporary sediment control that uses K-rails to form the sediment deposition area, or to isolate the near bank construction area. Install K-rails at toe of slope in accordance with procedures described in NS-5, Clear Water Diversion.

Barriers are placed end to end in a pre-designed configuration and gravel filled bags are used at the toe of the barrier and at their abutting ends to seal and prevent movement of sediment beneath or through the barrier walls.

Appropriate Applications

- This technique is useful at the toe of embankments, cuts or fills slopes.

Limitations

- The K-rail method should not be used to dewater a project site, as the barrier is not watertight.

Implementation

- Refer to NS-5, Clear Water Diversion, for implementation requirements.

Instream Construction Sediment Control

There are three different options currently available for reducing turbidity while working in a stream or river. The stream can be isolated from the area in which work is occurring by means of a water barrier, the stream can be diverted around the work site through a pipe or temporary channel, or one can employ construction practices that minimize sediment suspension.

Whatever technique is implemented, an important thing to remember is that dilution can sometimes be the solution. A probable “worst time” to release high TSS into a stream system might be when the stream is very low; summer low flow, for example. During these times, the flow may be low while the biological activity in the stream is very high. Conversely, the addition of high TSS or sediment during a big storm discharge might have a relatively low impact, because the stream is already turbid, and the stream energy is capable of transporting both suspended solids, and large quantities of bedload through the system. The optimum time to “pull” in-stream structures may be during the rising limb of a storm hydrograph.

Techniques to minimize Total Suspended Solids (TSS)

- **Padding** - Padding laid in the stream below the work site may trap some solids that are deposited in the stream during construction. After work is done, the padding is removed from the stream, and placed on the bank to assist in re-vegetation.
- **Clean, washed gravel** - Using clean, washed gravel decreases solid suspension, as there are fewer small particles deposited in the stream.
- **Excavation using a large bucket** - Each time a bucket of soil is placed in the stream, a portion is suspended. Approximately the same amount is suspended whether a small amount of soil is placed in the stream, or a large amount. Therefore, using a large excavator bucket instead of a small one, will reduce the total amount of soil that washes downstream.

- **Use of dozer for backfilling** - Using a dozer for backfilling instead of a backhoe follows the same principles – the fewer times soil is deposited in the stream, the less soil will be suspended.
- **Partial dewatering with a pump** - Partially dewatering a stream with a pump reduces the amount of water, and thus the amount of water that can suspend sediment.

Washing Fines

Definition and Purpose

- Washing fines is an “in-channel” sediment control method, which uses water, either from a water truck or hydrant, to wash stream fines that were brought to the surface of the channel bed during restoration, back into the interstitial spaces of the gravel and cobbles.
- The purpose of this technique is to reduce or eliminate the discharge of sediment from the channel bottom during the first seasonal flow. Sediment should not be allowed into stream channels; however, occasionally in-channel restoration work will involve moving or otherwise disturbing fines (sand and silt sized particles) that are already in the stream, usually below bankfull discharge elevation. Subsequent re-watering of the channel can result in a plume of turbidity and sedimentation.
- This technique washes the fines back into the channel bed. Bedload materials, including gravel cobbles, boulders and those fines, are naturally mobilized during higher storm flows. This technique is intended to delay the discharge until the fines would naturally be mobilized.

Appropriate Applications

- This technique should be used when construction work is required in channels. It is especially useful in intermittent or ephemeral streams in which work is performed “in the dry”, and which subsequently become re-watered.

Limitations

- The stream must have sufficient gravel and cobble substrate composition.
- The use of this technique requires consideration of time of year and timing of expected stream flows.
- The optimum time for the use of this technique is in the fall, prior to winter flows.
- Consultation with, and approval from the Department of Fish and Game and the Regional Water Quality Control Board may be required.

Implementation

- Apply sufficient water to wash fines, but not cause further erosion or runoff.
- Apply water slowly and evenly to prevent runoff and erosion.
- Consult with Department of Fish and Game and the Regional Water Quality Control Board for specific water quality requirements of applied water (e.g. chlorine).

Inspection and Maintenance

- None necessary

Costs

Cost may vary according to the combination of practices implemented.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspect and repair equipment (for damaged hoses, fittings, and gaskets).

References

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

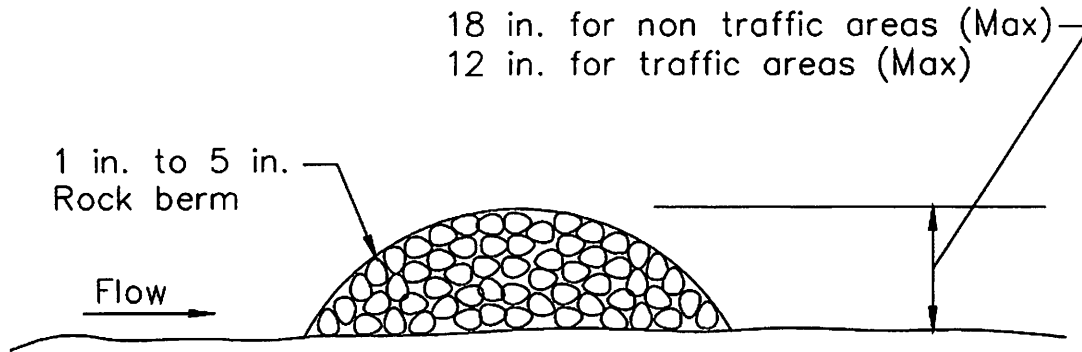
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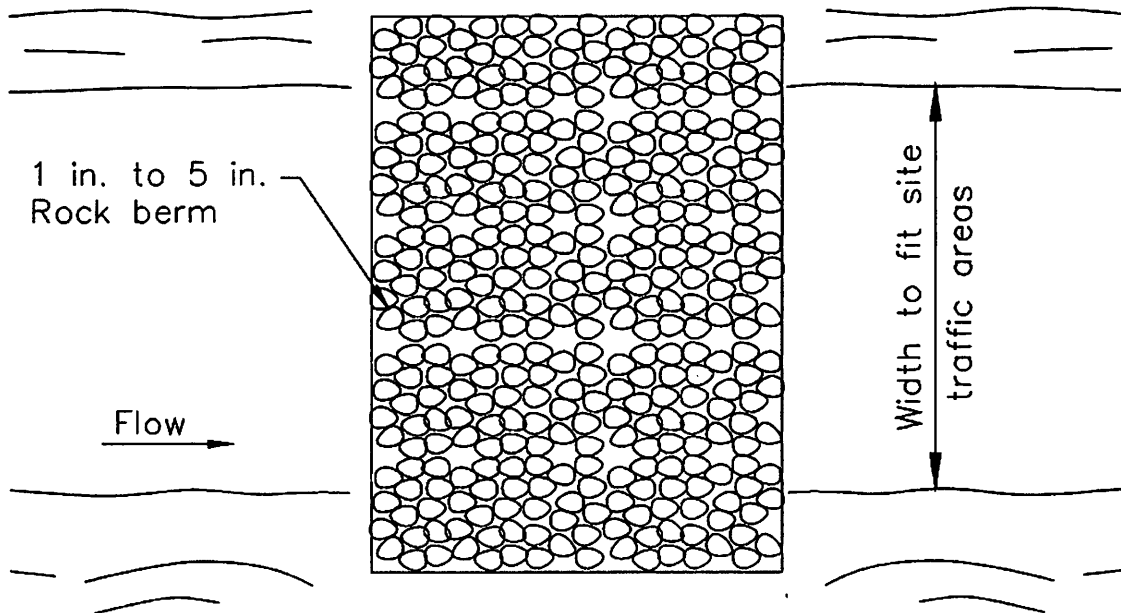
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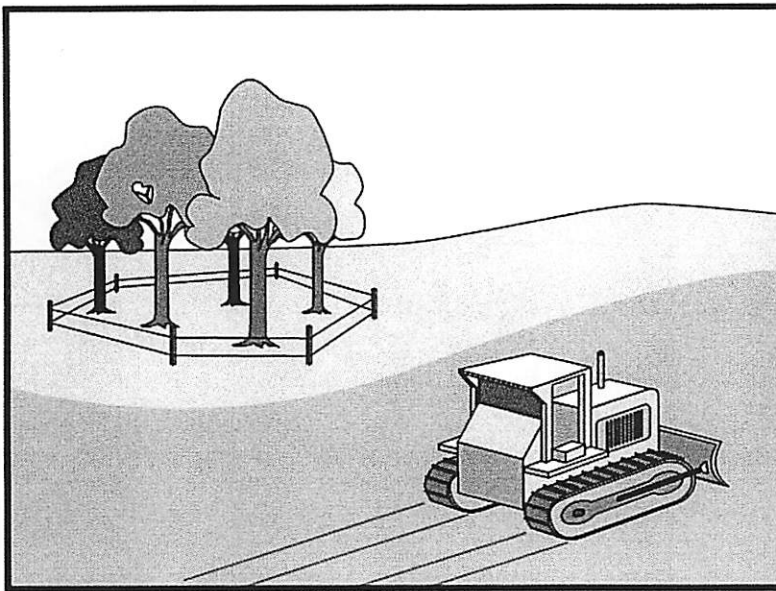
SECTION



PLAN

TYPICAL ROCK FILTER
NOT TO SCALE

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.

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | <input checked="" type="checkbox"/> |
| SE | Sediment Control | |
| TR | 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



EC-2 Preservation Of Existing Vegetation

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

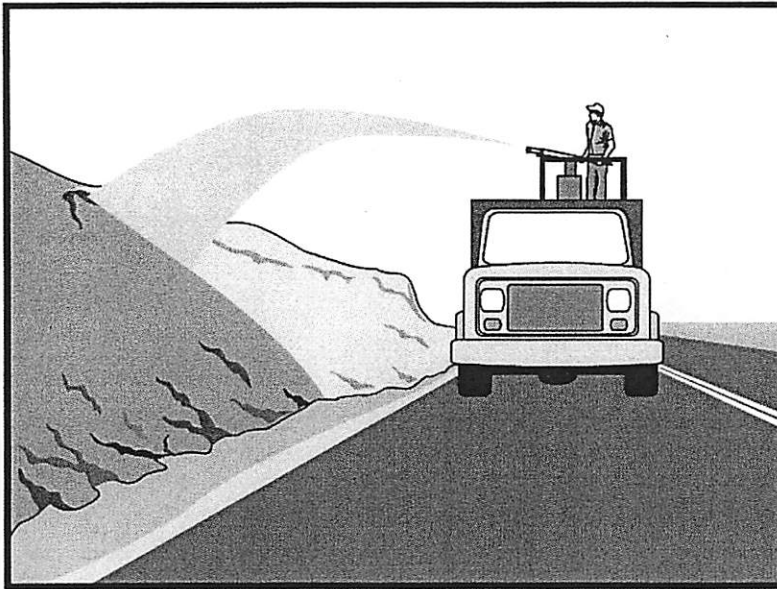
Costs

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 trees 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
 - Fertilize stressed or damaged broadleaf trees to aid recovery.
 - Fertilize trees in the late fall or early spring.



Description and Purpose

Hydraulic mulch consists of applying a mixture of shredded wood fiber or a hydraulic matrix, and a stabilizing emulsion or tackifier with hydro-mulching equipment, which temporarily protects exposed soil from erosion by raindrop impact or wind.

Suitable Applications

Hydraulic mulch is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established, and disturbed areas that will be re-disturbed following an extended period of inactivity.

Limitations

Wood fiber hydraulic mulches are generally short lived and need 24 hours to dry before rainfall occurs to be effective. May require a second application in order to remain effective for an entire rainy season.

Implementation

- Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
- To be effective, hydraulic matrices require 24 hours to dry before rainfall occurs.
- Avoid mulch over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | <input checked="" type="checkbox"/> |
| SE | Sediment Control | |
| TR | 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-4 Hydroseeding
- EC-5 Soil Binders
- EC-6 Straw Mulch
- EC-7 Geotextiles and Mats
- EC-8 Wood Mulching



- Paper based hydraulic mulches alone shall not be used for erosion control.

Hydraulic Mulches

Wood fiber mulch can be applied alone or as a component of hydraulic matrices. Wood fiber applied alone is typically applied at the rate of 2,000 to 4,000 lb/acre. Wood fiber mulch is manufactured from wood or wood waste from lumber mills or from urban sources.

Hydraulic Matrices

Hydraulic matrices include a mixture of wood fiber and acrylic polymer or other tackifier as binder. Apply as a liquid slurry using a hydraulic application machine (i.e., hydro seeder) at the following minimum rates, or as specified by the manufacturer to achieve complete coverage of the target area: 2,000 to 4,000 lb/acre wood fiber mulch, and 5 to 10% (by weight) of tackifier (acrylic copolymer, guar, psyllium, etc.)

Bonded Fiber Matrix

Bonded fiber matrix (BFM) is a hydraulically applied system of fibers and adhesives that upon drying forms an erosion resistant blanket that promotes vegetation, and prevents soil erosion. BFMs are typically applied at rates from 3,000 lb/acre to 4,000 lb/acre based on the manufacturer's recommendation. A biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFMs should not be applied immediately before, during or immediately after rainfall if the soil is saturated. Depending on the product, BFMs typically require 12 to 24 hours to dry and become effective.

Costs

Average cost for installation of wood fiber mulch is \$900/acre. Average cost for installation of BFM is \$5,500/acre.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Areas where erosion is evident shall 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.
- Maintain an unbroken, temporary mulched ground cover throughout the period of construction when the soils are not being reworked.

References

Controlling Erosion of Construction Sites Agricultural Information #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.

Sedimentation and Erosion Control, An Inventory of Current Practices Draft, US EPA, April 1990.

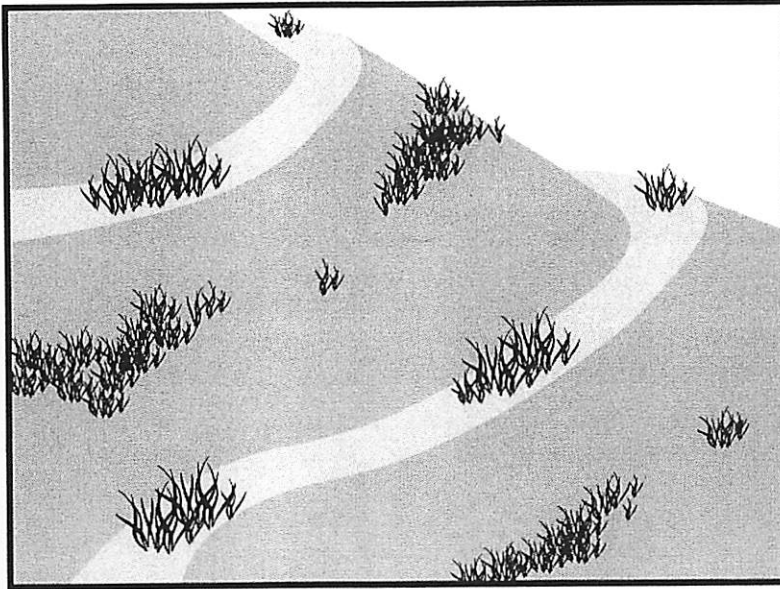
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Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transportation (Caltrans), November 1999

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 wood fiber, seed, fertilizer, and stabilizing emulsion with hydro-mulch equipment, to temporarily protect exposed soils from erosion by water and wind.

Suitable Applications

Hydroseeding is suitable for soil disturbed areas requiring temporary protection until permanent stabilization is established, and disturbed areas that will be re-disturbed following an extended period of inactivity.

Limitations

- Hydroseeding may be used alone only when there is sufficient time in the season to ensure adequate vegetation establishment and coverage to provide adequate erosion control. Otherwise, hydroseeding must be used in conjunction with mulching (i.e., straw mulch).
- Steep slopes are difficult to protect with temporary seeding.
- Temporary seeding may not be appropriate in dry periods without supplemental irrigation.
- Temporary vegetation may have to be removed before permanent vegetation is applied.
- Temporary vegetation is not appropriate for short term inactivity.

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | <input checked="" type="checkbox"/> |
| SE | Sediment Control | |
| TR | 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-5 Soil Binders
- EC-6 Straw Mulch
- EC-7 Geotextiles and Mats
- EC-8 Wood Mulching



Implementation

In order to select appropriate hydroseeding mixtures, an evaluation of site conditions shall be performed with respect to:

- Soil conditions
- Site topography
- Season and climate
- Vegetation types
- Maintenance requirements
- Sensitive adjacent areas
- Water availability
- Plans for permanent vegetation

The local office of the U.S.D.A. Natural Resources Conservation Service (NRCS) is an excellent source of information on appropriate seed mixes.

The following steps shall be followed for implementation:

- Avoid use of hydroseeding in areas where the BMP would be incompatible with future earthwork activities and would have to be removed.
- Hydroseeding can be accomplished using a multiple step or one step process. The multiple step process ensures maximum direct contact of the seeds to soil. When the one step process is used to apply the mixture of fiber, seed, etc., the seed rate shall be increased to compensate for all seeds not having direct contact with the soil.
- Prior to application, roughen the area to be seeded with the furrows trending along the contours.
- Apply a straw mulch to keep seeds in place and to moderate soil moisture and temperature until the seeds germinate and grow.
- All seeds shall be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. The container shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained. All legume seed shall be pellet inoculated. Inoculant sources shall be species specific and shall be applied at a rate of 2 lb of inoculant per 100 lb seed.
- Commercial fertilizer shall conform to the requirements of the California Food and Agricultural Code. Fertilizer shall be pelleted or granular form.
- Follow up applications shall be made as needed to cover weak spots and to maintain adequate soil protection.
- Avoid over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

Costs

Average cost for installation and maintenance may vary from as low as \$300 per acre for flat slopes and stable soils, to \$1600 per acre for moderate to steep slopes and/or erosive soils.

| Hydroseeding | | Installed Cost per Acre |
|---------------|---------------|-------------------------|
| High Density | Ornamentals | \$400 - \$1600 |
| | Turf Species | \$350 |
| | Bunch Grasses | \$300 - \$1300 |
| Fast Growing | Annual | \$350 - \$650 |
| | Perennial | \$300 - \$800 |
| Non-Competing | Native | \$300 - \$1600 |
| | Non-Native | \$400 - \$500 |
| Sterile | Cereal Grain | \$500 |

Source: Caltrans Guidance for Soil Stabilization for Temporary Slopes, Nov. 1999

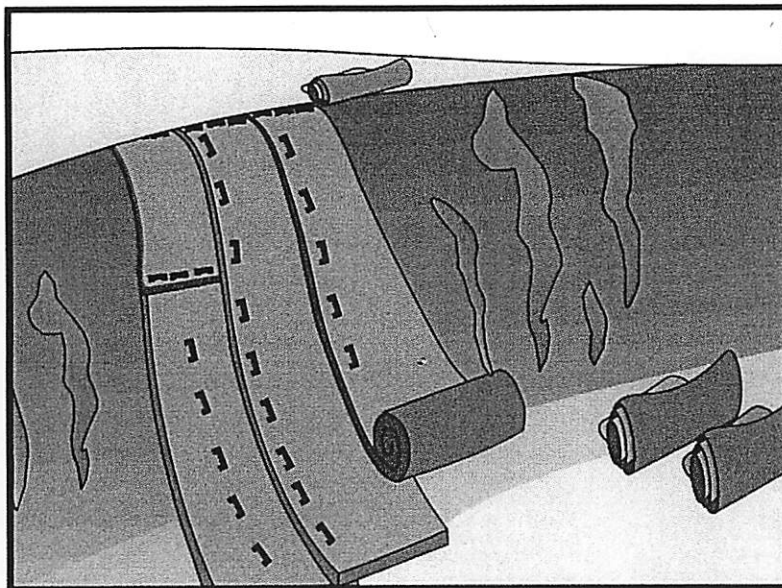
Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Areas where erosion is evident shall 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 shall be inspected for complete coverage and adjusted as needed to maintain complete coverage.

References

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

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



Description and Purpose

Mattings of natural materials are used to cover the soil surface to reduce erosion from rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface. Additionally, matting may be used to stabilize soils until vegetation is established.

Suitable Applications

Mattings are commonly applied on short, steep slopes where erosion hazard is high and vegetation will be slow to establish. Mattings are also used on stream banks where moving water at velocities between 3 ft/s and 6 ft/s are likely to wash out new vegetation, and in areas where the soil surface is disturbed and where existing vegetation has been removed. Matting may also be used when seeding cannot occur (e.g., late season construction and/or the arrival of an early rain season). Erosion control matting should be considered when the soils are fine grained and potentially erosive. These measures should be considered in the following situations.

- Steep slopes, generally steeper than 3:1 (H:V)
- Slopes where the erosion potential is high
- Slopes and disturbed soils where mulch must be anchored
- Disturbed areas where plants are slow to develop
- Channels with flows exceeding 3.3 ft/s

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | <input checked="" type="checkbox"/> |
| SE | Sediment Control | |
| TR | Tracking Control | |
| WE | Wind Erosion Control | 3 |
| NS | Non-Stormwater Management Control | |
| WM | Waste Management and Materials Pollution Control | |

Legend:

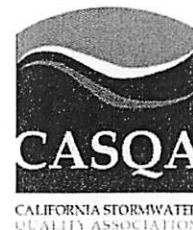
- Primary Objective
- Secondary Objective

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-8 Wood Mulching



- Channels to be vegetated
- Stockpiles
- Slopes adjacent to water bodies of Environmentally Sensitive Areas (ESAs)

Limitations

- Properly installed mattings provide excellent erosion control but do so at relatively high cost. This high cost typically limits the use of mattings to areas of concentrated channel flow and steep slopes.
- Mattings are more costly than other BMP practices, limiting their use to areas where other BMPs are ineffective (e.g. channels, steep slopes).
- Installation is critical and requires experienced contractors. The contractor should install the matting material in such a manner that continuous contact between the material and the soil occurs.
- Geotextiles and Mats may delay seed germination, due to reduction in soil temperature.
- Blankets and mats are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (since staples and netting can catch in mowers).
- Blankets and mats must be removed and disposed of prior to application of permanent soil stabilization measures.
- Plastic sheeting is easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
- Plastic results in 100% runoff, which may cause serious erosion problems in the areas receiving the increased flow.
- The use of plastic should be limited to covering stockpiles or very small graded areas for short periods of time (such as through one imminent storm event) until alternative measures, such as seeding and mulching, may be installed.
- Geotextiles, mats, plastic covers, and erosion control covers have maximum flow rate limitations; consult the manufacturer for proper selection.
- Not suitable for areas that have heavy foot traffic (tripping hazard) – e.g., pad areas around buildings under construction.

Implementation***Material Selection***

Organic matting materials have been found to be effective where re-vegetation will be provided by re-seeding. The choice of matting should be based on the size of area, side slopes, surface conditions such as hardness, moisture, weed growth, and availability of materials.

The following natural and synthetic mattings are commonly used:

Geotextiles

- Material should be a woven polypropylene fabric with minimum thickness of 0.06 in., minimum width of 12 ft and should have minimum tensile strength of 150 lbs (warp), 80 lbs (fill) in conformance with the requirements in ASTM Designation: D 4632. The permittivity of the fabric should be approximately 0.07 sec^{-1} in conformance with the requirements in ASTM Designation: D4491. The fabric should have an ultraviolet (UV) stability of 70 percent in conformance with the requirements in ASTM designation: D4355. Geotextile blankets must be secured in place with wire staples or sandbags and by keying into tops of slopes to prevent infiltration of surface waters under geotextile. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Geotextiles may be reused if they are suitable for the use intended.

Plastic Covers

- Plastic sheeting should have a minimum thickness of 6 mils, and must be keyed in at the top of slope and firmly held in place with sandbags or other weights placed no more than 10 ft apart. Seams are typically taped or weighted down their entire length, and there should be at least a 12 in. to 24 in. overlap of all seams. Edges should be embedded a minimum of 6 in. in soil.
- All sheeting must be inspected periodically after installation and after significant rainstorms to check for erosion, undermining, and anchorage failure. Any failures must be repaired immediately. If washout or breakages occur, the material should be re-installed after repairing the damage to the slope.

Erosion Control Blankets/Mats

- Biodegradable rolled erosion control products (RECPs) are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable.
 - **Jute** is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh. It is designed to be used in conjunction with vegetation and has longevity of approximately one year. The material is supplied in rolled strips, which should be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
 - **Excelsior** (curled wood fiber) blanket material should consist of machine produced mats of curled wood excelsior with 80 percent of the fiber 6 in. or longer. The excelsior blanket should be of consistent thickness. The wood fiber must be evenly distributed over the entire area of the blanket. The top surface of the blanket should be covered with a photodegradable extruded plastic mesh. The blanket should be smolder resistant without the use of chemical additives and should be non-toxic and non-injurious to plant and animal life. Excelsior blankets should be furnished in rolled strips, a minimum of 48 in. wide, and should have an average weight of 0.8 lb/yd^2 , ± 10 percent, at the time of manufacture. Excelsior blankets must be secured in place with wire staples. Staples

- should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- **Straw blanket** should be machine produced mats of straw with a lightweight biodegradable netting top layer. The straw should be attached to the netting with biodegradable thread or glue strips. The straw blanket should be of consistent thickness. The straw should be evenly distributed over the entire area of the blanket. Straw blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd². Straw blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
 - **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured to the ground with U-shaped staples or stakes in accordance with manufacturers' recommendations.
 - **Coconut fiber blanket** should be a machine produced mat of 100 percent coconut fiber with biodegradable netting on the top and bottom. The coconut fiber should be attached to the netting with biodegradable thread or glue strips. The coconut fiber blanket should be of consistent thickness. The coconut fiber should be evenly distributed over the entire area of the blanket. Coconut fiber blanket should be furnished in rolled strips with a minimum of 6.5 ft wide, a minimum of 80 ft. long and a minimum of 0.5 lb/yd². Coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
 - **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a biodegradable mat. It is designed to be used in conjunction with vegetation and typically has longevity of several years. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
 - **Straw coconut fiber blanket** should be machine produced mats of 70 percent straw and 30 percent coconut fiber with a biodegradable netting top layer and a biodegradable bottom net. The straw and coconut fiber should be attached to the netting with biodegradable thread or glue strips. The straw coconut fiber blanket should be of consistent thickness. The straw and coconut fiber should be evenly distributed over the entire area of the blanket. Straw coconut fiber blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd². Straw coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
 - **Non-biodegradable RECPs** are typically composed of polypropylene, polyethylene, nylon or other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well.

- **Plastic netting** is a lightweight biaxially oriented netting designed for securing loose mulches like straw or paper to soil surfaces to establish vegetation. The netting is photodegradable. The netting is supplied in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Plastic mesh** is an open weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than 1/4 in. It is used with re-vegetation or may be used to secure loose fiber such as straw to the ground. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light. The mat is a dense, three dimensional mesh of synthetic (typically polyolefin) fibers stitched between two polypropylene nets. The mats are designed to be re-vegetated and provide a permanent composite system of soil, roots, and geomatrix. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Bonded synthetic fibers** consist of a three dimensional geomatrix nylon (or other synthetic) matting. Typically it has more than 90 percent open area, which facilitates root growth. It's tough root reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high volume discharges. It can be installed over prepared soil, followed by seeding into the mat. Once vegetated, it becomes an invisible composite system of soil, roots, and geomatrix. The material is furnished in rolled strips that must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high strength continuous filament geomatrix or net stitched to the bottom. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

Site Preparation

- Proper site preparation is essential to ensure complete contact of the blanket or matting with the soil.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 2 to 3 in. of topsoil.

Seeding

Seed the area before blanket installation for erosion control and revegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket

installation, all check slots and other areas disturbed during installation must be re-seeded. Where soil filling is specified, seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Fertilize and seed in accordance with seeding specifications or other types of landscaping plans. When using jute matting on a seeded area, apply approximately half the seed before laying the mat and the remainder after laying the mat. The protective matting can be laid over areas where grass has been planted and the seedlings have emerged. Where vines or other ground covers are to be planted, lay the protective matting first and then plant through matting according to design of planting.

Check Slots

Check slots are made of glass fiber strips, excelsior matting strips or tight folded jute matting blanket or strips for use on steep, highly erodible watercourses. The check slots are placed in narrow trenches 6 to 12 in. deep across the channel and left flush with the soil surface. They are to cover the full cross section of designed flow.

Laying and Securing Matting

- Before laying the matting, all check slots should be installed and the friable seedbed made free from clods, rocks, and roots. The surface should be compacted and finished according to the requirements of the manufacturer's recommendations.
- Mechanical or manual lay down equipment should be capable of handling full rolls of fabric and laying the fabric smoothly without wrinkles or folds. The equipment should meet the fabric manufacturer's recommendations or equivalent standards.

Anchoring

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Metal stake pins should be 0.188 in. diameter steel with a 1.5 in. steel washer at the head of the pin, and 8 in. in length.
- Wire staples and metal stakes should be driven flush to the soil surface.

Installation on Slopes

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Begin at the top of the slope and anchor the blanket in a 6 in. deep by 6 in. wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket down slope in the direction of water flow.
- Overlap the edges of adjacent parallel rolls 2 to 3 in. and staple every 3 ft.

- When blankets must be spliced, place blankets end over end (shingle style) with 6 in. overlap. Staple through overlapped area, approximately 12 in. apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
- Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples should be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 (H:V) to 2:1 (H:V), require a minimum of 2 staples/yd². Moderate slopes, 2:1 (H:V) to 3:1 (H:V), require a minimum of 1 1/2 staples/yd².

Installation in Channels

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Dig initial anchor trench 12 in. deep and 6 in. wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 in. deep and 6 in. wide across the channel at 25 to 30 ft intervals along the channels.
- Cut longitudinal channel anchor trenches 4 in. deep and 4 in. wide along each side of the installation to bury edges of matting, whenever possible extend matting 2 to 3 in. above the crest of the channel side slopes.
- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 12 in. intervals. Note: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3 in.
- Secure these initial ends of mats with anchors at 12 in. intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench. Unroll adjacent mats upstream in similar fashion, maintaining a 3 in. overlap.
- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 12 in. intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Alternate method for non-critical installations: Place two rows of anchors on 6 in. centers at 25 to 30 ft. intervals in lieu of excavated check slots.
- Staple shingled lap spliced ends a minimum of 12 in. apart on 12 in. intervals.
- Place edges of outside mats in previously excavated longitudinal slots; anchor using prescribed staple pattern, backfill, and compact soil.
- Anchor, fill, and compact upstream end of mat in a 12 in. by 6 in. terminal trench.

- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

Soil Filling (if specified for turf reinforcement)

- Always consult the manufacturer's recommendations for installation.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes, or brooms for fine grading and touch up.
- Smooth out soil filling just exposing top netting of mat.

Temporary Soil Stabilization Removal

- Temporary soil stabilization removed from the site of the work must be disposed of if necessary.

Costs

Relatively high compared to other BMPs. Biodegradable materials: \$0.50 - \$0.57/yd². Permanent materials: \$3.00 - \$4.50/yd². Staples: \$0.04 - \$0.05/staple. Approximate costs for installed materials are shown below:

| Rolled Erosion Control Products | | Installed Cost per Acre |
|--|--------------------------------|--------------------------------|
| Biodegradable | Jute Mesh | \$6,500 |
| | Curled Wood Fiber | \$10,500 |
| | Straw | \$8,900 |
| | Wood Fiber | \$8,900 |
| | Coconut Fiber | \$13,000 |
| | Coconut Fiber Mesh | \$31,200 |
| | Straw Coconut Fiber | \$10,900 |
| Non-Biodegradable | Plastic Netting | \$2,000 |
| | Plastic Mesh | \$3,200 |
| | Synthetic Fiber with Netting | \$34,800 |
| | Bonded Synthetic Fibers | \$50,000 |
| | Combination with Biodegradable | \$32,000 |

Source: Caltrans Guidance for Soil Stabilization for Temporary Slopes, Nov. 1999

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season, and at two-week intervals during the non-rainy season.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.

- 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.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.
- Make sure matting is uniformly in contact with the soil.
- Check that all the lap joints are secure.
- Check that staples are flush with the ground.
- Check that disturbed areas are seeded.

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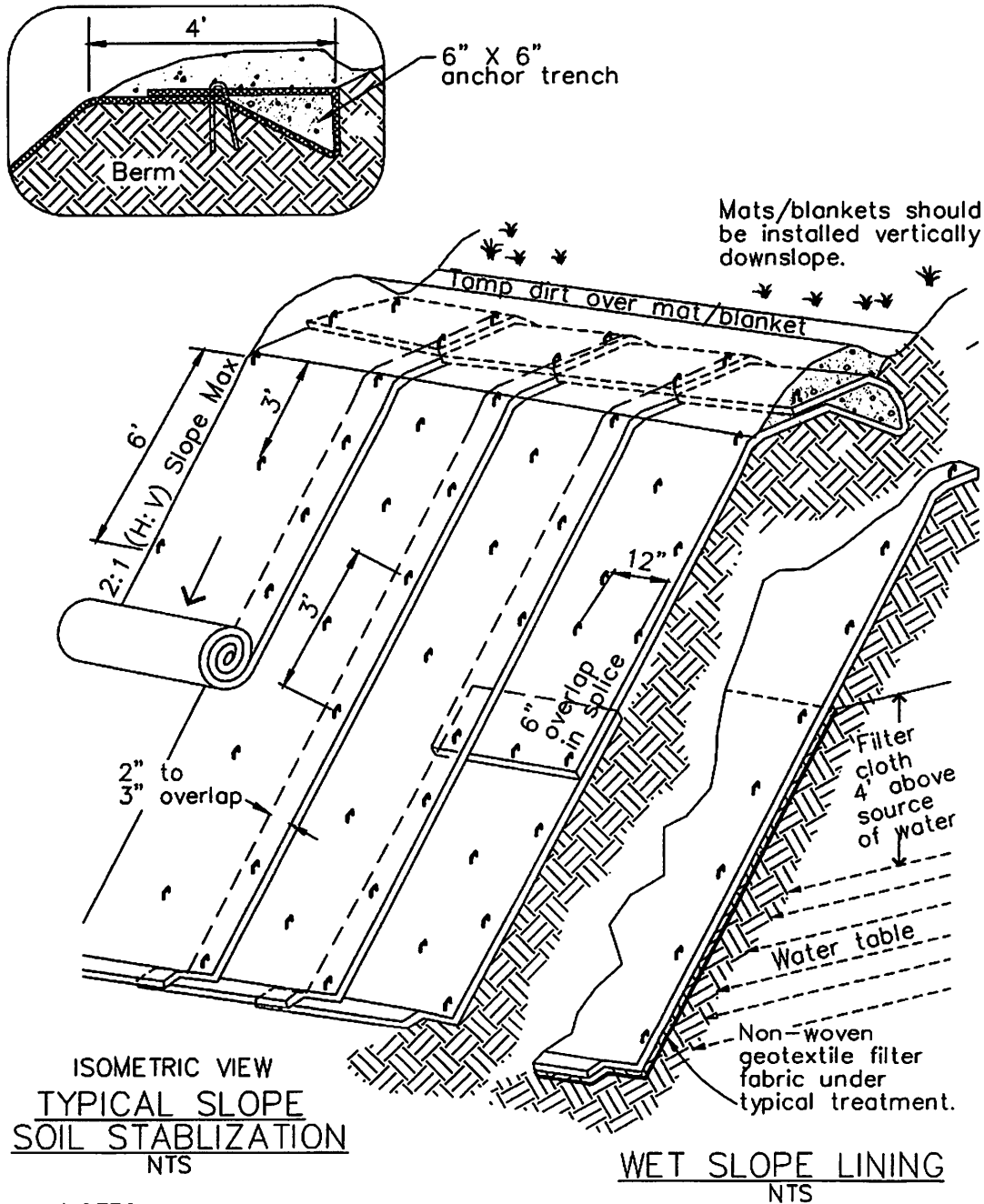
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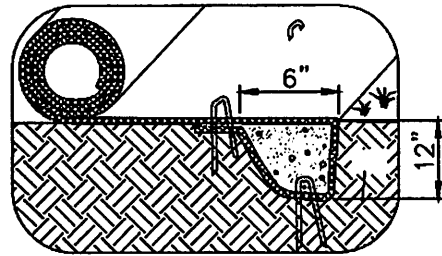
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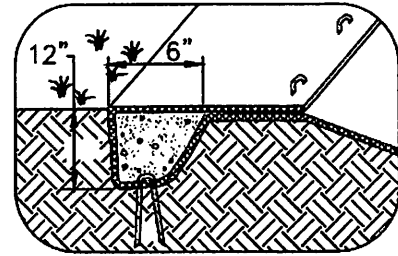
NOTES:

1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

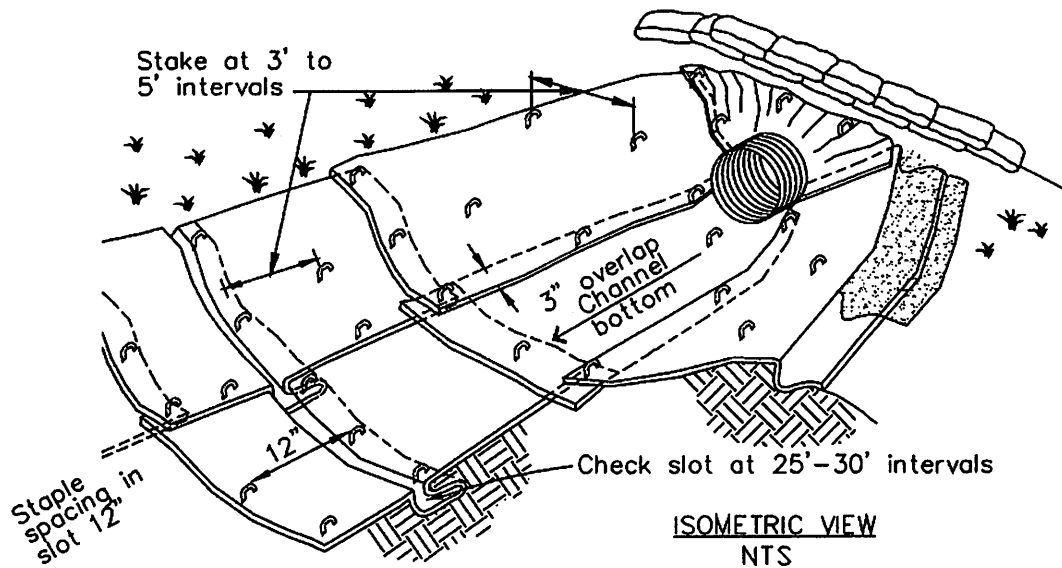
TYPICAL INSTALLATION DETAIL



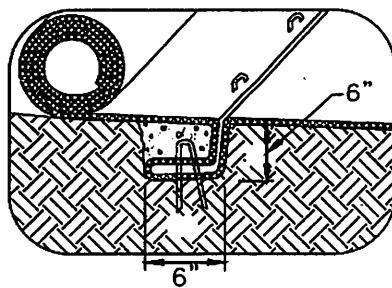
INITIAL CHANNEL ANCHOR TRENCH
NTS



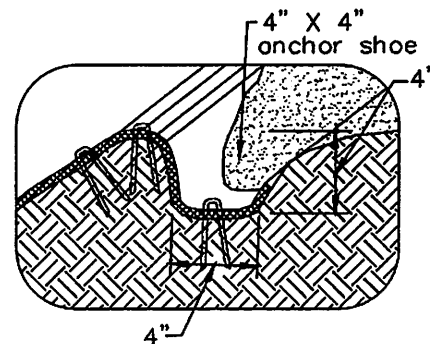
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH
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ISOMETRIC VIEW
NTS



INTERMITTENT CHECK SLOT
NTS

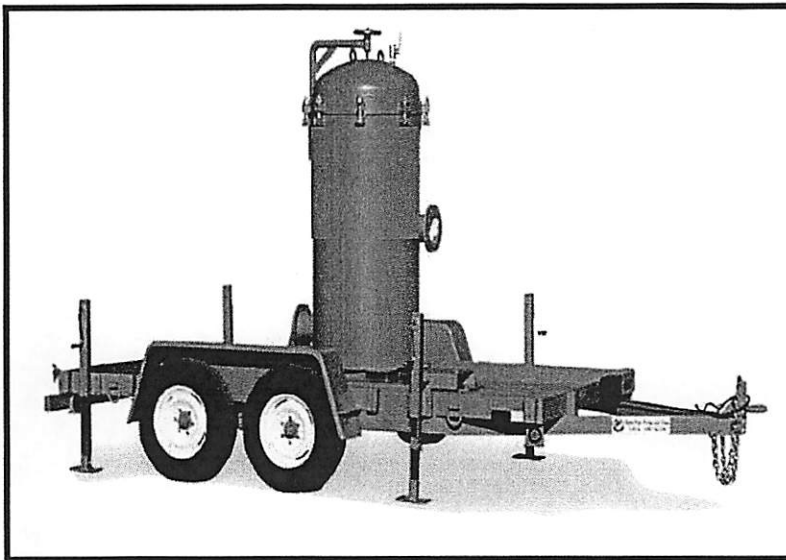


LONGITUDINAL ANCHOR TRENCH
NTS

NOTES:

1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

TYPICAL INSTALLATION DETAIL



Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation must be removed from a work location so that construction work may be accomplished.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (stormwater) from depressed areas at a construction site.

Limitations

- Site conditions will dictate design and use of dewatering operations.
- The controls discussed in this best management practice (BMP) address sediment only.
- The controls detailed in this BMP only allow for minimal settling time for sediment particles. Use only when site conditions restrict the use of the other control methods.
- Dewatering operations will require, and must comply with, applicable local permits.

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | |
| SE | Sediment Control | <input checked="" type="checkbox"/> |
| TR | 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 | <input checked="" type="checkbox"/> |
| Organics | |

Potential Alternatives

- SE-5: Fiber Roll
- SE-6: Gravel Bag Berm
- SE-9: Straw Bale Barrier



- Avoid dewatering discharges where possible by using the water for dust control, by infiltration, etc.

Implementation

- Dewatering non-stormwater cannot be discharged without prior notice to and approval from the Regional Water Quality Control Board (RWQCB) and local stormwater management agency. This includes stormwater that is co-mingled with groundwater or other non-stormwater sources. Once the discharge is allowed, appropriate BMPs must be implemented to ensure the discharge complies with all permit requirements and regional and watershed-specific requirements.
- RWQCB may require a separate NPDES permit prior to the dewatering discharge of non-stormwater. These permits will have specific testing, monitoring, and discharge requirements and can take significant time to obtain.
- The flow chart shown in Figure 1 should be utilized to guide dewatering operations.
- The owner will coordinate monitoring and permit compliance.
- Additional permits or permissions from other agencies may be required for dewatering cofferdams or diversions.
- Dewatering discharges must not cause erosion at the discharge point.

A variety of methods can be used to treat water during dewatering operations. Several devices are presented below and provide options to achieve sediment removal. The size of particles present in the sediment and Permit or receiving water limitations on sediment are key considerations for selecting sediment treatment option(s); in some cases, the use of multiple devices may be appropriate.

Sediment Basin (see also SE-2)

Description:

- A sediment basin is a temporary basin with a controlled release structure that is formed by excavation or construction of an embankment to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment basins are generally larger than Sediment Traps (SE-3).

Appropriate Applications:

- Effective for the removal of gravel, sand, silt, some metals that settle out with the sediment, and trash.

Implementation:

- Excavation and construction of related facilities is required.
- Temporary sediment basins must be fenced if safety is a concern.
- Outlet protection is required to prevent erosion at the outfall location.

Maintenance:

- Maintenance is required for safety fencing, vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-half.

Sediment Trap (See also SE-3)

Description:

- A sediment trap is a temporary basin formed by excavation and/or construction of an earthen embankment across a waterway or low drainage area to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment traps are generally smaller than Sediment Basins (SE-2).

Appropriate Applications:

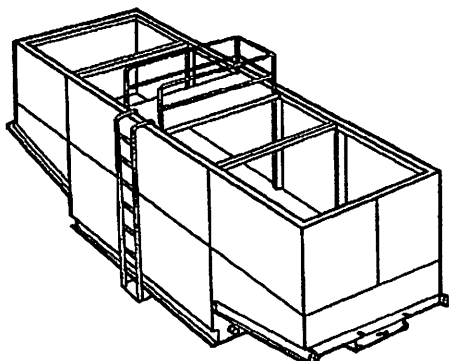
Effective for the removal of large and medium sized particles (sand and gravel) and some metals that settle out with the sediment.

Implementation:

- Excavation and construction of related facilities is required.
- Trap inlets should be located to maximize the travel distance to the trap outlet.
- Use rock or vegetation to protect the trap outlets against erosion.

Maintenance:

- Maintenance is required for vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Weir Tanks***Description:***

- A weir tank separates water and waste by using weirs. The configuration of the weirs (over and under weirs) maximizes the residence time in the tank and determines the waste to be removed from the water, such as oil, grease, and sediments.

Appropriate Applications:

- The tank removes trash, some settleable solids (gravel, sand, and silt), some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

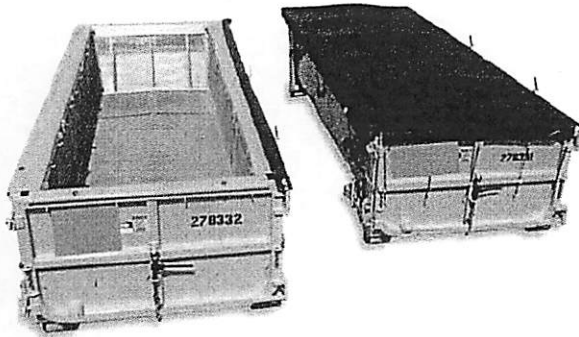
Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal must be by licensed waste disposal company.

Dewatering Tanks



Description:

- A dewatering tank removes debris and sediment. Flow enters the tank through the top, passes through a fabric filter, and is discharged through the bottom of the tank. The filter separates the solids from the liquids.

Appropriate Applications:

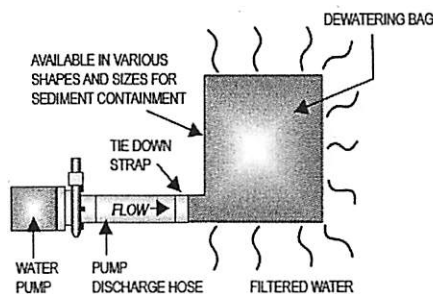
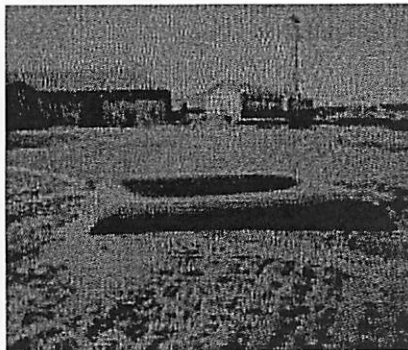
- The tank removes trash, gravel, sand, and silt, some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal must be by licensed waste disposal company.

Gravity Bag Filter**Description:**

- A gravity bag filter, also referred to as a dewatering bag, is a square or rectangular bag made of non-woven geotextile fabric that collects sand, silt, and fines.

Appropriate Applications:

- Effective for the removal of sediments (gravel, sand, and silt). Some metals are removed with the sediment.

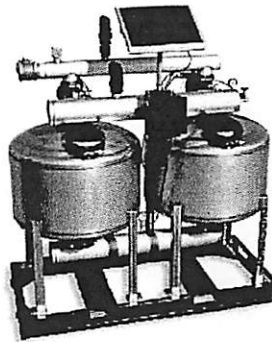
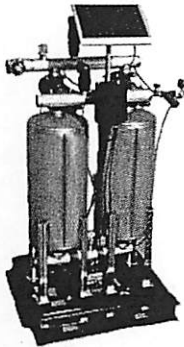
Implementation:

- Water is pumped into one side of the bag and seeps through the bottom and sides of the bag.
- A secondary barrier, such as a rock filter bed or straw/hay bale barrier, is placed beneath and beyond the edges of the bag to capture sediments that escape the bag.

Maintenance:

- Inspection of the flow conditions, bag condition, bag capacity, and the secondary barrier is required.
- Replace the bag when it no longer filters sediment or passes water at a reasonable rate.
- The bag is disposed of offsite.

Sand Media Particulate Filter



Description:

- Water is treated by passing it through canisters filled with sand media. Generally, sand filters provide a final level of treatment. They are often used as a secondary or higher level of treatment after a significant amount of sediment and other pollutants have been removed using other methods.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, and silt and some metals, as well as the reduction of biochemical oxygen demand (BOD) and turbidity.
- Sand filters can be used for stand-alone treatment or in conjunction with bag and cartridge filtration if further treatment is required.
- Sand filters can also be used to provide additional treatment to water treated via settling or basic filtration.

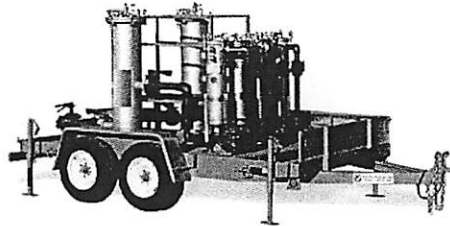
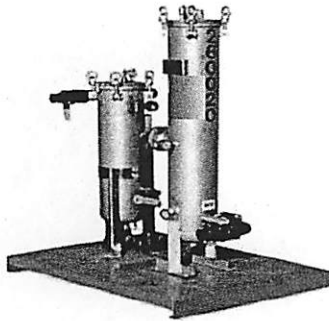
Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filters require regular service to monitor and maintain the level of the sand media. If subjected to high loading rates, filters can plug quickly.
- Vendors generally provide data on maximum head loss through the filter. The filter should be monitored daily while in use, and cleaned when head loss reaches target levels.
- If cleaned by backwashing, the backwash water may need to be hauled away for disposal, or returned to the upper end of the treatment train for another pass through the series of dewatering BMPs.

Pressurized Bag Filter



Description:

- A pressurized bag filter is a unit composed of single filter bags made from polyester felt material. The water filters through the unit and is discharged through a header. Vendors provide bag filters in a variety of configurations. Some units include a combination of bag filters and cartridge filters for enhanced contaminant removal.

Appropriate Applications:

- Effective for the removal of sediment (sand and silt) and some metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Oil absorbent bags are available for hydrocarbon removal.
- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

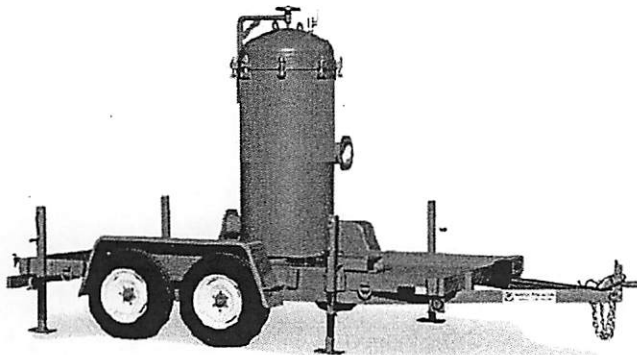
Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filter bags require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Cartridge Filter



Description:

- Cartridge filters provide a high degree of pollutant removal by utilizing a number of individual cartridges as part of a larger filtering unit. They are often used as a secondary or higher (polishing) level of treatment after a significant amount of sediment and other pollutants are removed. Units come with various cartridge configurations (for use in series with bag filters) or with a larger single cartridge filtration unit (with multiple filters within).

Appropriate Applications:

- Effective for the removal of sediment (sand, silt, and some clays) and metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Hydrocarbons can effectively be removed with special resin cartridges.
- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance.

Maintenance:

- The cartridges require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Costs

- Sediment controls are low to high cost measures depending on the dewatering system that is selected. Pressurized filters tend to be more expensive than gravity settling, but are often more effective. Simple tanks are generally rented on a long-term basis (one or more months) and can range from \$360 per month for a 1,000 gallon tank to \$2,660 per month for a 10,000 gallon tank. Mobilization and demobilization costs vary considerably.

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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.

- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Unit-specific maintenance requirements are included with the description of each unit.
- Sediment removed during the maintenance of a dewatering device may be either spread onsite and stabilized, or disposed of at a disposal site as approved by the owner.
- Sediment that is commingled with other pollutants must be disposed of in accordance with all applicable laws and regulations and as approved by the owner.

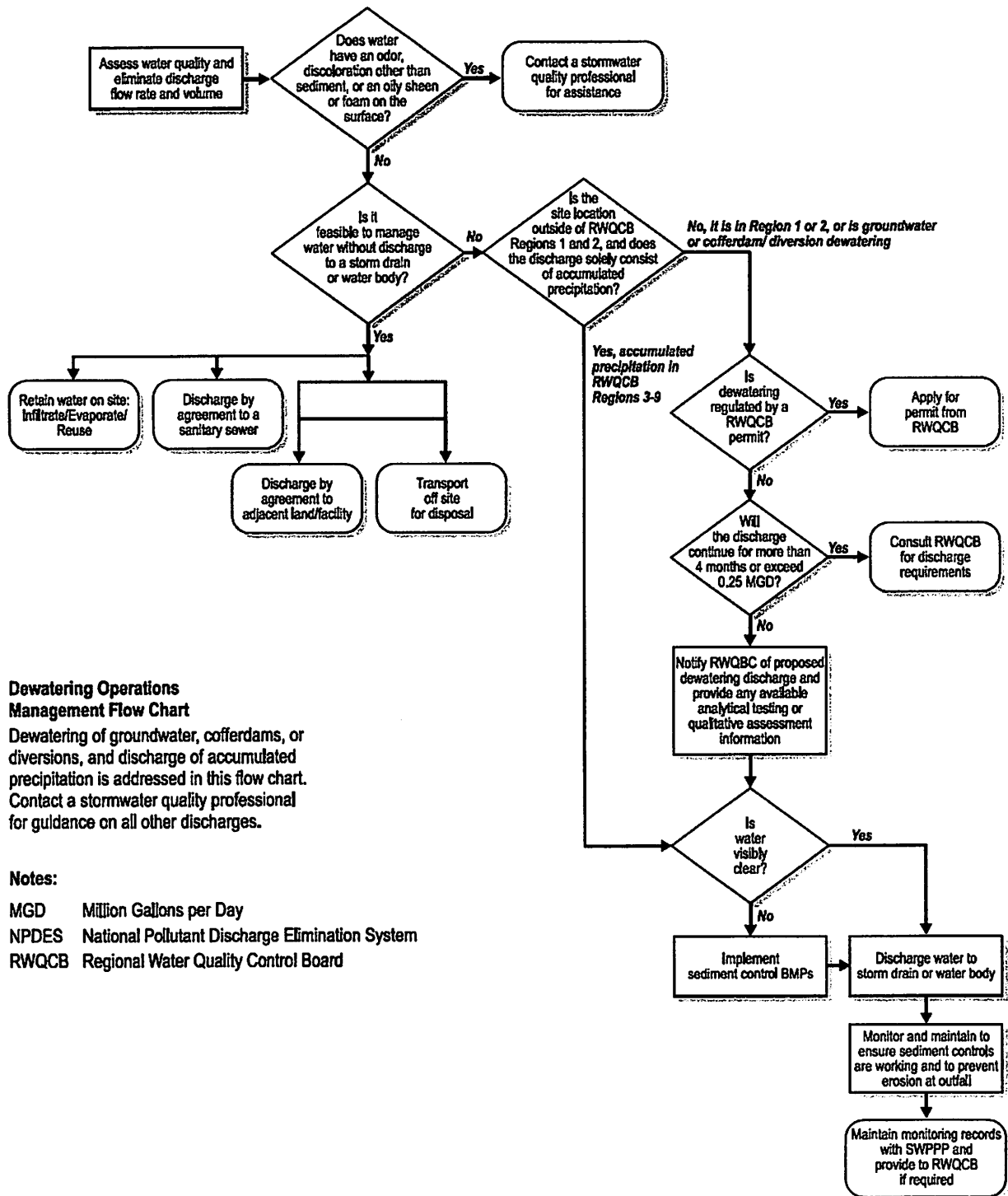
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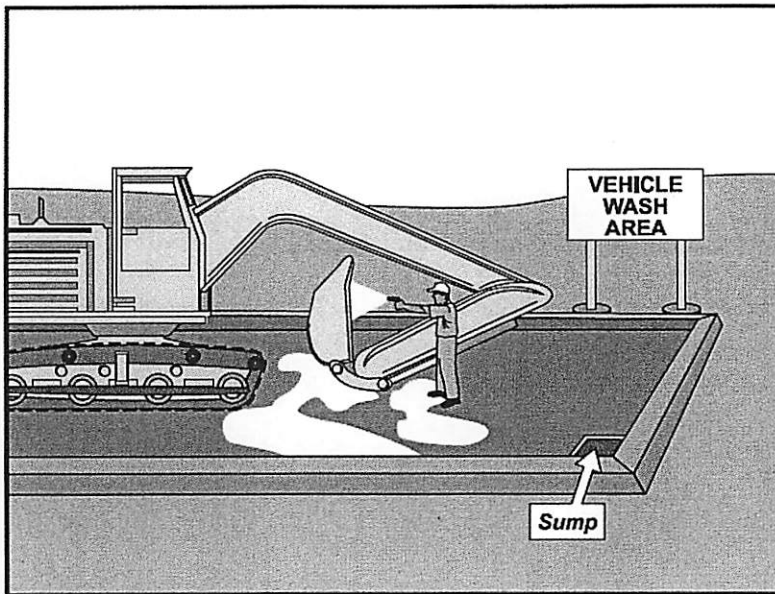
Dewatering Operations Management Flow Chart

Dewatering of groundwater, cofferdams, or diversions, and discharge of accumulated precipitation is addressed in this flow chart. Contact a stormwater quality professional for guidance on all other discharges.

Notes:

MGD Million Gallons per Day
 NPDES National Pollutant Discharge Elimination System
 RWQCB Regional Water Quality Control Board

Figure 1
Operations Flow Chart



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 TR-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:

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | |
| SE | Sediment Control | |
| TR | 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



NS-8 Vehicle and Equipment Cleaning

- 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
 - 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.

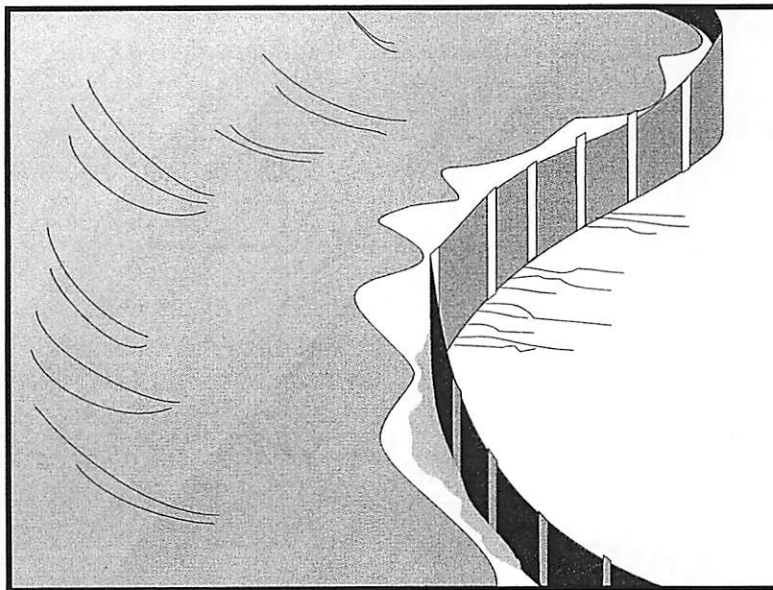
Inspection and Maintenance

- 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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- 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

A silt fence is made of a filter fabric that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They should also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion. Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Below other small cleared areas.

Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.

Objectives

| | | |
|----|--|-------------------------------------|
| EC | Erosion Control | |
| SE | Sediment Control | <input checked="" type="checkbox"/> |
| TR | 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

- SE-5 Fiber Rolls
- SE-6 Gravel Bag Berm
- SE-8 Sandbag Barrier
- SE-9 Straw Bale Barrier



- Do not use in locations where ponded water may cause flooding.
- Do not place fence on a slope, or across any contour line. If not installed at the same elevation throughout, silt fences will create erosion.
- Filter fences will create a temporary sedimentation pond on the upstream side of the fence and may cause temporary flooding. Fences not constructed on a level contour will be overtopped by concentrated flow resulting in failure of the filter fence.
- Improperly installed fences are subject to failure from undercutting, overlapping, or collapsing.
 - Not effective unless trenched and keyed in.
 - Not intended for use as mid-slope protection on slopes greater than 4:1 (H:V).
 - Do not allow water depth to exceed 1.5 ft at any point.

Implementation

General

A silt fence is a temporary sediment barrier consisting of filter fabric stretched across and attached to supporting posts, entrenched, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap sediment by intercepting and detaining small amounts of sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

Silt fences are preferable to straw bale barriers in many cases. Laboratory work at the Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. While the failure rate of silt fences is lower than that of straw bale barriers, there are many instances where silt fences have been improperly installed. The following layout and installation guidance can improve performance and should be followed:

- Use principally in areas where sheet flow occurs.
- Don't use in streams, channels, or anywhere flow is concentrated. Don't use silt fences to divert flow.
- Don't use below slopes subject to creep, slumping, or landslides.
- Select filter fabric that retains 85% of soil by weight, based on sieve analysis, but that is not finer than an equivalent opening size of 70.
- Install along a level contour, so water does not pond more than 1.5 ft at any point along the silt fence.
- The maximum length of slope draining to any point along the silt fence should be 200 ft or less.
- The maximum slope perpendicular to the fence line should be 1:1.

- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft² of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.
- Silt fences should remain in place until the disturbed area is permanently stabilized.

Design and Layout

Selection of a filter fabric is based on soil conditions at the construction site (which affect the equivalent opening size (EOS) fabric specification) and characteristics of the support fence (which affect the choice of tensile strength). The designer should specify a filter fabric that retains the soil found on the construction site yet that it has openings large enough to permit drainage and prevent clogging. The following criteria is recommended for selection of the equivalent opening size:

1. If 50 percent or less of the soil, by weight, will pass the U.S. Standard Sieve No. 200, select the EOS to retain 85 % of the soil. The EOS should not be finer than EOS 70.
2. For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 except where direct discharge to a stream, lake, or wetland will occur, then the EOS should be no larger than Standard Sieve No. 100.

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U.S. Standard Sieve No. 100. If 85% or more of a soil, by weight, passes through the openings in a No. 200 sieve, filter fabric should not be used. Most of the particles in such a soil would not be retained if the EOS was too large and they would clog the fabric quickly if the EOS were small enough to capture the soil.

The fence should be supported by a plastic or wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Filter fabric material should contain ultraviolet inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 °F to 120 °F.

- Layout in accordance with attached figures.
- For slopes steeper than 2:1 (H:V) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to sensitive receiving waters or Environmentally Sensitive Areas (ESAs), silt fence should be used in conjunction with erosion control BMPs.

Materials

- Silt fence fabric should be woven polypropylene with a minimum width of 36 in. and a minimum tensile strength of 100 lb force. The fabric should conform to the requirements in ASTM designation D4632 and should have an integral reinforcement layer. The reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric should be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491.
- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.
- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.
- There are new products that may use prefabricated plastic holders for the silt fence and use bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end protection for any exposed bar reinforcement.

Installation Guidelines

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line the proposed silt fence.
- Bottom of the silt fence should be keyed-in a minimum of 12 in.
- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- When standard strength filter fabric is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy-duty wire staples at least 1 in. long. The mesh should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the mesh support fence may be eliminated. Filter fabric should be purchased in a long roll, and then cut to the length of the barrier. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with compacted native material.
- Construct silt fences with a setback of at least 3 ft from the toe of a slope. Where a silt fence is determined to be not practicable due to specific site conditions, the silt fence may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and difficult to maintain.

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.

Costs

- Average annual cost for installation and maintenance (assumes 6 month useful life): \$7 per lineal foot (\$850 per drainage acre). Range of cost is \$3.50 - \$9.10 per lineal foot.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed of, and replaced with new silt fence barriers.
- 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 barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence must be inspected and maintained.
- Holes, depressions, or other ground disturbance caused by the removal of the silt fences should be backfilled and repaired.

References

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

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

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

Sedimentation and Erosion Control Practices, and Inventory of Current Practices (Draft), UESPA, 1990.

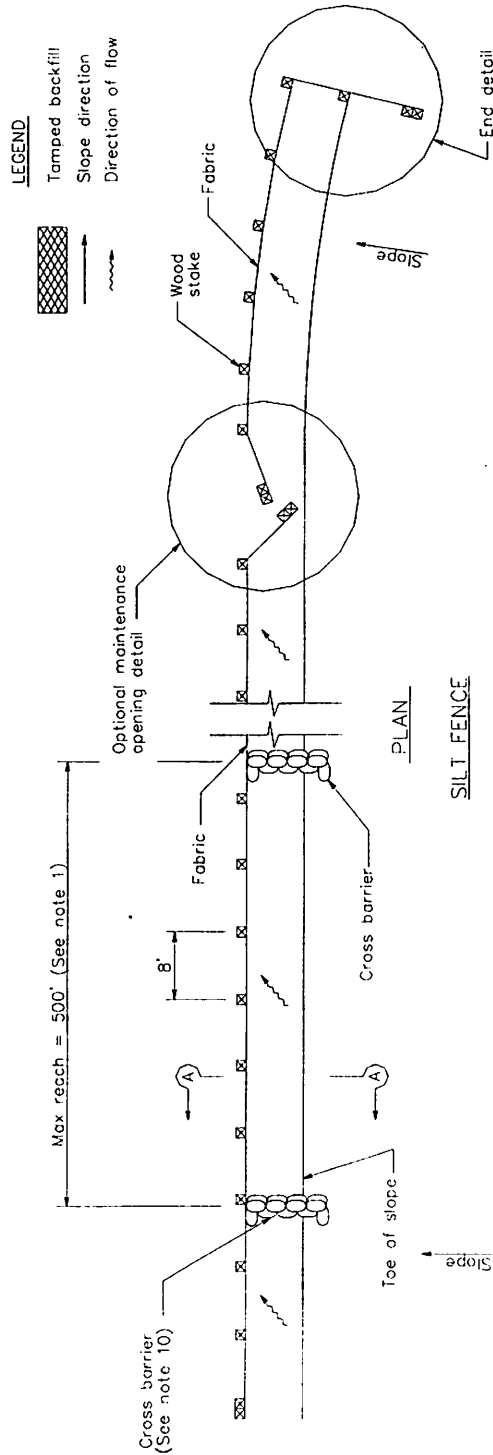
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Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

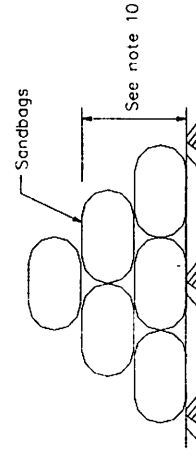
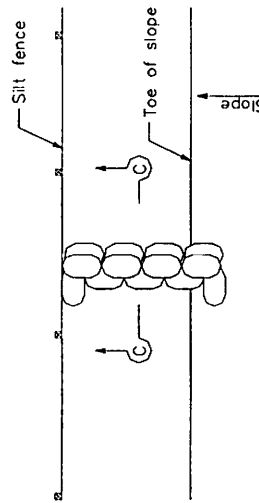
U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

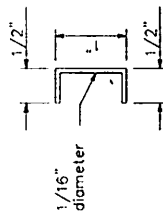
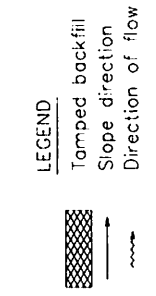
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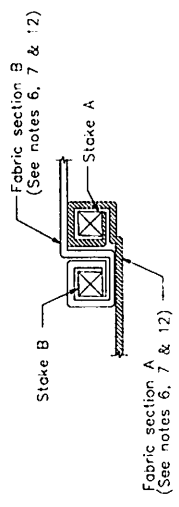
NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The last 8'-0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 stakes per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.

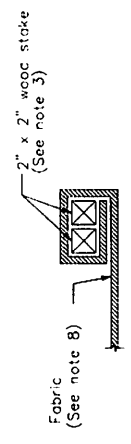




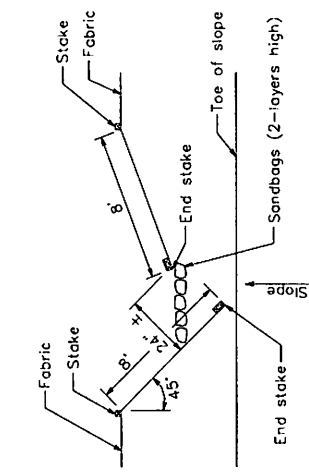
STAPLE DETAIL
(SEE NOTE 9)



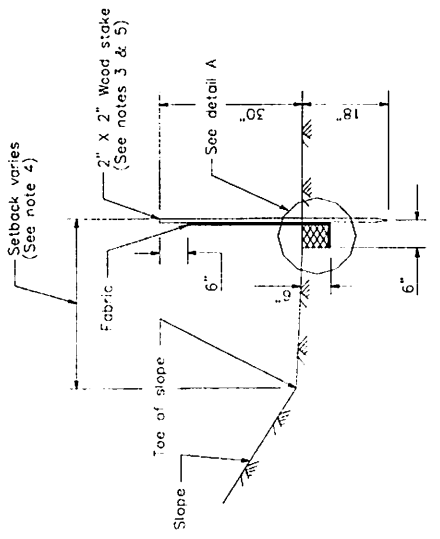
JOINING SECTION DETAIL (TOP VIEW)



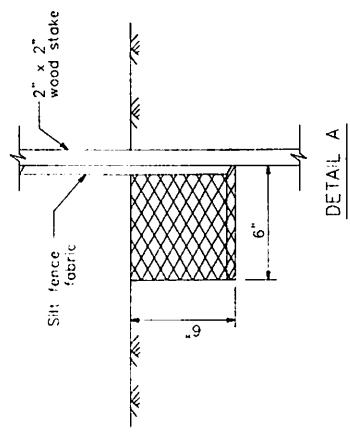
END STAKE DETAIL (TOP VIEW)



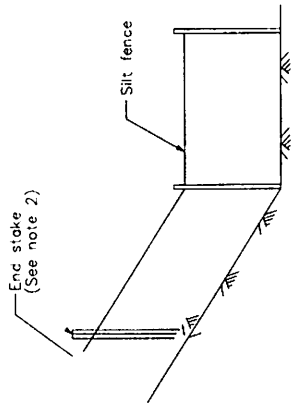
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)



SECTION A-A

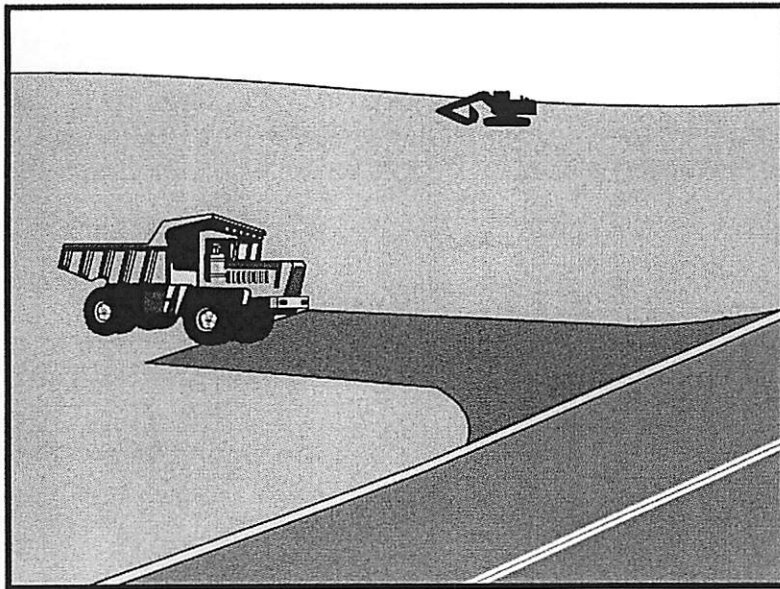


DETAIL A



END DETAIL

Stabilized Construction Entrance/Exit TC-1



Description and Purpose

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

Suitable Applications

Use at construction sites:

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

Limitations

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

Objectives

| | | |
|----|--|-------------------------------------|
| 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 | |
| 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



Stabilized Construction Entrance/Exit TC-1

Implementation

General

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

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

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

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft minimum, and 30 ft minimum width.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.

Stabilized Construction Entrance/Exit TC-1

- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

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

References

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

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

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

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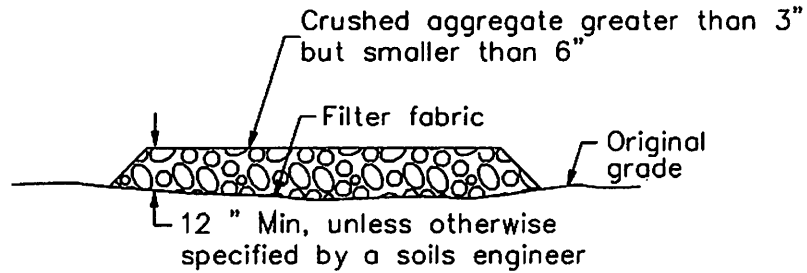
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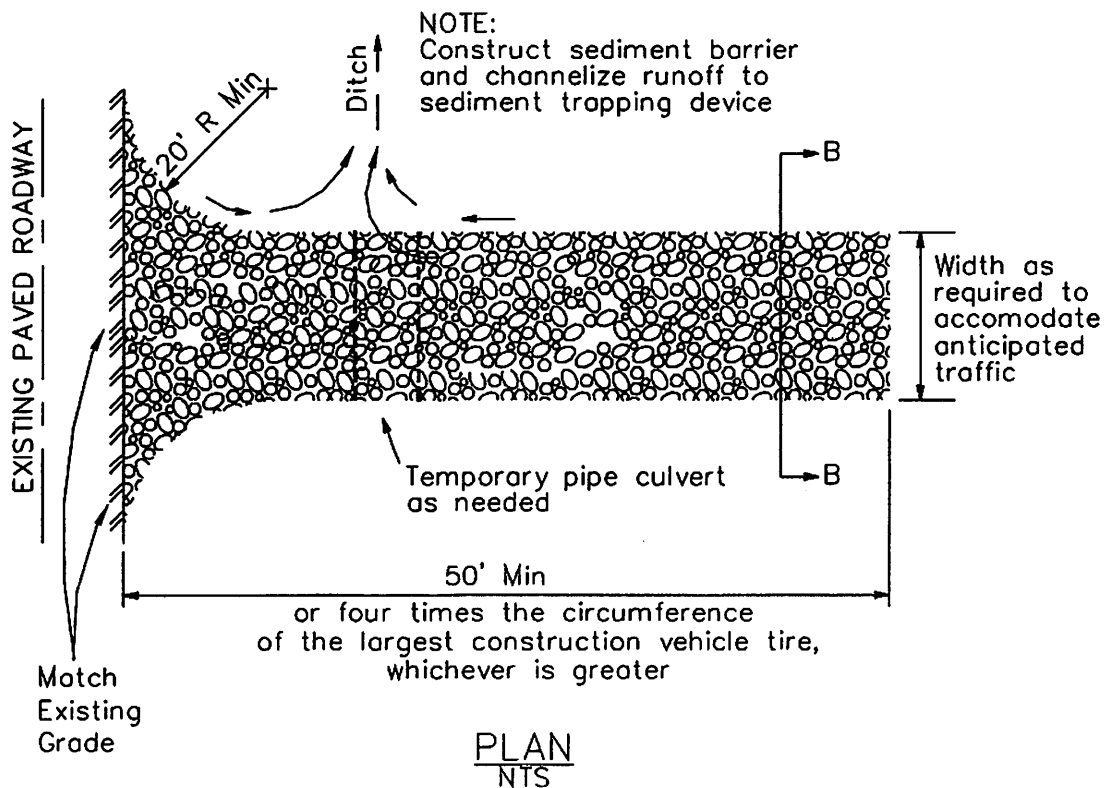
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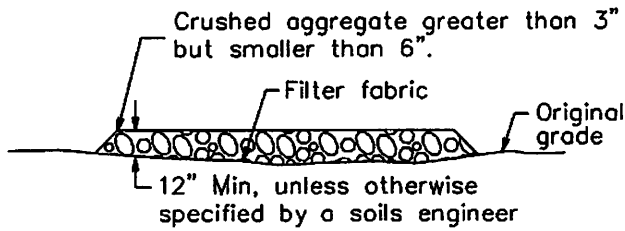
Stabilized Construction Entrance/Exit TC-1



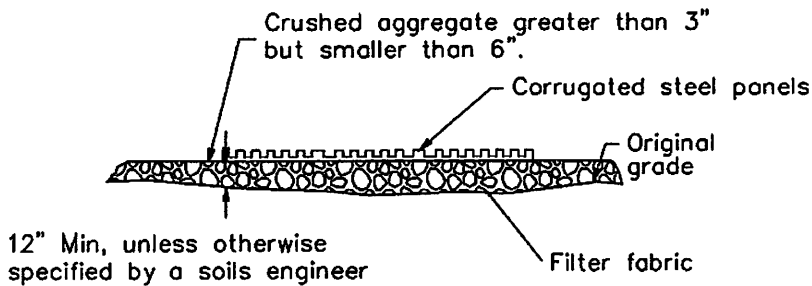
SECTION B-B
NTS



Stabilized Construction Entrance/Exit TC-1

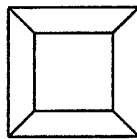


SECTION B-B
NTS

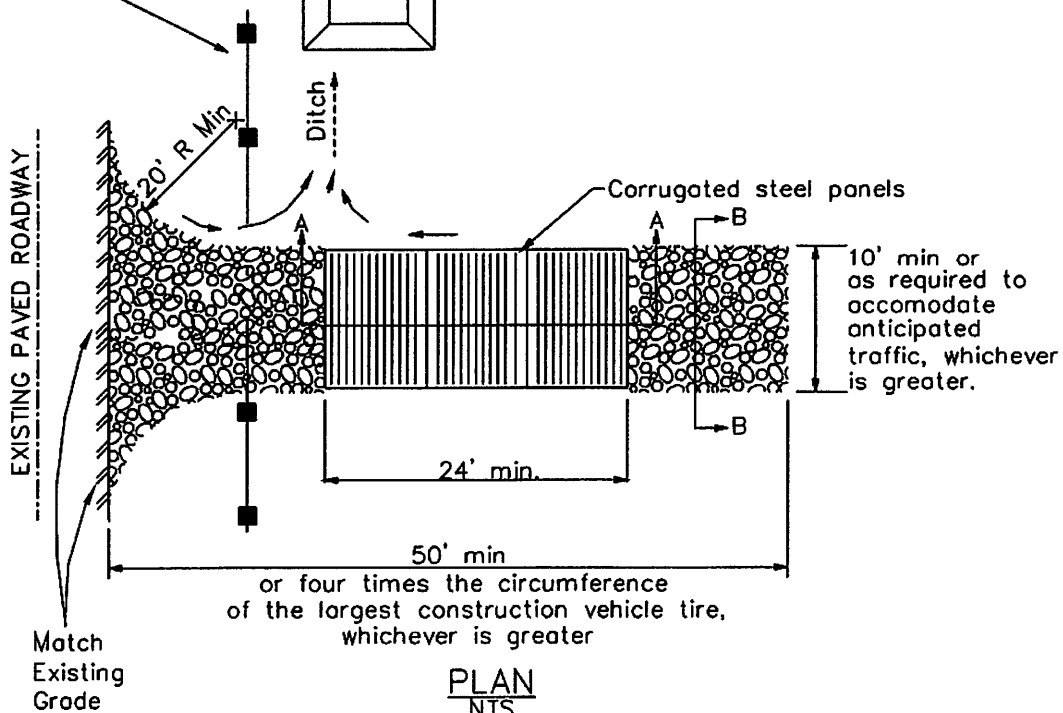


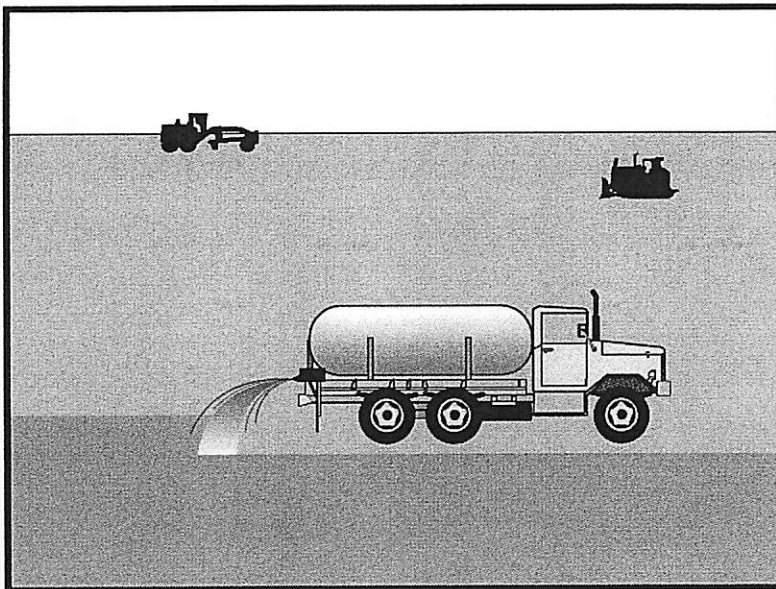
SECTION A-A
NOT TO SCALE

NOTE:
Construct sediment barrier and channelize runoff to sediment trapping device



Sediment trapping device





Description and Purpose

Wind erosion or dust control consists of applying water or other dust palliatives 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.

Suitable Applications

Wind erosion control BMPs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Sediment tracking onto paved roads
- 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 and should be applied daily (or more often) to be effective.
- Over watering may cause erosion.

Objectives

| | | |
|----|--|-------------------------------------|
| 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:

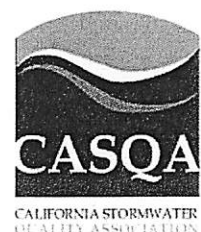
- Primary Objective
- Secondary Objective

Targeted Constituents

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

Potential Alternatives

None



- 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.
- Effectiveness depends on soil, temperature, humidity, and wind velocity.
- Chemically treated sub grades may make the soil water repellent, 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.
- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

Implementation

General

California's Mediterranean climate, with short wet seasons and long hot dry seasons, allows the soils to thoroughly dry out. During these dry seasons, 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.

Dust control, as a BMP, is a practice that is already in place for many construction activities. Los Angeles, the North Coast, and Sacramento, among others, have enacted dust control ordinances for construction activities that cause dust to be transported beyond the construction project property line.

Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). Approximately 90 percent of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and public health departments are in place in some regions within California.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Construction and Grading Permits: Require provisions for dust control plans.
- Opacity Emission Limits: Enforce compliance with California air pollution control laws.
- Increase Overall Enforcement Activities: Priority given to cases involving citizen complaints.
- Maintain Field Application Records: Require records of dust control measures from contractor;
- Stormwater Pollution Prevention Plan: (SWPPP): Integrate dust control measures into SWPPP.

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table shows dust control practices that can be applied to site conditions that 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 would include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time.

| SITE CONDITION | DUST CONTROL PRACTICES | | | | | | | | |
|--|------------------------|----------|----------------------------|---------------------------|-------------------|-------------|---|-------------------|-----------------------------------|
| | Permanent Vegetation | Mulching | Wet Suppression (Watering) | Chemical Dust Suppression | Gravel or Asphalt | Silt Fences | Temporary Gravel Construction Entrances/Equipment Wash Down | Haul Truck 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 Stock Pile Stabilization | | | X | X | | X | | | X |
| Demolition | | | X | | | | X | X | |
| Clearing/Excavation | | | X | X | | X | | | X |
| Truck Traffic on Unpaved Roads | | | X | X | X | | X | X | |
| Mud/Dirt Carry Out | | | | | X | | X | | |

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (EC-1, Scheduling).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and 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.
- Direct most construction traffic to stabilized roadways within the project site.
- 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 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."
- Materials applied as temporary soil stabilizers and soil binders also generally provide wind erosion control benefits.
- 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 wet suppression or chemical stabilization of exposed soils.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and vehicle wash down areas.
- Stabilize inactive construction sites using vegetation or chemical stabilization methods.
- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

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.

Costs

Installation costs for water and chemical dust suppression are low, but annual costs may be quite high since 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. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Check areas protected to ensure coverage.
- Most dust control measures require frequent, often daily, or multiple times per day attention.

References

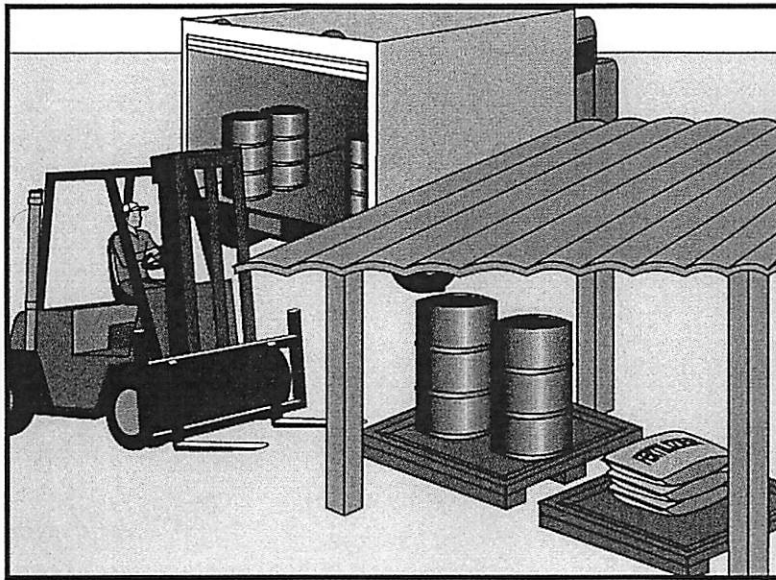
Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, 1992.

Caltrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

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), November 2000.



Objectives

| | | |
|----|--|-------------------------------------|
| 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

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease
- Asphalt and concrete components

Targeted Constituents

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

Potential Alternatives

None



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

Limitations

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

Implementation

The following steps should be taken to minimize risk:

- Temporary storage area should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be supplied for all materials stored.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located near the construction entrances, away from waterways, if possible.
 - Avoid transport near drainage paths or waterways.
 - Surround with earth berms. See EC-9, Earth Dikes and Drainage Swales.
 - Place in an area which will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.
- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- During the rainy season, consider storing materials in a covered area. Store materials in secondary containments such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.

- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.
- Chemicals should be kept in their original labeled containers.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

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

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

Material Delivery Practices

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

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.

Cost

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

Inspection and Maintenance

- 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 weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Keep an ample supply of spill cleanup materials near the storage area.
- Keep storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

References

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

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

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

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

APPENDIX D
MATERIAL SAFETY DATA SHEETS

Storm Water Pollution Prevention Plan for Construction Activities

Emergency Phone Numbers

| | | |
|---|--------------|-----|
| Fire, Police, Ambulance | | 911 |
| Owner: Pine Ridge Excavation & Landscape Liberty, Utah (435) 994-2061 | | |
| General Contractor | Office: Site | |
| | Mobile # | |
| Subcontractors | | |
| Sub #1 | Office: | |
| Sub #2 | | |
| Sub #3 | | |
| Sub #4 | | |
| | | |
| City or County Contact | | |
| State Ecology Dept. | | |
| | | |

Spill Report Form

| | |
|---|-------------------------|
| LOCATION: _____ | |
| _____ | Date: _____ Time: _____ |
| Regulatory agencies notified (date, time, person, agency, and how): _____ _____ _____ | |
| Material spilled: _____ | |
| Quantity spilled: _____ | |
| Source: _____ | |
| Cause: _____ _____ | |
| Extent of injuries (if any): _____ _____ | |
| Adverse environmental impact (if any): _____ _____ | |
| Immediate remedial actions taken at time of spill: _____ _____ | |
| Measures taken or planned to prevent recurrence: _____ _____ | |
| Additional comments: _____ _____ _____ | |
| This report prepared by: _____ | _____ (Signature) |
| _____ | _____ |

Storm Water Monitoring Form

| | |
|-------------------------|------------------------------|
| PROJECT: | CONTRACTOR: |
| RECEIVING WATER: | MONITOR PERFORMED BY: |

Monitoring date: _____ Time: _____
Current weather conditions: _____
Previous 24-hour weather conditions: _____

| SAMPLING POINT | TURBIDITY (NTU) |
|-----------------------|------------------------|
| Up-Stream | |
| Adjacent | |
| Downstream | |
| Comments: _____ | |
| _____ | |
| _____ | |
| _____ | |
| _____ | |

Sampler's Signature: _____
signature print name

Table 1

**BMP Maintenance and Inspection Schedule
(Source Control BMPs)**

Company: _____.

Address: _____.

_____.

| BMP Designation | BMP Name | Recommended Maintenance | Recommended Schedule of Maintenance |
|------------------------|---|--|--|
| EC-2 | Preservation of Existing Vegetation | Inspect flagged areas to make sure flagging has not been removed. If tree roots have been exposed or injured, recover and/or seal them. | Daily |
| EC-3 | Mulching | Maintain specified thickness of mulch cover. Eroded areas must be corrected and re-mulched. Drainage problems must be corrected. | Weekly and following storms |
| EC-4 | Hydroseeding | Re-seed areas failing to establish 80% cover within one month (during growing season). If re-seeding is ineffective, use sodding or nets/blankets. Eroded areas shall be corrected, re-planted, and irrigated as required. | Inspect to ensure growth weekly |
| EC-7 | Geotextiles and Mats | Inspect to ensure good contact with ground and no erosion of soils. Replace damaged material and re-staple where required. Correct erosion problems immediately. | Weekly and following storms |
| SE-1 | Silt Fence | If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored. | Daily |
| TC-1 | Stabilized Construction Entrance/Exit & Tire Wash | If the rock entrance is not working to keep streets clean, then install wheel wash, sweep streets, or wash streets if wash water can be collected. | Daily |
| WE-1 | Wind Erosion Control | Re-apply dust control measures as necessary to keep dust to a minimum. | Daily during dry weather |
| WM-3 | Stock Pile Management | Inspect perimeter sediment barrier. Repair or replace damaged material. | Daily |

Table 2

**BMP Maintenance and Inspection Schedule
(Runoff, Conveyance, and Treatment BMPs)**

Company: _____.

Address: _____.

_____.

| BMP Designation | BMP Name | Recommended Maintenance | Recommended Schedule of Maintenance |
|------------------------|---------------------------------|---|--|
| EC-9 | Earth Dikes and Drainage Swales | Inspect to insure structural integrity. Repair as needed | Weekly and following storms |
| EC-10 | Velocity Dissipation Devices | Inspect to ensure underlain soils are not eroding. Inspect for slippage on slopes. | Weekly and following storms |
| SE-1 | Silt Fence | Repair damaged fencing immediately. Intercept concentrated flows and reroute. Remove sediment accumulations at 6-inches. Replace deteriorated fencing material. Properly dispose of used fencing. | Weekly and following storms |
| SE-7 | Geotextiles and Mats | Inspect daily during rainy periods. Check for undercutting, end runs, and damages. Remove accumulated sediment when one half the barrier height. | Daily during prolonged rainy periods. |

Erosion and Sediment Control Inspection Form Erosion Prevention

Inspector(s): _____ Date: _____

Site Name and Location: _____

Current Weather Conditions: _____ Last 24 Hours: _____

| BMP Designation | O.K | Not O.K. | BMP Condition, Corrective Action, General Notes |
|--|-----|----------|---|
| Construction Access Trackout? Street Clean? | | | |
| | | | |
| | | | |
| | | | |
| Soil Stabilization Signs of Erosion: Gullies? Slope Failures? Rills? | | | |
| | | | |
| | | | |
| | | | |
| Slope Protection Plastic Condition? Grass Growing? Hydroseed Condition? Matting? | | | |
| | | | |
| | | | |
| | | | |
| Perimeter Control Clearing Limits Marked? Silt Fences? Swales? | | | |
| | | | |
| | | | |
| | | | |
| Conveyances Stable Ditches? Check Dams Intact? Sand Bags? Slope Drains? | | | |
| | | | |
| | | | |
| | | | |
| TESC Management Revisions Required? | | | |
| | | | |
| | | | |
| | | | |
| Water Management Infiltration System? Clean and Dirty Water Separated Offsite Water Bypassing? | | | |
| | | | |
| | | | |
| | | | |
| Outlet Protection Stabilized? | | | |
| | | | |
| | | | |
| | | | |

Erosion and Sediment Control Inspection Form

Sediment Control

| BMP Designation | O.K | Not O.K. | BMP Condition, Corrective Action, General Notes |
|---|-----|----------|---|
| Storm water Retention And Monitoring | | | |
| BMP Maintenance | | | |
| Inlet Protection | | | |
| Dust Control | | | |
| Spill Prevention | | | |
| Condition of Discharge Water | | | |
| Comments: | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

FIGURES

*Figure 1
Site Topography Map*

Figure 2
(Pine Ridge Excavation & Landscape Erosion Control Plan)