STORM WATER POLLUTION

PREVENTION PLAN

Blackwood Creek Stream and Floodplain Restoration

Project Site IIIB – 2012

USDA FOREST SERVICE LAKE TAHOE BASIN MANAGEMENT UNIT

(LTBMU)

SUBMITTED BY:

Lake Tahoe Basin Management Unit – Ecosystem Conservation Department
35 College Drive, South Lake Tahoe, CA 96150

Legally Responsible Person (LRP)

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Lake Tahoe Basin Management Unit

530-543-2600

PREPARED BY:
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Waterways Consulting, Santa Cruz CA

2/22/12

Matt Weld, QSD **Date**

SWPPP Date: February 22, 2012

TABLE OF CONTENTS

Appendices

Figures

I. Introduction and Certifications

IA. SWPPP Objectives

The objectives of this SWPPP are:

1. Disclose / describe project area water and sediment controls designed to prevent storm water discharges to a live channel downstream of the project site from exceeding a 24-hour arithmetic average of 20 Nephelometric Turbidity Units (NTU) during project implementation, or discharge to a temporary land treatment area in excess of 200 NTU.

2. Disclose / describe project area water and sediment controls to prevent project activities from impacting stream channel flows below the project area so that turbidity does not exceed 3 NTUs, or 10 percent above natural levels, whichever is greater, per R6T-2009-0043.

3. Disclose / describe the control and sequestration of airborn fine particulates during construction activities.

4. Disclose / describe best management practices to control hazardous materials utilized as part of the project.

5. Disclose / describe project elements designed to maintain post-project erosion within the range of natural levels for constructed channel flow introduction, over-wintering flows, and post-project snowmelt floods the following spring.

6. Disclose / describe how the project will meet the long-term environmental performance elements as described in the Blackwood Creek Bedded Sediment TMDL (LRWQCB, 2007).

IB. SWPPP Implementation Schedule

A tentative schedule with starting and ending dates for project activities and BMPs is displayed in Figure 1 (provided in separate electronic file). This schedule is tentative and based on best available knowledge in terms of contracting timelines, heavy machinery availability, and expected ground conditions. Appropriate BMPs in each construction area will be implemented prior to ground disturbing activities in that particular area. Project activities are planned to occur concurrently throughout the project, to ensure that the project can be completed this field season. The proposed implementation schedule is based on past observations of cessation of peak flows. Implementation will be delayed if field conditions related to soil moisture content and channel flows are not suitable. Some work will be deferred until the following season if environmental protection cannot be maintained. Determination for continuing to pursue work in the higher risk areas such as the upper South Channel will be made around the last week of August.

As such this figure will be a working product that will be updated by the end of each week as needed throughout the project, to reflect current conditions. Updates will be kept on site to be

utilized by the implementation team, and provided to Waterboard staff. A formal amendment to the SWPPP of Figure 1 will be made at the end of the field season.

IC. Trainings and Certifications

The Project Design Engineer, who will serve as QSD, is a California State Registered Civil Engineer (#62235) and is a Certified CPESC #5606 specialist, with QSD # 01091

Project managers are USDA Professional Grade Hydrologists and hold graduate level degrees related to water resource management. Both project managers have completed the state SWPPP practitioner/developer training.

By April 13, 2012 the QSP will meet the certification requirement of Section VII.B.3 of the Construction General Permit. Craig Oehril has passed the QSP exam and will be the QSP for this SWPPP pending certification. Certification will be documented as a SWPPP amendment.

ID. Permit Registration Documents

Six documents are submitted along with the SWPPP. They are:

1. 401 Water Quality Certification Application
2. 401 Attachment 2 – Hydrology Checklist
3. 401 Attachment 3 – Exemption criteria
4. 401 Attachment – Wetlands Delination Report
5. NOI for NPDES Application
6. Project plans and specifications
7. Excerpt from USFS / California Dept. of Fish and Game MOU
8. Blackwood Phase III Reach 1, Project Analysis Addendum

A copy of the permits shall be kept on site and are available at all times for review by Waterboard staff, other environmental permitting agency staff, and project personnel. Once permits are received, the project WDID number will be added to this document.

WDID# - _____

IE. Contractors

Algerine West Excavation/Construction (Jackson, CA) will complete the boulder supply / haul contract initiated in 2010.

IF. Emergency contacts and 24-hour phone numbers

The following individuals may be contacted in an emergency, in order of listing:

Project Management	Title	Contact Number
Craig Oehrli	Project Manager	530-545-2057
Theresa Loupe	Project Manager	775-901-1069
James Harris	Emergency Spill Coordinator	530-307-1210
Susan Norman	Physical Sciences Group Leader	530-400-9888

IG. SWPPP Availability and Public Records Access

A copy of the final approved SWPPP will be kept on site when project implementation activities are occuring, and will be available upon request to any Tahoe Basin environmental regulatory personnel (LRWQCB, TRPA, USACE, TRPA, DFG) or interested member of the public. All amendments to the SWPPP will also be kept on site, attached to the SWPPP. Copies can be requested from either the Project Managers, Physical Sciences Group Leader, or public information representative for the USDA Forest Service Lake Tahoe Basin Management Unit, 35 College Drive, South Lake Tahoe CA 96150.

Paper or electronic records required by this SWPPP shall be retained for a minimum of three years from the date generated or date submitted, whichever is later.

IH. SWPPP Amendments

Unforeseen or changing field conditions may require amendments to design plans and/or the SWPPP to maintain water and environmental protection, and to achieve the overall restoration goals of the project. Amendments shall be documented on the SWPPP change log form contained in Appendix A, and maintained with the SWPPP on site.

A Project Manager will contact the designated Lahontan Contact representative identified on the NPDES Permit by phone immediately of identified changes in the field which may adversely impact surface or ground waters, 100-year floodplains, or SEZs. If this individual's voice mail indicates that another individual should be contacted in their absence, that person will be contacted. If only voice mail is reached, changes will be discussed when a Lahontan staff person establishes contact in response to this initial contact. Changes will not be implemented on the ground prior to this discussion, unless it involves minor changes which will not adversely impact sensitive areas based on the judgment of the project manager, or imminent threats to water quality exist unless change is made, or if the Regional Board staff has not made contact with the USFS project manager(s), the LTBMU Physical Sciences Group Leader, or the Ecosystem Staff Officer within 24 hours of initial notification (excluding weekends and holidays).

The change log form in Appendix A will include documentation of description of change, including mitigations, as well as rationale/justification for change.

All references to design specifications below, refers to the permitted design plans, including approved SWPPP amendments.

II. Project Information

IIA. Project description, site address and driving directions

The project area is 42 acres total, including 0.6 miles and 9 acres of direct river and floodplain restoration. There is approximately 20 acres of SEZ within the project limits designated as "no disturbance" areas, 10 acres of upland where conifers will be harvested for restoration work, and a 3-acre material storage and stockpile area (See Figure 2 for project and stockpile area location). Actual SEZ locations will be field verified prior to implementation. Actions involve use of heavy machinery and hand crews for placement of imported boulders, native alluvium, and whole trees with root-wads, riparian planting and replanting of displaced riparian vegetation, as displayed on the site plans presented in Appendix B.

The site is located in Placer County, CA in Section 34 T15N R16E SE1/4 NE1/4. Driving directions from the Forest Service Supervisor's Office are:

Start at **35 COLLEGE DR, SOUTH LAKE TAHOE**

1. Turn left onto **COLLEGE DRIVE**
2. Turn left onto **AL TAHOE BLVD** – go 0.7 miles
3. Turn left onto **LAKE TAHOE BLVD (US-50)** – go 2.0 miles
4. Turn right onto **EMERALD BAY RD (CA-89)** – go 23.2 miles
5. Turn left onto **Barker Pass Road** – go 2.5 miles to **intersection of Barker Pass Road and FS Road 15N38**
6. Turn left onto **FS Road 15N38** – go 0.5 mile to **intersection of FS Road 15N38 and FS Road 15N38A**
7. Park along FS Road 15N38A – walk southwest 100 yards to northeastern corner of Blackwood 3B project area.

IIB. Potential Construction Site Pollutants of Concern and Sources

Many project activities have the potential to temporarily generate sediment (and associated nutrients) through transport of air or water borne particulates during implementation, as a result of excavating, transporting, and placing earthen materials in or near the Blackwood Creek stream channel. There is also the potential for release of sediments during the implementation of water diversion and control measures; limited potential for release of hazardous materials, in the form of fuels and lubricants used with project equipment; and lastly, there is the potential for sediment transport post-construction, if disturbed surfaces are not properly treated and winterized. The BMPs described in this SWPPP and design plans are designed to address these potential sources of pollutants.

IIC. Site Location Map

Figure 2 illustrates the general location of the Blackwood Phase IIIB project. See sheet C2 in Appendix B for project site details and Figure 3 of this document for stockpile area detail. Figure 4A and 4B respectively (provided in separate electronic files) illustrate the existing site conditions related to locations of SEZ boundaries, stream channels, and 100 year floodplains, as well as the proposed changes to active floodplain area and 100 year floodplain boundary limits

as a result of the project. Watercourse and wetlands delineation was performed per Army Corp of Engineers protocol and is presented in the Welands Delineation report provided as an attachment to the 401 application. SEZ delineation was performed per TRPA guidelines.

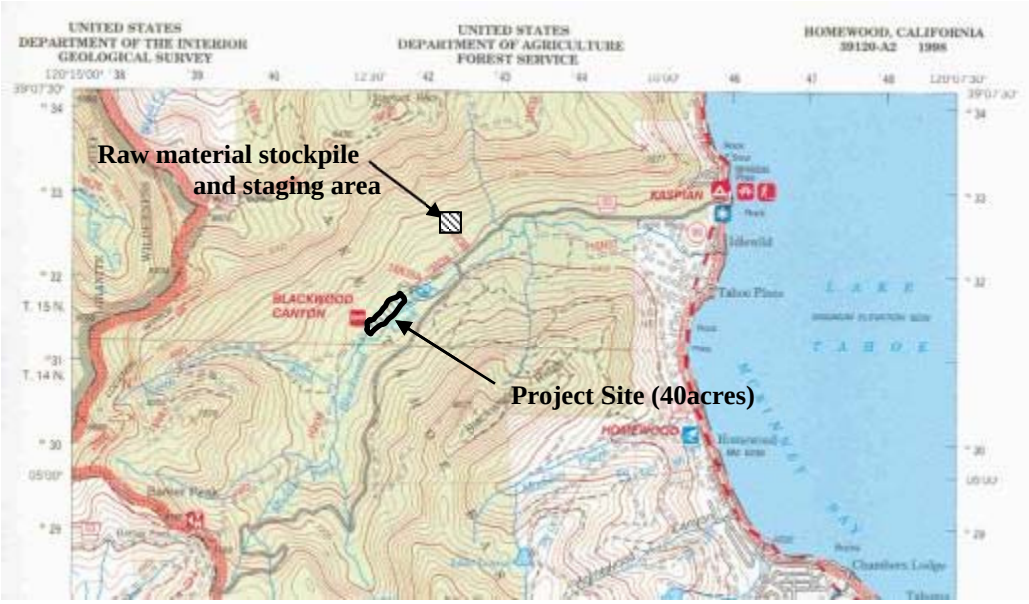


Figure 2: General Vicinity Map

III. Best Management Practices

IIIA. Site Management

The six site management measures to minimize threats to water quality are:

Construction materials (alluvium, imported boulders and logs etc.) – No activity involving the processing, transport, placement, and stabilizing of materials will take place prior to application of BMPs as described in this SWPPP and Engineering Plans and Specifications. Once applied, the BMPs will be inspected and repaired as necessary.

Hazardous Materials (Fuels and Lubricants) – See Section V.F below

Waste Management – Project materials that cannot be reused (fencing erosion fabric, etc.) will be transported off site by dump truck and disposed at the refuse transfer station in South Lake Tahoe, CA. Project personnel will use existing sanitation (bathrooms) and garbage disposal facilities at the OHV campground located at the northeast edge of the project area.

Vehicle Storage – Vehicles and machinery will not be stored in the SEZ or within the limits of the existing 100-year floodplain. Vehicles and machinery will be stored on the non-SEZ portion of project access road TR1 and the pullout or in the raw material stockpile area on FS 1503B.

Vehicle Access Routes – Vehicles and machinery traffic and staging will be confined to the access routes as shown on EPS Sheet C2, or field fit as described in this document. Temporary road routes will not impact sensitive areas or create excessive sedimentation. If routes are

proposed to cross sensitive areas, not already shown on design plans, Waterboard staff will be notified in advance and consulted prior to determining final route location.

Construction Limits - Vehicles and machinery traffic will not be permitted to travel outside the limits of disturbance as shown on EPS Sheet C9.

IIIB. Sediment and Erosion/Stabilization Control

The following information describes construction period activities as well as associated sediment controls and area-specific stabilization measures. Sequencing of operations may overlap or vary depending on site-specific water conditions or unforeseen field conditions. These practices as described are designed to achieve compliance with the National Pollutant Discharge Elimination System (NPDES) Construction Permit (Board Order No. R6T-2011-0019). A field tour with Waterboard and other pertinent permitting agency staff will be scheduled to verify that site conditions have not changed to a degree that a change in either the project design or SWPPP is required. A design and/or SWPPP amendment may be warranted in the case of significant site condition change. It is anticipated that this field tour will take place in early August.

1. Material stockpile/equipment staging area BMPs and hauling.

The LTBMU will use the same stockpile/staging area utilized during 2010 operation, located on FS road 1503B that splits north off of Barker Pass Road (Figure 3).

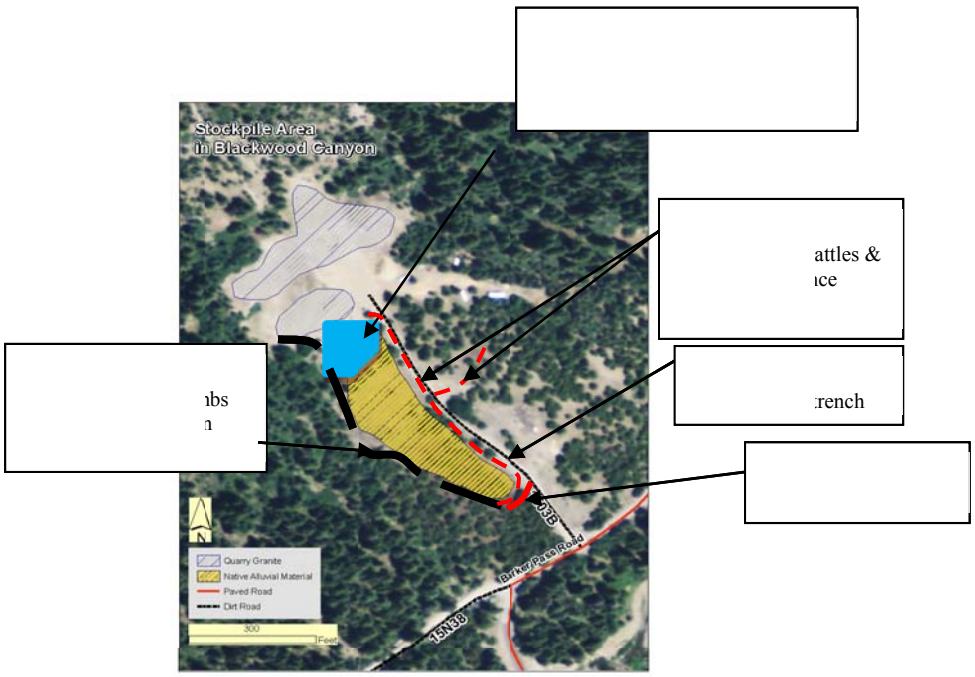


Figure 3 - Stockpile area BMPs

Winterization BMPs installed in 2010 will be inspected and repaired/upgraded as necessary. Boulders, logs, and river alluvium are stockpiled in the area currently. These materials will be delivered by truck from this stockpile area to the restoration area as needed. Boulders consist of

two size classes (48-60" diameter (for use in constructing weirs) & 8-36" diameter (for use in engineered stream bed, floodplain protection sill, and rock slope protection); 8 to 10" diameter rock (technically cobble size) are included as part of the boulder stockpile and will be part of interstitial fill and streambed material mix for this project). Material is clean, blocky quarry granite (plagioclase feldspar to mica ratio suggests that this rock is classified as granite) rock with a specific gravity of 2.5. Based on inspection by the Forest Service, the rock appears to be hard and non-friable, and the durability of the material is appropriate for this application. Haul of the remaining 7 percent of boulders needed for the project (700 tons) will begin once field conditions at the Tragedy Quarry on the El Dorado National Forest, and the boulder stockpile area permit. This area will also be used to stage heavy equipment, maintenance equipment, and fuels/lubricants. The Forest Service will maintain existing BMPs at the alluvial stockpile area as shown in Figure 3. Portions of the existing straw wattles across the access road will be removed and bio-degradable straw wattles with stakes will be staged for control of sediment and runoff from the staging area during storm events. The stockpile area entrance driving surface will be upgraded per specifications and EPS sheet C11.

2. TR1 Access road BMP re-installation, maintenance, and project area fencing

TR1 was created in 2003 (Blackwood Phase I) and used again in 2010 (Blackwood Phase 3B relic berm removal) projects. A portion of the existing TR1 road (from junction of 15N38 for 175 feet down road to the break in slope just past the turnout) will be re-commissioned by pulling back the slash placed on the road for 2010 winterization, and re-compacting the road surface to create a 16-foot wide drivable surface. The final 350 feet of TR1 is located on the terrace and follows an old road prism and will be cleared, grubbed, and compacted to create a drivable surface. TR1 has one vehicle passing pullout located 150 feet from the Barker Pass split as shown on EPS sheet C2.

Silt fence will be installed at the locations shown on EPS C9 per the specifications described on EPS C11. Project area boundary construction fencing will be installed on the TR1 eastern boundary, and the boundary between the conifer harvest area and Middle Fork Barker Pass Road with specifications described on EPS sheet C9.

3. Conifer removal

Approximately 380 conifers will be removed in the area shown on EPS sheet C2. These conifers, including the attached root balls, will be utilized to construct large wood debris structures in both the floodplain and restored channel. Conifers will be removed in two phases as described in the schedule in Figure 1, to facilitate efficient stockpile area management.

Trees will be selected based on considerations to protect soil and water resources, and suitability for constructing wood debris structures as part of this project. However as a secondary benefit, a USFS Biologist will assist a USFS Silviculturist in marking the trees in a manner that may encourage the expansion of existing Aspen stands. A field review of the mark will be conducted with Waterboard staff prior to removal operations. The location of all SEZs have been field verified and flagged prior to conducting any ground disturbing activity, and are illustrated on Figures 4A and 4B.

The goal will be to remove conifers with DBH greater than 8" and less than 24" located near existing Aspen stands as illustrated in Figure 4A. The trees will be pushed over using heavy equipment utilized for the restoration project (excavator or equivalent) and from there whole trees will be transported individually by this equipment to temporary staging areas as shown on EPS sheet C2. The following BMPs will be applied to ensure protection of soil and water resources during conifer removal activities.

- Conifer harvest area SEZs will be flagged and avoided. The location of SEZs was field verified prior to implementation, utilizing SEZ soil and vegetation indicators as defined by TRPA. No naturally occurring seeps or springs were found. Conifers may be removed adjacent to some SEZs to encourage expansion of SEZ vegetation, but the project manager will estimate the area of disturbance based on tree size so that uprooting of trees will not result in soil disturbance within the SEZ. Since SEZ mapping occurred after completion of Final Designs, these features will be mapped and added to Page C2 of the design plans, along with adjustments to project features (such as the west log staging area) as a formal SWPPP amendment, following the pre-project field tour with Waterboard staff described in Section IIIB.

- The following heavy equipment exclusion buffer will be utilized: 75 feet adjacent to the North Blackwood Channel, including twenty five feet from the high floodplain terrace cutbank, whichever is greater; 50 feet adjacent to intermittent (Class II) channels, 25 feet from any identified ephemeral (Class III) channels. All stream channel buffers will be flagged.
- The precise location and distribution of access paths for tree removal has not been determined. Access paths to individual groups of trees will be no greater than 16 feet in width and field fit to remove suitable trees in a manner that results in the smallest overall length of access path possible, in order to minimize unnecessary compaction of forest soils. Access paths will be cleared of vegetation, including trees within the alignment that are greater than 8 inches DBH. The location of haul routes to log stockpile areas will be flagged. Current locations of log stockpile areas on design plans and maps will need to be adjusted based on SEZ verification. Logs will not be stockpiled in SEZs.

- Once access paths are determined, crossings may be required over ephemeral drainages. Temporary Humboldt crossings on ephemeral drainages would be constructed if the access path crossing is located on a part of an ephemeral drainage with well defined channel cut banks. No constructed crossing would be implemented if the access path can be located to cross an ephemeral channel where there are no defined cut banks. If Humboldt crossings are needed, they would be installed and removed when the channels are dry. If channel is not dry at time needed for end of season winterization, dewatering BMPs will be employed prior to crossing removal. Humboldt crossings on ephemeral drainages would also be removed before large (1 inch or greater) forecasted storm events. Any channel bank or bed disturbance resulting from the crossing ephemeral channels would be repaired, and the channel will be returned to pre-existing conditions.

- The LTBMU soil moisture determination protocol will be used to evaluate soil moisture conditions and determine operability prior to tree removal. Samples will be taken at the 2 to 8 inch depth. This determination protocol is presented in Appendix E.

- If 80% or more of the conifer removal treatment area exhibits operable soil moisture conditions, mechanical tree removal operations would begin; however, any areas that exhibit inoperable conditions will be flagged and avoided.

- The following measures will be taken to remove easily detachable sediment from the root wads of removed conifers. Log root wads will be washed with a high pressure hose to remove easily detachable sediment after they are placed in the log staging areas. It is not expected to remove strongly aggregated material that is not easily detached from application of a high pressure hose. This washing will occur during dust abatement, and/or near the end of the workday. Washing will be done at a rate and frequency that does not produce turbid overland flow, soil displacement, saturated conditions or tracking of wet soils off site.

- Trees will be selected for removal so that damage to other trees from falling and transport is minimized. If tree removal results in unavoidable damage to non-marked trees nearby (scarring or limb removal), and a damaged tree is deemed to be a hazard, the LTBMU will remove the tree at that time.

- Upon completion of tree removal log stockpile areas and access paths will be rehabilitated using excavator bucket with teeth to de-compact the soil and eliminate preferential flow paths. Rehabbed surfaces will be mulched and graded to match existing forest floor elevation and contours. Mulch will be applied as described in Design plan revegetation notes page C10. In addition, soils disturbed as a result of uprooting tree root balls will be raked over to smooth out the surface of forest floor, and mulched. Rehabilitation of access paths and other disturbed soils will begin the week following completion of tree removal activities.

4. River Alluvium Substrate Construction

There are two types of alluvial material that will be used as part of construction.

Stream substrate - Harvested alluvial material, screened or augmented as necessary to the specifications for stream substrate defined on EPS sheet C10, will be used to the create the floodplain surface substrate, as well as the engineered streambed material as described below.

Engineered streambed material - Finished stream substrate mixed with boulders to the specification for engineered streambed material defined on EPS sheet C10, will be used to create the bank full channel surface substrate and channel and floodplain grade control sills.

The total volume of <10 inch diameter material needed for the project is 7,300 cubic yards. A total of 12,500 cubic yards was harvested during floodplain restoration operations in 2010. Visual observations of this material suggest that the harvested alluvium obtained during

floodplain restoration operations completed in 2010 is approximately 10-30 percent sand and finer size particles with the remainder consisting of gravels and small cobbles, suggesting that the existing particle size distribution will meet the specifications for stream substrate as defined in EPS sheet C10 with a minimum level of further processing. This material is currently stored in the stockpile area. The following is the sequence of steps needed to test and prepare the river and floodplain fill and channel substrate material.

4.1 Bulk sample sieve analysis will be conducted to determine and verify particle size composition and distribution in the stockpiled harvested alluvium.

- Ten bulk samples will be collected at randomly selected surface locations and depths throughout the stockpiled material. Samples will be collected using a backhoe or power auger with material placed in 5-gallon buckets and sieved in the field using the USFS bulk sample field sieving protocol (USFS, 2001). Results will be reported to Waterboard staff when obtained. Test results will be used to determine whether stockpiled alluvium currently meets the particle size distribution range specifications for the stream substrate as shown in EPS sheet C10, (note* the No. 10 sized class, will be determined through field testing as described below).

- If the substrate does not meet the particle size distribution specifications, then screen to meet EPS sheet C10 specification. Screening operations would take place within a designated area within the stockpile storage area, as shown on Figure 2. Bio-degradable straw wattle or silt fence will be used to contain the resulting spoil pile area from transport of runoff, and dust abatement will be achieved through watering.
- If the substrate still does not meet the particle size distribution specifications, obtain cobble-gravel substrate in specified size gradation from a commercial vendor, and mix as needed until constructed alluvial material meets particle size distribution specifications. Commercial vendors (*Tahoe Sand & Gravel*) have the capacity to provide gravel/cobble particle sizes up to 100 Yd^3at short notice.

4.2 Subsurface substrate testing to a depth of four feet will be conducted to examine the substrate particle size distribution and the vertical distribution of the substrate composition of the existing river deposits. The surface material will be scraped off so that the material tested does not reflect deposition that occurred during disturbed conditions. The depth of this surface layer to scrape off will be based on best professional judgment. This testing of existing substrate composition will be conducted to determine the range of particle size distributions that will be specified for construction of the stream substrate from the stockpile material in step 1.

- A total of nine pits will be constructed in the North Channel and adjacent floodplain with a backhoe to a depth of 4 feet. The resulting spoil pile from each pit will then be thoroughly mixed using both the backhoe and hand tools. A sample will be collected from each separate pit spoil pile (using a backhoe or hand tools) and the material placed in 5-gallon buckets and sieved in the field using the USFS bulk sample field sieving protocol (USFS, 2001). The results from the nine pits will then be analyzed to determine the average range of particle size distributions for the No. 10 size class.

The location of the nine test pits (3 in riffle habitat, 3 in pool habitat, and 3 within approximately 25' of adjacent floodplain) are illustrated on Figure 4B. Locations were chosen based on best professional judgment of those locations that best reflect desired natural condition for testing. Based on this determination, an ingress and egress access path from Barker Pass road to the North Fork Channel for the backhoe was selected to avoid damage to riparian and woody vegetation and ground/channel/floodplain surfaces. The backhoe will only make one entry and exit into the North Fork channel to construct the pits, during operable soil moisture conditions, and will travel primarily within the rocky channel bed of a currently dry intermittent channel, so minimal soil disturbance is expected. All test pits will be refilled. If visible disturbance does occur, soils will be stabilized through a combination of reshaping and mulching as determined appropriate by Project Manager. This work will occur prior to the implementation of any in-channel restoration activities, and either prior to or concurrently with conifer removal activity.

- Additionally, vertical faces of river test plots will be logged to catalogue sedimentary sequencing to a depth of 4 feet. Strata will be logged and segregated into sedimentary units based on depositional character and documented in a manner similar to that shown in "Geology in the Field" (Compton, 1985) pg. 239. Data will be used to document the characteristics of the existing geologic setting.

4.3 The design engineer ((Matt Weld RCE # 62235) will evaluate the data and make a professional determination and recommendation for the particle size distribution for the Rock Specification Notes #3-Stream Substrate No. 10 size class. The USFS will then propose an amendment (with justification) to the SWPPP for this particle size class. The USFS will consult with Waterboard staff to determine whether any amendments to the SWPPP are required as it relates to particle size ranges of constructed substrate.

4.4 Surface roughness testing will be conducted to compare surface roughness of natural vs. constructed surfaces. The surface is defined as the top six inches of stream channel and floodplain surfaces. Tests will be run on existing stream and floodplain surfaces (likely to occur in the North Channel), as well as constructed test plots, per the protocols as presented in Appendix I. Test plots of constructed substrate (approximately 20' X 20'X 1.5'depth) will be installed in the stockpile area using imported boulders and the alluvium material prepared in step 4.1.

Test results will be used to determine whether the constructed surfaces will have comparable or higher levels of roughness when compared to reference site surfaces, after construction and jetting of the test plot surfaces (see Appendix I for roughness metrics). If roughness metrics in the constructed surface substrate are less than that measured in the reference sites, screening or addition of purchased material will be applied until the constructed substrate surface roughness metrics in the test plots are comparable or higher than that measured in existing surfaces.

Stream substrate will be mixed with stockpiled boulders to complete the construction of engineered streambed material per the design plan specifications... Mixing will occur in the stockpile area.

4.5 Stream substrate, engineered stream substrate, and boulders will be placed per EPS sheets C5 and C6. In-channel placement depth will vary to meet (within tolerance shown on plans) the constructed north channel / south channel riffle crests, as well as weir crest profiles elevations shown on EPS sheet C3,4, and 5. Pools will be constructed where shown on EPS sheet C3. Floodplain fill depth will vary based on top of bank elevation related to cross section shape per EPS sheet C6.

5. North Channel & Floodplain Construction

This work will begin when flows in the North Channel have gone subsurface. Prior to construction, the design engineer will lay out grade and feature location stakes with an electronic total station-surveying instrument. Sediment control BMPs for this area include constructing a sediment containment basin (C) per specifications illustrated on EPS sheet C9; basin C location will be field fit based on North Channel flow and site conditions at that time. Silt fence will be installed per EPS sheet C9 to enclose the downstream edge of the basin and along the north-south channel confluence area channel edge.

Restoration actions consist of the following:

- Installing log structures at locations per EPS sheet C4, and detail per EPS sheet C5 Section A,
- Constructing North Channel weirs and grading and with locations and profile detail per EPS sheet C4, and EPS sheet C5 details for Weir Profile, Pool Cross Section B, and Weir Crest Cross Section C;
- Constructing weir extensions at location shown on EPS sheet C4, and EPS sheet C5 details for Weir Extension Section D and Cross Section E.
- Harvest alluvium will be placed in between weir extensions, and will be constructed in lifts per EPS sheet C10 Earthwork Note 4 with stockpiled native alluvium,
- Reshaping and repositioning of a relic berm illustrated by topography on EPS sheet C4, and EPS sheet C5 Cross section E. (This relic berm was constructed during installation of a fish ladder which was removed during a previous phase of Blackwood restoration, and is now being reshaped to allow expansion of the floodplain in this area).
- Finish grade alluvial surfaces will be jetted until surface water runs clear.

6. South Channel – weir and weir extension construction, grading and grade controls

This work will begin when flow along the log structure located approximately 50 feet northwest of the river station 1+00 as shown on EPS sheet C4 falls below 0.5 CFS. Work may begin at a higher flow if soil moisture conditions are conducive to an earlier start date, with utilization of appropriate water controls as described in section IIIC.

To provide sediment and runoff control at this location, an earthen swale will be constructed (per EPS sheet C9) along the bottom of the log structure at river station 1+00. The swale will convey turbid runoff to sediment basin A, in the event that seepage is present during work. The storage/treatment capacity of this swale will be approximately 500 cubic feet. Sediment basin A will also be constructed at the location and dimensions as shown on EPS sheet C9. The total storage capacity of this basin is 2,450 cubic feet. A silt fence will be installed at the location illustrated on EPS sheet C9, just downstream of the constructed swale and Sediment basin A, to act as a secondary containment feature.

Restoration actions consist of the following:

- Adding extensions to existing weirs per EPS sheets C4 and C5 Section D,
- Valley grading, and constructing a log habitat structure with locations shown per EPS sheets C4 and details shown on C8.
- Once construction in the above areas is complete, main channel weir construction with location shown on per EPS sheets C4 and EPS C5 details for Weir Profile, Pool Cross Section B, and Weir Crest Cross Section C will begin.
- Once all the weirs are in place, finish channel surfaces will be constructed in lifts per EPS sheet C10 Earthwork Note 4 with stockpiled native alluvium.
- Finish grade alluvial surfaces will be jetted until surface water runs clear.

When road TR1 is decommissioned, the earthen swale will be obliterated by using an excavator to reshape the earthen material to finish grades. No material to will be removed as a result of this activity. Sediment basin A will remain in place (with all geo-textile material removed), to be obliterated through natural deposition processes.

7. Main South Channel and Floodplain

This work will begin as flows in the South Channel go subsurface, and when North channel work and South Channel weir work has been completed, and when flows at the stream crossing location for the TR2 access road have dropped to 8 cfs or less (located at station 24+00 on EPS sheet C2). Water controls will be implemented as described in section III.C. Prior to construction, the Design Engineer will lay out grade and feature location stakes with an electronic total station-surveying instrument. TR2 and TR3 will be installed through clearing and grubbing of vegetation, and shaping and compaction of the road surface.

The location of TR2 is illustrated on EPS sheet C2. TR3 will be constructed from TR2 to TR1. The exact location of TR3 will be determined by the Design Engineer, Project Manager, and Restoration Crew Leader, based on existing field conditions; the Forest Service will notify Waterboard staff when the exact location is determined. The approximate alignment will likely be within the existing dry channel bed as illustrated on EPS sheets C2 and C9, and riparian vegetation will be avoided or removed. TR3 will be connected to TR1 (which will be extended beyond North Channel river station 5+50 crossing) to create a project area loop road to facilitate safe and efficient material haul operations. A stream crossing will be installed at approximately the location shown near North Channel station 5+50 on EPS C2 Detail 1. TR4 and TR5 off the main access path will be constructed to install floodplain roughness structures. Construction

fencing will be installed along the perimeter of TR4 and TR5 prior to floodplain roughness structure construction operations; the exact location of the no-disturbance areas accessed by TR4 and TR5 may vary slightly to accommodate construction operations or avoid riparian vegetation not shown. Silt fence will be installed at the locations shown on EPS sheet C9 per the specifications described on EPS sheet C11. Project area boundary construction fencing will be installed along the TR2 western boundary with specifications described on EPS sheet C11. Areas of existing floodplain vegetation (cottonwood / willow patches shown on EPS sheet C3) will be preserved and fenced off for protection.

Once access roads and BMPs are installed, restoration actions consist of the following:

- Channel and floodplain fill operations to raise the new channel and floodplain surfaces 3 to 4 feet above existing grades per EPS C10 Earthwork Note 4.
- Finish shaping in areas shown on EPS sheet C3 and detail per EPS sheet C6 sections A and B.
- Construction of log habitat structures per EPS sheet C8 detail, all notes.
- Construction of floodplain roughness structure per EPS sheet C7 detail 3.
- Finish grade alluvial surfaces will be jetted until surface water runs clear.

Contingency: Although this work is planned to occur after construction of the South Channel weirs, a situation may occur where groundwater levels are too high to initiate the South Channel weir work even though surface flows in the South Channel have ceased or can be diverted. In this situation channel and floodplain fill operations above the location of these weirs may begin first. In this scenario, Sediment Basin B would be constructed as illustrated on EPS Sheet C9. The capacity of this basin would be 2,450 cubic feet. This sediment basin would then be removed, once Sediment Basin A was constructed, as part of weir construction. Removal would consist of removal of geotextile and filter fence, and reshaping the earthen material with an excavator to finish grades. If ponded water exists in the Basin at the time of basin removal, due to a prior storm event, this water would be pumped to a suitable upland location as described in Section IIIC of this document.

8. Stream Crossing Installation

Stream crossings will be installed at two locations as illustrated on EPS sheetC2, at South Channel station 24+00 and North Channel station 5+50. Stream crossings will be installed according to the specifications as illustrated on EPS sheet C2, detail 1. The following steps describe sequencing of crossing installation. If flow is present in the channel during crossing installation, water control measures will be implemented as described in Section IIIC. Flow dissipaters will be placed at the base all diversion or crossing pipes throughout the project area. Dissipaters will likely be sand bags filled with coarse alluvial material. Installation will occur as follows:

1. The final location of the stream crossings will be determined in the field by the project leader, restoration crew leader, and design engineer, during staking and layout operations prior to construction. Grading minimization, surface fine sediment deposit avoidance, and disturbance to existing vegetation will be considered during location selection.

2. Install 10-mil industrial standard plastic barrier on surface for road crossing encapsulation. Leave extra barrier material on upstream and downstream ends to tie into filter fence.
3. Place three 12" culvert storm flow pipes on top of plastic barrier, and place non woven geotextile fabric over culvert piles.
4. Place one foot depth of straw over entire length of geotextile fabric.
5. Place road fill consisting of primarily gravels and cobbles with some sand and fines (less than 20%) over the straw layer, and grade to finish grade.

9. Decommissioning Temporary Roads, Stream Crossings, and Stockpile/Staging Area

All temporary roads will be decommissioned by:

- Tilling compacted surfaces on road segments not located on alluvial material within floodplain and channel.

- Reshaping the road prism to match adjacent contours.

- Mulch tilled road surface on road segments not located on alluvial material within floodplain and channel according to specification on EPS Sheet C10.

Road surfaces located on pre-project 100 year floodplain will be reshaped to match adjacent topography, loosened with excavator bucket teeth, and jetted along with rest of disturbed alluvial surfaces within the project.

TR4, TR5 and portions of TR3 will be decommissioned the week following the completion of restoration activities in the areas those roads access.

The stream crossings will be decommissioned by:

- Removing road fill down to the top of the culverts.
- Removing culverts and sandbag headwalls.
- Carefully blading off remaining road fill down to visible surface of straw layer.
- Use hand crews to pull up 10 mil plastic barrier with straw layer on top.

Care will be taken not to tear or rip plastic barrier during fill removal and hand crew operations.

In the event water is present in the creek, water controls will be employed as described in Water Control Section IIIC.

If disturbed surfaces are inadvertently created by heavy equipment in the dry channel bed during stream crossing removal, surfaces will be restored to natural conditions. If sand sized or smaller fill material is deposited on alluvial surfaces, the alluvial surfaces will be jetted to seat fines back into the interstitial spaces between larger river rocks while the crossing segment is isolated from live flows.

The stockpile/staging area will be decommissioned by:

- Rip and till compacted surfaces with bulldozer or excavator with bucket teeth.

- Blade surface and any remaining alluvial material spoil piles to match existing topography.

- Mulch disturbed surfaces with on-site native material from surrounding forest areas (pine needles and slash). Much will be placed to achieve a soil cover of 50%, based on visual estimates.

- Plant with native seed (upland native seed mix grown in the region and supplied locally) to jump-start vegetation colonization.

10. Other BMPs applied throughout Project Area

Road Maintenance

As roadbed materials are displaced during use on access road driving surfaces, they will be maintained by pulling in displaced roadbed material along the road edge and smoothing the road surface using a backhoe with a box scraper or equivalent. Entrance of roads will be maintained according to specifications on rock entrance detail notes on EPS C11.

Dust Abatement

Dust abatement will occur on all project road surfaces, the material stockpile areas, and any soil disturbing activities that are likely to generate dust during excavation operations. A water truck will be utilized to provide water for this purpose. Water will be applied at a rate so as to not produce turbid overland flow, soil displacement, or saturated conditions. The project leader or designated representative will monitor water application to ensure that over-application does not occur.

Dust abatement in construction areas where a water truck cannot be utilized will be accomplished using water pumps and hose-lays from the creek. The creek pumping (sources are from the creek upstream of construction areas and water truck draft point located on creek at Barker Pass Bridge) limit will be 0.5 CFS or less if pumping rate is determined to be impacting aquatic resources, which will be unlikely given the heavy snowpack conditions. All draft hoses will be screened to prevent uptake of fish. Dust abatement watering over disturbed surfaces will be conducted at the end of each work week prior to weekend shutdown.

Field Fits

Filter fence post spacing will be field fit to achieve sediment control objectives. Fence post spacing may vary from the specifications presented on EPS sheet C11 if rocky or dense riparian root mass areas are encountered. In these cases it may be necessary to backfill behind the filter fence to achieve the design ground surface seal.

There may also be a need to add and field fit vehicle passing pullouts on access roads. Any additional pullouts deemed necessary for project efficiency and safety will be identified and discussed with Waterboard staff, and field fit. Pullouts would be designed so that the road is no greater than approximately 32 feet wide for a distance of 50 feet, unless site conditions require greater dimensions.

Field fitting may be required for almost any of the structures illustrated on the design plans if unknown site conditions are encountered during excavation. In cases where this results in a change in the location, size, dimensions, and other specifications on the design plans, such changes will be communicated to Waterboard staff, and documented on SWPPP change log forms.

Planting and Irrigation

Woody riparian shrubs and trees (willow and cottonwood) removed as part of project excavations, and revegetation consisting of willow stakes, willow bunching, and cottonwood poles, may be incorporated per EPS sheet C7 during construction. Once construction is completed, irrigation of planted riparian vegetation will occur as needed to maintain vegetation health.

Winterization

Winterization actions are scheduled as illustrated on Figure 1for finishing of alluvial surfaces and decommissioning. In addition, all filter fencing and project area fencing will be removed according to the schedule in Figure 1. This schedule is designed to complete winterization once work in a given project area is complete, to complete all active project construction by October 1, and to complete the remainder of winterization by October 15th. Phasing of implementation will be closely evaluated throughout the year, and project activities would be delayed until the following year, if we are not able to complete all active project construction by October 1. A variance will be requested by October 1, if emergency conditions warrant.

IIIC. Water controls during construction

The following information describes construction period surface water and reemerging ground water conditions and area specific protection measures. Water control sequencing may overlap or vary depending on site specific water conditions or unforeseen field conditions to implement the project expiditiously. These practices as described are designed to achieve compliance with the National Pollutant Discharge Elimination System (NPDES) Construction Permit (Board Order No. R6T-2011-0009).

Water controls

Water control feature implementation and removal generally will occur as outlined in the project schedule; additional measures may be needed. The Forest Service shall inform the Waterboard staff of changes needed, consultation would occur, and SWPPP amendments would be submitted

as required. The following describes the water controls that will be implemented and amended (if needed) for environmental protection.

- Sediment basins and the earthen swales will be constructed to capture storm water runoff or project-generated turbid flows, as illustrated on EPS sheet C9. The storage capacity of basins A, B and C will be approximately 2,450 cubic feet each, for a total capacity of 7,350 cubic feet. The earthen swale will have a capacity of approximately 500 cubic feet.

- Diversions: If live flows are present in the channel in a location where in-channel work will be implemented (i.e. stream crossings, South Channel structures), coffer dams and/or coffer dams with diversion pipes will be deployed. Coffer dams that do not require diversion pipes will be used to sequester flow temporarily during installation of live stream crossings and installed per EPS sheet C11. In the event that surface water of between 0-8 CFS is present at either of the two stream crossings during installation or removal, pumping to dewater and divert flow with a coffer dam upstream will be required. Coffer dam diversion capacity will be approximately 12 CFS. In the event that lower South Channel flow (ranging from 0 to 8 CFS) is present prior to the planned activities described in section 7 for the Main South Channel**,** water will be diverted along the southern edge of the restoration area from a gravity fed coffer dam and diversion pipe located near the South Channel river Station 5+50, and extending to Station 2+00 . The capacity of the diversion pipe system will be 12 CFS. The approximate sequence for coffer dams and coffer dams with diversion pipes is:

    1. Lay down filter barrier fabric, and lay out first row of sandbags
    2. Temporarily divert surface flow around the project area using pumps and hoses. Diverted flow is expected to be clean, and not generate turbidity..
    3. Build up the coffer dam per EPS sheet C11.
    4. Install pipes in dam (if required for application) per EPS sheet C11.
    5. Install gravel filled sand bag energy dissipaters at pipe outlet, and flow test .
    6. Install stream crossings (also requiring flow testing and outflow dissipaters) as described earlier in this document, or conduct construction associated with diversion as needed.
    7. Once stream construction is complete, temporarily divert surface flow around the project area using pumps and hoses. Then dismantle diversion, and release flow into constructed section. Continue pumping and treating until flow through the disturbance prism is visually clear.
    8. For stream crossings, dismantle crossing in reverse order, using pumps to divert water around the disturbance prism. Wash and treat until disturbance prism water is visually clear.
    9. Release live flow back through disturbance prism.

- Dewatering: If the project site is completely dry and surface flow returns or emerges in the channel within the project area during implementation because of a storm or groundwater interception, the LTBMU will deploy gasoline powered pumps to provide additional water quality protection to prevent the water control treatment systems from exceeding capacity

- Turbid flow control: whenever turbid flows are captured during pumping operation, turbid flows will be pumped to a suitable upland location. Upland locations will likely be located in the conifer harvest area above the North Channel and the cottonwood forest area between the North and South Channels. The specific location where turbid flows will be pumped will depend on where within the project this mitigation is needed, and the site characteristics at that location. Site characteristics such as surface vegetation roughness and direction of surface and subsurface flow paths will be considered in determining the location and distance where turbid water will be pumped, to ensure that surface or subsurface flows are not conveyed back into the project area or channel. The project will have the hose capacity to pump flows as far as 500 feet from the construction area. Pumped flows will be monitored to ensure that flows are infiltrated, and do not result in turbid surface runoff or subsurface seepage back into the channel. Portable pumps will be on site. The capacity of this contingency (based on both pumping and expected infiltration capacity) is 9 cubic feet per second (~2400 gallons per minute). This can be achieved using two four-inch and two two-inch pumps with additional pumps held as backup in case of equipment breakdown.

- Any surface flow generated by project activities (jetting, pumping) during any stage of project operations is expected to infiltrate or be captured by the sediment basin at downstream end of the project. Pumping sediment basins may also be used if sediment basin water capacity is already at 50 percent because of storm flow or unexpected ground water release. Turbid water from the basin will be pumped to the cottonwood – conifer area above the 100 year floodplain between the South and North Channel, and will be monitored to ensure return flows to the channel are not generated. This procedure would also be followed if ponded water is present in sediment basin A or B prior to basin removal.

IIID. Post-Construction Fine Sediment Management Measures

See Project Addendum Note 1 for a discussion on general channel response; processes associated with fine sediment import, storage, and export; and design features that are conducive to fine sediment control at a natural level.

IIIE. Disturbed Soil Areas (DSA)

Project activities are illustrated on the design plans sheet C2. The approximate areas of temporarily disturbed soils shown are: Disturbed Areas = 9 acres of SEZ, 10 acres of non-SEZ, and 3 acres of a non-SEZ stockpile area**.** Within this area of disturbance there is 3,200 linear feet of fill at a total fill volume of 5,000 CY within the stream channel, and 3,200 linear feet of fill at at total fill volume of 13,000 CY within the riparian area adjacent to the stream channel.

IV. BMP Inspection, Maintenance, and Rain Event Action Plans

IVA. BMP Inspection and Maintenance

Project area BMPs, storm water, and project area water controls will be inspected daily by a designated SWPPP practioner (QSP). Inspections will be documented on the daily BMP inspection logs presented in Appendix C and stored on site. Inspection logs will be reviewed by the project manager (or designated representative) before the end of each day to review deficiencies and initiate corrective measures as needed.

IVB. Rain Event Action Plan (REAP)

Precipitation forecasts will be monitored daily by the Project Manager or designated representative throughout project implementation. When a storm event with a >30% chance of precipitation is predicted by NOAA, or when visual observations indicate that an event is imminent, a Rain Event Action Plan (REAP-Appendix F) will be prepared in accordance with guidance provided in the General Permit. The REAP will be conducted in sufficient time prior to the event to evaluate whether additional measures are needed to stabilize the site in preparation for the event. All copies of completed REAP forms will be stored on site with the daily inspection logs.

V. Construction Site Monitoring and Reporting Plan (CSMRP)

VA. Purpose

Site monitoring and reporting is conducted to 1) document that the project is built to specifications; 2) document instances of water quality / impacts; and 3) document actions taken to mitigate impacts.

VB. Visual Monitoring (Inspections)

Visual monitoring and BMP inspections will be conducted daily, including 24 hours prior to a forecasted rain event in areas where active construction is occurring, and project area wide following rain events. Monitoring will be conducted by a qualified SWPPP practitioner (QSP) or personnel that the QSP designates, and will be reviewed by a QSP and Project Managers. Daily inspection forms presented in Appendix C of this SWPPP will be kept in a log book on site and will contain information as outlined in Section 3 Part 4 of Attachment C of the NPDES #CAGS616002.

The SWPPP and design plans, and complete copy of the General Permit will be kept on site for easy reference and to ensure monitoring is performed to the required specifications.

In addition visual monitoring of soil and water protection BMPs utilized as part of conifer removal activities will also be conducted, according to requirements as described in Attachment O of the 2009 Lahontan Timber Waiver. This includes 3 components, Implementation Checklist monitoring, random regional Best Management Practices Evaluation Program (BMPEP) monitoring, and focused BMPEP monitoring. Implementation checklist monitoring will be conducted utilizing the BMP implementation checklist also presented in Appendix D of this

SWPPP. The protocols for LTBMU's vegetation mangement project implementation monitoring program have been sent to the Waterboard seperately from this SWPPP (Vegetation Management Projects Implementation Monitoring Program protocol, Updated January 3, 2011). This checklist will be utilized immediately prior to implementation of conifer removal activities, 24 hours prior to forecasted rain events, and after winterization/project closeout BMPS have been implemented.

The conifer removal area will also be included in the pool for random selection to achieve USFS regionally assigned targets for the BMPEP program pertaining to vegetation management activities.

And finally, because Blackwood Creek meets the definition of a high risk watershed as described in the 2009 Timber Waiver, a focused BMPEP evaluation will be conducted during implementation within the conifer removal area for T01- Streamside management zones. This protocol will evaluate the implementation and effectiveness of prescribed SEZ and watercourse flagging and avoidance.

VC. Water Quality Sampling and Analysis

A turbidity sampling plan (Appendix G) will be deployed if an actual discharge to surface waters occurs during project implementation, or if surface flows are present in stream channels exiting the project area. Visual monitoring and turbidity sampling will continue post-construction during rain events, until the first winter season snow event or November 15, whichever occurs earlier.

There are no identified sources for non-visible pollutants that have the potential to contaminate storm water, so no monitoring is proposed for non-visible constituents.

Sampling of non-stormwater discharges will be conducted when there is a breach, malfunction, leakage, or spill observed which could result in the discharge for pollutants to surface waters. In the event of a non-stormwater discharge an analytical laboratory will be contacted to collect samples.

VD. Watershed Monitoring Option

This project is designed to comply with the requirement of the Blackwood Bedded Sediment TMDL. A project effectiveness monitoring plan (Appendix H) has been developed and will be implemented to evaluate the degree to which short and long term TMDL targets are being met. This plan also meets the monitoring requirements for regulatory permitting as it relates to restoration effectiveness.

VE. Quality Assurance and Quality Control

All monitoring data will be collected following established protocols and guidance as identified throughout the document.

Documentation for samples that will be analyzed by a laboratory will include the following:

- Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location.
- Chain of Custody (CoC): Sampling personnel shall complete the CoC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the CoC when the sample(s) is turned over to the testing laboratory or courier.

VF. Mitigation Measures for Hazards and Hazardous Materials

The following summarizes the notifications and actions that will be followed for incidents related to hazardous spills. LTBMU personnel are not expected to engage in the determination or cleanup of significant large-scale hazardous spills (significant in this case is defined as a release of a hazardous material of a volume that exceeds the capability of the on-site spill cache), but rather to follow the appropriate procedures to quickly notify the appropriate qualified agencies and/or contractors. It is important that every LTBMU employee know that they are not to touch, smell, taste or in any way make physical contact with possible or known hazardous materials.

The notification process, related to emergency spill situations, is summarized in the LTBMU Spill Plan (LTBMU, 2010), and this plan will be readily available at the project site, along with this SWPPP. This plan is available to all LTBMU employees and Camino Dispatch, and is posted on the internal LTBMU website.

The requirements for the protection of the environment from hazardous materials (diesel fuel, motor oil, gasoline, and hydraulic fluids) are:

1. Fuels, oils, and hydraulic fluid may not be stored anywhere with the 100 year floodplain or SEZs.
2. All personnel vehicles will be steam cleaned prior to entering the construction area; rented heavy machinery will be steam cleaned prior to delivery.
3. All refueling and routine servicing for heavy equipment shall be performed outside the 100 year floodplain on TR1.
4. All other machinery will be serviced and fueled outside the SEZ. Fuels and lubricants for light machinery will be stored outside the SEZ in weatherproof containers which are not in direct contact with the ground. Containers will be stored in a lockbox adjacent to the pullout on TR1.
5. All motorized equipment shall be parked overnight, on weekends and during other periods of shutdown outside both the existing 100-year floodplain and SEZs.
6. The Forest Service shall store within the designated staging area a spill cache with sorbent pads. No construction operations are allowed until the spill cache is in place. The cache must be stored in weatherproof container. Any sorbent materials used must be replaced within 10 days.
7. All used sorbent materials may not be stored within the project area and must be disposed in accordance with Federal, State, and local laws and regulations.
8. Any spill of fuel or lubricants must be reported immediately QSP, QSP designate, or project leader.

9. The USFS shall cease all operations and devote on-site contracted and non-contracted personnel to the containment of any spill until such time as all reasonable measures have been taken.

MSDS for Fuels and Lubricants are provided in Appendix J. Additionally, equipment contractors and non-–LTBMU heavy machinery personnel will provide their own non-emergency hazardous spill prevention and cleanup plan, which will be reviewed by the project manager as part of contractor selection and award, to ensure compliance with the NPDES permit requirements.

VG. Non-Compliance Reporting

The LTBMU will contact the Waterboard if an unpermitted discharge off the project site into a live water course occurs. The LTBMU will brief Waterboard staff of the magnitude, extent and duration of the discharge and any remedial measures taken within 24 hours of the incident via email and/or direct contact. Details will be included in the daily inspection log at the project site.

VH. Annual Report

If project completion is delayed, the LTBMU will file an annual report in the SMARTS database by November 30 following project site winte rization. Information will comply with minimum reporting requirements as described in Section VII of Attachment of the NPDES general reporting requirements.

VI. Final Report

The LTBMU will file a final report in the SMARTS database following project completion. Information will comply with minimum reporting requirements as described in Section VIII of Attachment C of the NPDES general reporting requirement.

APPENDIX A – SWPPP AMENDMENT LOG FORM

DATE:

LOCATION (RIVER STATION):

ACTION / JUSTIFICATION:

WATERBOARD CONTACT / CORRESPONDENCE:

APPENDIX B – PROJECT PLANS AND SPECIFICATIONS

(SUBMITTED AS SEPARATE ELECTRONIC FILE)

APPENDIX C – VISUAL INSPECTIONS AND MONITORING FORMS

FEATURE INSPECTED	DISCREPANCY DETECTED (YES/NO)
DAMAGE TO CONTAINMENT MEASURES OR EROSION CONTROL FENCING	
IMPROPERLY INSTALLED OR INEFFECTIVE EROSION CONTROL FENCING / BOUNDARY FENCE TAMPERING	
UNAUTHORIZED VEHICLE ACCESS OR VEHICLE ACCESS INTO A "NO DISTURBANCE AREA	
DISTURBED AREAS WITH INADEQUATE EROSION PREVENTION AND SEDIMENT CONTROL PROTECTION	
EVIDENCE OF ANY SEDIMENT LEAKAGE THROUGH EROSION CONTROL FENCING OR CONTAINMENT DIKES / APPROXIMATE % OF SEDIMENT BASIN CAPACITY FILLED IF WATER IS PRESENT	
SEDIMENT PILES LEFT UNPROTECTED OR LOCATED IN A DRAINAGE WAY.	
SPILLED OR IMPROPERLY STORED HAZARDOUS MATERIALS	
UPSTREAM RUNOFF DIVERSION STRUCTURES ARE IN PLACE AND FUNCTIONAL	
ANY EVIDENCE OF SEDIMENT TRACKING FROM CONSTRUCTION EQUIPMENT	
ANY SIGNS OF SOIL EROSION OR DEPOSITION DOWNGRADIENT FROM RUNOFF DISCHARGES	
SEDIMENT ACCUMULATION WITHIN ONSITE WATER DRAINAGE CONTROL STRUCTURES.	
ANY EVIDENCE OF ILLICIT, NOT AUTHORIZED, OR AUTHORIZED NON-STORM WATER DISCHARGES.	
ANY OBSERVED IMPACTS TO A RECEIVING WATER	

A YES ANSWER TO ANY OF THESE QUESTIONS WILL BE FOLLOWED BY A DOCUMENTED EXPLANATION AND DESCRIPTION OF REMEDIAL ACTION TAKEN.

DATE: TIME: OBSERVER:

INCIDENT(S):

Feature inspected

Discrepancy detected (yes)/no)

WEATHER CONDITIONS

BMP LOCATION AND PHOTO OF INCIDENT:

REMEDIAL ACTION(S):

DATE OF COMPLETED REMEDIAL ACTION:

SIGNATURE OF OBSERVER:

APPENDIX D – BMP IMPLEMENTATION CHECKLIST
BLACKWOOD CONIFER REMOVAL AREA

Name of Evaluator:

Date of Evaluation:

Type of Evaluation (check one):

(I)Pre-Implementation_____

(S)Post-Storm Event_____

(D) During Implementation_____(2wks after start)

(W)Post Winterization_____

Type	Design Features and BMPs	Yes	No	Comment
I,D	The following heavy equipment exclusion buffer will be utilized: 75 feet adjacent to the North Blackwood Channel, including twenty five feet from the high floodplain terrace cutbank, whichever is greater; 50 feet adjacent to intermittent (Class II) channels, 25 feet from any identified ephemeral (Class III) channels. All steam channel buffers will be flagged.			
I,D	SEZs will be flagged and avoided as displayed on EPS C2. Current SEZ delineation is based on existing riparian vegetation GIS layers. The location of SEZs will be field verified prior to implementation, utilizing SEZ vegetation indicators as defined by TRPA. Conifers may be removed immediately adjacent to some SEZs to encourage expansion of SEZ vegetation.			
D	The precise location and distribution of access paths for tree removal has not been determined. Access paths to individual groups of trees will be no greater than 16 feet in width and field fit to remove suitable trees in a manner that results in the smallest overall length of access path possible, in order to minimize unnecessary compaction of forest soils.			
I,S	Soil moisture measured between 2 and 8 inches in depth will be in the operable range in areas where mechanical equipment will be used (see attached table).			
I,S	If 80% or more of the conifer removal treatment area exhibits operable soil moisture conditions, mechanical tree removal operations would begin, however any areas that exhibit inoperable conditions will be flagged and avoided.			

W	Upon completion of tree removal, all staging areas and access paths will be rehabilitated using excavator buckets with teeeth to de-compact the soil and eliminate preferential flow paths. Ripped surfaces will be mulched with o- site native materials (pine needles and slash) and graded to match existing forest floor elevation and contours. In addition, soils disturbed as a result of uprooting tree root balls will be raked over to smooth out surface of forest floor, and mulched. Rehabilitation of access paths and other disturbed soils will begin the week following completion of tree removal activities.			

Additional Comments:

APPENDIX E - WET SOILS CHECK REFERENCE SHEET

	Coarse Soils	**Light Soils**
Soil Moisture % Increases Downward	Loamy sands, fine sand loam, very fine sands, coarse sands	Fine sandy loams, sandy loams, very fine sandy loam
Dry soils	Dry, loose, single grained flows thru fingers	Dry, loose, flows thru fingers
Moist soil	Still appears dry, will not form a ball with pressure	Still appears to be dry; will not form a ball
Moist soil	Still appears dry, will not form a ball with pressure	Tends to ball under pressure but seldom will hold together
Very moist soil	Tends to stick together slightly, sometimes forms a very weak ball	Forms a weak ball breaks easily, will not stick. Plastic limit or non-plastic.
Wet soils	Upon squeezing, free water may appear. Wet outline is left on hand. Non-plastic.	Upon squeezing free water may appear. Wet outline left on hand.

Soils too Wet, No Mechanical Equipment

APPENDIX F - RAIN EVENT ACTION PLAN (REAP)

1. Date:	2. Project name & WDID #:
3. Date rain predicted to occur:	4. Predicted % chance of rain (conduct REAP if NOAA predicts minimum 30% chance of precipitation). .
5. Site information: Site name, location (address, physical description, nearest landmark and/or access point)	
6. Project storm water manager information: Name, Company, Phone # (24/7)	
7. Review information & scheduling: ☐ Inform site personnel of predicted rain ☐ Check scheduled activities and reschedule as needed ☐ Alert erosion/sediment control provider (if applicable) ☐ Alert sample collection contractor (if applicable) ☐ Schedule staff for extended rain inspections (including weekends & holidays) ☐ Check erosion and sediment control (ESC) material stock ☐ Review BMP map/SWPPP ☐ Other_____ ☐ _____	

□ _____

8. Record all active and inactive disturbed soil areas (DSAs), material storage areas, stockpiles, vehicle and equipment storage and maintenance areas, and waste management areas. Cross-reference to BMP plans by sheet #.

For each area, list action items to perform and areas to review prior to the rain event. Potential action and review items are included in item 10, below.

DSA/Sheet #	Action(s) needed	Responsible party
Inspected by		
DSA/Sheet #	Action(s) needed	Responsible party
Inspected by		

DSA/Sheet #	Action(s) needed	Responsible party
Inspected by		
DSA/Sheet #	Action(s) needed	Responsible party
Inspected by		

DSA/Sheet #	Action(s) needed	Responsible party
Inspected by		
DSA/Sheet #	Action(s) needed	Responsible party
Inspected by		
Stockpile/Sheet #	Action(s) needed	Responsible party
Inspected by		
Stockpile/Sheet #	Action(s) needed	Responsible party
Inspected by		
Stockpile/Sheet #	Action(s) needed	Responsible party
Inspected by		
Vehicle and equipment storage area/Sheet #	Action(s) needed	Responsible party
Inspected by		
Waste management area/Sheet #	Action(s) needed	Responsible party
Inspected by		

9. Describe locations and amounts of additional rain event erosion and sediment control materials needed to carry out REAP:

10. Potential action & review items

10a. Review site BMPs

- Adequate capacity in sediment basins and traps
- Site perimeter controls in place
- Disturbed area controls in place
- Catch basin and drop inlet protection in place and cleaned
- Temporary erosion controls deployed and installed per specification
- Temporary perimeter controls deployed around disturbed areas and stockpiles
- Roads swept; site ingress and egress points stabilized
- Other:_____

_____

10b. Material storage/stockpile areas

- Material under cover or stored
- Perimeter control around stockpiles
- Other:_____
- _____
- _____

10c. Waste management areas

- Dumpsters closed
- Drain holes plugged
- Recycling bins covered
- Concrete wash-out stations covered
- Sanitary stations bermed and protected from tipping
- Other_____
- _____
- _____

10d. Spill and drips

- All incident spills and drips, including paint, stucco, fuel, and oil cleaned
- Drip pans emptied
- Other_____
- _____
- _____

11. Attach a printout of the weather forecast from the NOAA website to the REAP. Insert REAP in SWPPP.

12. Certification:

I certify under penalty of law that this Rain Event Action Plan (REAP) will be performed in accordance with the General Permit by me or under my direction or supervision.

Designated SWPPP Practitioner signature, date, printed name

APPENDIX G – WATER QUALITY (TURBIDITY) SAMPLING PLAN

This sampling and analysis plan describes the strategy for sampling and analyzing stream flow turbidity during construction of the project in order to ensure compliance with state water quality standards.

Scope of Monitoring Activities

Discharge from the site due to rain events will be sampled if flow is observed in the creek flowing through the project area, or direct discharge to surface waters is observed, Based on previous observations of channel hydrology in this intermittent reach of Blackwood creek, the channel is still expected to be dry for most 2011 implementation actions. In the event that surface water is present, the Forest Service will collect samples above and below the project once a day in the afternoon and or until surface flow ceases. If there is evidence of direct discharge of storm water to surface water from, the detention basin outlets, samples will also be collected from this discharge. A minimum of three samples per day will be collected for each day that storm water is discharged offsite. If fewer than three discharge points are present at the site, at least three samples shall be collected from the discharge locations(s).

Sampling Locations

Sampling locations will be established by the project manager prior to construction activities. Sampling locations are based on proximity to identified discharge, accessibility for sampling, personnel safety, and other factors. Once sampling locations are established, they these will be documented in a SWPPP amendment.

SAMPLE COLLECTION AND HANDLING

A clean collection device will be used to collect water samples in or near the main current, which will then be transferred to clearly identified sample bottles. Sampling equipment will be decontaminated properly prior to sample collection.

Collecting water samples directly from ponded, sluggish, or stagnant water will be avoided.

To reduce potential contamination, sample collection personnel will:

- Don a pair of surgical gloves prior to the collection and handling of each sample at each location.
- Not contaminate the inside of the sample bottle by allowing it to come in contact with any material other than the water sample.
- Discard sample bottles or sample lids that have been dropped on the ground.
- Not allow falling or dripping rainwater to enter sample containers.
- Not eat, smoke, or drink during sample collection.

Field Analysis

Water samples will be analyzed for turbidity (in NTUs) in the field using hand held Turbidimeters. Sample, analysis, and equipment calibration will be in accordance with manufacturer's specifications.

- The instruments will be maintained in accordance with manufacturer's instructions.
- The instrument(s) will be calibrated before each sampling and analysis event or daily (maximum).
- Maintenance and calibration records will be maintained with the SWPPP.

DATA MANAGEMENT AND REPORTING

Turbidity sample results (in NTUs) will be recorded in a daily log maintained at the construction site. Data will be available for review upon request. Once the project is complete, this data will be entered into an electronic spreadsheet for analysis and reporting.

Data Evaluation

The downstream water quality sample analytical results will be evaluated to determine if the downstream sample(s) exceeds 3 NTUs or a > 10% increase in turbidity relative to the levels found in the upstream (control) sample, whichever is greater; or exceeding a 24-hour arithmetic average of 20 Nephelometric Turbidity Units (NTU) during project implementation for a stormwater event.

If the downstream sample concentrations exceed the above established standard, the Forest Service will evaluate the BMPs, site conditions, and surrounding influences to determine the probable cause for the increase, and take corrective actions as necessary.

If turbidity sampling exceeds a 24-hour arithmetic average of 20 NTUs then the QSP shall report the sampling results to the SMARTS database within 5 days.

CHANGE OF CONDITIONS

Whenever the SWPPP monitoring indicates a change in site conditions that might affect the appropriateness of sampling locations, sampling locations and protocols will be revised accordingly. All such revisions will be recorded as amendments to the SWPPP, and reported by email to Waterboard staff within two business days.

APPENDIX H – BLACKWOOD CREEK MONITORING PLAN

(submitted in separate electronic file)

APPENDIX I – ALLUVIAL AND NATURAL SUBSTRATE ANALYSIS AND TESTING

The LTBMU is taking material (sediment) that was once streambed substrate, handling it extensively (lots of mixing), placing it back in the stream channel, and modifying it through jetting such that it is functionally equivalent to natural streambed. Most gravel bed streams develop an armor layer through winnowing of fines from the surface, and surface particle size distributions tend to be coarser than sub-surface (Figure 1 from Kondolf 2003). So, in effect, jetting takes the place of natural hydraulics in development of the armor layer.

Figure 1. Typical surface versus subsurface particle size characteristics in gravel bed river substrate.

Currently we have the engineering criterion of a maximum of 20% fines by weight to provide required streambed permeability characteristics. Unfortunately, we have no information on natural surface or subsurface substrate characteristics in the project area or in a similar geomorphic setting nearby at this time. These data will serve as baseline characteristics for comparison with the constructed channel. Therefore preconstruction field data (surface and bulk sampling) in the project area also will be included so that we can answer these two questions:

- What proportion of the streambed is covered by fines <4mm in a natural nearby setting and how does this compare with the fines proportion in the constructed bank full channel? This is important as it is reflective of the amount of fine material that may be mobilized by subsequent high flows.

- What is the roughness or particle protrusion of the streambed in a nearby natural setting and how does this compare with the surface roughness and particle protrusion characteristics of the constructed bank full channel? This is important because the degree to which gravel or cobble components are distinct on the bed from a surrounding matrix of finer particles determines whether or not shadowing fines which discourage mobilization at lower discharges, occurs.

Sampling Methodology

Test plots for stockpiled substrates will be constructed as described earlier in Section IIIB of the SWPPP. Sampling in the natural river channel will be taken earlier prior to construction activities, as soon as portions of the reach have dried. Additionally, vertical faces of river test plots will be logged to verify substrate heterogeneity or homogeneity.

For natural channel sites, select two units for surface sampling from each of these strata (two riffles, two pools, two floodplain areas) in both the constructed (once constructed and jetted) and natural areas; quantifying the of variability within strata in the natural and constructed areas; depending on analysis of data, more units may be required. We will apply two sampling protocols:

1) Wolman pebble counts within each unit, with 100 particles being sampled within each geomorphic unit. Particles would be selected based on a random walk pattern, with samples taken at systematic intervals (every 3 ft or two steps) as described by Kondolf (2003). The fine particle cutoff for pebble counts is typically <4mm.

2) Roughness data collected by sampling with a random hoop throw within the geomorphic unit. The data collected within the hoop throw would be number of free matrix particles, and the depth to embeddedness (DTE) of all embedded gravel and larger size particles. At least four random hoops should be sampled, with the goal of measuring DTE of at least 100 particles. Because all of this work can be done in the dry, measuring DTE should be relatively straightforward, from the top of the particle perpendicular to the surrounding plane of embeddedness as described in Sylte and Fischenich (2002).

Results Analysis

Standards for meeting stream roughness criteria are:

- Pebble counts
    - Calculate percent finer than 4mm. Also plot particle size distribution curves.
    - Standard: constructed streambed will have a comparatively similar percent fines. Also, particle distribution curves will be compared visually and constructed channels should exhibit similar or coarser distributions.
- Free matrix particles
    - Calculate average free matrix particles per hoop.
    - Standard: constructed streambed will have a comparatively similar or higher mean number of free matrix particles.
- DTE
    - Calculate mean DTE and statistics of variability

- Standard: Constructed streambed will have a comparatively similar or higher mean DTE.

Cobble-gravel substrate will be added to constructed bank full channel surfaces if these standards are not met.

APPENDIX J – MSDS FOR FUELS AND LUBRICANTS

(separate electronic file)

APPENDIX K – SWPPP CERTIFICATION

Qualified SWPPP Developer

Project name: Blackwood Creek Stream and Floodplain Restoration Project Site IIIB

"This Stormwater Pollution Prevention Plan and Appendices were prepared under my direction to meet the requirements of the Construction General Permit for Storm Water discharge in the Lake Tahoe Hydrologic Unit (Board Order No R6T-2011-0019). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

QSD Signature

2/22/12

Date

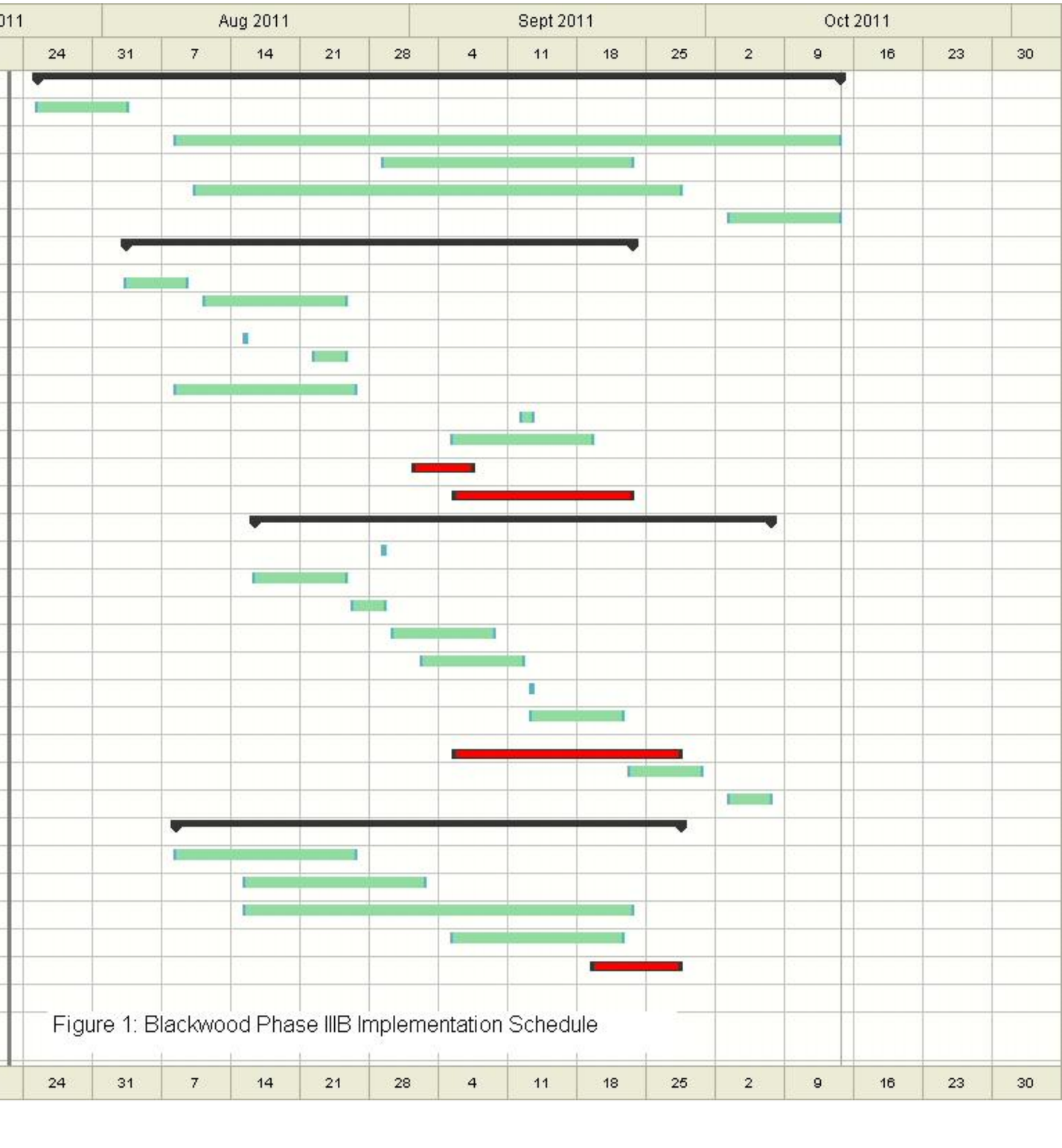
Matt W. Weld, Principal Engineer, QSD #01091

QSD Name and Title

(831) 421-9291 / (831) 566-8486

Telephone Number

Activity Name	Start Date	Finish Date
Labor Crew	7/25/11	10/14/11
BMP installation at conifer harvest area	7/25/11	8/3/11
Water control BMPs installation,maintanence, and winterization	8/8/11	10/14/11
Place salvaged vegetation	8/29/11	9/23/11
Moisturizing of lifts and jetting of finish surface materials.	8/10/11	9/28/11
BMP removal using hand crews (fencing, coir log installation, filter fabric disposal etc..)	10/3/11	10/14/11
Wood Crew (EXC 1&2)	8/3/11	9/23/11
Clear temp roads TR1 & part of TR2 (if necessary)	8/3/11	8/9/11
Remove and stockpile conifers	8/11/11	8/25/11
Construct sediment basin C	8/15/11	8/15/11
Install north channel wood structure next to existing berm near north channel river station 6+00	8/22/11	8/25/11
Wood structure construction in north channel and on floodplain, at confluence	8/8/11	8/26/11
Install TR4 and TR5	9/12/11	9/13/11
Remove and stockpile conifers	9/5/11	9/19/11
Finish TR2 (if necessary) & install TR3	9/1/11	9/7/11
Install channel and floodplain structures (main south channel)	9/5/11	9/23/11
Rock Crew (EXC 2&3)	8/16/11	10/7/11
Sediment basin A and earthen swale construction	8/29/11	8/29/11
Relocate berm and place rock slope protection at lower edge of berm	8/16/11	8/25/11
Log structure construction at downstream end of project	8/26/11	8/29/11
Existing weir extension construction (river station 1+00 to 3+00)	8/30/11	9/9/11
Weir construction at the lower end of north / south channels (river station 4+00)	9/2/11	9/12/11
Sediment basin B decomission	9/13/11	9/13/11
Weir construction at the upper end of north / south channels (river station 4+50)	9/13/11	9/22/11
Channel and floodplain construction (main south channel) (above river station 4+50)	9/5/11	9/28/11
Decomission access roads without stream crossings	9/23/11	9/30/11
Decomission access roads with stream crossings	10/3/11	10/7/11
Earthen Material Processing (EXC 1)	8/8/11	9/28/11
Substrate screening	8/8/11	8/26/11
Engineered substrate mixing	8/15/11	9/2/11
Transport fill for in-channel construction areas	8/15/11	9/23/11
Provide weir boulders for construction	9/5/11	9/22/11
Transport and place engineered stream substrate (main south channel)	9/19/11	9/28/11



Note: Red bar denotes activites for which timing is still uncertain based on current hydrologic conditions.

Figure 1: Blackwood Phase IIIB Implementation Schedule

LEGEND

EXISTING CONDITIONS 100–YEAR WATER SURFACE BOUNDARY

EXISTING SEZ BOUNDARY

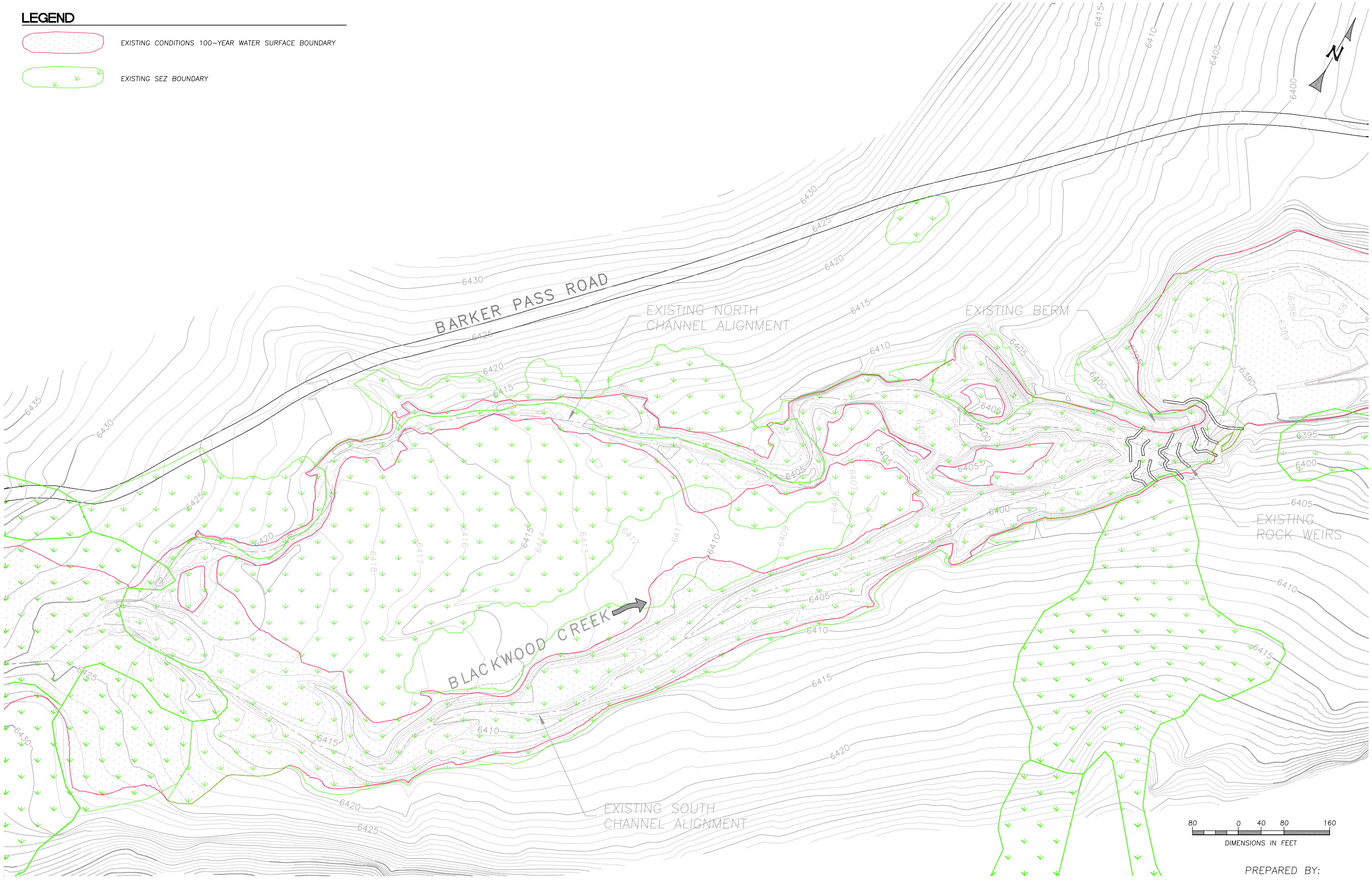


FIGURE 4A - BLACKWOOD REACH 1 - EXISTING CONDITIONS OVERVIEW

PREPARED BY:
WATERWAYS
CONSULTING INC.

LEGEND

PROPOSED CONDITIONS 100-YEAR WATER SURFACE BOUNDARY

AREA OF FLOODPLAIN EXPANSION (9.1 ACRES)

EXISTING SEZ BOUNDARY

TEMPORARY ACCESS ROAD TO BED SAMPLING LOCATIONS

BSP-6 PROPOSED BED SAMPLING LOCATION

TEMPORARY ACCESS ROAD TO BED SAMPLING LOCATIONS

BARKER PASS ROAD

EXISTING NORTH CHANNEL ALIGNMENT

EXISTING BERM

BSP-1

BSP-2

BSP-3

BSP-4

BSP-5

BSP-6

BSP-7

BSP-8

BSP-9

BLACKWOOD CREEK

EXISTING SOUTH CHANNEL ALIGNMENT

EXISTING ROCK WEIRS

80 0 40 80 160

DIMENSIONS IS FEET

PREPARED BY:

WATERWAYS CONSULTING INC.

FIGURE 4B - BLACKWOOD REACH 1 - PROPOSED 100-YR WATER SURFACE BOUNDARY AND FLOODPLAIN EXPANSION AREA OVERVIEW