CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000

WASTE DISCHARGE REQUIREMENTS

FOR

HEAVENLY MOUNTAIN RESORT

EL DORADO AND ALPINE COUNTIES

The California Regional Water Quality Control Board, Lahontan Region (Water Board) finds:

1. Discharger
   VAILRESORTS® (Heavenly) operates Heavenly Mountain Resort (Facility), located mostly on lands owned or administered by the United States Department of Agriculture Forest Service – Lake Tahoe Basin Management Unit (LTBMU). On May 7, 2002, the LTBMU issued a 40-year Special Use Permit for Heavenly's operations on its lands. Heavenly owns and operates the California Base Area, which includes a ski lodge, associated parking lots, and a small portion of the adjacent ski lifts and slopes. Heavenly also owns the Gondola Base station at Stateline that services the upper mountain, but the Gondola Base Station is not part of the facility regulated under this Order. The City of South Lake Tahoe (CSLT) owns and shares with Heavenly the maintenance of the roads providing access to the California Base Area, except for a portion of Wildwood Avenue (south of Saddle Road), which Heavenly owns. For the purpose of this Order, Heavenly and the LTBMU are "dischargers."

2. Facility Location
   Heavenly is located south of Lake Tahoe in both California and Nevada (Figure 1). More than 90 percent of the California portion of the resort is within El Dorado County and the remaining portion is in Alpine County. The California portion of the Facility is located in the South Tahoe Hydrologic Area (HU 634.10) of the Lake Tahoe Hydrologic Unit and the Woodfords Hydrologic Area (HU 633.10) of the West Fork Carson River Hydrologic Unit in Section 1, T.12N., RI8E.; Sections 6 and 7, T.12N., R 19E.; and Sections 27, 35, and 36, T.13N., R 18E., MDB&M. The California Base is located south of Saddle Road, between Wildwood Avenue and Keller Road.

3. History of Previous Regulation by the Water Board
   The Water Board has regulated storm water and authorized non-storm water discharges from the Facility in a series of Orders since 1970. Most recently, the Water Board updated Waste Discharge Requirements (WDRs) for the Heavenly Ski Area on July 9, 2003 and included requirements to implement the Heavenly Valley Creek Total Maximum Daily Load (TMDL) for sediment, which became effective September 2002.

This Order supersedes and rescinds previous Order R6T-2003-0032, as amended, upon the effective date of this Order except for enforcement purposes.

4. Reason for Action

Heavenly proposes to expand summer recreational activities within the limits of the developed ski area in response to the Ski Area Recreational Opportunity Enhancement Act (SAROEA), which was enacted by Congress in November 2011. The Act amended the National Forest Ski Area Permit Act of 1986 to provide public policy direction to, and authority for, the Forest Service to approve facilities to support summer and year-round natural resource-based recreation at ski areas. The Act recognizes the public benefits to be gained from expanding public access to year-round recreation opportunities in developed ski areas, including additional employment and economic activity for communities with public-land ski areas. Heavenly is implementing its Epic Discovery Project (Project), which adds recreational attractions and activities to be used primarily in the summer season.

Increased summer use at ski areas in recent years has been driven by new technologies and the growing number of people seeking outdoor recreational activities in more managed settings. In response to the policy direction and to visitor preferences, Heavenly has previously implemented a number of outdoor environment-based recreation activities including ropes courses, zip lines, hiking trails and summer tubing. The proposed Project would broaden the range of existing recreational opportunities and is responsive to visitor preferences for a more diverse range of activities. Heavenly intends to integrate the proposed summer activities into a comprehensive environmental education program to teach visitors about the unique Lake Tahoe environment and how they can help conservation efforts.

As part of the Project, Heavenly proposes to construct and operate additional attractions including ziplines/canopy tours, ropes courses, an alpine coaster, multi-use public trails, and interpretive facilities. These additional attractions would be located at the top of Gondola, East Peak base, and Sky Meadows base. The new attractions would be mostly operated in summer, but some facilities may also be run year round. The WDRs are being updated to account for the additional activities and facilities, address environmental issues identified through project planning activities, and update TMDL requirements.

5. Heavenly Mountain Resort Master Development Plan

A Resort Master Development Plan (MDP) for the Facility, which was prepared pursuant to the Tahoe Regional Planning Agency (TRPA) Code of Ordinances, was adopted by the TRPA Governing Board and approved by the LTBMU in 1996. The MDP is a multi-year plan that guides improvements, expansions, operations, and facility uses, including erosion control, tree removal, ski run development and maintenance, revegetation, and other practices that protect water quality and other environmental thresholds under TRPA jurisdiction. The MDP was last amended in 2007.

The Project required an amendment to the MDP, which was adopted by the TRPA in April 2015. This Order implements the requirements to protect water quality included in the MDP as amended in 2015.

6. Facility and Discharge Area

The Facility includes lifts, slopes, and terrain features for downhill skiing, snowboarding, sledding and tubing, base and on-mountain lodges, restaurants and maintenance buildings, snow making ponds and equipment, hiking, cross-country ski and snowshoe trails, parking areas, water quality control facilities and a portion of Wildwood Avenue south of Saddle Road. The Facility will include improvements constructed as part of the Epic Discovery Project. The resort encompasses about 10,530 acres (only 4,800 skiable acres) in California and Nevada and includes 29 ski lifts, 97 trails, approximately 720 acres of named trails, 650 lift acres, and approximately 30 miles of summer maintenance roads within the resort boundary.

For the purposes of this Order, the California portion of the Heavenly Mountain Resort is the "Facility" from which the discharge occurs and is shown on Figure 2. The Facility covers approximately 2,200 acres within the LTBMU Special Use Permit area in California. Storm water and snowmelt runoff from the Facility is generated and discharged into several watersheds draining to Lake Tahoe and one watershed draining into Nevada (Figure 3), as discussed further in Finding No. 11, below. Approximately 370 acres within the Heavenly Special Use Permit boundary are in Alpine County and drain to areas within the West Fork Carson River drainage in Nevada; approximately 1830 acres are in El Dorado County and drain to watersheds tributary to Lake Tahoe.

Heavenly applies deicers and abrasives to CSLT roads providing access to the California Base Area, including, but not limited to Ski Run Boulevard, Needle Peak Road, Wildwood Avenue, and Saddle Road. These CSLT roads are not part of the Facility under this Order, but are areas from which storm water discharge is regulated under Municipal National Pollutant Discharge Elimination System Storm Water Permit issued to CSLT (NPDES No. CAG616001).

7. Potential Pollutants

Chemicals used in the operations of the Facility include diesel fuel, lube oils, hydraulic oil, gasoline, anti-freeze, paints, solvents, propane, cleansers, snow conditioning and deicing chemicals (salt), and traction abrasives. Explosives are used for snow safety and avalanche control. Fertilizers and/or other soil amendments are used on revegetation and restoration sites. Potential pollutant discharges are related to hill-slope development and erosion, snow conditioning at terrain parks, road sanding and de-icing, and automobile and equipment use. Fine sediment, nitrogen, and phosphorus are the primary pollutants of concern for discharges that reach Lake Tahoe and its tributaries.

8. California Base Area Runoff and Controls

The California Base Area is an approximately 14-acre area that includes the California Base Lodge, parking lot, Lower Maintenance Shop, Heavenly Tram, and access road. Prior to development, the area was mapped as wetland, but was filled to create the base facility. Storm water and snow melt runoff, containing sediment and other pollutants associated with traction abrasives and deicers, is discharged below the California Base Area after treatment in storm water vaults. Surface runoff and seepage from the adjacent ski slopes, runoff from the parking lot and the Heavenly-owned access road, and flow from iron-rich springs near the base of the fill slopes below the parking lot commingle and leave Heavenly property near the intersection of Saddle Road and Wildwood Avenue.

Crossing under Saddle Road, the runoff combines with seepage from small springs north of Saddle Road to form the headwaters of the Bijou Park Creek, which flows to Lake Tahoe approximately 1.5 miles to the northwest. The creek is perennial for about one mile below the Facility then becomes ephemeral as it reaches a wide meadow area north of Tamarack Road. North of the meadow, a narrow channel runs through a housing subdivision to a storm drain inlet behind the Knights Inn Motel on Highway 50. When flows are sufficient, water would enter the storm drain inlet and discharge to Lake Tahoe through the Ski Run Marina.

For public safety, Heavenly applies traction sand and de-icing salts to the parking lot, access road and CSLT roads leading to the California Base Area. These pollutants are discharged in storm water runoff from the Facility and enter Bijou Park Creek. Due to high groundwater conditions, storm water runoff treatment by infiltration is not feasible in this area. In 1991 Heavenly installed six underground sedimentation vaults to partially treat runoff from its parking lot before it enters Bijou Park Creek. Heavenly also acquired and restored a one-acre Stream Environment Zone (SEZ) lot immediately south of Tamarack Road to improve downstream treatment and SEZ function. The lot was deeded to the CSLT in 1994 with obligation to maintain the improvements in perpetuity. The restored SEZ should provide some pollutant reductions for flows entering Lake Tahoe, but does not provide any benefit to the approximately one-mile reach of Bijou Park Creek between Tamarack Road and the California Base Area. Although these efforts improved surface water protection, additional treatment was required to meet limitations and objectives for Bijou Park Creek and Lake Tahoe.

Subsequently, Heavenly completed an assessment of the California Base Area and developed a plan to install a StormFilter™ system to treat runoff from this area. The system includes filter canisters inside vaults in the parking lot and at the corner of Saddle Road and Wildwood Avenue. The system was determined to be the best available technology (BAT) at the time and the effluent quality from the system was expected to meet effluent limitations for turbidity, total nitrogen, and total phosphorus. The system was not expected to be able to treat chloride in runoff. By October 2008, Heavenly completed installing filters in each of the vaults. A total of 456 individual filter cartridges were installed within the treatment vaults beneath the parking lot and access road.

Since October 2008, water quality samples have been collected from the influent and effluent points of the StormFilter™. Various technical issues have prevented consistent collection of reliable samples from the treatment vaults. In addition, effluent results frequently contain higher concentrations of certain pollutants than the influent samples. In response, Heavenly has taken the following actions to improve the performance of the system:

a. Replaced vault covers with solid manhole lids to limit the infiltration of surface water and sediment into the vaults.

b. Removed deposited sediment from all vaults on an annual basis during summer months.

c. Executed a maintenance agreement with Contech (StormFilter™ manufacturer) and established a schedule for inspection and replacement of filter cartridges that are beyond their design life. As of October 2014, all 456 filter cartridges had been replaced in the system at least once.

d. Developed a plan to install remote sensors to trigger sampling during storm events to obtain more consistent and representative samples.

To date, monitoring data have not indicated significant improvement in the performance of the StormFilters™ despite these actions. Concentrations of total phosphorus, total nitrogen and turbidity in effluent frequently exceed the effluent limitations in the WDRs and effluent concentrations do not show improvement from concentrations found in influent samples. Additional information is needed for Heavenly to determine how to improve the performance of the parking lot treatment facilities, evaluate additional source control measures (particularly for salt/chloride) that may be needed, and assess the appropriateness of compliance requirements given the limitations of the current technologies.

The receiving water for the California Base Area discharge is Bijou Park Creek. Creek samples indicate that concentrations of chloride, total phosphorus, and total nitrogen exceed the applicable water quality objectives. The data indicate that discharges from the California Base Area and applications of traction sand and de-icers to access roads cause or contribute to excursions from objectives.

9. Sky Meadows Basin Erosion Assessment

Bioassessment monitoring results in the Sky Meadows reach of Heavenly Valley Creek indicate poor biotic conditions due to sedimentation and possibly other stressors. An erosion assessment of the area was conducted as part of the Project Environmental Impact Report (EIR - Appendix 3.1-F of the EIR) to identify areas of unnatural or accelerated erosion (hot spots) and restoration opportunities to mitigate for additional disturbance in the watershed and improve conditions associated with existing operations. This Order includes requirements and a time schedule to complete Sky Meadows Basin restoration work identified in the Project EIR.

10. Site Geology

The section of the Carson Range in which the Facility is situated is formed from a granitic batholith. Soils are derived from deposits of decomposed granite rock including quartz, monzonite, and granodiorite. The granitic rock at the Facility ranges from rock outcrops to decomposed granitic grus. Grus is crumbled granite that forms by physical weathering, specifically the hot-and-cold cycling of the daily temperatures. Grus typically produces coarse-textured soil. Coarse textured soils are highly permeable, have surface layers that do not absorb water readily, and are easily eroded. The decomposed materials leave residual soils on slopes and form colluvial soils from eroded materials further downslope.

Much of the steep terrain has a thin layer of young soils that occur on actively eroding slopes. If these soils are disturbed, runoff is rapid and erosion hazard is high. Rocky outcrop areas have rapid runoff but only a slight erosion hazard. Small areas of recent alluvium, adjacent to streams and meadows on level to gently sloping slopes, support riparian vegetation and have a seasonal high water table at a depth of 12 to 24 inches. Springs are commonly found near the base of steep granitic slopes in locations such as the California Base Area.

11. Site Hydrology

The largest portion of the Facility is in the Heavenly Valley Creek watershed. Watershed boundaries referenced in this section are shown on Figure 3. Heavenly Valley Creek flows into Trout Creek, a tributary to the Upper Truckee River and Lake Tahoe. The Heavenly Valley Creek watershed is designated as CA-1. Within Heavenly's LTBMU permit boundary, the watershed is approximately 64,750 square miles with approximately 3,400 feet of vertical relief. Many of the upper ski runs, lifts, and facilities of the resort are within the upper watershed of Heavenly Valley Creek. Heavenly Valley Creek is generally a perennial stream with peak flows from May to July.

The highest point in the Heavenly Valley Creek watershed is Monument Peak at 10,053 feet. The watershed contains Sky Meadows at approximately 8,600 feet in elevation. A few hundred yards below Sky Meadows, Heavenly Valley Creek flows into the Sky Meadows Reservoir, which is an approximately 25-acre reservoir used for snowmaking and irrigation storage. Approximately 1,300 feet below the reservoir dam, tributaries join the main stream of Heavenly Valley Creek. Heavenly Valley Creek flows southwest for approximately 1,200 feet before exiting the developed portion of the ski resort at approximately 7,900 feet in elevation. Heavenly Valley Creek drops another 1,300 feet in the next 1.5 miles before exiting Heavenly's LTBMU permit boundary at approximately 6,600 feet in elevation.

Hidden Valley Creek is another tributary to Trout Creek, and thus Lake Tahoe, that originates near the Facility. This stream is important because it is relatively undisturbed by the resort operations while being in close proximity to other disturbed areas and sharing certain general characteristics. It therefore serves as a comparable water body to Heavenly Valley Creek, and represents conditions that provide a natural point of reference.

Several smaller watersheds are also contained within the Facility. The CA-6 watershed is 412 acres and includes steep ski slopes (the Face), the California Base Area, Wildwood-Keller Creek, and Bijou Park Creek. Development of the California Base Area involved more than ten acres of cut and fill to create the California Lodge, maintenance facilities, and parking lots. The origin of Bijou Park Creek is a seep northwest of the California Base and is perennial for a distance before it spreads out into meadow areas north of Tamarack Road in the CSLT. In high runoff periods, the creek would eventually enter a storm drain inlet south of Highway 50 and then drain into Lake Tahoe at the Ski Run Marina.

The CA-4 watershed is approximately 136 acres, containing one access road and Bijou Creek. Bijou Creek drains into Lake Tahoe approximately 2,000 feet west of Bijou Park Creek.

There are several drainage areas that span state boundaries and, therefore, are "interstate waters." The CA-7 watershed is approximately 284 acres and discharges into the casino core area on the Nevada side of the state line. Nearly all of the 370 acres of California land that drain towards the West Fork Carson River in Nevada is in the Mott Canyon watershed (NV-1), while a few acres drain into the South Fork Daggett Creek watershed (NV-2+5) in Nevada.

12. Water Quality Control Plan
The Water Board adopted the *Water Quality Control Plan for the Lahontan Region* (Basin Plan), which took effect on March 31, 1995. This Order implements the Basin Plan, as amended.

13. Impaired Waters and TMDLs
The upper segment of Heavenly Valley Creek has been impaired by sediment related to historic ski resort development. In 1990, Heavenly Valley Creek was placed on the Clean Water Act (CWA) section 303(d) list of impaired waters (those not meeting water quality objectives or maintaining beneficial uses) for sediment. In accordance with federal requirements, a TMDL was prepared and subsequently adopted by the Water Board in January 2001 to ensure attainment of all sediment-related water quality standards. Basin Plan amendments (Chapter 4.13) establishing the TMDL and implementation plan for Heavenly Valley Creek within the LTBMU permit boundaries of the Facility received final approval from the U.S. Environmental Protection Agency (EPA) on September 30, 2002, and are now in effect.

The TMDL is based on U.S. Forest Service (USFS) channel condition monitoring protocols, modeling of hill slope erosion rates, and implementation of ongoing erosion control and revegetation work. The TMDL implementation program primarily relies on continuation of existing erosion control and monitoring programs carried out under an adaptive management approach by Heavenly. Over time, certain assessment protocols have been revised and updated in accordance with USFS procedures. This Order implements the TMDL by updating the WDRs to reflect the current monitoring approaches now used by the state and the USFS to assess desired conditions.

Heavenly has complied with the TMDL since its adoption and is consistently meeting the TMDL targets, with the exception of benthic organisms. The following instream and hillslope targets are met: 1) instream total sediment load of 58 tons per year as a 5-year rolling average; 2) stream condition inventory of improving and stable trends in channel morphology; and 3) effective implementation and maintenance of BMPs for roads and ski runs. The target for benthic macroinvertebrate (BMI) health is an improving trend approaching conditions found in Hidden Valley Creek (used as a reference stream condition). Results from two of the three sampling locations on Heavenly Valley Creek meet the target. However, conditions in the Sky Meadows reach of Heavenly Valley Creek do not meet the target and continue to show poor conditions. Additional erosion control measures are needed to improve BMI health in this area.

Lake Tahoe and its tributary, Trout Creek, may be affected by discharges from the Facility. Lake Tahoe has since 2002 been listed as impaired pursuant to section 303(d) for the pollutants nitrogen, phosphorus, and sedimentation/siltation. Trout Creek was placed on the section 303(d) list in 2002 for the pollutants iron, nitrogen, pathogens, and phosphorus. In accordance with federal requirements, a TMDL was prepared and subsequently adopted by the Water Board in 2010 to ensure attainment of water quality standards. Basin Plan amendments (Chapter 5.18) establishing the TMDL and implementation plan for Lake Tahoe received final approval from the U.S. Environmental Protection Agency (EPA) on August 16, 2011, and are now in effect. The Lake Tahoe TMDL includes pollutant loading estimates for forested lands, such as the LTBMU lands where Heavenly conducts its operations. The Lake Tahoe TMDL and this Order do not include waste or load allocations (e.g., on a daily or annual basis) or required load reductions to implement the Lake Tahoe TMDL specific to the forest and land areas owned or managed by Heavenly. Rather, Lake Tahoe TMDL implementation requires loading reductions from historic conditions to maintain and attain water quality objectives in accordance with time schedules in the Lake Tahoe TMDL. This Order implements laod reductions from the Faciity consisten with the requirements of the Lake Tahoe TMDL.

14. Receiving Waters

The receiving waters are surface waters within the South Lake Tahoe Hydrologic Area (HA 634.10) and the Woodfords Hydrologic Area (HA 633.10), and ground waters in the Tahoe Valley – South Basin (Department of Water Resources (DWR) No. 6-5.01) and Carson Valley (DWR No. 6-6).

15. Beneficial Uses

The designated beneficial uses of surface waters for the South Lake Tahoe Hydrologic Area are MUN, AGR, GWR, REC-1, REC-2, COMM, COLD, WILD, RARE, MGR, and SPWN. Beneficial uses of surface waters for the Woodfords Hydrologic Area are MUN, AGR, IND, GWR, FRSH, NAV, POW, REC-1, REC-2, COMM, COLD, WILD, RARE, and SPWN. Beneficial uses of ground waters for the Tahoe Valley – South Basin are MUN, AGR, and IND. Beneficial uses of ground waters for the Carson Valley Basin are MUN, AGR, IND, and FRSH.

16. Policy for Maintaining High Quality Waters

State Water Board Resolution No. 68-16 requires the Water Board, in regulating activity that may produce or increase the discharge of waste, to maintain existing high quality waters of the state. Changes in water quality are allowed only if: (1) the change is consistent with maximum benefit to the people of the state, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that described in water quality control plans or policies; and (2) the activity that produces the waste is required to meet WDRs to prevent pollution and nuisance, and best practicable treatment or control measures necessary to assure the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

Heavenly is a major public recreational facility and an important economic asset in the Lake Tahoe area. The proposed activity that may produce or increase the discharge of waste is the Project and will involve new land disturbance that could increase erosion and wastes in discharges of storm water. Traction abrasives and de-icing materials (sodium chloride) are applied to roadways and parking lots to ensure the safety of the public using the Facility. Land disturbance associated with construction and operation of roads, ski runs, and support facilities increase sediment loading to surface waters if not appropriately controlled. Storm water discharges from the Facility have increased sediment, sodium, chloride, turbidity, total dissolved solids (TDS), total suspended sediment (TSS), and other wastes in storm water from maintenance and operation of vehicles, equipment, and recreational facilities. Heavenly Valley Creek and Bijou Park Creek are tributary to Lake Tahoe, an Outstanding National Resource Water. Because Lake Tahoe water quality is impaired for nutrients and fine sediment, no further degradation can be authorized for these constituents. Therefore the Water Board must determine whether (2), above, is met sufficiently to prevent any additional water quality degradation as a result of the Project and Facility.

Surface water monitoring for turbidity, TSS, total phosphorus (TP), total nitrogen (TN) and chloride ion (Cl) has been conducted for many years at two points (“below Patsy’s” and “property line”) on Heavenly Valley Creek, one point on Bijou Park Creek, and one point on Hidden Valley Creek, which is used as a reference stream for comparisons with Heavenly Valley Creek and other surface waters. Reference stream concentrations are considered representative of existing high quality waters largely unimpacted from human activities; however, sampling results from the reference stream indicate that TP and Cl consistently exceed the established water quality objectives for Trout Creek, which apply to Heavenly Valley Creek and Hidden Valley Creek by application of the tributary rule. Data for Hidden Valley Creek indicate these very low objectives for TP and Cl (annual averages 0.015 mg/l and 0.15 mg/l, respectively) are not met under natural background conditions in this area. That is, application of Trout Creek objectives to Hidden Valley Creek, by the tributary rule, is not justified by the data. A discussion of data collected from water

years[1] 2006 through 2013 (eight years) for each of the constituents of concern noted above is presented below.

Turbidity - Water quality objectives for all surface waters in the Lake Tahoe Basin include "waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent." As the objective is stated in part as "increases" above "natural levels" compliance with this objective is frequently determined by comparing turbidity in an upstream area unaffected by the activity resulting in a discharge with an affected downstream area within the same water body. Upstream and downstream sampling for turbidity in Heavenly Valley Creek shows turbidity is comparable between upstream and downstream sampling locations, with downstream turbidity slightly lower than upstream turbidity. As another way to compare, approximately 70 percent of the 16 annual average results from the two sampling locations on Heavenly Valley Creek are consistent with those of Hidden Valley Creek (reference stream/natural levels). The average of these 11 annual results is 1.44 NTU (Nephelometric Turbidity Units) compared to 1.79 NTU for the reference stream. Staff concludes that the streams are substantially similar with regard to turbidity, which is consistent with natural levels of erosion. Five of the 16 annual results exceed the reference stream levels and together averaged approximately 10 NTU. Water Board staff conclude these increases do not exceed natural levels for Heavenly Valley Creek by more than 10 percent.

Because the Bijou Park Creek emerges as a spring in the immediate vicinity of the Facility discharge below the California Base Area, comparisons with turbidity in Bijou Park Creek upstream of the discharge are impossible. Therefore, staff evaluated whether the waters are "free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses" as a result of the discharge. Results from Bijou Park Creek indicate that turbidity levels chronically exceed natural levels found in Hidden Valley Creek. Each of the eight annual values was significantly greater than the annual reference stream values. The mean annual average turbidity for the eight years analyzed was approximately 46 NTU. The levels observed in the Bijou Park Creek are in the area directly affected by the discharges from the California Base Area and are significantly above applicable turbidity limitations for effluent discharges to surface waters (20 NTU). This and effluent data indicates the current treatment system is unable to meet the turbidity limitations prescribed to protect the receiving waters. The effects of the discharge on Bijou Park Creek and Lake Tahoe are unknown and potentially significant because Lake Tahoe is impaired for clarity (closely related to turbidity). The Water Board considers the discharge of turbidity from the Facility is causing or contributing to a condition of pollution or nuisance in Bijou Park Creek and its downstream receiving waters and no additional degradation can be allowed.

[1] Water year is from October 1 through September 30 the following year. For example, the water year from October 1, 2005 through September 30, 2006 is referred to as water year 2006.

Total Suspended Sediment (TSS) - The water quality objective for TSS is 60 mg/L expressed as an annual 90th percentile value. All results from the two locations on Heavenly Valley Creek meet the water quality objective. Approximately 70 percent of the 16 annual results from the two sampling locations on Heavenly Valley Creek are consistent with those of the reference stream. The average of these 11 annual values is 2.54 mg/L compared to 4.69 mg/L for the reference stream. Five of the 16 annual values exceed the annual reference stream levels and together averaged approximately 31 mg/L.

Results from Bijou Park Creek indicate the mean annual TSS value for the eight years analyzed was approximately 95 mg/L. TSS levels chronically exceed the above-cited objective and natural levels found in the reference stream. Each of the eight annual values was significantly greater than the annual reference stream values. The levels observed in the Bijou Park Creek are in the area directly affected by the discharges from the California Base Area and are significantly above applicable TSS limitations (60 mg/L). This and other effluent data indicates the current treatment system for the California Base Area is unable to meet the TSS objectives prescribed to protect the receiving waters. The effects of the discharge on Bijou Park Creek and Lake Tahoe are unknown and potentially significant because Lake Tahoe is impaired for fine sediment (a portion of TSS). The Water Board considers the discharge of TSS is causing or contributing to a condition of pollution or nuisance in Bijou Park Creek and its downstream receiving waters and no additional degradation may be allowed.

Total Phosphorus (TP) - The water quality objective for TP expressed as an annual average value is 0.015 mg/L. This numeric objective for Heavenly Valley Creek is derived from Trout Creek objectives by application of the tributary rule. All results from the two locations on Heavenly Valley Creek and the reference stream exceed the water quality objective. Approximately 80 percent of the 16 annual results from the two sampling locations on Heavenly Valley Creek are consistent with those of the reference stream. The average of these 13 annual values is 0.024 mg/L compared to 0.03 mg/L for the reference stream. Three of the 16 annual values did not appear to be correlated with the annual reference stream levels and together averaged approximately 0.12 mg/L. Staff concludes from this data that the tributary-rule TP objective is unmet, and most likely is inappropriate based on the comparison with the reference stream conditions. Data are sufficient to conclude the waters are not “high quality” with regard to TP, as the objectives are unmet in the undisturbed reference stream thought to represent natural conditions. Nonetheless, the waters exhibit TP levels that would generally be considered excellent in other contexts, and do not show substantial increases due to human activities. Because the objectives are unmet, however, the Water Board may not authorize any detectable increase in TP due to the Facility.

The water quality objective for TP for Bijou Park Creek is based on the limit for Lake Tahoe of 0.008 mg/L, by application of the tributary rule. Each of the annual average TP results for Bijou Park Creek exceeds the water quality objective.

Results from sampling Bijou Park Creek also indicate that TP levels chronically exceed natural levels found in the reference stream. The mean annual TP value for the eight years analyzed was approximately 0.31 mg/L compared with 0.03 mg/L for the reference stream. Each of the eight annual values was significantly greater than the annual reference stream values. The levels observed in the Bijou Park Creek are in the area directly affected by the discharges from the California Base Area and are, on average, more than 37 times greater than applicable TP limitations (0.008 mg/L) by the tributary rule and nearly four times greater than the reference stream. This and other effluent data indicates the current treatment system for the California Base Area is unable to meet the TP objectives prescribed to protect the receiving waters. The effects of the discharge on Bijou Park Creek and Lake Tahoe are unknown and potentially significant because Lake Tahoe is impaired for TP. The Water Board considers the discharge of TP is causing or contributing to a condition of pollution or nuisance in Bijou Park Creek and its downstream receiving waters and no additional degradation may be allowed.

Total Nitrogen (TN) - The water quality objective for TN in Heavenly Valley Creek expressed as an annual average value is 0.19 mg/L. This numeric objective for Heavenly Valley Creek is derived from Trout Creek objectives by application of the tributary rule. Except for one year averaging 0.225 mg/L all of the annual results from the reference stream met the water quality objective. Approximately 80 percent of the 16 annual results from the two sampling locations (eight results each) on Heavenly Valley Creek are consistent with those of the reference stream. The average of these 13 annual values is 0.124 mg/L compared to 0.14 mg/L for the reference stream. Three of the 16 annual values did not appear to be correlated with the annual reference stream levels and together averaged approximately 0.36 mg/L. Staff concludes that water quality in the two streams is similar and generally in compliance with the annual average objective for TN.

The water quality objective for Bijou Park Creek is based on the limit for Lake Tahoe of 0.15 mg/L. The mean annual TN value for the eight years analyzed was approximately 1.0 mg/L compared with 0.14 mg/L for the reference stream. Results from Bijou Park Creek indicate that TN levels chronically exceed natural levels found in the reference stream. Each of the eight annual values was significantly greater than the annual reference stream values. The levels observed in the Bijou Park Creek are in the area directly affected by the discharges from the California Base Area and are, on average, more than six times greater than applicable TN limitations (0.15 mg/L) by the tributary rule and seven times greater than the reference stream. This and other effluent data indicates the current treatment system for the California Base Area is unable to meet the TN objectives prescribed to protect the receiving waters. The effects of the discharge on Bijou Park Creek and Lake Tahoe are unknown and potentially significant because Lake Tahoe is impaired for TN. The Water Board considers the discharge of TN is causing or contributing to a condition of pollution or nuisance in Bijou Park Creek and its downstream receiving waters and no additional degradation may be allowed.

Chloride - The water quality objective for chloride in Heavenly Valley Creek expressed as an annual average value is 0.15 mg/L. This numeric objective for Heavenly Valley Creek is derived from Trout Creek objectives by application of the tributary rule. All results from the two locations on Heavenly Valley Creek and the reference stream exceed the water quality objective. However, all eight annual average results from each of the two Heavenly Valley Creek locations trend higher than the results from the reference stream. The average of these 16 annual values is approximately 1.3 mg/L compared to 0.6 mg/L for the reference stream. Thus, the reference stream Cl average is four times greater than the tributary-rule objective, and Heavenly Valley Creek averages more than twice that reference-stream level. The reason for this difference in not known, but may be attributable to snow-conditioning salts applied to the terrain park areas (and not in the reference stream watershed).

The water quality objective for Cl in Bijou Park Creek is based on the limit for Lake Tahoe of 3.0 mg/L. The mean annual chloride value for the eight years analyzed was approximately 98.0 mg/L compared with 0.6 mg/L for the reference stream. Results from Bijou Park Creek indicate that chloride levels chronically exceed natural levels found in the reference stream. Each of the eight annual values was significantly greater than the annual reference stream values. The levels observed in the Bijou Park Creek are in the area directly affected by the discharges from the California Base Area and are, on average, more than 32 times greater than applicable Cl limitations (3.0 mg/L) by the tributary rule and 163 times greater than the reference stream. This data indicates the discharge from the California Base Area is causing Cl objectives to be violated in the receiving waters. The effects of the discharge on Bijou Park Creek and Lake Tahoe are unknown. Lake Tahoe is not impaired for Cl. Heavenly and/or the CSLT apply Cl for public safety to the California Base Area and roads leading there and this activity is the likely source of the excess Cl. Cl is known to be toxic to aquatic organisms at levels of 230 mg/L or above. In the absence of contrary evidence the excursions from water quality objectives due to the discharge do not appear to be at levels toxic to aquatic life (e.g., in Bijou Park Creek) or at levels that would otherwise impair the waters for beneficial uses. The Water Board considers the discharge of Cl is causing or contributing to a condition of pollution or nuisance in Bijou Park Creek due to the excursions from objectives, and no additional degradation can be allowed.

Summarizing, water quality appears to be maintained in Heavenly Valley Creek in a condition not significantly affected by human activities with the exception of Cl possibly attributable to use of snow-conditioning salt on the ski areas. These WDRs require existing and revised erosion control measures (Mitigation Measure WATER-C1b – Findings of Fact, Attachment A) as well as additional erosion hot spot treatment (Mitigation Measure WATER-C1a – Findings of Fact, Attachment A) to achieve and maintain compliance with the standards related to sediment control (turbidity, TSS, TP, and TN) and TSS loading requirements under the Heavenly Valley Creek TMDL. Salt is used on terrain parks in the Heavenly Valley Creek watershed and appears to have the effect of doubling natural chloride levels in the

creek (based on reference stream conditions). Although chloride is higher than natural background levels (reference stream), the increase is slight and would not be expected to impair water quality for beneficial uses. Because the levels of Cl in Heavenly Valley Creek are above applicable objectives, Heavenly must take actions to reduce the Cl levels in Heavenly Valley Creek due to controllable sources. The Water Board cannot authorize water quality degradation for Cl above the existing objectives, but may consider site-specific objectives for Cl in Heavenly Valley Creek at some future time.

These WDRs also require Heavenly to address water quality violations identified in the Bijou Park Creek watershed related to the operations and management of the access roads and parking areas at the California Base Area. This has occurred despite significant investment by Heavenly in treatment systems to control and abate the discharge that are currently deemed ineffective. The general approach to compliance for addressing historic or ongoing impacts to water quality associated with storm water discharges is to adaptively manage and iteratively improve controls over time and/or as necessary to comply with water quality objectives. Heavenly has been working with staff and continues to engage in this adaptive management process. To address the violations of relevant discharge and receiving water requirements in Bijou Park Creek, as discussed above, these WDRs require Heavenly to complete an engineering evaluation of the treatment facilities and sampling procedures, evaluate road and parking lot source control opportunities, and implement appropriate operational adjustments to achieve compliance with the applicable water quality standards as ordered by the Water Board herein.

The Water Board acknowledges that water quality degradation has occurred due to historic and ongoing operations of the resort despite the application of available and practicable treatment and control systems. Where objectives or limits are violated, no additional degradation is authorized and the Water Board will continue to work with Heavenly to achieve compliance with objectives and limits. No additional water quality degradation or increased waste discharge is anticipated from the project with implementation of the controls identified in the EIR and included herein. The Project is required to meet WDRs to prevent pollution and nuisance, and use of best practicable treatment or control measures will assure the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

17. Evaluation of Water Code Section 13241
Pursuant to Water Code section 13263 the requirements of this Order take into consideration the provisions of section 13241:

a. Past, present, and probable future beneficial uses of water.
Past, present, and probable future beneficial uses of water are described in Finding 15 above and will be maintained by Heavenly. The Order requires Heavenly to maintain and protect water quality to serve the designated beneficial uses.

b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
Refer to Findings 10, 11, and 16, above. The environmental characteristics of the hydrographic units have been extensively studied as part of the Heavenly Valley Creek TMDL and this Order continues requirements to implement controls necessary to meet the TMDL targets. Other tributaries in the watershed have also been monitored for over 20 years. This Order continues and improves the monitoring program established under previous Orders.

c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
Lake Tahoe is the ultimate receiving water for discharges from the Facility. Water quality conditions beyond the Facility boundaries are controlled under the Lake Tahoe TMDL program, which is implemented on a watershed-wide basis and coordinated through the jurisdiction of municipalities and the LTBMU in the area. Controls placed on Heavenly's discharges, which enter tributaries to Lake Tahoe, are part of the overall effort to meet the objectives of the Lake Tahoe TMDL, and the more site-specific requirements of the TMDL for sediment in Heavenly Valley Creek. Other than the Facility, there are no other significant factors that may affect water quality in the area in which the Facility is located.

d. Economic considerations
Heavenly is a significant economic asset for the Lake Tahoe area. Additional summer season activities regulated under this Order will improve economic conditions for Heavenly and other support businesses. The requirements include improved controls and treatment in an iterative fashion and/or in accordance with a time schedule and are reasonable to achieve water quality protection.

e. The need for developing housing within the region.
The Project requires no additional housing since housing is already sufficient to accommodate winter-time operations, which require much more personnel than during summer-time operations.

f. The need to develop and use recycled water
There is no need to develop and recycle wastewater from the Facility, nor legal ability to do so. Wastewater generated from the Facility is currently treated and recycled by the South Tahoe Public Utility District.

18. Consideration of California Water Code section 106.3
Water Code section 106.3 establishes a state policy that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes, and directs state agencies to consider this policy when adopting regulations pertinent to water uses described in the section, including the use of water for domestic purposes.

The Project enhances use of the Facility as a year-round recreational site. These WDRs implement effluent limitations and requirements to meet established receiving water objectives that will maintain all designated beneficial uses of water. Therefore, the requirement to consider access to safe, clean and affordable water has been met in this Order.

19. California Environmental Quality Act (CEQA) Compliance

A joint Environmental Impact Report/Environmental Impact Statement/Environmental Impact Statement[2] (EIR/EIS/EIS) was prepared for the project by Hauge Brueck Associates on behalf of the TRPA pursuant to Article VII of the Tahoe Regional Planning Compact and Chapter 5 of the TRPA Code of Ordinances, the Water Board pursuant to the California Environmental Quality Act (CEQA, Public Resources Code Section 21000, et seq.), and the LTBMU pursuant to the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) (40 CFR section 1500 et seq.). The EIR is hereby incorporated into this Order by refence. The environmental setting and analysis included in the EIR/EIS/EIS tiers from, and references, the environmental setting and analysis included in the EIR/EIS/EIS documents that were previously prepared for the adopted 1996 Heavenly Ski Resort Master Plan and the 2007 Master Plan Amendment. Where appropriate, the data analysis, and conclusions presented in the previous Master Plan environmental documentation were updated and refined.

a. Environmental Impact Report

A Notice of Preparation was published in November 2013 notifying the public of the Water Board's intent, as lead agency, to prepare an EIR. Public scoping meetings were held during December 2013 to ask for input on potential environmental impacts from the project. A Draft EIR/EIS/EIS was circulated through the State Clearinghouse (SCH# 2013112051) from August 22, 2014 through October 27, 2014. The EIR analyzed three action alternatives at an equal level of detail and one preferred (proposed) alternative was identified. The EIR identified and analyzed the potential environmental impacts of alternative projects that could be carried out under this Order.

b. Mitigation and Monitoring Plan

The project EIR analyzed the potential environmental impacts from the Project, which identified potentially significant impacts to biological, water, and transportation resources that require mitigation to reduce impacts to less than significant levels. A Mitigation and Monitoring Plan (MMP) was prepared that updates the MMP from the original 1996 Master Plan and Master Plan Amendment adopted by the LTBMU, TRPA, and El Dorado County in 2007. The 2015 MMP has been updated based on measures that have been completed, measures that are no longer needed, existing measures that are ongoing, and new measures that are required to reduce potential impacts from the Project. The updated 2015 MMP is presented in Attachment B and is made part of this Order. Certain EIR mitigation measures contained in Attachment B are not within

[2] Heavenly Mountain Resort Epic Discovery Project EIR/EIS/EIS, February 2015

the Water Board's authority to require (for example, those mitigation measures related to transportation and wildlife). The Water Board recognizes that another agency (USFS or TRPA) has responsibility for monitoring these mitigation measures. However, as CEQA lead agency the Water Board remains responsible for ensuring that implementation of all mitigation measures occurs in accordance with the program. Therefore, as a condition of this Order, the Heavenly is required to submit reports to the Water Board documenting implementation of and compliance with the mitigation program. This is a continuation of requirements that Heavenly has been subject to and complied with since the Master Development Plan was last updated in 2007.

c. Certification of Final EIR; Identification of Potentially Significant Impacts
In a public meeting on May 14, 2015, the Water Board adopted this Order certifying the EIR which describes potentially significant environmental impacts from the Project and reflects the Water Board's independent judgment and analysis. The final EIR was presented to the Water Board and it has considered the information contained in the final EIR prior to approving these WDRs. . Findings required by CEQA sections 15091 through 15093 regarding any significant environmental effects of the Project are included in Attachment A, which are supported by substantial evidence in the documents and files which constitute the record of proceedings and are located at the Water Board's South Lake Tahoe office. Potentially significant effects and associated mitigation measures are identified in the below-cited EIR chapters for the following water quality, transportation, and biological resources:

- EIR chapter 3.1: Water Resources: Hydrology, Water Quality, and Cumulative Watershed Effects
- EIR chapter 3.3: Transportation, Parking and Circulation
- EIR chapter 3.5: Wildlife and Fisheries.

The effects were reduced to levels that are not significant with changes in the Project and/or the inclusion of mitigation measures.

20. Notification and Consideration of Comments
The Water Board has notified Heavenly and interested parties of its intent to issue WDRs for the discharge and Facility. A notice of the availability of a draft Order was also provided by posting a copy of the tentative WDRs to the Water Board's internet website on February 27, 2015. The Water Board has considered comments provided in accordance with applicable time limits, and adopted this Order at a public meeting following opportunity to comment.

IT IS HEREBY ORDERED, pursuant to Water Code sections 13260, 13263, and 13267 this Order is effective as of **July 1, 2015** and Heavenly must comply with the following:

I. DISCHARGE SPECIFICATIONS

A. Effluent Limitations - Lake Tahoe Hydrologic Unit

1. All waste discharges generated within those portions of the Facility located within the Lake Tahoe Hydrologic Unit, or generated as a result of operations or development of the Facility, which are discharged to surface waters, lands with underlying ground water, or land-based treatment or disposal systems within the Lake Tahoe Hydrologic Unit, must not contain constituents in excess of the following concentrations:

Table 1
Lake Tahoe Hydrologic Unit
Surface Water Runoff Effluent Limits*

Constituent	To Land	To Surface Waters
Total Nitrogen (mg/l as N)	5.0	0.5
Total Phosphorus (mg/l as P)	1.0	0.1
Total Iron (mg/l)	4.0	0.5
Turbidity (NTU)	200	20
Grease & Oil (mg/l)	40	2.0
* Calculated as the daily average of all effluent samples collected from a single discharge point.		

2. If constituent concentrations of runoff waters entering the subject property exceed the numerical standards specified above, there shall be no statistically significant increase (at a 90% confidence level) in the constituent concentrations of the waters as the waters are discharged from the Facility.

B. Receiving Water Limits for Surface Waters – Regionwide

Unless otherwise specified, the following objectives (listed alphabetically) apply to all surface waters of the Lahontan Region, including the Lake Tahoe HU:

Ammonia

The neutral, unionized ammonia species ($NH_3°$) is highly toxic to freshwater fish. The fraction of toxic $NH_3°$ to total ammonia species (NH_4^+ + $NH_3°$) is a function of temperature and pH. Basin Plan Tables 5.1-5 and 5.1-6 were derived from USEPA ammonia criteria for freshwater. Ammonia concentrations shall not exceed the values listed for the corresponding conditions in these tables. For temperature and pH values not explicitly in these tables, the most conservative value neighboring the actual value may be used or criteria can be calculated from numerical formulas developed by the USEPA.

Bacteria, Coliform
Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. *The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.*

Biostimulatory Substances
Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

Chemical Constituents
Waters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 64444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

Waters designated as AGR shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes).

Waters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

Chlorine, Total Residual
For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.

Color
Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

Dissolved Oxygen
The dissolved oxygen concentration, as percent saturation, shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation.

For waters with the beneficial uses of COLD, COLD with SPWN, WARM, and WARM with SPWN, the minimum dissolved oxygen concentration shall not be less than that specified in Table 5.1-8.

Floating Materials
Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

For natural high quality waters, the concentrations of floating material shall not be altered to the extent that such alterations are discernable at the 10 percent significance level.

Oil and Grease
Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses.

For natural high quality waters, the concentration of oils, greases, or other film or coat generating substances shall not be altered.

Nondegradation of Aquatic Communities and Populations
All wetlands shall be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants; or which lead to the presence of undesirable or nuisance aquatic life.

All wetlands shall be free from activities that would substantially impair the biological community as it naturally occurs due to physical, chemical and hydrologic processes.

Pesticides
For the purposes of this Basin Plan, pesticides are defined to include insecticides, herbicides, rodenticides, fungicides, pesticides and all other economic poisons. An economic poison is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi or weeds capable of infesting or harming vegetation, humans, or animals (CA Agriculture Code ı 12753). Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There shall be no detectable increase in bioaccumulation of pesticides in aquatic life.

pH
In fresh waters with designated beneficial uses of COLD, changes in normal ambient pH levels shall not exceed 0.5 pH units. For all other waters, the pH shall not be depressed below 6.5 nor raised above 8.5.

The Regional Board recognizes that some waters of the Region may have natural pH levels outside of the 6.5 to 8.5 range. Compliance with the pH objective for these waters will be determined on a case-by-case basis.

Radioactivity
Radionuclides shall not be present in concentrations which are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life.

Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

Sediment
The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

Settleable Materials
Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.

Suspended Materials
Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses.

For natural high quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

Suspended Sediment
Suspended sediment concentrations in streams tributary to Lake Tahoe shall not exceed a 90^{th} percentile value of 60 mg/L. (This objective is equivalent to the Tahoe Regional Planning Agency's regional "environmental threshold carrying capacity" standard for suspended sediment in tributaries.) *The Regional Board will consider revision of this objective in the future if it proves not to be protective of beneficial uses or if review of monitoring data indicates that other numbers would be more appropriate for some or all streams tributary to Lake Tahoe.*

Taste and Odor
Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. For naturally high quality waters, the taste and odor shall not be altered.

Temperature
The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such an alteration in temperature does not adversely affect the water for beneficial uses.

For waters designated COLD, the temperature shall not be altered.

Temperature objectives for COLD interstate waters and WARM interstate waters are as specified in the "Water Quality Control Plan for Control of Temperature in The Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" including any revisions. This plan is summarized in Chapter 6 (Plans and Policies) and included in Appendix B.

Toxicity
All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. *Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration and/or other appropriate methods as specified by the Regional Board.*

The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for "experimental water" as defined in *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al. 1998).

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

C. Receiving Water Limits for Surface Waters - Certain Water Bodies

The following objectives (listed alphabetically) are in addition to the regionwide objectives specified above and supersede the regionwide objectives in the event of any conflict. These objectives apply to certain surface waters of the Lake Tahoe Hydrologic Unit (HU).

Algal Growth Potential
For Lake Tahoe, the mean algal growth potential at any point in the Lake shall not be greater than twice the mean annual algal growth potential at the limnetic reference station. *The limnetic reference station is located in the north central portion of Lake Tahoe. It is shown on maps in annual reports of the Lake Tahoe Interagency Monitoring Program. Exact coordinates can be obtained from the U.C. Davis Tahoe Research Group.*

Biological Indicators
For Lake Tahoe, algal productivity and the biomass of phytoplankton, zooplankton, and periphyton shall not be increased beyond the levels recorded in 1967-71, based on statistical comparison of seasonal and annual means. *The "1967-71 levels" are reported in the annual summary reports of the "California-Nevada-Federal Joint Water Quality Investigation of Lake Tahoe" published by the California Department of Water Resources.*

Clarity
For Lake Tahoe, the vertical extinction coefficient shall be less than 0.08 per meter when measured below the first meter. When water is too shallow to determine a reliable extinction coefficient, the turbidity shall not exceed 3 Nephelometric Turbidity Units (NTU). In addition, turbidity shall not exceed 1 NTU in shallow waters not directly influenced by stream discharges. *The Regional Board will determine when water is too shallow to determine a reliable vertical extinction coefficient based upon its review of standard limnological methods and on advice from the U.C. Davis Tahoe Research Group.*

Conductivity, Electrical

In Lake Tahoe, the mean annual electrical conductivity shall not exceed 95 umhos/cm at 25°C at any location in the Lake.

pH
In Lake Tahoe, the pH shall not be depressed below 7.0 nor raised above 8.4.

Plankton Counts
For Lake Tahoe, the mean seasonal concentration of plankton organisms shall not be greater than 100 per ml and the maximum concentration shall not be greater than 500 per ml at any point in the Lake.

Suspended Sediment
Suspended sediment concentrations in streams tributary to Lake Tahoe shall not exceed a 90th percentile value of 60 mg/L. (This objective is equivalent to the Tahoe Regional Planning Agency's regional "environmental threshold carrying capacity" standard for suspended sediment in tributaries.) *The Regional Board will consider revision of this objective in the future if it proves not to be protective of beneficial uses or if review of monitoring data indicates that other numbers would be more appropriate for some or all streams tributary to Lake Tahoe.*

Transparency
For Lake Tahoe, the annual average Secchi disk deep water transparency shall not be decreased below 29.7 meters, the levels recorded in 1967-71.

Table 2

Additional Receiving Water Limits for Lake Tahoe and Trout Creek

Surface Waters	Objective (mg/L except as noted) [1,2]						
	TDS	Cl	SO_4	B	N	P	Fe
Lake Tahoe	60 65	3.0 4.0	1.0 2.0	0.01 -	0.15 -	0.008 -	--
Trout Creek	50 60	0.15 0.20	--	--	0.19 -	0.015 -	0.03 -

[1] Annual average value/90th percentile value.
[2] Objectives are as mg/L and are defined as follows:
B - Boron
Cl - Chloride
SO_4 - Sulfate
Fe - Iron, Total
N - Nitrogen, Total
P- Phosphorus, Total
TDS - Total Dissolved Solids (Total Filterable Residues)

D. Heavenly Valley Creek TMDL Targets

The Heavenly Valley Creek Sediment TMDL established certain instream and hillslope targets that interpret the narrative water quality objectives for the watershed based on identified desired conditions and USFS monitoring protocols adopted in 2003. This Order implements the Heavenly Valley Creek Sediment TMDL with the following updated targets:

Table 3
Heavenly Valley Creek Sediment TMDL Targets

Parameter	Target[3]
Instream Sediment Load	Maximum of 58 tons/year as a 5-year rolling average, as measured at the property line monitoring station.
Stream Condition Index (SCI)	Rating of "Good" or better
Benthic Macroinvertebrate Health (BMI)	Improving trend in benthic macroinvertebrate community metrics with stable conditions comparable to Hidden Valley Creek.
BMP Effectiveness	Rating of "Good" or better
Watershed Maintenance and Restoration Program (WMRP)	Rating of "Good" or better

[3] Rating criteria for SCI, BMP effectiveness, and WMRP programs are presented in Attachment C.

E. Receiving Water Limits for Surface Waters - West Fork Carson River Hydrologic Unit

The following additional water quality objectives apply to all surface waters of the West Fork Carson River Hydrologic Unit:

Algal Growth Potential: The mean of monthly mean of algal growth potential shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

Biostimulatory Substances: The concentrations of biostimulatory substances shall not be altered in an amount that could produce an increase in aquatic biomass to the extent that such increases in aquatic biomass are discernible at the 10 percent significance level.

Color: The color shall not exceed the 13 Platinum Cobalt Unit mean of monthly means (approximately equal to the State of Nevada standard of 13 Platinum Cobalt Unit sample mean).

Dissolved Oxygen: The dissolved oxygen concentration shall not be depressed by more than 10 percent, below 80 percent saturation or below 7.0 mg/L at any time, whichever is more restrictive.

pH: Changes in normal ambient pH levels shall not exceed 0.5 unit.

Sodium Adsorption Ratio (SAR): Water quality objectives for SAR are set to protect the irrigated agriculture component of the Agricultural Supply (AGR) beneficial use. SAR is calculated using the following equation, where Na = sodium ion concentration, Ca= calcium ion concentration, and Mg = magnesium ion concentration.

$$SAR = \frac{Na}{\sqrt{\frac{Ca + Mg}{2}}}$$

Concentrations of all chemical constituents in the equation above are expressed in milliequivalents per liter. As a ratio, SAR has no units.

The following water quality objective for SAR, as an annual average, applies to surface waters of the West Fork Carson River HU. Except as noted below, SAR objectives apply to the entire water body and its tributary surface waters in California.

Water Body SAR (Annual Average)

West Fork Carson River **1**

The Lahontan Regional Board recognizes that SAR may be higher than the value above in certain surface waters of the West Fork Carson River watershed due to natural sources of sodium, including geothermal sources. Where higher SAR values occur only as a result of natural sources, the affected water bodies or water body segments will not be considered to be in violation of the applicable SAR objective.

Species Composition: Species composition of the aquatic biota shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

Taste and Odor: The taste and odor shall not be altered.

Turbidity: The turbidity shall not be raised above a mean of monthly means value of 2 NTU. (This objective is approximately equal to the State of Nevada standard of 2 NTU annual mean.)

F. Receiving Water Limits for Ground Waters – Regionwide

The following water quality objectives apply to all ground waters of the Lahontan Region:

Bacteria, Coliform
In ground waters designated as MUN, the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 milliliters.

Chemical Constituents
Ground waters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 64444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

Waters designated as AGR shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes).

Ground waters shall not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.

Radioactivity
Ground waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

Taste and Odor
Ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For ground waters designated as MUN, at a minimum, concentrations shall not exceed adopted secondary maximum contaminant levels specified in Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

G. Receiving Water Limits for Ground Waters – West Fork Carson River Hydrologic Unit

The following additional objective applies to the West Fork Carson River Hydrologic Unit:

For ground waters under the West Fork Carson River Hydrologic Unit, the taste and odor shall not be altered.

H. Waste Discharge Prohibitions

The following discharge prohibitions apply to the Facility except for discharges of storm water when wastes in the discharge are controlled through the application of management practices or other means and the discharge does not cause a violation of water quality objectives. Certain exemptions to the waste discharge prohibitions below may apply as set forth in chapters 4.1 and 5.2 of the Basin Plan.

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

2. Where any numeric or narrative water quality objective contained in this Plan is already being violated, the discharge of waste that causes further degradation or pollution is prohibited.

3. The discharge of waste that could affect the quality of waters of the state that is not authorized by the State or Regional Board through waste discharge requirements, waiver of waste discharge requirements, NPDES permit, cease and desist order, certification of water quality compliance pursuant to Clean Water Act section 401, or other appropriate regulatory mechanism is prohibited.

4. The discharge of untreated sewage, garbage, or other solid wastes into surface waters of the Region is prohibited. (For the purposes of this prohibition, “untreated sewage” is that which exceeds secondary treatment standards of the Federal Water Pollution Control Act, which are incorporated in this plan in Section 4.4 under “Surface Water Disposal of Sewage Effluent.”)

5. The discharge attributable to human activities of any waste or deleterious material to surface waters of the Lake Tahoe HU is prohibited.

   An exemption to this prohibition may be granted whenever the Regional Board finds all of the following:

   a. The discharge of waste will not, individually or collectively, directly or indirectly, adversely affect beneficial uses, and

   b. There is no reasonable alternative to the waste discharge, *and*

   c. All applicable and practicable control and mitigation measures have been incorporated to minimize potential adverse impacts to water quality and beneficial uses.

6. The discharge attributable to human activities of any waste or deleterious material to land below the highwater rim of Lake Tahoe or within the 100-year floodplain of any tributary to Lake Tahoe is prohibited.

7. The discharge attributable to human activities of any waste or deleterious material to Stream Environment Zones (SEZs) in the Lake Tahoe HU is prohibited.

   The Regional Board may grant exemptions to Prohibitions 6 and 7, above, for projects relocating existing structures within the 100-year floodplain, within an SEZ, where the area of the structure is relocated on the same parcel or within a defined project area and where the following finding can be made (a “project area” may include multiple adjacent or non-adjacent parcels): The relocation must result in net or equal water quality benefit. Net or equal benefit is defined as an improvement in or maintenance of function of the associated area of 100-year floodplain, SEZ, spawning habitat, or stream inlet. Net or equal benefit may include, but is not limited to, one or more of the following:

a. Relocation of structure to an area further away from the stream channel or wetlands;

b. Protection of restored 100-year floodplain or SEZ or an equivalent area (at a 1:1 ratio for floodplain or 1.5:1 for SEZ) of offsite 100-year floodplain or SEZ through deed restriction or conveyance to a mitigation bank or land conservancy or similar. For projects involving disturbance of wetlands, offsite mitigation may involve larger mitigation ratios;

c. For projects involving the relocation of more than 1000 square feet of impervious coverage within a 100-year floodplain or SEZ, a finding, based on a report prepared by a qualified professional, that the relocation will improve the functioning of the floodplain or SEZ and will not negatively affect the quality of existing habitats.

8. The discharge of garbage or other solid waste to lands within the Lake Tahoe Basin is prohibited.

9. The discharge of industrial waste within the Lake Tahoe Basin is prohibited. Industrial waste is defined as any waste resulting from any process or activity of manufacturing or construction. Stormwater discharges from industrial facilities are not prohibited when wastes in the discharge are controlled through the application of management practices or other means and the discharge does not cause a violation of water quality objectives.

II. REQUIREMENTS

A. Best Management Practices (BMPs)

1. Unless a variance has been granted by the Executive Officer, there shall be no removal of vegetation nor disturbance of existing ground surface conditions between October 15 of any year and May 1 of the following year.

2. Prior to October 15 of each year, Heavenly shall provide permanent or temporary (if project is incomplete) stabilization/cover of all disturbed or eroding areas.

3. Surplus or waste material and/or fill of earthen material shall not be placed in drainage ways or within the 100-year flood plain of any surface water of the Lake Tahoe Hydrologic Unit.

4. All loose piles of soil, silt, clay, sand, debris, or other earthen materials must be protected in a reasonable manner to prevent the discharge of these materials to waters of the state.

5. Prior to any disturbance of existing soil conditions, Heavenly shall install temporary erosion control facilities to prevent transport of eroded earthen materials and other wastes off of the property.

6. During construction activities, all non-construction areas in the vicinity must be protected to prevent unauthorized disturbance.

7. All disturbed areas shall be adequately restabilized and revegetated, and be continually maintained until vegetation becomes established.

8. Surplus waste earthen materials shall be removed from the Facility and deposited at a legal point of disposal, or restabilized on-site in accordance with erosion control plans submitted by Heavenly. At no time shall waste earthen materials be placed in surface water drainage courses, or in such a manner or location as to allow the discharge of such materials to adjacent undisturbed land or to any surface water drainage course.

9. At a minimum, runoff from impervious surfaces shall be treated and/or contained on site for a 20-year, 1-hour storm. A 20-year, 1-hour storm would produce approximately 1.0 inch of rain. Storm water runoff in excess of the design storm that leaves the site shall only be discharged to a storm drain or to a stabilized drainage. The Executive Officer can accept alternate treatment methods where site limitations prevent on-site treatment, containment, and infiltration.

10. Surface flows from the Project site shall be controlled so that they do not cause downstream erosion at any point.

11. There shall be no significant modification of existing drainage ways or existing stream channels except for those modifications designed to improve water quality and beneficial uses. All modifications of the bed, channel, or bank of a stream require prior written acceptance by the Water Board, the California Department of Fish and Wildlife, and the United States Army Corps of Engineers.

12. Drainage swales that are disturbed by construction activities must be stabilized by appropriate soil stabilization measures to prevent erosion.

13. Snow storage and disposal shall be managed to avoid, reduce and/or minimize the discharge of pollutants, including sand and de-icing materials, to receiving waters.

14. Use of best available source reduction measures for de-icing materials (salts) is required to avoid and minimize pollutant discharges from paved parking areas, roads, and ski areas.

15. The amount of abrasives applied on paved parking areas and roads msut be minimized to the extent practicable.

16. Apply to paved parking areas and roads abrasives of the kind that minimize the amount of fine sediment and soluble N and P in runoff from the Facility with respect to available sources.

17. Conduct frequent sweeping to maximize the recovery of solid pollutants.

B. Mitigation Requirements

1. Heavenly must implement all the mitigation measures identified in the 2015 MMP (Attachment B).

2. The following mitigation requirements must be completed to reduce and control hill slope erosion and sedimentation to surface waters. Implement the operations and maintenance measures (items 7.5-1 through 7.5-3 of the 2015 MMP) as applicable to the Facility. For item 7.5-3, Water-C1a (Sky Meadows/Sky Basin erosion reduction measures), the erosion sites must be mitigated according to the following schedule:

   a. Phase I Hotspots – complete by **October 15, 2015**

   b. Phase II Hotspots – complete by **October 15, 2016**

   c. Phase III Hotspots - prioritize and schedule for restoration in ongoing WMRP.

C. Time Schedule for Compliance – California Base Area Runoff and Bijou Park Creek

Discharges from the California Base Area show chronic violations of effluent limits and receiving water objectives for certain pollutants. Additional evaluation and implementation of source control and treatment measures are needed to mitigate these conditions to the extent practicable. Heavenly must address the following issues related to pollutants in storm water runoff from the California Base Area parking lot, which then enter Bijou Park Creek.

1. Bijou Park Creek Chloride Levels

   a. Conduct a feasibility study to transition from applying rock salt to the parking area and access roads to applying liquid brine. Results from other agencies have shown that brine applications can significantly reduce the mass of sodium chloride applied to pavements and discharged to water while maintaining safe conditions on the roadways.

b. Assess the extent and degree of chloride in Bijou Park Creek. The current compliance sampling point is very close to the discharge point and it is unclear whether elevated chloride concentrations persist downstream of this point. Heavenly must prepare a plan acceptable to the Water Board to assess the fate of chloride in Bijou Park Creek

2. Turbidity, TSS and Nutrients in Parking Lot discharges

a. Conduct an engineering evaluation and recommend measures to improve the performance of the StormFilter™. Additionally, determine needed revisions to the sampling protocol to obtain representative samples of the discharge from the system.

b. Conduct a feasibility study to convert from cinders to Washoe Septic sand (or equivalent) for the application of traction sand to the parking lot and access roads.

A feasibility report on using brine, higher quality traction sand, improvements to the StormFilter™, and a monitoring plan to assess chloride in Bijou Park Creek must be submitted to Water Board by **November 1, 2015**. The feasibility report must include the evaluation, recommendations, and timeframes for implementing the feasible improvements. The proposed chloride assessment plan for Bijou Park Creek described in 1.b. above must, at a minimum, identify the sampling points, collection frequency, timing relative to implementation of additional source controls, duration of the study, and reporting. Heavenly must incorporate any Water Board staff comments into a final plan that will be provided for Executive Officer acceptance within thirty days of receiving comments from the Water Board.

D. Snow Conditioning

Snow conditioning materials applied to terrain parks and other ski areas have the potential, if applied in excess quantities, to contribute to increased concentrations of chloride in runoff and receiving waters. Snow conditioning materials, if used on terrain parks or other ski areas, must be applied by appropriate methods and in quantities that minimize the discharge of pollutants to receiving waters. Heavenly must track and report the application of such materials. Heavenly must, at a minimum, by **November 1, 2015**, propose actions and a schedule, or describe actions that have already been taken, to attain concentrations of chloride in Heavenly Valley Creek that are comparable to concentrations of chloride in Hidden Valley Creek (reference conditions).

E. Facilities and Watershed Awareness

Heavenly must annually inform ski area employees of the location and purpose of ski area erosion control improvements and encourage employees to report possible maintenance needs to supervisors and the facilities manager. Heavenly shall submit a letter certifying completion of employee information dissemination annually by **June 30** each year.

III. PROVISIONS

A. Standard Provisions

Heavenly must comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment D which is made part of this Order.

B. Construction Activities

This Order regulates minor construction activities that involve less than one acre of land disturbance and maintenance activities that involve more than one acre of land disturbance that are conducted to maintain the original line and grade of the Facility. This Order does not regulate construction activities that involve one acre or more of land disturbance, or work in waters of the U.S. For these activities Heavenly must seek general permit coverage under separate applicable NPDES permitting processes, or other Clean Water Act agreements.

C. Monitoring and Reporting Program

A monitoring and reporting program (MRP) is necessary to verify compliance with requirements. Pursuant to Water Code section 13267, subdivision (b), Heavenly must comply with MRP No. 2015-TENT as specified by the Water Board Executive Officer.

D. Rescission of WDRs

Order R6T-2003-0032, as amended, is hereby recinded upon the effective date of this Order, except for enforcement purposes.

I, Patty Z. Kouyoumdjian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Lahontan Region, on May 14, 2015.

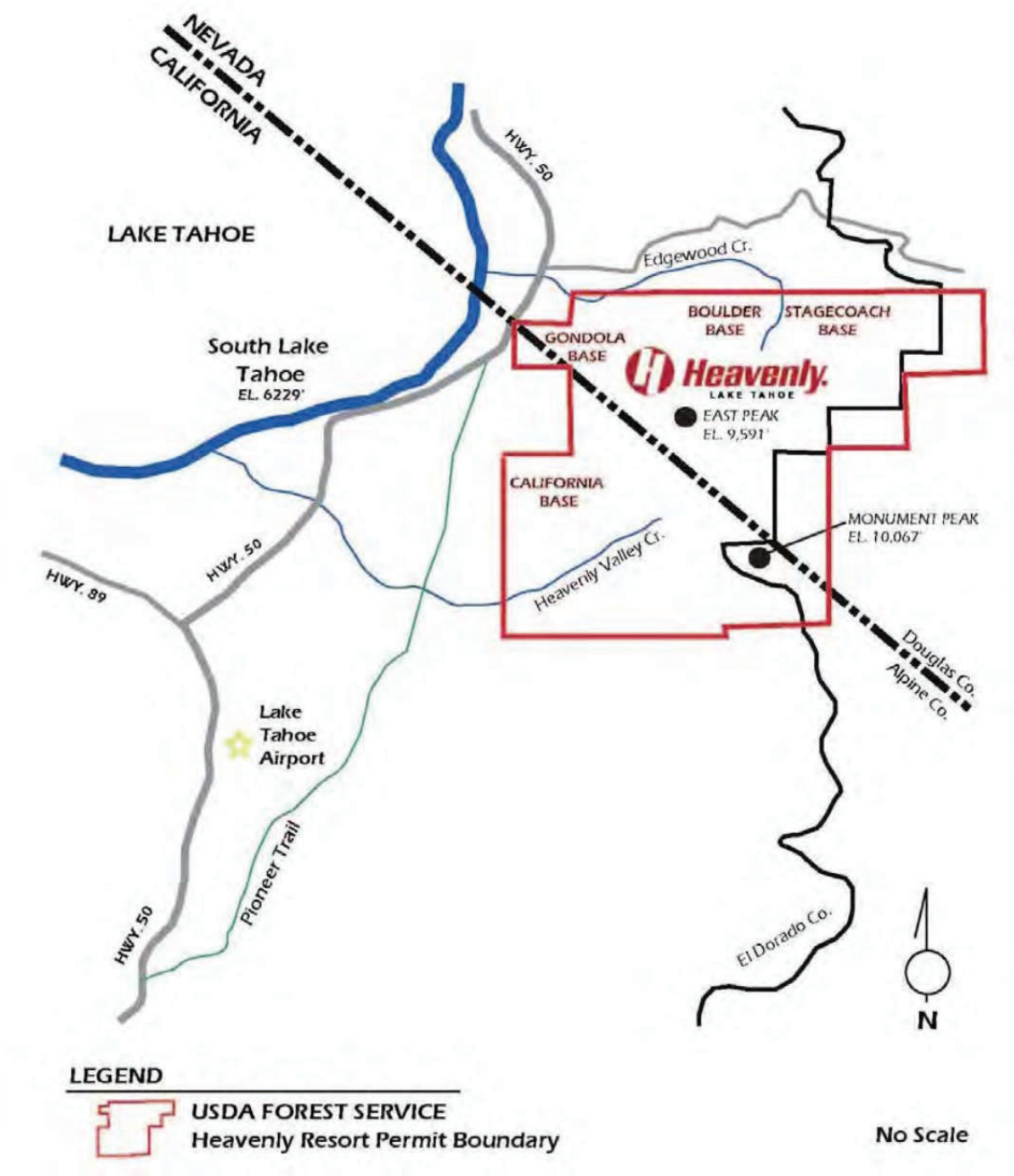
Patty Z. Kouyoumdjian

PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

Figures: 1 – Location Map
2 – Facility Boundaries
3 – Watershed Locations

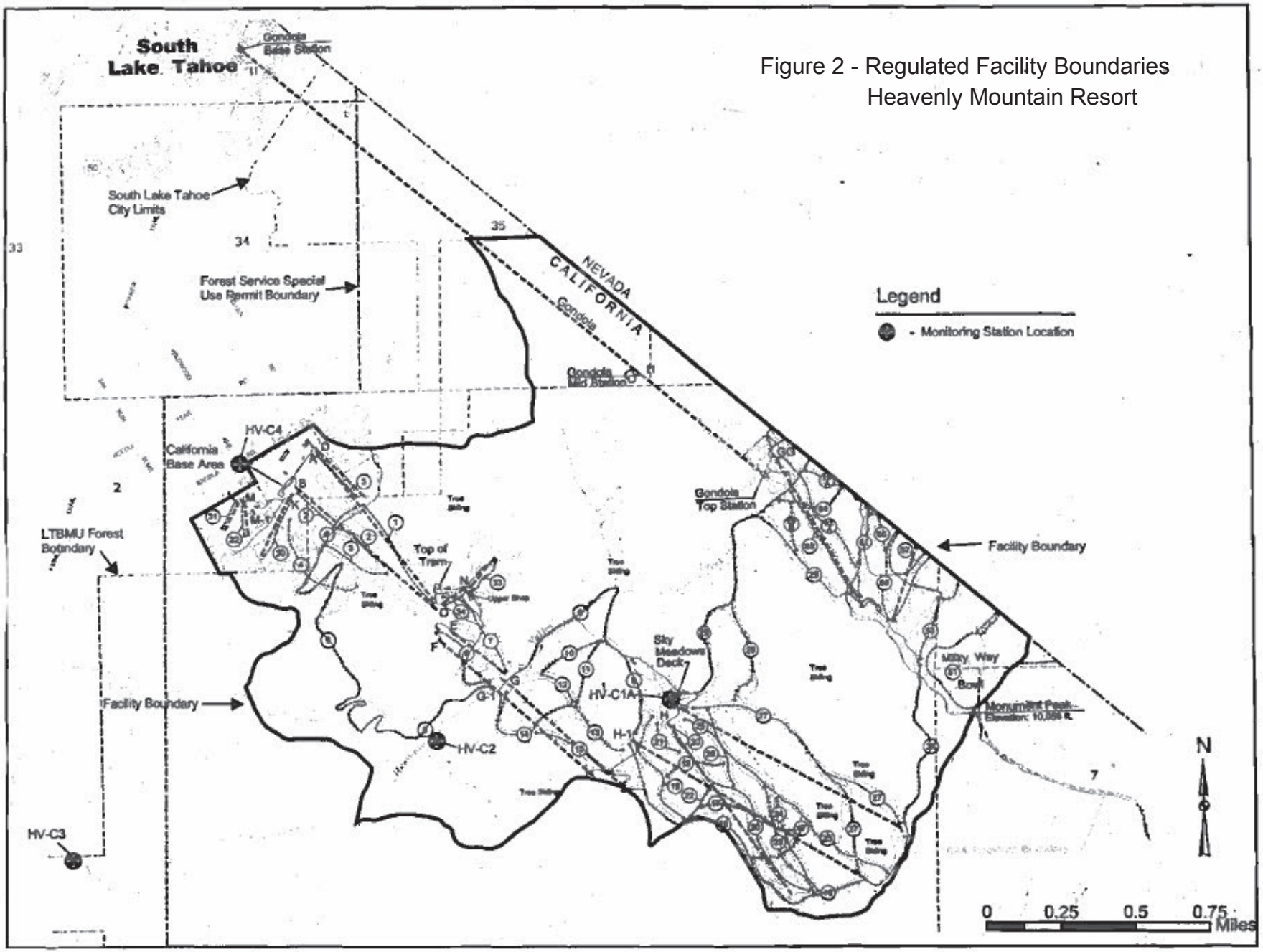
Attachments: A - Findings
B - 2015 Mitigation and Monitoring Plan
C - Rating criteria for SCI, BMI health, BMP effectiveness, and CWE restoration
D - Standard Provisions for Waste Discharge Requirements

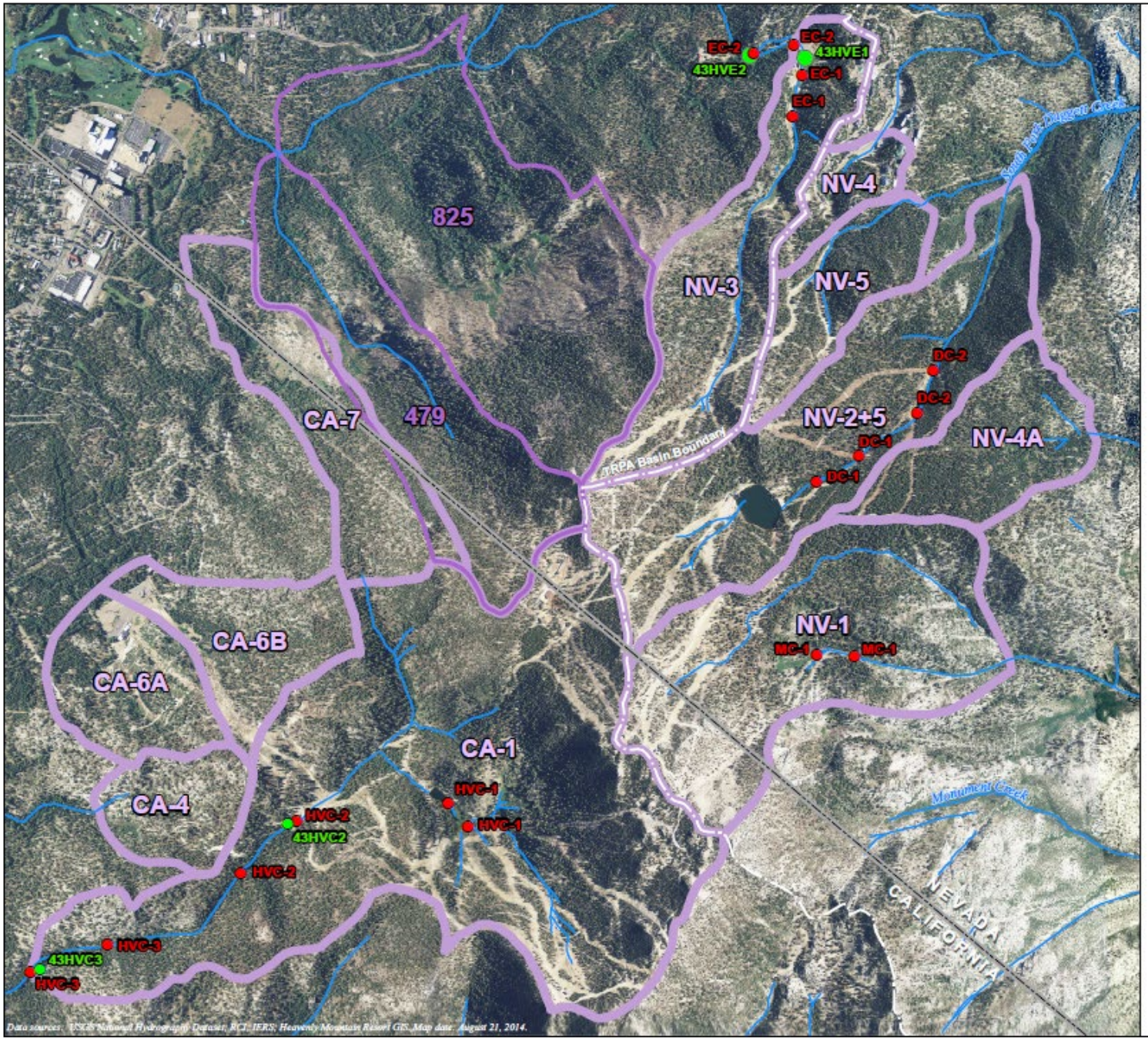
Figure 1 – Heavenly Mountain Resort Location Map



Map from Cardno ENTRIX - *Heavenly Mountain Resort Environmental Monitoring Program Comprehensive Report Water Years: 2006 – 2011*, January 17, 2012 (revised October 2013)

Figure 2 - Regulated Facility Boundaries
Heavenly Mountain Resort





HEAVENLY MOUNTAIN RESORT
EPIC DISCOVERY PROJECT

Figure 3: Heavenly Watersheds, Streams, and Monitoring Sites

- Water Quality Sample Stations
- SCI Stream Reaches
- Streams
- Sub-basins
- Watershed Basins

43HVC2	Below Patsy's WQ Station
43HVC3	Property Line WQ Station
43HVC4	CA Parking Lot WQ Station
43HVE1	Upper Edgewood WQ Station
43HVE2	Lower Edgewood WQ Station
HVC-1	Sky Meadows SCI Reach
HVC-2	Below Party's SCI Reach
HVC-3	Property Line SCI Reach
EC-1	Upper Edgewood SCI Reach
DC-1	Upper Daggett SCI Reach
DC-2	Lower Daggett SCI Reach
MC-1	Mott SCI reach

0 1,500 3,000
Feet

1:36,000

HAUGE BRUECK
ASSOCIATES

Attachment A

Findings

Heavenly Mountain Resort
Epic Discovery Project
Environmental Impact Report (CEQA)

(SCH# 2013112051)

California Regional Water Quality Control Board,
Lahontan Region

February 2015

Hauge Brueck Associates. 2015. Findings of Fact and Statement of Overriding Considerations. *Heavenly Mountain Resort Epic Discovery Project.* February. (SCH #201311205) Sacramento, CA. Prepared for California Regional Water Quality Control Board, Lahontan Region, South Lake Tahoe, CA.

TABLE OF CONTENTS

Tables

Foreword

This document contains the Findings required by the California Environmental Quality Act (CEQA) (Pub. Res. Code 21081[a]) and section 15091 of the State CEQA Guidelines (14 Cal. Code Reg. 15091). The Findings are contained in Section 1 of the following document. Because no significant and unavoidable impacts would occur, a statement of overriding considerations is not required per section 15093 of the State CEQA Guidelines (14 Cal. Code Reg. 15093).

Acronyms and Abbreviations

BA	biological assessment
BE	biological evaluation
BMP	best management practice
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CERP	Construction Erosion Reduction Program
CEQA	California Environmental Quality Act
CWE	cumulative watershed effects
EIR	environmental impact report
EIS	environmental impact statement
ERA	equivalent roaded area
Findings	findings of fact
LCD	land coverage designation
LTBMU	Lake Tahoe Basin Management Unit
MMP	Mitigation Monitoring Plan
MPA	Master Plan Amendment
NEPA	National Environmental Policy Act
RWQCB	Regional Water Quality Control Board
SAROEA	Ski Area Recreational Opportunity Enhancement Act
SEZ	stream environment zone
SNFPA	Sierra Nevada Forest Plan Amendment
SNYLF	Sierra Nevada yellow legged frog
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TOC	thresholds of concern
TMDL	Total maximum daily load
TRPA	Tahoe Regional Planning Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
Water Board	California Regional Water Quality Control Board, Lahontan Region
WDR	waste discharge requirements

1. Findings

1.1 Introduction

The Heavenly Mountain Resort Epic Discovery Project (Project) is designed to expand and diversify year-round, non-skiing recreational opportunities at Heavenly, primarily for summer time users. Proposed projects would utilize existing infrastructure (e.g., ski lifts) and guest service facilities to provide a wide variety of summer activities for guests. All activities would be accessed using the existing Gondola from the base station at Heavenly Village. The environmental impact report (EIR) evaluates at an equal level of detail three project alternatives, including the no-project alternative. The alternatives utilize different combinations of the following activities, grouped by general location:

- Adventure Peak (Entirely within the Lake Tahoe Basin)
    - Mid-Station Zipline Canopy Tour
    - Sky Cycle Canopy Tour
    - Forest Flyer Alpine Coaster
    - Smaller Infill Activities
    - Interpretive Activities at Tamarack Lodge
- East Peak Basin (Almost entirely outside the Lake Tahoe Basin)
    - Mountain Bike Park
    - East Peak Zipline Canopy Tour
    - East Peak Reservoir Water Activities
    - Interpretive Activities at East Peak Lodge
    - East Peak Lodge Hiking Trail
- Sky Meadows Basin (Entirely within the Lake Tahoe Basin)
    - Sky Meadows Zipline Canopy Tour
    - Sky Meadows Challenge Course
    - Ridge Run Lookout Tower and Observation Deck
    - Interpretive Activities at Sky Deck
- Mountainwide
    - Educational Opportunities and Interpretive Information
    - Mountain Excursion Tour
    - Connecting Trails (e.g., Panorama Trail to connect East Peak Lake area to Tahoe Rim Trail and Van Sickle Park)
    - Emergency Gondola Snow Cat Evacuation Route (Winter Use Only)

The Heavenly Mountain Resort (also referred to as Heavenly in this document) is a year-round resort located partially inside and partially outside of the Lake Tahoe Region on the south shore of Lake Tahoe.

Heavenly is situated within El Dorado County, California and Douglas County, Nevada, primarily on United States Department of Agriculture Forest Service (USFS) lands. Access to the Heavenly Mountain Resort is by way of U.S. Highway 50 and State Highway 89 from California and U.S. Highway 50 and State Highway 207 from Nevada. The Lake Tahoe Airport is located approximately six miles from the California base area, and the Reno Cannon International Airport is approximately 55 miles to the northeast of the Nevada base areas.

The project area for the EIR analysis encompasses Adventure Peak, East Peak Basin, and Sky Meadows Basin. Adventure Peak, located at the top of the Heavenly Gondola, would continue to serve as the primary access portal and hub for most non-skiing activities. Adventure Peak currently provides year-round, family-oriented and non-skiing activities on the mountain. Proposed activities would extend beyond Adventure Peak to two other on mountain locations - the East Peak Basin to the east and the Sky Meadows Basin to the west. These three distinct activity centers would be linked by a combination of existing ski lifts, proposed hiking and mountain biking trails, proposed ziplines or similar conveyances, and existing summer roads (e.g., Mountain Excursion Tour vehicles).

The proposed project was analyzed in the Final EIR, dated February 2015, which was prepared pursuant to CEQA and the State CEQA Guidelines (14 Cal. Code Reg. 15000 et seq.). The Final EIR considered potential construction and operational impacts on the environment that would result from the project alternatives.

To support a decision on a project for which an EIR is prepared, a lead or responsible agency must prepare written findings of fact (Findings) for each significant environmental impact and each alternative identified in the EIR in accordance with Section 15091 of the CEQA Guidelines. The California Regional Water Quality Control Board, Lahontan Region (Water Board), as the lead agency, has prepared these Findings for the proposed project. The Findings must be adopted by the Water Board after certification of the Final EIR and at the time of approval of the project.

Section 15091 of the CEQA Guidelines states that no public agency shall approve or carry out a project for which an EIR has been certified that identifies one or more significant environmental effects of the project, unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:

1. Changes or alternatives have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.
   [14. Cal. Code Reg. 15091(a)(1)]
2. Such changes or alternatives are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
   [14. Cal. Code Reg. 15091(a)(2)]
3. Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the measures or project alternatives identified in the Final EIR.
   [14. Cal. Code Reg. 15091(a)(3)]

The Water Board staff has prepared a Final EIR for the proposed project, and the Water Board certified the Final EIR at its Board meeting in May 2015. The Final EIR identified various significant environmental impacts of the proposed project.

In compliance with CEQA and Section 15091 of the State CEQA Guidelines, the Water Board has prepared the following Findings, which include a finding for each significant environmental impact (Section 1.2) and the project alternatives considered (Section 1.3). For the purposes of these Findings, the impacts and mitigation measures have been summarized and presented by issue area as follows, in the same order presented in the Final EIR. The mitigation measures are described in full in the referenced sections of the Final EIR (Volume I) and are hereby incorporated by reference.

- 3.1 Water Resources: Hydrology, Water Quality, and CWE
- 3.3 Transportation, Parking and Circulation
- 3.5 Wildlife and Fisheries

1.2 Findings for Significant Environmental Impacts

1.2.1 Water Resources: Hydrology, Water Quality, and CWE

Impact WATER-C1: Would the Project have significant cumulative impacts to water resources in watershed CA-1? (Less than Significant with Mitigation, Proposed Action and Alternatives)

The Final EIR (Volume I, Section 3.1.) identified as a significant impact that the project would result in cumulative impacts to water resources in watershed CA-1. The following projects are considered as past, present or reasonably foreseeable future actions in and downstream of the CA-1 watershed: MPA 07 project components; South Tahoe Public Utility District facilities maintenance and upgrades; Trout Creek Bridge to Ski Run Highway 50 Improvements; conservation and restoration projects in the Trout Creek watershed; South Tahoe Greenway Shared-Use Trail Project; El Dorado County road and BMP maintenance projects; Powerline Bike Trail; and Heavenly Valley Creek Fuels Reduction Project. There is the potential for increase in magnitude, duration or frequency of an existing adverse biotic condition, as measured by benthic macroinvertebrates (BMI), as the result of increased sedimentation in the watershed. Cumulative percent equivalent roaded areas (ERA) would approach the watershed threshold of concern (TOC) established from previous EIRs.

Past and Current Conditions. Past conditions have been well documented and reported in the Heavenly Valley Creek TMDL Staff Report (Lahontan 2000), the MPA 07 EIR/EIS/EIS and the Master Plan (MP) 96 EIR/EIS/EIS. Current watershed conditions are summarized in Section 3.1-2.2 (DEIR/EIS/EIS Volume I, Chapter 3.1). Overall current watershed condition is rated as Good with a Stable trend, however, the poor score for biotic health (as measured by benthic macroinvertebrates (BMI)) in the Sky Meadows reach, does raise a flag for a potential cumulative impact in the watershed above Sky Meadows related to sedimentation.

Past ski area development that began in the 1950's created changes in peak and total runoff, soil quality, vegetation, topography and stream channel morphology in the CA-1 watershed and headwaters of

Heavenly Valley Creek. On-site impacts to resources resulted. The MP 96 EIR/EIS/EIS analyses recognized the adverse effects of past activities on resource impact severity and as a result a number of watershed level mitigations were prescribed, including the on-going CWE Restoration Program, CERP, and Environmental Monitoring Program.

On-going monitoring of physical, chemical and biological indicators of watershed health reports improvements in most indicators. Watershed conditions have markedly improved over the last several decades as a result of changes in ski area operations and management; road decommissioning; application, monitoring and maintenance of permanent BMPs; and wide-scale revegetation of ski runs and road cut and fill slopes. Stream condition inventories report stable channel conditions that are within the range of natural variability and comparable to reference conditions. Surface water quality monitoring results indicate improved compliance with state annual standards and on-going compliance with the sediment TMDL five-year rolling average numeric target. Biotic conditions however, do not yet approach desired conditions described below.

Desired Condition. The numeric targets developed for the Heavenly Valley Creek sediment TMDL are intended to interpret the narrative and numeric water quality objectives, which in turn provide for support of designated beneficial uses.

Desired conditions for Heavenly Valley Creek include:

Total instream sediment load: The numerical target for total instream sediment loading in Heavenly Valley Creek is 58 tons/year, expressed as a five year rolling average as measured at the Property Line monitoring station. This number reflects the modeled maximum feasible reduction in sediment loading with full application of BMPs to the watershed. It is believed to be close to natural conditions and reasonably comparable with the estimated 45 tons/year total sediment load in Hidden Valley Creek, a nearby reference stream.

Stream condition index and stability: Over time, Heavenly Valley Creek should show a trend of increasing stability in channel morphology.

Macroinvertebrate community health: Over time, there should be improving trends in benthic macroinvertebrate community metrics, approaching conditions in Hidden Valley Creek.

Watershed disturbance: Schedules in ski resort master plan mitigation program for implementing and maintaining BMPs for roads and ski runs are met, with progress and BMP effectiveness reported annually and evaluated at 5-year intervals.

Effective soil cover (vegetation, woody debris, organic matter, rocks) on ski runs and roads: Cover meets modeled mitigation targets set for specific road/run segments in watershed, and overall cover rating is "Good" or better using LTBMU evaluation criteria.

Range of Variability. There is inherent seasonal and annual variation in sediment delivery to streams, and in the impacts of sediment on aquatic species during different critical life stages. The Heavenly Valley Creek TMDL addresses long term erosion patterns and instream impacts by using longer time frames for implementation and evaluation, and relies on an adaptive management approach. Load allocations are expressed as 5 year rolling averages to account for seasonal and annual variability. The TMDL and allocations are expected to promote recovery of aquatic habitat over time, to the point which will support

the beneficial uses of concern. The TMDL contains an implicit margin of safety, based on conservative assumptions, to compensate for uncertainty in the analysis, and to ensure that the allocations, when achieved, will result in attainment of standards.

Threshold of Concern/Existing, Proposed and Potential Cumulative Percent ERAs. The TOC for watershed CA-1 is set at 5%. Existing %ERA for watershed CA-1 is 3.99%. Implementation of the Proposed Project and Alternative 2 would increase the %ERA by 0.30 to 4.29%. Alternative 1 would increase %ERA by 0.41 to 4.40%. When considering new summer uses and facilities as additive to those actions approved for the MPA 07, the %ERA upon build out is estimated at 4.59%. Cumulative %ERA would approach but not exceed the numerical watershed TOC. This %ERA is representative of on-site effects of total disturbance within the Heavenly special use permit area of CA-1.

Potential for Cumulative Watershed Effects. As the %ERA approaches the TOC, the risk for cumulative watershed effects in watershed CA-1 increases. The Project impacts would be avoided and minimized through design features and site-specific resource protection measures and the Project would not result in a significant increase in impact over existing conditions; however, the Sky Basin has recent in-stream BMI scores that indicate poor biotic conditions. Although the significance of these results is being assessed as part of the on going Environmental Monitoring Program, the data indicate that there is an existing impaired condition for in-stream biotic condition. As such, new summer uses and facilities in the Sky Basin, when considered in the context of past, present, and reasonably foreseeable future actions in the CA-1 watershed, could perpetuate an existing impaired biotic condition in Sky Meadows.

Cumulative increases in impact severity can occur if an existing adverse condition increases in magnitude, duration or frequency (Reid 2010). The potential for cumulative off-site watershed effects in this watershed is high. There is potential for continued cumulative off-site watershed effects as reflected by biotic health within this watershed, and currently there is not a high level of certainty regarding which restoration strategies will be effective in improving biotic condition scores. Increased monitoring efforts in this watershed will provide information for effective restoration and mitigation strategies over the long term. The discussion below provides the most current assessment of restoration and mitigation strategies that should be implemented at this time.

Restoration and Mitigation Strategies. The on-going CWE Restoration Program (Appendix 3.1-D of the FEIR/EIS/EIS) outlines projects for mitigation of past ski area development impacts, as identified in the MPA 07 mitigation and monitoring program. Heavenly would continue to implement restoration projects as capital projects are constructed. On-going monitoring would continue to identify and prioritize high risk areas for restoration and maintenance.

As part of the analysis conducted for the Project, an assessment of primary sources of erosion was completed in July 2014 in the CA-1 watershed above the Sky Reservoir. Appendix 3.1-F of the FEIR/EIS/EIS details the erosion-focused monitoring results and outlines the recommended mitigation measures to reduce sources of fine sediments that may be contributing to low scores of in-channel biotic health and downstream sediment impacts.

In addition, future road management, including design, maintenance and monitoring of resort access roads, will be conducted as described in DEIR/EIS/EIS Volume I Chapter 2, Section 2.3.5. The Special Use permit between Heavenly Resort and the Forest Service will be amended to incorporate these

changes to roads management at Heavenly to ensure these activities are conducted to the same standards as the rest of the Forest Service road network.

The on-going Environmental Monitoring Program implemented in compliance with Lahontan's WDR monitoring and reporting program will be amended to include expanded stream channel condition monitoring in the Sky Meadows reach to better determine the cause of poor biotic condition scores and document future trends. The actual metrics and protocols to be added will be determined through an interagency effort led by Lahontan.

Appendix 3.1-F of the Final EIR/EIS/EIS details the erosion-focused monitoring results and outlines the recommended mitigation measures. The potential for off-site impacts would be attenuated by the existing Sky Reservoir, but sediment-focused mitigation and monitoring of on-site cumulative watershed effects in Sky Meadows would be necessary to reduce existing impact intensity of erosion and sedimentation in the upper watershed. The implementation of restoration and mitigation actions planned in the MPA 07 mitigation and monitoring program and those proposed for the No Action, Proposed Action and Alternatives in mitigation measure WATER-C1a and WATER-C1b would reduce cumulative impacts to level of less than significant.

Relationship to the Lake Tahoe TMDL. Current monitoring data indicates that this watershed is meeting the thresholds for suspended sediment as described in the Heavenly TMDL for this metric (Volume I, Chapter 3.1, Section 3.1-2.3). The proposed 2.1 acres of new permanent disturbance is not expected to change this trend. Annual suspended sediment loads may continue to decrease even further below established TMDL thresholds, as a result of proposed mitigation measures, including those to reduce fine sediment impacts that are likely affecting current biotic health in the Sky Meadows Reach.

Mitigation Measures

Implementation of mitigation measure WATER-C1a will commence prior to or concurrent with additional development within the Sky Basin, addressing potential and active sediment sources with high hydrologic connectivity to Heavenly Valley Creek. Mitigation measure WATER-C1b amends the on-going monitoring program to include roads and trails monitoring to comply with current Forest Service protocols, adds site-specific requirements for additional substrate analysis for Heavenly Valley Creek and updates SCI pebble count protocols to conform to SWAMP protocols for all Heavenly SCI reaches, including Hidden Valley Creek reference reaches. Mitigations will inform and focus the required management and restoration actions to improve biotic conditions in the Sky Meadows. Mitigations will inform and focus the required management and restoration actions to address high risk areas of erosion, reduce watershed percentage ERAs, and conduct on-going road and trail maintenance to reduce cumulatively considerable impacts to a less than significant level. The Water Board will include the following mitigation measures within the WDRs issued to Heavenly Mountain Resort.

Mitigation Measure WATER-C1a: CA-1 Erosion Reduction Measures (Proposed Action and Alternatives)

Prior to or concurrent with new permanent or temporary disturbance in the Sky Basin, the highest risk (i.e., those with the greatest potential for sediment loading to a channel) sources of erosion or "hotspots" that would have a direct effect on Heavenly Valley Creek channel and BMI scores

shall be mitigated, as outlined in Epic Discovery Draft EIR/EIS/EIS Appendix 3.1-F. First phase hotspots shall be addressed prior to new disturbance and shall include numbers 31, 32, 33, 34, 35, 36, and 49, as based on combinations of high erosion risk, high connectivity and/or close proximity to the channel and/or SEZ. Phase two hotspots shall be addressed prior to or concurrent with new disturbance and shall include numbers 13, 30, 37, 38, 41, 42, 43, 44, 45 and 46 because of combinations of high connectivity, but moderate erosion risk or lower proximity to the channel and/or SEZ. Hotspots numbers 6, 7, 39, 40, 47 and 48 shall be retained and implemented as part of mitigation measure 7.5-1 (ongoing Watershed Maintenance and Restoration Program) to correct areas of chronic sources of erosion that pose lower risk of sediment transport to the channel and/or SEZ. The status of implementation and effectiveness of these mitigation measures shall be documented through mitigation measure 7.5-2 (ongoing Environmental Monitoring Program) and reported to TRPA, Forest Service and Lahontan in annual monitoring reports.

Mitigation Measure WATER-C1b: Amendment to MPA 07 Mitigation Measure 7.5-2, On-Going Environmental Monitoring Program (Proposed Action and Alternatives)

The on-going Environmental Monitoring Program, Mitigation Measure 7.5-2, addresses the Lahontan Board Order No. R6T-2003-0032A2 waste discharge requirements (WDRs) and implements the monitoring and reporting program for Heavenly Mountain Resort. The Program includes the following monitoring components:

Water Quality Monitoring

BMP Effectiveness Monitoring

Riparian Condition Monitoring

Condition and Trend Monitoring

In summary, the Heavenly Mountain Resort Environmental Monitoring Program should continue to be revised and organized to adequately meet the monitoring and reporting requirements set forth in all regulatory documents and the Mitigation and Monitoring Program of the MPA 07.

The on-going Environmental Monitoring Program (Program) has been updated for 2015 through a revision of the Lahontan WDR and monitoring and reporting program. The Program includes additional monitoring requirements that have been identified for avoidance and reduction of cumulative watershed effects, as follows:

- Roads and trails monitoring within the Heavenly special use permit boundary shall be revised to comply with current Forest Service protocols, including the mountain bike trails constructed as part of the Mountain Bike Park in the Mott Creek Watershed (applies only to NV-1). Other general use mountain bike and hiking and maintenance trails would not be components of the Environmental Monitoring Program, but on-going effectiveness of design features shall be monitored and maintained through the current Heavenly operations and maintenance program.

- For the Heavenly Valley Creek Sky Meadows Reach only, the stream channel condition monitoring component shall be amended to add further monitoring for in-stream fine sediment to provide a better assessment of causes of poor biotic health and document effectiveness of mitigation strategies.

Finding

The Water Board finds that such mitigation measures are feasible and has adopted them as part of the WDRs and Monitoring Program. Therefore, the Water Board finds that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. [14. Cal. Code Reg. 15091(a)(1)]

1.2.2 Transportation, Parking and Circulation

Impact TRANS-1: Will the Project result in the generation of 200 or more new Daily Vehicle Trip Ends? (Less than Significant with Mitigation, All Alternatives)

The Final EIR (Volume I, Section 3.7) identified as a significant impact that the project would result in 728 daily trips. Table 1 documents the project trip generation estimates for the Proposed Action and Alternatives. The trip generation estimates are not expected to change between project alternatives. As shown in Table 1, the Project will generate more than 200 net new daily vehicle trip ends. The creation of more than 200 new daily trips is a significant impact based on the evaluation criteria for TRANS-1.

Table 1

Total Summer Trip Generation

Trip Type	Daily Trips	PM Peak Hour Trips		
		Total	Inbound	Outbound
Visitor	448	57	23	34
Employee	280	34	0	34
TOTAL	**728**	**91**	**23**	**68**

Source: Fehr & Peers 2014

Mitigation Measure

Heavenly has agreed to include the following mitigation measure into the Project in order to reduce any traffic-related impacts to levels of insignificance. Implementation of the Project as specified in the final EIR, including the implementation of all mitigation measures, is a condition of the WDRs issued by the Water Board.

Mitigation Measure TRANS-1: Traffic and Air Quality Mitigation Program (Proposed Action and Alternatives)

As identified in the Final EIR (Volume I, Chapter 5.0), Heavenly shall contribute to the Air Quality Mitigation Fund in accordance with Chapter 65 – Traffic and Air Quality Mitigation Program of the TRPA Code of Ordinances. The air quality mitigation fee shall be assessed in accordance with the mitigation fee schedule in the TRPA Rules of Procedure. Fees generated by the air quality mitigation fee are used to support programs/improvements that reduce vehicle miles traveled (VMT), improve air quality, and encourage alternative modes of transportation.

Finding

The Water Board finds that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. [14. Cal. Code Reg. 15091(a)(1)]. Implementation of mitigation measure TRANS-1 will reduce the impact to a less than significant level because fees generated by the air quality mitigation fee are used to support programs/improvements that reduce VMT, improve air quality, and encourage alternative modes of transportation. The Water Board finds that such a mitigation measure (TRANS-1) is feasible and Heavenly will be required to implement it as a condition of its WDRs; however, the Water Board find that it is partially within the responsibility and jurisdiction of another public agency (TRPA) and such changes have been adopted by such other agency or can and should be adopted by such other agency. [14. Cal. Code Reg. 15091(a)(2)]

1.2.3 Wildlife and Fisheries

Impact BIO-1: Would the Project, directly or indirectly, cause a loss of individuals or occupied habitat of endangered or threatened fish or wildlife species? (Less than Significant with Mitigation, Project and Alternatives)

The Final EIR (Volume I, Section 3.9) identified as a significant impact that the project would result in impacts to listed species, particularly Sierra Nevada yellow-legged frog habitat. However, Heavenly has agreed to incorporate mitigation measures into the final project that will reduce any impacts to less than significant.

No threatened or endangered fish or wildlife species are known to nest or be present within 0.5 mile of the project area. Great gray owl, a State of California Endangered Species, does not contain large amounts of suitable habitat within the project area. Great gray owls are strongly associated with meadows as this habitat type is used for hunting voles, gophers and other prey (Sears 2002) up to an elevation of 8,000 feet. Great gray owls tend to spend the majority of their time within 200 m of a meadow edge, within suitable habitat containing dense canopy cover, large trees and numerous snags. Breeding and wintering habitat is strongly correlated with healthy wet meadow systems (Van Riper and Wagtendonk. 2006). Great gray owls are also sensitive to human presence, as observed in Yosemite National Park (Van Riper and Wagtendonk. 2006).

The only wet meadow in the project area is located at Sky Meadows Basin, where the elevation is 8,500 feet and the area is heavily developed with the presence of a ski lodge, two lift base stations, a

snowmaking pond and associated pump house and auxiliary buildings. Additionally, the meadow is bordered on three sides by existing roadways utilized all seasons for vehicle travel over the snow and summer usage. Due to the limited meadow area, existing level of disturbance in the Sky Meadow Basin and surrounding area and the high elevation of the proposed project (above the elevation range of great gray owls) the likelihood of great gray owls being present in the project area is extremely unlikely. No impacts to this species are likely as a result of project implementation.

Other California Threatened and Endangered species (identified in Table 3.9-1 of the DEIR, Volume I, Chapter 3.9) have potentially suitable habitat within the project area and while no records, documentation or observations for these species has occurred, the potential exists for their being present within the Special Use Permit Boundary.

At present, annual wildlife surveys are performed at Heavenly for California spotted owl and northern goshawk. Sightings of any threatened or endangered species (i.e. Sierra Nevada yellow-legged frog, fisher) would be reported to the Forest Service, USFWS, California Department of Fish, Nevada Division of Wildlife and TRPA (if sighting occurs within the Tahoe Basin).

Suitable habitat for Sierra Nevada yellow-legged frog (SNYLF) has been delineated by LTBMU using criteria provided by the Region 5 office. Suitable habitat is defined by the Regional office per consultation with USFWS memo dated 28 May 2014. The suitable habitat for SNYLF is defined as follows: Suitable breeding habitat typically occurs above 4,500 feet in elevation and includes permanent water bodies or those hydrologically connected within permanent water such as lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), and pools (such as a body of impounded water contained above a natural dam). Most types of creeks, plunge pools within intermittent creeks, seeps, springs, and wet meadows plus surrounding areas up to a distance of 25m (82 ft). Where proximate water bodies occur within 300 m (984) feet of one another (typical of some high mountain lake habitat), suitable habitat for dispersal and movement includes the overland area between lake shorelines; in mesic habitats such as lake and meadow systems, the entire area of physically contiguous or proximate habitat is suitable for dispersal and foraging.

Suitable habitat for Sierra Nevada yellow-legged frog has been identified in the Sky Meadows Basin and East Peak Lake area. The projects associated with this area includes the Sky Meadows Challenge Course and East Peak Lake water activities. The Sky Meadows Challenge Course, as noted in the project description, is mostly contained in the trees adjacent to Heavenly Valley Creek and surrounded by existing disturbance and structures associated with resort operations. The Sky Meadows Challenge Course project proposes new pathways that will be located adjacent to the stream channel and upland area and within the 25m area surrounding the stream habitat. The Sky Meadows Challenge Course will not result in any modifications to the creek channel or result in any changes to the existing creek channel habitat. Under Alternative 1, the Sky Basin Coaster includes structures within the mapped suitable habitat. The bottom terminals and a small portion of the Sky Basin Coaster track is in the upland area but within the 25m buffer area.

Three surveys have been performed by USFS personnel in the Sky Meadows Basin and East Peak Lake areas: one in 2013 and two in 2014 (two surveys). No Sierra Nevada yellow-legged frog were observed in either area or survey year. East Peak Lake supported Sierran tree frog (*Pseudacris sierra*) adults and tadpoles in both surveys, while only Long-toed salamander (*Ambystoma macrodactylum*) was observed in the Sky Meadows Basin in the pond behind the California dam. Three surveys have been performed in

the last 10 years, but USFS protocol has not been met to classify the habitat as Unutilized Potential in accordance with Region 5 direction (USDA 2014) due to the fact that one of the surveys did not occur within 3-5 week of snowmelt within a year where the winter snowpack was 80% or above normal. As one additional survey is required that meets these criteria, the existing suitable habitat is classified as Utilization Unknown.

While the project in the Sky meadows basin (Sky Meadows Zipline Canopy Tour, Sky Meadows Challenge Course) and the Sky Meadows Coaster (Alternative 1) are located in suitable habitat, impacts to the habitat are minimal due to the projects location in the uplands and above ground with only minimal disturbance to the riparian area. The Sky Meadows Coaster will be located in 1.69 acres of SNYLF habitat, but as discussed above the coaster is placed above ground with little disturbance to the ground (installation of footings for railings and track). Both the Sky Meadows Challenge Course (0.06 acres) and the Sky Meadows Canopy tour (0.33 acres) are located above ground and will not have any direct impact to the habitat. The proposed East Peak Maintenance Trail located at the edge of East Peak Lake will cross 0.06 acres of habitat as the Beginner Bike Trail crosses 0.02 acres. The East Peak Canopy Tour crosses 0.10 acres of habitat but is aerial in this location so no disturbance is associated with this project. Please refer to Figures 3.9-1 and 3.9-2 (FEIR, Volume I, Chapter 3.9) that identifies the suitable habitat for SNYLF in association with these activities. Locations of the projects in upland habitat is unlikely to have impacts to the species as there are no dispersal locations (additional water bodies) located adjacent to Heavenly Valley Creek and East Peak Lake. Due to the fact that two years of surveys (three surveys total) have been performed with no detections of SNYLF; it is unlikely, however still possible, that SNLYF are present within the Sky Meadows Basin. East Peak Lake has been supporting reproductive amphibians as shown in the survey data, but no detections for SNYLF have occurred during the past surveys so it is unlikely that SNYLF are present in the area due to relative low quality habitat in East Peak Lake. Impacts to the habitat in this area are expected to be minimal as the lake will be utilized for water activities (paddle boats and kayaks), accessed by a floating dock that will not result in impacts to the vegetation along the shoreline.

Increased human presence in the areas surrounding the suitable habitat for SNYLF will not have an impact on the species if present due to the controlled nature of access and where the public and staff will be allowed to be present. All walking and vehicle traffic will be confined to existing and proposed walkways that are outside the suitable habitat and located in the upland areas. No dispersed walking or hiking activities will be allowed in association with these projects in the vicinity of SNYLF habitat.

While there is a low probability of SNYLF occurring in either the Sky Meadows Basin and East Peak Lake based on two years of surveys, it cannot be ruled out that SNYLF may occur in the project areas. Based on the project locations in the upland portions of the suitable habitat and minor impacts to riparian vegetation outside the stream corridor for the Sky Meadows Coaster (Alternative 1) and the lack of detections during two years of surveys, the proposed project may affect individuals but would not likely result in a loss of viability of the species.

Mitigation Measures

Heavenly has agreed to include the following mitigation measure into the Project in order to reduce any impacts to Sierra Nevada Yellow-legged Frogs to levels of insignificance. Implementation of the

Project as specified in the final EIR, including the implementation of all mitigation measures, is a condition of the WDRs issued by the Water Boards.

Mitigation Measure BIO-1: Delay Sky Meadows Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities Until Sierra Nevada Yellow-legged Frog Surveys and USFWS Consultation Are Complete

As identified in the Final EIR (Volume I, Section 5.0), Heavenly Mountain Resort shall delay implementation of projects located in Sky Meadows or East Peak Lake (e.g., Sky Meadows Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities) until protocol surveys (3 surveys in the past 10 years in accordance with USFS/USFWS protocol) are completed for the Sky Meadows Basin and East Peak Lake suitable habitat for Sierra Nevada yellow-legged frog (SNYLF).

If SNYLF are determined to be present in the project area, Heavenly shall formally consult with CDFW (California projects only) and LTBMU with USFWS regarding potential impacts to the species. If the results of consultation allow; the Projects may be allowed to proceed with protection measures developed in consultation with CDFW, LTBMU and USFWS. If it is determined that protection measures cannot be implemented to reduce impacts to the species, each activity proposed in the delineated habitat area that will result in new disturbance and human interaction will be eliminated from the Project (e.g., Sky Basin Coaster, Sky Meadows Challenge Course, East Peak Lake Dock).

If SNYLF are not determined to be present within the delineated suitable habitat, Heavenly shall start informal consult with CDFW (California projects only) and LTBMU with USFWS regarding potential impacts to designated habitat that has been classified as "Unutilized Potential" in accordance with Region 5 direction (USFS Memorandum dated 5/28/14). If the results of the informal consultation allow the Project to go forward, the Projects may be allowed to proceed with habitat protection measures developed in consultation with CDFW, LTBMU and USFWS provided there will be no significant adverse effects.

Finding

The Water Board finds that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. [14. Cal. Code Reg. 15091(a)(1)]. The Water Board finds that such a mitigation measure (BIO-2) is feasible and Heavenly will be required to implement it as a condition of its WDRs; however, the Water Board finds that it is partially within the responsibility and jurisdiction of other public agencies (CDFW, LTBMU USFS) and such changes have been adopted by such other agency or can and should be adopted by such other agency. [14. Cal. Code Reg. 15091(a)(2)]

Impact BIO-3: Would the Project have an adverse effect to migratory land bird species or their associated habitats? (Less than Significant with Mitigation, Project and Alternatives)

The Final EIR (Volume I, Section 3.9) identified as a significant impact that, the project would have an adverse effect to migratory land bird species. Many of the proposed activities in the Epic Discovery proposal involve new activities located in the canopy of the forested habitat located in the core of the resort. The Sky Cycle Canopy Tour, Mid-Station Zipline Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour and the Sky Meadows Challenge Course will take place above ground and in the canopy of the forest. These activities will increase the frequency of human interaction with both nesting and foraging migratory bird species. Past summer activities have been predominantly ground based with the exception of the Heavenly Zipline that is parallel to the Tamarack ski lift and the Gondola used to access the upper portions of the mountain. New above ground summer activities (e.g., additional ziplines and the ropes course) are opening during the summer of 2014, but have not yet had the potential to contribute to disturbance of nesting birds. Human presence in the canopy could result in the displacement of avian species from suitable nesting areas due to increased noise and threats of predation. Additionally, suitable foraging habitat may be lost in the vicinity of the canopy due to human activity and the presence of structures.

Increased human presence may also impact the success of nesting migratory birds. The impacts of existing human presence are evident within and outside Heavenly Mountain Resort's operational footprint. Winter skiing within the resort boundaries occurs mountain-wide while existing summertime recreation is more limited and occurs in more concentrated locations. Winter skiing is focused on existing cleared ski runs. However, tree skiing also occurs within the areas between ski runs and in currently undeveloped areas of the resort within its boundaries. Increased human presence within the resort can also impact wildlife species that reside or forage in the vicinity and have a detrimental effect on nesting migratory birds. Increased human presence can impact wildlife by causing species which are not tolerant of human activity to avoid otherwise suitable nesting/denning habitat and modify foraging behaviors.

Ziplining through and above the canopy may have a negative impact on the suitability of nesting and foraging habitat for migratory bird species. Behavioral responses from nesting birds may result from canopy activities. Overflights from ziplining and other human activities in the canopy and over East Peak Lake (which could potentially impact nesting waterfowl) may result in increased arousal, alertness, pressure and stress on nesting bird species. If continual and chronic, the increased stress levels of nesting bird species may result in a decrease in the animal's fitness and ability to survive and successfully nest. Occasional overflights and human presence may not result in long-term impacts to migratory birds species but high frequencies over long periods of time during the nest season may have an adverse impact to the nesting success of migratory birds that utilize the proposed project areas.

While surveys for special status species have taken place throughout Heavenly since the mid 1990s, not all suitable nesting habitats for migratory birds have been surveyed. In addition, many species of migratory birds, MIS and FS sensitive species change their nest locations on an annual basis and therefore past surveys cannot be used for proposed out-year projects. Baseline surveys for nesting migratory bird

species have not been performed therefore it is not known the extent the proposed project areas are utilized by migratory bird species.

As discussed in Chapter 3.8 Vegetation (DEIR Volume I), increased fragmentation results in secondary impacts to forested stands/habitat in the form of edge effects. An indirect biological impact to habitat as a result of edge effects is increased predation on native fauna within the habitat patch. Nest predators such as *Corvidae* species and brood parasites (brown-headed cowbird) often are found at increased densities in edge habitats (Whitcomb, *et al.,* 1981; Brittingham and Temple 1983). Creation of new cleared areas and new facilities would result in increased fragmentation of the habitat and may result in increased predation on migratory bird nests as a result. While the nest itself would not be removed physically, as is the case in direct removal, the success of nests could have the potential to be compromised and effectively result in a loss as a result of indirect effects from increased human interaction.

Due to the lack of data in regards to the specific use of the project areas by migratory bird species, and the potential for impacts to the breeding success of migratory birds as a result of increased human activity and presence in the tree canopy, the baseline condition of the suitable habitat may be modified.

The impacts described above to migratory bird species are likely to be local in the direct vicinity of the proposed activities and facilities and not widespread impacts to suitable nesting habitat within the Operational Boundary or the Special Use Permit Boundary. Due to the local nature of the potential habitat modifications resulting from increased human activity and presence, it is not anticipated that the Project will result in declines of migratory bird populations but would more likely impact local individuals occupying habitat at Heavenly Mountain Resort. However, these impacts may be in conflict with the Migratory Bird Treaty Act of 1918.

Based on the extent of existing human presence throughout the resort boundaries, and the impact of proposed modifications of suitable nesting habitat for migratory songbirds as a result of increased human presence and activity, this impact is considered to be potentially significant. While measures are built into the Proposed Action and the Alternatives to protect raptor and migratory bird nest sites from direct removal, the potential exists for future modification of habitat that would decrease its suitability for migratory birds occupying the Project area.

Mitigation Measure

Heavenly has agreed to include the following mitigation measure into the Project in order to reduce any impacts to migratory land bird species or their associated habitat to levels of insignificance. Implementation of the Project as specified in the final EIR, including the implementation of all mitigation measures, is a condition of the WDRs issued by the Water Boards.

Mitigation Measure BIO-3: Migratory Bird and Habitat Utilization Survey

In order to protect migratory bird nests from increased human presence in the tree canopy during the breeding season, Heavenly Mountain Resort shall perform nesting bird surveys for the following projects: Mid-Station Canopy Tour, Sky Cycle Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour and the Sky Meadows Challenge Course. The surveys shall be completed annually and as needed prior to the start of project operations during the breeding season (April –August). The surveys shall identify migratory birds nesting on or

immediately adjacent to proposed structures (including trees used as platforms) and equipment associated with the above-listed projects (projects that are located within the forest canopy).

To better understand the extent of migratory bird utilization of the habitats located in the above referenced project locations, bird point counts shall be performed to determine species diversity, nesting data as well as population size. The first point count survey of the project areas shall be performed prior to commencement of construction activities during nesting season. The results of the initial baseline survey shall be compared to future nesting surveys performed on an annual basis, in the vicinity of the projects. Daily inspection surveys of the project facilities shall be conducted by the operator to determine the presence of bird nesting activity. If the nest is not active (does not contain either eggs or hatchlings/young) the nest may be removed. If a migratory bird nest is located on a structure (including tree based platforms) or equipment associated with a project during annual surveys and is found to be active (containing either eggs or hatchlings/young), a buffer avoidance zone shall be instituted until it has been determined the nestlings have fledged. The distance of the buffer avoidance zone shall be determined by USFS and shall reflect the tolerance level of the individual pair, species, level of activity/disturbance and duration necessary to avoid any significant adverse effect. Project activities and operations associated with the forest canopy based projects shall cease within the identified buffer avoidance zone if determined necessary to protect the active nest by USFS, NDOW and CDFW biologists. Annual surveys shall be performed indefinitely to alleviate impacts to future nests.

Finding

The Water Board finds that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. [14. Cal. Code Reg. 15091(a)(1)]. The Water Board finds that such a mitigation measure (BIO-3) is feasible and Heavenly will be required to implement it as a condition of its WDRs; however, the Water Board finds that it is partially within the responsibility and jurisdiction of another public agency (USFS) and such changes have been adopted by such other agency or can and should be adopted by such other agency. [14. Cal. Code Reg. 15091(a)(2)]

Impact BIO-4: Would the Project cause a loss of wildlife nursery/den sites and associated habitat? (Less than Significant with Mitigation, Project and Alternatives)

The Final EIR (Volume I, Section 3.9) identified as a significant impact that, the project would have an adverse effect to wildlife nursery/den sites. Habitat within the project area is suitable for wildlife nursery sites (*e.g.*, Pacific marten den sites). All alternatives would result in modification through potential direct removal, or alteration of habitat that could result in loss of nursery/den sites.

Direct removal of suitable potential nursery sites would occur through tree and habitat removal for construction of new canopy activities, coasters and supporting structures. The two coasters are proposed to be placed in areas with suitable nesting and nursery habitat. As noted in Impact BIO-2, Slauson and Zielinski (2012) have evidence of reproducing females within the operational boundary of the resort. The report is currently unpublished and therefore information in regards to suspected locations of reproductive females are not currently available. If the draft study is published before the Final EIR/EIS/EIS is

completed and decisions are rendered on the Project, the information will be added to the record for consideration by the public and decision makers.

Nursery/den sites associated with other species (squirrel and marmot) aside from marten may be present in the project area. Direct removal may occur through ground disturbance and or tree removal associated with construction activities. In addition to direct removal of habitat, nursery sites can be negatively affected due to indirect effects. Indirect effects may result from adjacent habitat removal, increased human presence and noise generated by increased facilities and activities, canopy tours, bike trails, mountain tours, summertime activities and operations. Increased human presence may also impact the success of wildlife nursery sites. The impacts of existing human presence are evident within and outside Heavenly Mountain Resort's operational footprint. Existing winter skiing within the resort boundaries occurs mountain-wide while existing summertime recreation is more limited and occurs in more concentrated locations at the Gondola Mid-Station, Von Schmidt Flat, the top of Tamarack Lift and along the summer hiking trails that exist along the summer vehicular access roadways. Increased human presence can impact wildlife by causing species which are not tolerant of human activity to avoid otherwise suitable nesting/denning habitat and modify foraging behaviors. The Mid-Station Zipline Canopy Tour, Sky Cycle Canopy Tour and the Forest Flyer Coaster are proposed in areas where little to no existing human activities have historically taken place.

Current summer activities are limited to use of the Gondola for sight seeing, limited hiking opportunities utilizing summer operation roadways, the existing zipline from the top of Tamarack to the top of the Gondola and activities set up in the vicinity of the Gondola Top Station (e.g., summer tubing, portable climbing walls, newly opened ropes course, etc.). Many of the proposed activities located in Adventure Peak, East Peak Lake Basin, and Sky Meadows Basin will introduce new human disturbance to areas that have had little previous human presence during summer. Increased noise, potential harassment, and discarded refuse would likely result from increases in the summer use of these areas and have the potential to directly and indirectly impact wildlife nursery sites.

Reproductive female marten have been observed within the operational boundary of Heavenly Mountain Resort during 2009-2011 and are believe to be present. As the location of marten den sites and other species den sites are not known, the potential exists for direct removal from ground disturbing activities associated with Proposed Action and Alternatives, therefore this impact is considered potentially significant.

Mitigation Measure

Heavenly has agreed to include the following mitigation measure into the Project in order to reduce any impacts to wildlife nursery/den sites and their associated habitat to levels of insignificance. Implementation of the Project as specified in the final EIR, including the implementation of all mitigation measures, is a condition of the WDRs issued by the Water Boards.

Mitigation Measure BIO-4: Wildlife Nursery Site Survey

As identified in the Final EIR (Volume I Section 5.0), Heavenly Mountain Resort shall conduct a thorough pre-construction survey of project areas for wildlife nursery sites and den locations. The survey shall be performed by a professional biologist with experience locating nursery/den sites and shall be performed prior to initial ground disturbance for a project activity. The survey

area shall include the location of ground disturbance and areas within 100 meters of ground disturbing activities, as well as any area where staging will occur or access will be provided for construction equipment. The contracted biologist shall report the findings of the survey to the USFS LTBMU. The responsible official may implement an LOP or adapt construction timelines or facility locations as determined necessary to provide adequate protection necessary to prevent any significant adverse effect. If an LOP is implemented, construction may only occur between August 1 and March 15.

Finding

The Water Board finds that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. [14. Cal. Code Reg. 15091(a)(1)]. The Water Board finds that such a mitigation measure (BIO-4) is feasible and Heavenly will be required to implement it as a condition of its WDRs; however, the Water Board finds that it is partially within the responsibility and jurisdiction of another public agency (USFS) and such changes have been adopted by such other agency or can and should be adopted by such other agency. [14. Cal. Code Reg. 15091(a)(2)]

Impact BIO-8: Would the Project result in increased human/wildlife interactions? (Less than Significant with Mitigation, Project and Alternatives)

The Final EIR (Volume I, Section 3.9) identified as a significant impact that, the project would result in an increase in interactions between humans and wildlife. Human presence can impact wildlife through disturbance, modification of habitat, increased noise and discarded refuse. Disturbance to wildlife from human presence may result in behavioral or physiological responses. Behavioral responses may take the form of avoidance, habituation, or attraction. These behavioral responses may result in physiological changes such as altering energy expenditure, nest placement or abandonment or reduced survivorship of young. Species that tolerate human presence and activity may become dependent on human food through foraging in trash, thereby reducing their overall health. Wildlife species that are not tolerant of human activity include northern goshawk and pileated woodpeckers. Increased human presence in the form of ski resort activities may cause wildlife species that are not tolerant of human presence to vacate otherwise suitable habitat and reside in locations outside the resort.

Other species that are more tolerant to human presence may become dependent on human food sources and therefore lose their ability to forage naturally. Black bear, Pacific marten, Douglas squirrels, golden mantled ground squirrels, chipmunk spp., mountain chickadees and Clark's nutcracker are some species that are present within Heavenly Mountain Resort and have been observed foraging for human food mountain wide and within refuse/trash containers (personal observation). Consumption of human foodstuffs by these animals can lead to digestive and health problems and behavior modifications. Readily available human food and refuse limits these species ability to naturally forage and can cause dependency on human food. Animals that become dependent on this non-natural foraging technique often become aggressive toward humans as they associate humans with food. Other behavior changes, such as delayed and decreased hibernation activity, smaller home range size and modified patterns of activity, is evident in black bears within the Tahoe Basin (Beckman and Berger 2003). Numerous black bear encounters have been documented at Heavenly Mountain Resort whereby aggressive behavior

toward humans was exhibited by black bears attempting to forage in refuse/trash containers in both summer and winter months.

Expansion of summer uses associated with the Epic Discovery projects may result in increased human presence impacts to sensitive wildlife, including the generation of additional refuse, potential harassment and increased levels of noise, which would result in increased frequency of interaction.

Mitigation Measures

Heavenly has agreed to include the following mitigation measure into the Project in order to reduce any impacts related to increased human/wildlife interactions. Implementation of the Project as specified in the final EIR, including the implementation of all mitigation measures, is a condition of the WDRs issued by the Water Boards.

Mitigation Measure BIO-8: Wildlife Trash Management and Education Program

As identified in the Final EIR (Volume I, Section 5.0), Heavenly Mountain Resort shall create and implement a trash management program for the entire resort. The program shall consist of installation of wildlife proof trash containers located at each of the lodge facilities and food service areas within the resort. A trash removal and management plan shall also be formulated and implemented to expedite timely removal of refuse from deposition points to approved collection points located at the base areas or to a point designated outside the resort. The removal and management plan shall include specified storage areas and practices within each facility to prevent access to refuse by wildlife species. An educational component of said plan shall be included in an effort to decrease litter and improper feeding of and ramifications to wildlife. The education program shall be directed toward Heavenly Mountain Resort staff through training, and toward the public through signage and presentations throughout the proposed Epic Discovery project locations. The plan shall be reviewed annually by USFS LTBMU.

Finding

The Water Board finds that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. [14. Cal. Code Reg. 15091(a)(1)]. The Water Board finds that such a mitigation measure (BIO-8) is feasible and Heavenly will be required to implement it as a condition of its WDRs; however, the Water Board finds that it is partially within the responsibility and jurisdiction of another public agency (USFS) and such changes have been adopted by such other agency or can and should be adopted by such other agency. [14. Cal. Code Reg. 15091(a)(2)]

1.3 Findings for Alternatives

1.3.1 Preface

As described in Section 1.1, *Introduction*, above, the Final EIR evaluates at an equal level of detail three project alternatives, each with different combinations of the following activities:

- Adventure Peak (Entirely within the Lake Tahoe Basin)
    - Mid-Station Zipline Canopy Tour
    - Sky Cycle Canopy Tour
    - Forest Flyer Alpine Coaster
    - Smaller Infill Activities
    - Interpretive Activities at Tamarack Lodge
- East Peak Basin (Almost entirely outside the Lake Tahoe Basin)
    - Mountain Bike Park
    - East Peak Zipline Canopy Tour
    - East Peak Reservoir Water Activities
    - Interpretive Activities at East Peak Lodge
    - East Peak Lodge Hiking Trail
- Sky Meadows Basin (Entirely within the Lake Tahoe Basin)
    - Sky Meadows Zipline Canopy Tour
    - Sky Meadows Challenge Course
    - Ridge Run Lookout Tower and Observation Deck
    - Interpretive Activities at Sky Deck
- Mountainwide
    - Educational Opportunities and Interpretive Information
    - Mountain Excursion Tour
    - Connecting Trails (e.g., Panorama Trail to connect East Peak Lake area to Tahoe Rim Trail and Van Sickle Park)
    - Emergency Gondola Snow Cat Evacuation Route (Winter Use Only)

A range of alternatives were considered by the Water Board, and development of these alternatives is described in detail in the Final EIR (Volume I, Chapter 2, Section 2.4). The Water Board also analyzed the No Project alternative as required by CEQA. Thus, the following three project alternatives were analyzed in the Final EIR:

- No Project
- Alternative 1 – Sky Meadows Basin Coaster Alternative
- Alternative 2 – Eliminate Sky Meadows Challenge Course

The project objectives (Final EIR, Volume I Chapter 1, Section 1.3) are intended to diversify summer and year round activities pursuant to SAROEA by which to engage a larger segment of summer and non-ski/ride visitors seeking more managed recreation opportunities by providing:

- Adventure and thrill-based experiences that require little specialized knowledge, skills, equipment or familiarity with the mountain environment;

- Activity-based interaction with a forested, mountain environment in a controlled setting, offering an opportunity for users to interact with and learn about nature;

- Human-powered, active recreational experiences that cater to all ability levels;

- Interpretive programs that offer an educational experience for users seeking to learn more about the environment;
- A range of activities appealing to multi-generational families and groups increasing the opportunities for both self-directed activities and managed activities on USFS lands;
- Expanded non-ski/ride recreational opportunities, year round;
- Implementation of the Regional Plan Update pursuant to the South Shore Area Plan and Tourist Core Area Plan accelerating the Region's transition from a gaming-driven destination to a recreation-based destination;
- A broader range of recreational activities in low snow years; and
- Transition of a seasonal workforce to increased year round employment.

The Water Board cannot specify how Heavenly Mountain Resort complies with the SAROEA. Therefore, Heavenly could employ any of the action alternatives. Each of the two action alternatives meet the project objectives and are considered to be feasible. The Water Board requires as a condition of its WDRs that Heavenly implement the mitigation measures described in this document and implement the project as described in the certified Final EIR. Should Heavenly Mountain Resort select projects or locations that would be different than those addressed in the EIR, then the Water Board would have to analyze whether any additional environmental effects would occur due to the changes and prepare appropriate CEQA documentation (addendum, supplemental or subsequent document).

The No-Project alternative is the only of the three alternatives examined in the Final EIR in detail that is rejected. The reasons for its rejection as infeasible are described below. Other alternatives were considered in the EIR but dismissed from further detailed analysis for the reasons disclosed in the EIR (refer to Final EIR, Volume I, Section 2.5, "Alternatives Considered but Eliminated from Detailed Study".

1.3.2 No Project Alternative

Under the No Project Alternative, a continuation of existing management practices would occur without changes, additions, or upgrades to existing conditions. The No Action Alternative (continued implementation of the 2007 Master Plan Amendment) allows a comparison of the effects from continued implementation of the 2007 Ski Area Master Plan to the Action Alternatives. Existing summer uses would continue, including sightseeing via the Heavenly Gondola, hiking and mountain biking on existing roadways and pathways, and operation of activities such as the climbing wall, tubing hill, ziplines and ropes courses.

Finding

The Water Board finds that No Project does not achieve the project objectives pursuant to SAROEA and is therefore rejected.

1.4 Statement of Overriding Considerations

After considering the Final EIR in conjunction with making the Findings, the lead agency must not approve the project for which the EIR was prepared unless the project as approved will not have a significant effect on the environment; or all avoidable significant effects on the environment have been eliminated or substantially lessened, and the agency finds that "specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment." (Public Resources Code Section 21081[b])

Since no significant and unavoidable impacts are associated with this Project or Alternatives, a Statement of Overriding Considerations is not required.

Attachment B
Mitigation and Monitoring Plan
Heavenly Mountain Resort

5.0 MITIGATION & MONITORING PLAN

5.1 BACKGROUND

The following mitigation and monitoring plan (MMP) is an update of the MMP from the MPA 07, as adopted by the Forest Service, TRPA, and El Dorado County in 2007. The original MMP was developed based on mitigation measures included in the Draft and Final EIR/EIS/EIS documents prepared for the MP 96. Based upon measures that have been completed, measures that are no longer needed, and new measures that are required to reduce potential effects of the Epic Discovery Project, the MMP has been revised and some measures have new numbering. The Table below summarizes the changes that are proposed to the MPA 07 MMP. Detailed descriptions of each mitigation measure are included in Sections 5.4 through 5.7. The measures of the MMP are numbered "7.X" because this revised MMP shall be placed in the Heavenly Master Plan as Chapter 7 upon its adoption to add Epic Discovery projects.

5.2 SUMMARY OF MMP MEASURES

Table 5-1 summarizes the mitigation measures that are incorporated into the Proposed Action and Action Alternatives.

Table 5-1

Summary of Mitigation Measures/Design Features

Agency Lead	Measure Number	Measure Title	Existing or Proposed	Justification for Revision or Removal from MPA 07 MMP
PLANNING MEASURES				
TRPA	7.3-1	TRPA Mitigation Monitoring Activities	Existing	
TRPA	7.3-2	Design and site the proposed Powderbowl Lodge to minimize visibility from off-site views	Existing	
TRPA	7.3-3	Design and site the proposed Gondola Mid Station Restaurant to minimize visibility from off-site views	Existing	
TRPA	7.3-4	Design and site the proposed Sand Dunes Lodge to minimize visibility from off-site views	Existing	
CONSTRUCTION MEASURES				
ALL	7.4-1	Implement the Construction Erosion Reduction Program	Existing	
ALL	7.4-2	Construct Infiltration Facilities	Existing	
ALL	7.4-3	Meet Water Quality Standards	Existing	
ALL	7.4-4	Implement Adaptive Ski Run Prescriptions	Existing	
ALL	7.4-5	Control Runoff due to Future Construction and Long-term Operation of Facilities	Existing	
ALL	7.4-6	Avoid and/or Restore Future Disturbed SEZ	Existing	
ALL	7.4-7	Avoid and/or Restore Future Disturbed Jurisdictional Waters and Wetlands	Existing	
TRPA	7.4-8	TRPA Land Coverage Mitigation	Existing	
ALL	7.4-9 (BIO-1)	Delay Sky Meadows Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities Until Sierra Nevada Yellow-legged Frog Surveys and USFWS Consultation Are Complete	Proposed	
ALL	7.4-10	Reduce and Control Fugitive Dust	Existing	
TRPA-USFS	7.4-11	Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows	Existing	
ALL	7.4-12	Active Raptor and Migratory Bird Nest Site Protection	Existing	

Agency Lead	Measure Number	Measure Title	Existing or Proposed	Justification for Revision or Removal from MPA 07 MMP
		Program		
TRPA-USFS	7.4-13	Monitor and Protect Northern Goshawk	Existing	
TRPA-USFS	7.4-14 (BIO-4)	Wildlife Nursery Site Survey	Proposed	
USFS	7.4-15	Utilize Boundary Management Plan to Manage Skier Access on Adjacent NFS Lands	Revised	Revised measure to require a boundary management plan to manage skier access on Forest System Lands within Forest Plan Prescription 9.
USFS	7.4-16	Evaluate and Monitor Known Archaeological Resources Within Comstock Logging Historic District	Existing	
ALL	7.4-17	Identify and Protect Undiscovered Archaeological Resources	Existing	
USFS	7.4-18	Protect the Tahoe Rim Trail	Existing	
OPERATIONS AND MAINTENANCE MEASURES				
ALL	7.5-1	Watershed Maintenance and Restoration Program	Revised	
ALL	7.5-2 (WATER-C1b)	On-Going Environmental Monitoring Program	Revised	Proposed revision to the existing monitoring program - identified as WATER-C1b in Chapter 3.1. Adds requirement for road monitoring in compliance with current USFS protocols. Adds monitoring of stream channel condition in Sky Meadows.
ALL	7.5-3 (WATER-C1a)	CA-1 Erosion Reduction Measures	Proposed	
USFS	7.5-4 (WATER-C3)	NV-1 Erosion Reduction Measures	Proposed	
TRPA-USFS	7.5-5	Maintain Water Rights Balance	Existing	
USFS	7.5-6	Maintain Water Flows in Heavenly Valley Creek	Existing	
USFS	7.5-7	Maintain Water Flows in Daggett Creek	Existing	
USFS	7.5-8	Maintain Compliance with Water Entitlements	Existing	
TRPA-	7.5-9	Reduce Vehicle Emissions	Existing	

Agency Lead	Measure Number	Measure Title	Existing or Proposed	Justification for Revision or Removal from MPA 07 MMP
CNTY				
TRPA	7.5-10	Snow Removal Noise Mitigation Methods	Existing	
TRPA	7.5-11	Snowmaking Noise Mitigation Methods for Base Areas	Existing	
TRPA	7.5-12	Rock Busting Noise Mitigation Methods	Existing	
TRPA	7.5-13	Restrict Hours of Amphitheater Operations	Existing	
TRPA	7.5-14 (TRANS-1)	Traffic and Air Quality Mitigation Program	Proposed	
TRPA	7.5-15	Implement the Coordinated Transportation System (Public Transit Services)	Existing	
TRPA-USFS	7.5-16	Protect Tahoe Draba Populations within Heavenly Mountain Resort	Revised	Revise MPA 07 measure 7.5-21 to require better fencing/barriers near Tahoe draba populations.
TRPA-USFS	7.5-17	Minimize Loss/Degradation of Sensitive Plant Species	Existing	
TRPA-USFS	7.5-18	Invasive Plant Management	Existing	
TRPA-USFS	7.5-19	Monitor and Protect Nesting and Fledgling Bird Species	Existing	
ALL	7.5-20 (BIO-3)	Migratory Bird and Habitat Utilization Survey	Proposed	
ALL	7.5-21 (BIO-8)	Wildlife Trash Management and Education Program	Proposed	
USFS	7.5-22	Maintain Timber Thinning Practices	Existing	
TRPA-CNTY	7.5-23	Provide Employee Housing	Existing	

5.3 MMP ORGANIZATION

The mitigation measures are presented in the following categories:

5.4 Compliance with Existing Programs	A listing of currently applicable regulations and the mitigation measures provided to reflect compliance with these regulations.
5.5 Planning Measures	Those measures requiring additional study, adoption of plans, or adoption of regulations.
5.6 Construction Measures	Those measures which are implemented prior to and during construction.
5.7 Operation and Maintenance Measures	Those measures which are required during the ongoing operation and maintenance of the project.

Each mitigation measure is described in the following format:

Description	The description of the mitigation measure.
Impacts Mitigated	The impact(s) addressed by the mitigation measure.
Mitigation Level	The level to which the impact is anticipated to be mitigated.
Lead Agency	The public agency or individual which has the responsibility for insuring that the measure is carried out.
Implementing Entity	The entity or individual which has the responsibility for implementing or performing the measure.
Monitoring Agency	The public agency which has the responsibility for monitoring to insure that the mitigation measure is effective in mitigating the impact.
Timing	The appropriate point in time at which the mitigation measure is to be initiated and completed.
Status	The status of the implementation of the measure through present, particularly whether the measure is ongoing or completed.

5.4 COMPLIANCE WITH EXISTING PROGRAMS (REGULATORY COMPLIANCE)

All applicable Regional, City, County, State, and Federal codes and regulations shall be complied with, including but not limited to:

Tahoe Regional Planning Agency

- Environmental Threshold Carrying Capacities
- Regional Plan for the Lake Tahoe Basin
- Code of Ordinances
- Plan Area Statements

Lahontan Regional Water Quality Control Board

- Updated Waste Discharge Requirements
- Lahontan Basin Plan

El Dorado County

- General Plan
- Zoning Ordinance
- Air Pollution Control District
- Uniform Building Code
- Environmental Management Department (food safety and hazardous materials)

State of California

- Air Resources Board
- Cal OSHA - Worker Safety Rules and Standards
- Department of Industrial Relations
- Division of Occupational Safety and Health, Elevator, Lift, and Ride

State of Nevada

- Nevada Division of Environmental Protection (fuel storage and water quality)
- Nevada Division of Environmental Health (water)

Forest Service

- Watershed Maintenance and Restoration Program
- LTBMU Forest Plan
- Title IV
- Heavenly Special Use Term Permit
- National Historic Preservation Act (Section 106 compliance)

Douglas County

- Master Plan & Development Code
- Zoning Ordinance
- International Building Code
- International Fire Code

U.S. Army Corps of Engineers

- Clean Water Act, Section 404

City of South Lake Tahoe

- General Plan
- Zoning Ordinance
- Uniform Building Code

5.5 PLANNING MEASURES

7.3-1 TRPA Mitigation Monitoring Activities

Description	TRPA and Heavenly shall maintain a mitigation monitoring agreement. The agreement shall require Heavenly to provide adequate funding for TRPA staff to monitor compliance with Master Plan mitigation programs. Many mitigation measures are ongoing, and are therefore not related to any individual project permits or existing compliance programs at TRPA. This mitigation monitoring agreement would ensure TRPA has adequate staff resources to effectively monitor the implementation of Master Plan programs. Specific development projects may have additional compliance requirements not included in this monitoring program which are not covered by the TRPA permit application fee, and which Heavenly may be required to fund.	
Impacts Mitigated	96 Final EIR/EIS/EIS: Monitoring of all impacts that must be mitigated by measures included in the Master Plan MMP.	
Mitigation Level	Compliance with Heavenly Mountain Resort Master Plan mitigation measure requirements.	
Lead Agency	TRPA	
Implementing Agency	TRPA	
Monitoring Agency	TRPA	
Timing	**Start:**	Ongoing.
	Complete:	Throughout Master Plan implementation.
Status	Ongoing	

7.3-2 SCENIC-3: Design and Site the Proposed Powderbowl Lodge to Minimize Visibility From Off-Site Views

Description

Prior to permitting of construction, the following mitigation measures should be taken:

1. Prepare field simulations of the height and mass of the proposed structure. Such simulations may include story poles, balloons or other techniques that effectively demonstrate extent of visibility from off-site views.
2. Determine visibility of proposed structure from viewpoints identified in the MPA 07 EIR/EIS/EIS.
3. If simulations demonstrate that the building may extend above the adjacent ridge line or tree line as viewed from off-site viewpoints, changes to the building height, roof pitches, massing, siting, proposed grading or design would be made to reduce the buildings visibility.
4. Confirm effectiveness of revised siting and design measures with revised simulations.

Impacts Mitigated 06 EIR/EIS/EIS-SCENIC-3: The Powderbowl Lodge Would be Visible

	From Off-site Views	
Mitigation Level	Reduced visual effects of Powderbowl Lodge.	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Prepare revised simulations if Powderbowl Lodge design is modified from design studied in 2006.
	Complete:	Following analysis of revised design, if applicable.
Status	Completed summer 2006. Proposed lodge site analyzed in 2006 will not be visible from offsite viewpoints. If a revised lodge plan is submitted in the future, simulations may be required if determined by TRPA project review.	

7.3-3 SCENIC-4: Design and Site the Proposed Gondola Mid Station Restaurant to Minimize Visibility From Off-Site Views

Description

Prior to permitting of construction, the following mitigation measures should be taken:

1. Prepare field simulations of the height and mass of the proposed structure. Such simulations may include story poles, balloons, or other techniques that effectively demonstrate the extent of visibility from off-site views.
2. Determine visibility of proposed structure from viewpoints identified in the MPA 07 EIR/EIS/EIS.
3. If simulations demonstrate that the building may extend above the adjacent ridge line or tree line as viewed from off-site viewpoints, changes to the building height, roof pitches, massing, siting, proposed grading or design would be made to reduce the buildings visibility.
4. Confirm effectiveness of revised siting and design measures with revised simulations.

Impacts Mitigated	06 EIR/EIS/EIS-SCENIC-4: The Gondola Mid-Station Restaurant Would be Visible From Off-Site Viewpoints	
Mitigation Level	Reduced visual effects of Gondola Mid Station Restaurant	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Prior to project construction.
	Complete:	Prior to project construction.
Status	Incomplete. Project has not been proposed.	

7.3-4 SCENIC-8: Design and Site the Proposed Sand Dunes Lodge to Minimize Visibility From Off-Site Views

Description

Prior to permitting of construction, the following mitigation measures should be taken:

1. Prepare field simulations of the height and mass of the proposed structure. Such simulations may include story poles, balloons or other techniques that effectively demonstrate extent of visibility from off-site views.
2. Determine visibility of proposed structure from viewpoints identified in the MPA 07 EIR/EIS/EIS.
3. If simulations demonstrate that the building may extend above the adjacent ridge line or tree line as viewed from off-site viewpoints, changes to the building height, roof pitches, massing, siting, proposed grading or design would be made to reduce the buildings visibility.
4. Confirm effectiveness of revised siting and design measures with revised simulations.

Impacts Mitigated

06 EIR/EIS/EIS-SCENIC-8: The Sand Dunes Lodge Would be Visible From Off-Site Viewpoints

Mitigation Level

Reduced visual effects of proposed Sand Dunes Lodge

Lead Agency

TRPA

Implementing Agency

Heavenly Mountain Resort

Monitoring Agency

TRPA

Timing

Start: Prior to project construction.

Complete: Prior to project construction.

Status

Incomplete. Project has not been proposed.

5.6 CONSTRUCTION MEASURES

7.4-1 Implement the Construction Erosion Reduction Program

Description

Refer to Attachment 1 (APPENDIX 2-B of the 06 Draft EIR/EIS/EIS) for the Construction Erosion Reduction Program (CERP) and the Watershed Management Guidebook: An Outcome-Based Guide to Watershed Management (Drake, K. and M. Hogan. 2013).

Implementation of the CERP would minimize the rate of soil loss from Heavenly Mountain Resort caused by construction activities. The program is now considered a USFS design feature for all Master Plan facility implementation at Heavenly and is updated by the USFS as necessary to be consistent with the latest Forest Service procedures for erosion control. Heavenly would be the implementing entity, and the Forest Service or TRPA would be the lead and monitoring agency. Mitigation measures contained in this program will be finalized during individual project design and implemented during construction of each new facility.

The Erosion Control Plan and Revegetation Specifications for Ski Runs and Disturbed/Developed Areas was updated and integrated as part of the CERP prepared for the MPA 07. The revegetation specification for ski trails and developed and disturbed project areas were revised and updated by an outside contractor and subsequently included in the Watershed Management Guidebook prepared by Drake and Hogan. During these revisions, monitoring results from the Environmental Monitoring Program (1995-2003) were incorporated to integrate more effective BMPs, changes in ski area management directives, improved seed mixtures, Forest Service native plant program, and Forest Service noxious weed management program into the plan. The CERP also helps facilitate project documentation and record keeping.

Impacts Mitigated

06 EIR/EIS/EIS- WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs

06 EIR/EIS/EIS- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction

06 EIR/EIS/EIS- WATER -3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks

06 EIR/EIS/EIS- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level

Future development must not increase sedimentation rates from the ski resort that would adversely impact downstream beneficial uses.

Lead Agency

Forest Service, TRPA, and Lahontan

Implementing Agency

Heavenly Mountain Resort

Monitoring Agency

Forest Service

Timing	**Start:**	At beginning of each construction project.
	Complete:	Following successful implementation of construction mitigation measures.
Status	Ongoing	

7.4-2 Construct Infiltration Facilities

Description

Heavenly shall, for new facilities with impervious surfaces, evaluate whether infiltration of storm water may contaminate the groundwater. If groundwater is not at risk, Heavenly shall design and construct infiltration facilities with capacity, at a minimum for a 20-year, 1-hour storm event. If groundwater is at risk of contamination, Heavenly shall design and construct SEZs, detention ponds or other facilities to prevent an increase in the peak flow. Facilities should be designed using the methodology in TRPA's Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Best Management Practices. This design feature is evaluated at the site-specific engineering design phase for all projects at Heavenly Mountain Resort.

In addition to installing infiltration facilities, SEZs or detention ponds to prevent an increase in peak flow, the following additional mitigation measures can also be used:

Reduce the coverage footprint for new facilities or when modifying existing facilities by incorporating low impact development principles. Low impact development strives to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Methods, such as bioretention, green roofs, permeable pavers, or cisterns, can be incorporated into project design.

Impacts Mitigated

96 Draft EIR/EIS/EIS: Peak and total runoff increases due to future construction of facilities identified in 95 Draft EIR/EIS/EIS Table 4.1-13.

06 EIR/EIS/EIS- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction

06 EIR/EIS/EIS- WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks

06 EIR/EIS/EIS- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level	Runoff capacity for 20-year, 1-hour storm event.	
Lead Agency	TRPA and Lahontan	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	At beginning of each construction project.
	Complete:	Following successful construction of infiltration

facility.

Status Ongoing

7.4-3 Meet Water Quality Standards

Description

1. Heavenly shall implement the Watershed Maintenance and Restoration Program (Appendix 3.1-D of the Epic Discovery Project Draft EIR/EIS/EIS). The program should be revised and prioritized as determined by future monitoring and the Forest Service Heavenly Road Maintenance Agreement.
2. Heavenly shall continue to implement the CERP (Mitigation Measure 7.4 1).
3. Heavenly, Lahontan and the Forest Service shall implement the Environmental Monitoring Program (Mitigation Measure 7.5 2).
4. Heavenly shall install and maintain BMPs at all facilities and parking lots (Mitigation Measure 7.4-2).
5. At least one water year prior to construction of Ski Lift Z and/or Ski Trails 86, 87, 89, 91 (now Ski Trails Z1, Z2, Z4, and Z8 in the MPA 07), the Forest Service and NDEP will conduct a field visit to determine an appropriate site for installation of a monitoring station on the South Fork of Daggett Creek if the Forest Service and NDEP determine that installation of a monitoring site for water quality is necessary.
6. Snow grooming equipment and activities are not permitted on ski trails deficient of snow cover adequate enough to protect soil and water resources.

Impacts Mitigated

06 EIR/EIS/EIS- WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks

06 EIR/EIS/EIS-WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level State and Regional water quality constituent standards; Updated Waste Discharge Permit

Lead Agency Forest Service

Implementing Agency Heavenly Mountain Resort

Monitoring Agency Forest Service

Timing

Start: Ongoing

Complete: Ongoing

Status Ongoing

7.4-4 Implement Adaptive Ski Run Prescriptions

Description	Heavenly shall implement the ski trail prescriptions proposed in the Easy Street Run Hazard Reduction Program (Attachment 2) on all future ski trails and selected and approved existing ski trails with significant hazards, adapting prescription techniques to monitoring results from demonstration projects. Monitoring results will be reviewed and the program amended and improved based on these results. The program is a process-based, adaptive management approach to ski trail implementation. Heavenly shall be the implementing and monitoring entity, and the Forest Service shall be the oversight and approval agency. For ski trails in the Lake Tahoe Basin, TRPA shall also be the approval agency.
Impacts Mitigated	06 EIR/EIS/EIS-WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs 06 EIR/EIS/EIS-WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction 06 EIR/EIS/EIS-WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks 06 EIR/EIS/EIS-WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks
Mitigation Level	Future development must not increase sedimentation rates from the ski resort that would adversely impact downstream beneficial uses.
Lead Agency	TRPA
Implementing Agency	Heavenly Mountain Resort
Monitoring Agency	TRPA
Timing	**Start:** Ongoing **Complete:** Ongoing
Status	Ongoing and adapted to monitoring results and new technologies

7.4-5 Control Runoff due to Future Construction and Long-Term Operation of Facilities

Description

1. Before design and construction of each specific project, identify the likely project-specific impacts and identify specific appropriate mitigation measures for each impact. Heavenly shall continue to include temporary and permanent BMPs details and specifications on all project designs submitted to TRPA and the Forest Service for approval. BMPs are intended to reduce runoff and capture sedimentation that creates water quality impacts from construction.
2. New facilities with impervious surfaces shall be designed and constructed with infiltration BMPs with a minimum capacity for a 20-year, 1-hour storm event. Runoff structures and BMPs will be designed and constructed to require minimal maintenance, avoid directing runoff into sensitive areas, and adequately treat the 20-year, 1 hour storm. In addition, Heavenly shall continue to maintain existing runoff diversion structures and other erosion reduction BMPs as required in the Revised Environmental Monitoring Program.
3. While underground snowmaking may be proposed and approved for summer-groomed ski trails and select road segments exempted under the MP 96 (see Figure 2-3 of the 95 Draft EIR/EIS/EIS), all subsequently proposed snowmaking shall be installed above ground except as follows: If a certain situation dictates installing snowmaking systems below ground, the impacts of the ground disturbance shall be determined and mitigated to less than significant using site-specific BMPs or removal or restoration of other existing disturbances. If impacts from new trenching cannot be adequately mitigated, then snowmaking equipment shall be installed above ground. Under ground snowmaking alternatives were not analyzed in the 06 Draft EIR/EIS/EIS because the existing CWE model is not sensitive enough to differentiate short-term non-vegetation removal and non-land coverage disturbances.
4. Scheduling and documentation of maintenance activities will be formalized to facilitate monitoring and reporting activities required through the Environmental Monitoring Program and the Updated Lahontan Waste Discharge Permit. A map is required to identify the locations of these structures and would facilitate annual maintenance and documentation of maintenance activities and timing.

Impacts Mitigated

06 EIR/EIS/EIS- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction

06 EIR/EIS/EIS- WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks

06 EIR/EIS/EIS- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level

Site-specific, but at a minimum runoff capacity for 20-year, 1-hour storm event; effective soil cover adequate to control soil loss

Lead Agency	TRPA and Lahontan	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	During the planning stages of a facility
	Complete:	Ongoing
Status	Ongoing	

7.4-6 Avoid and/or Restore Future Disturbed SEZs

Description

MPA 07 Projects

Implementation of the following mitigation measures will reduce the impact from future SEZ disturbance to less than significant. Depending on project location, the Forest Service, TRPA, or Lahontan will be the lead and monitoring agencies. Heavenly will be the implementing entity. Mitigation implementation will occur at or before the time of development of the new MPA 07 facility.

In-Basin

1. Run widening activities (Ski Trails I1, H9, H10, H11, S2, and Z2) will be conducted over the snow, or by other means that do not cause ground disturbance, and ONLY coniferous trees will be felled and left in place. Shrubs and herbaceous vegetation will remain, no ground disturbance will occur, and hydrologic function of the SEZ will be preserved.
2. Heavenly shall, prior to the time of construction of Ski Trails H13, 12, and 5a, design the ski trails to avoid new disturbance to SEZs and SEZ setbacks or minimize if avoidance is not possible as determined jointly by the Forest Service, TRPA, and Lahontan. If impacts to hydrologic function or permanent degradation to riparian communities are determined, findings must be made for TRPA Code of Ordinances 30.5.2 and the Lahontan Basin Plan (restoration at a minimum of 1.5:1 ratio and net environmental benefit).
3. Upon replacement of Boulder Ski Lift (Ski Lift Q), the ski lift base will be relocated outside the SEZ along with all buildings involved in Boulder Operations. Alternatively, facilities may be moved to the existing Boulder parking lot if TRPA determines that the relocation area is man-modified and does not require restoration. Ski Lift Q must be replaced in its current alignment, and no direct disturbance or indirect impacts to the Edgewood Creek SEZ Restoration project area will be permitted.
4. No vehicles or equipment are permitted off road in SEZs without justification and prior approval from TRPA, Lahontan, and the Forest Service.
5. Channel and streambed stability are important components of sediment reduction and SEZ functionality. Therefore, hand pruning methods will be used to maintain riparian vegetation at a minimum height of 3 feet in the vicinity of active low flow channels. The vicinity will be defined as between the banks and within a 5 foot buffer on either side of the channel. Mechanical thinning could

occur outside the designated channel and buffer area.

6. All tree removal/cutting activities for construction of the ski lifts will be conducted to reduce the potential for ground disturbance within SEZs. Mechanisms for cutting trees will be over the snow or involve the use of helicopters.
7. Sky Meadows and the portion of Heavenly Valley Creek, which feeds the meadow, will be restored (according to a Restoration Plan prepared by a third party and approved by TRPA and the Forest Serviced) after removal of the Sky Meadows facilities and deck. Decommissioned road segments R93 and R94 will remain closed.
8. If avoidance is not possible pursuant to mitigation measure 1, Heavenly will apply for and seek exemption findings from the Lahontan and TRPA and implement appropriate restoration in the minimum amount of 1.5 times the area of new disturbance.
9. For projects within jurisdictional wetlands and waters, a Section 404 permit from the USACE and water quality certification from Lahontan (in California) will be required.

Out-of-Basin

1. Heavenly will remove coniferous trees and trim only the tops of vegetation (to a height of no less than 3 feet tall) along the SEZ portions of Ski Trails 17, 18, U3, U4, Z1, Z2, Z3, Z4, Z8.
2. Heavenly will, for development in SEZs/RCAs outside the Lake Tahoe Basin, comply with relevant Forest Service BMPs and guidelines regarding development within RCAs to minimize the severity of impacts to SEZs/RCAs from development, including restoration of up to 37.29 acres (24.86 times ratio of 1.5:1) of SEZs/RCAs outside the Lake Tahoe Basin.
3. Heavenly will, for development in SEZs/RCAs outside the Lake Tahoe Basin, minimize the areal extent and intensity of the impacts including, but not limited to, use of helicopters to install ski lift towers.
4. Channel and streambed stability are important components of sediment reduction and SEZ functionality. Therefore, Heavenly will minimize operational impacts to the SEZs/RCAs by using hand-pruning methods to maintain riparian vegetation at a minimum height of 3 feet in the vicinity of active low flow channels. The vicinity will be defined as between the banks and within a 5 foot buffer on either side of the channel. Mechanical thinning could occur outside the designated channel and buffer area.
5. For projects within jurisdictional wetlands and waters, a Section 404 permit from the USACE and water quality certification from Lahontan (in California) will be required.

Impacts Mitigated

06 EIR/EIS/EIS- SEZ-3: SEZ Disturbance due to the Construction of Proposed Facilities

06 EIR/EIS/EIS- SEZ-4: Disturbance of Jurisdictional Wetlands and Waters Due to the Construction of Proposed Facilities

Mitigation Level

Compliance with TRPA & Forest Service criteria for disturbance within an SEZ.

Lead Agency

TRPA, Lahontan and Forest Service

Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA and Forest Service	
Timing	**Start:**	Prior to development of a new facility.
	Complete:	Upon completion of the proposed facility.
Status	Ongoing, with restoration projects completed.	

7.4-7 Avoid and/or Restore Future Disturbed Jurisdictional Wetlands and Waters

Description

MPA 07 Projects

Implementation of the following mitigation measures will reduce the impact to less than significant. The Forest Service and USACE will be the lead and monitoring agencies. Lahontan may be a lead and monitoring agency for 401 Certification of projects located in California. Heavenly will be the implementing entity. Mitigation will occur at or before the time of development of the new MPA 07 facility.

1. Heavenly will, before development begins, complete a jurisdictional wetlands delineation to determine the actual location of jurisdictional wetlands and waters surrounding the specific project.
2. Heavenly will avoid development within the wetlands and waters to the extent possible as determined jointly by USACE and the Forest Service.
3. Heavenly will, if development within the wetlands cannot be avoided, obtain a Section 404 permit from the USACE or approval under existing general permits, including water quality certification (Section 401) by Lahontan (in California), and comply with all requirements of the permit to mitigate specific impacts of the project (including coordinating with CDFW to comply with Section 1600 of the FGC if there is removal of riparian vegetation).
4. Sky Meadows Lodge and Deck (CA-1), the Base of Ski Lift Q (NV-3), and Boulder Operations will be relocated to locations outside delineated wetland boundaries to reduce impacts caused by past projects.
5. All tree removal activities for construction of ski lifts and ski trails will be conducted to reduce the potential for ground disturbance within wetlands or jurisdictional waters.
6. Additionally, as stated in the Updated Waste Discharge Permit (Board Order NO. R6T-2003-0032, page 15) for projects that impact SEZs [or wetlands] in California, "…any disturbance to SEZ [or wetlands] for new construction is prohibited unless the Regional Board provides an exemption to prohibitions against discharge or threatened discharge of wastes attributable to new development in SEZ [or wetlands]. If the Regional Board provides an exemption, additional mitigation measures may also be required for their permitting."

Impacts Mitigated	06 EIR/EIS/EIS- SEZ-4: Disturbance of Jurisdictional Wetlands and Waters Due to Construction of Proposed Facilities	
Mitigation Level	Compliance with U.S. Army Corps of Engineers wetlands permitting requirements.	
Lead Agency	U.S. Army Corps of Engineers and Lahontan	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	U.S. Army Corps of Engineers	
Timing	**Start:**	Prior to development of a new facility.
	Complete:	Upon completion of the proposed facility.
Status	Ongoing, with restoration projects completed.	

7.4-8 TRPA Land Coverage Mitigation

Description	As documented in a TRPA Land Coverage Verification letter dated December 5, 2005 (06 Draft EIR/EIS/EIS Appendix 3.4-B), Heavenly removed and restored 422,623 ft2 of previously existing land coverage, including 105,415 ft2, (2.4 acres) in Hydrologic Transfer Area 4 (South Stateline) and 317,208 ft2 (7.2 acres) in Hydrologic Transfer Area 5 (Upper Truckee). An additional 37,897 ft2 (0.86 acres) of banked coverage may become available in Hydrologic Transfer Area 5 after successful restoration. To utilize the 434,580 ft2 (as outlined in Table 3.4-2 of this 06 Draft EIR/EIS/EIS) of available land coverage within the Heavenly project area (includes remaining coverage available plus banked coverage), TRPA must make appropriate relocation findings included in the Code of Ordinances, and temporary and permanent BMPs must be installed and maintained as outlined in mitigation measure 7.4-1, the Construction Erosion Reduction Program (CERP).	
Impacts Mitigated	06 EIR/EIS/EIS-EARTH-1: New Permanent Land Coverage.	
Mitigation Level	Land coverage no greater than allowed by TRPA using the Bailey Land Capability Classification system.	
Lead Agency	TRPA	
Implementing Agency	TRPA and Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Upon approval of the MPA 07
	Complete:	Upon completion of project construction and Findings.
Status	Ongoing	

7.4-9 BIO-1: Delay Sky Meadows Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities Until Sierra Nevada Yellow-legged Frog Surveys and USFWS Consultation Are Complete

Description	Heavenly Mountain Resort shall delay implementation of projects located in Sky Meadows or East Peak Lake (e.g., Sky Meadows

	Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities) until protocol surveys (3 surveys in the past 10 years in accordance with USFS/USFWS protocol) are completed for the Sky Meadows Basin and East Peak Lake suitable habitat for Sierra Nevada yellow-legged frog (SNYLF). If SNYLF are determined to be present in the project area, Heavenly shall formally consult with CDFW (California projects only) and LTBMU with USFWS regarding potential impacts to the species. If the results of consultation allow; the Projects may be allowed to proceed with protection measures developed in consultation with CDFW, LTBMU and USFWS. If it is determined that protection measures cannot be implemented to reduce impacts to the species, each activity proposed in the delineated habitat area that will result in new disturbance and human interaction will be eliminated from the Project (e.g., Sky Basin Coaster, Sky Meadows Challenge Course, East Peak Lake Dock). If SNYLF are not determined to be present within the delineated suitable habitat, Heavenly shall start informal consult with CDFW (California projects only) and LTBMU with USFWS regarding potential impacts to designated habitat that has been classified as "Unutilized Potential" in accordance with Region 5 direction (USFS Memorandum dated 5/28/14). If the results of the informal consultation allow; the Projects may be allowed to proceed with habitat protection measures developed in consultation with CDFW, LTBMU and USFWS.
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - BIO-1: Would the Project, directly or indirectly, cause a loss of individuals or occupied habitat of endangered or threatened fish or wildlife species?
Mitigation Level	Protection of listed species located within the Heavenly operational boundary.
Lead Agency	USFS and TRPA
Implementing Agency	USFS
Monitoring Agency	USFS
Timing	**Start:** Prior to construction of proposed Sky Meadows Challenge Course and East Peak Lake Water Activities **Complete:** Upon completion of surveys and consultation with USFWS.
Status	New measure proposed for Epic Discovery Project

7.4-10 Reduce and Control Fugitive Dust

Description

Heavenly shall require its contractors to implement mitigation measures during project construction to minimize the generation and transport of construction related fugitive dust. These measures consist of using chemical dust suppressants (with prior review and approval by the Lahontan staff for California projects) and/or water on unpaved roads, graded and excavated areas and material storage piles, and of cleaning on-site paved roads daily to remove tracked-on dirt and mud.

Impacts Mitigated

Cumulative change in ambient fine particulate (PM_{10}) concentrations.

Mitigation Level

Reduce fine particulate emissions during construction.

Lead Agency

TRPA

Implementing Agency

Heavenly Mountain Resort

Monitoring Agency

TRPA

Timing

Start: Upon commencement of project construction.

Complete: Upon completion of project construction.

Status

Ongoing

7.4-11 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows

Description

1. Heavenly Mountain Resort shall retain a qualified biologist to conduct a preliminary vegetation survey prior to the project-level design or approval of any proposed facility. This vegetation survey shall identify all deciduous trees, wetlands, and meadows located within or adjacent to the proposed construction corridor and shall delineate facility-siting alternatives that avoid the loss or degradation of these resources. Heavenly Mountain Resort, through consultation with the Forest Service and TRPA, shall then implement a final engineered facility siting alternative that avoids the loss or degradation of riparian or wetland plant communities.

2. If TRPA, Lahontan, and the Forest Service jointly determine (the Forest Service, Lahontan, and TRPA shall determine separately on lands of individual jurisdiction) that the construction of any new facility cannot be sited to avoid the loss or degradation of riparian or wetland plant communities, the areal extent of the impact and the intensity of the impact shall be minimized. Methods for minimizing impact shall include, but not be limited to, the realignment of facilities to minimize the acreage of riparian or wetland plant communities affected, hand excavation adjacent to riparian or wetland plant communities, and use of helicopters to install ski lift towers and other facilities. For each acre of disturbed riparian or wetland vegetation, an area 1.5 times the impacted area shall be restored or created within the special use permit boundary.

Impacts Mitigated

96 Final EIR/EIS/EIS: Loss or degradation of native vegetation associations due to the construction of new MP 96 facilities.

06 EIR/EIS/EIS-7.4-8: Loss or degradation of native vegetation associations due to the construction of new MPA 07 facilities.

Mitigation Level	Non-degradation of deciduous trees, wetlands, and meadows.	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Prior to the approval of a MPA 07 project.
	Complete:	Upon completion of construction or, if necessary, following implementation of vegetation creation and restoration.
Status	Ongoing	

7.4-12 Active Raptor and Migratory Bird Nest Site Protection Program

Description	Pre-construction surveys, conducted during the nesting season immediately prior to project construction, shall be conducted to identify any active raptor nest sites within the selected alignment. During initial construction activities (tree removal), a Forest Service qualified biological monitor shall be onsite to evaluate whether any raptors or migratory birds are occupying trees within 100 feet of the construction corridor. The biological monitor will have the authority to stop construction near occupied trees if it appears to be having a negative impact on nesting raptors or migratory birds or their young observed within the construction setbacks of the project area. If construction is stopped, the monitor must consult with, Forest Service and TRPA staff within 24 hours to determine appropriate actions to continue construction while reducing impacts to identified raptors or migratory birds.	
Impacts Mitigated	06 EIR/EIS/EIS-BIO-2: Loss of active raptor and migratory bird nests.	
Mitigation Level	Protection of raptor and migratory bird nests and fledglings.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Pre-construction of projects.
	Complete:	Upon completion of construction activities.
Status	Ongoing, as projects are proposed.	

7.4-13 Monitor and Protect Northern Goshawk

Description

1. Surveys for northern goshawk shall be funded by Heavenly and conducted by the Forest Service or by others approved by the Forest Service prior to the onset of any project that proposes to affect suitable northern goshawk habitat or any project located within 0.5 mile of suitable northern goshawk habitat. All surveys shall be in accordance with the most recent Forest Service Region 5 protocol. If a northern goshawk nesting territory is discovered, a Protected Activity Center shall be delineated in accordance with the Sierra Nevada Forest Plan Amendment Record of Decision

(January 2004). A LOP must be maintained to prohibit activities or vegetation treatments which may disrupt breeding within ¼ mile of the PAC from February 15 through September 15. The LOP may be waived if surveys confirm nesting is not occurring or if the activity is of such scale and duration that impacts to breeding Northern goshawks would not occur. A one-quarter mile disturbance zone surrounding the nesting tree shall be delineated in accordance with TRPA Code of Ordinances 62.4.1(A) for in-basin areas. No manipulation of the habitat within the disturbance zone is allowed unless manipulation is necessary for habitat enhancement.

2. Heavenly Mountain Resort shall fund and the Forest Service or the TRPA shall prepare (and both the Forest Service and TRPA shall approve) updated northern goshawk habitat maps at 5-year intervals throughout the life of the MPA 07. These maps shall reflect the loss or modification of existing suitable northern goshawk habitat and shall identify new habitat areas created by the maturation of early and mid-successional forest stands and shall be based on the latest scientific information. The updated northern goshawk habitat maps shall be used to identify areas that must be surveyed for northern goshawk prior to allowing construction activities to proceed. Updated habitat maps shall not interrupt two year survey protocols. Maps utilized for the first year of surveys shall be utilized for the second year of surveys regardless if updates occur.

Impacts Mitigated 96 Final EIR/EIS/EIS Disturbance of northern goshawk nesting or foraging habitat.

06 EIR/EIS/EIS – BIO-4: Loss of sensitive (including Management Indicator Species) wildlife individuals or habitat?

Mitigation Level Maintenance of northern goshawk habitat at Heavenly; protection of nesting goshawks from noise and human disturbance.

Lead Agency TRPA

Implementing Agency Heavenly Mountain Resort

Monitoring Agency TRPA

Timing **Start:** Project Review.

Complete: Ongoing.

Status Ongoing

7.4-14 BIO-4: Wildlife Nursery Site Survey

Description Heavenly Mountain Resort shall conduct a thorough pre-construction survey of project areas for wildlife nursery sites and den locations. The survey shall be performed by a professional biologist with experience locating nursery/den sites and shall be performed prior to initial ground disturbance for a project activity. The survey area shall include the location of ground disturbance and areas within 100 meters of ground disturbing activities, as well as any area where staging will occur or access will be provided for construction equipment. The contracted biologist shall report the findings of the survey to the USFS LTBMU. The Responsible Official may implement an LOP, adapt construction timelines or facility locations as determined necessary to provide adequate protection. If an LOP is implemented, construction may only

	occur between August 1 and March 15.	
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - BIO-4: Would the Project cause a loss of wildlife nursery/den sites and associated habitat?	
Mitigation Level	Protection of identified nursery/den sites.	
Lead Agency	USFS	
Implementing Agency	USFS and Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Prior to construction of Epic Discovery Projects.
	Complete:	Ongoing.
Status	New measure for Epic Discovery Project	

7.4-15 Utilize Boundary Management Plan to Manage Skier Access on Adjacent NFS Lands

Description	Heavenly Mountain Resort shall prohibit skier access from the Gondola Mid Station by posting ski area boundary markers and roping the perimeter of the facility. Access is permitted through managed skier gates along the ski area boundary.	
Impacts Mitigated	Installation of ski resort facilities on lands designated for Management Prescription 9 of the LTBMU's Forest Plan. (MP 96 and MPA 07)	
Mitigation Level	Compliance with Management Prescription 9 of the LTBMU's Forest Plan.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MPA 07.
	Complete:	Ongoing.
Status	Ongoing	

7.4.16 Evaluate and Monitor Known Archaeological Resources Within Comstock Logging Historic District

Description

1. The sites must be formally evaluated for the NRHP by a qualified professional as either contributors to the proposed discontiguous Comstock Logging Historic District, or on their own merits as historic properties.
2. Their data potential (criterion D) and their associations (A and B) must be established in consultation with the Nevada State Historic Preservation Office (SHPO). Concurrently, if the resources are determined to be in basin, they should also be evaluated for designation as TRPA historic resources in compliance with TRPA Code Sections 67.6 and 67.7.
3. In addition, the sites must be monitored to determine the extent of

deterioration and to discourage vandalism.

4. Avoidance of cultural resources by project components is desired.

5. If project redesign is not feasible and cultural resources that have been evaluated and determined eligible to the NRHP will be impacted, consultation and concurrence with SHPO, TRPA, Forest Service, and/or the Washoe Tribe in dealing with the affected resources must occur and measures to reduce the impact to less than significant identified. Another option that may be determined appropriate after site evaluation and monitoring is a program of public interpretation.

Impacts Mitigated

96 Final EIR/EIS/EIS: Destruction of known archaeological resources in the vicinity of existing ski trails, ski lifts, summer uses, and maintenance activities.

06 EIR/EIS/EIS – CULT-1: Potential to Disturb Known Cultural Resources

Mitigation Level Identification and protection of significant archaeological resources

Lead Agency Forest Service

Implementing Agency Forest Service and Heavenly Mountain Resort

Monitoring Agency Forest Service

Timing

Start: Upon approval of the Heavenly Mountain Resort MPA 07.

Complete: Ongoing.

Status Ongoing

7.4-17 Identify and Protect Undiscovered Archaeological Resources

Description

1. The LTBMU Heritage Resources staff shall have the opportunity to spot-check proposed construction areas and to consult with the SHPO, prior to final decisions regarding the siting of specific facilities.

2. If previously undiscovered resources are discovered or revealed during construction or any subsequent activity, all activity will cease in the vicinity of the discovery until the LTBMU Heritage Resources staff for either California or Nevada assesses it for eligibility to the NRHP, compliance with TRPA Code Section 67, and/or (in the event of a prehistoric or ethnographic find) for Native American (Washoe) values. This assessment will occur in consultation with the SHPO, TRPA, and the Washoe Tribe, as appropriate.

3. Cessation of activity will continue until proper treatment can be determined and implemented.

4. Avoidance of the resource may be an appropriate mitigation measure.

5. An implemented interpretive program for the cultural resource may be determined to ban an important component to the mitigation measure after evaluation of the resource.

6. The appropriate contingency clause stipulating this stop-work

condition will be inserted in all contracts related to the undertakings.

Impacts Mitigated	96 Final EIR/EIS/EIS - Potential destruction of undiscovered archaeological sites during construction of facilities. 06 EIR/EIS/EIS – CULT-1: Potential to Disturb Known Cultural Resources
Mitigation Level	Identification and protection of significant archaeological resources
Lead Agency	Forest Service and TRPA
Implementing Agency	Forest Service and Heavenly Mountain Resort
Monitoring Agency	Forest Service and TRPA
Timing	**Start:** Upon approval of the Heavenly Mountain Resort MPA 07. **Complete:** Ongoing.
Status	Ongoing

7.4-18 Protect the Tahoe Rim Trail

Description

Heavenly Mountain Resort shall implement the following measures in the Galaxy and Wells Fargo Ski Lift areas to allow for continued use of the TRT during construction of resort facilities:

- The construction of permanent structures (ski lift terminals or towers) which would block trail use shall be prohibited within the current alignment of the TRT.
- Safety hazards within or adjacent to the TRT, including blasting areas, trenches, ski lift construction sites, and tree removal areas, shall be roped off and posted to prohibit public access during construction.
- Heavenly shall work with USFS, TRT and local media outlets to inform the general public of potential closure times, dates and alternative access to other areas of the TRT.
- Wherever possible, ski trails shall be sited to not intersect with the existing TRT. In addition, ski lift towers shall be sited so as to provide the greatest distance of natural vegetative buffer, including trees, woody plant material, and groundcover between the trail and the tower foundations. As required to protect Watershed resources, new ski trails and ski lifts shall be constructed in order to minimize the removal of existing ground vegetation. Implementation of these measures would reduce the potential impact to less than significant.

Impacts Mitigated	96 Final EIR/EIS/EIS - Short-term conflicts with the use of the Tahoe Rim Trail caused by construction of Ski Lifts R, Y, and EE and Ski Trails 72 to 77 06 EIR/EIS/EIS – REC-2: Will the Project conflict with an established recreational use in the area?
Mitigation Level	Maintenance of the existing recreational value of the Tahoe Rim Trail.
Lead Agency	Forest Service

Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MPA 07.
	Complete:	Upon completion of MPA 07 construction.
Status	Ongoing.	

5.7 OPERATIONS AND MAINTENANCE MEASURES

7.5-1 Watershed Maintenance and Restoration Program

Description

Heavenly shall implement the Watershed Maintenance and Restoration Program (Epic Discovery Draft EIR/EIS/EIS Appendix 3.1-D). The program will be updated as needed to identify restoration priorities that are determined by ongoing monitoring. Forest Service monitoring for the summer maintenance road system will be incorporated into this Program and will be used to develop the restoration and maintenance schedule for road segments.

Cumulative Watershed Effects (CWE) modeling tools were used to analyze watershed health and design restoration programs during the environmental review of the 96 MP, 07 MPA and the Epic Discovery Project. For future Master Plan implementation and monitoring, CWE modeling tools will no longer be used to determine whether erosion reduction targets have been achieved. CWE modeling tools are not sensitive enough to be useful on a project-level scale. The in-field monitoring required as part of the Ongoing Environmental Monitoring Program (Measure 7.5-2) provides a more accurate method for determining success of the proposed restoration measures. The reporting required by the updated WDRs ensures that measures are implemented and maintained.

The Watershed Maintenance and Restoration Program will continue to include restoration and maintenance projects that are included in the MPA 07 Phase I, II, and III capital project implementation plan contained in Appendix 3.1-D. Additionally, the Watershed Maintenance and Restoration Program will include long-term maintenance needs for facility BMPs, road and ski trail projects with improved pre- and post-project implementation and effectiveness monitoring. All large scale ski trail restoration projects were completed under the original 1997 CWE Restoration Program and now require maintenance. The exception is Edgewood Bowl Restoration, which was scheduled for completion in 1998 under the CWE Restoration Program and is now scheduled in conjunction with the proposed replacement of the North Bowl Chair Ski Lift.

The Watershed Maintenance and Restoration Program project list contained in Appendix 3.1-D would be implemented to further reduce the potential for erosion or soil loss due to long term operation of existing and proposed facilities. The Watershed Maintenance and Restoration Program is organized in phases based on Priority ski trail and road segments treatment needs and further linked to capital project implementation phasing.

The Forest Service would be the lead and monitoring agency, and Heavenly would be the implementing entity. Timing for implementation of the mitigation measures of this program is ongoing.

Impacts Mitigated

06 EIR/EIS/EIS- WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs

06 EIR/EIS/EIS- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction

06 EIR/EIS/EIS- WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks

06 EIR/EIS/EIS- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Mitigation Level

Future development must not increase sedimentation rates from the ski resort that would adversely impact downstream beneficial uses.

Lead Agency

Forest Service, Lahontan and TRPA

Implementing Agency

Heavenly Mountain Resort

Monitoring Agency

Forest Service

Timing

Start: Ongoing

Complete: Ongoing

Status

The Watershed Maintenance and Restoration Program is to be implemented as outlined in Table 4 of Appendix 3.1-D and amended by the Forest Service Road Maintenance Program and Environmental Monitoring Program.

7.5-2 WATER-C1b: On-Going Environmental Monitoring Program

Description

The on-going Environmental Monitoring Program, Mitigation Measure 7.5-2, addresses the Lahontan Board Order No. R6T-2003-0032A2 waste discharge requirements (WDRs) and implements the monitoring and reporting program for Heavenly Mountain Resort. The Program includes the following monitoring components:

Water Quality Monitoring

BMP Effectiveness Monitoring

Riparian Condition Monitoring

Condition and Trend Monitoring

In summary, the Heavenly Mountain Resort Environmental Monitoring Program should continue to be revised and organized to adequately meet the monitoring and reporting requirements set forth in all regulatory documents and the Mitigation and Monitoring Program of the MPA 07.

The on-going Environmental Monitoring Program shall be updated for 2015 through an amendment of the Lahontan WDR and monitoring and reporting program. The Program shall include additional monitoring requirements that have been identified for avoidance and reduction of cumulative watershed effects, as follows:

- Roads and trails monitoring within the Heavenly special use permit boundary shall be amended to comply with current Forest Service protocols, including the mountain bike trails constructed as part of the Mountain Bike Park in the Mott Creek Watershed (applies only to NV-1). Other general use mountain bike and hiking and maintenance trails would not be components of the Environmental Monitoring program, but on-going effectiveness of design features shall be monitored and maintained through the current Heavenly operations and maintenance program.
- For the Heavenly Valley Creek Sky Meadows Reach only, the stream channel condition monitoring component shall be amended to add monitoring for in-stream fine sediment to provide a better assessment of causes of poor biotic health and document effectiveness of mitigation strategies.

Impacts Mitigated

06 EIR/EIS/EIS- WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs

06 EIR/EIS/EIS- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction

06 EIR/EIS/EIS- WATER-3: MPA 07 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks

06 EIR/EIS/EIS- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

Epic Discovery EIR/EIS/EIS - WATER-C1: Would the Project have significant cumulative impacts to water resources in watershed CA-1?

Epic Discovery EIR/EIS/EIS - WATER-C3: Would the Project have significant cumulative impacts to water resources in watershed NV-1?

Mitigation Level

Compliance with state and regional water quality standards and allowable watershed TOCs.

Lead Agency

Forest Service, Lahontan (in CA) and TRPA (In Basin)

Implementing Agency

Forest Service and Heavenly Mountain Resort

Monitoring Agency

Forest Service

Timing

Start: January 1995.

Complete: Ongoing under agreement between Heavenly and Forest Service and Heavenly and third party contractor

Status

Amendment to ongoing agreement in place between Heavenly, TRPA, Forest Service and third party contractors. To be added as an amendment to the Lahontan WDRs and monitoring and reporting program.

7.5-3 WATER-C1a: CA-1 Erosion Reduction Measures

Description

Prior to or concurrent with new permanent or temporary disturbance in the Sky Basin, the highest risk (i.e., those with the greatest potential for

	sediment loading to a channel) sources of erosion or "hotspots" that would have a direct effect on Heavenly Valley Creek channel and BMI scores shall be mitigated, as outlined in Epic Discovery Draft EIR/EIS/EIS Appendix 3.1-F. First phase hotspots shall be addressed prior to new disturbance and shall include numbers 31, 32, 33, 34, 35, 36, and 49, as based on combinations of high erosion risk, high connectivity and/or close proximity to the channel and/or SEZ. Phase two hotspots shall be addressed prior to or concurrent with new disturbance and shall include numbers 13, 30, 37, 38, 41, 42, 43, 44, 45 and 46 because of combinations of high connectivity, but moderate erosion risk or lower proximity to the channel and/or SEZ. Hotspots numbers 6, 7, 39, 40, 47 and 48 shall be retained and implemented as part of mitigation measure 7.5-1 (ongoing Watershed Maintenance and Restoration Program) to correct areas of chronic sources of erosion that pose lower risk of sediment transport to the channel and/or SEZ. The status of implementation and effectiveness of these mitigation measures shall be documented through mitigation measure 7.5-2 (ongoing Environmental Monitoring Program) and reported to TRPA, Forest Service and Lahontan in annual monitoring reports.
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - WATER-C1: Would the Project have significant cumulative impacts to water resources in watershed CA-1?
Mitigation Level	Inform and focus the required management and restoration actions to improve biotic conditions in the Sky Meadows.
Lead Agency	Forest Service, Lahontan and TRPA
Implementing Agency	Heavenly Mountain Resort
Monitoring Agency	Forest Service
Timing	**Start:** Prior to Construction of Sky Basin Projects
	Complete: Ongoing
Status	New program prepared for Epic Discovery Project.

7.5-4 WATER-C3: NV-1 Erosion Reduction Measures

Description	Prior to new permanent or temporary disturbance in the Mott Creek watershed (NV-1), the highest risk (i.e., those with the greatest potential for sediment loading to a channel) sources of erosion or "hotspots", numbers 1, 3, 4, 5 and 6 as outlined in Epic Discovery Draft EIR/EIS/EIS Appendix 3.1-G shall be implemented. Hotspot numbers 7, 8, 9, 10, 11, 13, 16, 20, 21, 22, 23 and 24 shall be addressed during field fitting and phased construction of the proposed mountain bike trails. Those lower risk hotspots 2, 12, 14, 15, 17, 18 and 19 shall be retained and implemented as part of mitigation measure 7.5-1 (ongoing Watershed Maintenance and Restoration Program). The status of implementation and effectiveness of these mitigation measures shall be documented through mitigation measure 7.5-2 (ongoing Environmental Monitoring Program) and reported to TRPA, Forest Service and Lahontan in annual monitoring reports.
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - WATER-C3: Would the Project have significant cumulative impacts to water resources in watershed NV-1?

Mitigation Level	Inform and focus the required management and restoration actions to improve soil and water quality conditions in the Mott Creek watershed.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Prior to Construction of Mott Creek watershed Projects
	Complete:	Ongoing
Status	New program prepared for Epic Discovery Project.	

7.5-5 Maintain Water Rights Balance

Description

Water Rights/Water Use Monitoring Program

To ensure that water from Heavenly's various supplies is used in appropriate quantities and locations, a Water Use/Water Rights monitoring program would be implemented. The goal of the program would be to measure or estimate the quantity of water supplied by each source and where the water is used.

Using the flow monitoring facilities, Heavenly would prepare an annual report indicating the quantity of water used from each of its sources, the maximum entitlement from each of its sources, and the amount of water consumed by each of Heavenly's uses, including snowmaking in and out of the Tahoe Basin in both California and Nevada. Additionally, flow records for each of the creek monitoring stations, estimated flow into East Peak Lake and releases from East Peak Lake would be included. This report would be submitted to the Forest Service for review and concurrence. If the Forest Service finds that Heavenly is out of compliance with any terms of their water rights, Heavenly would, in the future, modify their operating procedures to comply with the water right requirements.

Impacts Mitigated

96 Final EIR/EIS/EIS: Water diversions from Heavenly Valley Creek may result in violations of water right requirements.

96 Final EIR/EIS/EIS: Noncompliance with Heavenly water entitlements.

96 Final EIR/EIS/EIS: Future increased creek water diversions from Heavenly Valley Creek may result in violation of water right requirements.

96 Final EIR/EIS/EIS: Future increased use of water by Heavenly may not comply with the water entitlements.

06 EIR/EIS/EIS- WATER USE-1: Potential for Changes in Streamflow (Daggett, Mott and Bijou Park Creeks) and Lake Level (East Peak Lake) Effects Based upon Proposed Groundwater Pumping

06 EIR/EIS/EIS- WATER USE-2: Potential for Changes in Groundwater Levels Based upon Proposed Groundwater Pumping

Mitigation Level

Compliance with water rights restrictions.

Lead Agency	State of Nevada and Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	State of Nevada and Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MPA 07.
	Complete:	Ongoing.
Status	Ongoing; all meters needed to monitor water use and balance conditions are in place.	

7.5-6 Maintain Water Flows in Heavenly Valley Creek

Description

1. Heavenly shall implement the Water Rights/Water Use Monitoring Program so that it can be determined how much water is used in California and Nevada both in- and out-of-basin.
2. Heavenly shall, using the upgraded monitoring station at Heavenly Valley Creek station HV-C1A (upstream of California Reservoir), continue to monitor the inflow to the Reservoir, so that the required release rates are known.
3. Heavenly shall operate the California Reservoir such that the minimum release requirements are complied with.
4. Heavenly shall document compliance in the annual water use/water rights report (Mitigation Measure 7.5-5), to include flow records at HV-C1A, California Reservoir release records and flow records at HV-C2.
5. Heavenly shall, if water use does not conform with water rights and the Reservoir operating permit, modify future operation of the Reservoir to comply with the water right and operating permit restrictions.
6. Heavenly shall obtain water for summertime irrigation from sources other than Heavenly Valley Creek.
7. Heavenly shall manage the California Reservoir and Dam such that the Dam releases equal the inflow to the Reservoir during the summer such that instream flows are not decreased.

Impacts Mitigated

96 Final EIR/EIS/EIS: Water diversions from Heavenly Valley Creek may result in violations of water right requirements

96 Final EIR/EIS/EIS: Future increased creek water diversions from Heavenly Valley Creek may result in violation of water right requirements.

96 Final EIR/EIS/EIS: Diversion of creek water from Heavenly Valley Creek for summer irrigation of revegetation/restoration sites may constitute a nonattainment of the TRPA fisheries threshold concerning instream flows.

Mitigation Level	Compliance with water right requirements for Heavenly Valley Creek. Compliance with TRPA instream flow threshold for Heavenly Valley Creek.	
Lead Agency	TRPA and Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upgraded monitoring station shall be installed within 90 days after approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing. The upgraded monitoring station was funded in 2004 by Vail Resorts. Data is now being recorded. Annual water use reports are being prepared.	

7.5-7 Maintain Water Flows in Daggett Creek

Description

1. Heavenly shall install a flow gauge to measure the release from East Peak Lake.

2. Heavenly shall estimate flow into East Peak Lake based upon the previous months' total precipitation and then calculate the required release (as done above for average, wet, and dry years in 95 Draft EIR/EIS/EIS Table 4.3-7).

3. Heavenly shall operate East Peak Lake Dam to satisfy the calculated release rates, the requirements of water right permit 50525, and downstream claimants needs. No more than 0.5 cfs shall be diverted between November 2 and March 15, and no diversions shall be made from March 16 through November 1. However, releases are not required to exceed the estimated Daggett Creek inflow even if downstream claimants' needs are not satisfied.

4. Heavenly shall document compliance in an annual water use/water rights report, to include records of estimated flow into and release from East Peak Lake.

5. Heavenly shall, if water use does not conform with water right restrictions, modify operations to conform with the water right restrictions or purchase decreed downstream water rights to cover any diversions above those permitted by Water Right 50525.

Impacts Mitigated	96 Final EIR/EIS/EIS: Diversion of creek water from Daggett Creek (outside the Lake Tahoe Basin) may result in violations of water right requirements. 96 Final EIR/EIS/EIS: Increased creek water diversions from Daggett Creek may result in violation of water right requirements.
Mitigation Level	Compliance with water right requirements for Daggett Creek.
Lead Agency	State of Nevada

Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing	

7.5-8 Maintain Compliance with Water Entitlements

Description

Implementation of the following mitigations would reduce the impact to less than significant. Forest Service would be the lead and monitoring agency and would review the annual report; Heavenly would be the implementing entity. Mitigations should be implemented upon approval of this document and continued indefinitely.

1. Heavenly shall limit water use to conform with their approved water rights including limiting water use to quantities available under approved water rights and restricting uses to proper POUs. For water purchased from STPUD and KGID, Heavenly shall comply with water rights restrictions associated with the purchased water.
2. Heavenly shall implement the Water Rights/Water Use Monitoring Program which will enable Heavenly to determine the quantity and location of water use, and thus to determine if Heavenly's water right requirements are satisfied.
3. Heavenly shall annually determine the maximum permissible water uses for each location (California, Nevada, in-region, out-of-region) based upon the quantities supplied by each source and the current water use restrictions of each source.
4. Heavenly shall annually prepare a report documenting that water uses conform to water rights restrictions.
5. Heavenly shall, if water use for the previous year does not conform with water rights, modify future water use operations to conform with the approved water rights.
6. Heavenly shall obtain approval of the California (App. Nos. 30227 and 80228) and Nevada (No. 58345) water rights application to use 594 and 150 afa of Lake Tahoe water in California and Nevada in the Lake Tahoe Basin for snowmaking. Also, Heavenly shall apply for and obtain approval of the changes to existing Nevada water rights POUs discussed above and shown in the 96 Final EIR/EIS/EIS Figure 4.3-3. If approval of these applications is not obtained, Heavenly shall currently and at all time in the future limit water use to conform to their approved water rights.
7. Heavenly shall, if Heavenly's on-site water supplies are insufficient to satisfy its water demands, purchase additional water from STPUD and KGID. For water purchased from STPUD and KGID, Heavenly shall use the water within their approved service areas. Additionally, for water use out-of-basin and in Nevada, Heavenly shall develop new water supplies (drill

additional wells) such that they can fully utilize their approved water rights.

Impacts Mitigated	96 Final EIR/EIS/EIS: Noncompliance with Heavenly water entitlements. 96 Final EIR/EIS/EIS: Future increased use of water by Heavenly may not comply with the water entitlements.	
Mitigation Level	Compliance with Heavenly water entitlements.	
Lead Agency	Forest Service and TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing	

7.5-9 Reduce Vehicle Emissions

Description

To reduce the potential impact to ambient CO concentrations, Heavenly shall work with responsible agencies to implement a mitigation package to ensure construction projects do not significantly increase ambient CO concentrations. The mitigation measure for this impact would require participation of many different emission contributors. These sources include vehicular traffic, home fire places, industrial sources, and other combustion engines.

The combination of mitigation measures selected would depend on three key factors:

- the Alternative selected for implementation
- the phasing of the Alternative
- the level of mitigation desired.

All three of these factors must be addressed by Heavenly and other lead and responsible agencies before a final mitigation package can be prepared and implemented. The final mitigation package must reduce CO emissions associated with the operation of the Heavenly Mountain Resort to help attain and maintain the CO standards within the Lake Tahoe Air Basin.

Heavenly has implemented the following mitigation measures as required in the MP 96 Mitigation and Monitoring Program:

- Developed additional control technologies (e.g., low emission vehicles) on mobile and stationary diesel-powered equipment as recommended in the 96 Final EIR/EIS/EIS.
- Expanded the Heavenly Shuttle Bus System – provides free shuttle service between all Heavenly Base areas (including the gondola) and all area lodging facilities. A free employee shuttle was also added.

- Improved Existing Transit System – free rides for Heavenly employees on BlueGo fixed route system, contributed to start-up and operation of the CTS (BlueGo) public transit system.
- Improved Parking Management to Maximize Shuttle Bus Usage – parking fee for Heavenly Village structure, parking management implemented in the surrounding neighborhoods and at the adjacent Town Center.
- Low Emission Vehicles for Use as Buses and Shuttles – Heavenly is replacing several diesel shuttles with CNG shuttles and plans on continuing to incorporate alternatively fueled vehicles into the fleet as vehicles are retired.

In addition to the measures implemented to date, the following mitigation measures were recommended in the 96 Final EIR/EIS/EIS to address cumulative CO conditions. Due to the recent exceedance of CA CO standards, these mitigation measures should also be considered to reduce near-term CO effects of the MPA 07.

Heavenly shall require that construction equipment operating procedures (equipment maintenance and limitations on equipment idle time) be followed by contractors, that low-sulfur diesel fuel is used, and that low NOx emitting engines are used in construction equipment. Heavenly must follow dust control measures during construction. Best available control technology (BACT) shall be used for all construction equipment.

Heavenly shall consider offering skiers the option of purchasing morning as well as afternoon half-day ski lift tickets. This would reduce peak hour parking lot traffic by shifting some of the half-day skier exit traffic to the midday period.

Impacts Mitigated

96 Final EIR/EIS/EIS: Cumulative change in ambient carbon monoxide concentrations.

96 Final EIR/EIS/EIS: Cumulative change in ambient fine particulate (PM_{10}) concentrations.

06 EIR/EIS/EIS-AQ-1: Change in Ambient Carbon Monoxide Concentrations

Mitigation Level

Reduce carbon monoxide and fine particulate emissions from construction equipment and vehicular traffic.

Lead Agency

El Dorado County, TRPA and TTD

Implementing Agency

Heavenly Mountain Resort; City of South Lake Tahoe; Hotels; Casinos

Monitoring Agency

El Dorado County and TRPA

Timing

Start: Upon approval of the Heavenly Mountain Resort MPA 07.

Complete: Ongoing.

Status

Ongoing

7.5-10 Snow Removal Noise Mitigation Methods

Description

In order to mitigate this impact to less than significant levels, Heavenly must reduce the CNEL values to 1982 levels or the PAS noise

standards, whichever is less, at the California and Boulder base areas. The 1982 CNEL value is the same as the existing and predicted Action Alternative values. These values can be reduced to the PAS CNEL noise standard by minimizing nighttime snow removal operations, and by constructing noise barriers along the perimeters of the parking lots. The noise barriers may be constructed from the snow removed from the parking lot. In later season operations during snowmelt, a barrier of snow may not be practical. In this situation, snow removal operations should occur during daytime or evening hours only. At the California Base, the upper parking lot should be cleared first, and clearing of the lower parking lot should be delayed until daytime hours whenever possible. These measures will provide up to a 15 to 20 dB CNEL noise reduction. The reduction of CNEL levels shall be reevaluated annually to ensure that Heavenly is implementing all possible snow removal measures available to attain the PAS CNEL noise standards.

Impacts Mitigated	96 Final EIR/EIS/EIS: Exceedance of TRPA PAS noise standards during snow removal at the California and Boulder base areas in the absence of snowmaking noise.	
Mitigation Level	TRPA Plan Area Statement CNEL levels.	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing	

7.5-11 Snowmaking Noise Mitigation Methods for Base Areas

Description

To reduce the impact to a less than significant level, Heavenly must reduce noise levels to 1982 values or the PAS noise standards, whichever is less. The reduction of CNEL levels shall be reevaluated annually to ensure that Heavenly is implementing all possible snowmaking measures available to attain the PAS CNEL noise standards.

There are numerous measures available, that when used in combination, would reduce the CNEL values to below 1982 levels or the PAS noise standards, whichever is less. The mitigation and monitoring plan shall specify which measures will be used to meet the PAS CNEL noise standards. These measures include the following, which are listed in order of priority:

1. Use of fan guns (or other similar technology with similar or better noise reductions) in place of air/water nozzles or air/water guns which are low noise.

2. Re-direction of nozzles and fans to minimize noise exposures at PAS boundaries.

3. Reduction in the numbers of nozzles and/or fans.

4. Use of setbacks to reduce noise exposures at PAS boundaries.

5. Use of noise reduction housings for air/water nozzles.

6. Use of barriers at low-mounted air/water nozzles.

7. Reduction in snowmaking activities at nighttime.

8. Sponsor research into reducing noise produced by snowmaking. This may include support of industry-wide research activities, specific studies concerning nozzle design sponsored directly by Heavenly, and the study of alternatives in placement of guns and fan guns at Heavenly.

At the Stagecoach and Boulder Bases, Heavenly will strive to replace all air/water nozzles with fan guns. This will reduce CNEL values measured at TRPA PAS boundaries significantly due to the lower noise emissions of each source, as well as a reduction in the number of sources (one fan gun can replace three or four air/water nozzles). Fan guns would be placed to provide adequate coverage, and, where possible, would be oriented to reduce noise exposures at TRPA PAS boundaries. Using the first three items of the priority list would achieve compliance with the PAS standards. The schedule for Stagecoach would be to achieve a 20 dB reduction in CNEL exposures at the PAS boundaries in Year 1999. At Boulder, a 25 dB reduction would be the goal for Year 2001.

At the California Base, it is anticipated that the entire list of mitigation measures would be pursued. The schedule for mitigation monitoring is to achieve a 10 dB reduction by Year 1999, a 15 dB reduction by Year 2001, with a goal of a 35 dB reduction by Year 2006. It should be noted that the above reductions would be achieved at a reference location near Saddle and Keller Roads, and that there would be a trade-off in that noise levels would be increased by new sources in the vicinity of CA Base Area Ski Lifts K, L, and M.

The noise monitoring program should include:

1. Noise measurements to verify CNEL or short-term noise levels:

    a) At remote PAS boundaries affected by snowmaking (such as the Edgewood Bowl area);

    b) At the California Base when studying alternatives in replacements of air/water nozzles with fan guns, re-direction of nozzles, use of housings and barriers, etc.;

    c) At the Stagecoach and Boulder Base areas after fan guns have been installed;

    d) At the California Base near Ski Lifts K, L, and M after ski lifts have been installed;

    e) As required in connection with Heavenly's nozzle noise reduction research efforts; and

    f) As required for concerts.

2. Installation of a long-term noise monitoring station at the California Base near Saddle and Keller Roads. This site could be set up before snowmaking begins in the late Fall, and left in operation over the Winter to document noise levels from snowmaking and snow removal.

Impacts Mitigated

96 Final EIR/EIS/EIS: Exceedance of TRPA PAS noise standards during the use of snowmaking equipment at the California base area.

96 Final EIR/EIS/EIS: Exceedance of TRPA PAS noise standards during the use of snowmaking equipment at the Boulder base area.

96 Final EIR/EIS/EIS: Exceedance of TRPA PAS noise standards during the use of snowmaking equipment at the Stagecoach base area.

Mitigation Level TRPA Plan Area Statement CNEL levels.

Lead Agency TRPA

Implementing Agency Heavenly Mountain Resort

Monitoring Agency TRPA

Timing

Start: Upon approval of the Heavenly Mountain Resort MP 96.

Complete: Ongoing.

Status Ongoing.

7.5-12 Rock Busting Noise Mitigation Methods

Description

In order to mitigate the impact to a less than significant level, Heavenly must control the number, size and location of "rock busting" blasts in order to meet PAS noise standards. In order to mitigate the impact to a less than significant level, Heavenly must control the number, size and location of "rock busting" blasts in order to meet PAS noise standards.

1. Rock busting operations noise impacts have been thoroughly analyzed in the 95 Draft EIR/EIS/EIS Noise Section 4.6, and are described above. It is expected that additional rock busting operations will occur as a part of the continued development of the Master Plan. In order to reduce this impact to less than significant, existing mitigation measures for rock busting shall continue to be implemented to reduce on mountain rock busting noise.
2. The noise levels vary based upon shot size and shot timing. Based upon the analysis in the 95 Draft EIR/EIS/EIS, locations of the 50 dB and 55 dB C-weighted CNEL contours are about 2,900 feet and 1,800 feet, respectively, from the blast site. In order to reduce this impact to less than significant, existing mitigation measures for rock busting shall continue to be implemented to reduce on mountain rock busting noise.

Audible noise due to blasting is not commonly considered to be a significant source of annoyance if blasting is controlled to meet safety standards on the project site.

Impacts Mitigated	96 Final EIR/EIS/EIS - Potential exceedance of TRPA PAS noise standards during summer "rock busting". 06 EIR/EIS/EIS – Potential Exceedance of TRPA PAS Noise Standards During Summer "Rock Busting."	
Mitigation Level	TRPA Plan Area Statement CNEL levels.	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MPA 07.
	Complete:	Ongoing.
Status	Ongoing	

7.5-13 Restrict Hours of Amphitheater Operations

Description	Restrict hours of concert noise to the daytime and early evening (non-nighttime) hours. Technically, concerts would need to cease operations by 10:00 p.m. However, it is recommended that concerts cease operations by sunset. This would be consistent with the hours of operations assumed for the amphitheater noise study. In addition, concerts should not extend more than 6 hours in duration.	
Impacts Mitigated	06 EIR/EIS/EIS-NOISE-5: Potential exceedance of TRPA PAS noise standards during summer concerts.	
Mitigation Level	TRPA Plan Area Statement CNEL levels.	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MPA 07.
	Complete:	Ongoing.
Status	Ongoing.	

7.5-14 TRANS-1: Traffic and Air Quality Mitigation Program

Description	Heavenly shall contribute to the Air Quality Mitigation Fund in accordance with Chapter 65 – Traffic and Air Quality Mitigation Program of the TRPA Code of Ordinances. The air quality mitigation fee shall be assessed in accordance with the mitigation fee schedule in the TRPA Rules of Procedure. Fees generated by the air quality mitigation fee are used to support programs/improvements that reduce VMT, improve air quality, and encourage alternative modes of transportation.

Impacts Mitigated	Epic Discovery EIR/EIS/EIS - TRANS-1. Will the Project result in the generation of 200 or more new Daily Vehicle Trip Ends?
Mitigation Level	Provide Funding for Basin projects to Reduce VMT.
Lead Agency	TRPA
Implementing Agency	Heavenly Mountain Resort
Monitoring Agency	TRPA
Timing	**Start:** Upon approval of the Epic Discovery Project
	Complete: Upon payment of calculated fees.
Status	New measure for Epic Discovery Project.

7.5-15 Implement the Coordinated Transportation System (Public Transit Services)

Description

Heavenly shall continue to implement their part of the ongoing package of air quality and traffic mitigation measures presented in the CTS Memorandum of Understanding.

The goals of the CTS are fourfold and are to provide:

1. A unified and *singular* public transit system in the South Shore;
2. A predominantly *market/demand* driven rather than a predominantly *schedule* driven public transit system;
3. A transit system that treats riders as *guests* rather than *passengers*; and
4. A *guest interactive* public transit system that connotes and promotes guest convenience.

A description of the contributions to the CTS Mitigation Fund, physical contributions, specific road, intersection and other physical improvements that would be provided by each of the proponents of the MOU Projects are:

C. Heavenly Mountain Resort

1. The project's fair share contribution to the CTS Mitigation Fund;
2. Continued operation of the existing winter bus fleet and additional operation of some portion of that same bus fleet in the summer as part of the CTS; and
3. Construction of the proposed Gondola, which effectively mitigates DVTE, DVMT, and intersection LOS for the majority of the Heavenly Mountain Resort ongoing projects as more particularly set forth in the Heavenly Mountain Resort MP 96 and its 96 Final EIR/EIS/EIS.

Impacts Mitigated

96 Final EIR/EIS/EIS: The Peak Hour Levels of Service at Intersections Along U.S. Highway 50 Would Operate At Unacceptable Conditions in the Year 2007.

06 EIR/EIS/EIS- TRANS-1: Summer Vehicle Miles of Travel

	06 EIR/EIS/EIS- TRANS-2: Level of Service	
	06 EIR/EIS/EIS- TRANS-3: Parking	
Mitigation Level	Improvements to the Levels of Service at Intersections Along U.S. Highway 50 by Reducing the Dependence on the Automobile.	
Lead Agency	TRPA and South Shore Transportation Management Association	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Upon Future Project Permit Approval
	Complete:	Ongoing
Status	Ongoing	

7.5-16: Protect Tahoe Draba Populations within Heavenly Mountain Resort

Description

1. *Surveys:* All facilities that are proposed to be located within potential Tahoe draba habitat shall have surveys performed prior to site planning for the subject facility. All in-basin Tahoe draba plants shall be avoided and protected using protective measures identified below for in-basin projects.
2. *Fencing:* For out-of-basin projects and for in-basin projects as outlined below in #4, minimize loss of Tahoe draba plants by installing protective fencing around occupied habitat that is adjacent to Forest Service approved construction projects. Heavenly shall install resource protection fencing in areas of known Tahoe draba occurrences that are immediately adjacent to facilities, trails, roadways or other activities that may impact existing plants. The resource fencing shall be placed in the specified locations on a seasonal basis after the snow melts and before summer activities (e.g., public operation and construction/maintenance crews) commence. The goal of the resource protection fencing is to prevent both vehicular access and to eliminate the ability for people to access the protected area. The fence shall be composed of metal stakes placed at a maximum distance of 20 feet for the extent of the length. A minimum of three ropes, at least 4 feet in height, shall be tied to the posts so as to prevent access across the fence line. For fencing placed along roadways, it shall be placed at the edge of the road surface below the toe of the slope on which the plants exist so as to maximize protection. Additionally, interpretative signage shall be placed along the fence line to identify the Tahoe draba. The fencing shall be removed at the end of the dry season after construction access or recreational activities have ceased.
3. *Boardwalks:* In order to further protect Tahoe draba habitat and existing plants, elevated boardwalks will be used to cross sensitive areas for access to the Sky Meadows Coaster and Sky Meadows Zipline Canopy Tour. These boardwalks shall be elevated a minimum of 6 inches above the soil surface and be constructed of grated material that allows light and moisture to pass. The purpose of the boardwalk is to allow for the movement of soil below and to maintain habitat connectivity and not further fragment suitable habitat for Tahoe draba.

4. *Avoidance:* For in-basin projects, avoid loss of Tahoe draba by siting facilities away from Tahoe draba populations and by installing protective fencing around occupied habitat where it is adjacent to proposed facilities.

5. *Rock Removal:* Construction activities should avoid capping rocks/boulders that have Tahoe draba growing near them. If rocks must be capped near Tahoe draba populations, existing plants shall be covered during blasting with canisters or other approved protective measures. This measure is in addition to fencing described above in bullet number 2.

6. *Monitoring:* Fences and blasting operations near Tahoe draba plants shall be monitored for the duration of the construction season by contractors, Heavenly staff, and Forest botanists to ensure compliance.

7. *Interpretive Program:* Develop and implement an employee orientation and training program for Tahoe draba for those employees associated with summer operations, such as interpretive programs, zip line, and hiking trails. Interpretive materials may include a description or illustration of Tahoe draba, an overview of the plant's natural history, general locations of the species at Heavenly, and measures that could be employed to protect the plant and its habitat from disturbance. Interpretive materials and services should be provided at entry points for summer visitors to the resort.

Impacts Mitigated

2006 EIR/EIS/EIS – VEG-1: Loss directly or indirectly (including through spread of noxious weeds), of individuals or habitat of endangered, threatened, or rare (CNPS 1B) plant species?

1996 EIR/EIS/EIS - Potential loss or disturbance of Tahoe draba populations within the Master Plan Development Area. (Existing 1994-95 Conditions plus 1996 Master Plan)

Loss or disturbance of Tahoe draba populations due to increased summer recreational activity. (Existing 1994-95 Conditions plus 1996 Master Plan)

Epic Discovery EIR/EIS/EIS - VEG-2: Would the Project result in an overall decrease in long term trends in Tahoe draba populations within the Project area?

Mitigation Level Maintenance of existing Tahoe draba populations at Heavenly.

Lead Agency Forest Service (Mountain Wide) and TRPA (In-Basin)

Implementing Agency Heavenly Mountain Resort

Monitoring Agency Forest Service (Mountain Wide)

Timing

Start: Project planning.

Complete: Ongoing.

Status Ongoing

7.5-17 Minimize Loss/Degradation of Sensitive Plant Species

Description

1. Heavenly Mountain Resort shall retain a qualified biologist, funded by Heavenly or fund Forest Service personnel, to conduct a

preliminary sensitive plant survey prior to project level siting of any proposed facility within the Heavenly Mountain Resort permit area. The purpose of the survey shall be to identify occurrences of any LTBMU sensitive plant species (note: Tahoe draba is addressed in Measure 7.5-16) within or adjacent to the proposed construction corridor and to develop facility siting alternatives that avoid or minimize the loss or degradation of sensitive plants.

- If sensitive plants are present in project area then at a minimum, a 100 ft buffer will be placed around the plants and the facility shall be sited outside of the buffer.
- If the 100 ft buffer is not feasible, additional mitigation measures may be discussed for the following plant species: Galena Creek rock cress, Cup Lake draba, long-petaled lewisia, and three-ranked hump-moss.
- If the 100 ft buffer cannot be accommodated or impacts to the species cannot be mitigated, additional mitigation measures will not be allowed for the following species, unless there is an increase in current populations: Arabis tiehmii (Tiehm's rock cress), Botrychium ascendens (upswept moonwort), Botrychium crenulatum (scalloped moonwort), Botrychium lineare (slender moonwort), Botrychium lunaria (common moonwort), Botrychium minganense (Mingan moonwort), Botrychium montanum (western goblin), Bruchia bolanderi (Bolander's candle moss), Epilobium howellii (subalpine fireweed), Erigeron miser (starved daisy), Eriogonum umbellatum var. torreyanum (Torrey's or Donner Pass buckwheat), Helodium blandowii (Blandow's bog-moss), Hulsea brevifolia (short-leaved hulsea), Lewisia kelloggii ssp. hutchisonii (Kellogg's lewisia), L. k. ssp. kelloggii (Kellogg's lewisia), Meesia ulignosa (broad-nerved hump-moss) and Peltigera hydrothyria (veined water lichen).
- The Forest Service will determine any additional mitigation measures for species on the sensitive plant list that are not included in this environmental document based on the known occurrence information.
- If watch list species are found in the project area, mitigation measures will be discussed and be based on species presence and distribution.

2. In order to minimize disturbance in potential habitat for TES species, facilities should be sited to avoid the following habitats:
   - Riparian areas, wetlands, and meadow vegetation
   - Old growth sites where trees are greater than 30 in dbh
3. Because of limited information pertaining to the effect of man-made snow on sensitive plants, snow guns shall not be placed where snowmaking would directly affect any sensitive plant species.
4. Prior to the final approval of any proposed facility within the permit boundaries, Heavenly Mountain Resort shall prepare or fund a qualified biologist to prepare a project-level biological evaluation (BE) pursuant to Forest Service policy. The BE prepared for each project within Heavenly Mountain Resort MPA 07 Development

Area shall incorporate information from the Heavenly Mountain Resort MPA 07 Programmatic BE, as well as information obtained during project-specific biological field surveys. Based on this information, the project level BEs shall identify potential project impacts to sensitive plants and fungi and incorporate mitigation measures to reduce these impacts. The recommendations of the BE shall be approved by the Forest Service and TRPA prior to the onset of construction of any new facility at the Heavenly Mountain Resort.

Impacts Mitigated	06 EIR/EIS/EIS – VEG-1: Loss directly or indirectly (including through spread of noxious weeds), of individuals or habitat of endangered, threatened, or rare (CNPS 1B) plant species?	
Mitigation Level	Maintenance and protection of potential existing sensitive plant populations at Heavenly.	
Lead Agency	TRPA and Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Project construction.
	Complete:	Ongoing.
Status	Ongoing	

7.5-18 Invasive Plant Management

Description

1. As a term and conditions of Heavenly Mountain Resort's Special Use Permit, Heavenly will develop a long-term integrated weed management plan. This plan should include annual monitoring associated with existing weed infestations and new project construction. Plans should include control and abatement plans, restoration and revegetation plans, and annual reporting requirements (weed treatments, infestation sizes, and locations will be reported). Currently, three noxious weed species are located within Heavenly Mountain Resort's boundary on both Forest Service and privately owned land: tall whitetop (*Lepidium latifolium*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*).
2. Summertime maintenance and excavation equipment vehicles used for project implementation should be weed free and cleaned of all attached mud, dirt, and plant parts before entering the project area. This practice shall be done at a vehicle washing station or steam cleaning facility (power or high-pressure cleaning) before the equipment and vehicles enter the project area.
3. Equipment, materials, or crews shall not be staged in noxious weed infested areas.
4. All gravel, fill, mulches or other materials should be weed free. Use onsite sand, gravel, rock or organic matter where possible. Otherwise, obtain materials from gravel pits and fill sources that have been determined to be weed-free by the Forest Service Noxious Weed Coordinator. Topsoil from disturbance will be

saved and put back to use in onsite revegetation, unless contaminated with noxious weeds.
All activities that require seeding or planting should use locally collected native seed sources whenever possible. Plant and seed material should be collected from as close to the project area as possible, from within the same watershed and at a similar elevation whenever possible. Persistent non-natives such as timothy (Phleum pretense), orchardgrass (Dactylis glomerata), or ryegrass (Lolium sp.) should be avoided. Seed mixes should be approved by Forest Service Botanists.

5. Weed infestations identified before project implementation that are within the project area should be treated or "flagged and avoided" according to the species present and project constraints. Before the implementation of the Epic Discovery Project, Heavenly will treat and monitor the existing locations of tall whitetop located near the top of the Tamarack Chairlift (#296) and Sky Chairlift (#169).
6. Construction areas should be monitored for 3 years post-project to ensure that no new weed infestations move into the area disturbed during project implementation.
7. Heavenly will implement an annual employee orientation and training program for employees that work in ground disturbing activities. Training could include an introduction to the noxious weeds currently present on the mountain, (tall whitetop, Canada thistle, and bull thistle), photographs of the weeds, a map identifying known weed locations, and a list of the mitigation measures being implemented to eradicate the noxious weeds.

Impacts Mitigated	06 EIR/EIS/EIS – VEG-1: Loss directly or indirectly (including through spread of noxious weeds), of individuals or habitat of endangered, threatened, or rare (CNPS 1B) plant species?	
Mitigation Level	Maintenance and protection of potential existing sensitive plant populations at Heavenly.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Project construction.
	Complete:	Ongoing.
Status	Ongoing	

7.5-19 Monitor and Protect Nesting and Fledgling Bird Species

Description	Heavenly shall not conduct any summer concerts at the Gondola Top Station prior to August 1. Prohibition of concerts prior to this time would allow most local resident birds to complete fledging and minimize the potential for nest failure. Alternatively, Heavenly may choose to conduct a more focused study to determine whether concert-related noises do result in nest failure of local resident nesting birds. This study would be conducted with the approval and in consultation with the Forest Service and TRPA. If no nest failure is documented, constraints on the timing of summer concerts at the Gondola Top Station may be reduced or eliminated.	
Impacts Mitigated	96 Final EIR/EIS/EIS: Noise Impacts Associated with Summer Concerts at the Gondola Top Station	
Mitigation Level	Maintain TRPA sound level recommendations at the Gondola Top Station during nesting and fledgling periods.	
Lead Agency	TRPA	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Project Review.
	Complete:	Ongoing.
Status	Ongoing	

7.5-20 BIO-3: Migratory Bird and Habitat Utilization Survey

Description

In order to protect migratory bird nests from increased human presence in the tree canopy during the breeding season, Heavenly Mountain Resort shall perform nesting bird surveys for the following projects: Mid-Station Canopy Tour, Sky Cycle Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour and the Sky Meadows Challenge Course. The surveys shall be completed annually prior to the start of project operations during the breeding season (April –August). The surveys shall identify migratory birds nesting on or immediately adjacent to proposed structures (including trees used as platforms) and equipment associated with the above-listed projects (projects that are located within the forest canopy).

To better understand the extent of migratory bird utilization of the habitats located in the above referenced project locations, bird point counts shall be performed to determine species diversity, nesting data as well as population size. The first point count survey of the project areas shall be performed prior to commencement of construction activities during nesting season. The results of the initial baseline survey shall be compared to future nesting surveys performed on an annual basis, in the vicinity of the projects. Daily inspection surveys of the project facilities shall be conducted by the operator to determine the presence of bird nesting activity. If the nest is not active (does not contain either eggs or hatchlings/young) the nest may be removed. If a migratory bird nest is located on a structure (including tree based platforms) or equipment associated with a project during annual surveys and is found to be active (containing either eggs or

	hatchlings/young), a buffer avoidance zone shall be instituted until it has been determined the nestlings have fledged. The distance of the buffer avoidance zone shall be determined by USFS and shall reflect the tolerance level of the individual pair, species, level of activity/disturbance and duration. Project activities and operations associated with the forest canopy based projects shall cease within the identified buffer avoidance zone if determined necessary to protect the active nest by USFS, NDOW and CDFW biologists. Annual surveys shall be performed indefinitely to alleviate impacts to future nests.	
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - BIO-3: Would the Project have an adverse effect to migratory land bird species or their associated habitats?	
Mitigation Level	Protect active bird nests (e.g., containing either eggs or hatchlings/young).	
Lead Agency	USFS	
Implementing Agency	USFS and Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Prior to construction of Epic Discovery Projects that utilize tree canopy.
	Complete:	Ongoing.
Status	New measure for Epic Discovery Project	

7.5-21 BIO-8: Wildlife Trash Management and Education Program

Description	Heavenly Mountain Resort shall create and implement a trash management program for the entire resort. The program shall consist of installation of wildlife proof trash containers located at each of the lodge facilities and food service areas within the resort. A trash removal and management plan shall also be formulated and implemented to expedite timely removal of refuse from deposition points to approved collection points located at the base areas or to a point designated outside the resort. The removal and management plan shall include specified storage areas and practices within each facility to prevent access to refuse by wildlife species. An educational component of said plan shall be included in an effort to decrease litter and improper feeding of and ramifications to wildlife. The education program shall be directed toward Heavenly Mountain Resort staff through training, and toward the public through signage and presentations throughout the proposed Epic Discovery project locations. The plan shall be reviewed annually by Forest biologist.	
Impacts Mitigated	Epic Discovery EIR/EIS/EIS - BIO-8: Would The Project result in increased human/wildlife interactions?	
Mitigation Level	Minimize interactions between humans and wildlife.	
Lead Agency	USFS	
Implementing Agency	USFS and Heavenly Mountain Resort	
Monitoring Agency	USFS	
Timing	**Start:**	Prior to implementation of Epic Discovery Projects.

	Complete:	Ongoing.
Status	New measure for Epic Discovery Project	

7.5-22 Maintain Timber Thinning Practices

Description	Heavenly Mountain Resort shall be required to continue working with the Forest Service in determining areas that require timber thinning practices as established by the LTBMU Land and Resource Management Plan to reduce the potential for rapid and intensive wildfire spread due to excessive fuel loading. In addition, non-flammable materials shall be used on roofs, and cleared ingress/egress at base areas will be a priority. Timber thinning practices shall be consistent with the management criteria developed for maintenance and enhancement of wildlife habitat values.	
Impacts Mitigated	96 Final EIR/EIS/EIS: Potential exposure of future ski resort visitors to wild/forest fires. 96 Final EIR/EIS/EIS: Indirect effects to wildlife and fisheries.	
Mitigation Level	Controlled fuel loading.	
Lead Agency	Forest Service	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	Forest Service	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing	

7.5-23 Provide Employee Housing

Description

- Heavenly Mountain Resort would complete a housing report to document the number of Heavenly employees (on a monthly basis), and the occupancy of Heavenly-owned employee housing.
- A Base Year would be defined as the year prior to the first phase of mountain expansion allowed under the adopted MP 96. Base employment is defined as the number of Heavenly Mountain Resort employees on the payroll during the peak month of the Base Year. According to Heavenly, peak employment during the 1996/1997 season was 1,607 employees.
- Heavenly Ski Resort would maintain its current housing program and will assist employees to locate housing as part of the annual employee orientation program for those employees seeking employee housing that cannot be accommodated in Heavenly-owned housing.

Impacts Mitigated	96 Final EIR/EIS/EIS: Increased pressure on affordable housing supply.	
Mitigation Level	Suitability, price and availability of housing for year round residents.	
Lead Agency	TRPA and El Dorado County	
Implementing Agency	Heavenly Mountain Resort	
Monitoring Agency	TRPA	
Timing	**Start:**	Upon approval of the Heavenly Mountain Resort MP 96.
	Complete:	Ongoing.
Status	Ongoing	

5.8 MANAGEMENT RESPONSE TO MONITORING AND EVALUATION

5.8-1 Soil and Water Quality

The previous sections of this chapter describe a variety of mitigation measures necessary to prevent adverse impacts to resources as a result of the implementation of the Proposed Action. Appendix 3.1-D of the 06 Draft EIR/EIS/EIS describes a revised environmental monitoring plan to evaluate and determine whether there is an overall trend of improvement in environmental conditions at the resort for soil and water resources. The monitoring program is also designed to determine whether the proposed actions (including mitigation measures) are successful in preventing adverse impacts from MPA 07 implementation. The monitoring program would be the same under each alternative.

The purpose of this section is to describe the process that will be followed to disclose monitoring and evaluation results to all interested parties, and how these results will be utilized by Heavenly Resort, USFS, Lahontan, and TRPA to identify and prioritize appropriate management actions in response to monitoring results.

The environmental monitoring plan and the Lahontan Monitoring and Reporting requirements that are contained in the adopted Waste Discharge Requirements specify that an annual monitoring report will be prepared by January 15th each year to disclose the results of the previous year's monitoring, including an evaluation of achievement of environmental standards and targets. The environmental monitoring plan also specifies that a comprehensive analysis will be prepared at 5 year intervals, and will include an evaluation of trends over the past 5 years of data collection. These monitoring reports will be utilized to initiate the adaptive management process.

As monitoring reports are completed by a third-party contractor approved by the appropriate agencies, they will be sent by hard copy to USFS, TRPA, and Lahontan by May 1st of each year. Reports will be available for public review at TRPA, USFS and Lahontan offices as well as posted on appropriate websites including but not limited to, the Heavenly Resort website, the LTBMU website, and the Tahoe Integrated Information Management System (TIIMS) website.

Within 60 days of receiving the completed monitoring reports, Heavenly, USFS, Lahontan and TRPA staff will develop an action plan based on the monitoring results. The following steps will be followed for the action plan process:

- Determine if monitoring results indicate implementation (or lack of implementation) of proposed actions/mitigation measures contributed to exceedance of environmental standards, goals, and targets (herein termed environmental triggers).
- Determine level of significance of exceedance of triggers (using qualitative assessment based on numerical analysis.)
- Identify specific response(s) to address exceedances of environmental triggers.
    - Response can include alternatives to proposed action, and/or additional mitigation measures if impacts of alternatives were adequately analyzed through the NEPA process.

- Specific responses will be presented in an action plan for the upcoming field season(s), which describes what will be done, where work will be done, and when work is to be conducted. Specific actions will be prioritized and scheduled based on a qualitative assessment of significance.

Once an action plan is developed based on the most recent annual or comprehensive monitoring report, the action plan will be made available on the same websites utilized to post monitoring reports. Notice of the availability of this action plan will be sent to interested parties. If requested by interested parties, a meeting will be held to discuss the action plan recommendations. Subsequent monitoring reports will include a specific section(s) describing follow-up monitoring of proposed management actions to identify whether the actions were implemented, and evaluate the success of the actions.

Examples of "triggers" that may initiate a management response, and examples of the toolbox of actions that may be considered to address the triggers are provided below. These lists are not meant to be all-inclusive. However, management responses will not be considered that may have different/greater adverse effects than those considered in the MPA 07 EIR/EIS/EIS.

Potential Triggers

- An apparent degradation in water quality that can be linked to management activities. (water quality and macroinvertebrate sampling).

- Documented failures in BMP implementation (BMPEP).

- Documented failures in BMP effectiveness. Visible signs of unacceptable levels of uncontrolled runoff, accelerated erosion and sediment transport from ski trails, roads, and developed facilities. (BMPEP)

- Indicators of channel degradation (based on Stream Condition Inventory (SCI) Sampling).

- Analysis of ski trail restoration techniques indicates more cost/effective low maintenance techniques for restoring soil function on previously summer graded ski trails and other disturbed lands (Soil Restoration monitoring).

- An apparent reduction in overall effective soil cover at the resort, resulting in evidence of increased rill and gully erosion. Will also include evaluation of soil function, acknowledging that cover may not be the most significant variable in creating stable soils (Effective Soil Cover Monitoring).

- Evidence of poor success in SEZ restoration, based on hydrologic and vegetation indicators.

Potential Management Responses

The following are potential actions that will be considered in the management toolbox in response to monitoring results.

- Discontinue or reduce tree removal activity associated with creation of new conventional or gladed ski trails through removal and thinning of tree overstory.
- Utilize less ground disturbing techniques for tree removal.
- Continue restoration of historic ski trails that exhibit poor soil function resulting in increased runoff and erosion, or to improve overall watershed condition where monitoring indicators indicate a degrading trend. Consider techniques evaluated through the soil restoration monitoring program.
- Correct mitigation measures that were either not implemented, were not implemented correctly, or are not effective.
- If BMPs were implemented as designed, but were not effective, prescribe more aggressive BMPs and/or retrofit existing BMPs.

5.8-2 Traffic and Parking

The previous sections of this chapter describe a variety of mitigation measures necessary to prevent adverse impacts to resources as a result of the implementation of the Proposed Action. The monitoring program is designed to determine whether the proposed actions (including mitigation measures) are successful in preventing adverse impacts from MPA 07 implementation. The monitoring program would be the same under each alternative.

The purpose of this section is to describe the process that will be followed to disclose monitoring and evaluation results to all interested parties, and how these results will be utilized by Heavenly Resort, Douglas County, El Dorado County, the City of South Lake Tahoe and TRPA to identify and prioritize appropriate management actions in response to monitoring results.

Heavenly shall prepare a parking monitoring report at the end of each ski season. This report shall include:

- A list of the days during which overflow parking was used on Ski Run Boulevard, South Benjamin Drive, and Galaxy Bowl and any days when overflow parking was full at these locations.
- The number of parking spaces used at Galaxy Bowl each day this area was used for overflow parking.
- A statement regarding whether any days during which these overflow parking areas were filled.

The monitoring reports will be utilized to initiate the adaptive management process.

Monitoring Reports are available for public review on the TRPA and the Heavenly Resort websites.

In addition, historical annual average daily traffic, monthly, and hourly traffic counts can be obtained from NDOT's Annual Traffic Report, the NDOT Traffic Information Access (TRINA) website (http://www.nevadadot.com/trina/), and Caltrans Traffic and Vehicle Data Systems website (http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm) or by contacting these

agencies directly. These traffic counts can be accessed by interested parties to evaluate traffic trends on US 50 near South Lake Tahoe.

Within 60 days of receiving the completed monitoring reports, Heavenly, TRPA, Douglas County, El Dorado County, and the City of South Lake Tahoe staff, depending on the areas affected, will develop an action plan based on the monitoring results. The following steps will be followed for the action plan process:

- Determine if monitoring results indicate implementation (or lack of implementation) of proposed actions/mitigation measures contributed to exceedance of environmental standards, goals, and targets (herein termed environmental triggers).
- Determine level of significance of exceedance of triggers (using qualitative assessment based on numerical analysis.)
- Identify specific response(s) to address exceedances of environmental triggers.
    - Response can include alternatives to proposed action, and/or additional mitigation measures if impacts of alternatives were adequately analyzed through the environmental review (e.g., TRPA, CEQA, NEPA) process.
- Specific responses will be presented in an action plan for the upcoming operating season, which describes what will be done, where, and when measures will be implemented. Specific actions will be prioritized and scheduled based on a qualitative assessment of significance.

Once an action plan is developed based on the most recent annual monitoring report, the action plan will be made available on the same websites utilized to post monitoring reports. Notice of the availability of this action plan will be sent to interested parties. If requested by interested parties, a meeting will be held to discuss the action plan recommendations. Subsequent monitoring reports will include a specific section(s) describing follow-up monitoring of proposed management actions to identify whether the actions were implemented, and evaluate the success of the actions.

Examples of "triggers" that may initiate a management response, and examples of the toolbox of actions that may be considered to address the triggers are provided below. These lists are not meant to be all inclusive. However, management responses will not be considered that may have different/greater adverse affects than those considered in the MPA 07 EIR/EIS.

Potential Triggers

- An increase in the percentage of visitors who drive to Heavenly Resort as reported by Heavenly's yearly visitor survey.
- An increase in Sunday PM peak hour traffic volumes based on available Caltrans count data on US 50 near Echo Summit.
- An increase in number of days and spaces used for overflow parking at monitored locations.
- An increase in illegally parked cars near Heavenly base areas during winter skiing operations.

Potential Management Responses

The following are an example of the potential actions that will be considered in the management toolbox in response to monitoring results:

- Increase marketing for using alternative modes to access Heavenly Mountain Resort.
- Provide a park and ride lot and shuttle service from a location west of Ski Run Boulevard
- Provide bus/shuttle service from the "Wye" to Heavenly.
- Provide shuttle service from the Sacramento International Airport, similar to the South Tahoe Express service from Reno International Airport.
- Expand shuttle service from the San Francisco Bay area.

5.8-3 Late Seral / Old Growth Enhancement

MPA 07 Mitigation measure/design feature VEG-3 Late Seral/Old Growth Forest Enhancement was identified as necessary to prevent adverse impacts to late seral/old growth forest as a result of the implementation of the MPA 07. The enhanced stand treated under VEG-3 shall be monitored every 5 years to determine whether the proposed enhancement prescription is progressing successfully. The monitoring program would be the same under each Action Alternative.

The purpose of this section is to describe the process that will be followed to disclose monitoring and evaluation results to all interested parties, and how these results will be utilized by Heavenly Resort, Forest Service and TRPA to identify and prioritize appropriate management actions in response to monitoring results if deemed necessary.

The USFS or a third-party shall prepare a forest enhancement monitoring report every 5 years to track the progress of the enhanced stand using the stand structure element criteria as provided in Table 3.8-16 of the MPA 07 Final EIR/EIS/EIS. This report shall include a summary and status of each of the stand structure criteria and a discussion as to how the stand is progressing toward late seral/old growth characteristics.

Examples of "triggers" that may initiate a management response, and examples of the toolbox of actions that may be considered to address the triggers are provided below. These lists are not meant to be all inclusive. However, management responses will not be considered that may have different/greater adverse affects than those considered in the MPA 07 EIR/EIS.

Potential Triggers

- Failure of the management prescription to meet the desired criteria outlined in the prescription.

Potential Management Responses

The following are potential actions that will be considered in the management toolbox in response to monitoring results.

- A new stand of equal or greater acreage shall be identified and approved by TRPA and Forest Service as suitable for restoration/enhancement.
- A prescription shall be formulated for the new stand as a site specific tool for restoration/enhancement using the stand structure criteria as outlined in MPA 07 Final EIR/EIS/EIS Table 3.8-16.
- The new stand enhancement prescription shall be implemented.

CHAPTER 5 - ATTACHMENT 1

Construction Erosion Reduction Program (CERP)

Revised **Construction Erosion Reduction Program**

(Mitigation 7.4-1)

Introduction and Overview

Implementation of the *Revised* Construction Erosion Reduction Program (revised CERP) will minimize the rate of soil loss from Heavenly caused by construction activities. This program serves as a working version of Mitigation Measure 7.4-1 approved as part of the Mitigation and Monitoring Program (MMP) from the 1996 Master Plan (MP 96). The revised CERP will be implemented as part of all Action Alternatives proposed in the MPA 05 and is referenced as a design feature for several impacts identified in Sections 3.1 and 3.2 of the Heavenly Mountain Resort Master Plan Amendment 05 Draft EIR/EIS/EIS (06 Draft EIR/EIS/EIS). Heavenly is the implementing entity, and the Forest Service or TRPA are the lead and monitoring agency. The standard design features, construction procedures and best management practices (BMPs) contained in this program will be finalized during project-specific design and permitting and implemented during construction of all new facilities, ski trails, ski lifts roads, and snowmaking lines. The updated of the erosion control plan and revegetation specifications (formerly the Summer Operations and Erosion Control Plan , an Appendix of the 95 Draft EIR/EIS/EIS) is required under this mitigation and will further improve upon the CERP.

Potential short-term impacts to water resources from construction of ski lifts, ski trails, access roads, and snowmaking pipelines are identified in Table-1 and discussed below. Standard design features, construction procedures and BMPs for each potential impact are also presented and discussed. The potential impacts identified in Table 1 are based on a general description of construction and revegetation techniques. The potential impacts to water resources from construction activities are due primarily to changes in ski trail off quantity and quality. For this program, ski trail off is defined as snow melt and/or rainfall that ski trail over the ground surface regardless of whether it eventually soaks in to the ground or flows to a creek.

This program serves as mitigation for those impacts identified in the MP 96 the following impacts identified for the MPA 05:

- WATER-1: Existing Percent ERA in Watersheds CA-6, NV-1 and NV-4 are above allowable TOCs
- WATER 2: Peak and Total Runoff Increases Due to Vegetation Removal and Impervious Surface Construction
- WATER-3**:** MPA 05 Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, Mott and Daggett Creeks
- WATER-4: Phase I Ski Area Construction and Operation May Lead to Noncompliance with Surface Water Quality Standards and Thresholds in Heavenly Valley, Bijou Park, Edgewood, and Daggett Creeks

In Table 1, specific construction procedures are identified for each project component that has the potential for negative impacts on water resources. Soil and/or vegetation disruption are listed as potential impacts on water resources because this disruption can lead to increased runoff or degradation of runoff quality. One or more mitigation measures are identified for each potential impact.

Where available, the mitigation measures are accompanied by a reference to BMPs listed in the *TRPA Water Quality Management Plan for the Lake Tahoe Region -Volume II, Handbook of Best Management Practices* and/or a description of the mitigation method in the *Heavenly Valley Summer Operation and Erosion Control Plan* (SOECP, 10/15/92, Appendix Q of the 95 Draft EIR/EIS/EIS), which should be referenced until the updated erosion control plan and revegetation specifications are completed. The Updated Erosion control Plan and Revegetation Specifications Plan should incorporate the amendments to the MPA 05 Mitigation and Monitoring Program, update standards and practices with new technology, and adapt monitoring and management results and recommendations from the *Comprehensive Monitoring Report for Water Years 1991-2003* or CMR (Forest Service 2004) and subsequent Annual and Quarterly Environmental Monitoring Reports.

An estimate of the effectiveness of the proposed mitigation measures is also included in Table 1. The effectiveness estimates are based on the mitigation measures being properly installed and maintained. Thus, the actual effectiveness of the mitigation measures depends on awareness and diligence of the construction workers, field supervisors, and project managers.

Design and construction of buildings, parking lots, and other impervious surfaces must include BMPs with adequate capacity for at a minimum the 20-year, 1-hour storm event. Construction is limited to the defined grading season (May 1 through October 15) unless otherwise approved by TRPA, except removal of trees or large boulders as described below. If there is runoff from the construction-site, construction shall be halted until additional erosion reduction techniques are implemented and runoff from the site is contained. An alternative to or improved design for infiltration trenches (permanent BMP) at ski lifts is recommended, as infiltration trenches installed at ski lift top and base stations have proven difficult to clean and maintain.

The following paragraphs discuss the Table 1 impacts and corresponding design features, construction procedures, and BMPs that either do not have a reference in the SOECP/Handbook of BMPs or warrant further explanation. The discussion is broken into sub-sections by project component type.

Table 1

Potential Construction Impacts and Mitigations/Design Features - Ski Trails/Ski Ski Lifts, Access Roads, Snowmaking Pipelines

Project Component (1)	Specific Activity (2)	Potential Impacts to Water Resources (3)	Proposed Mitigation Measures	SOECP ref. or TRPA BMP No. (4)	Estimated Effectiveness (5)
General	Soil disturbing activities	Erosion of soil	Minimize and delineate site with project fencing; Install site-specific temporary soil erosion reduction techniques	BMP 1-34[6]	High to Low
	Stockpiling excavated soil	Stockpiled soil can be easily eroded and cause contamination of runoff and streams	When topsoil can be salvaged, cover and surround soil piles until removed; if salvaged topsoil is insufficient for revegetation of site soil amendments and incorporation of organic matter may be required	BMP 9, 10, or 13	High
	Revegetation of disturbed areas	Undesirable species or poor results leading to erosion	Revegetate/restore according to established guidelines; Revegetation specifications and seed mixes must be approved by Forest Service	SOECP pp. 34-38; to be included in the Revised SOECP (2005)	Moderate
	Fertilizing revegetated areas	Contamination of surface water or groundwater with fertilizer	Apply fertilizers according to established product and TRPA guidelines	BMP 63 and SOECP pp. 35-37 TRPA Fertilizer Management Program	Moderate to low
	Construction debris	Contamination of runoff or groundwater Blowing/movement of litter	Thorough clean-up of entire construction zone during (at least weekly) and after construction		High
Ski Lift	Tree removal	Soil disruption from tree felling and dragging	Remove tree limbs and spread over ground Leave fallen trees in place if possible and maximize contact with the ground Remove only when snow cover is adequate to protect soil and water resources or remove with helicopter[7]	SOECP pp. 19 - 21	High
	Ski lift tower footing	Disrupt soil with backhoe or digging	Minimize backhoe use - hand excavate and use	BMPs: Erosion : 9, 10	High to Moderate

Table 1

Potential Construction Impacts and Mitigations/Design Features - Ski Trails/Ski Ski Lifts, Access Roads, Snowmaking Pipelines

Project Component (1)	Specific Activity (2)	Potential Impacts to Water Resources (3)	Proposed Mitigation Measures	SOECP ref. or TRPA BMP No. (4)	Estimated Effectiveness (5)
	excavation	practices Erosion of disturbed soil	spider hoe; transport to site with helicopter Employ temporary and permanent erosion control measures Stabilize slopes and Revegetate[8]	Revegetation: 18,19 SOECP pp. 34-38	
	Bottom and top station construction	Disrupt soil with heavy equipment and excavation	Minimize project area and equipment use Employ temporary and permanent erosion control measures Revegetate[8]	BMPs: Erosion : 9, 10 Revegetation:18,19 SOECP pp. 34-38	Moderate to High
	Tower installation	Additional road construction and clearing of vegetation	Fly towers to site with helicopter[9]	SOECP pp. 23	High
	Pour new tower footings	Concrete spill could interfere w/ revegetation	Construct off site if possible and fly in with helicopter or Break-up and remove spilled concrete to a landfill		High
	Abandon unused footings	Erosion around excavation and exposure of unused footing	Install erosion control barriers and Cover with soil, mulch and revegetate Erosion control BMPs should remain in place and be maintained until revegetation has established or site has stabilized	BMP 18, or 19 and possibly, 58 or 59	Moderate to High
	Ski lift Completion: Tower finishing and cable installation	Paint, lubricants or solvents released to soil with potential for migration into and contamination of surface water or groundwater	Use drop cloths especially around towers and top and bottom stations If necessary, employ spill emergency response plan		Moderate to High
Ski Trail[7]	Tree removal	Soil disruption from tree felling and dragging	Lop and scatter tree limbs Grind stumps to ground level Leave fallen trees in place and maximize contact with ground if possible or chip	SOECP pp. 19 – 21 See Easy Street Hazard Reduction Project (Appendix 3 of the MPA	High

Table 1

Potential Construction Impacts and Mitigations/Design Features - Ski Trails/Ski Ski Lifts, Access Roads, Snowmaking Pipelines

Project Component (1)	Specific Activity (2)	Potential Impacts to Water Resources (3)	Proposed Mitigation Measures	SOECP ref. or TRPA BMP No. (4)	Estimated Effectiveness (5)
			on site and spread to depth of 3-6 inches depending on site Remove only when snow cover is adequate to protect water and soil resources) or remove with helicopter[7]	05)	
	Brush removal	Erosion of newly exposed soil	Leave low lying vegetation undisturbed[10] Cut tops of tall plants to 3-4 feet instead of removing plants Revegetate exposed areas w/ low growing vegetation[8]	SOECP p. 17, 22 – 23 See Easy Street Hazard Reduction Project (Appendix 3 of the MPA 05)	Moderate to High
	Boulder removal	Holes and soil disruption Fire Hazard	Boulders will not be removed, but capped off to 12-18 inches Follow blasting guidelines	SOECP p.29 See Easy Street Hazard Reduction Project (Appendix 3 of the MPA 05	High
	Summer grading of ski trails (grooming)	Exposure of soil to erosion- increase runoff	Summer grading is not planned for ski trails, existing or new		High

Table 1

Potential Construction Impacts and Mitigations/Design Features - Ski Trails/Ski Ski Lifts, Access Roads, Snowmaking Pipelines

Project Component (1)	Specific Activity (2)	Potential Impacts to Water Resources (3)	Proposed Mitigation Measures	SOECP ref. or TRPA BMP No. (4)	Estimated Effectiveness (5)
Access Roads - Unpaved	Grading	Disturbance of soil Erosion of exposed soil on completed road sections	All road plans need Profiles and estimates of cut and fill slope volumes Water bars or engineered dips (according to Forest Service detail) across road in critical locations; outlets armored Weedfree Coir log dike, silt fence or straw wattles/coir logs parallel to road where cross-slope is steep Grade as to avoid sidecast of materials	SOECP pp. 15- 16 and 24 BMP 9 or 10; FSH 7709.55 Transportation Planning Handbook; FSH 7709.56 Road Preconstruction Handbook; EM 7720 Transportation System Development; FSH 7709.56B Drainage Structures Handbook	Moderate to High
	Tree removal	Soil disruption from tree felling and dragging	Route road to minimize major tree removal Remove tree limbs and spread over ground for revegetation/decom projects Leave fallen trees in place and perpendicular to the fall line if possible Remove only when snow cover is adequate or remove w/ helicopter[7]	SOECP pp. 19 - 21	High
	Brush removal	Erosion due to removal and newly exposed soil	Route road to minimize brush removal Revegetate[8] exposed areas	SOECP p.16-17	Moderate

Table 1

Potential Construction Impacts and Mitigations/Design Features - Ski Trails/Ski Ski Lifts, Access Roads, Snowmaking Pipelines

Project Component (1)	Specific Activity (2)	Potential Impacts to Water Resources (3)	Proposed Mitigation Measures	SOECP ref. or TRPA BMP No. (4)	Estimated Effectiveness (5)
	Decommission temporary roads	Soil disruption and removal of existing erosion control structures	Soil reconditioning/amendments, revegetation[8], and addition or enhancement of organic matter	BMP 9 or 10 SOECP p.16-17 and 34-38; FSH 7709.55 Transportation Planning Handbook; FSH 7709.56 Road Preconstruction Handbook; EM 7720 Transportation System Development; FSH 7709.56B Drainage Structures Handbook	Moderate
Access Roads - Paved	Same as first 3 for unpaved roads	Same as first 3 for unpaved roads	Same as first 3 for unpaved roads	Same as for unpaved roads	Moderate to High
	Clearing, grading and compaction	Disturbance of soil due to more machinery in use	Minimize use of heavy equipment Provide stabilized staging and turn-around area		Moderate
	Asphalt paving	Asphalt products in runoff	Pave only during prolonged dry weather Use pervious asphalt if appropriate for site Clean up all spilled and excess material		High
	Partially completed road projects	Increased runoff from compacted or paved sections	Insure runoff controls have adequate capacity Clean and maintain all runoff control structures		Moderate to High
Snowmaking Pipelines	Excavation of trenches for buried pipeline	Disruption of soil and vegetative cover - high potential for erosion	Place pipes above ground except along existing summer graded runs Coir log or wattle dike or silt fence &water bars	BMP 9, 10, 23 SOECP p.15-17 and 34-37	High

Table 1

Potential Construction Impacts and Mitigations/Design Features - Ski Trails/Ski Ski Lifts, Access Roads, Snowmaking Pipelines

Project Component (1)	Specific Activity (2)	Potential Impacts to Water Resources (3)	Proposed Mitigation Measures	SOECP ref. or TRPA BMP No. (4)	Estimated Effectiveness (5)
			(diversions) Cover stockpiled soil Backfill as soon as possible Mulch and Revegetate[8]		
	Moving pipe sections with backhoe	Disruption of soil and vegetative cover	Minimize backhoe turning and maneuvering Hay bale dike or silt fence Mulch and revegetate if necessary	BMP 9, 10, 23 SOECP p.16-17 and 34-37	Moderate to High
	Dragging pipeline into position	Disruption of soil and vegetation	Employ skid protection (e.g. pads, boards or tarps adequate to prevent soil disturbance) at critical locations		Moderate

1 Project components covered in this table. "General" indicates applicability to any of the five components.
2 Includes construction and post-construction activities related to completion of the project component.
3 Soil and/or vegetation disruption may lead to increased runoff or degraded runoff quality.
4 Refer to indicated pages in the Heavenly Summer Operation and Erosion Control Plan (SOECP) 10/15/92 Appendix Q of the 95 Draft EIR/EIS/EIS. Best Management Practices (BMP) described in Water Quality Management Pan for the Lake Tahoe Region - Volume II. Handbook of Best Management Practices, Tahoe Regional Planning Agency (TRPA), Nov. 30, 1988.
5 Estimated maximum effectiveness of proposed mitigation measure(s) if properly installed and maintained.
6 Use of soil erosion reduction construction BMPs to include, but not limited to, temporary construction-site practices, temporary sediment barriers, temporary soil stabilization techniques, temporary runoff control, temporary grade stabilization structures, and temporary sediment retention structures as recommended and described in the TRPA Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Best Management Practices
7 Fallen trees and other large obstacles (boulders, stumps) should be left in place and situated flush to the ground surface unless they are skier safety hazards. Trees can also be lopped and scattered onsite or chipped and spread onsite. Boulders should be capped to a manageable height (12-18 inches) without soil disturbance. If removed trees and obstacles should be removed during periods when there is sufficient snow coverage to protect water and soil resources or flow out with helicopter. If soil can be seen through the snow or becomes mixed in the snow due to the dragging of the trees, the log removal should be discontinued until a deeper snow pack is in place. Ski trail hazard reduction prescriptions are described in Appendix 3 of the MPA 05.
8 All areas disturbed shall be fully stabilized and revegetated. Revegetation of disturbed areas shall occur before the first growing season after completion of construction. Revegetation may include use of mulch or tackifiers to reduce erosion during the initial stages of revegetation and may require application of soil amendments.
9 Unless access is possible over existing roads, ski towers shall be flown to the construction-site and placed by helicopter to avoid construction of new or temporary roads and vegetation and soil disturbance.
10 During clearing of ski trails, as much low lying vegetation shall be left undisturbed as is possible. New ski trail prescriptions are described in Appendix 3 of the MPA 05 and will be revised and adapted to monitoring results from demonstration projects.

General Construction

This category applies to construction activities common to all project components. The potential impacts and proposed construction standards and BMPs apply to many construction activities. Disruption of vegetation is a serious impact on the Heavenly's slopes because vegetation is crucial in stabilizing steep slopes and because it grows very slowly and is difficult to re-establish once damaged or removed. The most important mitigation is the delineation of the project area, access road and staging areas to minimize disturbance. All areas disturbed by construction will require slope stabilization, revegetation, and site-specific permanent BMPS. Under Mitigation 7.4-1 (Revised CERP), development of specific guidelines for slope stabilization and revegetation of disturbed lands is required as part of the Updated Erosion Control Plan and Revegetation Specifications. The TRPA Fertilizer Management Program outlines techniques to prevent contamination of stream environment zones by fertilizers. These guidelines are updated regularly and personnel overseeing revegetation operations shall confer with Forest Service and TRPA resource specialists for guidance on the latest practices and for approval of all seed mixtures.

Construction debris includes construction material fragments, marking tape, empty spray cans and any other unnatural substances that may blow, roll or wash into waterways or leach into the groundwater. This material will be picked up daily or more frequently when there is wind and/or rain. After construction of each section of ski lift, ski trail, road or pipeline is complete, Heavenly staff will inspect the entire construction zone and insure that all litter and debris have been removed from the site and the adjacent forest.

Standard Construction BMPs

In addition to the BMPs already covered in the other subsections, the following temporary (construction) and permanent BMPs are required in all areas that are disturbed during development of new facilities. Project-specific BMPs will appear on all project design plans and will be designed and sized at a minimum for the 20-year, one-hour TRPA design storm. Temporary BMPs must be installed and then approved by a Forest Service resource specialist or TRPA compliance staff member (if in California, Lahontan may also be involved) prior to initiation of project construction.

Site plans will be developed, which show topography, drainage ways, existing vegetation, existing roads, other nearby facilities and approximate locations of site-specific temporary and permanent BMPs. The new facilities will be planned, as safety measures allow, to minimize earth movement, to minimize vegetation removal, and to be located outside of existing drainage ways. “No Access Areas” will be identified on the site plan and will include vegetated areas, SEZs, and existing drainage ways that are not part of the project site. Standard BMPs listed below, and project-specific BMPs on project design plans are consistent with the TRPA Water Quality Management Plan (208 Plan) and Forest Service guidelines, and are designed to infiltrate water from the 20-year, 1-hour storm event.

Temporary BMPs will be monitored and maintained throughout construction by Heavenly staff on a daily basis and before, during and following forecasted precipitation events. Reporting should be completed on a weekly basis. If measures are not adequately protecting soils, drainage ways and other undisturbed resources, additional BMPs will be prescribed prior to continuation of construction. Permanent BMPs will be monitored annually for the first five years following construction to assess effectiveness, and additional BMPs will be prescribed if existing treatments fail to protect the site from accelerated erosion. BMP monitoring is outlined in the Revised Environmental Monitoring Program in Appendix 3.1-D of the MPA 05 Draft EIR/EIS/EIS.

Standard Temporary BMPs (General Construction)

The following measures will be applied prior to construction activities in appropriate sites as shown on project plans and designs:

1. Boundary fencing/Vegetative protective fencing will be placed and maintained to clearly identify the limits of the construction site and to identify the "No access areas." The limits of construction will be 50 feet beyond the edge of the ski lift top or bottom terminals, 25 feet around the ski lift towers to be constructed, 10 feet around the ski lift towers to be removed, unless indicated otherwise on the project plans.
2. Boundary/Protective fencing of "No Access Areas" and all sediment barriers will be inspected and repaired on a daily basis and as necessary before, during and following storm events.
3. Sediment barriers will be placed around the downslope side of the construction site and above drainage ways located nearby and below the construction site. Locations of sediment barriers shown on plans are approximate and installation will be reviewed in the field by Heavenly, Forest Service and TRPA.
4. Sediment barriers will be inspected on a daily basis during construction of damage and appropriate placement to reduce potential erosion. Existing barriers will be repaired or new barriers installed on a daily basis during construction
5. Sediment barriers will be maintained until revegetation is approved by Forest Service and TRPA.
6. If possible, top soil will be conserved from the project area by stockpiling top soil separately from other excavated soils.
7. Covered topsoil stockpiles will be inspected and covering repaired as needed on a daily basis during construction. Topsoil stockpiles shall be protected with appropriate BMPs such as. coir logs
8. Coir log sediment barriers, filter fences will be placed around the downslope side of disturbed areas. After the footings or foundations are placed and trenches are backfilled, the stockpiled soil will be replaced around the facility. After Final grade is achieved, top soil or soil amendment will be spread evenly over the final grade.
9. Stockpiled soil along trenches shall be placed on the uphill side of the trench. Stockpiled soil (topsoil separately from other soils) will be placed within the construction site unless the site within the SEZ. No stockpiles of soil or materials shall be allowed in SEZ and alternative staging areas must be identified on the

project plans. Stockpiles shall be lightly watered as necessary or covered with tarps to control wind erosion. Sediment barriers such as filter fences, and/or coir logs will be placed around the downslope side of the stockpiled soil.

10. Sediment barriers such as filter fences, and/or coir logs will be placed around the downslope side of all construction sites (including building foundations, trenches and roadways) and above drainage ways located nearby and below the construction site.
11. After construction is completed, the disturbed areas will be revegetated and covered with pine needle mulch or other approved mulch material. Revegetation plan should be approved by the Forest Service.
12. Loose construction materials and packaging and litter will be cleaned up daily and will be disposed of or stored appropriately.
13. Roadways and staging areas used during construction will be provided with dust abatement (water truck).
14. Whenever facilities or equipment are painted, oiled, lubricated, or other chemicals are used, drop cloths will be used to prevent chemicals from contaminating the soil.
15. Roadways and staging areas used during construction will be provided with dust abatement (watering truck).
16. Construction areas will be accessed from existing roadways. Roads used during constructions will be inspected weekly for appropriate drainage and grading. Ruts will be repaired immediately. Waterbars, culverts, and ditches (drainage structures) will be maintained on a weekly basis during construction prior to October 15th and on a daily basis for construction activities after October 15th.
17. Vehicles will not be allowed to park outside of designated staging areas. If this is occurs, alternative means of transportation must be provided by Heavenly Mountain Resort. No vehicles or equipment will be allowed in the SEZ without the approval of TRPA.

Standard Permanent BMPs (General Construction)

The following measures constitute permanent mitigation and will be applied after project completion:

1. All construction activities are to be completed in accordance with federal, state, and local, health and safety regulations.
2. Immediately following top soil replacement, disturbed sites will be revegetated. Seed mixes or plant species will be determined and prescribed by the Heavenly Technical Advisory Committee. In 2005, Revised Revegetation specifications are to be developed by a third party contractor and approved by TRPA and the LTBMU as stated in mitigation 7.5-33. The revised revegetation specifications will be included in the revisions completed for the updated Erosion Control Plan.
3. Earthen berms, water bars, armored conveyance ditches, settling basins, and infiltration trenches will be installed to intercept and infiltrate increased runoff from permanent structures and clearing of vegetation.

4. Jute netting or erosion control blankets will be used on steep slopes to help establish the revegetation. Slopes steeper than 2:1 may require rip rap or engineered support.
5. No tree or surface boulder removal will be allowed except as indicated on project plans. If necessary, existing vegetation will be trimmed to a height necessary for construction, yet keeping plants alive for revegetation.
6. Trees will be flush cut and stumps will be left in place.
7. No vegetation will be cut within SEZs with the exception of marked trees.
8. Boulders large enough to cause a skier safety hazard will be blasted into smaller pieces or capped to a lesser height, and the disturbed areas will be heavily mulched. Smaller rocks will be left in place and undisturbed.
9. The trunks of trees will be left in place or removed if they constitute a skier safety hazard. If removed overland, there must be snowcover sufficient to project soil and water resources. At any time, the trunks may also be removed using a helicopter to fly the trunks to an appropriate disposal site. The limbs of the fallen trees will be spread over the ground along the ski lift and ski trail alignments. Trunks that are not removed should be in contact with the ground and aligned perpendicular to the slope. Forest Service personnel will inspect trunk alignment to ensure that concentrated water flows will not result.
10. Infiltration trenches or other permanent BMPs will be installed to intercept runoff from impervious surfaces.
11. All areas disturbed during construction, including access corridors, storage areas, staging areas, and construction areas shall be revegetated according to specifications. Upon completion of grading and construction, and prior to revegetation, all areas to be revegetated shall be inspected by the Revegetation Specialist (qualified third party to be consulted and hired; designation will be in writing submitted to the Forest Service prior to construction). Heavenly shall notify the engineer at least five working days prior to planting to schedule the required inspection. Final planting and seeding treatment areas will be staked in the field at this time. Revegetation treatments shall not be initiated without the approval of the engineer.
12. The limbs of all removed or trimmed vegetation will be spread over the disturbed areas after construction is finished. For SEZ areas this will be project specific.
13. No straw will be applied in the SEZ.

Ski Lift Construction

Temporary BMPs (Ski lifts)

Standard temporary BMPs are listed in the General Construction section above under "Standard Temporary BMPs." The following measures will be applied prior to construction activities in appropriate sites as shown on project plans and designs:

1. Access to ski lift terminals will be along existing roadways or access roads proposed as part of the project design. If there is no existing roadway, ski lift towers and footings will be delivered on site by helicopter and personnel will

access the tower areas by foot. No decommissioned roadways will be reopened in conjunction with construction of ski lifts. Equipment access routes and parking areas shall be restricted to existing roads or staging areas shown on project plans. No construction access routes shall cross stream channels or SEZ except in corridors delineated with protective fencing prior to construction and as approved by governing agencies

2. Ski lift towers will be located outside of the SEZ whenever possible. No vehicles or heavy equipment will be used to install or replace ski lift towers located in SEZs. Installation will be accomplished by helicopter and by personnel accessing the site by foot.
3. Filter fence and/or coir logs will be installed at the downhill side of each tower footing and secured with stakes. For slopes greater than 20%, several layers of these erosion control BMPs in addition to rock, may be necessary.
4. Sediment barriers will be maintained until revegetation is approved by the Revegetation Specialist.

Permanent BMPs (Ski lifts)

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied as part of the project or after project completion, depending on the project needs and the type of BMP:

1. The ski lift alignments will not be summer groomed or graded and native materials (plants, rocks, logs, etc.) will be left in place unless they present a skier safety hazard.
2. Infiltration trenches or other drainage control structures will be provided to intercept runoff from the impervious surfaces of the ski lift top and bottom stations.
3. Stabilize ski lift loading and unloading ramps with geotextile and rock.
4. Trees will be felled across the fall line of the ski lift alignment to function as erosion control structures and to decrease slope lengths. Limbs will be loped and scattered across disturbed tower areas.
5. After footings or foundations are placed, replaced or removed, suitable stockpiled subsoils will be used for backfill. Stockpiled topsoil will be spread evenly over the area when final grading is complete and the disturbed area will be either heavily mulched or revegetated.
6. Within the ski lift alignment, tress will be flush cut and stumps will be left in place. Other vegetation will be trimmed or properly pruned to a height necessary for construction or skier safety, but all efforts will be made to keep the vegetation alive). Only boulders large enough to cause a safety hazard will be blasted into smaller pieces, and the disturbed area will be heavily mulched. Smaller rocks will be left in place and undisturbed.
7. Ski lift loading and unloading ramps will be stabilized with geotextile or engineered BMPs such as rock retaining walls or riprap depending on slope.
8. Ski lift terminals will be colored "Forest Green" and the ski lift towers will be colored "tower gray."

9. Access to the ski lift towers will be along existing roads or towers will be flown in to the tower footing sites.

Ski Trail Construction

Potential impacts and mitigation measures from ski trail construction are addressed in Table X-1. Summer grading (also called grooming) is listed as ski trail construction activity, and the mitigation is that no new ski trails will be summer graded. Ski trails will instead be implemented as outlined in the *Easy Street Run Hazard Reduction Project* (2004) included in Appendix 3 of the MPA 05 upon adaptation to monitoring results from future demonstration projects and approval by TRPA and Forest Service. The ski trail prescriptions are designed to minimize potential soil disturbance and resultant revegetation requirements while still allowing for a decrease in height of overall effective soil cover for conservation of energy and water resources (water and power needed for snowmaking).

Temporary BMPs (Ski Trails)

Standard temporary BMPs are listed in the General Construction section above under "Standard Temporary BMPs." The following measures will be applied prior to construction activities in appropriate sites as shown on project plans and designs:

1. Ski trail boundaries shall be delineated with orange construction fencing to ensure areas outside the proposed ski trail are not disturbed by construction.

2. Efforts shall be made to protect existing vegetation to the greatest extent feasible.

Permanent BMPs (Ski Trails)

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied after project completion:

1. Ski trails will be constructed according to the process-based Easy Street Run Hazard Reduction Program, as adapted to monitoring results and approved by TRPA (In-basin), Forest Service, and Lahontan (California-side only).

2. No new ski trails will be summer graded.

3. Ski trails will be revegetated according to site specific revegetation plans.

4. Ski trails will be designed whenever feasible to avoid crossing or otherwise directly impacting SEZs.

5. Ski trail widening projects within SEZ will only allow for the cutting of conifer trees and the removal of trunks and logs over snow cover at a depth sufficient for the protection of soil and water resources if removal of trees is approved as part of the project. No other vegetation will be cut in order to preserve the hydrologic function of the SEZ.

Road Construction and Maintenance

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied during project planning and design, implemented during project construction and/or implemented after project completion, as appropriate:

1. Existing roads that are used for construction access will be upgraded in accordance with Forest Service specifications defined in this program and as outlined in the appropriate Forest Service Manual, as outlined below.
2. Existing roads will meet standards for maintenance, operations, and design, including identification of critical design vehicles, review of standards, identification of upgrade needs, and implementation or scheduled implementation of upgrades.
3. Upgrades will be designed and constructed in accordance with Forest Service standards. Plans will be reviewed and approved by the Forest Service prior to construction activities.
4. New roads shall be designed in accordance with Forest Service standards for planning, design, and construction. Criteria for roads shall be established prior to design including; critical vehicle, maximum grade, drainage spacing, maximum vertical curves, maximum horizontal curves, pullout spacing, and surface type. Criteria will be established by both access needs and Forest Service specifications.
5. Roads will be located to minimize impacts to resources.
6. Plans will be reviewed and approved by the Forest Service prior to construction activities.
7. The LTBMU Land Resource Management Plan requires that roads incorporate best management practices to minimize impacts to resources. Additionally, the plan requires that soils along existing roads be stabilized. Forest Service standards established in the manuals and handbooks are the nationally accepted practices for designing, maintaining, and constructing roads on National Forest System Lands. Best Management Practices for roads are considered within three different activities; planning and design, maintenance and operations, and new construction.
8. In general, road activities should be completed in accordance with the standards and guidelines established in the following handbooks and manuals to meet Best Management Practices:

Maintenance and Operations

Forest Service standards dictate how, when, why, who, and what will be completed for operation and maintenance of roads on National Forest System lands. Standards require maintenance schedules, monitoring, and maintenance plans for existing roads. Roads are to be additionally prioritized for maintenance or reconstruction. Roads that are in need of reconstruction are to be reviewed for location, design, and BMPs. All new roads and roads used for project access shall meet standards listed herein.

a. FSH 7709.55 Transportation System Maintenance Handbook
b. FSH 7709.59 Transportation System Operations Handbook
c. EM 7710 Transportation Atlas, Records, and Analysis
d. EM 7730 Transportation System Operations and Maintenance

Planning and Design

Planning and design standards dictate design criteria and identification of road access needs. Further, standards define Best Management Practices by the access criteria for specific roads. Planning and design is necessary for all new road construction but also for the existing road system. Road analysis of the existing road system shall identify access needs and prioritize decommissioning, redesign and reconstruction. Road projects will be phased with associated projects. All new roads and roads used for project access shall meet standards listed herein.

a. FSH 7709.55 Transportation Planning Handbook
b. FSH 7709.56 Road Preconstruction Handbook
c. EM 7720 Transportation System Development
d. FSH 7709.56B Drainage Structures Handbook

New Construction

New roads needed for projects shall be designed in accordance with Forest Service Standards to meet Best Management Practices. Prior to design road design criteria shall be established in accordance with Forest Service standards. Specifically, the Road Preconstruction Handbook shall be followed for all new road designs.

a. FSH 7709.56 Road Preconstruction Handbook
b. FP-03 Standards Specifications for Construction of Roads and Bridges on Federal Highways Projects.

The general road construction activities that require additional explanation relate to paved roads and unpaved roads, are as follows:

Temporary BMPs (Roads)

Standard temporary BMPs are listed in the General Construction section above under "Standard Temporary BMPs." The following measures will be applied prior to construction activities in appropriate sites as shown on project plans and designs

1. No new roads will be constructed to facilitate construction of ski trails or ski lifts, access will occur using existing roadways, or will occur over the snow for tree removal purposes.
2. Clearing, grading and compaction: Grading and paving for a paved road involves more and/or heavier machinery than for dirt surface roads because paved roads are usually wider and asphalt trucks, paving machines, and rollers are required. The number of vehicles involved could cause significant soil compaction or vegetation disruption, especially considering their weight. Therefore, the construction should begin from a cleared and stabilized staging area that can also serve as a truck turn-around. Construction should be coordinated so that driving of machinery off the roadway to pass other vehicles does not occur.
3. Asphalt paving: Paving should be conducted immediately after grading/road bed preparation and only during the grading season (May 1 to October 15) so that asphalt products are not washed off the road surface by rain and spilled asphalt can be cleaned up without contaminating water resources. Coir log sediment barriers and/or filter fences should be placed to collect and filter the runoff.
4. Partially completed road projects (paved or unpaved): Significant runoff can be generated from cleared or paved areas before construction is complete and all permanent runoff handling structures are in place. Therefore, temporary erosion controls should be employed before construction begins and maintained until the permanent drainage controls are complete. The temporary erosion control measures should be sized to handle increased runoff from compacted or paved areas up-slope of their location.
5. Existing roadways impacted by ski trail construction will receive required dust abatement (watering) daily or more frequently as needed. Prior to construction, road drainage and surface treatments including waterbars, rolling dips, base rock, and enzyme cohesive treatment will be applied or maintained. Roads will be monitored during construction to ensure adequate drainage is maintained. Ruts should not be allowed to form and will be corrected immediately should the issue arise.
6. All construction traffic will be minimized and scheduled during project planning.
7. The project boundary and parking and staging areas will be clearly delineated with project fencing and adequately signed. Fencing will be inspected daily by Heavenly personnel and repaired as necessary.
8. Project-specific temporary BMPs for the control of runoff will be properly sized and sited on all road plans.
9. Temporary BMPs will be installed prior to the start of the project and will be maintained throughout the life of the active project and until revegetation and site stabilization has been approved by the Forest Service or TRPA. Covered topsoil

stockpiles will be inspected and maintained on a weekly basis and after storm events.

Permanent BMPs (Roads)

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied during project planning and design, implemented during project construction and/or implemented after project completion, as appropriate:

Forest Service engineers will access road conditions upon project completion and make recommendations for post-project repairs and maintenance. Post-project road work will be scheduled in accordance with the revised CWE Restoration Program (Appendix 2-D, Table 4) for the end of the construction seasons or if necessary, the following field season to correct damage occurring from increased use.

1. Forest Service will review and approve all road plans.

2. Following backfilling, rolling dips will be added to the permanent road segment at a distance specified by Forest Service guidelines based on the slope. Rolling dips will be cut across access road beds and directed into outlet protection.

3. All roadways shall be designed with BMPs to treat at a minimum the 20-year, 1-hour storm event.
4. Engineered dips shall be used in place of waterbars on new construction and temporary roads.
5. Grades greater than 6% shall received road base at 4 inch depth and full width.
6. Roads shall have a 3% outslope with no berms.
7. Daylight all segments to provide adequate cross drain and minimize concentration of sheet flow.
8. Backslopes shall be constructed at 2:1 or flatter and stabilized with vegetation where possible, otherwise jut mat (or equivalent) with pine needle mulch shall be used.
9. Riprap shall be applied where practical and applicable to prevent soil erosion from runoff
10. After construction is complete, disturbed areas will be covered with a minimum of 2 inches of pine needle or native mulch. If native mulch is not available, then weed free straw or other weed free mulch material may be used.
11. All compacted areas that are to be restored shall be decompacted to a minimum depth of 10 inches. Additional measures to incorporate soil amendment such as compost or wood chips will be applied and then tilled into the soil to promote soil productivity and infiltration and to reduce surface erosion.
12. Surface and subsurface drainage will be installed to minimize trenching requirements and utilize natural swales where possible.
13. Road alignments shall contour across slopes and grades will be limited to 10% or less to minimize erosion hazards wherever possible.
14. Maximum road grades are as follows:
    a. Vehicles pulling trailers – 12%

b.High clearance and four wheel drive vehicles – 18%

15. Grades on curves and switchbacks should be reduced.
    a. Grade above switchback for 150 – 200’ at 5% maximum
    b. Grade at switchback should be 8% max, 6% preferred.
    c. Continue same grade beyond switchback so vertical curve lies off switchback.

Decommissioned Roads

Roads shall be identified for decommissioning through the Road Analysis Process, through the Environmental Monitoring Program and CWE Restoration Process as mitigation, or through project specific analysis. During analysis of the roads specific resource concerns shall be identified so that the most appropriate methods of road decommissioning may be used.

1. COMPACTION:

a) Compacted areas from vehicle use shall be decompacted to a minimum depth of 12”.
b) Subsoilers or winged rippers shall be used for effective decompaction. Excavator or backhoe buckets may also be used for decompaction.
c) Unmodified rippers behind dozers or tractors have proven to be unsuccessful for decompaction efforts and shall not be used.
d) Further, multiple passes will be made as necessary to ensure that infiltration and soil function will be restored.
e) Testing methods will be employed to demonstrate that soils have been decompacted to support infiltration and revegetation.

2. SLOPE RECONTOUR

a) Where cut and fill slopes exist, recontouring methods will be used to close roads and restore hillslope hydrology.
b) Cut slopes will be pulled up to the maximum extent possible to fill cuts and match natural slope contour.
c) Only soils on-site will be allowed for recontouring, unless specifically approved in project specific plans by TRPA and the Forest Service.
d) Where substantial vegetation exists it will be avoided to the extent possible.
e) Site specific prescriptions shall be prepared and establish criteria for preserving vegetation vs. recovering altered soils.
f) Heavenly will develop project plans will specify appropriate prescriptions.
g) All plans shall include criteria to determine prescriptions including: winter grooming, skier safety, aspect, type of vegetation, extent of cut, scenic affects, and soil stability.

h) Finish grades shall be left free of blade/bucket marks including; teeth marks, linear cuts and steep piles.
i) Finish grades shall be uneven to reflect natural landforms.
j) After slopes have been recontoured roughness will be added to naturalize site and provide additional barriers to vehicle use.
k) Woody debris and boulders are the primary materials to be used.
l) Materials shall be buried to the widest dimension or 1/3 of the total height minimum. Additionally, materials shall be placed in clumps, randomly spaced, and placed non-linearly to mimic natural conditions as much as possible. \
m) Roughness will only be placed in such a way to not cause safety concerns for the public or equipment.
n) Roughness will be considered for each site and designed to site specific criteria.

3. BARRIERS

a) Where roads to be decommissioned intersect existing roads barriers will be installed to prohibit vehicle access.
b) Barriers will be spaced a maximum of 40".
c) Barriers will be clumped in a non-linear alignment to look as natural as possible. Barriers will use durable natural materials such as rock boulders when ever possible. All Boulders shall be buried to the widest dimension or 1/3 of the total height minimum.
d) Artificial materials may be used if no natural materials are available or practical.
e) No barriers will be placed that could cause safety concerns for the public and equipment.
f) Barriers will be considered for each site and designed to meet site specific criteria.

4. SOIL PREPARATION

a) Where soils have been disturbed, organic matter will be incorporated to promote infiltration and long term restoration.
b) In general wood chip compost shall be incorporated into the top 10" of disturbed soil.
c) Typical application will include applying 2" of chips to disturbed areas and tilling the organic matter into soils a minimum of 12".
d) Amounts may vary depending upon site specific conditions.
e) Other methods may be substituted in order to use the best methods possible to ensure long term soil stabilization and revegetation on difficult sites.

Hiking Trail Construction and Maintenance

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied during project planning and design, implemented during project construction and/or implemented after project completion, as appropriate:

Temporary BMPs (Hiking Trails)

Standard temporary BMPs are listed in the General Construction section above under "Standard Temporary BMPs." The following measures will be applied prior to construction activities in appropriate sites as shown on project plans and designs.

1. All trail routes will be flagged in the field prior to project design and approval shall be required from the Forest Service.

Permanent BMPs (Hiking Trails)

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied during project implementation or after project completion, as appropriate:

1. The LTBMU Land Resource Management Plan requires that trails meet Forest Service Design standards to meet Best Management Practices and minimize impacts to resources. Forest Service standards established in the manuals and handbooks are the nationally accepted practices for designing, maintaining, and constructing trails on National Forest System Lands. The following manuals define Forest Service Standards for trails:

    a) Trail Management Handbook FSH 2309.18
    b) Forest Service Trail Accessibility Guide (FSTAG)
    c) Standard Specifications for Trail Construction EM 7720-102

2. Trails will be designed and maintained to meet Forest Service Standards.
3. All existing trails that do not meet Forest Service standards shall be redesigned and reconstructed to meet Forest Service Standards listed in the appropriate manuals.
4. New trails shall be considered for universal access. If universal access standards are not accommodated documentation of limitations are required.
5. Trails will be constructed to meet use levels and use types and upgraded as necessary to prevent adverse resource impacts.
6. Trails constructed in decomposed granite (DG) soils will be constructed at grades below 5%. If 5% cannot be achieved, trails will be hardened using rock steps, trail tread rip rap, or other armoring techniques
7. Trails with grades of less than 5% will not require surface armoring and will be drained with rolling dips that are constructed into the trail. Otherwise waterbars and rolling dips will be used to drain the trail.
8. Trail segments where grades exceed 5% to 15% conditions will be assessed to determine where trail armoring is necessary.

9. For trails over 15%. Substantial armoring techniques, such as steps will be sued to protect trail tread from erosion.
10. Switchbacks will be constructed where side slopes exceed 15%.
11. For side slopes less than 15% climbing turns will be used.
12. Trails will be aligned to contour across slopes and avoid fall-line alignments such as straight up ridges.
13. Perform annual maintenance on all trails, including tree removal, drainage maintenance, tread maintenance, and sign maintenance.
14. Identify sections of trail that may need reconstruction or additional armoring.
15. Close, block, and decompact user created trails that develop.
16. Sign and maintain trails for hiking use only, take necessary measures to discourage other summer uses on trails.

Snowmaking Pipelines

Potential impacts and proposed mitigation measures that are not adequately described in the SOECP or TRPA BMP Handbook are:

1. Snowmaking pipelines will not be buried unless the pipeline is being placed in a previously summer graded ski trail or active roadway. Impacts due to snowmaking were not analyzed for the MPA 05 because of the MP 96 mitigation that all future snowmaking would be installed above ground to avoid increases in watershed ERAs. Therefore, site-specific analysis is necessary and required for installation of below ground snowmaking. Should site conditions require installation of snowmaking pipelines underground, Heavenly must first submit project -specific design plans, which also include complete restoration plans for the "snowmaking corridor," to the Forest Service for approval. Forest Service may require the use of a hill slope model such as the Watershed Erosion Prediction Program (WEPP) to further refine design and restoration plans to ensure that no increase in erosion will occur as a result of the project.

2. Dragging the pipeline into position: Areas for pipe shall be clearly marked and designated routes to pipe shall also be marked to minimize disturbance. Pipeline sections are welded together at the top or base of a ski trail and placed using winches and cables. This method could result in soil and/or vegetation disruption if the pipeline is dragged directly on soil or vegetation. Careful winching and placement of skid pads boards, or tarps adequate to prevent soil disturbance at critical locations as the pipeline is dragged into position would greatly reduce the damage. If pipeline sections are welded together after being moved into place by a backhoe or other heavy equipment, care must be taken not to disturb or remove soil and vegetation with the heavy equipment.

3. Completion of Pipeline: Pipeline completion may involve painting, gluing or assembly of mechanical parts requiring adhesives, solvents or lubrication. Spills can potentially release these harmful substances to soils or water resources. Care should be taken to avoid spilling or discharging even small amounts of the

substances because of potential movement and detrimental effects on vegetation. Spilled material should be cleaned up immediately.

Facilities

Potential impacts and proposed mitigation measures that are not adequately described in the SOECP or TRPA BMP Handbook are:

Temporary BMPs (Facilities)

Standard temporary BMPs are listed in the General Construction section above under "Standard Temporary BMPs." The following measures will be applied prior to construction activities in appropriate sites as shown on project plans and designs:

1. Disturbance for proposed access roads and utility construction will be limited to 20 feet within the roadway alignment. Exceptions will be granted on a site-by-site basis following review by Forest Service erosion control specialists and Heavenly personnel.

2. Soils excavated from the trench should be placed toward the cut slope of the road to avoid sloughing onto fill slopes below.

3. Coir logs (certified weed free), filter fence or coir logs will be placed and secured downslope of the construction area.

4. New areas of disturbance will have the following temporary BMPs applied:

    a) Top soil will be conserved through the project area by stockpiling it separately from other excavated subsoils. Stockpiled topsoil will be placed near the construction site, and will be covered with tarps to protect the soil from wind and rain. Top soil will be replaced over the trenches after the final road grade has been achieved.
    b) Stockpile all surface logs, woody debris, slash from cut trees, and pine needles for replacement as mulch upon project completion.
    c) Disturbance, including utility trenches and its contents, will be limited to a maximum 10-foot-wide corridor for utilities located outside of existing or proposed roadways. Exceptions to this 10-foot-wide corridor may occur where there is minimal soil cover over rock outcroppings. Heavenly operations personnel are required to contact the Forest Service when a maximum 20-foot section of trench exceeds the 10-foot width, and additional mitigation measures may be required.

5. Project facilities and corridors shall be delineated with orange fencing. Filter fabric and/or coir logs should be used wherever the potential for soil erosion exists. No disturbance should occur outside the boundary. Locations of parking and staging should also be included within the fenced areas.

Permanent BMPs (Facilities)

Standard BMPs are listed in the General Construction section above under "Standard Permanent BMPs." The following measures constitute permanent mitigation and will be applied after project completion:

1. Outlet protection, such as discharge aprons or plants, will be added at the end of all waterbars and rolling dips that do not already have sufficient material to infiltrate runoff.

2. No new cut slopes of slope greater than 2:1 will be created. Cut slopes associated with the temporary roadway will be obliterated and restored following completion of construction activities. Cut slopes associated with permanent road segments will be treated with revegetation, rock rip-rap, or erosion control blankets.

3. Base rock may be added to steep road segments and corners to improve traction and prevent ruts from developing.

4. Infiltration trenches or other drainage control structures shall be constructed around the dripline of the buildings.

5. Three inches of 1.5 inch or less clean rock shall be placed beneath all deck surfaces.

6. BMPs will be monitored annually for the first five years following construction to assess performance, additional BMPs will be prescribed if existing treatments fail to protect the site from accelerated erosion.

7. All road BMPs and new road construction shall meet or exceed Forest Service Standards and Specifications.

8. All disturbed areas shall be rehabilitated with a combination of surface cover treatments as stated in design specifications. At a minimum top soil, rocks, and woody material shall be replaced in a natural looking pattern. A minimum of 2" native pine needle mulch is required over all disturbed areas. If native pine needle mulch is not available then certified weed free straw or other weed free mulch may be used (except in SEZ).

Snow Grooming Activities

All grooming activities shall maintain minimum snow cover to protect slope treatment from deterioration including soil compaction, vegetation damage, and slope armoring destruction, as required in the Heavenly Ski Resort Special Use Permit with the Forest Service.

Erosion Control and Revegetation

An important component of the CERP is revegetation. Heavenly shall update the Erosion Control Plan and Revegetation Specifications for Ski Trails and Disturbed/Developed

Areas (previously referred to as "Heavenly Valley Summer Operation and Erosion Control Plan"). The revegetation specifications for ski trails and developed and disturbed project areas will be revised and updated by an outside contractor. During these revisions, monitoring results from the Environmental Monitoring Program (1995-2003) will be appropriately incorporated to include more effective BMPs, changes in ski area management directives, improved seed mixtures and Forest Service native plant program (seed mixtures will vary according to site conditions), and noxious weed management programs. The plan should also help facilitate project documentation and record keeping.

Construction Erosion Monitoring

During construction of new facilities, soil erosion reduction and water quality improvement BMPs will be implemented to minimize soil erosion as described above. However, monitoring and inspection of construction-sites is still necessary to ensure that appropriate BMPs are implemented, are effective, and are maintained. Inspections for compliance will be conducted at the start of construction, at least once a week throughout the construction period (Forest Service or TRPA Compliance Personnel), and during and immediately following storm events. Additionally, Heavenly personnel are responsible for daily monitoring and maintenance of BMPs and for the completion of a weekly reporting log If visual inspections indicate that BMPs are not effective, construction will be halted until adequate BMPs are in place. BMP compliance monitoring is conducted as outlined in Appendix 3.1-D, the Revised Environmental Monitoring Program.

For projects completed for the MPA 05, a designated and qualified Heavenly employee will complete informal daily and formal weekly project logs/records to properly document installation and maintenance of BMPs. These records are necessary to fulfill monitoring requirements set forth in the Updated Discharge Permit (Lahontan 2003).

Long term BMP effectiveness monitoring and road and trail monitoring will be completed as outlined in the Revised Environmental Monitoring Program.

CHAPTER 5 - ATTACHMENT 2

Easy Street Run Hazard Reduction Program

Easy Street Run Hazard Reduction Demonstration Project

(ESRHRP)

Monitoring Report

Prepared by
Melanie M. Greene
Parsons Scientist

1.0 Project Background

The Easy Street Run Hazard Reduction Demonstration Project (ESRHRP) was proposed in 2004 by Heavenly Mountain Resort for purposes of demonstrating an iterative, process-based approach for ski trail (synonymous with "ski run") construction, which balanced the needs of ski are development and management with the protection of soil and water resources, while also decreasing dependency on snowmaking and associated resource use. Parsons (Stateline, NV) prepared the original ski trail prescriptions proposed in the original proposed amendment to the MP 96 in 2004. An updated version of the prescriptions is proposed in Appendix 3 of the 2005 Master Plan Amendment (MPA 05) that is analyzed for the 06 Draft EIR/EIS/EIS. The revision presented in the MPA 05 were based on preliminary monitoring results and input from personnel from Heavenly Mountain Resort (implementers), Forest Service (special use permit administrator and resource specialists), Tahoe Regional Planning Agency (TRPA-compliance) and Lahontan Regional Water Quality Control Board (Lahontan-Updated Discharge Permit administrator) and Parsons (consultant for impact analysis and document preparation).

Comments received during the public scoping period for the MPA 05 environmental assessment (EA) and again for the 06 Draft EIR/EIS/EIS, requested additional monitoring to be completed for the ESRHRP utilizing the Water Erosion Prediction Project (WEPP) soil erosion model, a process-based computer model, used to predict runoff, soil erosion, and sediment delivery. Additionally, the Comprehensive Monitoring Report (USFS 2004) and the Revised Environmental Monitoring Program (Appendix 3.1-D of the 06 Draft EIR/EIS/EIS) for Heavenly Mountain Resort contained recommendations and statements for exploration of WEPP for subsidizing and further calibration of the Cumulative Watershed Effects (CWE) Model and for utilization of effective soil cover monitoring on ski trails.

Melanie Greene and Stephanie Heller (Parsons and Forest Service Hydrologists, respectively) worked together during September 2005 to complete WEPP modeling for the ESRHRP utilizing first a version of Disturbed WEPP and next the Hillslope WEPP

version April 2004. Parsons and the Forest Service concluded that WEPP had potential for application towards prediction of erosional processes on ski trails as a result of implementation of ESRHRP prescriptions and long term ski area management but that first the WEPP model had to be built to reflect actual site specific conditions and ski area management.

Drea Traeumer, who originally assisted Forest Service scientists develop WEPP and who now works for Kennedy/Jenks Consulting as the staff hydrologist, was contracted to modify and refine Hillslope WEPP to more accurately model the ESRHRP. The results and conclusions from WEPP modeling are summarized under the WEPP subsection of this monitoring report. The complete technical report is included in Appendix 3.1-F of the 06 Draft EIR/EIS/EIS.

1.1 Project Objectives

- Preserve existing effective soil cover while reducing the height of existing effective surface cover (felled trees, large woody debris, stumps, and rock/boulders) to between 12-18 inches;
- Reduce consumption of electrical energy and water resources;
- Attain and maintain the 70% total effective soil surface cover as required by the Cumulative Watershed Effects (CWE) Analysis;
- Provide a variety of surface cover for wildlife microhabitat
- Improve visual quality

2.0 Field Monitoring Approach

Pre-treatment, pre-project, and post-project effective soil cover and photo point monitoring were completed for the ESRHP. The pre-project monitoring and photos were taken after the installation of the snowmaking lines, but prior to implementation of the ESRHP prescriptions. Ideally monitoring would have occurred prior to installation of snowmaking lines. Pre-treatment photos were taken on October 1, 2004 to characterize the project site and establish the three ski trail segments illustrated in Figure 1 for the Cumulative Watershed Effects (CWE) Model. Permanent photo points were not established at this time; however, Photos 2, 3, and 4 can be used for general comparison with pre-project (pages 9 through 16) and post-project (pages 18 through 25) photo points.

Pre-project monitoring was completed and permanent photo points established on July 21, 2005. Pre-project monitoring was completed after decommissioning and over-wintering of the access road installed during installation of snowmaking lines (seen in pre-treatment photos 2, 3, and 4) and prior to implementation of the ESRHP.

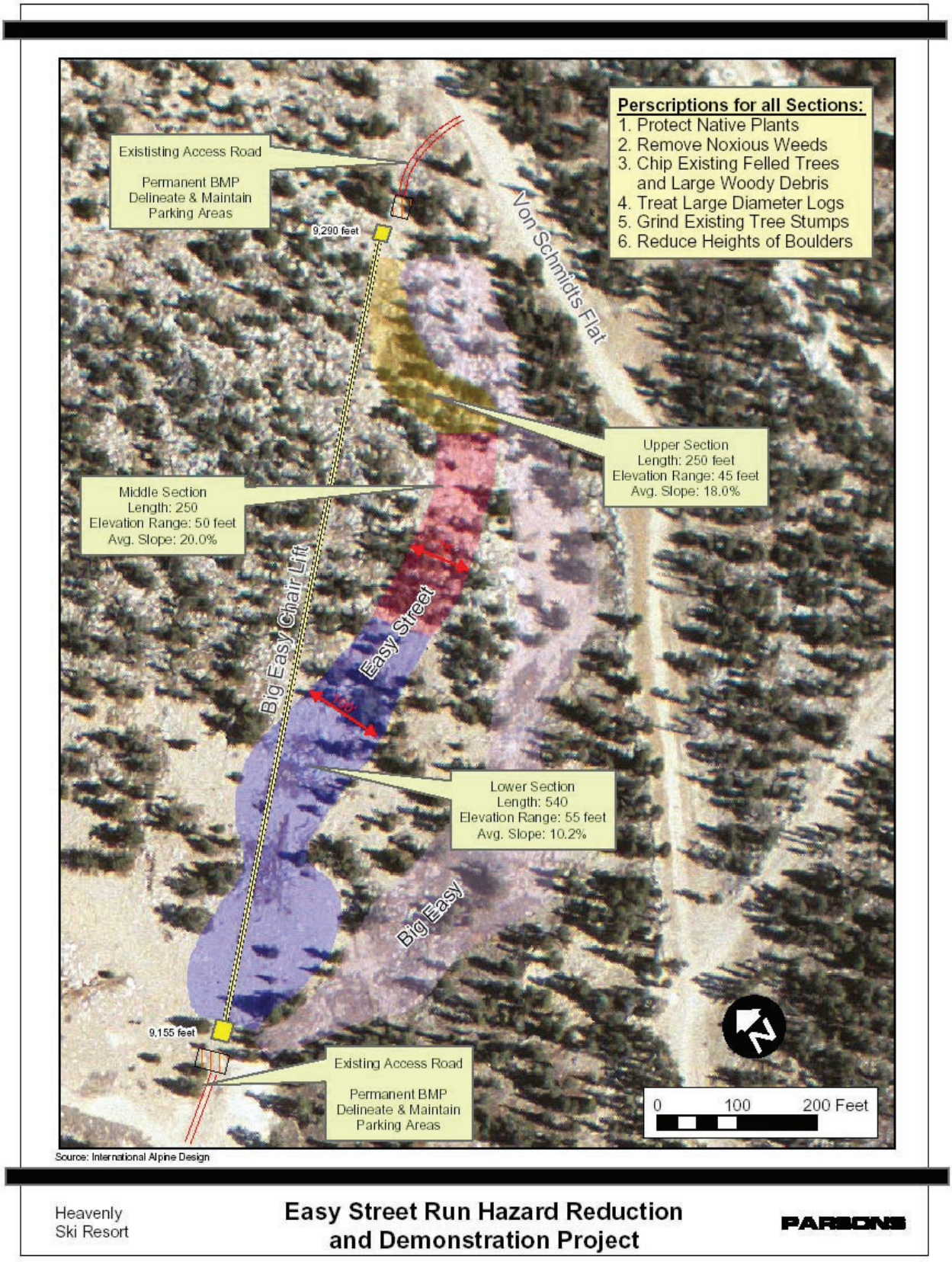


Figure 1. **Easy Street Run Hazard Reduction Project Area and Ski Trail Segments.**

Post-project monitoring was completed and permanent photo points were revisited on September 13, 2005. During this field visit, Heavenly Mountain Resort personnel were trained to complete the effective soil cover and photo point monitoring.

Storm monitoring was not completed in 2005. Spring runoff monitoring will be completed in between April and July 2006 depending on the timing of peak runoff conditions.

Future monitoring of proposed ski trail prescriptions will be a "pre-project", completed prior to implementation of proposed trails and snowmaking, and "post-project", completed after ski trail construction utilizing the prescriptions as outlined in the adapted ESRHP.

2.1 Field Monitoring Objectives

- Determine, describe and document pre- and post project surface conditions
- Identify potential erosional features
- Determine if prescriptions were implemented correctly and completely
- Determine the effectiveness of prescriptions during spring runoff period and significant storm events
- Monitor long-term effectiveness over prescriptions for erosion control
- Determine necessary maintenance activities and schedule
- Adapt and improve ESHRP prescriptions for use on other proposed ski trails

2.2 Field Monitoring and Photo Point Monitoring Results

The following subsections present monitoring results for pre-treatment, pre-project and post-project results. These monitoring scenarios are as defined below:

- Pre-treatment Conditions- ski trail constructed with snowmaking installed with no BMPs applied
- Pre-project Conditions- describe both the snow-making corridor and the adjacent ski trail area after each have been winterized with the application of surface cover and BMPS
- Post-project Conditions- describe both the snow-making corridor and the adjacent ski trail area after the application of ski trail prescriptions outlined in the ESRHRP.

2.2-1 Effectives Soil Cover Summary Results

Effective soil cover monitoring was completed using the same protocols used for the effective soil cover component of the Heavenly Environmental Monitoring Program proposed in the MP (96). Table 1 below presents the results of the effective soil cover monitoring.

Table 1. Effect Soil Cover Monitoring Results.

Easy Street Segment	% Total Cover	% Vegetation	% Organic Matter	% Rock	% Bare
Pre-treatment (10/2004) –Segment 1	70	0	34	36	30
Pre-project (7/2005)- Segment 1	(70)	(0)	(53)	(17)	(30)
Post-project (9/2005)- Segment 1	87	0	58	29	13
Total % Change	**+17**	**0**	**+24**	**-7**	**-17**
Pre-treatment (10/2004) –Segment 2	65	0	30	35	35
Pre-project (7/2005)- Segment 2	(71)	(3)	(50)	(18)	(29)
Post-project (9/2005)- Segment 2	99	3	66	30	1
Total % Change	**+34**	**0**	**+36**	**-5**	**-34**
Pre-treatment (10/2004) –Segment 3	35	0	15	20	65
Pre-project (7/2005)- Segment 3	(64)	(0)	(56)	(8)	(36)
Post-project (9/2005)- Segment 3	65	1	46	18	35
Total % Change	**+30**	**+1**	**+31**	**-2**	**-30**

The effective soil cover objective of 70% total cover was met for segments 1 and 2 but was not achieved on segment 3. One of the prescription objectives includes preserving existing effective soil cover while reducing the height of existing effective surface cover (felled trees, large woody debris, stumps, and rock/boulders) to between 12-18 inches. Evaluation results indicate that the rock component is under represented on all three segments, while the organic matter component increased due to application of mulch. No rills or gullies were noted on any segment during monitoring or interdisciplinary team fieldtrips.

No soil monitoring was conducted for the project, but visual assessments of post-project conditions conclude that the snowmaking corridor was not adequately restored. There is sufficient soil cover applied along the snowmaking corridor, but the hill slope was not restored to the original contour, remains a concave slope and resembles a decommissioned road segment.

2.2-2 Photo Monitoring

Photo points were established for pre-and post-project conditions following the protocols and forms in the Forest Service's "Photo Point Monitoring Handbook: Part A-Field Procedures" (Hall 2002). Ideally, photo points would have been established to represent pre-treatment conditions, but this monitoring task was not accomplished. Photo 1 illustrated an overview of the ski trail prior to installation of snowmaking and photos 2, 3, and 4 illustrate the general pre-treatment conditions of the three segments of the ski trail.

Photos 2, 3, and 4 are not directly comparable to pre- and post-project photo points, but serve to represent ski trail conditions prior to installation of permanent BMPs.

Photo 1. Overall Easy Street Run Hazard Reduction Project site prior to installation of Big Easy Ski Lift (Lift HH-1)

Pre-treatment photos

Photo 2: Easy Street Segment 1, pre-treatment conditions.

Photo 3: Easy Street Segment 2, pre-treatment conditions.

Photo 4: Easy Street Segment 3, pre-treatment conditions.

Pre-Project Photo Points

Four photo points were established along Easy Street Ski Trail (Ski Trail HH1) for purposes of pre and post project evaluation and for long term monitoring of effective soil cover and potential erosion for each of the ski trail segments. The photo points were named PPT 81_1, PPT 81_2, PPT 81_3, and 81_4. Two photos are taken at each photo point location and are termed A for the downslope perspective (e.g. 81_1A) and B for the upslope perspective (e.g. 81_1B). The following pages 9 through 16 contain the datasheets for the pre-project photo monitoring. Photo point 81_1 (A and B) documents pre-project conditions for Segment 3 (Lower Easy Street), photo point 81_2 (A and B) documents pre-project conditions for Segment 2 (Middle Easy Street), photo point 81_3 (A and B) documents pre-project conditions for Segment 1 (upper Easy Street), and photo point 81_4 (A and B) documents pre-project conditions for Segments 1 and 2 from the south ski trail boundary looking towards the northeast.

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project- **Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points
GPS Coordinates:	11S 0248011 4313648
Approximate Elevation:	9185 ft
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-1A (downslope)**
Camera Location:	Camera point is located at skier left of lift tower 3 of Big Easy Lift; photo point marker is an orange bolt head with a brass label located flush to the ground; bolt is flagged with red flagging
Compass Bearing:	240° SW-W
% Slope of Hillside:	4-10%
Length of Transect:	250 feet
Photo File Name:	PPT_81_1A_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project- **Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248011 4313648
Approximate Elevation:	9185 ft
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-1B (upslope)**
Camera Location:	Camera point is located at skier left of lift tower 3 of Big Easy Lift; photo point marker is an orange bolt head with a brass label located flush to the ground; bolt is flagged with red flagging
Compass Bearing:	82° E
% Slope of Hillside:	10-12%
Length of Transect:	300 feet
Photo File Name:	PPT_81_1B_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248131 4313700
Approximate Elevation:	9240 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-2A (downslope)**
Camera Location:	Slightly under rock on skier right between snowmaking hydrant and Lodgepole Pine
Compass Bearing:	250° SW-W
% Slope of Hillside:	20%
Length of Transect:	Middle Segment – 150 feet plus most of Lower Segment
Photo File Name:	PPT_81_2A_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248131 4313700
Approximate Elevation:	9240 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-2B (upslope)**
Camera Location:	Slightly under rock on skier right between snowmaking hydrant and Lodgepole Pine
Compass Bearing:	90° E
% Slope of Hillside:	20%
Length of Transect:	Middle Segment- upper 100 feet or so
Photo File Name:	PPT_81_2B_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248146 4313734
Approximate Elevation:	9260 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-3A (downslope)**
Camera Location:	Near, but downslope from Big Easy Top Station on skier right of ski trail; orange bolt head with red flagging and brass label located under dying Western White Pine (almost a snag in 2005)
Compass Bearing:	170° S
% Slope of Hillside:	18-20%
Length of Transect:	150 feet
Photo File Name:	PPT_81_3A_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248146 4313734
Approximate Elevation:	9260 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-3B (upslope)**
Camera Location:	Near, but downslope from Big Easy Top Station on skier right of ski trail; orange bolt head with red flagging and brass label located under dying Western White Pine (almost a snag in 2005)
Compass Bearing:	60° NE-E
% Slope of Hillside:	18%
Length of Transect:	200 feet
Photo File Name:	PPT_81_3B_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248145 4313730
Approximate Elevation:	9245 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-4A (downslope)**
Camera Location:	Directly across from PPT_81_2A and PPT_81_2B (skier left) by rock pile and downslope from Western White Pine
Compass Bearing:	270°W
% Slope of Hillside:	18%
Length of Transect:	200 feet
Photo File Name:	PPT_81_4A_**preproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Pre-Project**
Date:	July 21, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248145 4313730
Approximate Elevation:	9245 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-4B (upslope)**
Camera Location:	Directly across from PPT_81_2A and PPT_81_2B (skier left) by rock pile and downslope from Western White Pine
Compass Bearing:	10° N
% Slope of Hillside:	18%
Length of Transect:	500 feet
Photo File Name:	PPT_81_4B_**preproject**.jpg

Post-project Photo points

Photo points were revisited on September 13, 2005 to document post-project conditions. Post-project monitoring forms are included on pages 18 through 25. Two photos are taken at each photo point location and are termed A for the downslope perspective (e.g. 81_1A) and B for the upslope perspective (e.g. 81_1B). The following pages 9 through 16 contain the datasheets for the post-project photo monitoring. Photo point 81_1 (A and B) documents post-project conditions for Segment 3 (Lower Easy Street), photo point 81_2 (A and B) documents post-project conditions for Segment 2 (Middle Easy Street), photo point 81_3 (A and B) documents post-project conditions for Segment 1 (upper Easy Street), and photo point 81_4 (A and B) documents post-project conditions for Segments 1 and 2 from the south ski trail boundary looking towards the northeast.

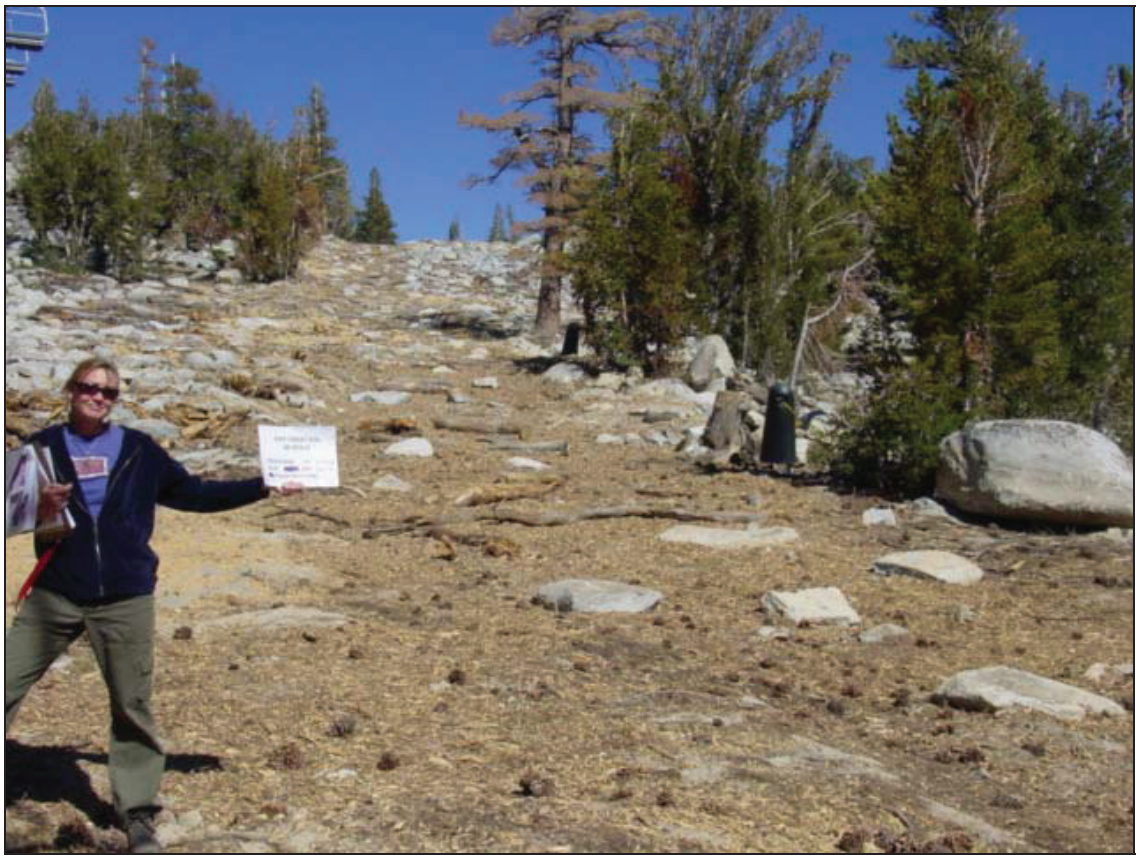
During this field visit, Heavenly staff was trained to establish photo points and complete photo point monitoring.

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points
GPS Coordinates:	11S 0248011 4313648
Approximate Elevation:	9185 ft
Examiner:	Melanie Greene-Parsons Scientist/ James and Tyler-HV Personnel
Photo Point:	**PPT 81-1A (downslope)**
Camera Location:	Camera point is located at skier left of lift tower 3 of Big Easy Lift; photo point marker is an orange bolt head with a brass label located flush to the ground; bolt is flagged with red flagging
Compass Bearing:	240° SW-W
% Slope of Hillside:	4-10%
Length of Transect:	250 feet
Photo File Name:	PPT_81_1A_**postproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project- **Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248011 4313648
Approximate Elevation:	9185 ft
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-1B (upslope)**
Camera Location:	Camera point is located at skier left of lift tower 3 of Big Easy Lift; photo point marker is an orange bolt head with a brass label located flush to the ground; bolt is flagged with red flagging
Compass Bearing:	82° E
% Slope of Hillside:	10-12%
Length of Transect:	300 feet
Photo File Name:	PPT_81_1B_**postproject**.jpg



Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248131 4313700
Approximate Elevation:	9240 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-2A (downslope)**
Camera Location:	Slightly under rock on skier right between snowmaking hydrant and Lodgepole Pine
Compass Bearing:	250° SW-W
% Slope of Hillside:	20%
Length of Transect:	Middle Segment – 150 feet plus most of Lower Segment
Photo File Name:	PPT_81_2A_**postproject.**jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248131 4313700
Approximate Elevation:	9240 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-2B (upslope)**
Camera Location:	Slightly under rock on skier right between snowmaking hydrant and Lodgepole Pine
Compass Bearing:	90° E
% Slope of Hillside:	20%
Length of Transect:	Middle Segment- upper 100 feet or so
Photo File Name:	PPT_81_2B_**postproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248146 4313734
Approximate Elevation:	9260 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-3A (downslope)**
Camera Location:	Near, but downslope from Big Easy Top Station on skier right of ski trail; orange bolt head with red flagging and brass label located under dying Western White Pine (almost a snag in 2005)
Compass Bearing:	170° S
% Slope of Hillside:	18-20%
Length of Transect:	150 feet
Photo File Name:	PPT_81_3A_**postproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248146 4313734
Approximate Elevation:	9260 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-3B (upslope)**
Camera Location:	Near, but downslope from Big Easy Top Station on skier right of ski trail; orange bolt head with red flagging and brass label located under dying Western White Pine (almost a snag in 2005)
Compass Bearing:	60° NE-E
% Slope of Hillside:	18%
Length of Transect:	200 feet
Photo File Name:	PPT_81_3B_**postproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248145 4313730
Approximate Elevation:	9245 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-4A (downslope)**
Camera Location:	Directly across from PPT_81_2A and PPT_81_2B (skier left) by rock pile and downslope from Western White Pine
Compass Bearing:	270°W
% Slope of Hillside:	18%
Length of Transect:	200 feet
Photo File Name:	PPT_81_4A_**postproject**.jpg

Camera Locations and Photo Points

Project:	Easy Street Run Hazard Reduction Project-**Post-Project**
Date:	September 13, 2005
Transect Name/Number:	Easy Street-Ski Trail 81
Number of Photo Points:	8 photo points total
GPS Coordinates:	11S 0248145 4313730
Approximate Elevation:	9245 feet
Examiner:	Melanie Greene-Parsons Scientist
Photo Point:	**PPT 81-4B (upslope)**
Camera Location:	Directly across from PPT_81_2A and PPT_81_2B (skier left) by rock pile and downslope from Western White Pine
Compass Bearing:	10° N
% Slope of Hillside:	18%
Length of Transect:	500 feet
Photo File Name:	PPT_81_4B_**postproject**.jpg

2.2-3 Spring Runoff Monitoring

Spring runoff monitoring completed during the establishment of pre-project photo points and pre-project effective soil cover evaluations. No rill or gully formation was noted during field monitoring and as documented in pre-project photo points. Future spring runoff monitoring should be conducted by Heavenly personnel during the actual snowmelt period, which varies with site-specific snow pack and climate.

2.2-4 Storm Monitoring

Storm monitoring was not completed as recommended. Heavenly personnel on site during July and August 2005 precipitation events observed no surface runoff during or after these events (verbal communications with ESRHRP project implementers). Appropriate photo point monitoring was not completed, however, and adequate documentation is not available.

2.3 Field Monitoring Conclusions and Adaptive Management Recommendations

- The pre-project monitoring is not a true representation of the ski trail because the ski trail had already been implemented. Additionally, the pre-project monitoring performed in 2004 was completed after snowmaking and the resulting access road had been installed. Ideally, pre-project monitoring would occur before any project activities in order to gain an understanding of the true ground cover that exists on the slope.
- The overall objective of the ski trail prescriptions is to achieve a ski trail with an effective surface cover that generally maintains the existing ground cover while only reducing the overall height of the cover (e.g. reduce the height of the boulders and improve contact of down trees with the soil surface). This was not achieved for the ESRHRP due to removal of significant amounts of rock for installation of the snowmaking line.
- Generally, the segments do not have a representative amount of rock (<3 inches) cover as compared to pre-treatment conditions and the hillslope was not restored to the original contour as a result.
- Most of the increase in effective soil cover was in the form of "duff" or native mulch that was produced on site with the use of a chipped and also brought in from off site sources. Ideally, all mulch will be produced from onsite materials obtained during ski trail implementation. Straw, even weed-free certified, is not recommended. Application of mulch may need to occur annually to maintain effective soil cover at 70%.
- Results of photo point monitoring do not indicate significant changes in cover along the ski trail corridor, but do indicate increased cover along the snowmaking corridor.
- Photo point monitoring indicates that the snowmaking corridor was not adequately restored to the original hill slope contours.
- Seasonal Runoff Evaluation and Storm Monitoring will need to occur next year along with Noxious Weed Monitoring; at this point in time it is not specified who

or what entity is responsible for this monitoring; a decision need to be made as to the frequency of Seasonal Runoff Monitoring (annual, every 3-5 years, or if additional project work is implemented)

- Permanent BMPs must be maintained to preserve the integrity of the slope (delineated parking areas, proper signage for closure and interpretive objectives)
- Adaptive management considerations (based on monitoring results and recommendations from agency resource specialists) include: improving soil resources, improving wildlife habitat, improving visual quality, incorporating underground utilities, and improved construction techniques (objectives are listed on page 3-10 and 3-11 of Appendix 3 of the MPA 05).
- **Supplemental modeling utilizing W.E.P.P (Watershed Erosion Prediction Program) should be performed for EIS analysis**

3.0 Water Erosion Prediction Project (WEPP) Modeling Overview

As recommended during field evaluations and during interagency field trips, WEPP modeling was completed for supplementation of ESRHRP monitoring. The complete report for the WEPP modeling performed for environmental impact analysis is included in Appendix 3.1-F of the 2006 Draft EIR/EIS/EIS. A complete description of the WEPP model and input and output parameter files are referenced to Appendix 3.1-F. A summary of the modeling results as they pertain to the ESRHRP monitoring is presented in this subsection.

The objective of WEPP modeling for the ESRHRP is to predict potential erosion that may result from ski trail implementation utilizing the prescriptions outlined in the ESRHRP. Erosion predictions are needed to understand the effects of ski trail prescriptions and various ski area management practices on Easy Street (Ski Trail 81), a recreational ski trail located at Heavenly Mountain Resort. The Water Erosion Prediction Project (WEPP) soil erosion model, a process-based computer model, was used to predict runoff, soil erosion, and sediment delivery from Easy Street Ski Trail. Various conditions were simulated using WEPP to predict the effects of different management activities and to increase the understanding of surface cover effects. Conditions representing the Easy Street Run Hazard Reduction Demonstration Project (ESRHRP), underground snow-making installation, and varied surface cover were simulated for Easy Street Ski Trail using the WEPP model.

3.1 WEPP Modeling Result

The following tables and summary of WEPP results are taken directly from the WEPP Technical Memo referenced to Appendix 3.1-F pages 13 through 19. WEPP predictions of soil loss and sediment yield for Easy Street Ski Trail under ESRHRP conditions are summarized in Tables 2 through 4 below. Easy Street Ski Trail was modeled as two hillslopes (a snow-making corridor and an adjacent ski trail) and their results combined to predict total loss and erosion. Easy Street Ski Trail was modeled as two hillslopes for the

ESRHRP analyses: a snow-making corridor and an adjacent ski run area. The results from each hillslope were combined to calculate total predicted soil loss and sediment delivery from Easy Street ski run under ESRHRP conditions. As WEPP returns estimates in units of tons per acre, soil loss and sediment delivery, in tons, were calculated for Easy Street Ski Trail using the assumed dimensions of the snow-making corridor and adjacent ski area, as presented in Table 5.

Table 2: Results for Snow-making Corridor Under ESRHRP Conditions

Average annual precipitation (in)	36.2	36.2	36.2
Average annual runoff - rainfall (in)	0.20	0.20	0.20
Average annual runoff - snowmelt (in)	3.1	3.0	3.0
Average annual soil loss (tons/acre)	54.9	31.1	19.8
Average annual sediment yield (tons/acre)	46.7	19.8	15.3
Percentage yield (%)	0.85	0.64	0.77

[a]Ratio of soil loss to sediment yield

Table 3: Results for Adjacent Ski Trail Area Under ESRHRP Conditions

Adjacent Ski Trail	Pre-treatment (Range of Surface Cover 35 – 70%)	Pre-project (Range of Surface Cover 64 – 71%)	Post-project (Range of Surface Cover 65 – 99%)
Average annual precipitation (in)	36.2	36.2	36.2
Average annual runoff - rainfall (in)	0.0	0.0	0.0
Average annual runoff - snowmelt (in)	0.0	0.0	0.0
Average annual soil loss (tons/acre)	0.0	0.0	0.0
Average annual sediment yield (tons/acre)	0.0	0.0	0.0
Percentage yield (%)	0.0	0.0	0.0

Table 4: Results for Easy Street Ski Trail Under ESRHRP Conditions

Snow-making Corridor + Ski Trail	Pre-treatment (Range of Surface Cover 35 – 70%)	Pre-project (Range of Surface Cover 64 – 71%)	Post-project (Range of Surface Cover 65 – 99%)
Average annual precipitation (in)	36.2	36.2	36.2
Average annual runoff - rainfall (in)	0.20	0.20	0.20
Average annual runoff - snowmelt (in)	3.1	3.0	3.0
Average annual soil loss (tons/acre)	54.9	31.1	19.8
Average annual sediment yield (tons/acre)	46.7	19.8	15.3
Percentage yield (%)	0.85	0.64	0.77

Table 5: WEPP Results for Easy Street Ski Trail (Corridor and Ski Trail) Under ESRHRP Conditions

Snow-making Corridor + Ski Trail[a]	Pre-treatment (Range of Surface Cover 35 – 70%)	Pre-project (Range of Surface Cover 64 – 71%)	Post-project (Range of Surface Cover 65 – 99%)
Average annual precipitation (in)	36.2	36.2	36.2
Average annual runoff - rainfall (in)	0.20	0.20	0.20
Average annual runoff - snowmelt (in)	3.1	3.0	3.0
Average annual soil loss (tons)	15.9	9.0	5.7
Average annual sediment yield (tons)	13.6	5.7	4.4
Percentage yield (%)	0.85	0.64	0.77

[a] Snow-making corridor is assumed to be 0.29 acres (1,040 ft x 12 ft) and adjacent ski trail area is assumed to be 1.79 acres (1,040 ft x 75 ft)

WEPP simulations showed that erosion processes at Easy Street Ski Trail are dominated by snowmelt, as little runoff occurs from rainfall. Simulations for Easy Street Ski Trail using the continuous, 30-year simulation and the 20-year, one-hour design storm predicted no soil loss or sediment yield for the adjacent ski trail area under ESRHRP Pre-treatment, Pre-project, and Post-project conditions. WEPP predictions to evaluate the effects on the adjacent ski trail area when the extent of surface cover was varied showed no soil loss or yield occurring under the 20-year, one-hour design storm when the surface was assumed to be bare. WEPP predictions using the 30-year, continuous simulation showed no soil loss or yield occurring when the surface cover of the adjacent ski trail area was greater than 10%; however, negligible loss and yield values of 0.20 tons/acre were predicted when a bare surface was assumed.

WEPP predicted negligible or no soil loss and sediment yield occurring on the adjacent ski trail area, which can be attributed to the soil properties and the extent of surface cover that were assumed. The extent of surface cover under ESRHRP conditions ranged from

35% to 99%, with a minimum cover of 35% occurring on the less steep, lower segment. Erosion is sensitive to the extent of surface cover and erosion is generally negligible when the extent of surface cover approaches 70% (B. Elliot, USFS RMRS, personal communication).

WEPP predictions using the 20-year, one-hour design storm showed no soil loss or sediment yield occurring on the adjacent ski trail area, which can be attributed to the soil properties that were assumed for the simulations. The WEPP soil file developed for a short grass prairie and assumed to best represent the soil conditions of the adjacent ski area has a bulk density of 1.3 g/cm^3 and an effective hydraulic conductivity of 25 mm/hr (1 in/hr). This effective hydraulic conductivity is equal to the intensity of the 20-year, one-hour design storm; therefore, all rainfall was infiltrated and no runoff or erosion was predicted, regardless of the extent of surface cover. Given that erosion was not predicted to occur on the adjacent ski trail area under the 20-year, one-hour design storm, a more appropriate analysis of soil erosion for a single-event may be to determine the probability of a given level of erosion occurring under a 24-hour storm event. This can be done by using the return probability analysis feature of WEPP, where the model uses the climate input file to internally calculate the 24-hour rainfall for the 5-, 10-, 20-, and 50-year return periods, and predicts the soil loss and sediment yield for each return period.

WEPP predictions for the snow-making corridor under ESRHRP conditions using the 30-year, continuous simulation showed runoff, soil loss, and sediment yield occurring on the snow-making corridor. Runoff values did not change significantly when the extent of surface cover was varied, due to the compaction and low hydraulic conductivity that was assumed; however, soil loss and sediment yield values did vary. Maximum average annual loss and yield values of 54.9 tons/acre and 46.7 tons/acre, respectively, were predicted for Pre-treatment conditions when the corridor surface was assumed bare, and predictions decreased as the extent of surface cover was increased. Predictions of the snow-making corridor under ESRHRP Pre-project conditions showed average annual soil loss and sediment yield decreased to 31.1 tons/acre and 17.5 tons/acre, respectively, which is a reduction of 61% and 62% when compared to Pre-treatment conditions. Similarly, WEPP predicted soil loss and sediment yield under ESRHRP Post-project conditions to further decrease in response to increased surface cover. Average annual soil loss and yield values of 19.8 tons/acre and 15.3 tons/acre, respectively, were predicted for ESHRP under Post-project conditions, which is a reduction of 64% and 67% when compared to Pre-treatment conditions. Similarly, WEPP predictions for the snow-making corridor under ESHRP conditions using the 20-year, one-hour design storm showed a decrease in soil loss and sediment yield as the extent of surface cover was increased between Pre-treatment, Pre-project, and Post-project simulations. WEPP simulations using the 20-year, one-hour storm predicted maximum soil loss and sediment yield values of 6.26 tons/acre occurring under Pre-treatment conditions. WEPP predicted soil loss and sediment yield would decrease to less than 2.0 tons/acre under Pre- and Post-project conditions, for an approximate reduction of 70%.

WEPP predictions to evaluate the effects of the extent of surface cover on the snow-making corridor using the 30-year, continuous simulation showed average annual soil loss and sediment yield values of 20.9 ton/acre and 14.2 tons/acre, respectively, when the extent of cover was held constant at 70%. Soil loss and sediment yield predictions

further decreased to 13.9 tons/acre and 8.5 tons/acre, respectively, when the extent of cover was increased to 100%.

3.2 WEPP Modeling Conclusions

WEPP simulations showed the effects of soil properties and the extent of surface cover on soil loss and sediment yield predictions can be significant. WEPP predictions for undisturbed soils showed negligible erosion, regardless of the extent of surface cover. However, WEPP predictions were high for disturbed soils, but decreased as the extent of surface cover was increased. WEPP did not predict soil loss or sediment yield for the adjacent ski area under ESRHRP conditions; however, loss and yield were predicted for the snow-making corridor. This can be attributed to the assumptions that were made about the soil properties that significantly influence erosion: effective hydraulic conductivity, bulk density, rill erodibility, and interrill erodibility. WEPP files developed for highly compacted forest roads have low effective hydraulic conductivity and high bulk density, high rill erodibility, and high interrill erodibility, which were assumed to represent the soil properties of the snow-making corridor. Conversely, WEPP files developed for short grass prairie have a higher effective hydraulic conductivity and lower bulk density, lower rill erodibility, and lower interrill erodibility, and were assumed to represent the soil properties of the adjacent ski trail area. Without measured, site-specific data, assumptions about the soil properties were made that may have resulted in under- or over-predictions of soil loss and sediment yield. While these were the best available methods, and the predictions by WEPP are reasonable, calibrating the model with measured, site-specific data for effective conductivity, bulk density, rill erodibility, and interril erodibility will improve the accuracy of the model.

Site-specific measurements for effective hydraulic conductivity, rill erodibility, and interrill erodibility can be made through rainfall simulation studies at disturbed, forest sites. Interrill erodibilitiy and effective hydraulic conductivity can be measured during the same study; however, rill erodibility studies are done independently and are more time consuming. Effective hydraulic conductivity is a function of soil textural properties and land management practices; however, disturbance or land management practices can increase or, in some cases, overwhelm the effects of soil textural properties. For example, repeated, annual tillage over many years can neutralize many natural effects of agricultural soils, so that only soil texture properties remain. Alternately, significant disturbances to forest soils (i.e. roads, skid trails, and fire) can overwhelm the effects of soil textural properties because the magnitude of the disturbance becomes more important than the inherent soil properties. For this reason, rainfall simulation studies may be used to measure the effective hydraulic conductivity of disturbed forest soils.

WEPP simulations for the snow-making corridor were made using data representing a worst-case scenario, i.e. highly compacted soils and a long, unbroken overland flow path. Further, simulations of the recovering snow-making corridor assumed passive, non-use only and did not consider the effects of mechanical treatments that accelerate recovery, such as road ripping. Studies show that road ripping treatments can increase effective hydraulic conductivity to a maximum rate of 10mm/hr within the first two years of

treatment, beyond which hydraulic conductivity generally does not increase with time (R. Foltz, USFS RMRS, personal communication).

3.3 WEPP Adaptive Management Recommendations

The WEPP model was applied to various conditions to understand the effects of ski trail prescriptions and management practices through the prediction of soil erosion. A greater understanding of the effects of these practices can be gained by improving the accuracy of the WEPP model through calibration with site-specific data. With greater understanding, adaptive management strategies can be applied to more effectively improve future ski trail designs, prescriptions, management practices, and restoration efforts. Further, WEPP could be an effective tool to develop low-impact design alternatives, and to evaluate the impacts of proposed designs as part of an alternatives analysis process. The following activities could provide the necessary feedback to gauge and respond to the effects of various practices, and are recommended as a potential adaptive management strategy.

- Measure effective hydraulic conductivity, rill erodibility, and interrill erodibility (through rainfall simulation studies) and bulk density before and after to the implementation of prescriptions or management activities
- Calibrate WEPP parameters using measured data to improve the model's accuracy
- Utilize WEPP's return period analysis feature to predict the probability of a given level of erosion occurring for a 24-hour storm event
- Apply WEPP predictions of soil loss and sediment yield to develop and evaluate design alternatives, and to improve future prescriptions, management practices, and restoration efforts for ski trail areas.

4.0 Future Discussions/Decisions/Research for ESRHRP

- Complete demonstration project on ski trail of steeper terrain. Include bulk density measurements for determination of pre and post-project soil compaction
- Demonstration of successful site-specific restoration of snow making corridors and determination of site recovery times
- Site access requirements
- Determination of most effective and efficient equipment
- Most effective depth of mulch applications and determination of ski trail maintenance frequencies

- Determination of the validity of CWE's 70% effective soil cover requirements for high elevation ski trails
- Who is responsible for long term monitoring?

Appendix 3.1-D of Epic Discovery EIR/EIS/EIS

Table 4

Revised CWE Restoration Program (2006-2016 and On-going)

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
PHASE I								
CA-1								
1	R99	Powderbowl Access	Construct Runs G9 (**Powderbowl Woods Built in 2007)**	Post-project road maintenance treated annually; Access spur eliminated and second spur improved as part of Powderbowl lift replacement project; t 0.08 acres upgraded/0.07 acres decommissioned	2008	2008	RCI Photo Documentation	Yes
2	R141-R143	Lower California Trail	Construct I4 **(Pinnacles 1 Implemented in 2007)**	Revegetate, Mulch; Decommissioned Road segment R143 treated as part of log deck decommissioning	2007	2013	Heavenly Mountain Operations Staff	Yes
3	R141-R143	Lower California Trail	Construct I5 **(Pinnacles 2 Implemented in 2007)**	Revegetate, Mulch; Decommissioned Road segment R143 treated as part of log deck decommissioning	2008	2013	RCI Photo Documentation/ Heavenly Project Records	Yes
4	R166-R167	Roundabout Road	Construct Run 1A	Forest Service to advise as to need for Pre- and Post project maintenance; Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	On-going	On-going	RCI Plan Sets	Future Capital Project
5	R263	Mid-station Road	Construct Gondola Hiking Trails	Forest Service to advise as to need for Pre- and Post project maintenance Road segments R261-R263 are treated annually as part of opening summer mountain access. Daily	2007	On-going	RCI Plan Set	Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				Summer dust abatement watering program.				
6	R1-4	Skyline	Skyline Trail Realignment **(Implemented in 2008)**	Decommission and revegetate abandoned road segments per design plans in MPA 07 EIR/EIS/EIs Appendix 2-J Skyline Trail was regraded with substantial slope stabilization, roadway width narrowing and erosion resistance treatment per approved design plans. Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program when open to public hiking.	2008	On-going	RCI Photo Documentation; BMP Effectiveness Monitoring Annual Report; Construction Season Summary; RCI Plan Set	Yes On-going Road Maintenance
7	Gondola Top Station	Site Clean Up/Landscaping	Construct Additional Tubing/Winter Park at Top of Gondola **(Implemented in 2010 and 2013)**	Remodel and Expand Vehicle and Lift Maintenance Shop at Top of Tram (Upper Shop) Gondola area clean up conducted and wood chip cover placed annually throughout top of gondola area. Revegetation seed mix planted in 2010, 2011, & 2013 in front of Tamarack Lodge. Daily Summer dust abatement watering program. Area receiving naturalized landscape seed and plantings as part of Summer Activities enhancements. Additional surface drainage improvements in flat areas where water accumulates to be implemented in 2014.	2007	Ongoing	RCI Photo Documentation; BMP Effectiveness Monitoring Annual Report; Construction Season Summary; RCI Plan Set; Heavenly Project Records	Yes
8	R250-R253	Von Schmidt to East Peak	Replace/Relocate Lifts S and T **(Olympic Lift replaced in 2007/North Bowl Lift not Replaced)**	Forest Service to advise as to need for Pre- and Post project maintenance Road is treated annually as part of opening summer mountain access.	2007	On-going	Heavenly Mountain Operations Staff	Yes Ongoing Road Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				Road corridor is roped annually and pine needles applied to road shoulders. Included in daily Summer dust abatement watering program. Segment 250 to be treated following construction of Big Easy zipline project.				
9	R155-R156	Groove/Upper Shop	Upper Shop SEZ Improvements **(Implemented in 2006 and 2007)**	May require pre- and post project road work per review by Forest Service; rock-lined drainages are difficult to clean out due to the design implemented, but maintenance is necessary; maintenance of revegetation of cut and fill slopes; waterbar/rolling dip repairs Road improvements implemented per project design plans. Existing road is partially paved and maintained annually as part of summer road maintenance. Road base added to switch back corner (2013)	2007	On-going	RCI Photo Documentation; BMP Effectiveness Monitoring Annual Report; Construction Season Summary; RCI Plan Set; Heavenly Project Records	Yes On-going Road Maintenance
10	R91-R95	Sky Meadows	Removal of Sky Meadows Deck and Meadow Restoration	Forest Service to advise as to need for Pre- and Post project maintenance This Project would be implemented upon construction of Powerbowl Lodge, summer uses would be serviced by temporary structures that would be removed prior to the start of winter uses	--	--		Future Capital Project Ongoing Road Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
11	R47-R57	Lower Ridge Road	Construction of Powderbowl Lodge	Forest Service to advise as to need for Pre- and Post project maintenance Existing road maintained annually as part of summer road maintenance. Daily Summer dust abatement watering program on road segments up to Powderbowl Express lift station.	2007	On-going	RCI Photo Documentation; Heavenly Project Records	Future Capital Project Ongoing Road Maintenance
12	R58-R79	Maggie's Road	Construction of Powderbowl Lodge	General project maintenance; revegetation of cut and fill slopes, cleaning and repair of drainage ditches; repair of rolling dips; additional base rock may be required prior to use for Phase I projects; Forest Service to advise as to need for Pre- and Post project maintenance; Existing road maintained annually as part of summer road maintenance. Road has a road base surface from base of Patsy's chair to CA pumphouse. Daily summer dust abatement watering program	2007	On-going	RCI Photo Documentation; BMP Effectiveness Monitoring Annual Report; Construction Season Summary; RCI Plan Set; Heavenly Project Records	Future Capital Project Ongoing Road Maintenance
13 (Same as #5)	R263	Mid-station Road	Construct Gondola Hiking Trails	Forest Service to advise as to need for Pre- and Post project maintenance Road segments R261-R263 are treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program.	2008	2011	RCI Plan Set	Future Capital Project Ongoing Road Maintenance
14 (Same as #9)	R155-R156	Upper Shop	Upper Shop BMP and SEZ Restoration Project- Phase I **(Implemented in 2006 and 2007)**	Road upgrades implemented per design plans in Appendix 3.2-A	2006	2008		Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
15	Ski Run Segment Revegetation	CA-1 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring The following ski runs were treated as part of 2011/2012 minor run widening project: Canyon 1 & 2, Ellie's Trail, Swing Trail, and Liz's'. Hot spots on Ridge Run are identified and treated. Blue Angel Chutes waterbars were rebuilt in 2010 and re-mulched in 2011. Water bar and road maintenance on Mombo Run in 2010. Pioneer Run (Ski Run N1) was treated with "Full Hogan prescription" in 2013. Ski School teaching area (Trail O1) is site of on-going experimental test plots by IERS. Irrigation annually on Ridge, Lower Cat Track, Creek Station, Maggie's Corner, Sky Meadows, Gondola Area and Pioneer Trail. Monitoring of effective soil cover and specification of erosion control treatments have evolved over the monitoring period, in consultation with the Forest Service and Lahontan. The initial focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies.	2010	2013	Heavenly Mountain Operations Staff	Yes On-going Ski Run Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
CA-4								
16	R167-R176	Roundabout System	All Phase I projects on the California-side of the resort will utilize this road system **(Implemented 2007-2013)**	Forest Service to advise as to need for Pre- and Post project maintenance Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	2007	On-going	RCI Photo Documentation; Heavenly Project Records	Yes
17	Ski Run Segment Revegetation	CA-4 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	X	On-going		No
CA-6 **18**	R177-R187	Roundabout System	All Phase I projects on the California-side of the resort will utilize this road system **(Implemented 2007-2013)**	Forest Service to advise as to need for Pre- and Post project maintenance Road is treated annually as part of opening summer mountain access, including placing road base in specific corners. Daily Annual Summer dust abatement watering program	2007	On-going	RCI Photo Documentation; Heavenly Project Records	Yes
19	Compliance Project	California Parking Lot	BMP Retrofit Project on the California Parking Lot **(Implemented in 2006)**	Compliance with Updated Discharge Permit Stormfilter-brand stormwater management system installed, barren slopes revegetated, snow removal and storage plan developed and implemented, Maintenance on the parking lot, surrounding areas and Stormfilter system is conducted annually. Filter cartridges in vaults are replaced as needed to remain effective.	2006 Phase 1	2007 Phase 2	RCI Photo Documentation, HMR BMP Effectiveness Monitoring Annual Report/ Construction Season Summary, RCI Plan Set, Heavenly Records and TRPA Project File Inspections	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
20	Ski Run Segment Revegetation	CA-6 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring World Cup treated in 2010. Poma Run treated annually. Adult Ski School Area treated in 2008 as part of surface lift replacement project. Soil cover on East Bowl & Gunbarrel runs remains effective and do not need further treatment at this time Other erosion hot spots are field-identified and treated. Lower slopes are irrigated annually. Monitoring of effective soil cover and specification of erosion control treatments have evolved over the monitoring period, in consultation with the USFS and Lahontan. The initial focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies.	2007	On-going	RCI Photo Documentation, HMR BMP Effectiveness Monitoring Annual Report/ Construction Season Summary, Heavenly Project Records	Yes
CA-7								
21	R264-R267	Mid-station Road	Reconstruct Mid-station Access Road **(Implemented in 2008)**	Phase I Project per design plans in Appendix 2-L Roadway was reconstructed per approved plans. Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	2008	On-going	RCI Photo Documentation, BMP Effectiveness Monitoring Annual Report/ Construction Season	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
							Summary	
NV-1								
22	Ski Run Segment Revegetation	NV-1 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program Monitoring Erosion hot spots are field-identified and treated. Hot spots identified during 2014 field assessment will be addressed prior to additional capital development in NV-1; Areas include Orion's, Big Dipper and Aries Woods trails. Cross-slope waterbar maintenance needed on Orion's & Big Dipper runs. Road base added to corners in road segments 610-614 (Ski Run U1). Monitoring of effective soil cover and specification of erosion control treatments have evolved over the monitoring period, in consultation with the USFS and Lahontan. The initial focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies.	2007	On-going	RCI Photo Documentation, HMR BMP Effectiveness Monitoring Annual Report/ Construction Season Summary, Heavenly Project Records, Heavenly Mountain Operations Staff	Partial
NV-2+5								

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
23	R580-R581	Top of Comet Access Road	Construct W5	Cut slope stabilization; control surface runoff on to Aries run and new W5; maintenance of rolling dips	2007	2009		Future Capital Project Ongoing Road Maintenance
24	R500-R504 (Road segments R500, R501 and R504 are in NV-3; Road Segments R 502 and R503 are in NV-2+5)	Von Schmidt to East Peak	Replace/Relocate Lifts S and T **(Olympic Lift replaced in 2007/North Bowl Lift not Replaced)**	Forest Service to advise as to need for Pre- and Post project maintenance Road segment 504 was abandoned as part of Olympic lift replacement project. Other road segments were treated as part of lift replacement project. Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program when hiking trails are open. Road Segment 503 to be treated following completion of Big Easy zipline project	2007	On-going	Heavenly Mountain Operations Staff	Partial
25	Ski Run Segment Revegetation	NV-2+5 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program Monitoring Former ATV trail on upper Comet Run has been decommissioned; Comet Run and $100 Saddle area are irrigated annually. Erosion hot spots are field-identified. New trails 14 and 15 utilized soil cover treatment prescription, which remains effective. Cross-slope waterbar maintenance needed on Comet and Jack's runs. Monitoring of effective soil cover and specification of erosion control treatments have evolved over the monitoring period, in consultation with the USFS and Lahontan. The initial	2011	On-going		Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies.				
NV-3								
26	R531-R540 (Road Segments R531-R540 are located in NV-2+5)	Upper Wayhome Road	Realign Run 6/ Road Segments R531-540	Now called Nevada Trail; Restore and revegetate abandoned road segments Existing road still in use and is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	-- --		Heavenly Project Records	Future Capital Project Ongoing Road Maintenance t
27	R633	Base of North Bowl Chair	Replace/realign Lift S **(Olympic Lift replaced in 2007/North Bowl Lift not Replaced)**	Restore and revegetate abandoned road segment Road segment 633 was not relocated and remains in use. Road is treated annually as part of opening summer mountain access.	2007	On-going	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Future Capital Project Ongoing Road Maintenance
28	R630-R632	Base of North Bowl Chair	Replace/realign Lift S **(Olympic Lift replaced in 2007/North Bowl Lift not Replaced)**	Road segments to receive pre- and post project maintenance per design plans in Appendix G Road is treated annually as part of opening summer mountain access. Road segment 631 was moved further away from Edgewood Creek and was regraded and armored	2007	On-going	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Future Capital Project Ongoing Road Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
29	R521-R523	Top of North Bowl Chair Access Road/Pepi's	Replace/realign Lift S **(Olympic Lift replaced in 2007/North Bowl Lift not Replaced)**	Road segments to received maintenance upon replacement/realignment of Lift S per design plans in Appendix 2-G Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program. Rock slope protection added to cut slope above road along Road segment 522 in 2014	2007	On-going	Heavenly Mountain Operations Staff	Yes On-going Road Maintenance
30	R571-R573A	Olympic Base to Tower 18	Remove Lift T **(Olympic Lift replaced in 2007)**	Decommission road segments upon removal/relocation of lift Road to base of Olympic lift treated as part of lift replacement project. Road Segments 573 and 573A were decommissioned as part of project. Road decommissioning included soil loosening, amendments, seed, mulch	2007	2009	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Yes On-going Road Maintenance
31	R506-R513	Alternate Route to East Peak	Construct Runs S8 **(Implemented in 2007)**	These segment are decommissioned; maintenance and revegetation	X	On-going		No
32	Olympic1-5	Run S1	Construct S9 **(Implemented in 2007)**	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring Run segments adjacent to lift terminals were treated as part of Olympic Express lift replacement project. Run S1 is irrigated annually to maintain soil cover.	2009	On-going	RCI Photo documentation, Heavenly Mountain Operations Staff	Yes On-going Ski Run Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				Monitoring of effective soil cover and specification of erosion control treatments have evolved over the monitoring period, in consultation with the USFS and Lahontan. The initial focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies.				
33	N/LNBOWL1-4	Run S3	Construct S10 **(Implemented in 2007)**	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring Edgewood Creek SEZ restoration project completed in 2006. Effective soil cover in non-SEZ sections of ski run remains effective	2006	2007	RCI Photo Documentation	Yes
34	Ski Run Segment Revegetation	NV-3 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring Run Q1 revegetated as part of SEZ restoration project in Edgewood Bowl. Trail X1 revegetated with “Full Hogan prescription” as part of Boulder Magic Carpet removal. Olympic Run is irrigated annually. Monitoring of effective soil cover and	2006	2010	RCI Photo Documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				specification of erosion control treatments have evolved over the monitoring period, in consultation with the USFS and Lahontan. The initial focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies. Ski run segment known as the Olympic Downhill Traverse needs maintenance.				
NV-4								
35	BMP Retrofit Project		Stagecoach Parking Lot	Full BMPs are needed at this facility to decrease the ERA of NV-4 to below the allowable TOC	--	--		Future Capital Project
36	Ski Run Segment Revegetation	NV-4 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program Monitoring The Tahoe Rim Trail was relocated and the existing trail segment was decommissioned by the Tahoe Rim Trail Association (TRTA). TRTA has agreed to re-decommission it in 2014 due to continued use by hikers. Lower Stagecoach Trail has a small number of specific areas lacking effective cover to be retreated. It is the only ski trail in the watershed.	2012	On-going	Heavenly Mountain Operations Staff	Partial

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
NV-4A **37**	R557-R562 (Road Segments R557-R562 are located in NV-4 and NV-5)	Nevada Trail (was Wayhome)	Phase I Projects will utilize these road segments	Forest Service to advise as to need for Pre- and Post project maintenance Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	2007	On-going	Heavenly Project Records	Yes On-going Road Maintenance
38	Ski Run Segment Revegetation	NV-4a Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program Monitoring Perimeter Run treated with wood chips in 2011 as part of implementing Trail U3	2011	2011	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes
NV-5								
39	R545-R550	Nevada Trail (was Wayhome)	Phase I Projects will utilize these road segments **(Not Implemented)**	Forest Service to advise as to need for Pre- and Post project maintenance Existing road still in use and is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	2007	On-going		Yes
40	Ski Run Segment Revegetation	NV-5 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program Monitoring Upper Stagecoach Trail is extremely well-vegetated with effective cover. Additional maintenance or treatment is	2008	2009	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary,	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	Sediment Source (CWE Model)	Road/Run/ Facility Name	2007 Master Plan Capital Project Linkage	CWE Restoration Project Description	Project Start Date	Project Completion Date	Data Source	CWE Program Implementation Credit
				not necessary. Revegetation and wood chips using the "Full Hogan" prescription were added to several segments of the existing Stagecoach trail as part of a snowmaking improvements project resulting in effective cover. Monitoring of effective soil cover and specification of erosion control treatments have evolved over the monitoring period, in consultation with the USFS and Lahontan. The initial focus on soil cover has been broadened to include infiltration potential, slope, and surface roughness. The 2011 CMR put forth this expanded approach, and implementation is under development with the relevant agencies			Heavenly Mountain Operations Staff	
PHASE II								
CA-1								
41	Patsy1-6	Run E1	Replace Lift E	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring General run maintenance last completed in 2006	2006	2006	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
42	R148-149	Groove/Upper Shop Road	Remove Lift F	Forest Service to advise as to need for Pre- and Post project maintenance General road maintenance completed in 2008	2008	2008	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Future Capital Project
43	R528-R530 (Road Segments R228-R530 located in NV-2+5)	Lift HH	Construct Lift HH **(Lift at Von Schmits – Built 2009)**	Forest Service to advise as to need for Pre- and Post project maintenance (road in summer, transport lift in winter) Road is treated annually as part of opening summer mountain access. Daily Summer dust abatement watering program	2009	On-going	RCI Photo Documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes On-going Road Maintenance
44	Bettys6-9	Run H6	Construct Run H12/Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
45	Ridge1-5	Run 3	Construct Run H13/Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	Sediment Source (CWE Model)	Road/Run/ Facility Name	2007 Master Plan Capital Project Linkage	CWE Restoration Project Description	Project Start Date	Project Completion Date	Data Source	CWE Program Implementation Credit
46	Groove1-5	Run E2	E2 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
47	Watrfall1	Run G4	G4 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
48	PwdrblRn1-7	Run G8	G8 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
49	PowdrBwl1-4	Run G8	G9 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
50	Bettys1-5	Run H5	H5 Snowmaking (below ground)	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
51	ElleSwng1-3	Run I2	I2 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
--	No Project	No Project	GG2 Snowmaking		--	--		No Project required
52	FORTY9ER1-4	Run GG5	GG5 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
53	In-ground Halfpipe	Run H11	Construct along Run H11	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
--	No Project	No Project	HH2 Snowmaking		--	--		No Project required
--	No Project	No Project	HH3 Snowmaking		--	--		No Project required
54 **(Same as #9)**	R155-R156	Vehicle Maintenance Shop at Top of Tram	Remodel and Expand Facility **(Implemented 2006-2008)**	May require pre- and post project road work per review by Forest Service; rock-lined drainages are difficult to clean out due to the design implemented, but maintenance is	2007	On-going	RCI Photo Documentation; BMP Effectiveness Monitoring	Yes On-going Road Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				necessary; maintenance of revegetation of cut and fill slopes; waterbar/rolling dip repairs Road improvements implemented per project design plans. Existing road is partially paved and maintained annually as part of summer road maintenance. Road base added to switch back corner (2013)			Annual Report; Construction Season Summary; RCI Plan Set; Heavenly Project Records	
55	R250-R256	Von Schmidt Road/Run	10 Snowmaking	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
56	General Revegetation/Landscaping	General Revegetation/ Landscaping	Construct Top of Gondola Lodge **(Implemented 2010/Tamarack Lodge)**	Landscaping Plan	2007	On-going	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes
57	R127-R136	California Breakover/Helwinkle's	Construct Top of Gondola Lodge **(Implemented 2010/Tamarack Lodge)**	Forest Service to advise as to need for Pre- and Post project maintenance In 2010, RCI designed and we implemented a road drainage improvement project for the upper road section near the top of Cal Trail Breakover.. Road base to nearly the entire length of roadway most recently in 2013	2010	2013	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
58	General Revegetation/Landscaping	General Revegetation/ Landscaping	Expand Tubing at Top of Gondola **(Implemented in 2009)**	Landscaping Plan	2007	On-going	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes
59	Ski Run Segment Revegetation	CA-1 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	Yes On-going Ski Run Maintenance
CA-4								
60	Communication site Access Road	Communication site Access Road	Angel's Roost **(Implemented in 2011)**	Forest Service to advise as to need for Pre- and Post project maintenance Access road decommissioned (soil loosening, amendments, seed, mulch)	2012	2012	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
61	Ski Run Segment Revegetation	CA-4 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary, Heavenly Mountain Operations Staff	On-going Ski Run Maintenance
CA-6								
62	Ski Run Segment Revegetation	CA-6 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		On-going Ski Run Maintenance
63	Site Clean up		Relocate Lower Shop off-site		--	--		Future Capital Project
CA-7 **--**	No Project				--	--		No Project required
NV-1								
64	BIGDIP1-4	Run V4	Construct V11 **(Implemented 2011)**	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program	X	X		No

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
65	Ski Run Segment Revegetation	NV-1 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
NV-2+5								
66	R620A	R620A	Replace Lift U	Maintenance of BMPs (waterbars) and Run Revegetation	--	--		Future Capital Project
67	R531-R539	Upper Wayhome (Ski Run 6)	Phase I Project to realign Ski Run 6	Now called Nevada Trail; Phase I project to realign this road/ski run segment; abandoned road segment will be decommission and revegetated in accordance with Forest Service standards and guidelines for decommissioned roads;	--	--		Future Capital Project
--	No Project	No Project	Construct Run U4/Snowmaking		2011	2011		No Project Required
68	ORIONS 9-11	Run V9	Construct Run V12/Snowmaking **(Implemented in 2007)**	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	X	X		No
--	No Project	No Project	Construct Run 14/Snowmaking **(Implemented in 2010)**		--	--		No Project Required
	No Project	No Project	Construct Run 15/Snowmaking **(Implemented in 2010)**		--	--		No Project Required

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
69	PERIMIR5-9	Run U1	Snowmaking U1	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
70	R649-R655	Lower Galaxy/Stump Piles	Snowmaking U2	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
71	R584-R585	Knob Trail	Snowmaking V3	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
72	R609	Lower Dipper Return	Snowmaking V5	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
73	Jack1-3	Run W2	Snowmaking W2	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
74	Ski Run Segment Revegetation	NV-2+5 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		Future Capital Project
NV-3								
75	R631-R632 and NB Access Road	Base of North Bowl/Boulder and NB Access Road	Replace Lift Q	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
76	OLYMPIC4-9	Run S1	Snowmaking S1	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
--	No Project	No Project	Snowmaking S2	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		No Project Required
--	No Project	No Project	Snowmaking S3	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		No Project Required
77	R519-R522	Pepi's	Snowmaking S4	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
78	R599-606A	Old NV Fuel Island	Snowmaking S6	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
79	R599-606A	Old NV Fuel Island	Snowmaking S7	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Capital Project not implemented/CWE Restoration Project not triggered
80	Ski Run Segment Revegetation	NV-3 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area	On-going	On-going		On-going Ski Run Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
				Monitoring				
NV-4								
81	R560-R563	Middle Wayhome/Nevada Trail	R2 Snowmaking	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Capital Project not implemented/CWE Restoration Project not triggered
82	BMP Retrofit Project	BMP Retrofit Project	Stagecoach Deck and Parking Lot	BMP Parking Lot and Revegetate Areas Disturbed by Deck Expansion	--	--		Future Capital Project
83	Ski Run Segment Revegetation	NV-4 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
NV-4A								
84	PERIMTR5-9	Run U1	Construct Run U3/Snowmaking **(Implemented in 2010)**	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	X	X		No
85	Ski Run Segment Revegetation	NV-4A Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
NV-5								
86	R566-R570	Access to Olympic Downhill	Construct Run R3	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
87	R662-R664	George's	Construct Run R4	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
88	R545-R548	Lower Wayhome/Nevada Trail	Construct Run 16	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
--	No Project	No Project	Construct Run 18		--	--		No Project Required
89	UPRSTG1-4	Run R1	R1 Snowmaking	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program Monitoring Snowmaking corridor treated in 2008 and 2009 and remains effective. The remaining area of Upper Stagecoach Trail is well-vegetated with effective cover. Additional maintenance or treatment is not necessary.	2008	2009	RCI Photo documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Yes
90	Ski Run Segment Revegetation	NV-5 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
PHASE III								

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
CA-1								
91	Upmombo1-2; MOMBOMED1-5	Mombo (Run G6) and Mombo Meadows (Run G5)	Extend Lift A	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
92	R268	J Lift Access Road	Construct Lift J	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
93	R159, R159A, R160; PIONRPMA1-2	Pioneer Water Tank Road/Pioneer Poma	Replace Lift N **(Implemented in 2008)**	Road Maintenance; Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring Lift replaced in 2008. Road to old water tank was decommissioned and fully recontoured in 2011. Also, ski run along Pioneer Poma got full restoration treatment in 2013 (all water bars removed).	2018	2013	RCI Photo Documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Yes
94	R76-R80	Creek Station	Patsy's Hut/Snow Beach Expansion **(Implemented in 2010)**	Road Maintenance; Maintenance of BMPs (waterbars and sediment basins) and Revegetation of lift areas; Forest Service to advise as to need for Pre- and Post project maintenance Road is treated annually as part of opening summer mountain access Daily Summer dust abatement watering program. Umbrella Bar was relocated in 2010. Road segments 76-80 were treated in 2010 and 2011.	2010	On-going	RCI Photo Documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Yes

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
95	R90-R94/I5-4-6	Sky Meadows East/Run I1	Replace Lift I	Road Maintenance; Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
96	Ski Run Segment Revegetation	CA-1 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
CA-4								
97	Ski Run Segment Revegetation	CA-4 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
CA-6 --	No Project		Relocate Snowmaking Building		--	--		No Project Required
98	LrGnbrl1-3	Run B2	Replace California Lodge	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
99	Ebowl1-5	Run B1	Replace Lift A	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
100	CA Parking Lot		Kid's Camp at CA Base **(Implemented 2008)**	Maintenance of Parking Lot BMPs	On-going	On-going		Yes
101	WbolPom1-5	Runs K1 and K2	Replace Lift K	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
102	WbolPom1-5	Runs K1 and K2	Replace Lift L	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
103	WbolPom1-5	Runs K1 and K2	Replace Lift M	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	--	--		Future Capital Project
104	Ski Run Segment Revegetation	CA-6 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
CA-7								
105	R264-R267	Analyze effects of change in use from emergency to transport	Construct Mid-station Restaurant	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
NV-1								
106	R272-275	Sand Dunes Access Road	Construct Sand Dunes Restaurant/Lodge/Access Road	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
107	R594-R596	Orion's Road	Construction Sand Dunes Restaurant Lodge/Access Road	Segments to be decommissioned upon completion of Sand Dunes Access Road	--	--		Future Capital Project
108	R622-R627	Mott Canyon Base	Replace/Relocate Lift DD	Pre-project creek crossing enhancement/Post-project road maintenance; Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
109	R616-617	Mott Canyon Top	Replace/Relocate Lift DD	Decommission road segments upon removal/relocation of lift	--	--		Future Capital Project
110	Ski Run Segment Revegetation	NV-1 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
NV-2+5								

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
111	Ski Run Segment Revegetation	NV-2+5 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
NV-3								
112	R250-R250A; R500-R504	Von Schmidt's To East Peak	Expand East Peak Maintenance	Forest Service to advise as to need for Pre- and Post project maintenance	--	--		Future Capital Project
113	Edgewood Bowl Maintenance	Edgewood Bowl Maintenance	Construct Boulder Base Area and Skiers Services Building	Maintenance of SEZ Project	2011	2011		Future Capital Project
114	Edgewood Bowl Maintenance	Edgewood Bowl Maintenance	Expand Deck at Existing Lodge	Maintenance of SEZ Project	2012	2012		Future Capital Project
115	Ski Run Segment Revegetation	NV-3 Ski Run segments	General maintenance of revegetation projects **- No Records Kept**	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
NV-4								
116	Ski Run Segment Revegetation	NV-4 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance
NV-4A								

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
117	U3	Ski Run U3	Construct U3/Snowmaking **(Implemented in 2010)**	Adapted and Approved ESRHRP Prescriptions Ski Run U3 (Outlaw Trail) implemented without snowmaking	2010	2011	RCI Photo Documentation, BMP Effectiveness Monitoring Annual Report, Construction Season Summary	Yes
118	U4	Ski Run U4	Construct U4/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project
NV-5								
119	Z1-1,2,3	Run Z1	Construct Z1/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project
120	Z2-1,2,3	Run Z2	Construct Z2/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project
121	Z3-1,2,3	Run Z3	Construct Z3/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project
122	Z4-1,2,3,4	Run Z4	Construct Z4/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project
123	Z5-1	Run Z5	Construct Z5/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project
124	Z7-1,2,3	Run Z7	Construct Z7/Snowmaking	Adapted and Approved ESRHRP Prescriptions	--	--		Future Capital Project

PHASE I, II and III Restoration					Project Recordkeeping			
Watershed/ Project Number	**Sediment Source (CWE Model)**	**Road/Run/ Facility Name**	**2007 Master Plan Capital Project Linkage**	**CWE Restoration Project Description**	**Project Start Date**	**Project Completion Date**	**Data Source**	**CWE Program Implementation Credit**
125	Ski Run Segment Revegetation	NV-5 Ski Run segments	General maintenance of revegetation projects	Maintenance of Ski Run BMPs (waterbars and sediment basins) and Revegetation; Determined annually as part of the revised Environmental Monitoring Program and Updated Discharge Permit General Ski Area Monitoring	On-going	On-going		On-going Ski Run Maintenance

Appendix 3.1-F of Epic Discovery EIR/EIS/EIS

INTEGRATED ENVIRONMENTAL
RESTORATION SERVICES, INC

SKY BASIN (UPPER CA-1 WATERSHED)
EROSION ASSESSMENT

Prepared by

Kevin Drake, CPESC

Integrated Environmental Restoration Services, Inc.

August 2014

COMMON GROUND • UNCOMMON SOLUTIONS

P.O. BOX 7559 • 2780 LAKE FOREST ROAD • TAHOE CITY, CA 96145

OFFICE: 530.581.IERS (4377) • FAX: 530.581.0359

CA Contractor #762506 • NV Contractor #47205A

www.IERStahoe.com

Table of Contents

BACKGROUND

This erosion assessment implements the effective soil cover monitoring requirement of the Master Plan Amendment 2007 (MPA 07) mitigation measure 7.5-2. Mitigation measure 7.5.2 details the on-going Environmental Monitoring Program that was originally developed and implemented by the Forest Service as part of the Master Plan 1996 EIR/EIS/EIS. The Environmental Monitoring Program was subsequently updated and included in the MPA 07 and is now jointly overseen by the Tahoe Regional Planning Agency (TRPA), USDA Forest Service, and California Water Quality Control Board – Lahontan Region (Lahontan).

The effective soil cover monitoring protocols outlined in the ongoing Environmental Monitoring Program did not prove to be robust enough in past years. As a result, the erosion-focused rapid assessment methodology (described below) began to replace previous protocols in 2013 in an effort to develop a more prioritized framework for addressing watershed erosion issues. An initial summary of erosion hot spots in the CA-1 watershed was provided in the Mitigation and Monitoring Plan Annual Report (October 2012-September 2013). The erosion assessment in Sky Basin builds on a broader erosion assessment for the entire Heavenly Valley Creek watershed (CA-1) that began in 2013.

ASSESSMENT OVERVIEW

The Sky Basin erosion assessment was conducted on July 22, 2014 in the drainage area above Sky Meadows, in the upper portion of the CA-1 watershed. The assessment utilized the erosion-focused rapid assessment (EfRA) methodology described in the *Watershed Management Guidebook* (Drake et al. 2012 - http://www.ierstahoe.com/pdf/research/watershed_management_guidebook.pdf). This methodology focuses on identifying the primary sources of erosion ("hot spots") through a simple GIS-based flow accumulation mapping exercise followed by targeted on-the-ground assessment. This approach is based on developing an understanding of water flow patterns in the watershed to address the root cause(s) of erosion issues (often a failed water bar or other concentrated drainage features) rather than using modeling and extrapolation to make statements about the theorized condition of the entire watershed. The output of the EfRA process is a matrix of field-assessed hot spots with qualitative ranking criteria, associated maps and photos. This information can be used to prioritize erosion hot spots for treatment within a watershed context. That is, hot spots with high erosion potential (or actual observed erosion) and high hydrologic connectivity to surface waters are generally ranked as higher priorities and hot spots with lower erosion potential and/or connectivity to surface water are ranked as lower priorities.

EROSION HOT SPOT RANKING CRITERIA AND SUMMARY MATRIX

- **Erosion Risk (high/medium/low – H/M/L):** combination of soil and site factors that directly influence erosion potential such as soil density/compaction, slope angle (steepness), total surface cover, and presence of flow concentration features (e.g. gully, water bar).
- **Active Erosion (Y/N):** visual evidence of erosion observed.
- **Active Deposition (Y/N):** visual evidence of sediment deposition observed.
- **Proximity to Stream/SEZ (H/M/L):** distance from hot spot to nearest ephemeral drainage, stream or SEZ (as the crow flies). Categories are: L = >500ft, M = 100-500ft, H = <100ft
- **Connectivity to Stream/SEZ (H/M/L):** likelihood of runoff and sediment from hot spot being transported to a drainage, stream or SEZ. Assessing connectivity requires basic understanding of hydrologic processes

and a keen eye in the field, yet can be somewhat subjective. In general, high connectivity is characterized by a well-defined drainage path with minimal potential for storage or infiltration (e.g. a relatively steep gully/ditch). Low connectivity is generally characterized as having broad topographic definition and little to no evidence of recent concentrated flow.

- **Overall Priority (H/M/L):** This is a synthesis of the five criteria above and provides a relative priority for treating hot spots. The most important factors considered here are the magnitude of the erosion source and the likelihood of sediment reaching Sky Meadow or Heavenly Valley Creek above the reservoir.

Note: numbering of hot spots in the matrix does not begin at 1 because it is a continuation of erosion assessment work in the CA-1 watershed that began in 2013. New hot spots are numbered sequentially from where the 2013 assessment left off. Hot spots 6, 7, and 13 were initially identified in 2013 and are included in this assessment because of their location within Sky Basin. Hot spots identified during the more recent 2014 assessment are numbered sequentially beginning with hot spot 30.

Table 1. Heavenly Erosion Hot Spot Summary Matrix (Sky Basin Drainage Area – Upper CA-1 Watershed)

Hot Spot #	Type	Erosion Risk	Active Erosion	Active Deposition	Proximity to Stream/SEZ	Connectivity to Stream/SEZ	Overall Priority	Problem Description	Treatment Recommendation(s)
6	Water Bar	H	Y	Y	L	L	L	Giant sediment plume and incising WBs downslope of road, all caused by concentrated road runoff	re-direct road runoff away from slope, then remove WBs on slope and stabilize with full restoration treatment (~15,000sf)
7	Gully	M	Y	Y	L	L	L	Road drainage to breached WB formed gully down fir-covered ski run.	maintain drainage to WB on ski run; rake out gully; apply thick mulch to lower ski run above road (~2500sf)
13	Water Bar	H	Y	Y	M	H	H	water bar draining to reservoir	install PN wattles as sediment forebay; create small infiltration swale at WB outlet (~500sf)
30	Disturbed area	L	N	Y	H	H	M	bare and poorly vegetated area under Sky Deck (~3000sf)	restoration and planting shade-tolerant meadow/riparian species
31	ski run	M	Y	Y	H	H	H	erosion from bare ski run area above road (and on road) directly to meadow below	full restoration treatment (~2500sf)
32	swale	M	Y	Y	H	H	H	rock-lined swale around Canyon base filled with sediment; sediment plume into meadow	remove sediment and rebuild rock-lined swale; install several mulch filter berms in swale; remulch lift loading areas as needed to maintain surface mulch (~500sf)
33	ski run	H	Y	Y	H	M	H	steep ski run (lower double down) with low surface cover and sparse trees; water bar near bottom of run filled with sediment and overtopped	rehab water bar and convert to infiltration swale; install several mulch berms on ski run OR cover lower portion of ski run with mulch (1500-15,000sf, depending on treatment)
34	ski run	H	Y	Y	H	H	H	steep ski run (lower ridge run/sky chute) with little surface cover and widespread erosion; several v-shaped water bars direct water to a culvert system that leads to meadow and several water bars have overtopped (causing erosion below)	rehab water bars and convert to infiltration swales; install several mulch berms on ski run OR cover ski run with mulch (2500-15,000sf, depending on treatment)
35	road	M	N	N	H	H	H	bare, compacted vehicle turnaround and access to Sky lift	maintain wood chip mulch cover on turnaround area near creek (~500sf)

Hot Spot #	Type	Erosion Risk	Active Erosion	Active Deposition	Proximity to Stream/SEZ	Connectivity to Stream/SEZ	Overall Priority	Problem Description	Treatment Recommendation(s)
								base, which is ~20ft from creek channel	
36	water bar	H	Y	Y	M	H	H	water bar draining road is causing erosion under large ski run sign, compromising power box, and contributing runoff and sediment to ski run below (lower ridge run - hot spot 34)	create spreading/infiltration area at water bar outlet and add pine needle filter berms to trap sediment (~500sf)
37	water bar	H	Y	Y	L	H	H	road drainage collects at V-shaped water bar with culvert direct to meadow; erosion along water bar (head cutting); water bar overtopped at culvert inlet, causing erosion downslope	rehab water bars and convert to infiltration swales; rake out and mulch rills (~1000sf)
38	water bar	H	Y	Y	L	H	H	road drainage directed along water bar on ski run; erosion along water bar and downslope where water bar overtopped	rehab water bars and convert to infiltration swales; also rebuild water bar on roadway; ; rake out and mulch rills on ski run (~1000sf)
39	ephemeral drainage	H	Y	Y	L	H	L	large ephemeral drainage; lots of woody debris in flow line and moderate mulch cover in surrounding areas	no action recommended
40	water bar	H	Y	Y	L	M	L	many water bars on high roller ski run above and below summer road; many have failures where they have overtopped, causing erosion downslope	rehab water bars at failure points and convert into infiltration swales through soil loosening, wood chip incorporation (~10,000-15,000sf)
41	water bar	H	Y	Y	L	H	M	ski run (upper ridge run) with ~6 eroding water bars that direct runoff into large drainage that eventually outlets at the Canyon lift base and connects to Sky Meadow; many water bars have failures.	rehab water bars at failure points and convert into infiltration swales through soil loosening, wood chip incorporation (~10,000-15,000sf)

Hot Spot #	Type	Erosion Risk	Active Erosion	Active Deposition	Proximity to Stream/SEZ	Connectivity to Stream/SEZ	Overall Priority	Problem Description	Treatment Recommendation(s)
42	stream channel	M	N	N	H	H	M	south fork of SEZ channel above Sky Meadow culvert with mostly bare soil and moderately steep slopes on both sides of channel; old decomposed jute and plastic netting observed from previous USFS erosion control efforts; generally no visible erosion from banks; channel is somewhat straight and incised but no significant head cuts or bank erosion observed	definitely potential for restoration/stabilization of banks (loosening/seeding/mulch - no fabric); approx ~5000sf of bare soil along channel
43	stream channel	M	Y	Y	H	H	M	bank erosion and sediment plume in south fork of SEZ channel above Sky Meadows culvert	bank stabilization/restoration treatment (loosening/seeding/mulch - no fabric); ~300sf
44	stream channel	M	Y	Y	H	H	M	sediment plume in south fork of SEZ channel above Sky Meadows culvert; sediment appears to have come from short section of rock-lined swale upslope of creek; no obvious bank erosion	decommission rock-lined swale, which appears to unnecessarily collect dispersed runoff from rocky slope above it (~1000sf)
45	water bar	H	Y	Y	H	H	H	very steep section of road (Hellwinkle's) is delivering sediment downslope into a fingered section of the north fork of the SEZ channel above Sky Meadows culvert; rills and gullies formed on hillslide below road and above channel	stabilize rills/gullies on hillside, and address road runoff. Road options: 1) surface and/or pave road; 2) decommission road and use only for emergency access; 3) improve infiltration capacity and conduct very frequent maintenance at sediment basins along road (~1000-5000sf)
46	water bar	H	Y	Y	H	H	H	very steep section of road (Hellwinkle's) is delivering sediment downslope into a fingered section of the north fork of the SEZ channel above Sky Meadows culvert; minor rilling on hillslide below road and above channel	options: 1) surface and/or pave road; 2) decommission road and use only for emergency access; 3) improve infiltration capacity and conduct very frequent maintenance at sediment basins along road (~1000-5000sf)

Hot Spot #	Type	Erosion Risk	Active Erosion	Active Deposition	Proximity to Stream/SEZ	Connectivity to Stream/SEZ	Overall Priority	Problem Description	Treatment Recommendation(s)
47	ephemeral drainage	M	Y	Y	L	H	L	large ephemeral drainage at crossing with lower Cal trail; relatively stable and well vegetated with small meadow below road crossing; evidence of flow during recent rain events but no obvious sediment transport	no action recommended
48	gully	M	Y	Y	L	M	L	well-established gully formed at downslope end of lower Cal trail; collects water from large drainage area; moderate amount of erosion and deposition observed from recent rain storm	full restoration treatment along gully (maintain general swale-like shape) to slow and infiltrate surface runoff during spring snowment and rain storms; installation of mulch filter berms would provide short-term benefits (~1500sf)
49	ski run	H	Y	Y	H	M	H	steep ski run (lower Ellie's) with compacted soil, moderate veg cover, and visible rilling; water bar near bottom of run filled with sediment and overtopped in several locations	rehab water bar and convert to infiltration swale; install several mulch berms on ski run OR cover lower portion of ski run with mulch (1500-15,000sf, depending on treatment)

EROSION HOT SPOT PHOTOS

Table 2. Heavenly Erosion Hot Spot Photo Summary

Hot Spot #	Photo 1	Photo 2
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EROSION HOT SPOT MAPS

See next page.

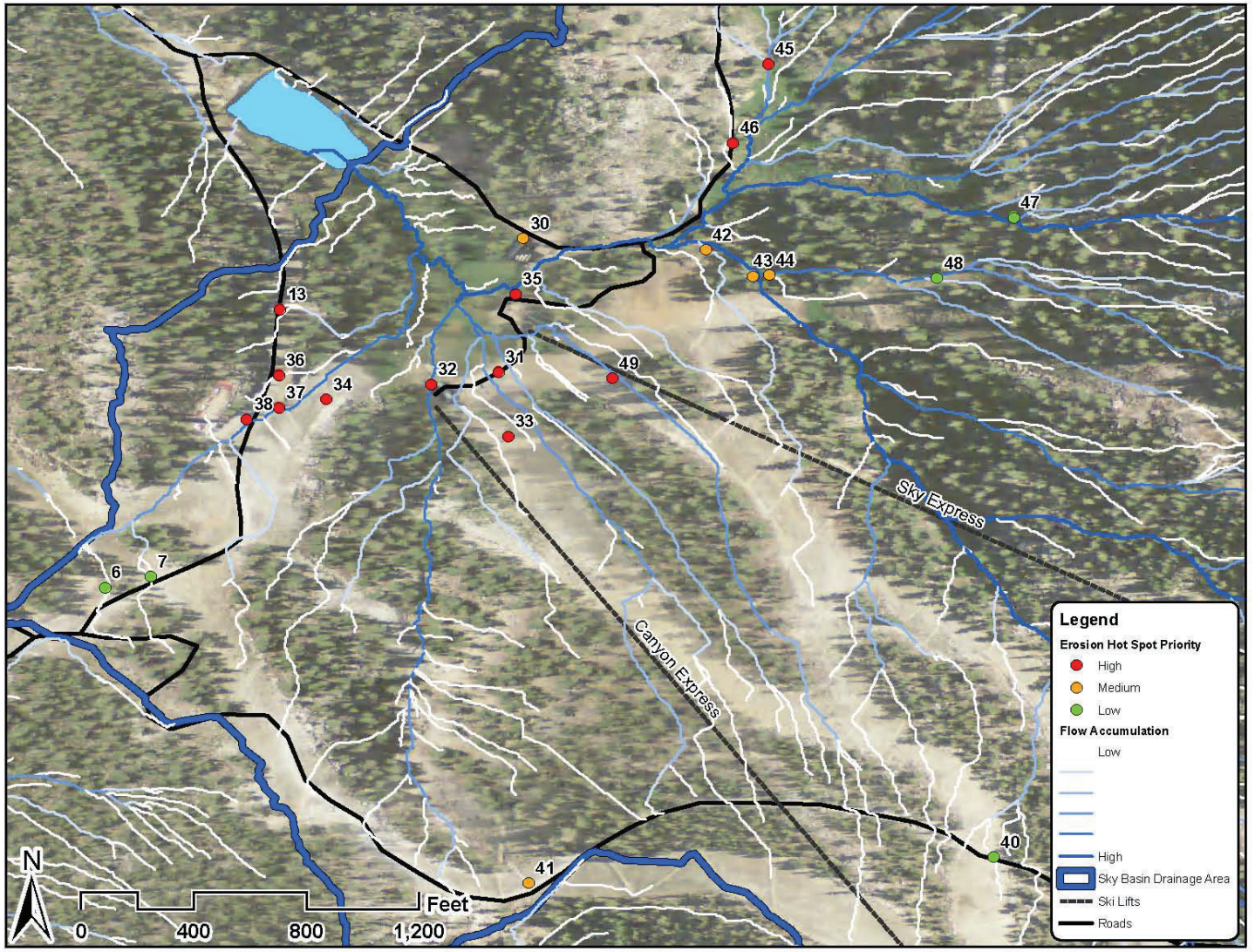
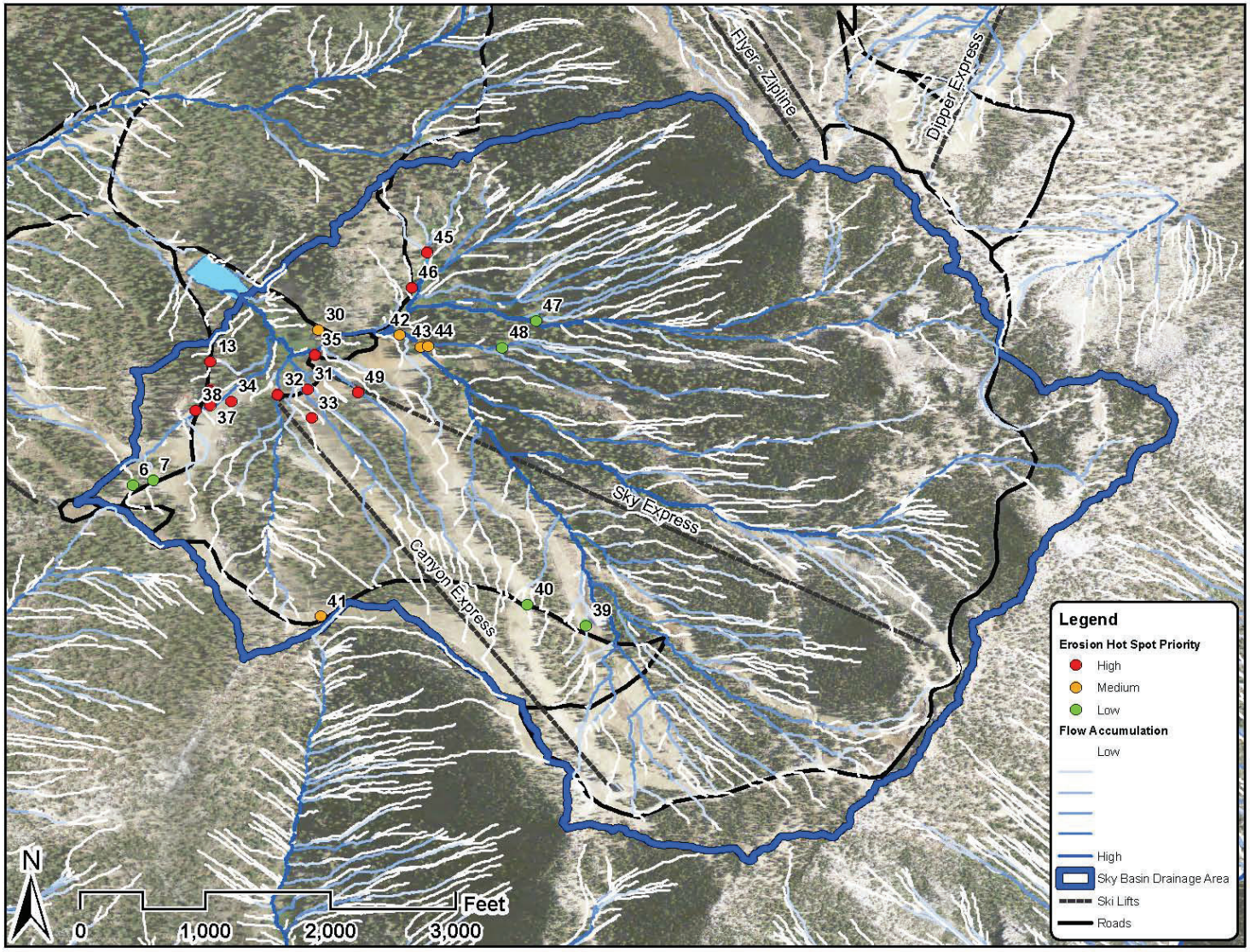


Figure 1. EfRA Summary Map showing hot spots in Sky Basin (CA-1).



Map Prepared by Kevin Drake, IERS, Inc. July 2014. Data Sources: Vail Corp, RCI, IERS, USGS

Figure 2. Summary Map showing hot spots in Sky Basin (CA-1), zoomed out to show entire Sky Basin drainage area.

LITERATURE CITED

Drake, K. and M. Hogan. 2012. Watershed Management Guidebook: An Outcome-Based Guide to Watershed Management. Prepared for the California State Water Resources Control Board. Available online at: http://www.ierstahoe.com/pdf/research/watershed_management_guidebook.pdf

Attachment C

Watershed and TMDL Target Evaluation Criteria

Water Quality Rating Criteria

Excellent:	All water quality parameters meet State and Tahoe Basin standards; water quality concentrations for all parameters are decreasing
Good:	Most water quality parameters meet State and Tahoe Basin standards; water quality concentrations for most parameters are decreasing compared to baseline data, while others are stable
Fair:	Some water quality parameters meet State and Tahoe Basin standards; water quality concentration for some parameters are decreasing compared to baseline, while others are stable
Poor:	No water quality parameters meet State and Tahoe Basin standards; water quality concentrations are increasing for some parameters

Stream Condition Rating Criteria

Excellent:	All channel conditions are stable or improving
Good:	Most channel conditions are stable or improving
Fair:	Some channel conditions are stable or improving
Poor:	Most channel conditions are not stable or improving

BMP Effectiveness Rating Criteria

Excellent:	90% of BMPs implemented correctly and functioning effectively; no evidence of sediment leaving the site and entering the stream channel
Good:	75% to 90% of BMPs implemented correctly and functioning effectively; some evidence of sediment leaving the site, but no sediment reaching the stream channel
Fair:	50% to 75% of BMPs implemented correctly and functioning effectively; some evidence of sediment leaving the site, some sediment reaching the stream channel
Poor:	Less than 50% of BMPs implemented correctly and functioning correctly; evidence of sediment leaving the site, excessive sediment reaching the stream channel

Watershed Maintenance and Restoration Program (WMRP) Implementation

Excellent: All WMRP projects implemented and maintained according to Annual Work List timeline

Good: All WMRP projects implemented according to Annual Work List; but some project components need reestablishing (for example, reseeding is necessary on some revegetation sites)

Fair: Only partial implementation of Annual Work List projects has been achieved according to timeline; or Annual Work List projects are one year behind schedule

Poor: No Annual Work List projects have been implemented, or Annual Work List projects are two years or more behind schedule

Overall Watershed Condition

Overall watershed condition is a qualitative evaluation that considers water quality, erosion monitoring, channel condition and BMI scores (when available).

Overall Watershed Trend

Trend evaluations gauge overall watershed condition to determine if ski area management activities are improving or degrading water quality and ecological health. The ratings are as follows:

Much Improved: Watershed condition (as measured by water quality, effective soil cover, channel condition, and BMP and CWE project implementation) greatly improved compared to 2005 conditions; all watershed components have improved

Improved: Watershed condition improved compared to 2005 conditions; most watershed components have improved

Stable: Watershed condition has remained more or less static as compared to 2005 conditions; some watershed components may have improved while others may have degraded

Degenerating: Watershed conditions have degraded; several watershed components have degraded while none have improved as compared to 2005 conditions

ATTACHMENT D

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

a. to enter upon premises in which an effluent source is located or in which any required records are kept;

b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements (WDRs);

c. to inspect monitoring equipment or records; and

d. to sample any discharge.

2. Reporting Requirements

a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.

b. Pursuant to California Water Code Section 13260 (c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances.

c. The Owners/Discharger of property subject to WDRs shall be considered to have a continuing responsibility for ensuring compliance with applicable WDRs in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the WDRs shall be reported to the Regional Board. Notification of applicable WDRs shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.

d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing, and correct that information.

e. Reports required by the WDRs, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or

refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation.

f. If the Discharger becomes aware that their WDRs (or permit) are no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their WDRs (or permit) be rescinded.

3. Right to Revise WDRs

The Regional Board reserves the privilege of changing all or any portion of the WDRs upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the WDRs may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and re-issuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the WDRs which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the WDRs. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs.

7. Waste Discharge Requirement Actions

The WDRs may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and re-issuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the WDRs conditions.

8. Property Rights

The WDRs do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the WDRs including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the WDRs shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the WDRs are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from treatment and disposal facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operation. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.

b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

MONITORING AND REPORTING PROGRAM NO. 2015-0021
WDID NO. 6A090033000

FOR

HEAVENLY SKI RESORT

_____El Dorado and Alpine Counties_____

I. GENERAL PROVISIONS

A. The monitoring and reporting program (MRP) must be conducted in accordance with the General Provisions for Monitoring and Reporting Programs (Attachment 1).

B. The Discharger must provide a certified cover letter (Attachment 2) with each MRP submittal to the Water Board.

II. ENVIRONMENTAL MONITORING PROGRAM

The Discharger must conduct the following monitoring activities as part of its Environmental Monitoring Program.

A. Water Quality Monitoring

1. Effluent and Receiving Water Sampling Stations - See Figures 1 and 2

   a. Heavenly Valley Creek – Station HVC-1a: at Sky Meadows
   b. Heavenly Valley Creek - Station HVC-2: near base of Patsy's lift.
   c. Heavenly Valley Creek - Station HVC-3: at LTBMU property line, approximately 0.4 miles upstream of Pioneer Trail.
   d. Bijou Park Creek - Station BPC-4: approximately 150 feet below northwest corner of Saddle Road and Wildwood Avenue.
   e. Hidden Valley Creek - Station HDVC-5: baseline/reference station, just above the confluence with Trout Creek.
   f. California Base - Stations HV-P1a and HV-P1b: both influent points to Storm Filter treatment vault.
   g. California Base - Station HV-P2: effluent from Storm Filter treatment vault.

2. Frequency of Water Quality Sampling

   Discharger must collect samples and analyze for each constituent at the frequency described in this section. The Discharger need not collect samples when locations are inaccessible due to snow, when the water is so low that a representative sample can't be taken, or when samples can't be taken due to

hazardous conditions. In these cases, the Discharger may shift sampling dates from those listed below. If samples are not collected, the Discharger must report the reasons why sampling could not be completed. The Discharger must record and report on weather conditions, including temperature and precipitation, for the time of sampling and for the previous day.

a. Heavenly Valley, Hidden Valley, and Bijou Park Creeks Receiving Water Sampling Locations – HVC-1a, HVC-2, HVC-3, BPC-4, and HDVC-5.

Monthly, plus bi-weekly (every two weeks) during spring runoff period. Spring runoff period typically occurs from April through mid-June. The duration of the spring runoff period should be evaluated based on stream hydrographs.

b. California Base Parking Area StormFilter™ Locations - HV-P1a, HV-P1b, and HV-P2.

Five runoff events per water year (October 1 – September 30 of following year). Samples must be collected to reflect both snow melt and rainfall runoff events to assess performance of StormFilter™.

3. Parameters to be Monitored

a. Receiving Water Sampling Locations at Heavenly Valley, Hidden Valley, and Bijou Park Creeks (HVC-1, HVC-2, HVC-3, HVC-4, and HDVC-5) – Flow rates must be measured using U.S. Geological Survey width-integrated discharge measurement procedures and grab samples must be collected and analyzed for the following:

Table 1

Parameter[1]	Minimum Reporting Limit
Total Nitrogen (TKN[2]+nitrate+nitrite)	0.01 mg/L
Total Phosphorus	0.01 mg/L
Turbidity	0.1 NTU
Suspended Sediment	1.0 mg/L
Chloride	0.1 mg/L

[1] Compliance with water quality standards expressed as annual averages must be calculated as the mean of monthly means for the 12-month water year (October 1 through September 30 the following year). Compliance with TMDL suspended sediment target of 58 tons/year must be calculated as a time- and flow-weighted mass per water year.
[2] Total Kjeldahl Nitrogen.

b. Influent and Effluent Sampling Locations for StormFilter™ at California Base Parking Area (HV-P1a, HV-P1b, and HV-P2) – Grab samples must be collected and analyzed for the following:

Table 2

Parameter	Minimum Reporting Limit
Oil and Grease with silica gel treatment	2 mg/L
Total Nitrogen (TKN+nitrate+nitrite)	0.1 mg/L
Total Phosphorus	0.01 mg/L
Turbidity	1 NTU
Chloride	0.1 mg/L

B. Heavenly Valley Creek Total Maximum Daily Load (TMDL) Monitoring

At locations HVC-1a, HVC-2, HVC-3, and HDVC-5, Heavenly must monitor the following to assess compliance with the Heavenly Valley Creek Sediment TMDL. Monitoring and calculation of annual suspended sediment loads at the LTBMU property line (sampling location HVC-3) must be conducted as required above in section II.A. Water Quality Monitoring.

1. At least once every four years corresponding with the second year of benthic macroinvertebrate (BMI) sampling intervals (see below) on Heavenly Valley Creek and Hidden Valley Creek, conduct U.S. Forest Service (USFS) Region 5 Stream Condition Inventory (SCI) surveys including the following metrics as described in the USFS SCI Handbook (Frazier et al. 2005, Stream Condition Inventory Technical Guide, USDA Forest Service, Pacific Southwest Region-Ecosystem Conservation Staff, Vallejo, CA); large woody debris, bankfull stage, cross-section, water surface gradient, width to depth ratio, entrenchment, habitat type, pools, streambank stability, streamshore water depth, streambank angle, and stream shading. SCI monitoring should generally follow after the bioassessment sampling, to avoid disturbance of instream habitats prior to bioassessment collections.

2. Concurrently with all benthic macroinvertebrate (BMI) sampling required in Section B(3), below, sample stream substrate for pebble count ("Module B") and cobble embeddedness ("Module C") in accordance with the State Water Board's Surface Water Ambient Monitoring Program (SWAMP) protocol "*Collecting Benthic Macroinvertebrate Samples & Associated Physical and Chemical Data for Ambient Bioassessments in California – Standard Operating Procedures Manual.*[3] The stream substrate and cobble embeddedness results and other site and method details (i.e., site name,

[3] Document may be found on the SWAMP website at http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#methods

location coordinates, sample date/time, etc.) must be submitted to the Water Board in electronic format using a completed Surface Water Ambient Monitoring Program (SWAMP) "Field Collection and Results Template" for habitat results. The most current version of SWAMP's Field Collection and Results Template (or an equivalent template compatible with the California Environmental Data Exchange Network, "CEDEN") must be used.

3. BMI community health must be monitored as follows:

i. Site Locations. Four sites will be monitored. Three stream reaches will be sampled along Heavenly Valley Creek: 1) at USFS property line (approx. 6,614 ft. elev.); 2) below Patsy's (approx. 7,921 ft. elev.); and 3) at Sky Meadows (approx. 8,540 ft. elev.); and one "control" stream reach will be sampled at Lower Hidden Valley Creek (approx. 6,642 ft. elev.)

ii. Sampling Frequency. Bioassessment monitoring must be conducted at all four sites at a frequency of two years on, two years off. Sampling frequency must be a continuation of the current schedule where bioassessment monitoring was last conducted in 2014 and 2015. The next sampling events are required in 2018 and 2019, etc.

iii. Index Period. Macroinvertebrate sampling must be conducted between July 1 and August 31, depending on flow conditions (i.e., sampling should occur earlier during the index period in dry years, and later in wet years, but always within the July-August index period).

iv. Field Methods. In collecting macroinvertebrate samples, the discharger must use the "Reachwide Benthos (Multihabitat) Procedure" specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007).[23]

v. Laboratory Methods. Macroinvertebrates must be identified and classified according to the Standard Taxonomic Effort (STE) Level 2 of the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT),[4] and using a fixed-count of 600 organisms per sample. Organisms of the family *Chironomidae* may be identified to the less-intensive level of subfamily.

vi. Quality Assurance. The Discharger or its consultant(s) must have and follow a quality assurance (QA) plan that covers the required bioassessment monitoring. The QA plan must include, or be supplemented to include, a specific requirement for external QA checks (i.e., verification of taxonomic identifications and correction of data where

[4] The STEs developed and maintained by SAFIT list the requirements for Level I and Level II taxonomic effort, and are located at: http://www.safit.org/ste.html. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at SAFIT's website.

errors are identified). External QA checks must be performed on one of the discharger's macroinvertebrate samples collected per calendar year, or ten percent of the samples per year (whichever is greater). QA samples must be randomly selected. The external QA checks must be paid for by the discharger, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used if approved in writing by Water Board staff. A copy of the QA plan must be provided to Water Board staff upon request.

vii. Sample Preservation and Archiving. For purposes of this MRP, the quoted terms are described as follows: The "original sample material" is that material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification. The "remaining subsampled material" is that material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but this needs to be verified via QA completeness checks.) The "identified organisms" are those organisms within the subsample that are specifically identified and counted.

The original sample material must be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material must be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms must be stored in 70 percent ethanol, in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms must be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, collection method). The identified organisms must be archived (i.e., retained) by the discharger for a period of not less than three years from the date that all QA steps are completed, and must be checked at least once per year and "topped off" with ethanol to prevent desiccation. The identified organisms must be relinquished to the Water Board upon request by any Water Board staff.

viii. Data Submittal. The macroinvertebrate results and other site and method details (i.e., site name, location coordinates, sample date/time, taxonomic identifications consistent with the specified SAFIT STEs, number of organisms within each taxa, etc.), must be submitted to the Water Board in electronic format using a completed Surface Water Ambient Monitoring

Program (SWAMP) "Taxonomy Results Template" for Benthic-Bioassessment-Algae. The most current version of SWAMP's Taxonomy Results Template (or an equivalent template compatible with the California Environmental Data Exchange Network, "CEDEN") must be used.

ix. Invasive Species Prevention. In conducting the required bioassessment monitoring, the Discharger and its consultants must take all reasonable precautions to prevent the introduction or spread of aquatic invasive species. At minimum, the Discharger and its consultants must follow the recommendations of the California Department of Fish and Game to minimize the introduction or spread of the New Zealand mudsnail.

C. Watershed Maintenance and Restoration Program (WMRP)

The Discharger must implement its ongoing WMRP. The WMRP includes both mitigation projects required under previous Master Plan Amendments (1996 and 2007) and identified projects where ongoing monitoring is needed. The following activities are required.

1. Track and report the status of mitigation/restoration projects included in the WMRP.

2. Complete an annual erosion hot spot assessment of the ski area and identify restoration projects to be completed. One assessment per year must be completed rotating each year between the Heavenly Valley Creek and Bijou Park Creek watersheds, except that, if hot spot assessment is needed in Nevada watersheds, the annual assessment may be completed on a rotating basis between the Heavenly Valley Creek, Bijou Park Creek, and Nevada watersheds. Therefore, the Heavenly Valley Creek and Bijou Park Creek watersheds must be assessed either once each every two years or once each every three years, depending on whether hot spot assessment is done in Nevada. The erosion assessment must be completed in accordance with the procedures presented in the Watershed Management Guidebook.[5] Report the results of the assessment annually. At a minimum, the assessment must identify the following items, the actions taken or to be taken to control or abate the erosion, and a schedule for completion:

   a. gully/rill erosion of slopes and graded ski runs
   b. erosion at culverts at drainage crossings
   c. degraded water bars

[5] Drake, K. and M. Hogan. 2013. Watershed Management Guidebook: An Outcome-Based Guide to Watershed Management. Prepared for the California State Water Resources Control Board.

d. failing energy dissipaters
e. erosion or sedimentation at drainage channels/ditches
f. erosion from water supply lines, snowmaking, and irrigation pipes

3. Develop and report an Annual Worklist that describes the significant maintenance and restoration projects to be completed during the summer (dry season) of each year. The Annual Work list must cover mitigation projects required from previous Master Plan commitments as well as projects identified by the annual erosion hot spot assessment. Projects should be prioritized based upon links or triggers to capital projects, erosion risk, site stability, and proximity/connectivity to surface waters.

4. Implement and report the results of the Construction Erosion Reduction Program, including the review of the temporary and permanent construction BMPs implemented at the Facility.

III. OPERATIONS AND MAINTENANCE PROGRAM

A. Facilities Maintenance Monitoring

Inspections must be made by the Discharger on a quarterly basis at all lodges, maintenance shops, and paved parking areas and roads where snow removal and deicing activities are conducted. Any erosion, surface runoff problems, wastewater disposal problems, or other adverse pollution conditions found must be clearly described along with the corrective measures taken to mitigate the conditions. In the event that no such problems are found, a statement certifying this condition must be included for each inspection.

Results of these inspections, focusing on identification of maintenance needs and the corrective measures taken, must be recorded and reported. At a minimum, the inspections must include the condition of drop inlets, drainage collection systems, traps and sediment vaults, culverts and outfalls, and drainage diversion structures. Inspections must check for:

1. blockage by debris, ice, or sediment
2. damage by vehicle or equipment
3. adequate energy dissipation
4. depth or volume of material accumulated in vaults oil separators, and sediment traps
5. filter conditions
6. eroding drainage conveyances or diversions
7. spilled or improperly stored chemicals exposed to weather (paints, fuels, sealants, oils, greases, anti-freeze etc.) at lodges and maintenance shops
8. any sewage disposal problems, and
9. parking lots and roads for sediment/sand build-up.

B. Snow Conditioning and Snowmaking Enhancement Monitoring

If snow conditioning or snowmaking enhancement chemicals or other additives are used on ski slopes (including tubing runs, half-pipes, jumps, or terrain parks), a log of the following information must be kept and reported:

1. location of application and type of material applied (including Material SafetyData Sheet)
2. dates of application
3. amounts of applications in terms of total pounds and pounds per acre
4. composition of the snow conditioning or snowmaking enhancement chemicals or other additives

C. Deicers and Abrasive Application and Recovery Monitoring

The quantity of ice control agents and abrasives used on Heavenly property and on City of South Lake Tahoe (CSLT) streets maintained by Heavenly must be recorded and reported. When the Discharger applies deicers and/or abrasives on parking lots, base facilities, private roads, or CSLT roads leading to the California Base area, the Discharger must keep a daily log and report a monthly summary of the following:

1. location and dates of applications, including street names if applied within CSLT
2. the rate and amount of each material applied daily, with subtotals for Heavenly property and CSLT streets

The quantity of material recovered from the roadways and BMPs must also be recorded and reported according to the method of recovery. The Discharger must keep a daily log and report a monthly summary of the following:

1. location and dates of maintenance, including street names if within CSLT
2. amounts of material recovered by maintenance activities
3. location of disposal facilities

Traction abrasives should meet or approach the requirements of Caltrans' "specification H" (Attachment 3) or similar. The properties of the material must be recorded and reported based on analyses of samples representative of each unique source material used. Abrasives must be analyzed for the parameters shown below. Alternative methods may be used upon approval by the Water Board Executive Officer.

Table 3

Parameter	Method
Total Moisture Content	CTM 226
Turbidity	Caltrans[6]
Sand Equivalent	CTM 217
Durability	CTM 229
Gradation	CTM 202

D. USFS Roads Monitoring

Conduct road monitoring in accordance with USFS protocols as required by Heavenly's Road Maintenance Agreement with the LTBMU for system roads, which is to be finalized by spring of 2015.

IV. ADDITIONAL REQUIREMENTS

A. 2015 MMP Mitigation Monitoring

The Discharger must monitor and report annually on the status of all mitigation measures included in the 2015 MMP that were developed under the CEQA process for the current and past MDPs.

B. Facilities and Watershed Awareness Training

The Discharger must annually inform ski area employees of the location and purpose of ski area erosion control improvements and will encourage employees to report possible maintenance needs to supervisors and the facilities manager. Confirmation of the training must be reported annually.

V. REPORTING

A. The following reports are required to be submitted to the Water Board.

[6] See Attachment 3 for Caltrans Method of Test for Turbidity Analysis of Traction Abrasives

Report	Report Contents
Quarterly Report	• Water quality monitoring of ski area (II.A) • Facilities maintenance monitoring (IV.B.)
Annual Report	• Water quality monitoring of ski area (II.A.) • Facilities maintenance monitoring (III.A.) • Snow conditioning and snowmaking materials (III.B.) • Deicers and abrasives application and recovery (III.C.) • USFS Roads Monitoring (III.D.) • Facilities watershed awareness training (IV.B.)
Mitigation and Monitoring Plan Report	Status of 2015 Master Plan MMP items
BMI Raw Data	Electronic file submittal of TMDL BMI data & metadata
Comprehensive Review	Include all Annual Report elements with the addition of Heavenly Valley Creek TMDL monitoring results (II.B.1, II.B.2., II.B.3). A comprehensive review of the status and trends of watershed and instream conditions relative to applicable rating criteria (Attachment B of WDRs). The comprehensive reviews cover a five-year period starting with the period of water years 2012 through 2016 and each subsequent five year period thereafter.

B. The above data, including sampling results and inspections, must be submitted to the Water Board in accordance with the schedule described below. The Discharger must provide copies of the laboratory data sheets and any field data sheets, and compile the data in a tabular form for review by the Water Board. The discharger must arrange the data in a tabular form so that the dates, the constituents, and the concentrations are readily discernible. The data must be summarized in such a manner as to clearly illustrate compliance with the discharge requirements. Reports must be submitted at the frequency listed below.

Monitoring Period	Report Due Date
October 1 – December 31	February 1
January 1 – March 30	May 1
April 1 – June 30	August 1
October 1 – September 30	January 15 (except years Comprehensive Review is due)
Water Year (October 1 - September 30)	May 1 of the following year
July 1 – August 31**	Electronic file submittal of TMDL BMI data & metadata within 30 days of receipt of analyses. BMI/SCI results discussion to be included with Comprehensive Review
October 1, 2011 – September 30, 2016, and every 5 years thereafter	January 15, 2017 and every 5 years thereafter

* Annual Report includes first three quarterly report periods plus the fourth quarter (July 1 – September 30) of the water year

** BMI Index period

Ordered By: Patty Z. Kouyoumdjian Date: May 14, 2015

PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

Figures:
1. Surface Water Sampling Locations
2. Storm Filter water quality treatment system sampling points

Attachments:
1. General Provisions for Monitoring and Reporting
2. Monitoring Report Certification Cover Page
3. Caltrans “Specification H” for road abrasives and turbidity test method

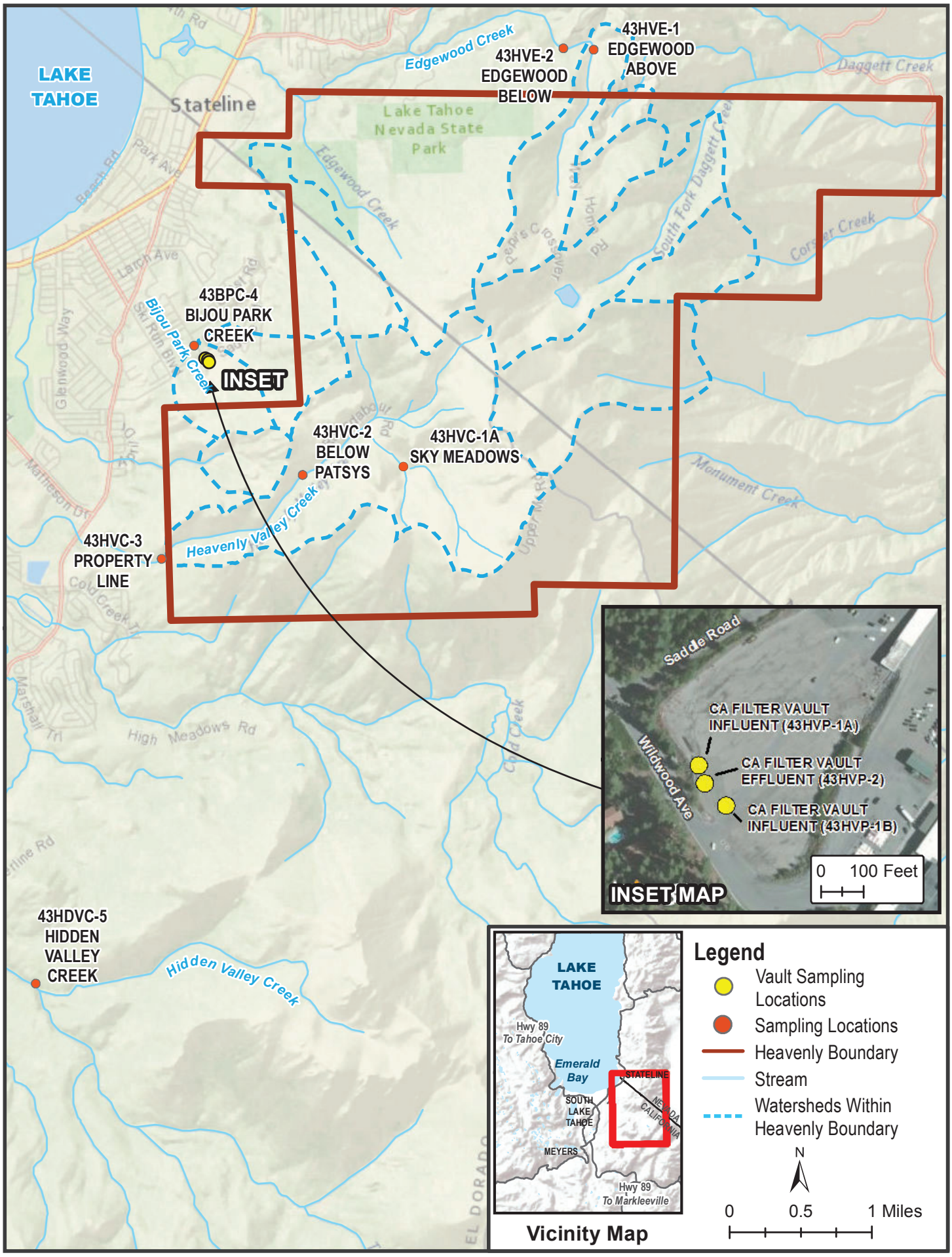


Figure 1

Date: 1/30/2015

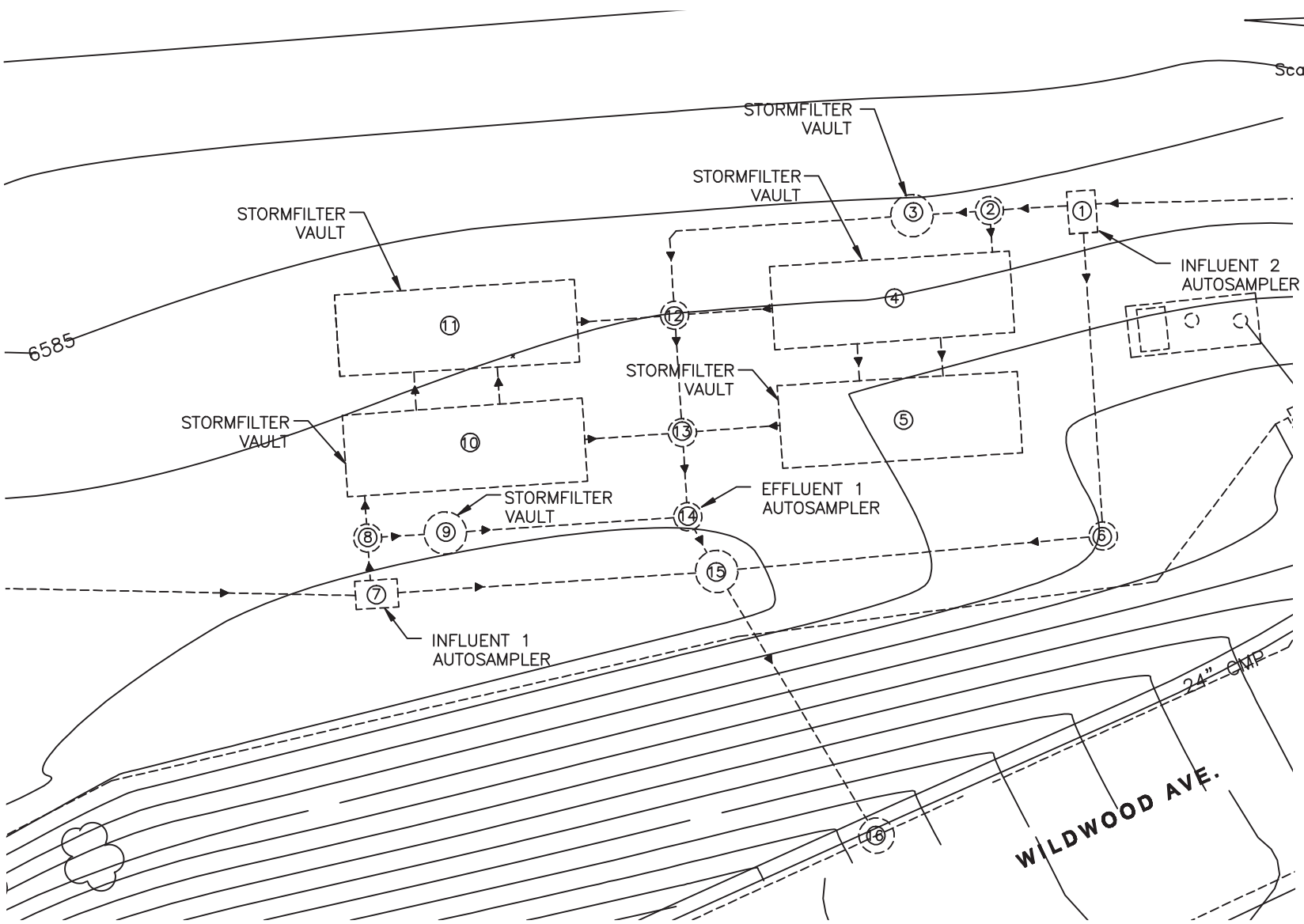


FIGURE 2
California Base Lodge Parking Lot
Storm Filter Water Quaility Treatment System

Prepared: 1/22/08

RESOURCE CONCEPTS, INC.

ATTACHMENT 1

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

i. Standard Methods for the Examination of Water and Wastewater

ii. Methods for Chemical Analysis of Water and Wastes, EPA

b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board Executive Officer. Specific methods of analysis must be identified on each laboratory report.

c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.

d. The Discharger shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. Pursuant to California Water Code Section 13267(b), all sampling and analytical results shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

ii. In the case of a partnership, by a general partner;

iii. In the case of a sole proprietorship, by the proprietor; or

iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the following:

i. Name and telephone number of individual who can answer questions about the report.

ii. The Monitoring and Reporting Program Number.

iii. WDID Number.

f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation under Section 13268 of the Water Code.

ATTACHMENT 2
Monitoring Report Cover Page and Certification

Date _____

California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Facility Name: _____

_____

Address: _____

_____

_____

_____

Contact Person: _____

Job Title: _____

Phone: _____

Email: _____

WDR/NPDES Order Number: _____

WDID Number: _____

Type of Report (circle one)**:** **Monthly Quarterly Semi-Annual Annual Other**

Month(s) (circle applicable month(s)*: **JAN FEB MAR APR MAY JUN**
JUL AUG SEP OCT NOV DEC

***annual Reports** (circle the first month of the reporting period)

Year: _____

Violation(s)? (Please check one):_____**NO** _____ **YES***

***If YES is marked complete a-g (Attach Additional information as necessary)**

a) Brief Description of Violation:_____

_____

_____

_____

_____

b) Section(s) of WDRs/NPDES Permit Violated: _____

c) Reported Value(s) or Volume:

d) WDRs/NPDES Limit/Condition:

e) Date(s) and Duration of Violation(s):

f) Explanation of Cause(s):

g) Corrective Action(s)
(Specify actions taken and a schedule for actions to be taken)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision following a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my knowledge of the person(s) who manage the system, or those directly responsible for data gathering, 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.

If you have any questions or require additional information, please contact _____at the number provided above.

Sincerely,

Signature:_____

Name: _____

Title: _____

Attachment 3

Tahoe Basin Specification "H" (rev. 10/21/2014)

Applicable Documents:

All material is subject to inspection and acceptance by State personnel.
Conformance to the requirements will be determined by the following State of California Department of Transportation, Materials Engineering & Testing Services, California Test Methods:

- California Test 125 - Method for Sampling Highway Materials and Products Used in the Roadway Structural Sections
- California Test 202 – Method of Tests for Sieve Analysis of Fine and Course Aggregates.
- California Test 217 – Method of Test for Sand Equivalent.
- California Test 229 – Method of Test for Durability Index.
- California Test 226 – Method of Test for Moisture Content
- Method of Test for Turbidity Analysis of Traction Abrasives

Sand:

Material shall be clean sand, free from clay or organic material. Material shall meet the following requirements:

TEST	CTM	VALUE
Sand Equivalent (SE)	217	80 min
Durability Fine (DF)	229	55 min

The material shall conform to the following grading, as measured by CTM 202:

SIEVE SIZE	PERCENTAGE PASSING
3/8"	100%
1/4"	95-100%
#8	40 - 60%
#16	10 - 30%
#50	0 - 5%
#200	0 - 1%

a. Must meet the above grading and durability specifications.
b. Total moisture content must be low enough so that the sand will not freeze in the truck or the sander.
c. Total moisture content measured as per CTM 226: Shall be less than 5%
d. Must not contain frozen lumps larger than one (1) inch in size.
e. Sand must be suitable for de-icing highways.
f. Color: Sand shall not be the color black or dark gray when material is wet or dry.
g. A Certificate of Compliance with the specification is to be provided with each day's delivery regardless of the number of deliveries that occur that day.
h. Payment associated with turbidity measurements will be paid as follows:

NTU	Accept/Reject Load -- Payment
<150	Accept – 100% of invoice paid
150-249	Accept -- 70% of invoice paid (30% reduction in price)
250+	Accept -- 00% of invoice paid (70% reduction in price)

Method of Test for Turbidity Analysis of Traction Abrasives

A. Scope

The Turbidity Analysis of Traction Abrasives test method has been developed to aid Caltrans in reducing the amount of FSP in traction abrasives used in the Lake Tahoe Basin by providing a means to field test abrasives samples taken from aggregate stockpiles. The method provides an indication of the fine sediment particle (FSP)(< 16 microns in diameter) content of aggregate materials such as those used for traction abrasives on roadways during winter driving conditions. This analysis provides a screening level analysis and the determination of actual fine sediment content (percent mass) should be determined through standardized laboratory methods for particle-size analysis such as ASTM D 422.

This procedure describes a method of preparing dry traction abrasives samples for turbidity measurements by mixing the material with water to suspend the FSP. Turbidity measurements may be performed using a portable turbidimeter in field situations or by standard methods, such as EPA Method 180.1, in an analytical laboratory.

B. Apparatus

The following equipment is required to perform this test:

1. A 1.5-2.0 L minimum size glass or plastic container with lid.
2. An analytical balance or scale accurate to 0.01 g
3. Portable turbidimeter accurate to 0.1 NTUs (field test only)

C. Materials

Use distilled or deionized water for the normal performance of this test. If it is determined that normal tap water is of such quality that it does not affect the test results, it is permissible to use it in lieu of distilled or deionized water.

D. Control

The temperature of the water should be maintained at 20 $\pm$ 2˚C during the performance of this test.

E. Sample Preparation

1. Obtain a representative sample of the material to be tested. Stockpile sampling of aggregates should be conducted according to the procedures in California Test 125 Part G.
2. Using the analytical balance or scale, create quantities of aggregate and water in a ratio of 1:20 by mass (e.g. 50 g aggregate and 1000 g of water). *Note: The 1:20 ratio was selected because it produces turbidities that are readily measurable by most portable turbidimeters without requiring dilutions, and that are not near the lower end of their typical range of accuracy.*
3. Combine the aggregate and water in the sample container. Gently invert the container 25 times at a rate of 1 inversion per second, to break up material and suspend fines. Do not agitate vigorously or entrain air bubbles in the solution.
4. Allow the mixture to soak for 10 minutes and then repeat the 25 inversions, again being careful not to entrain air bubbles.
5. Allow the mixture to sit for 30 seconds then, using the pipette, withdraw an adequate volume of solution for the turbidity measurement. Withdraw the sample from the center of the container approximately one-inch below the surface.

6. Obtain the turbidity measurement of the sample following the procedures specified by the manufacturer of the specific turbidimeter being used.
7. Repeat the above procedure three times and calculate an average value from the three measurements.

F. Quality Assurance Procedures

1. Turbidimeter Verification of Accuracy and Calibration:
    a. Follow the manufacturer's instructions to perform all recommended maintenance procedures and verify that the instrument is accurate to the specified limits for the measurement range of interest.
    b. If necessary, calibrate the instrument per the manufacturer's instructions using calibration standards appropriate for the measurement range of interest.
    c. Document all verification and calibration procedures and measurements and include with the reported test results.

G. Troubleshooting

1. Consult the instrument manufacturer for additional guidance if the suggestions below do not remedy the problem.
2. For erratic readings:
    a. Check voltage of the batteries and replace if needed.
    b. There may be bubbles in the system: tap the sample chamber system to dislodge bubbles.
3. For unusually high or low turbidity readings:
    a. See 2b: Bubbles
    b. There may be fouling of optical surfaces: clean with a lint-free cloth or toothbrush.
4. If readings at first appear stable and then begin to increase inexplicably:
    a. Check for moisture condensation on the cell wall
    b. Wipe cell dry with a soft, lint-free cloth.
    c. Apply a thin veneer of silicon oil (if compliant with manufacturer's instructions).
5. If blank samples or calibration standards do not read accurately:
    a. Check that the cells are oriented as instructed.
    b. Check the age/expiration of the calibration solutions.
    c. Check the accuracy against another instrument.

Photographs of Abrasives Turbidity Testing Method

Collection of abrasives samples from stockpile using CTM 125

Weighing subsample and mixing with water

Mixing the abrasives with the water by gently inverting the sample jar. The inversion process is repeated twice with a 10-minute soaking period in between.

Withdrawing a sub-sample and obtaining the turbidity measurement