Heavenly Mountain Resort
Epic Discovery Project

Scoping Summary Report

Introduction

The U.S. Department of Agriculture (USDA) Forest Service/Lake Tahoe Basin Management Unit (LTBMU), Tahoe Regional Planning Agency (TRPA) and Lahontan Regional Water Quality Control Board sought input regarding a proposal to expand summer uses at Heavenly Mountain Resort as part of the Epic Discovery Project. An environmental impact statement (EIS) and environmental impact report (EIR) will be prepared and circulated for comment before a decision is made.

The scoping (request for comments) period began on November 19, 2013 and ran until December 20, 2013. Public scoping included notification to local media outlets, scoping letters mailed or emailed to interested parties, and two public meetings held on December 4, 2013 at the TRPA Advisory Planning Commission and December 18, 2013 at the LTBMU.

In response to the scoping request, formal input was received from the following organizations and individuals on the dates indicated.

Name	Date
Skip Canfield – Nevada State Clearinghouse, State Land Use Planning Agency	December 23, 2013
Ben Fish	December 20, 2013
Joyce Dillard	December 19, 2013
Pete Fink	December 19, 2013
Clay Grub	December 17, 2013
Clay Grub	December 18, 2013
Christine Dobrowski	December 19, 2013
Eric Gerkin	December 15, 2013
Danso Gaymerah	December 17, 2013
Meghan Kelly	December 12 2013
James McCray	December 12, 2013
Ed Stimach	December 12, 2013
Adam Anderson	December 13, 2013
Jeff Glass	December 5, 2013
Ellie Waller	December 4, 2013
Shari Malone	December 2, 2013
Cathy and Bob Cliff	December 2, 2013
Corine Noble	December 2, 2013
Kevin Joell	December 19, 2013
Elizabeth Harrison – Nevada State Lands	December 20, 2013
Bob Ward	December 20, 2013
Dave McClure	December 18, 2013
Peter Mauer, TRPA Advisory Planning Commission Member	December 18, 2013
Charlie Donahue, TRPA Advisory Planning Commission Member	December 18, 2013
Ellie Waller	December 18, 2013

Summary of Comments

Definitions

Comments related to National Forest System Lands were grouped into two groups: **1. Non-Significant Issues and 2. Significant Issues.** A Description of each group is outlined below. Responses reflect how comments were incorporated and addressed in the decision document.

- **Non-Significant Issues** do not meet the Purpose and Need for the project; are outside the scope of the proposed action; are already decided by law, regulation, or Forest Plan; are not supported by scientific evidence; are addressed by project design features; or are addressed by additional information or clarification of the proposed action. Non-Relevant issues also represent opinions and statements which do not present problems or alternatives and include those comments that meet the Purpose and Need for the project but were considered in alternatives already studied and eliminated, or additional project design features were developed which reduced or eliminated the effects.

- **Significant Issues** meet the Purpose and Need for the project and are relevant because of the extent of the geographic distribution, the duration of effects, or the intensity of interest or resource conflict and therefore merit consideration for the development of an alternative to the proposed action.

As stated in the Notice of Preparation/Notice of Intent, the purpose and need of the Proposed Action is as follows:

> *As provided for in the Ski Area Recreational Opportunity Enhancement Act of 2011, Heavenly proposes to improve year-round recreation opportunities within the developed portions of the ski area on National Forest System lands using existing facilities and infrastructure to meet the expanding needs and expectations of visitors to Lake Tahoe, better support the year-round local economy in South Lake Tahoe area, connect a diverse group of visitors to our national forest with recreation and educational opportunities to further inspire passion and excitement for the outdoors.*

Comments

Comments received are categorized based on their relevance to the Project (see definitions above) and organized based on issue areas, including issues surrounding recreational uses, scenic quality, biological resources, air quality and transportation. A number of fully supportive comments were received, many emphasizing the value of expanding summer uses at Heavenly Mountain Resort, specifically the mountain bike park and trail system.

1. Non-Significant Issues

Support for the Proposed Action

"The community will benefit with better connected non-motorized trails, I especially like the Panorama Bike Trail connecting the Van Sickle Trail from the urban core at Heavenly Village into the back side of the Tahoe Rim Trail near Mott Canyon." (Ben Fish)

“The reroute of the Tahoe Rim Trail near Mott Canyon will be a huge benefit by getting the trail off the old steep dirt road in that section. This needs to happen to upgrade the character of the Tahoe Rim Trail in that small stretch. I encourage close coordination and working partnership with the Tahoe Rim Trail Association on this reroute and the Panorama Trail.” (Ben Fish)

“The varied recreation opportunities offer residents and visitors more opportunities to experience the outdoors. The new activities suit a wide range of ages and ability levels getting more people outside year round. I like the different types of activities proposed and encourage Heavenly to allow for modifications depending on future trends in outdoor recreation.” (Ben Fish)

“The infrastructure is already in place at Heavenly in this area and adding more year round activities makes sense by concentrating recreation activities in all seasons. A summer time connection between the Gondola, Tamarack Lodge, East Peak Lodge and eventually California Base Lodge would make summer recreation offerings on par with winter activities. Summer recreation in Tahoe and in the mountains and forests at Heavenly should be just as accessible to people as it is in the winter.” (Ben Fish)

“Excellent range of activities for both locals and tourists alike. I think this is a great move in the right direction for South Lake Tahoe. I am very pleased to see Vail Resorts investing in year round recreation. “ (Pete Fink)

“I am an avid mountain biker living in Reno. I think it would be awesome to add some mountain biking trails in the Heavenly Resort area. I would love to see lift-accessible trails.” (Eric Gerken)

“I generally support the development of the project for two reasons: 1) As outdoor summer recreation continues to expand in the Lake Tahoe region our experience shows that if we don't provide environmentally sustainable facilities (especially backcountry trails), users will create unsustainable ones which often will impact the most sensitive areas, and 2) the economic health of the SLT area is becoming increasing dependent on outdoor recreation, requiring more planning and outdoor opportunity to remain viable. “ (Clay Grub)

“Just a note to let you know i strongly support a bike park at heavenly! “ (Danso Gaymerah)

“I'm writing in support the Heavenly Epic Discovery Project and the associated mountain bike park. The construction of a mountain biking park would vastly increase the recreation potential of the South Shore. The summer tourism boost would bring much needed economic stimulation to our economy and help revitalize the businesses at the Stateline and elsewhere. It would help South Lake Tahoe become a world renown recreation destination like Whistler or Park City. It will help the overall health of our community, physically, socially, and economically, while providing people with outdoor experiences that create lifelong environmental advocates.” (Meghan Kelly)

“Since I cannot attend the meeting on December 18th, I wanted to email you to share my excitement and support of this project! I’m a local and mountain bike regularly, but I often have friends and family visit who do not have the stamina at this altitude to access some of the beautiful vistas in Tahoe. This park sounds like it would open one more area, and provide one more great reason, for friends, family and tourists to visit Tahoe. This town could use all the business it can get and the drive to Tahoe is not short for most people, so one more motivating factor like this sounds great! I hope this project comes to fruition!” (James McCray)

“Hello I am in favor of this project and my tax dollars going towards as much summer and winter fun as possible. My friend and his family and me and my family spend a lot of time using the winter and

summer sporting areas in and around Lake Tahoe from skiing at Heavenly and mounting biking the Flume trail to even riding and taking part in Centuries in and around the lake. The addition of mountain biking at Heavenly would be great for our family's as well as creating new jobs and additional income would be good for the area." (Ed Stimach)

"I am writing in support of Heavenly's plan for a mountain bike park and connector trails to Van Sickle and the Rim trail. This is long overdue as we need more summertime recreation options at Heavenly. This will benefit locals as well as the tourist. Please approve this plan. " (Adam Anderson)

"I've heard rumors about a new trail – believe called "Panorama Trail " from the Heavenly Gondola Mid Station to the Van Sickle Trail. As a resident of South Lake Tahoe and avid hiker I'm quite excited. " (Shari Malone)

"We are pleased to hear that a new trail from mid-gondola to Van Sickle is being planned. We frequently hike from Keller/Saddle roads near the tram, across the mountain side, under the gondola and thru the burn giving stunning views of our beautiful lake. An additional trail will give hikers and bikers more ways to enjoy this incredibly beautiful area." (Cathy and Bob Cliff)

"I have to say that I am all in favor of the intention to expand the summer activities at Heavenly Valley Resort. While I currently live in Santa Fe, New Mexico I am retiring in two years and we will be moving to South Lake Tahoe where we have a home. Although I am getting up there in years, I am an avid mountain biker and love to see new opportunities and places to ride. I have been very pleased with the recent expansion of trails in the south lake area and this was one of the considerations in our buying a home there. I also like the positive economic impact that new trails brings to a region. We have certainly been experiencing that in Santa Fe. Since hosting the IMBA World Summit and greatly expanding the local trail networks, the visitor and convention bureau has seen an onslaught of mountain bike tourists. Santa Fe was even named in USA Today and a couple other publications as one of the top ten mountain bike towns in the country. South Tahoe could be on that list with the help of this Heavenly Project." (Bob Ward)

"TAMBA supports the Epic Discovery Project, specifically inclusion of the bike park trail network, bike skills area and new multi-use connector trails towards social and economic benefit to Tahoe. "(Kevin Joell)

"We are pleased to see the rerouting of the Tahoe Rim Trail off of the existing fire road to singletrack near Mott Canyon. The Tahoe Rim Trail is a model trail and the wide and steep road section does not provide the trail experience that most users desire. We encourage Heavenly to work with the Tahoe Rim Trail Association on the TRT reroute and Van Sickle Connectors as they are instrumental in the management of the existing trails in those areas." (Kevin Joell)

> *Forest Service Response: Thank you for your support and involvement in the public scoping process. We look forward to continuing to work with citizens and agencies throughout this Project.*

Project Description Clarifications

"The highest concentration of activities should be at the top of the gondola and utilizing the Tamarack Lodge." (Ben Fish)

“Kids and Family areas should be a large component of the project. Creating trails and activities for all abilities will be a better use of the area than catering to a small audience. That said there should be some “expert” terrain in the bike park, similar to the winter ski slopes.“ (Ben Fish)

“You want to make sure trails are built to be fun downhill trails, not cross-country. You don’t want people saying they’d rather shuttle Corral-connector than pay to ride at Heavenly. Features are key. Advanced trails would be nice.” (Christine Dobrowski)

“This statement sounds like bikes will not be allowed to leave the bike park and will have to download via the Gondola and not allowed for example to access the Tahoe Rim Trail (TRT) "*Bike park users will be allowed to load their own bikes on the gondola but will not be allowed to ride them within the Tahoe Region except to return to the top of the gondola for downloading or to access the bike park using existing summer maintenance road segments on Von Schmidt’s Trail, Crossover Trail and Steve’s Road*." But looking at the trail map (http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5442586.pdf), it appears new trails will be built connecting the bike park to the TRT near Mott Canyon and the bottom of the Van Sickle trail via the Van Sickle Connector trail/Panorama Trail/TRT connector trail. Can you please clarify if bikes will be able to leave the park and access these new trails that pass though the new bike park? If not what will prevent them, or for that matter will anything block riders riding the TRT or Van Sickle from passing though the park on these new trails?” (Jeff Glass)

> *Response: Bike riders will be permitted to leave the mountain bike park on the proposed connector trails once they are implemented. An interim policy may be needed if the new connector trail segments are implemented in a time frame after the bike park trails are completed. The intent behind the Project Description was to clarify that the mountain bike park at Heavenly is primarily located on lands located outside of the Lake Tahoe Basin. Only minor trail connections to and from the mountain bike park will be located inside the Lake Tahoe Basin to minimize adverse effects to soil and watershed resources.*

“Explain why water activities are necessary at East Peak Lake. Lake Tahoe provides kayaking, boating, etc. This amenity will take away from “local” businesses sustainability.” (Ellie Waller)

> *Response: East Peak Lake activities offer a unique visitor experience and are intended to enhance summer activities in response to the USDA Forest Service Ski Area Recreational Opportunity Enhancement Act of 2011.*

“It would be nice if hikers could have access to this new trail.” (Corine Noble)

> *Response: Hikers will have access to the panorama trail. We have clarified this point in the project description.*

“For the Mountain Bike Trail Connectors which are discussed on page 11, what is meant by this statement, "*The trail will (be) 2-3 feet wide and be designed to incorporate project design features that will help minimize erosion and sedimentation and help to make it self-sustaining?’*"” (Elizabeth Harrison)

> *Response: Hiking and mountain bike trails will be constructed with best management practices (e.g., waterbars, soil armoring) designed to reduce the potential for erosion and reduce the need for ongoing maintenance activities.*

“Tell me about the concept of widening use on Forest Service and is it allowed? I am glad you mentioned CWE and its relationship with State Parks and Van Sickle Trail.” (Charlie Donohue)

Response: The Epic Discovery Projects offer a unique visitor experience and are intended to enhance summer activities in response to the USDA Forest Service Ski Area Recreational Opportunity Enhancement Act of 2011.

"Identify and execute a hiring policy that includes a percentage of locals before outside basin/country help is enlisted." (Ellie Waller)

Forest Service Response: Heavenly intends to hold a spring job fair each season to recruit and hire summer season employees. Existing Heavenly winter season employees will be encouraged to attend the fair. The job fair will also be open to the public. Hiring existing employees already familiar with Heavenly training, culture, service standards and related employee programs and policies can provide a number of benefits to the employee, the employer, the guests and the local community.

Consideration of Design Features

"A bike park and skills zone should be included similar to terrain parks in the winter." (Ben Fish)

"Family friendly trails need jumps. North Star's most popular trail is Live Wire – a jump trail" (Christine Dobrowski)

Forest Service Response: A bike skills course is provided near the top of the Gondola. Mountain bike parks trails will offer different ability levels from beginner to expert.

"We would like consideration given to keeping the multi-use Van Sickle Connector trail from turning into a return route for bike park traffic. This can be easily accomplished through proper trail design of the Panorama connector and appropriate signage.' (Kevin Joell)

Forest Service Response: Suggestions for project design features may be taken into consideration during conceptual design of specific components if they meet the purpose and need of the Project.

"Need a signage plan to ensure Bike Park Users clearly know when they are entering the multi-use trail system and the right-of-way etiquette rules." (Clay Grub)

"Need signage on Van Sickle to let users know 'End of bike park multi-use trail'. Lots of summer use (bikers) on Van Sickle." (Christine Dobrowski)

"A great number of hikers currently use the Van Sickle Connector Trail. How will the project minimize conflicts between downhill bike riders who likely will be traveling at high speed and the hiking community?" (Elizabeth Harrison)

"We hope you are currently considering alternate hiking & biking days for our safety, similar to the way the FLUME trail is run." (Cathy and Bob Cliff)

Forest Service Response: Trail usage will be analyzed in the EIS and if necessary, these suggestions will be taken into consideration as project design features or project modifications to maintain safety for all trail users.

Purpose and Need of Proposed Action

"Agenda item 3: A Notice of Preparation (NOP) for Heavenly's proposed Epic Discovery Project and subsequent EIR/EIS along with the Northstar Master Plan EIR recently released, will usher in Disneyland-like amusements in our Outstanding National Resource Water. The basin residents will see increased traffic, air quality issues, irreversible environmental impacts. Vail Corporation says it is responding to a need to improve summer-time visitation. Is this really needed in the Basin?" (Ellie Waller)

"I'll close with one of my favorite comments from the Breckenridge Peak 6 EIR that also incorporated a Forest Flyer. "*Our national forest is not an amusement park. The unique features of 'nature' should be preserved and promoted and the 'man-made' impact mitigated. I support many of the proposed resort expansions, but cannot support zipline tours or elevated rail flyers that exist primarily to provide an adrenaline rush (speed, height, etc.) to amuse or entertain visitors. These types of 'rides' are mechanical, commercial, amusement activities and do not further the goals of natural appreciation or environmental sensitivity. Neither are there location-dependent — they can be found anywhere in the U.S. Save our national forests. And promote the 'inherent' beauty and values that exists in nature and the 'human-powered' recreational activities that will nurture our next generation earth stewards*." (Ellie Waller)

"Lake Tahoe is a Summer Peak Destination, we already have a magnet and do not need an amusement park. We have an outstanding national resource." (Dave McClure)

> *Forest Service Response: The recently enacted Ski Area Recreational Opportunity Enhancement Act of 2011 provides authority for mountain resorts operating on National Forest System (NFS) lands to offer an expanded range of outdoor recreation activities in order to further recreational opportunities for the public, allow year-round utilization of existing resort facilities, and stimulate job creation and economic growth within local communities. The Project proposes to implement such activities at Heavenly to better utilize infrastructure within the existing ski area boundary.*

Potential Resource Impacts

"There is concern that the proposed activities/development will generate new parking needs. The document should sufficiently evaluate how and where the various visitors will access these improvements by different means and how that may impact surrounding land and land uses." (Elizabeth Harrison)

> *Forest Service Response: The transportation and circulation analysis will include evaluation of parking demand and supply and the various modes that visitors will use to access the mountain.*

"We are concerned about the platforms proposed as part of the zipline routes. Large trees generally provide good nesting habitat for a variety of songbirds, raptors, bats, and small mammals, and the artificial platforms along with constant human presence around such trees could potentially compromise nest site availability for a number of wildlife species. We would like this to be considered in the upcoming EIS." (Elizabeth Harrison)

> *Forest Service Response: The biological resources analysis will include analysis of increased human presence on habitat, including potential nesting habitat.*

"Are special events anticipated at some point that will utilize these new improvements? If so, the impacts associated with special events (parking, noise, water quality, etc.) should also be included in the analysis." (Elizabeth Harrison)

> *Forest Service Response: No special events are specifically planned as part of this proposal. Any future special events that may be proposed within the permit area on National Forest lands will undergo additional review and analysis by the Forest Service. Other agencies with jurisdiction will be included if necessary.*

"Will the new activities associated with the Heavenly Epic Discovery Project be operated at night? If so, the impacts associated should be included in the analysis." (Elizabeth Harrison)

> *Forest Service Response: The Epic Discovery project activities will not be operated at night.*

"What are the effects on Significant Ecological Areas for this watershed and any other watersheds that share plants, birds, animals and wildlife in the ecosystem. What water funding, federal, state and local, has been spent in the region. How does this fit into the State Integrated Regional Water Management Plan for the area. What Conservation Districts are involved and what are the effects. What Water Quality and Water Supply effects will be on this region and dependent regions. Where is the Economic and Fiscal Analysis." (Joyce Dillard)

"Provide an economic analysis of one zip line versus three (four with the kids zip)." (Ellie Waller)

> *Forest Service Response: The EIS will analyze the Project's effects to biological resources. The project does not result in changes to water use. The EIS will analyze the Project's effects on water quality and hydrology from construction of the proposed activities. An economic and fiscal analysis is not required to make an informed decision on the Project under NEPA, TRPA and CEQA regulations. Providing multiple activities, including more than one zip line, provides the user with a diversity of recreational choices, each offering a unique experience.*

"Provide an air quality analysis for the tour excursion vehicle operations. How many vehicles will be in operation daily? Provide info on proposed operating hours. Provide analysis of the dirt maintenance road usage for the tour excursion vehicles. (Ellie Waller)

Forest Service Response: The air quality analysis will include analysis of construction and operational emissions, including both on mountain (e.g., tour excursion vehicles) and off mountain (e.g., visitor trips) sources. "Scenic issues are not only related to road and lake, in this project's case the nationally recognized Tahoe Rim Trail within scenic corridor of amusements must be analyzed the potential to disrupt the hiking experience is great." (Ellie Waller)

> *Forest Service Response: These scenic and recreational quality resource considerations will be included in the analysis of environmental consequences when required by the National Environmental Policy Act (NEPA) or TRPA environmental process.*

"Provide detailed VMT analysis for the newly proposed summertime crowds that these amusements will draw to the Vail property and surrounding South Shore community properties." (Ellie Waller)

> *Forest Service Response: The transportation and circulation and air quality analysis will include evaluation of VMT from increased visitation to Heavenly during summer operations.*

"Will the Master Plan amendments be a separate process or combined with the EIS/EIS/EIR process and approval cycle? Are any Area Plan amendments required and will those amendments be a separate process or combined with the EIS/EIS/EIR process and approval cycle. If any separate plan amendments are proposed, ensure public noticing of these meetings. These amendments are controversial and so amendments should be fully vetted in public meetings and not held at the Hearings Officer Level or as Consent Calendar items." (Ellie Waller)

> *Forest Service Response: The EIS will analyze the Project and the proposed amendment to the Heavenly Ski Area Master Plan. There are no requirements for amendments to the Forest Plan, TRPA Plan Areas or TRPA Area Plans.*

"Please include an analysis of the forest fuel load within the areas of the planned improvements as part of this document preparation. This area is very steep and has significant fuel available for a forest fire." (Elizabeth Harrison)

> *Forest Service Response: The EIS will analyze the potential for wildland/forest fires as a result of implementation and operation of Project activities.*

"We would like to see the document evaluate human-bear conflicts very carefully. Since bears are highly active in the summer, the proposed increase in visitation during that time period will increase the risk of human-bear conflicts in the project area." (Elizabeth Harrison)

> *Forest Service Response: These suggestions along with other resource considerations will be included in the analysis of environmental consequences when required by the National Environmental Policy Act (NEPA) or TRPA environmental process.*

2. Significant Issues

Suggestions for Analysis

A number of suggestions for analysis of the proposed action were submitted, more specifically recreation, land use, scenic, biological, air quality, and transportation resources. These include:

"We encourage data gathering on the TRT in the Monument pass area both before and after the project begins operation to factually judge the level of increased use and determine if the bike park operation should subsidize trail maintenance on the trails thought to see increased use. Based on our knowledge of trail use in the area, we do not foresee this to be a major problem, however baseline data before the monument connector trail opens would provide clarity to the situation." (Kevin Joell)

> *Forest Service Response: The use of proposed trails will be evaluated to determine whether increased visitation to the TRT will require greater maintenance. If effects are identified, project design features or alternatives will be defined and studied in the EIS.*

"We would like to see the document analyze how visitors will be accessing the trail into Van Sickle State Park. What is projected to be the number of the visitors who will be accessing the new trails via the Van Sickle Connector Trail (going uphill) versus the number of visitors that will be using the new trail system as a downhill route (accessed from Heavenly facilities)? This evaluation is necessary to account for expected visitors through Van Sickle and also to understand whether this trail will be serving mostly

visitors paying to use Heavenly Valley facilities versus those that are just utilizing an enhanced trail system." (Elizabeth Harrison)

"To develop a new trail on State property, proper land use authorizations will be required. As a condition of the land use authorizations, it may be required that some maintenance/operation expenses are covered by the project if it is found that the new development causes increased visitors to Van Sickle State Park." (Elizabeth Harrison)

"In terms of the new trail that will be within Van Sickle State Park, how will the project ensure that bike riders don't try to utilize old legacy roads and trails rather than staying on constructed trails? There is a great chance that many of these old trails will get utilized if they are not restored or blocked which could be a water quality impact. Please consider the concern during the preparation of the document." (Elizabeth Harrison)

> *Forest Service Response: Trail usage will be analyzed in the EIS and if necessary, project design features or project modifications will be added to maintain safety for all trail users and minimize potential impacts to water quality.*

"Please consider the cumulative visual impacts from development activities (temporary and permanent). Some notable activities include proliferation of new roads, poorly-sited and designed structures, lack of co-location of infrastructure and improper lighting, to name a few." (Skip Canfield)

"Provide scenic analysis for Skycycle. Provide scenic analysis of all amenities that could impact Van Sickle State Park." (Ellie Waller)

"What is the visual impact to and from Freel Peak?" (Peter Maurer)

> *Forest Service Response: Scenic resources will be evaluated in the EIS and if necessary, project design features or alternatives will be defined and studied in the EIS.*

Will maintenance roads need to be widened? If so, provide tree removal and vegetation removal counts and analysis. Provide wildlife disruption analysis." (Ellie Waller)

"Provide environmental analysis of the trail widening as noted in NOP for the mountain bike park (e.g., 9-10 miles of trails). Provide analysis of any trail widening required for any of the proposed amenities which must include vegetation and tree removal counts." (Ellie Waller)

"Provide SEZ and stream analysis." (Ellie Waller)

> *Forest Service Response: Some new road construction (both permanent and temporary) is proposed along with trails for hiking and mountain bikes. Road and trail construction will be analyzed in the EIS and if necessary, project design features or project modifications will be added to minimize potential impacts to biological resources and/or SEZs/streams.*

"I commented extensively on the Vail Northstar proposed Forest Flyer. A 20-25 ft path must be cleared and is necessary for installation and operation of tracks and must be analyzed. Provide analysis of snow removal operations and snow clearing for operational affectivity. Provide a safety analysis of the Forest Flyer. Restrict operating hours to no later than 5:00 pm and not sundown as requested for Northstar. No night time operations (e.g, after 5:00 pm) should be allowed." (Ellie Waller)

Forest Service Response: The tree removal and ground disturbance required for construction of Project activities will be analyzed in the EIS. The Forest Flyer will not be operated in winter or at night and will therefore not require snow removal or lighting for nighttime operations. Hours of operation will be analyzed to determine whether there are potential impacts that would require restrictions or design measures to limit duration.

Recommended Mitigation Measures

"Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices. Effective lighting should have screens that do not allow the bulb to shine up or out. All proposed lighting shall be located to avoid light pollution onto any adjacent lands as viewed from a distance. All lighting fixtures shall be hooded and shielded, face downward, located within soffits and directed on to the pertinent site only, and away from adjacent parcels or areas. A lighting plan should be submitted indicating the types of lighting and fixtures, the locations of fixtures, lumens of lighting, and the areas illuminated by the lighting plan. Any required FAA lighting should be consolidated and minimized wherever possible." (Skip Canfield)

"Utilize building materials, colors and site placement that are compatible with the natural environment: Utilize consistent mitigation measures that address logical placement of improvements and use of appropriate screening and structure colors. Existing utility corridors, roads and areas of disturbed land should be utilized wherever possible. Proliferation of new roads should be avoided. For example, the use of compatible paint colors on structures reduces the visual impacts of the built environment. Using screening, careful site placement, and cognitive use of earth-tone colors/materials that match the environment improve the user experience for others who might have different values than what is fostered by built environment activities. Federal agencies should require these mitigation measures as conditions of approval for all permanent and temporary applications." (Skip Canfield)

Forest Service Response: Scenic resources will be evaluated in the EIS and if necessary, project design features (such as the measures recommended above) or alternatives will be defined and studied in the EIS.

"Tree removal appears to be a major disturbance component of this project, including a 20-25 foot path for the Forest Flyer Alpine Coaster and several other cleared pathways for ziplines and emergency evacuation. Large-sized trees and standing dead are very important for wildlife habitat. We would suggest that any trees with visible nests or nesting structures (i.e., witches' brooms, cavities) remain untouched whenever possible. We ask that you consider these concerns during the document preparation." (Elizabeth Harrison)

"Mitigation measures such as bear resistant trash containers and education at trailheads should be considered to reduce the likelihood of human-bear conflicts in the proposed project area." (Elizabeth Harrison)

Forest Service Response: The suggested mitigation measures will be considered during analysis of environmental consequences. If required by TRPA ordinance or the Basin plan, such measures will be incorporated as project design features. If potential effects to resources are determined to be adverse, appropriate mitigation measures will be recommended to avoid, reduce or minimize potential effects.

Alternatives to the Project Action

"Consideration could be made into connecting the California Base Area to the Panorama Bike Trail; this could alleviate some use off the Van Sickle Trail which will become even more popular with this expansion. Even a connection to Roundabout would be nice." (Ben Fish)

"Need connection from Mid Station to Panorama Trail." (Christine Dobrowski)

"We recommend that the document include an alternative that will utilize already disturbed paths/roads and ski trails to limit the amount of potential new disturbance associated with the planned development/use. These areas could be further treated to act as enhanced fuel breaks." (Elizabeth Harrison)

"However, there is one area in which the plan of action both misses an opportunity and is inconsistent with both the project purpose and need statement and overview language in the proposed action. The subject in question is listed in the NOP/NOI as "Mountain Bike Trail Connectors", giving the impression that these are relatively minor "bike only" trails. In reality, however, this description is being applied to over five miles of long discussed trail colloquially referred to within both the LTBMU and the local community as the "Panorama Trail". Even though LTBMU personnel state that this would be a "multi-user, non-motorized trail", the details of the proposed action would serve to restrict many users through a trail system layout impeding their access to the most appealing parts of the trail. The Panorama Trail was proposed in 2004 during the Daggett Summit Trail System Project planning process as a hiking and biking connection between the Heavenly Gondola (mid-station) and the now completed Van Sickle to Tahoe Rim Connector Trail. Because the 2005 Heavenly Master Plan was in the final stages of approval, a decision was made to wait until the next Heavenly planning cycle. Additional field work has since been done to prepare for input to that cycle. Hike and bike users and workers on the Van Sickle Trail and the Daggett sections of the TRT have remained enthusiastic since the Panorama Trail was first discussed. A different Panorama Trail concept has been included in this 2013 NOP/NOI with both a significant improvement and a serious omission. The good: Instead of only connecting the gondola with the Van Sickle Trail, the trail corridor was extended to include both a lengthening of the scenic sweep across the western face overlooking Lake Tahoe, and a wrap around crossing the north side of Heavenly to connect with the Tahoe Rim Trail near Mott Canyon. The bad: Unfortunately, all direct trail connection to the Gondola/Adventure Peak area was discarded, essentially removing the opportunity for users to make one way trail trips using the Gondola. The current proposed trail routing seems planned to support bikers using the Heavenly Bike Park while discouraging other users by requiring a long and tedious access route from the Gondola area." (Clay Grub)

> *Forest Service Response: The suggested alternatives will be considered to determine whether they will meet the purpose and need for the action and reduce or avoid potential environmental consequences.*

Approvals

I have reviewed the public scoping input and this summary report. I appreciate the questions and comments provided by the public.

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Nancy J. Gibson **Date**
Forest Supervisor
Lake Tahoe Basin Management Unit

Lahontan is not required to follow the NEPA scoping process, but has reviewed the responses provided to comments regarding CEQA jurisdiction and concur with this report.

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Bud Amorfini **Date**
Lahontan Regional Water Quality Control Board

ADVENTURE PEAK EPIC DISCOVERY ACTIVITIES

HEAVENLY MOUNTAIN RESORT
EL DORADO COUNTY, CALIFORNIA
APN 030-030-01
DOUGLAS COUNTY, NEVADA
APN 1318-00-002-010

STANDARD ABBREVIATIONS

A.C.	ASPHALTIC CONCRETE	I.E.	INVERT ELEVATION
@	AT	IMPROV.	IMPROVEMENT
AGG.	AGGREGATE	L.F.	LINEAR FEET
APPROX.	APPROXIMATE	M.H.	MANHOLE
BLDG.	BUILDING	MAX.	MAXIMUM
BLVD	BOULEVARD	MIN.	MINIMUM
BM	BENCH MARK	MON.	MONUMENT
C.B.	CATCH BASIN	NTS	NOT TO SCALE
C & G	CURB AND GUTTER	O.G.	ORIGINAL GROUND
CL	CENTERLINE	P.C.C.	PORTLAND CONCRETE CEMENT
CMP	CORRUGATED METAL PIPE	PE	POLYETHYLENE
CO	CLEAN OUT	PL	PROPERTY LINE
CONC.	CONCRETE	PP	POWER POLE
CULV.	CULVERT	RCP	REINFORCED CONCRETE PIPE
C.Y.	CUBIC YARDS	S.F.	SQUARE FEET
D.I.	DROP INLET	SD	STORM DRAIN
DIA.	DIAMETER	SDMH	STORM DRAIN MANHOLE
DR	DRIVE	SHT.	SHEET
E	ELECTRIC	SS	SANITARY SEWER
EL., ELEV.	ELEVATION	SSCO	SANITARY SEWER CLEANOUT
EXIST.,EX.	EXISTING	SSMH	SANITARY SEWER MANHOLE
FG	FINISH GRADE	STD.	STANDARD
F.H.	FIRE HYDRANT	TELE.	TELEPHONE
FL	FLOWLINE	TYP.	TYPICAL
FND.	FOUND	UTIL.	UTILITY
G	GAS	W	WATER

Project Coverage Table (Rev. 2014-2-27)

New Coverage	Existing 1a	Proposed 1a	Net Change
Adventure Peak Epic Discoveries			
Alpine Coaster Forest Flyer			
Buildings (Terminal, bull wheels, attendant's shed)		3,170	3,170
Coaster		1,256	1,256
Paths		810	810
Parking		432	432
Sky Cycle			
Structures		1,511	1,511
Paths and Queuing Areas		13,339	13,339
Maintenance Road		4,898	4,898
Mid Station Canopy Tour			
Paths and Queuing Areas		11,538	11,538
Structures		80	80
In-fill Activities			
Paths		3,938	3,938
Mountain Bike Skills Park		15,182	15,182
Concrete Pad for Bike Rental Area		2,000	2,000
Total Adventure Peak Epic Discoveries	-	58,154	58,154

Coverage Summary Table

Maximum Allowable Coverage (per Master Plan)	1a	1b	**Total**
Maximum Allowable Coverage per Master Plan			**2,053,854**
Balance Remaining of Coverage and Banked Coverage per Table 3.4-4 of the Final EIR/EIS/EIS[1]	434,580	4,464	**439,044**
Project Subtotals			
Northbowl/Olympic Express Lifts Project Balances	960	396	1,356
Gondola Hiking trails	54,501	0	54,501
Mid Station Road	50,469	0	50,469
Northbowl/Olympic Express Lifts - Plan Revision	216	0	216
World Cup/East Bowl Snowmaking - Plan Revision	283	0	283
Calif. Base Surface Lift Replacement	1,572	0	1,572
Skyline Trail Grading and Snowmaking	1,134	0	1,134
Top of the Gondola Lodge	42,387	0	42,387
Adjusted Gondola Permit Coverage	-27,519	0	-27,519
Umbrella Bar Relocation	651	0	651
Covered Surface Lift and Snowmaking	10,039	0	10,039
California Side Trail Widening	0	0	0
Adventure Peak Improvements	6,207	0	6,207
Zipline Adventure Ride	4,916	0	4,916
Verizon Angel's Roost Cell Tower and Back-up Bldg	584	0	584
Epic Race Course Electrical	0	0	0
Summer Activities	22,213	0	22,213
Tamarack Lodge Modifications	537	0	537
Adventure Peak Epic Discoveries	*58,154*	*0*	58,154
Removal of Gondola Hiking Trails	*-54,501*	*0*	-54,501
East Peak Basin Epic Discoveries	*1,210*	*0*	1,210
Sky Meadows Basin Epic Discoveries	*26,816*	*772*	27,588
Subtotals	**200,829**	**1,168**	**201,997**
Balance Remaining Upon Project Completion	**233,751**	**3,296**	**237,047**

1. Includes 10,541 square feet of existing coverage attributed to Sky Deck

LOCATION MAP

OWNER

HEAVENLY MOUNTAIN RESORT
P.O. BOX 2180
STATELINE, NV 89449
(775) 586-7000

SHEET INDEX

FOREST FLYER

MID STATION CANOPY TOUR

SKY CYCLE CANOPY TOUR

KIDDIE ZIP

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RCI Resource Concepts Inc

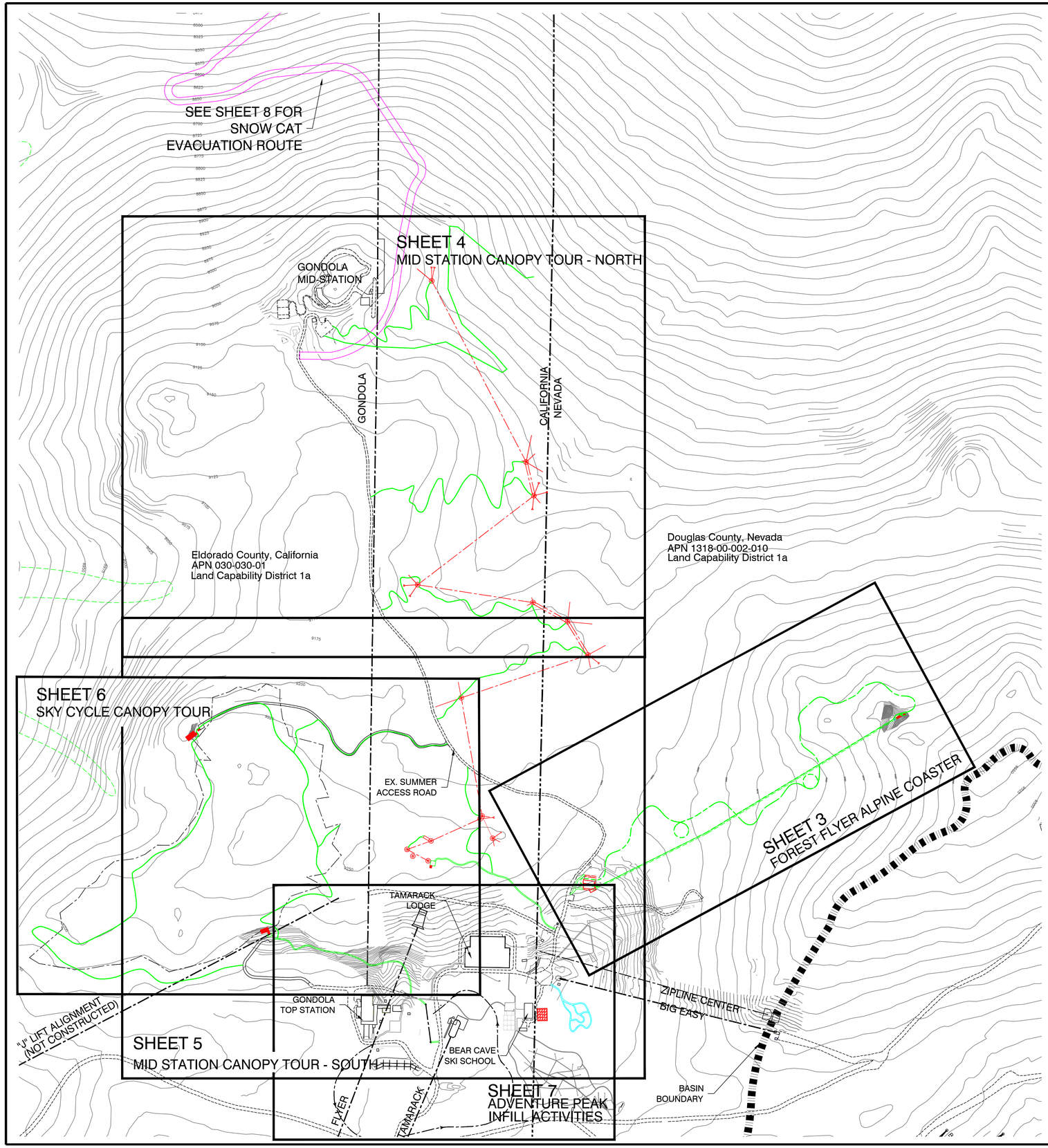
REVISION	DATE

HEAVENLY MOUNTAIN RESORT
Adventure Peak Epic Discovery Activities

TITLE SHEET

JOB NO.:	12-602.7
DATE:	02-27-14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 1



N

0 100 200 300 400

SCALE: 1"= 200'

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HEAVENLY MOUNTAIN RESORT
Adventure Peak Epic Discovery Activities

SITE PLAN AND SHEET INDEX

JOB NO.:	12-602.7
DATE:	02-27-14
DESIGNED:	MMG
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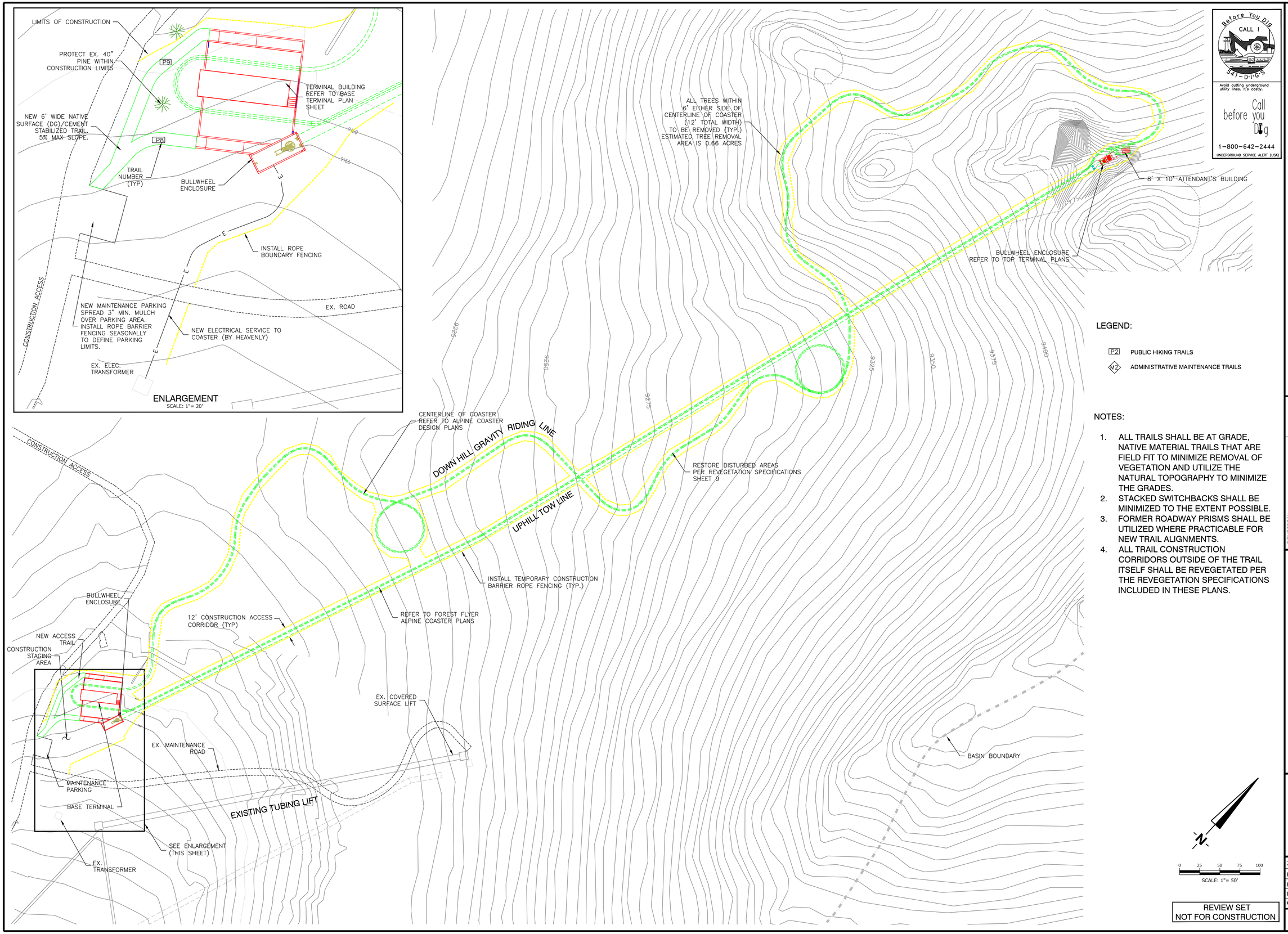
CHECKED:	MMG

SHEET 2

ENLARGEMENT
SCALE: 1"= 20'



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LEGEND:

P2 PUBLIC HIKING TRAILS

M2 ADMINISTRATIVE MAINTENANCE TRAILS

NOTES:

1. ALL TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE THE GRADES.
2. STACKED SWITCHBACKS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
3. FORMER ROADWAY PRISMS SHALL BE UTILIZED WHERE PRACTICABLE FOR NEW TRAIL ALIGNMENTS.
4. ALL TRAIL CONSTRUCTION CORRIDORS OUTSIDE OF THE TRAIL ITSELF SHALL BE REVEGETATED PER THE REVEGETATION SPECIFICATIONS INCLUDED IN THESE PLANS.

N

0 25 50 75 100
SCALE: 1"= 50'

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HEAVENLY MOUNTAIN RESORT
Adventure Peak Epic Discovery Activities

FOREST FLYER ALPINE COASTER

JOB NO.:	12-602.7
DATE:	02-27-14
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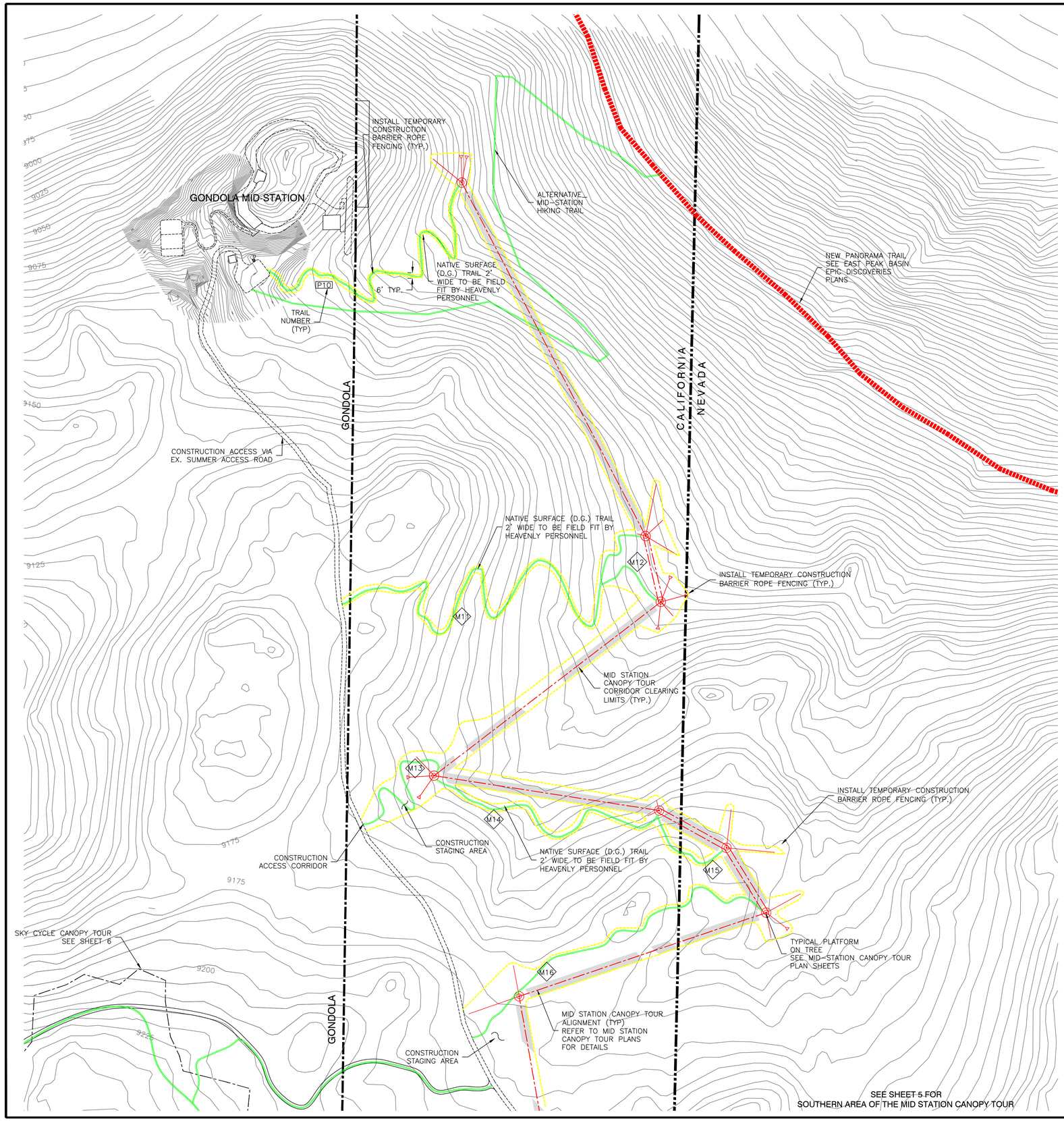
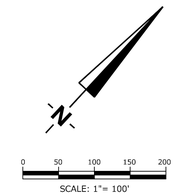
SHEET 3



SEE SHEET 5 FOR SOUTHERN AREA OF THE MID STATION CANOPY TOUR



LEGEND:

P2 PUBLIC HIKING TRAILS

M2 ADMINISTRATIVE MAINTENANCE TRAILS

MID STATION CANOPY TOUR CORRIDOR CLEARING LIMITS (TYP)
TOTAL ESTIMATED CLEARING: 1.4 ACRES

NOTES:

1. ALL TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE THE GRADES.
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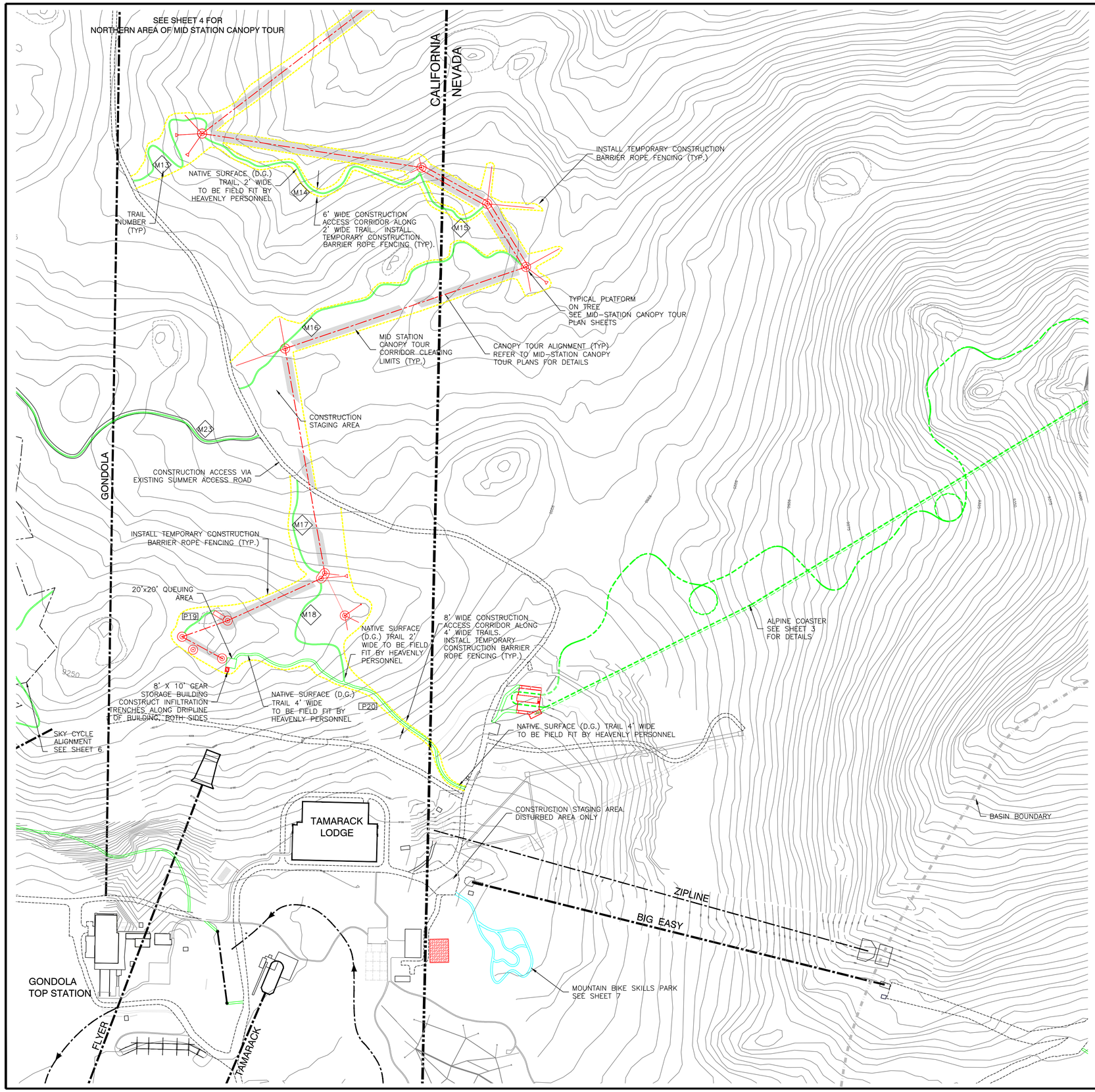
HEAVENLY MOUNTAIN RESORT
Adventure Peak Epic Discovery Activities

MID STATION CANOPY TOUR - NORTH

JOB NO.:	12-602.7
DATE:	02-17-14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 4



N

0 50 100 150 200

SCALE: 1"= 100'

LEGEND:

P2 PUBLIC HIKING TRAILS

M2 ADMINISTRATIVE MAINTENANCE TRAILS

MID STATION CANOPY TOUR CORRIDOR CLEARING LIMITS (TYP)
TOTAL ESTIMATED CLEARING: 1.4 ACRES

NOTES:

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MID STATION ZIPLINE TOUR

JOB NO.:	12-602.7
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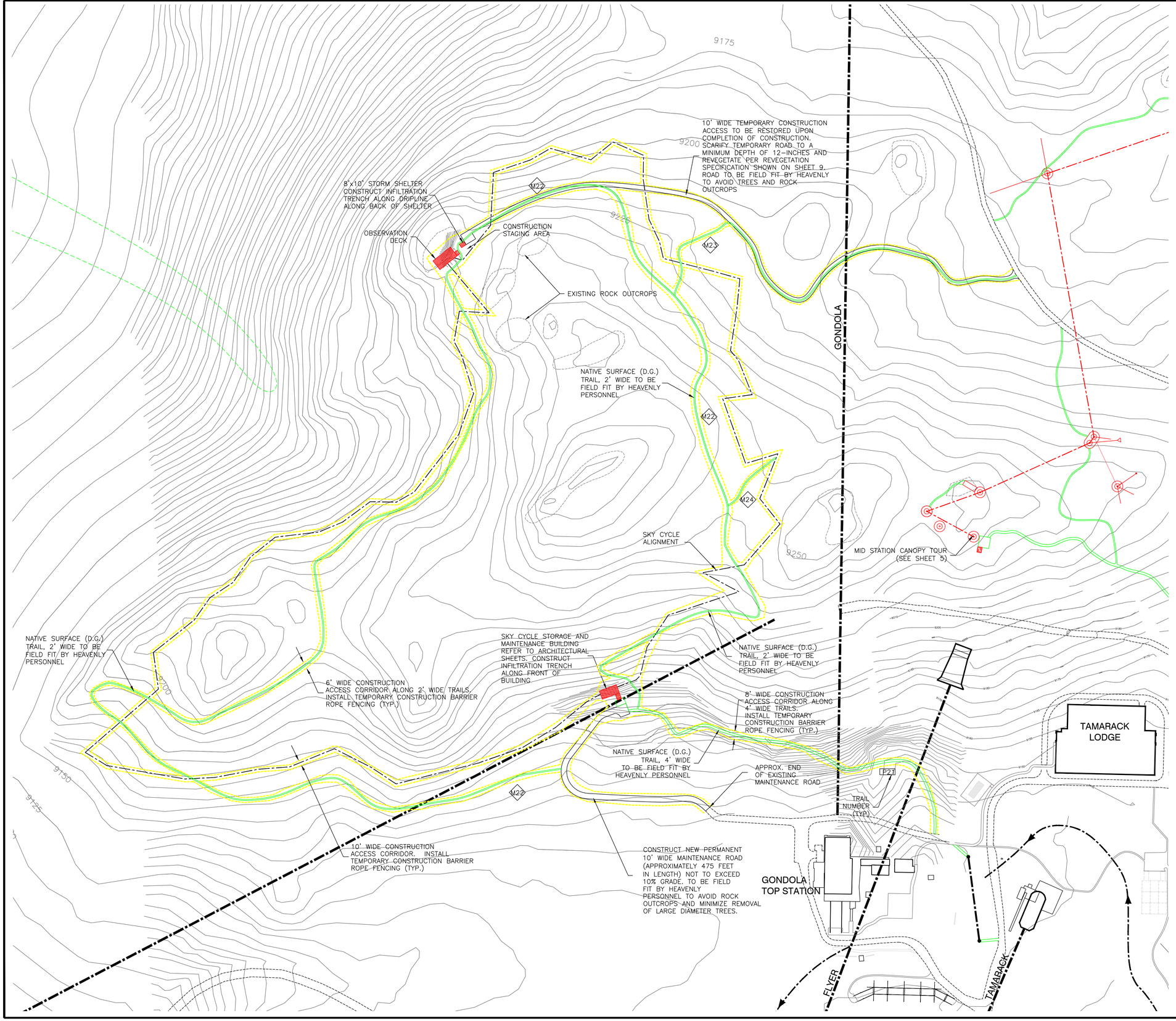
SHEET 5



N

0 40 80 120 160

SCALE: 1"= 80'

LEGEND:

P2 PUBLIC HIKING TRAILS

M2 ADMINISTRATIVE MAINTENANCE TRAILS

NOTES:

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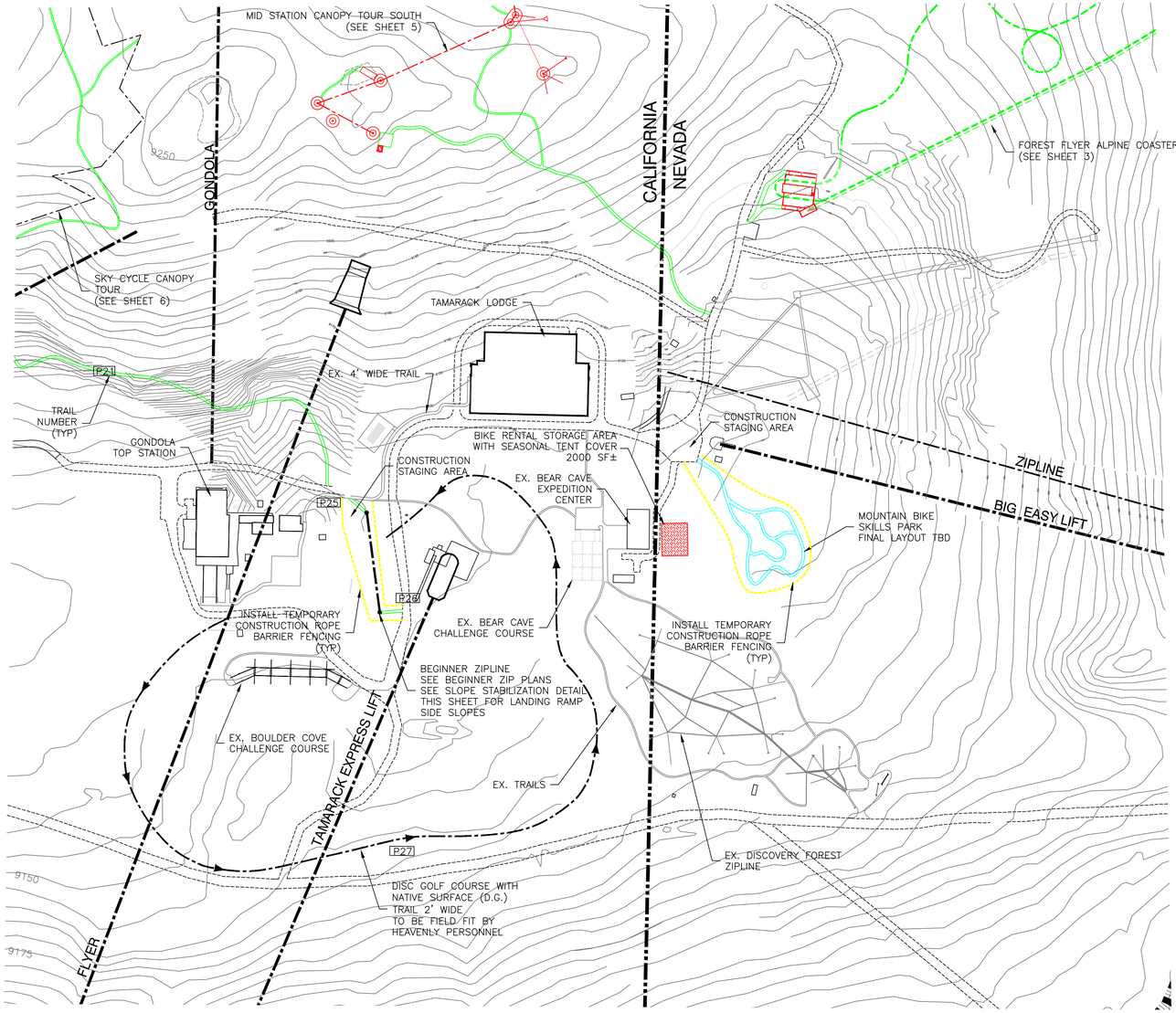
SKY CYCLE CANOPY TOUR

JOB NO.:	12-602.7
DATE:	02-27-14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 6



N

0 50 100 150 200

SCALE: 1"= 100'

LEGEND:

P2 PUBLIC HIKING TRAILS

MZ ADMINISTRATIVE MAINTENANCE TRAILS

NOTES:

1. ALL TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE GRADES.
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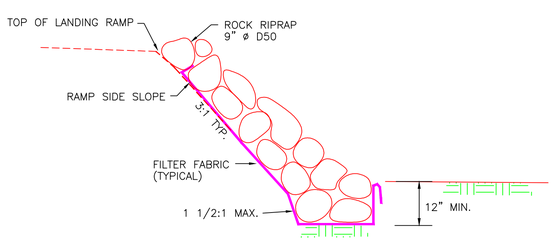

SLOPE STABILIZATION
KIDDIE ZIP LANDING RAMP SIDE SLOPES
NOT TO SCALE

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ADVENTURE PEAK INFILL ACTIVITIES

JOB NO.:	12-602.7
DATE:	02-27-14
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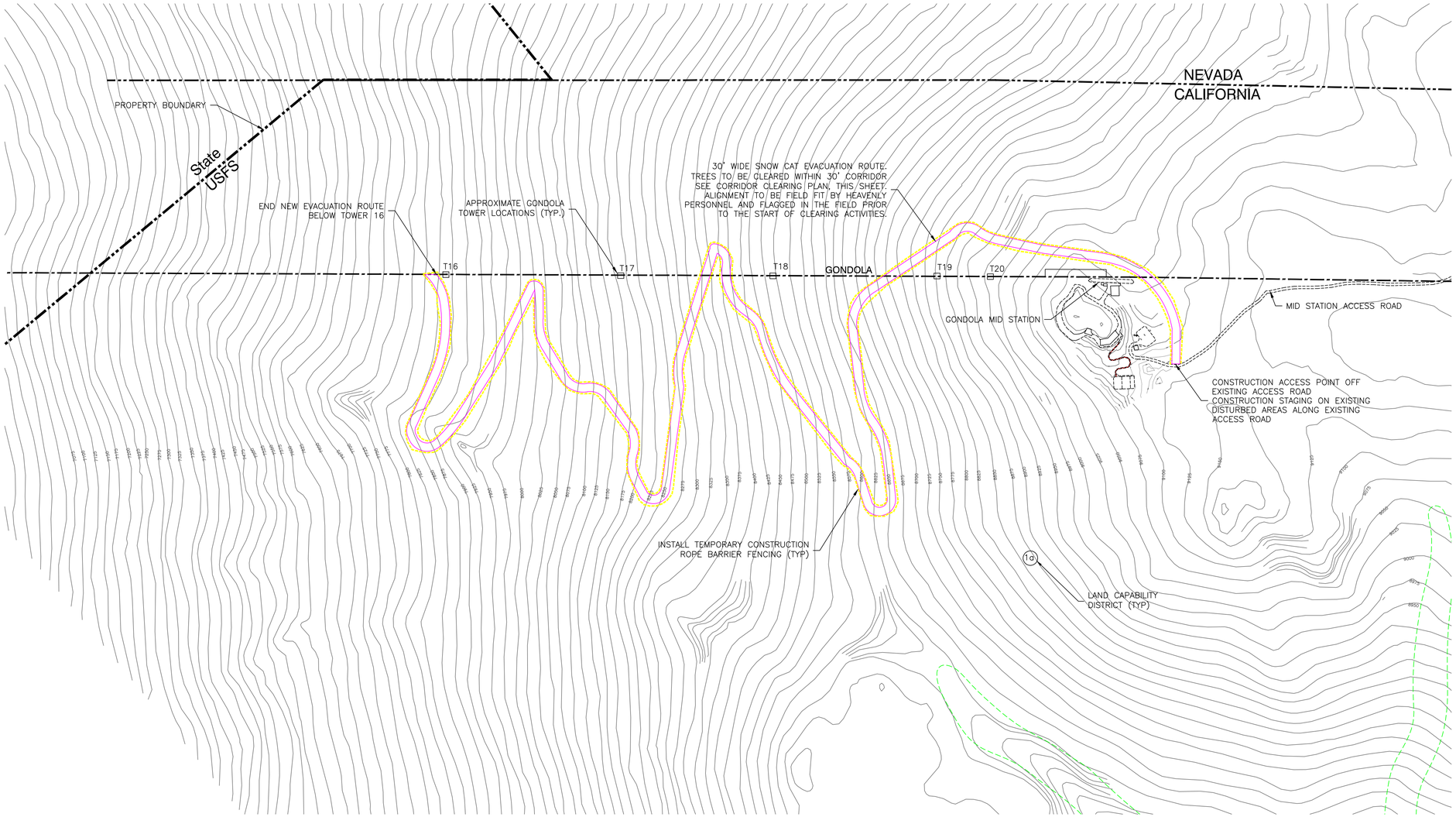
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 7



N

0 100 200 300 400
SCALE: 1"= 200'

CORRIDOR CLEARING PLAN

1. PROJECT PRESCRIPTIONS

The following prescriptions will be implemented. A combination of prescriptions, outlined below, will be field-verified by Heavenly representatives and those of other agencies

A. Prescription 1: Protect Native Plants and Revegetate

- Existing native shrubs along the proposed evacuation route will be field identified and avoided to the greatest extent possible.

B. Prescription 2: Remove Noxious Weeds

- Noxious weeds shall be flagged by a qualified Heavenly representative or consultant, isolated from project activity, and reported to the Lake Tahoe Basin Management Unit's (LTBMU) Ecosystem Conservation Department for formal taxonomic identification and removal activity scheduling.

C. Prescription 3: Construction Techniques

- The optimum pieces of equipment given the site conditions shall be used to minimize unwanted environmental effects. Typically, the work will be completed using hand tools and/or a spider hoe.
- All mechanical construction equipment used shall be limited to the 30-foot wide evacuation route corridor.
- All areas disturbed due to equipment movement shall be scarified and mulched with with a pine needle mulch incorporated into the top two inches of soil.

D. Prescription 3: Chip Existing Felled Trees and Large Woody Debris (less than 10 inches)

- All existing limbs shall be either chipped and spread evenly or scattered where the maximum height does not exceed 12 to 18 inches.
- Existing felled trees shall be chipped and the resulting mulch evenly distributed to an average depth of three inches.

E. Prescription 4: Treat Existing Large Diameter Logs (greater than 10 inches)

Large diameter logs cannot be mechanically chipped and will be treated separtely as described below:

- Existing large diameter logs shall be removed from the corridor
- Logs shall be placed in adjacent forested areas off the designated corridor to mimic natural surroundings.
- Logs along steeper sections will be mechanically placed perpendicular to the slope where needed tp reduce soil erosion hazards.

F. Prescription 5: Grind Existing Tree Stumps

- Stumps shall not be removed and soil disturbance will not occur.
- Stumps shall be cut or ground to less than 6 inches in height from the soil surface whenever safely possible.
- Existing rounds shall be removed in order to provide a more natural appearing condition.

G. Prescription 6: Reduce Height of Boulders

- Boulders shall be capped (blasted with explosives) to a height between 12 to 18 inches.
- Boulders will be moved by hand whenever possible, but the equipment onsite may also be utilized.
- Fragments shall be placed as to maximize contact with the soil surface with efforts to mimic the natural surroundings.

2. IMPROVING SOIL RESOURCES

- Rather than simply spreading the wood chips or other organic material on top of the soil, use the aged organic material from the Heavenly stockpile to blend into the onsite soil when possible based on site constraints.

3. WILDLIFE HABITAT

- Leave all shrubs and groundcover that are 18" in height or less in the corridor.
- Leave some areas of bare soil in order to serve as seed caches for rodents and birds.
- When placing rock on the slope, create pockets within groups of rock and create rock ledges with overhangs in order to provide refuge for rodents and small mammals.
- Rocks that are capped should have any removed pieces that are intact left in the corridor and arranged in such a manor that leaves overhangs and other spaces for wildlife shelter.
- Provide variety of higher heights of rock, not simply the minimum height of 12 inches (this technique will also provide visual quality benefits).
- Logs equal to or less than 18" diameter will be trimmed of branches so that all branches that are lower in height than the diameter of the log remain in order to provide micro-scale habitat for rodents and small mammals.
- Logs between 12" and 18" diameter should be present in densities at or greater than the surrounding forest, or not less than 10 logs per ace, whichever is greater.
- Logs should be aligned across the slope on the ground surface.
- Logs greater than 18" in diameter shall be moved to the edge of the corridor.

4. VISUAL QUALITY

- Randomly feather logs across the slope from the cleared corridor into the edges of the adjacent forested areas in order to add visual variety and avoid uniform log placement..
- Do not create longitudinal depressions or troughs that can serve as conduits for surface water runoff removing large volumes of soil or rock which result in a significant alteration of the slope shape.

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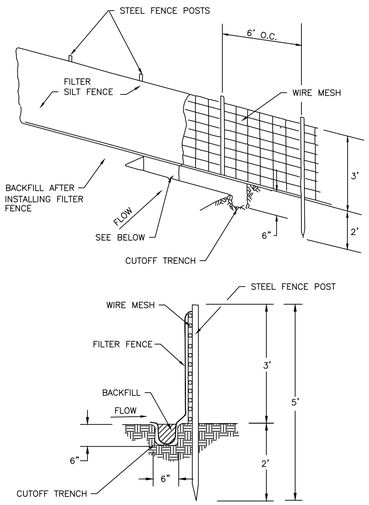
HEAVENLY MOUNTAIN RESORT
Adventure Peak Epic Discovery Activities

SNOW CAT EVACUATION ROUTE

JOB NO.:	12-602.7
DATE:	02-27-14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 8

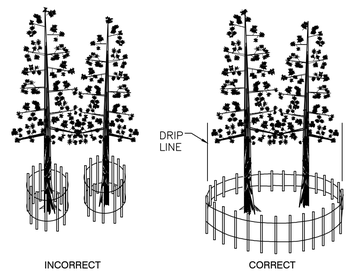


NOTES:

1. THE CONTRACTOR MAY USE MANUFACTURED FILTER FENCING IN LIEU OF THE ABOVE, SUBJECT TO SUBMITTAL OF MANUFACTURER'S DATA SHEETS TO THE ENGINEER FOR APPROVAL.
2. WIRE MESH CAN BE DELETED IF POST SPACING IS REDUCED TO 4-FOOT OC.
3. ENDS OF RUN OF FILTER FENCE SHALL BE TURNED UPHILL TO FORM A 'J'.

TEMPORARY EROSION CONTROL TYPICAL FILTER FENCE

NO SCALE



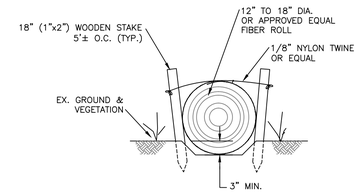
TREE PROTECTION FENCING

NOTE:

1. TEMPORARY FENCING TO BE A MINIMUM OF 4' HIGH.
2. POSTS TO BE SET AT A MINIMUM OF 6' ON CENTERLINE FROM EACH OTHER.
3. FENCING MATERIALS TO BE APPROVED BY THE ENGINEER.

TEMPORARY EROSION CONTROL TREE PROTECTION DETAIL

NO SCALE

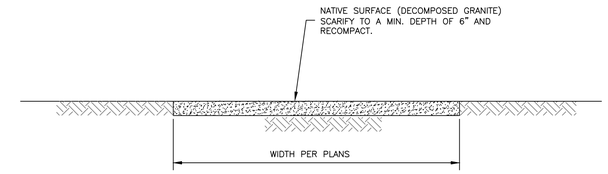


NOTES:

1. FIBER ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3" TO 6" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. FIBER MATERIAL SHALL BE BIODEGRADABLE WEED-FREE STRAW, JUTE, COIR, OR EXCELSIOR. MATERIALS REQUIRE TRPA AND U.S. FOREST SERVICE APPROVAL PRIOR TO INSTALLATION.

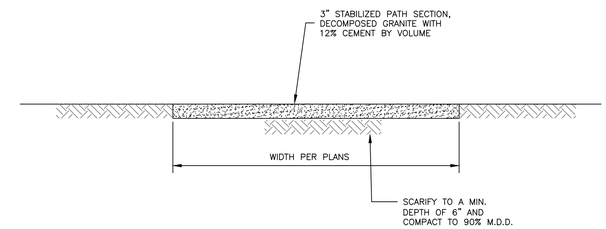
TEMPORARY SEDIMENT BARRIER FIBER ROLLS

NO SCALE



NATIVE SURFACE (DG) TRAIL DETAIL

NO SCALE



D/G CEMENT TRAIL DETAIL

NO SCALE

EROSION CONTROL NOTES

1. FOR ALL USE OF THE STAGING AREA WHEN SNOW COVER IS NOT PRESENT, HEAVENLY SHALL HAVE ALL TEMPORARY EROSION CONTROL MEASURES IN PLACE AND APPROVED BY TRPA. HEAVENLY SHALL INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND/OR EROSION. AFTER A RAINSTORM, ALL SILT AND DEBRIS MUST BE REMOVED FROM CHECK BERMS AND DESILTING FACILITIES, AND ANY DAMAGED EROSION CONTROL MEASURES MUST BE REPAIRED.
2. AN ONSITE INSPECTION BY TRPA STAFF IS REQUIRED PRIOR TO ANY CONSTRUCTION OR GRADING ACTIVITY. TRPA STAFF SHALL DETERMINE IF THE ONSITE CONSTRUCTION TEMPORARY EROSION CONTROL MEASURES HAVE BEEN PROPERLY INSTALLED. NO GRADING OR CONSTRUCTION SHALL COMMENCE UNTIL TRPA PRE-GRADE CONDITIONS OF APPROVAL ARE MET.
3. HEAVENLY SHALL BE RESPONSIBLE TO INSTALL AND MAINTAIN ALL CONSTRUCTION BMPS TO ENSURE PROPER WORKING CONDITIONS. ROADS USED DURING CONSTRUCTION WILL BE INSPECTED DAILY BY HEAVENLY FOR DRAINAGE AND GRADING. RUTS WILL BE REPAIRED IMMEDIATELY. WATERBARS, CULVERTS, AND DITCHES (DRAINAGE STRUCTURES) WILL BE MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION.
4. SEDIMENT BARRIERS AND CONSTRUCTION LIMIT FENCING WILL BE INSPECTED DAILY DURING CONSTRUCTION BY THE HEAVENLY FOR DAMAGE AND APPROPRIATE PLACEMENT. SEDIMENT BARRIERS SHALL BE REPAIRED AND/OR RELOCATED AS NEEDED ON A DAILY BASIS.
5. TEMPORARY BMP MEASURES SHALL BE IMPLEMENTED FOR ALL SUMMER IMPROVEMENT PROJECT LOCATIONS.
6. EXCAVATION SHALL NOT EXCEED 5-FEET BELOW GROUND SURFACE.
7. DISTURBED AREAS, ROADWAYS, AND STAGING AREAS USED DURING CONSTRUCTION SHALL BE SWEPT AND PROVIDED WITH DUST ABATEMENT SUCH AS A WATER TRUCK AS NEEDED.
8. FOR ALL NATIVE TREES TO REMAIN, TEMPORARY CONSTRUCTION FENCE SHALL BE INSTALLED AROUND THE DRIPLINE OF ALL TREES ADJACENT TO THE ROAD AND WORK AREAS, WHERE FEASIBLE, OR OTHER MEASURES DEEMED APPROPRIATE BY THE TRPA INSPECTOR.
9. HEAVENLY SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS.
10. TURNING OR MANEUVERING OF BACKHOE, EXCAVATOR OR OTHER EQUIPMENT WILL BE MINIMIZED TO REDUCE SOIL DISTURBANCE.
11. ALL BARREN AREAS AND AREAS DISTURBED BY CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE TRPA HANDBOOK OF BEST MANAGEMENT PRACTICES. APPLICATION OF A MULCH MAY ENHANCE VEGETATIVE ESTABLISHMENT.

REVEGETATION SPECIFICATIONS

PART 1. GENERAL

ALL AREAS DISTURBED DURING CONSTRUCTION OTHER THAN EXISTING ACCESS ROADS, INCLUDING ACCESS CORRIDORS, STORAGE AREAS, STAGING AREAS, AND CONSTRUCTION AREAS SHALL BE STABILIZED ACCORDING TO THESE SPECIFICATIONS. UPON COMPLETION OF GRADING AND CONSTRUCTION, AND PRIOR TO REVEGETATION, ALL AREAS TO BE REVEGETATED WILL BE INSPECTED BY THE ENGINEER'S REVEGETATION SPECIALIST (RS). THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE WORKING DAYS PRIOR TO PLANTING TO SCHEDULE THE REQUIRED INSPECTION. FINAL SEEDING AND MULCH TREATMENT AREAS WILL BE STAKED IN THE FIELD AT THAT TIME. REVEGETATION TREATMENTS PERFORMED BY AN OUTSIDE CONTRACTOR SHALL NOT BE INITIATED WITHOUT THE APPROVAL OF THE ENGINEER. REVEGETATION PERFORMED BY HEAVENLY PERSONNEL NEED NOT BE APPROVED BY THE ENGINEER OR THE REVEGETATION SPECIALIST PRIOR TO INITIATING REVEGETATION WORK.

STABILIZATION TREATMENTS SHALL BE INSTALLED AS PER THESE SPECIFICATIONS AND THE PLAN SHEETS AND SHALL CONSIST OF WOOD CHIP INCORPORATION INTO THE TOP 12 INCHES OF SOIL, SEEDING, AND PINE NEEDLE/WOOD CHIP MULCH APPLICATION.

PART 2. PRODUCTS AND EXECUTION OF TREATMENTS

SEED

SEED MIXTURES ARE SHOWN IN TABLE 1 ON THIS SHEET.

SEED SHALL BE CLEAN NEW CROP SEED, PURCHASED PREMIXED ON A PURE LIVE SEED (PLS) BASIS. SEED SHALL BE DELIVERED TO THE SITE IN ORIGINAL UNOPENED CONTAINERS BEARING THE DEALER'S GUARANTEED ANALYSIS AND GERMINATION PERCENTAGE, AND SHALL MEET THE STATE OF CALIFORNIA FREEDOM FROM NOXIOUS WEED REQUIREMENTS. NO SUBSTITUTIONS IN THE SEED MIXTURE WILL BE ACCEPTED WITHOUT WRITTEN APPROVAL FROM THE RS.

SEED LABELS SHALL BE REMOVED FROM THE SEED SACKS BY THE RS AT THE TIME OF SEEDING. SEED LABELS WILL INCLUDE DOCUMENTATION FOR EACH TYPE OF SEED CERTIFYING THAT A RECOGNIZED LABORATORY TESTED THE SEED WITHIN 6 MONTHS OF THE DATE OF DELIVERY.

Table 1. Seed Mix

Common Name Variety	Scientific Name	Seeding Rate Pure Live Seed Pounds Per Acre
Squirreltail (High elevation collection	Elymus elymoides ssp. Elymoides (Sierra)	10
Mokelumne or El Dorado Brome (or other high elevation Tahoe collection)	Bromus carinatus (Mokelumne)	5
Western Needlegrass (or other high elevation Tahoe collection)	Achnatherum occidentale	3
Antelope Bitterbrush (+5500 ft. Sierra Collection)	Purshia tridentata	5
Sulfur-flower Buckwheat	Erigonum umbellatum	2
	Total PLS Pounds Per Acre Rate	25

PART 2 (CONT.) PRODUCTS AND EXECUTION OF TREATMENTS

WOOD CHIPS

WOOD CHIPS SHALL BE PREPARED FROM TREES REMOVED DURING CONSTRUCTION AND MAINTENANCE ACTIVITIES ON HEAVENLY MOUNTAIN RESORT. TOPS AND BRANCHES OF TREES REMOVED ON THIS AND OTHER HEAVENLY MOUNTAIN RESORT PROJECT SITES WILL BE CHIPPED TO A MINIMUM DIAMETER OF 2 INCHES, AND A MAXIMUM LENGTH OF 6 INCHES.

PINE NEEDLES

PINE NEEDLES SALVAGED FROM THE CONSTRUCTION SITE CAN BE USED AS A MULCH MATERIAL. PINE NEEDLE MULCH SHALL BE WEED FREE AND CLEAN WITHOUT DEBRIS, OR EXCESSIVE WOODY MATERIAL.

SOIL TREATMENT

ALL AREAS TO BE STABILIZED (WITH AND WITHOUT SEEDING) SHALL BE LOOSENED TO A DEPTH OF AT LEAST 12 INCHES TO ALLEVIATE COMPACTION AND TO INCORPORATE WOOD CHIPS TO IMPROVE WATER INFILTRATION AND WATER HOLDING CAPACITY. A UNIFORM 3-INCH LAYER OF WOOD CHIPS SHALL BE SPREAD ACROSS THE SURFACE OF THE TREATMENT AREAS. WOOD CHIPS SHALL BE INCORPORATED INTO THE TOP 12 INCHES OF SOIL BY AN APPROVED LOOSENING METHOD. AREAS SHALL BE RAKED SMOOTH FOLLOWING WOOD CHIP INCORPORATION.

SEEDBED PREPARATION

AREAS DESIGNATED FOR SEEDING BY THE RS SHALL BE UNIFORMLY BROADCAST SEEDED WITH HAND OPERATED BROADCAST SEEDERS. THE CONTRACTOR SHALL PROVIDE THE RS A WRITTEN STATEMENT OR SITE DEMONSTRATION TO VERIFY THAT THE SEEDING BROADCAST EQUIPMENT HAS BEEN CALIBRATED TO THE SPECIFIED APPLICATION RATES. LARGE AND SMALL SIZE SEED AS INDICATED IN TABLE 1 SHALL BE BROADCAST IN SEPARATE APPLICATIONS. SEEDING SHALL NOT OCCUR UNDER CONDITIONS THAT WOULD ALLOW SEED TO BECOME WIND BORN. SEED SHALL NOT BE INCORPORATED AND APPLIED WITH HYDROMULCH. IMMEDIATELY FOLLOWING BROADCASTING, THE SEEDED AREAS SHALL BE LIGHTLY HAND-RAKED TO PLACE THE SEED AT DEPTH OF ¼ TO ½ INCH INTO THE SOIL. NO FURTHER VEHICULAR ACCESS WILL BE ALLOWED ON TREATMENT AREAS UPON COMPLETION OF SEEDING. SEEDINGS SHALL NOT BE LEFT OVERNIGHT WITHOUT RECEIVING MULCH TREATMENT.

PINE NEEDLE/ WOOD CHIP MULCH

ALL SEEDED AREAS SHALL BE MULCHED WITH PINE NEEDLES OR WOOD CHIPS. PINE NEEDLE MULCH SHALL BE SPREAD ACROSS SEEDED AREAS IN A LOOSE 2" LAYER TO ACHIEVE A MINIMUM OF 90 PERCENT COVER.

UNSEEDED TREATMENT AREAS SHALL BE MULCHED WITH WOOD CHIPS SPREAD IN A UNIFORM 6 TO 8 INCH LAYER.

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HEAVENLY MOUNTAIN RESORT
Adventure Peak Epic Discovery Activities

DETAIL SHEET

JOB NO.:	12-602.7
DATE:	02-27-14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 9

EAST PEAK LAKE BASIN EPIC DISCOVERY ACTIVITIES

HEAVENLY MOUNTAIN RESORT
EL DORADO COUNTY, CALIFORNIA
APN 030-030-01
DOUGLAS COUNTY, NEVADA
APN 1318-00-002-010

STANDARD ABBREVIATIONS

A.C.	ASPHALTIC CONCRETE
@	AT
AGG.	AGGREGATE
APPROX.	APPROXIMATE
BLDG.	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
C.B.	CATCH BASIN
C & G	CURB AND GUTTER
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC.	CONCRETE
CULV.	CULVERT
C.Y.	CUBIC YARDS
D.I.	DROP INLET
DIA.	DIAMETER
DR	DRIVE
E	ELECTRIC
EL., ELEV.	ELEVATION
EXIST.,EX.	EXISTING
FG	FINISH GRADE
F.H.	FIRE HYDRANT
FL	FLOWLINE
FND.	FOUND
G	GAS
I.E.	INVERT ELEVATION
IMPROV.	IMPROVEMENT
L.F.	LINEAR FEET
M.H.	MANHOLE
MAX.	MAXIMUM
MIN.	MINIMUM
MON.	MONUMENT
NTS	NOT TO SCALE
O.G.	ORIGINAL GROUND
P.C.C.	PORTLAND CONCRETE CEMENT
PE	POLYETHYLENE
PL	PROPERTY LINE
PP	POWER POLE
RCP	REINFORCED CONCRETE PIPE
S.F.	SQUARE FEET
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SHT.	SHEET
SS	SANITARY SEWER
SSCO	SANITARY SEWER CLEANOUT
SSMH	SANITARY SEWER MANHOLE
STD.	STANDARD
TELE.	TELEPHONE
TYP.	TYPICAL
UTIL.	UTILITY
W	WATER

Project Coverage Table (Rev 02-27-14)

New Coverage	Existing 1a	Proposed 1a	Net Change
East Peak Basin Epic Discoveries			
East Peak Lodge Hiking Trail (in Basin Segments) Trails		1,210	1,210
Total East Peak Basin Epic Discoveries	-	1,210	1,210
Total Coverage	**0**	**1,210**	**1,210**

Coverage Summary Table

Maximum Allowable Coverage (per Master Plan)	1a	1b	**Total**
Maximum Allowable Coverage per Master Plan			**2,053,854**
Balance Remaining of Coverage and Banked Coverage per Table 3.4-4 of the Final EIR/EIS/EIS[1]	434,580	4,464	**439,044**
Project Subtotals			
Northbowl/Olympic Express Lifts Project Balances	960	396	1,356
Gondola Hiking trails	54,501	0	54,501
Mid Station Road	50,469	0	50,469
Northbowl/Olympic Express Lifts - Plan Revision	216	0	216
World Cup/East Bowl Snowmaking - Plan Revision	283	0	283
Calif. Base Surface Lift Replacement	1,572	0	1,572
Skyline Trail Grading and Snowmaking	1,134	0	1,134
Top of the Gondola Lodge	42,387	0	42,387
Adjusted Gondola Permit Coverage	-27,519	0	-27,519
Umbrella Bar Relocation	651	0	651
Covered Surface Lift and Snowmaking	10,039	0	10,039
California Side Trail Widening	0	0	0
Adventure Peak Improvements	6,207	0	6,207
Zipline Adventure Ride	4,916	0	4,916
Verizon Angel's Roost Cell Tower and Back-up Bldg	584	0	584
Epic Race Course Electrical	0	0	0
Summer Activities	22,213	0	22,213
Tamarack Lodge Modifications	537	0	537
Adventure Peak Epic Discoveries	*58,154*	*0*	58,154
Removal of Gondola Hiking Trails	*-54,501*	*0*	-54,501
East Peak Basin Epic Discoveries	*1,210*	*0*	1,210
Sky Meadows Basin Epic Discoveries	*26,816*	*772*	27,588
Subtotals	**200,829**	**1,168**	**201,997**
Balance Remaining Upon Project Completion	**233,751**	**3,296**	**237,047**

1. Includes 10,541 square feet of existing coverage attributed to Sky Deck

LOCATION MAP

SHEET INDEX

EAST PEAK CONSTRUCTION PLAN SET

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HEAVENLY MOUNTAIN RESORT
East Peak Lake Basin Epic Discovery Activities

TITLE SHEET

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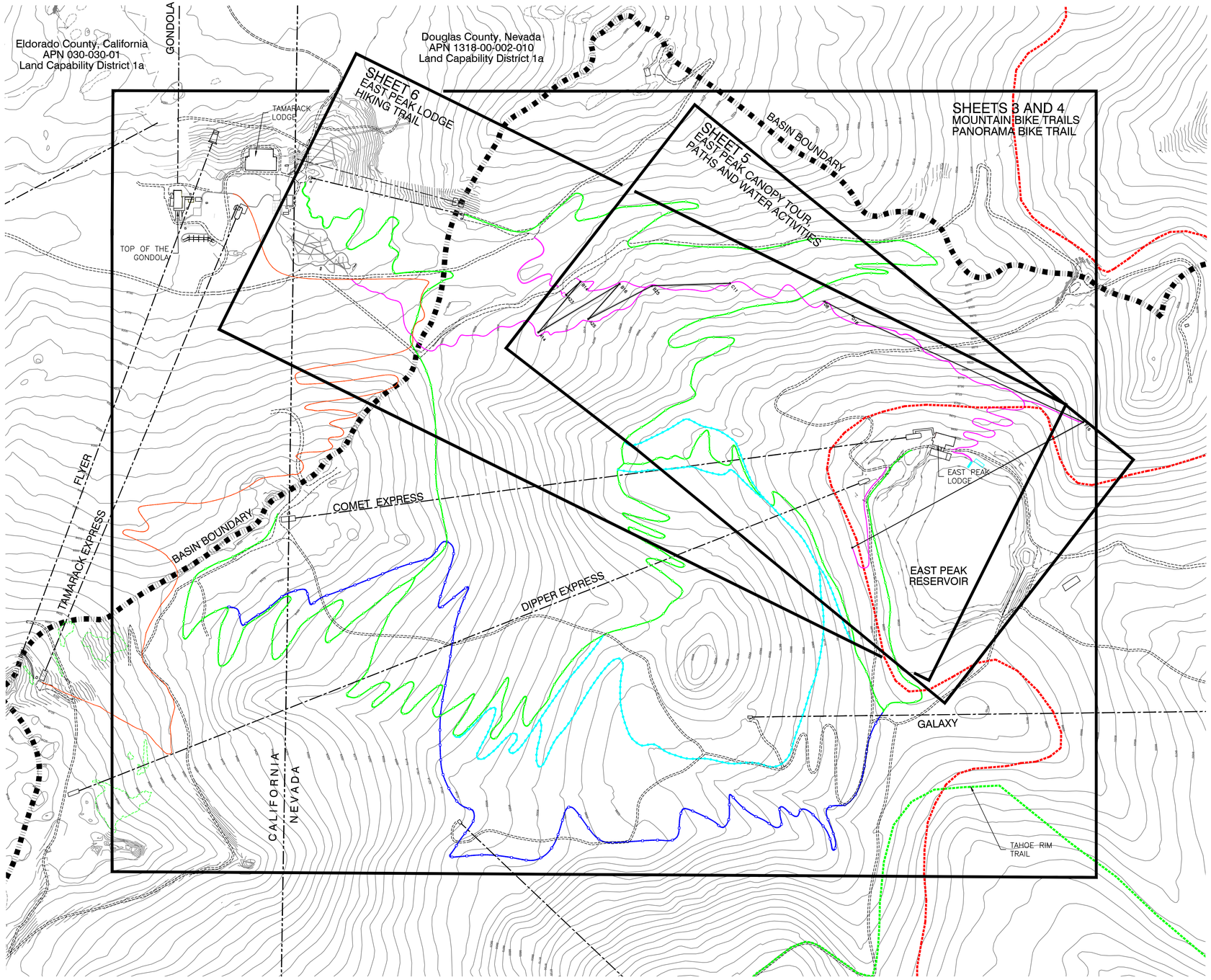
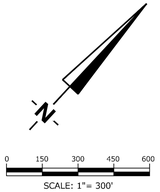
SHEET 1





LEGEND:

- MOUNTAIN BIKE BEGINNER TRAIL
- MOUNTAIN BIKE INTERMEDIATE TRAIL
- MOUNTAIN BIKE ADVANCED TRAIL
- PANORAMA BIKE TRAIL
- NEW HIKING TRAILS

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SITE PLAN AND SHEET INDEX

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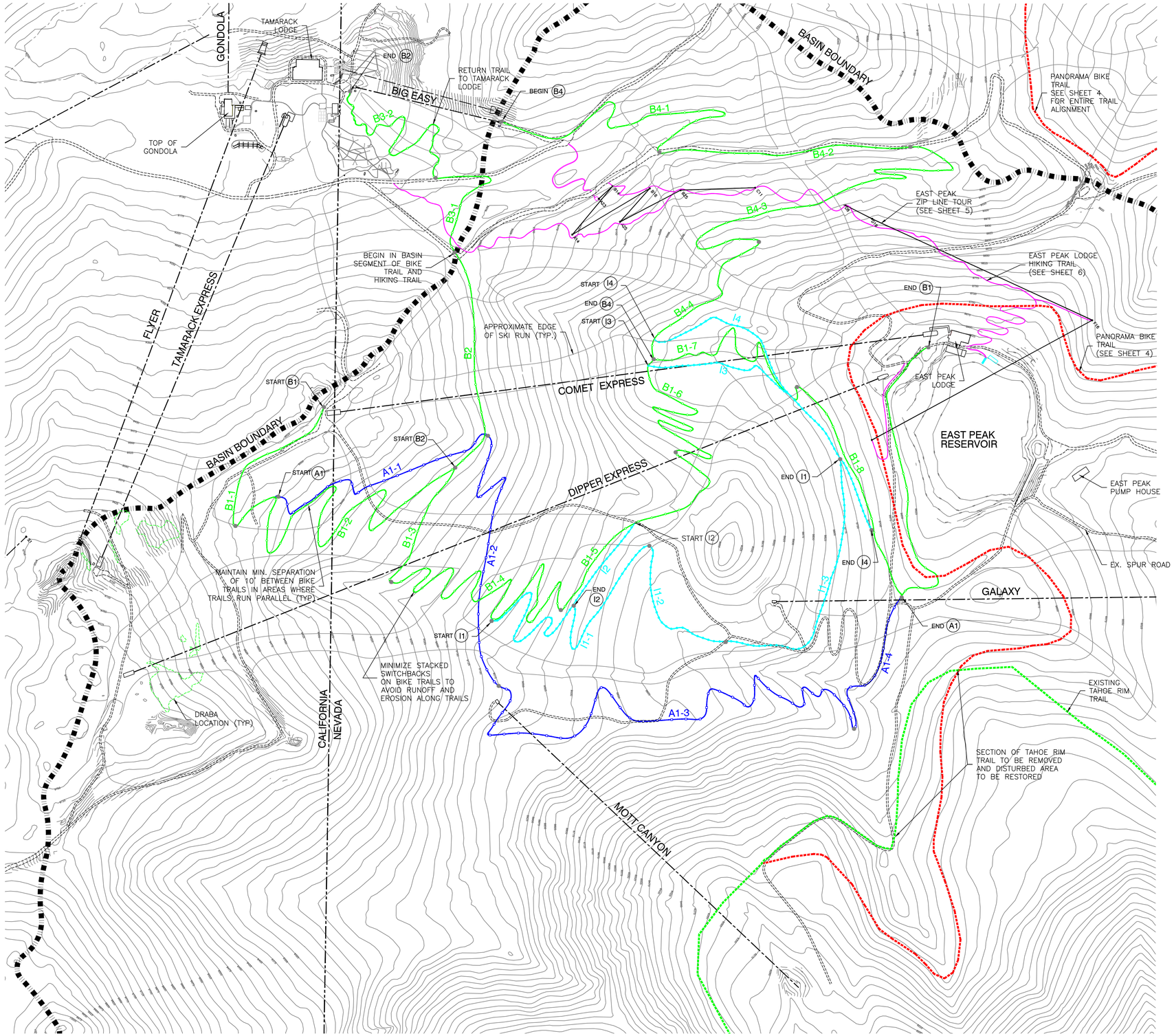
SHEET 2



N

0 150 300 450 600

SCALE: 1"= 300'

LEGEND:

- MOUNTAIN BIKE BEGINNER TRAIL
- MOUNTAIN BIKE INTERMEDIATE TRAIL
- MOUNTAIN BIKE ADVANCED TRAIL
- PANORAMA BIKE TRAIL
- NEW HIKING TRAILS
- B1-1 (B1) MOUNTAIN BIKE TRAIL SEGMENT DESIGNATION
- MOUNTAIN BIKE TRAIL SEGMENT START / STOP
- EXISTING ROADS
- EXISTING TRAILS
- APPROXIMATE EDGE OF SKI RUN

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MOUNTAIN BIKE PARK TRAIL

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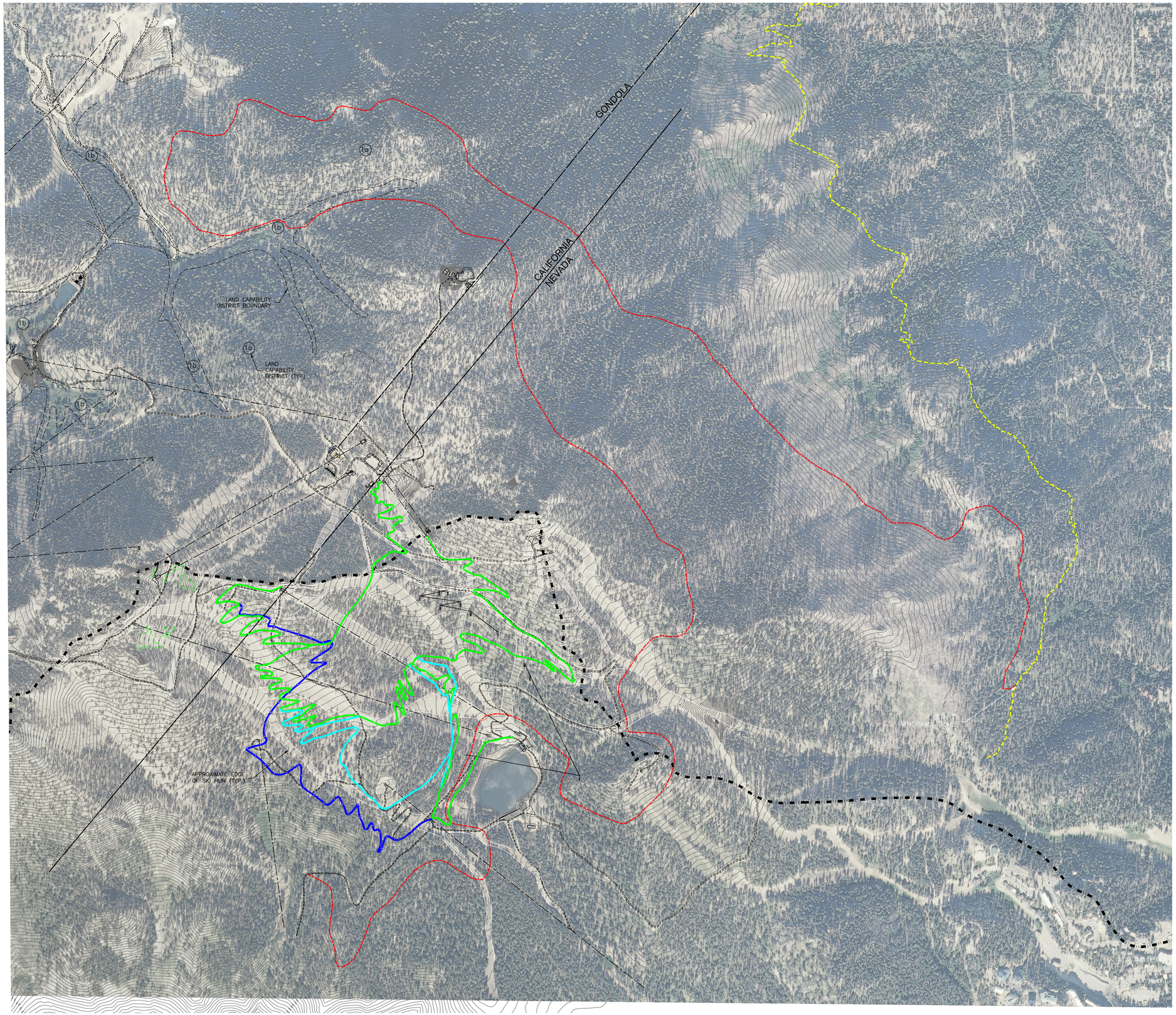
SHEET 3



N

0 30 60 90 120

SCALE: 1"= 600'

LEGEND:

- VAN SICKLE BIKE TRAIL
- MOUNTAIN BIKE BEGINNER TRAIL
- MOUNTAIN BIKE INTERMEDIATE TRAIL
- MOUNTAIN BIKE ADVANCED TRAIL
- PANORAMA BIKE TRAIL

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PANORAMA BIKE TRAIL

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SHEET 4

20'x20' QUEUING AREA
PLACE MULCH 3" DEEP.

P32

NATIVE SURFACE (D.G.)
4' WIDE TRAIL
TO THE TOP OF BIG EASY
(SEE SHEET 6)

P33

LAUNCH TOWER
REFER TO EAST PEAK
CONSTRUCTION PLAN SET
SEE SHEET 7 FOR
TEMPORARY EROSION
CONTROL

B14

A23

M34

B16

NATIVE SURFACE (D.G.)
2' WIDE TRAIL
TO BE FIELD FIT BY
HEAVENLY PERSONNEL

P29

TREE PLATFORM (TYP)
REFER TO EAST PEAK
CONSTRUCTION PLAN SET

B25

A14

A25

C11

EAST PEAK HIKING TRAIL
TO THE TOP OF THE GONDOLA
AREA
2-FT WIDE TRAIL TO BE FIELD FIT
BY HEAVENLY PERSONNEL
(SEE SHEET 6)

CONSTRUCTION ACCESS
VIA EX. SUMMER
ACCESS ROAD

P30

TRAIL
NUMBER
(TYP)

BASIN BOUNDARY

D8

EAST PEAK CANOPY TOUR
ALIGNMENT
REFER TO EAST PEAK
CONSTRUCTION PLAN SET

D16

EAST PEAK LODGE HIKING TRAIL
NATIVE SURFACE (D.G.)
2' WIDE TRAIL TO BE
FIELD FIT BY HEAVENLY PERSONNEL
(SEE SHEET 6 FOR COMPLETE ALIGNMENT)

P31

CONSTRUCTION ACCESS
VIA EX. SUMMER
ACCESS ROAD

COMET EXPRESS

CONSTRUCTION STAGING
AREA

BEGIN EAST PEAK LODGE HIKING TRAIL
NATIVE SURFACE (D.G.)
2' WIDE TRAIL TO BE
FIELD FIT BY HEAVENLY
PERSONNEL

M35

CONSTRUCTION STAGING
AREA

P37

DIPPER EXPRESS

NATIVE SURFACE (D.G.)
2' WIDE TRAIL TO BE
FIELD FIT BY HEAVENLY
PERSONNEL

EAST PEAK LODGE

NATIVE SURFACE (D.G.)
2' WIDE TRAIL TO
WATER ACTIVITIES AREA

F16

NEW SEASONAL
FLOATING DOCK
FINAL DIMENSION TBD

LANDING TOWER
REFER TO EAST PEAK
CONSTRUCTION PLAN SET
SEE SHEET 7 FOR
TEMPORARY EROSION CONTROL

QUEUING AREA
FOR BOAT RENTALS
DIMENSIONS TBD

P36

EAST PEAK RESERVOIR

N

0 50 100 150 200
SCALE: 1"= 100'

LEGEND:

P2 PUBLIC HIKING TRAILS

M2 ADMINISTRATIVE MAINTENANCE TRAILS

EAST PEAK CANOPY TOUR CORRIDOR
CLEARING LIMITS (TYP)
TOTAL ESTIMATED CLEARING: 1.4 ACRES

NOTES:

1. ALL HIKING TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE GRADES.
2. STACKED SWITCHBACKS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
3. FORMER ROADWAY PRISMS SHALL BE UTILIZED WHERE PRACTICABLE FOR NEW TRAIL ALIGNMENTS.
4. ALL TRAIL CONSTRUCTION CORRIDORS OUTSIDE OF THE TRAIL ITSELF SHALL BE REVEGETATED PER THE REVEGETATION SPECIFICATIONS INCLUDED IN THESE PLANS.
5. MOUNTAIN MIKE TRAILS ARE NOT SHOWN ON THIS SHEET FOR CLARITY. SEE SHEETS 3 AND 4 FOR MOUNTAIN BIKE TRAIL ALIGNMENTS.

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EAST PEAK CANOPY TOUR,
PATHS, AND WATER ACTIVITIES

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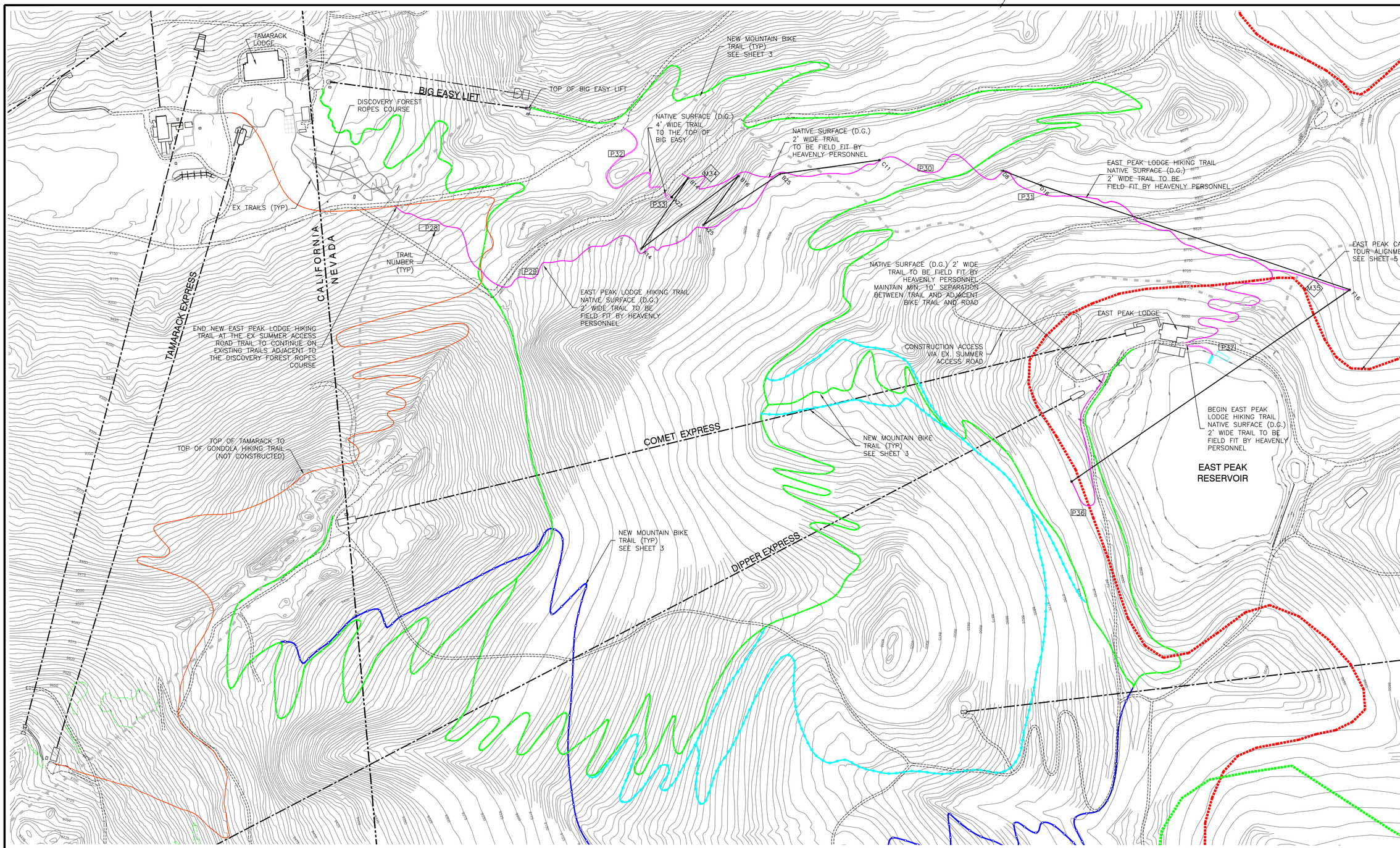
SHEET 5



LEGEND:

- P2 PUBLIC HIKING TRAILS
- M2 ADMINISTRATIVE MAINTENANCE TRAILS

NOTES:

1. ALL HIKING TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE GRADES.
2. STACKED SWITCHBACKS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
3. FORMER ROADWAY PRISMS SHALL BE UTILIZED WHERE PRACTICABLE FOR NEW TRAIL ALIGNMENTS.
4. ALL TRAIL CONSTRUCTION CORRIDORS OUTSIDE OF THE TRAIL ITSELF SHALL BE REVEGETATED PER THE REVEGETATION SPECIFICATIONS INCLUDED IN THESE PLANS.
5. MOUNTAIN MIKE TRAILS ARE NOT SHOWN ON THIS SHEET FOR CLARITY. SEE SHEETS 3 AND 4 FOR MOUNTAIN BIKE TRAIL ALIGNMENTS.

LEGEND:

- MOUNTAIN BIKE BEGINNER TRAIL
- MOUNTAIN BIKE INTERMEDIATE TRAIL
- MOUNTAIN BIKE ADVANCED TRAIL
- PANORAMA BIKE TRAIL
- NEW HIKING TRAILS
- TOP OF TAMARACK TO TOP OF GONDOLA TRAIL (NOT CONSTRUCTED)
- EXISTING ROADS
- EXISTING TRAILS

N

0 100 200 300 400

SCALE: 1"= 200'

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HEAVENLY MOUNTAIN RESORT
East Peak Lake Basin Epic Discovery Activities

EAST PEAK LODGE HIKING TRAIL

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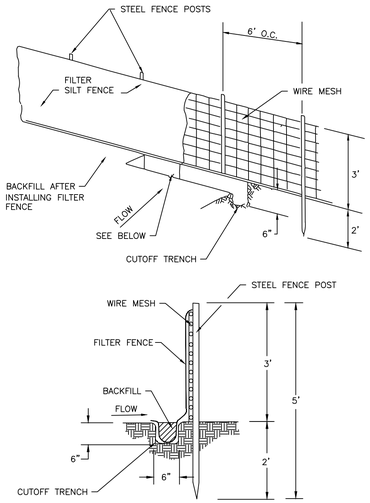
SHEET 6

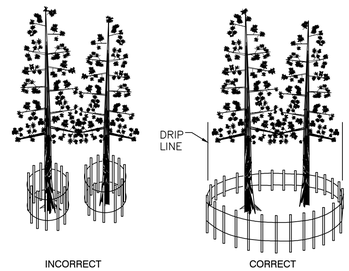


NOTES:

1. THE CONTRACTOR MAY USE MANUFACTURED FILTER FENCING IN LIEU OF THE ABOVE, SUBJECT TO SUBMITTAL OF MANUFACTURER'S DATA SHEETS TO THE ENGINEER FOR APPROVAL.
2. WIRE MESH CAN BE DELETED IF POST SPACING IS REDUCED TO 4-FOOT OC.
3. ENDS OF RUN OF FILTER FENCE SHALL BE TURNED UPHILL TO FORM A 'J'.

TEMPORARY EROSION CONTROL TYPICAL FILTER FENCE

NO SCALE



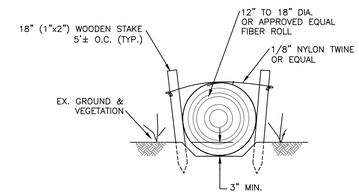
TREE PROTECTION FENCING

NOTE:

1. TEMPORARY FENCING TO BE A MINIMUM OF 4' HIGH.
2. POSTS TO BE SET AT A MINIMUM OF 6' ON CENTERLINE FROM EACH OTHER.
3. FENCING MATERIALS TO BE APPROVED BY THE ENGINEER.

TEMPORARY EROSION CONTROL TREE PROTECTION DETAIL

NO SCALE

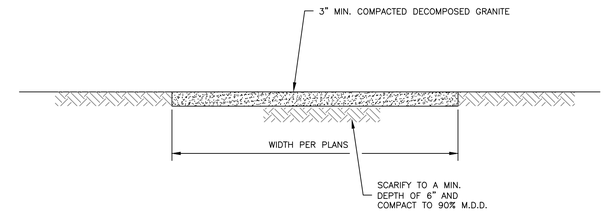


NOTES:

1. FIBER ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3" TO 6" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. FIBER MATERIAL SHALL BE BIODEGRADABLE WEED-FREE STRAW, JUTE, COIR, OR EXCELSIOR. MATERIALS REQUIRE TRPA AND U.S. FOREST SERVICE APPROVAL PRIOR TO INSTALLATION.

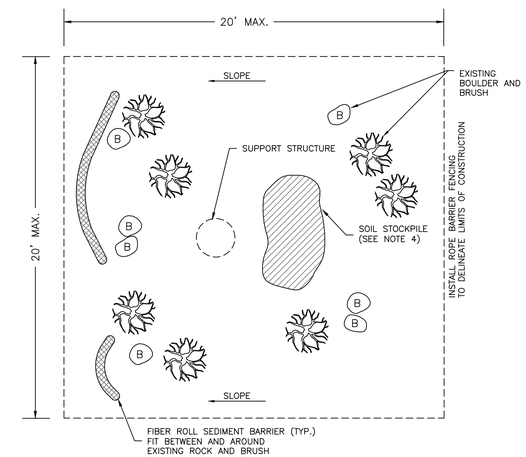
TEMPORARY SEDIMENT BARRIER FIBER ROLLS

NO SCALE

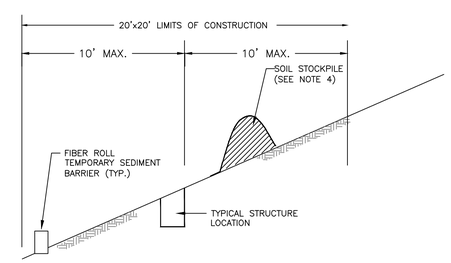


NATIVE SURFACE (DG) TRAIL DETAIL

NO SCALE



PLAN



ELEVATION

ZIPLINE GENERAL NOTES:

1. THERE SHALL BE A 20 FOOT BY 20 FOOT MAXIMUM CLEARING AROUND EACH ZIPLINE SUPPORT STRUCTURE.
2. ALL DISTURBED AREAS SHALL BE REVEGETATED PER THE REVEGETATION SPECIFICATIONS INCLUDED IN THESE PLANS. ANY VEGETATIVE DEBRIS FROM THE SITE SHALL BE CHIPPED AND/OR RE-SCATTERED OVER THE DISTURBED AREA.
3. SEZ AREAS WILL BE FLAGGED IN THE FIELD SO THAT THEY ARE CLEARLY VISIBLE DURING CONSTRUCTION.
4. STRUCTURE FOUNDATION EXCAVATION AND STRUCTURE PLACEMENT WILL BE COMPLETED USING HELICOPTERS TO MINIMIZE THE AMOUNT OF DISTURBANCE AT THE SITE. AFTER THE STRUCTURE HAS BEEN PLACED, ANY REMAINING SOIL FROM THE FOUNDATION EXCAVATION SHALL BE SPREAD WITHIN THE 20-FT X 20-FT CONSTRUCTION LIMITS. THESE AREAS SHALL BE REVEGETATED PER THE REVEGETATION SPECIFICATIONS INCLUDED IN THESE PLANS.

TEMPORARY EROSION CONTROL FOR STRUCTURE CONSTRUCTION

NOT TO SCALE

EROSION CONTROL NOTES

1. FOR ALL USE OF THE STAGING AREA WHEN SNOW COVER IS NOT PRESENT, HEAVENLY SHALL HAVE ALL TEMPORARY EROSION CONTROL MEASURES IN PLACE AND APPROVED BY TRPA. HEAVENLY SHALL INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND/OR EROSION. AFTER A RAINSTORM, ALL SILT AND DEBRIS MUST BE REMOVED FROM CHECK BERMS AND DESILTING FACILITIES, AND ANY DAMAGED EROSION CONTROL MEASURES MUST BE REPAIRED.
2. AN ONSITE INSPECTION BY TRPA STAFF IS REQUIRED PRIOR TO ANY CONSTRUCTION OR GRADING ACTIVITY. TRPA STAFF SHALL DETERMINE IF THE ONSITE CONSTRUCTION TEMPORARY EROSION CONTROL MEASURES HAVE BEEN PROPERLY INSTALLED. NO GRADING OR CONSTRUCTION SHALL COMMENCE UNTIL TRPA PRE-GRADE CONDITIONS OF APPROVAL ARE MET.
3. HEAVENLY SHALL BE RESPONSIBLE TO INSTALL AND MAINTAIN ALL CONSTRUCTION BMPS TO ENSURE PROPER WORKING CONDITIONS. ROADS USED DURING CONSTRUCTION WILL BE INSPECTED DAILY BY HEAVENLY FOR DRAINAGE AND GRADING. RUTS WILL BE REPAIRED IMMEDIATELY. WATERBARS, CULVERTS, AND DITCHES (DRAINAGE STRUCTURES) WILL BE MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION.
4. SEDIMENT BARRIERS AND CONSTRUCTION LIMIT FENCING WILL BE INSPECTED DAILY DURING CONSTRUCTION BY THE HEAVENLY FOR DAMAGE AND APPROPRIATE PLACEMENT. SEDIMENT BARRIERS SHALL BE REPAIRED AND/OR RELOCATED AS NEEDED ON A DAILY BASIS.
5. TEMPORARY BMP MEASURES SHALL BE IMPLEMENTED FOR ALL SUMMER IMPROVEMENT PROJECT LOCATIONS.
6. EXCAVATION SHALL NOT EXCEED 5-FEET BELOW GROUND SURFACE.
7. DISTURBED AREAS, ROADWAYS, AND STAGING AREAS USED DURING CONSTRUCTION SHALL BE SWEPT AND PROVIDED WITH DUST ABATEMENT SUCH AS A WATER TRUCK AS NEEDED.
8. FOR ALL NATIVE TREES TO REMAIN, TEMPORARY CONSTRUCTION FENCE SHALL BE INSTALLED AROUND THE DRIPLINE OF ALL TREES ADJACENT TO THE ROAD AND WORK AREAS, WHERE FEASIBLE, OR OTHER MEASURES DEEMED APPROPRIATE BY THE TRPA INSPECTOR.
9. HEAVENLY SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS.
10. TURNING OR MANEUVERING OF BACKHOE, EXCAVATOR OR OTHER EQUIPMENT WILL BE MINIMIZED TO REDUCE SOIL DISTURBANCE.
11. ALL BARREN AREAS AND AREAS DISTURBED BY CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE TRPA HANDBOOK OF BEST MANAGEMENT PRACTICES. APPLICATION OF A MULCH MAY ENHANCE VEGETATIVE ESTABLISHMENT.

REVEGETATION SPECIFICATIONS

PART 1. GENERAL

ALL AREAS DISTURBED DURING CONSTRUCTION OTHER THAN EXISTING ACCESS ROADS, INCLUDING ACCESS CORRIDORS, STORAGE AREAS, STAGING AREAS, AND CONSTRUCTION AREAS SHALL BE STABILIZED ACCORDING TO THESE SPECIFICATIONS. UPON COMPLETION OF GRADING AND CONSTRUCTION, AND PRIOR TO REVEGETATION, ALL AREAS TO BE REVEGETATED WILL BE INSPECTED BY THE ENGINEER'S REVEGETATION SPECIALIST (RS). THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE WORKING DAYS PRIOR TO PLANTING TO SCHEDULE THE REQUIRED INSPECTION. FINAL SEEDING AND MULCH TREATMENT AREAS WILL BE STAKED IN THE FIELD AT THAT TIME. REVEGETATION TREATMENTS PERFORMED BY AN OUTSIDE CONTRACTOR SHALL NOT BE INITIATED WITHOUT THE APPROVAL OF THE ENGINEER. REVEGETATION PERFORMED BY HEAVENLY PERSONNEL NEED NOT BE APPROVED BY THE ENGINEER OR THE REVEGETATION SPECIALIST PRIOR TO INITIATING REVEGETATION WORK.

STABILIZATION TREATMENTS SHALL BE INSTALLED AS PER THESE SPECIFICATIONS AND THE PLAN SHEETS AND SHALL CONSIST OF WOOD CHIP INCORPORATION INTO THE TOP 12 INCHES OF SOIL, SEEDING, AND PINE NEEDLE/WOOD CHIP MULCH APPLICATION.

PART 2. PRODUCTS AND EXECUTION OF TREATMENTS

SEED

SEED MIXTURES ARE SHOWN IN TABLE 1 ON THIS SHEET.

SEED SHALL BE CLEAN NEW CROP SEED, PURCHASED PREMIXED ON A PURE LIVE SEED (PLS) BASIS. SEED SHALL BE DELIVERED TO THE SITE IN ORIGINAL UNOPENED CONTAINERS BEARING THE DEALER'S GUARANTEED ANALYSIS AND GERMINATION PERCENTAGE, AND SHALL MEET THE STATE OF CALIFORNIA FREEDOM FROM NOXIOUS WEED REQUIREMENTS. NO SUBSTITUTIONS IN THE SEED MIXTURE WILL BE ACCEPTED WITHOUT WRITTEN APPROVAL FROM THE RS.

SEED LABELS SHALL BE REMOVED FROM THE SEED SACKS BY THE RS AT THE TIME OF SEEDING. SEED LABELS WILL INCLUDE DOCUMENTATION FOR EACH TYPE OF SEED CERTIFYING THAT A RECOGNIZED LABORATORY TESTED THE SEED WITHIN 6 MONTHS OF THE DATE OF DELIVERY.

Table 1. Seed Mix

Common Name Variety	Scientific Name	Seeding Rate Pure Live Seed Pounds Per Acre
Squirreltail (High elevation collection	Elymus elymoides ssp. Elymoides (Sierra)	10
Mokelumne or El Dorado Brome (or other high elevation Tahoe collection)	Bromus carinatus (Mokelumne)	5
Western Needlegrass (or other high elevation Tahoe collection)	Achnatherum occidentale	3
Antelope Bitterbrush (+5500 ft. Sierra Collection)	Purshia tridentata	5
Sulfur-flower Buckwheat	Erigonum umbellatum	2
	Total PLS Pounds Per Acre Rate	25

PART 2 (CONT.) PRODUCTS AND EXECUTION OF TREATMENTS

WOOD CHIPS

WOOD CHIPS SHALL BE PREPARED FROM TREES REMOVED DURING CONSTRUCTION AND MAINTENANCE ACTIVITIES ON HEAVENLY MOUNTAIN RESORT. TOPS AND BRANCHES OF TREES REMOVED ON THIS AND OTHER HEAVENLY MOUNTAIN RESORT PROJECT SITES WILL BE CHIPPED TO A MINIMUM DIAMETER OF 2 INCHES, AND A MAXIMUM LENGTH OF 6 INCHES.

PINE NEEDLES

PINE NEEDLES SALVAGED FROM THE CONSTRUCTION SITE CAN BE USED AS A MULCH MATERIAL. PINE NEEDLE MULCH SHALL BE WEED FREE AND CLEAN WITHOUT DEBRIS, OR EXCESSIVE WOODY MATERIAL.

SOIL TREATMENT

ALL AREAS TO BE STABILIZED (WITH AND WITHOUT SEEDING) SHALL BE LOOSENED TO A DEPTH OF AT LEAST 12 INCHES TO ALLEVIATE COMPACTION AND TO INCORPORATE WOOD CHIPS TO IMPROVE WATER INFILTRATION AND WATER HOLDING CAPACITY. A UNIFORM 3-INCH LAYER OF WOOD CHIPS SHALL BE SPREAD ACROSS THE SURFACE OF THE TREATMENT AREAS. WOOD CHIPS SHALL BE INCORPORATED INTO THE TOP 12 INCHES OF SOIL BY AN APPROVED LOOSENING METHOD. AREAS SHALL BE RAKED SMOOTH FOLLOWING WOOD CHIP INCORPORATION.

SEEDBED PREPARATION

AREAS DESIGNATED FOR SEEDING BY THE RS SHALL BE UNIFORMLY BROADCAST SEEDED WITH HAND OPERATED BROADCAST SEEDERS. THE CONTRACTOR SHALL PROVIDE THE RS A WRITTEN STATEMENT OR SITE DEMONSTRATION TO VERIFY THAT THE SEEDING BROADCAST EQUIPMENT HAS BEEN CALIBRATED TO THE SPECIFIED APPLICATION RATES. LARGE AND SMALL SIZE SEED AS INDICATED IN TABLE 1 SHALL BE BROADCAST IN SEPARATE APPLICATIONS. SEEDING SHALL NOT OCCUR UNDER CONDITIONS THAT WOULD ALLOW SEED TO BECOME WIND BORN. SEED SHALL NOT BE INCORPORATED AND APPLIED WITH HYDROMULCH. IMMEDIATELY FOLLOWING BROADCASTING, THE SEEDED AREAS SHALL BE LIGHTLY HAND-RAKED TO PLACE THE SEED AT DEPTH OF ¼ TO ½ INCH INTO THE SOIL. NO FURTHER VEHICULAR ACCESS WILL BE ALLOWED ON TREATMENT AREAS UPON COMPLETION OF SEEDING. SEEDINGS SHALL NOT BE LEFT OVERNIGHT WITHOUT RECEIVING MULCH TREATMENT.

PINE NEEDLE/ WOOD CHIP MULCH

ALL SEEDED AREAS SHALL BE MULCHED WITH PINE NEEDLES OR WOOD CHIPS. PINE NEEDLE MULCH SHALL BE SPREAD ACROSS SEEDED AREAS IN A LOOSE 2" LAYER TO ACHIEVE A MINIMUM OF 90 PERCENT COVER.

UNSEEDED TREATMENT AREAS SHALL BE MULCHED WITH WOOD CHIPS SPREAD IN A UNIFORM 6 TO 8 INCH LAYER.

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Zephyr Cove, NV 89448-8020
775-588-7500
RCI Resource Concepts Inc

REVISION

DATE

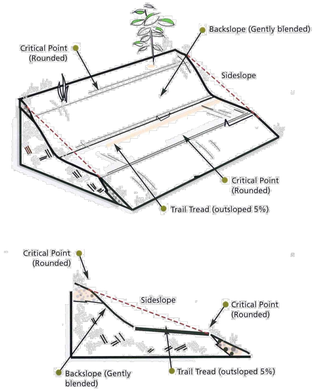
HEAVENLY MOUNTAIN RESORT
East Peak Lake Basin Epic Discovery Activities

DETAIL SHEET

JOB NO.:	12-602.7
DATE:	2/27/14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 7

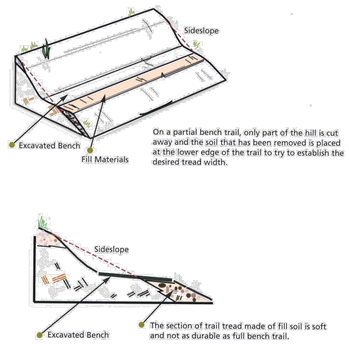
Full Bench Trail



FULL BENCH TRAIL

NO SCALE

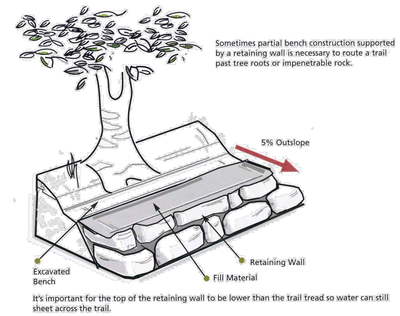
Partial Bench Trail



PARTIAL BENCH TRAIL

NO SCALE

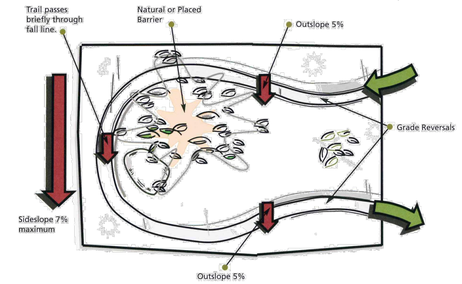
Partial Bench Trail with Retaining Wall



PARTIAL BENCH TRAIL WITH RETAINING WALL

NO SCALE

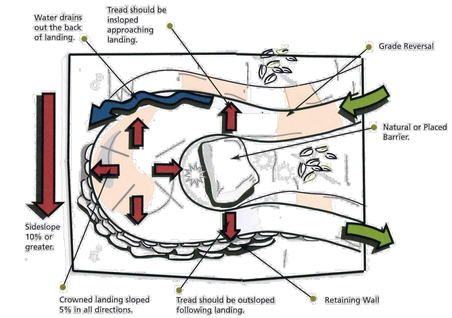
Climbing Turn



CLIMBING TURN

NO SCALE

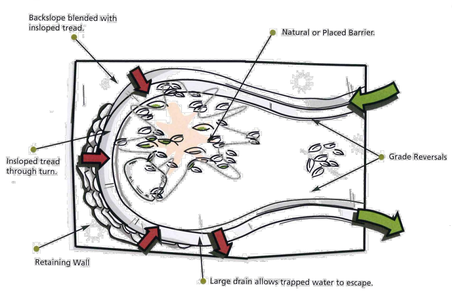
Rolling Crown Switchback



ROLLING CROWN SWITCHBACK

NO SCALE

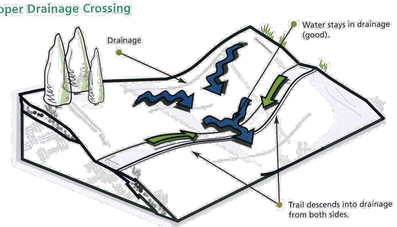
Insloped Turn



INSLOPED TURN

NO SCALE

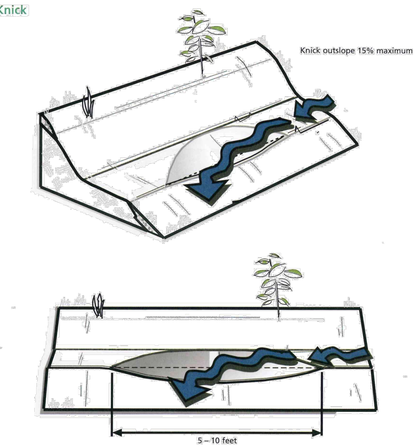
Proper Drainage Crossing



PROPER DRAINAGE CROSSING

NO SCALE

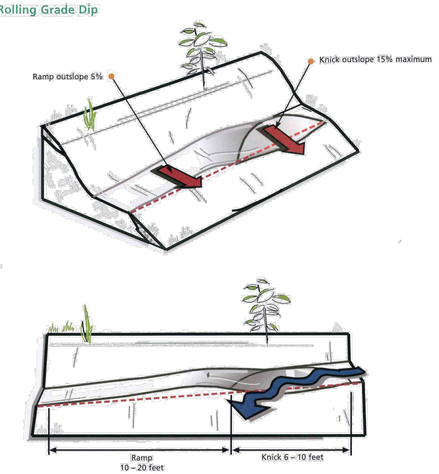
Knick



KNICKS

NO SCALE

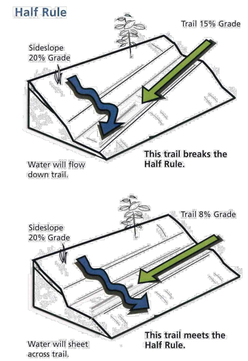
Rolling Grade Dip



ROLLING GRADE DIP

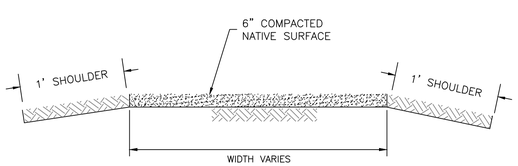
NO SCALE

Half Rule



HALF RULE

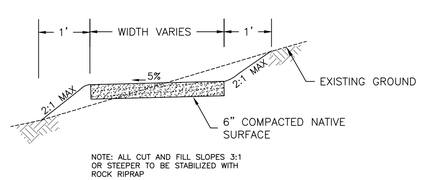
NO SCALE



BEGINNER AND INTERMEDIATE

MOUNTAIN BIKE TRAIL CROSS-SECTION AT GRADE CONSTRUCTION

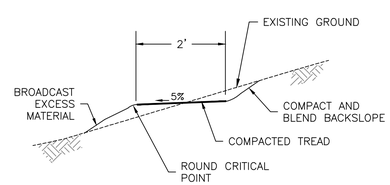
NO SCALE



INTERMEDIATE AND ADVANCED

MOUNTAIN BIKE TRAIL CROSS-SECTION CUT/FILL CONSTRUCTION

NO SCALE



ADVANCED

MOUNTAIN BIKE TRAIL CROSS-SECTION CONSTRUCTED WITH HAND TOOLS

NO SCALE

NOTES:

1. SCHEMATIC DETAILS OBTAINED FROM "TRAIL SOLUTIONS, IMBA'S GUIDE TO BUILDING SWEET SINGLE TRACK", 2004, PUBLISHED BY THE INTERNATIONAL MOUNTAIN BIKING ASSOCIATION.
2. TRAIL CONSTRUCTION SHALL ADHERE TO U.S. FOREST SERVICE - REGION 6, U.S. CUSTOMARY SPECIFICATION FOR CONSTRUCTION AND MAINTENANCE OF TRAILS, PACIFIC NORTHWEST REGION, DATED JULY 2005.
3. STACKED SWITCHBACKS SHALL BE MINIMIZED TO PREVENT RUNOFF AND EROSION ALONG BIKE TRAILS.
4. MOUNTAIN BIKE TRAILS SHOULD BE CONSTRUCTED WITH A MAXIMUM AVERAGE SLOPE OF 7%.
5. TRAIL DESIGN IS CONCEPTUAL AND BASED ON THE BEST INFORMATION AVAILABLE. TRAIL ALIGNMENT, GRADE, BERMS, AND FEATURES MAY BE MODIFIED AND "FIELD FIT" TO THE TERRAIN DURING CONSTRUCTION FOR CONSIDERATION OF EROSION CONTROL, SHORT-CUT PREVENTION, AND GUEST EXPERIENCE. BIKE TRAIL ALIGNMENT WILL BE FIELD FIT TO ENSURE BIKE TRAILS DO NOT INTERFERE WITH WINTER OPERATIONS.

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RCI Resource Concepts Inc

REVISION	DATE

HEAVENLY MOUNTAIN RESORT
East Peak Lake Basin Epic Discovery Activities

TRAIL GRADING DETAILS

JOB NO.:	12-602.7
DATE:	03/04/14
DESIGNED:	MMG
DRAWN :	MLM/FRB
CHECKED:	MMG

SHEET 8

SKY MEADOWS BASIN EPIC DISCOVERY ACTIVITIES

HEAVENLY MOUNTAIN RESORT
EL DORADO COUNTY, CALIFORNIA
APN 030-020-01

DOUGLAS COUNTY, NEVADA
APN 1318-00-002-010

STANDARD ABBREVIATIONS

A.C.	ASPHALTIC CONCRETE	I.E.	INVERT ELEVATION
@	AT	IMPROV.	IMPROVEMENT
AGG.	AGGREGATE	L.F.	LINEAR FEET
APPROX.	APPROXIMATE	M.H.	MANHOLE
BLDG.	BUILDING	MAX.	MAXIMUM
BLVD	BOULEVARD	MIN.	MINIMUM
BM	BENCH MARK	MON.	MONUMENT
C.B.	CATCH BASIN	NTS	NOT TO SCALE
C & G	CURB AND GUTTER	O.G.	ORIGINAL GROUND
CL	CENTERLINE	P.C.C.	PORTLAND CONCRETE CEMENT
CMP	CORRUGATED METAL PIPE	PE	POLYETHYLENE
CO	CLEAN OUT	PL	PROPERTY LINE
CONC.	CONCRETE	PP	POWER POLE
CULV.	CULVERT	RCP	REINFORCED CONCRETE PIPE
C.Y.	CUBIC YARDS	S.F.	SQUARE FEET
D.I.	DROP INLET	SD	STORM DRAIN
DIA.	DIAMETER	SDMH	STORM DRAIN MANHOLE
DR	DRIVE	SHT.	SHEET
E	ELECTRIC	SS	SANITARY SEWER
EL., ELEV.	ELEVATION	SSCO	SANITARY SEWER CLEANOUT
EXIST.,EX.	EXISTING	SSMH	SANITARY SEWER MANHOLE
FG	FINISH GRADE	STD.	STANDARD
F.H.	FIRE HYDRANT	TELE.	TELEPHONE
FL	FLOWLINE	TYP.	TYPICAL
FND.	FOUND	UTIL.	UTILITY
G	GAS	W	WATER

Project Coverage Table (Rev. 02-27-14)

New Coverage	Existing 1a	Proposed 1a	Net Change	Existing 1b	Proposed 1b	Net Change
Sky Meadows Basin Epic Discoveries						
Sky Basin Zip Line						
Paths and Queuing Areas		24,150	24,150		168	168
Sky Meadows Challenge Course						
Paths		138	138		604	604
Mountain Excursion Tour						
Parking/Pullouts		440	440			
Ridge Run Lookout Tower						
Structures		992	992			
Parking/Pullouts		440	440			
Paths		656	656			
Total Sky Meadows Basin Epic Discoveries	-	26,816	26,816	-	772	772
Total Coverage	**0**	**26,816**	**26,816**	**0**	**772**	**772**

Coverage Summary Table

Maximum Allowable Coverage (per Master Plan)	1a	1b	**Total**
Maximum Allowable Coverage per Master Plan			**2,053,854**
Balance Remaining of Coverage and Banked Coverage per Table 3.4-4 of the Final EIR/EIS/EIS[1]	434,580	4,464	**439,044**
Project Subtotals			
Northbowl/Olympic Express Lifts Project Balances	960	396	1,356
Gondola Hiking trails	54,501	0	54,501
Mid Station Road	50,469	0	50,469
Northbowl/Olympic Express Lifts - Plan Revision	216	0	216
World Cup/East Bowl Snowmaking - Plan Revision	283	0	283
Calif. Base Surface Lift Replacement	1,572	0	1,572
Skyline Trail Grading and Snowmaking	1,134	0	1,134
Top of the Gondola Lodge	42,387	0	42,387
Adjusted Gondola Permit Coverage	-27,519	0	-27,519
Umbrella Bar Relocation	651	0	651
Covered Surface Lift and Snowmaking	10,039	0	10,039
California Side Trail Widening	0	0	0
Adventure Peak Improvements	6,207	0	6,207
Zipline Adventure Ride	4,916	0	4,916
Verizon Angel's Roost Cell Tower and Back-up Bldg	584	0	584
Epic Race Course Electrical	0	0	0
Summer Activities	22,213	0	22,213
Tamarack Lodge Modifications	537	0	537
Adventure Peak Epic Discoveries	*58,154*	*0*	58,154
Removal of Gondola Hiking Trails	*-54,501*	*0*	-54,501
East Peak Basin Epic Discoveries	*1,210*	*0*	1,210
Sky Meadows Basin Epic Discoveries	*26,816*	*772*	27,588
Subtotals	**200,829**	**1,168**	**201,997**
Balance Remaining Upon Project Completion	**233,751**	**3,296**	**237,047**

1. Includes 10,541 square feet of existing coverage attributed to Sky Deck

LOCATION MAP

SHEET INDEX

SKY BASIN ZIP TOUR

SKY MEADOWS CHALLENGE COURSE

RIDGE RUN LOOKOUT TOWER

OWNER

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HEAVENLY MOUNTAIN RESORT
Sky Meadows Basin Epic Discovery Activities

TITLE SHEET

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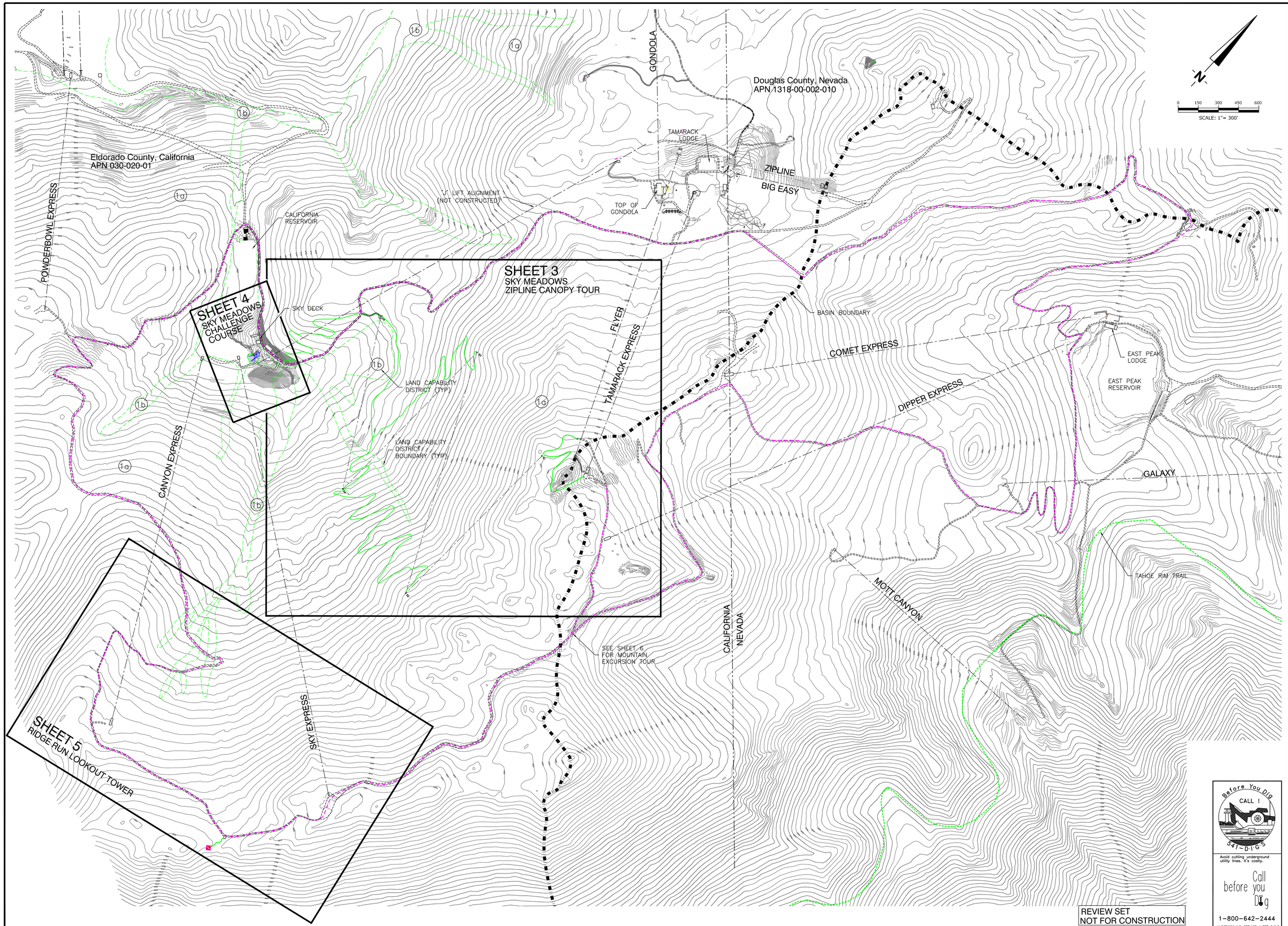
SHEET 1



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SITE PLAN AND SHEET INDEX

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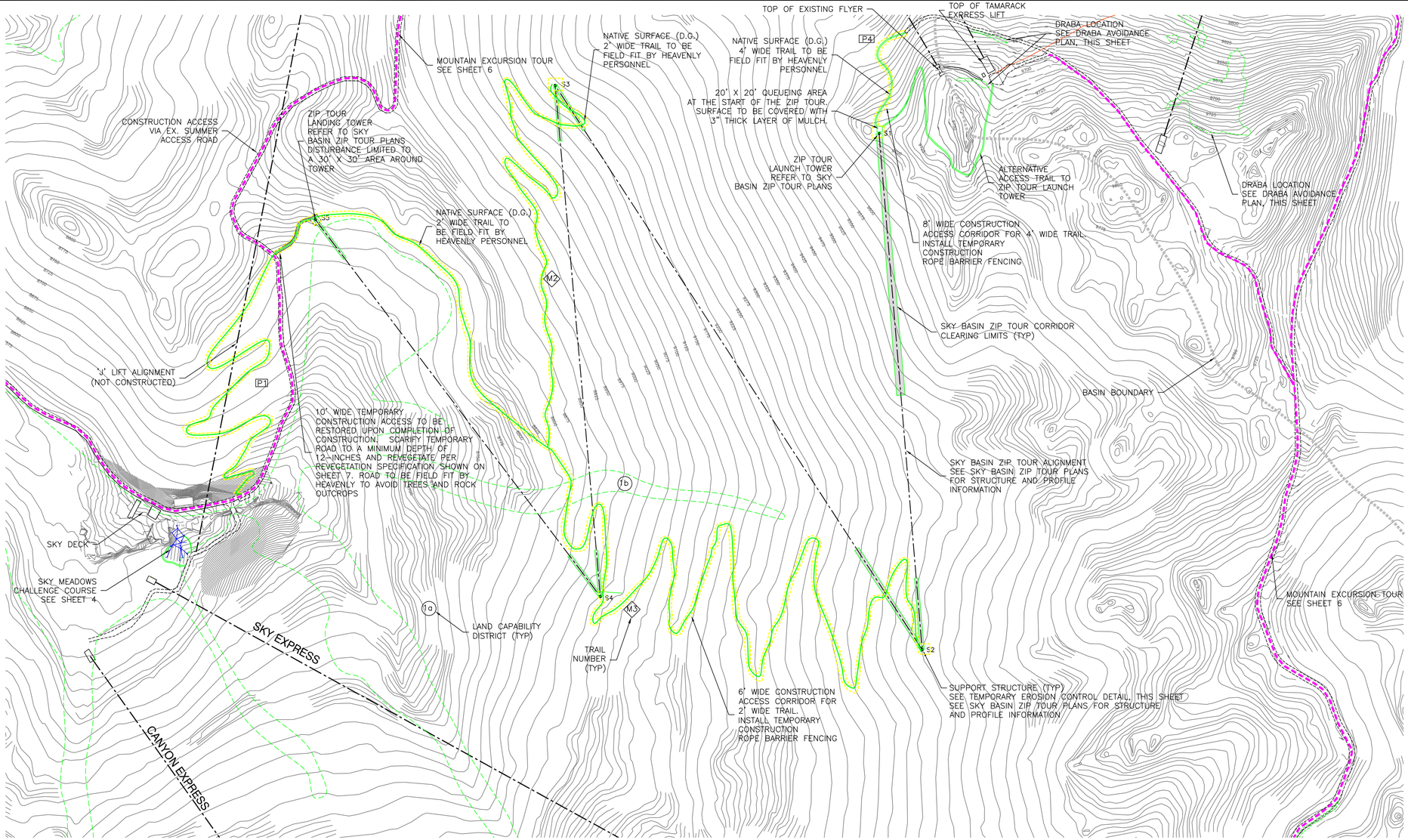
SHEET 2



N

0 100 200 300 400

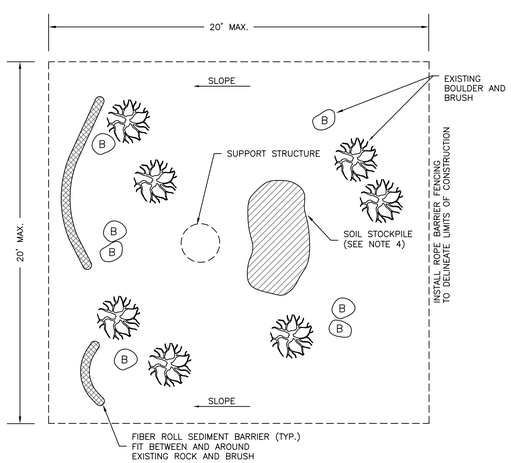
SCALE: 1" = 200'

LEGEND:

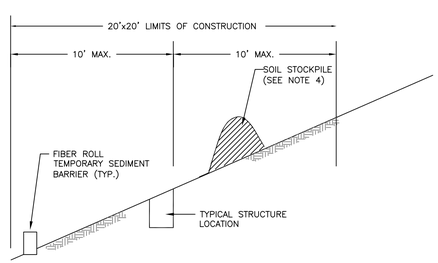
P-S2	PUBLIC HIKING TRAILS
S2	ADMINISTRATIVE MAINTENANCE TRAILS
	SKY BASIN ZIP TOUR CORRIDOR CLEARING LIMITS (TYP) TOTAL ESTIMATED CLEARING: 1.1 ACRES

NOTES:

1. ALL TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE GRADES.
2. STACKED SWITCHBACKS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE.
3. FORMER ROADWAY PRISMS SHALL BE UTILIZED WHERE PRACTICABLE FOR NEW TRAIL ALIGNMENTS.
4. ALL TRAIL CONSTRUCTION CORRIDORS OUTSIDE OF THE TRAIL ITSELF SHALL BE REVEGETATED PER THE REVEGETATION SPECIFICATIONS INCLUDED IN THESE PLANS.



PLAN



ELEVATION

TEMPORARY EROSION CONTROL FOR STRUCTURE CONSTRUCTION

NOT TO SCALE

SKY BASIN ZIP TOUR GENERAL NOTES:

1. There shall be a 20-foot by 20-foot maximum temporary clearing around each support structure.
2. All disturbed areas shall be revegetated per the revegetation specifications included in these plans. Any vegetative debris from the site shall be chipped and/or re-scattered over the disturbed area.
3. SEZ areas in the vicinity of construction will be flagged in the field so that they are clearly visible during construction.
4. Structure foundation excavation and structure placement will be completed using techniques to minimize the amount of disturbance at the site. After the structure has been placed, any remaining soil from any foundation excavation shall be spread within the 20-ft x 20-ft construction limits. These areas shall be revegetated per the revegetation specifications included in these plans.

TAHOE DRABA AVOIDANCE AND RESOURCE PROTECTION PLAN

EXISTING CONDITIONS AND PLANT LOCATIONS

Surveys for Tahoe Draba (Draba asterophora var. asterophora) were performed by Lake Tahoe Basin Management Unit botanists and Hauge Brueck botanists and biologists on the project. Plants were located in close proximity of and within the alignment of the existing road. Please see the plan sheets showing the plant locations.

Tahoe Draba shall be avoided, protected, and monitored during construction. There will be no vehicle traffic off road outside of construction limits.

PROTECTIVE MEASURES

In order to avoid and protect the existing Draba Asterophora plants the following measures shall be taken: The large populations shall be avoided and protected by surrounding the existing plants with continuous orange protective fencing.

All other plants shall be surrounded with orange protective fencing. A distance of 3 feet shall be maintained between the existing plants and the surrounding protective fence. All fences shall be maintained and supported by sufficient stakes or poles in such a manner to prevent access or disturbance to the enclosure.

Grading will be minimized in the area near the plants in order to maintain the existing vertical elevations. In the event blasting is required nearby, the plants shall be covered with canisters during blasting and canisters shall be removed immediately after blasting.

Continuous protective fencing shall be installed immediately adjacent to the existing plants. The protective fencing shall be installed in such a manner to protect the existing plants from both vehicle and pedestrian disturbance. All fencing shall be approved by the LTBMU Forest Botanist.

During and upon completion of construction activities, the area shall be monitored and surveyed for damaged plants. The Forest Botanist shall give final approval for removal of protective fencing.

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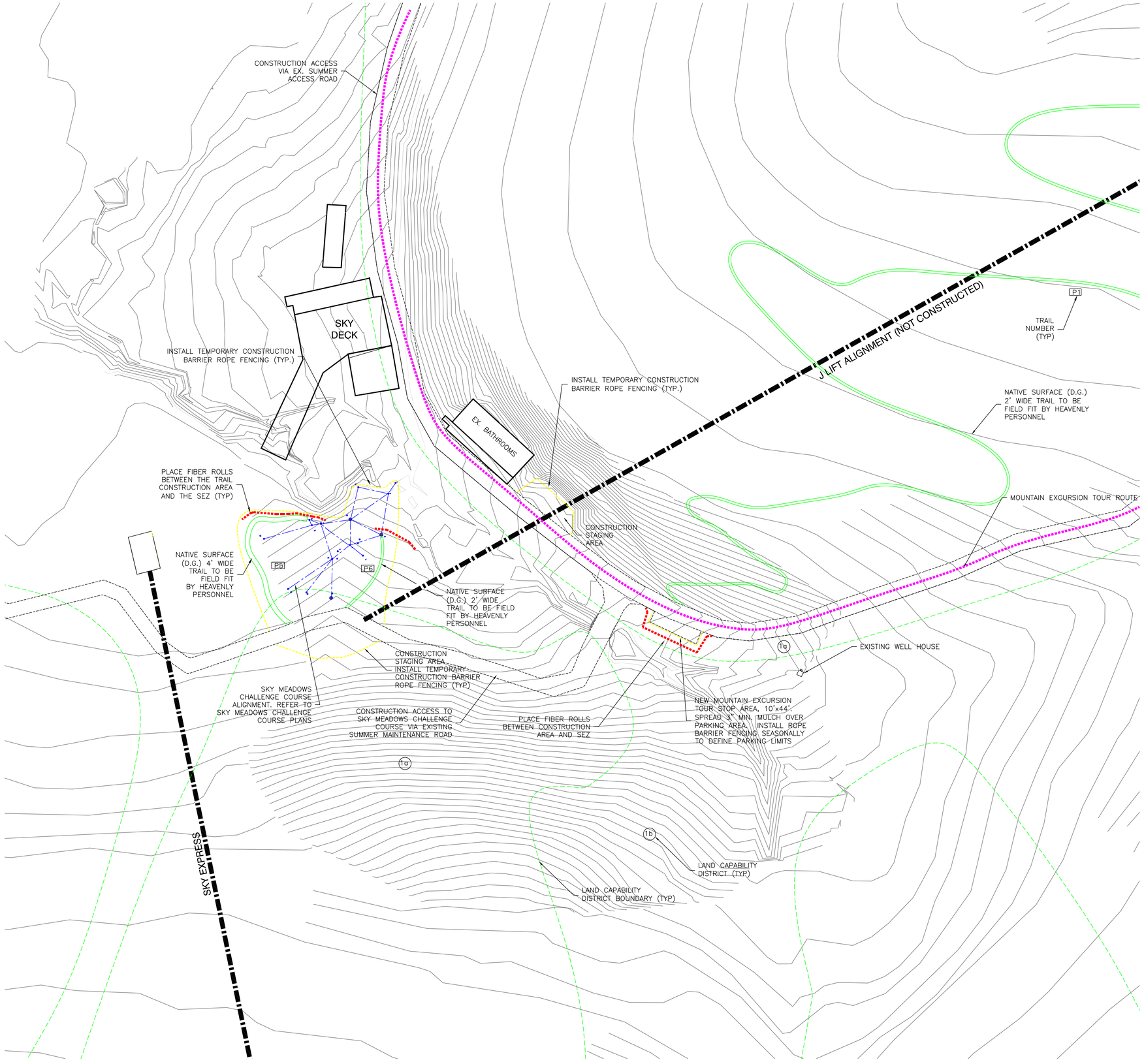
SHEET 3



N

0 20 40 60 80

SCALE: 1"= 40'

LEGEND:

P2 PUBLIC HIKING TRAILS

M2 ADMINISTRATIVE MAINTENANCE TRAILS

NOTES:

1. ALL TRAILS SHALL BE AT GRADE, NATIVE MATERIAL TRAILS THAT ARE FIELD FIT TO MINIMIZE REMOVAL OF VEGETATION AND UTILIZE THE NATURAL TOPOGRAPHY TO MINIMIZE GRADES.
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SKY MEADOWS CHALLENGE COURSE

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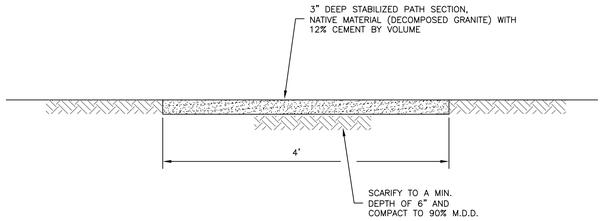
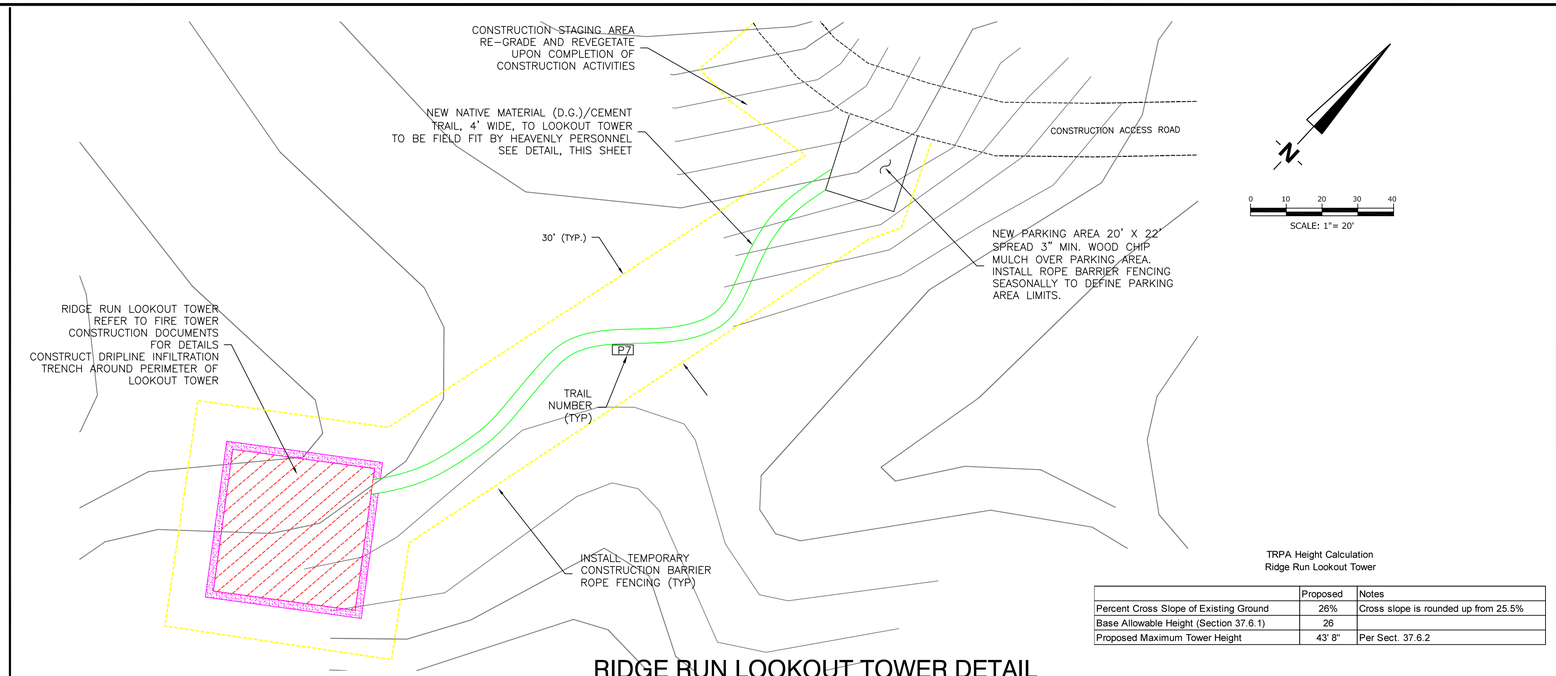
SHEET 4



DG/CEMENT TRAIL DETAIL

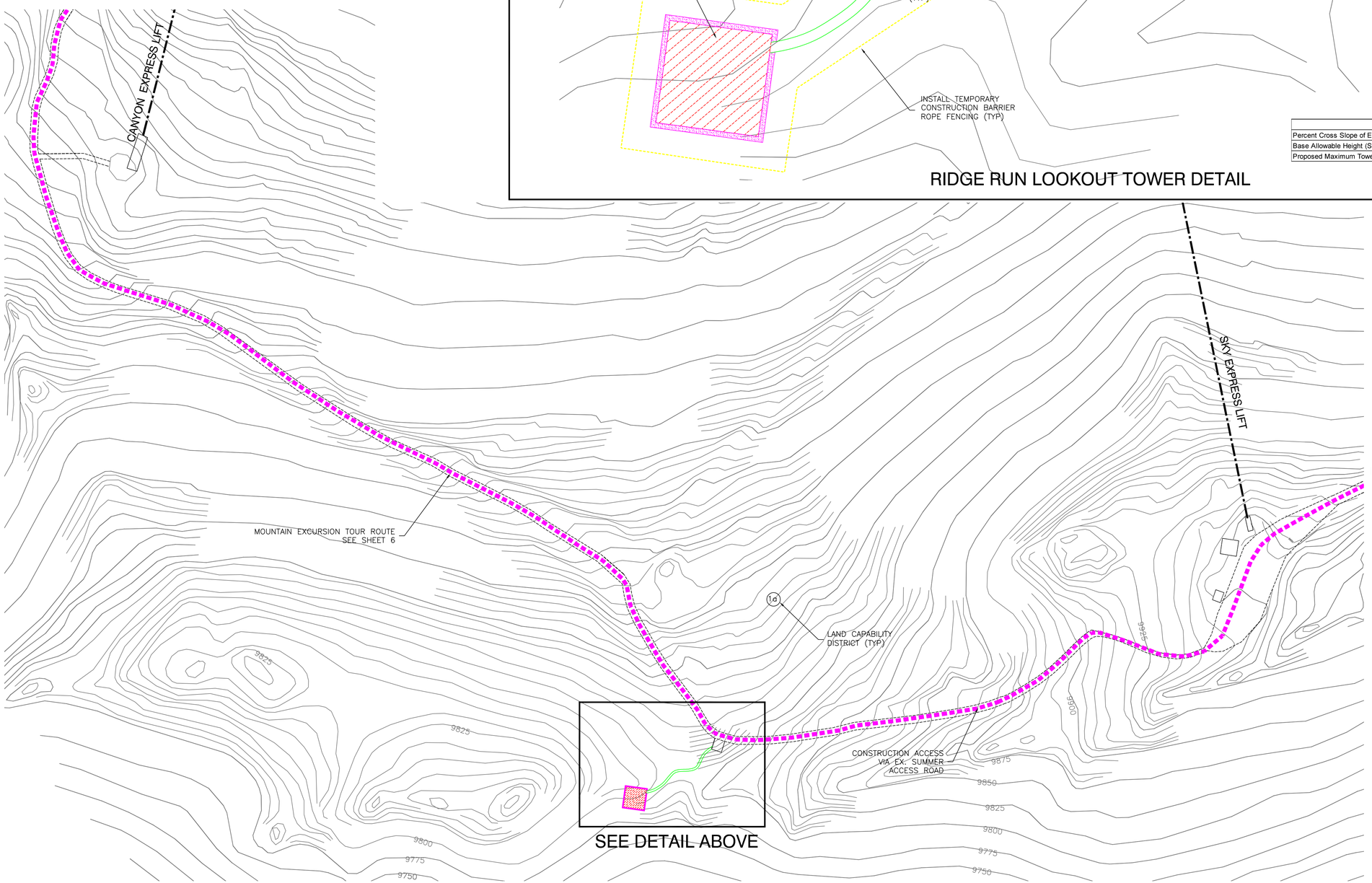
NO SCALE



RIDGE RUN LOOKOUT TOWER DETAIL

TRPA Height Calculation
Ridge Run Lookout Tower

	Proposed	Notes
Percent Cross Slope of Existing Ground	26%	Cross slope is rounded up from 25.5%
Base Allowable Height (Section 37.6.1)	26	
Proposed Maximum Tower Height	43' 8"	Per Sect. 37.6.2



LEGEND:

P2 PUBLIC HIKING TRAILS

MZ ADMINISTRATIVE MAINTENANCE TRAILS

NOTES:

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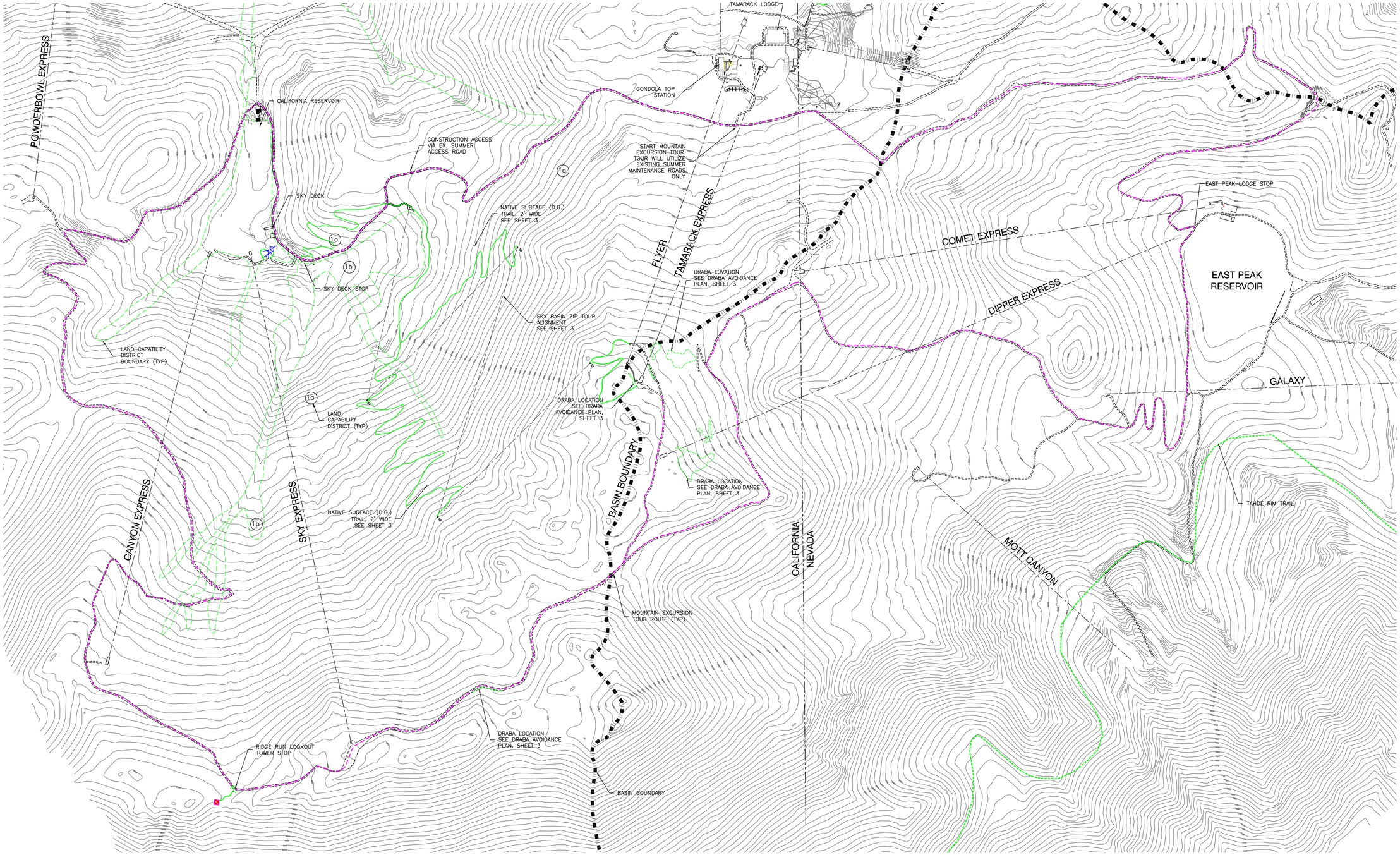
SHEET 5



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MOUNTAIN EXCURSION TOUR

N

0 200 400 600 800
SCALE: 1"= 400'

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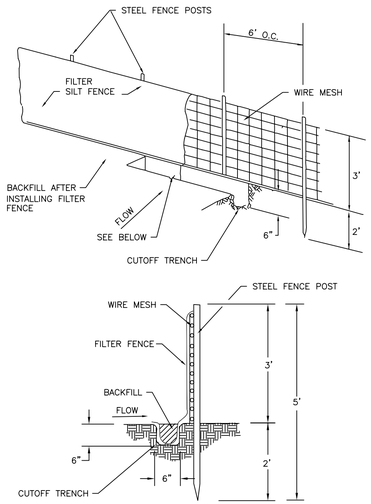
SHEET 6

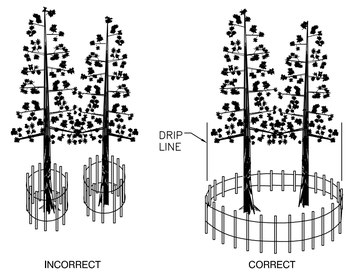


NOTES:

1. THE CONTRACTOR MAY USE MANUFACTURED FILTER FENCING IN LIEU OF THE ABOVE, SUBJECT TO SUBMITTAL OF MANUFACTURER'S DATA SHEETS TO THE ENGINEER FOR APPROVAL.
2. WIRE MESH CAN BE DELETED IF POST SPACING IS REDUCED TO 4-FOOT OC.
3. ENDS OF RUN OF FILTER FENCE SHALL BE TURNED UPHILL TO FORM A 'J'.

TEMPORARY EROSION CONTROL TYPICAL FILTER FENCE

NO SCALE



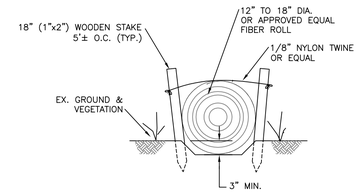
TREE PROTECTION FENCING

NOTE:

1. TEMPORARY FENCING TO BE A MINIMUM OF 4' HIGH.
2. POSTS TO BE SET AT A MINIMUM OF 6' ON CENTERLINE FROM EACH OTHER.
3. FENCING MATERIALS TO BE APPROVED BY THE ENGINEER.

TEMPORARY EROSION CONTROL TREE PROTECTION DETAIL

NO SCALE

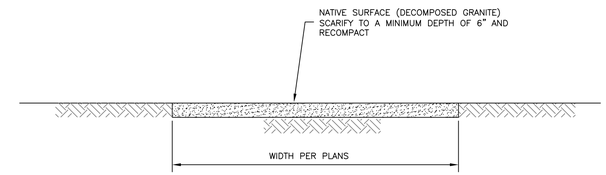


NOTES:

1. FIBER ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3" TO 6" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. FIBER MATERIAL SHALL BE BIODEGRADABLE WEED-FREE STRAW, JUTE, COIR, OR EXCELSIOR. MATERIALS REQUIRE TRPA AND U.S. FOREST SERVICE APPROVAL PRIOR TO INSTALLATION.

TEMPORARY SEDIMENT BARRIER FIBER ROLLS

NO SCALE



NATIVE SURFACE (DG) TRAIL DETAIL

NO SCALE

EROSION CONTROL NOTES

1. FOR ALL USE OF THE STAGING AREAS WHEN SNOW COVER IS NOT PRESENT, HEAVENLY SHALL HAVE ALL TEMPORARY EROSION CONTROL MEASURES IN PLACE AND APPROVED BY TRPA. HEAVENLY SHALL INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND/OR EROSION. AFTER A RAINSTORM, ALL SILT AND DEBRIS MUST BE REMOVED FROM CHECK BERMS AND DESILTING FACILITIES, AND ANY DAMAGED EROSION CONTROL MEASURES MUST BE REPAIRED.
2. AN ONSITE INSPECTION BY TRPA STAFF IS REQUIRED PRIOR TO ANY CONSTRUCTION OR GRADING ACTIVITY. TRPA STAFF SHALL DETERMINE IF THE ONSITE CONSTRUCTION TEMPORARY EROSION CONTROL MEASURES HAVE BEEN PROPERLY INSTALLED. NO GRADING OR CONSTRUCTION SHALL COMMENCE UNTIL TRPA PRE-GRADE CONDITIONS OF APPROVAL ARE MET.
3. HEAVENLY SHALL BE RESPONSIBLE TO INSTALL AND MAINTAIN ALL CONSTRUCTION BMPS TO ENSURE PROPER WORKING CONDITIONS. ROADS USED DURING CONSTRUCTION WILL BE INSPECTED DAILY BY HEAVENLY FOR DRAINAGE AND GRADING. RUTS WILL BE REPAIRED IMMEDIATELY. WATERBARS, CULVERTS, AND DITCHES (DRAINAGE STRUCTURES) WILL BE MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION.
4. SEDIMENT BARRIERS AND CONSTRUCTION LIMIT FENCING WILL BE INSPECTED DAILY DURING CONSTRUCTION BY THE HEAVENLY FOR DAMAGE AND APPROPRIATE PLACEMENT. SEDIMENT BARRIERS SHALL BE REPAIRED AND/OR RELOCATED AS NEEDED ON A DAILY BASIS.
5. TEMPORARY BMP MEASURES SHALL BE IMPLEMENTED FOR ALL PROJECT LOCATIONS.
6. EXCAVATION SHALL NOT EXCEED 5-FEET BELOW GROUND SURFACE.
7. DISTURBED AREAS, ROADWAYS, AND STAGING AREAS USED DURING CONSTRUCTION SHALL BE SWEPT AND /OR PROVIDED WITH DUST ABATEMENT SUCH AS A WATER TRUCK AS NEEDED.
8. FOR ALL NATIVE TREES TO REMAIN, TEMPORARY CONSTRUCTION FENCE SHALL BE INSTALLED AROUND THE DRIPLINE OF ALL TREES ADJACENT TO THE ROAD AND WORK AREAS, WHERE FEASIBLE, OR OTHER MEASURES DEEMED APPROPRIATE BY THE TRPA INSPECTOR.
9. HEAVENLY SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS.
10. TURNING OR MANEUVERING OF BACKHOE, EXCAVATOR OR OTHER EQUIPMENT WILL BE MINIMIZED TO REDUCE SOIL DISTURBANCE.
11. ALL BARREN AREAS AND AREAS DISTURBED BY CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE TRPA HANDBOOK OF BEST MANAGEMENT PRACTICES. APPLICATION OF A MULCH MAY ENHANCE VEGETATIVE ESTABLISHMENT.

REVEGETATION SPECIFICATIONS

PART 1. GENERAL

ALL AREAS DISTURBED DURING CONSTRUCTION OTHER THAN EXISTING ACCESS ROADS, INCLUDING ACCESS CORRIDORS, STORAGE AREAS, STAGING AREAS, AND CONSTRUCTION AREAS SHALL BE STABILIZED ACCORDING TO THESE SPECIFICATIONS. UPON COMPLETION OF GRADING AND CONSTRUCTION, AND PRIOR TO REVEGETATION, ALL AREAS TO BE REVEGETATED WILL BE INSPECTED BY THE ENGINEER'S REVEGETATION SPECIALIST (RS). THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE WORKING DAYS PRIOR TO PLANTING TO SCHEDULE THE REQUIRED INSPECTION. FINAL SEEDING AND MULCH TREATMENT AREAS WILL BE STAKED IN THE FIELD AT THAT TIME. REVEGETATION TREATMENTS PERFORMED BY AN OUTSIDE CONTRACTOR SHALL NOT BE INITIATED WITHOUT THE APPROVAL OF THE ENGINEER. REVEGETATION PERFORMED BY HEAVENLY PERSONNEL NEED NOT BE APPROVED BY THE ENGINEER OR THE REVEGETATION SPECIALIST PRIOR TO INITIATING REVEGETATION WORK.

STABILIZATION TREATMENTS SHALL BE INSTALLED AS PER THESE SPECIFICATIONS AND THE PLAN SHEETS AND SHALL CONSIST OF WOOD CHIP INCORPORATION INTO THE TOP 12 INCHES OF SOIL, SEEDING, AND PINE NEEDLE/WOOD CHIP MULCH APPLICATION.

PART 2. PRODUCTS AND EXECUTION OF TREATMENTS

SEED

SEED MIXTURES ARE SHOWN IN TABLE 1 ON THIS SHEET.

SEED SHALL BE CLEAN NEW CROP SEED, PURCHASED PREMIXED ON A PURE LIVE SEED (PLS) BASIS. SEED SHALL BE DELIVERED TO THE SITE IN ORIGINAL UNOPENED CONTAINERS BEARING THE DEALER'S GUARANTEED ANALYSIS AND GERMINATION PERCENTAGE, AND SHALL MEET THE STATE OF CALIFORNIA FREEDOM FROM NOXIOUS WEED REQUIREMENTS. NO SUBSTITUTIONS IN THE SEED MIXTURE WILL BE ACCEPTED WITHOUT WRITTEN APPROVAL FROM THE RS.

SEED LABELS SHALL BE REMOVED FROM THE SEED SACKS BY THE RS AT THE TIME OF SEEDING. SEED LABELS WILL INCLUDE DOCUMENTATION FOR EACH TYPE OF SEED CERTIFYING THAT A RECOGNIZED LABORATORY TESTED THE SEED WITHIN 6 MONTHS OF THE DATE OF DELIVERY.

Table 1. Seed Mix

Common Name Variety	Scientific Name	Seeding Rate Pure Live Seed Pounds Per Acre
Squirreltail (High elevation collection	Elymus elymoides ssp. Elymoides (Sierra)	10
Mokelumne or El Dorado Brome (or other high elevation Tahoe collection)	Bromus carinatus (Mokelumne)	5
Western Needlegrass (or other high elevation Tahoe collection)	Achnatherum occidentale	3
Antelope Bitterbrush (+5500 ft. Sierra Collection)	Purshia tridentata	5
Sulfur-flower Buckwheat	Erigonum umbellatum	2
	Total PLS Pounds Per Acre Rate	25

PART 2 (CONT.) PRODUCTS AND EXECUTION OF TREATMENTS

WOOD CHIPS

WOOD CHIPS SHALL BE PREPARED FROM TREES REMOVED DURING CONSTRUCTION AND MAINTENANCE ACTIVITIES ON HEAVENLY MOUNTAIN RESORT. TOPS AND BRANCHES OF TREES REMOVED ON THIS AND OTHER HEAVENLY MOUNTAIN RESORT PROJECT SITES WILL BE CHIPPED TO A MINIMUM DIAMETER OF 2 INCHES, AND A MAXIMUM LENGTH OF 6 INCHES.

PINE NEEDLES

PINE NEEDLES SALVAGED FROM THE CONSTRUCTION SITE CAN BE USED AS A MULCH MATERIAL. PINE NEEDLE MULCH SHALL BE WEED FREE AND CLEAN WITHOUT DEBRIS, OR EXCESSIVE WOODY MATERIAL.

SOIL TREATMENT

ALL AREAS TO BE STABILIZED (WITH AND WITHOUT SEEDING) SHALL BE LOOSENED TO A DEPTH OF AT LEAST 12 INCHES TO ALLEVIATE COMPACTION AND TO INCORPORATE WOOD CHIPS TO IMPROVE WATER INFILTRATION AND WATER HOLDING CAPACITY. A UNIFORM 3-INCH LAYER OF WOOD CHIPS SHALL BE SPREAD ACROSS THE SURFACE OF THE TREATMENT AREAS. WOOD CHIPS SHALL BE INCORPORATED INTO THE TOP 12 INCHES OF SOIL BY AN APPROVED LOOSENING METHOD. AREAS SHALL BE RAKED SMOOTH FOLLOWING WOOD CHIP INCORPORATION.

SEEDBED PREPARATION

AREAS DESIGNATED FOR SEEDING BY THE RS SHALL BE UNIFORMLY BROADCAST SEEDED WITH HAND OPERATED BROADCAST SEEDERS. THE CONTRACTOR SHALL PROVIDE THE RS A WRITTEN STATEMENT OR SITE DEMONSTRATION TO VERIFY THAT THE SEEDING BROADCAST EQUIPMENT HAS BEEN CALIBRATED TO THE SPECIFIED APPLICATION RATES. LARGE AND SMALL SIZE SEED AS INDICATED IN TABLE 1 SHALL BE BROADCAST IN SEPARATE APPLICATIONS. SEEDING SHALL NOT OCCUR UNDER CONDITIONS THAT WOULD ALLOW SEED TO BECOME WIND BORN. SEED SHALL NOT BE INCORPORATED AND APPLIED WITH HYDROMULCH. IMMEDIATELY FOLLOWING BROADCASTING, THE SEEDED AREAS SHALL BE LIGHTLY HAND-RAKED TO PLACE THE SEED AT DEPTH OF ¼ TO ½ INCH INTO THE SOIL. NO FURTHER VEHICULAR ACCESS WILL BE ALLOWED ON TREATMENT AREAS UPON COMPLETION OF SEEDING. SEEDINGS SHALL NOT BE LEFT OVERNIGHT WITHOUT RECEIVING MULCH TREATMENT.

PINE NEEDLE/ WOOD CHIP MULCH

ALL SEEDED AREAS SHALL BE MULCHED WITH PINE NEEDLES OR WOOD CHIPS. PINE NEEDLE MULCH SHALL BE SPREAD ACROSS SEEDED AREAS IN A LOOSE 2" LAYER TO ACHIEVE A MINIMUM OF 90 PERCENT COVER.

UNSEEDED TREATMENT AREAS SHALL BE MULCHED WITH WOOD CHIPS SPREAD IN A UNIFORM 6 TO 8 INCH LAYER.

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HEAVENLY MOUNTAIN RESORT
Sky Meadoes Basin Epic Discovery Activities

DETAIL SHEET

JOB NO.:	12-602.7
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SHEET 7

	Discharge (cfs)	Turburdity (NTU)	Suspended Sediment (mg/L)	Specific Conductivity (mmhos)	Nitrite/ Nitrate (mg/L)	Total Phosphorus (mg/L)	SRP (mg/L)	TKN (mg/L)	Total Nitrogen (mg/L)	Chloride (mg/L)	Total Iron (mg/L)
California State Standard			**60***			**0.015**			**0.19**	**0.15**	**0.03**
HV-C3- Property Line Annual Averages*											
2006	4.3	3.24	8.31	34.71	0.012	***0.032***	0.007	0.114	0.121	***2.467***	***0.341***
2007	0.76	1.95	2.1	50.2	0.005	***0.023***	0.006	0.08	0.084	***1.288***	***0.119***
2008	0.55	0.94	1.36	41.6	0.005	***0.018***	0.004	0.086	0.091	***1.95***	***0.09***
2009	0.46	0.79	1.86	41.83	0.003	***0.021***	0.004	0.061	0.06	***1.27***	***0.087***
2010	0.47	7.71	38.38	43.2	0.013	***0.089***	0.005	0.351	***0.387***	***0.965***	***0.064***
2011	5.47	9.14	20.37	46.53	0.026	***0.042***	0.006	0.129	0.154	***0.66***	***0.732***
2012	1.09	1.16	2.81	-	0.005	***0.020***	-	0.085	0.09	***0.94***	-
2013	0.72	1.37	2.97	-	0.003	***0.020***	-	0.103	0.106	***1.08***	-
# Samples	146	101	146	146	146	146	101	146	146	72	27
#Noncompliance	-	-	0	-	-	8	-	-	1	8	6
%Noncompliance	-	-	0.0%	-	-	100.0%	-	-	12.5%	100.0%	100.0%
Maximum Daily	21.38	102.00	506.00	63.70	0.06	1.05	0.02	4.25	4.31	5.90	2.50
Minimum Daily	0.01	0.07	0.27	25.00	0.001	0.009	0.001	0.02	0.00	0.10	0.03
Mean Daily	2.04	3.34	9.37	40.69	0.009	0.032	0.005	0.12	0.13	1.17	0.26
Std Error Daily	3.93	11.96	45.76	7.41	0.013	0.087	0.003	0.35	0.36	0.81	0.49
HV-H5- Hidden Annual Averages*											
2006	4.41	1.94	5.38	39.89	0.004	***0.032***	0.008	0.13	0.134	***0.843***	***0.107***
2007	1.18	1.24	2.76	47.42	0.007	***0.026***	0.01	0.095	0.102	***0.485***	***0.107***
2008	1.11	1.19	1.94	46.02	0.013	***0.025***	0.019	0.112	0.126	***0.993***	***0.082***
2009	0.81	1.42	3.00	44.57	0.008	***0.029***	0.008	0.112	0.12	***0.822***	***0.184***
2010	0.78	2.58	9.19	45.33	0.008	***0.043***	0.01	0.217	***0.225***	***0.4***	***0.134***
2011	7.05	3.27	9.16	45.90	0.004	***0.032***	0.007	0.162	0.167	***0.244***	***0.105***
2012	1.67	1.31	3.03	-	0.009	***0.025***	-	0.133	0.141	***0.309***	-
2013	1.42	1.35	3.06	-	0.009	***0.026***	-	0.108	0.117	***0.276***	-
# Samples	145	145	145	100	145	145	100	145	145	72	27
#Noncompliance	-	-	0	-	-	8	-	-	1	8	6
%Noncompliance	-	-	0.0%	-	-	100.0%	-	-	12.5%	100.0%	100.0%
Maximum Daily	31.93	16.00	70.00	66.80	0.04	0.20	0.08	0.97	0.97	2.40	0.44
Minimum Daily	0.09	0.09	0.40	15.23	0.001	0.011	0.001	0.04	0.04	0.10	0.01
Mean Daily	2.55	1.82	4.80	44.14	0.007	0.029	0.010	0.13	0.14	0.41	0.12
Std Error Daily	4.38	2.09	9.87	14.40	0.006	0.020	0.011	0.13	0.13	0.39	0.10

* Suspended Sediment Annual Averages shown are straight averages. The recalculated value using a weighted average based on the days between sample collection are shown in Table 2.3.

	Discharge (cfs)	Turburdity (NTU)	Suspended Sediment (mg/L)	Specific Conductivity (mmhos)	Total Phosphorus (mg/L)	SRP (mg/L)	Nitrate/ Nitrite (mg/L)	TKN (mg/L)	Total Nitrogen (mg/L)
Nevada State Standard		**10.0**	**25**			**0.100**			**0.60**
HV-E1-Edgewood Above (2006-2013)									
2006	0.66	3.9	4.4	71	0.040	0.009	0.001	0.164	0.165
2007	0.32	3.9	6.4	66	0.062	0.007	0.001	0.195	0.196
2008	0.57	6.0	11.5	64	0.087	0.004	0.003	0.302	0.304
2009	0.35	3.1	8.0	66	0.056	0.003	0.002	0.134	0.136
2010	0.08	2.3	5.5	69	0.030	0.004	0.002	0.150	0.152
2011	0.38	9.8	23.5	80	0.053	0.005	0.002	0.233	0.235
2012	0.31	5.1	11.3	98	0.064	0.002	0.002	0.185	0.188
2013	0.22	4.5	11.1	90	0.066	0.004	0.001	0.235	0.237
# Samples	79	79	79	79	79	79	79	79	79
#Noncompliance	-	3	7	-	-	0	-	-	3
%Noncompliance	-	4%	9%	-	-	0%	-	-	4%
Maximum Daily	3.24	82.00	205.0	131.0	0.366	0.015	0.008	1.098	1.10
Minimum Daily	0.003	0.80	0.40	42.70	0.016	0.001	0.001	0.078	0.079
Mean Daily	0.38	4.99	10.42	78.50	0.056	0.005	0.002	0.200	0.202
Std Error Daily	0.50	9.46	24.59	18.88	0.058	0.003	0.001	0.162	0.162
HV-E2-Edgewood Below (2006-2013)									
2006	0.69	**12.7**	18.6	153	0.093	0.009	0.031	0.232	0.263
2007	0.36	7.0	10.8	93	0.060	0.008	0.025	0.196	0.221
2008	0.42	**13.4**	23.5	97	0.131	0.005	0.018	0.319	0.337
2009	0.22	6.2	16.5	114	0.048	0.003	0.041	0.187	0.228
2010	0.12	6.4	14.1	113	0.035	0.005	0.028	0.182	0.210
2011	0.52	6.0	7.4	151	0.039	0.004	0.031	0.210	0.240
2012	0.32	5.4	9.1	134	0.044	0.003	0.037	0.252	0.289
2013	0.19	6.7	8.7	153	0.053	0.004	0.035	0.228	0.263
# Samples	108	109	109	109	109	109	109	109	109
#Noncompliance	-	18	13	-	-	0	-	-	2
%Noncompliance	-	17%	12%	-	-	0%	-	-	2%
Max	4.17	99.00	188.0	478.0	0.58	0.014	0.085	0.963	0.997
Min	0.01	0.65	1.20	43.80	0.01	0.001	0.001	0.064	0.083
Mean	0.39	8.10	12.88	136.34	0.06	0.005	0.032	0.227	0.259
Std Err	0.52	11.11	22.57	63.26	0.08	0.003	0.018	0.133	0.132

Lahontan Regional Water Quality Control Board

INTERNAL MEMO

To: Bud Amorfini, Engineering Geologist

From: Thomas Suk, Senior Environmental Scientist

Date: June 29, 2014

Subject: **HEAVENLY VALLEY CREEK—ANALYSIS OF RESULTS FROM A DECADE OF BIOASSESSMENT MONITORING (2001-2011), AND RECOMMENDATIONS FOR FUTURE MONITORING**

This memo replies to your request for bioassessment site scores for Heavenly Valley Creek for 2010 and 2011, and includes an analysis of the available bioassessment data for the past decade, with recommendations for the future.

Background

Total Maximum Daily Loads (TMDLs) were adopted by the Regional Water Board in January 2001, and approved by the USEPA in September 2002. The adopted "desired condition" for Heavenly Valley Creek is:

> **"Improving trends in benthic invertebrate community metrics over time, approaching conditions in Hidden Valley Creek"**

The adopted TMDLs (in part) required Water Board staff to work with the U.S. Forest Service (USFS) to design a bioassessment monitoring plan that is capable of tracking progress toward the desired condition. That plan was completed by the USFS and submitted to the Water Board in March 2003 (*see* USFS 2003). The plan called for bioassessment sampling at five sites at a frequency of "two years on, two years off" (i.e., sampling to be conducted 2002-03, 2006-07, 2010-11, 2014-15, etc., at least until attainment of the desired condition is documented).

It was subsequently proposed by the USFS, and agreed by Water Board staff, that one of the five sites (i.e., Upper Hidden Valley Creek, elevation 9,030 feet) would be dropped from the study design, due to its ephemeral flow conditions (which limited the value of the results) and difficult access (which imposed significant costs).

The remaining four sites include three "test" sites along Heavenly Valley Creek—i.e., Sky Meadows (at 8,540 feet elevation), Below Patsy's (at 7,921 ft.), and USFS Property Line (at 6,614 ft.)—and one "control" site at Hidden Valley Creek (6,642 ft.). The control site at Hidden Valley Creek is also known as "Lower" Hidden Valley Creek.

From 2001-2011, benthic macroinvertebrate (BMI) samples were collected by four different entities (using a variety of different methods), as summarized in Table 1, below:

Table 1. Bioassessment sampling events at four locations near Heavenly ski resort, including sampling entity and site codes.

Sample Year	Sample Date	HVC-1 Heavenly Valley Cr "Sky Meadows" R5BIO-016 (USFS)	HVC-2 Heavenly Valley Cr "Below Patsy's" R5BIO-018 (USFS)	HVC-3 Heavenly Valley Cr "Property Line" R5BIO-017 (USFS) 634HEV001 (SNARL)	LHC-1 (Lower) Hidden Valley Cr (control site) R5BIO-019 (USFS) 634HID001 (SNARL)
2001	Jul-01	USFS	USFS	USFS	USFS
2001	Jul-01			UCSB-SNARL	UCSB-SNARL
2002	Jul-02			UCSB-SNARL	UCSB-SNARL
2002	Jul-02	USFS	USFS	USFS	USFS
2003	Jul-03	USFS	USFS	USFS	USFS
2006	Sep-06	Heavenly	Heavenly	Heavenly	Heavenly
2007	Aug-07	Heavenly	Heavenly	Heavenly	Heavenly
2010	Aug-10	Heavenly	Heavenly	Heavenly	Heavenly
2011	Aug-11	Heavenly	Heavenly	Heavenly	Heavenly
2011	Oct-11				DFW-ABL

Methods

The bioassessment data (from multiple sources and dates, as summarized in Table 1) were compiled, formatted, scored, and analyzed for trends. Drs. Andrew Rehn and Peter Ode of the Dept. of Fish & Wildlife's Aquatic Bioassessment Laboratory (DFW-ABL) graciously agreed to assist us in compiling, formatting, scoring, and assessing the data.

It took several months (during 2013) and a lot of effort (by Andy, Pete, and me) just to obtain all of the data from the various sources. This initial step took longer than expected. In particular, some of the decade-old data were difficult and time-consuming to locate. I want to specifically acknowledge Dr. Joseph Furnish of the USFS, who provided substantial assistance in locating the "missing" data.

Once we had obtained and compiled all of the data, Dr. Rehn then formatted the data and calculated site scores for all sites/dates, using both the Eastern Sierra Index of Biological Integrity ("ESIBI," Herbst and Silldorff 2009), and the California Stream Condition Index (CSCI) which is currently being prepared for publication by DFW-ABL in collaboration with co-authors at the Southern California Coastal Water Research Project (*see* Mazor and others, in preparation).

The results were evaluated to assess the biotic condition of sites, and to assess trends at individual sites over time.

Results

The site scores are presented in Table 2, below:

Table 2. Bioassessment scores for sampling events at four stream locations near Heavenly ski resort (2001-11), calculated using the Eastern Sierra IBI (ESIBI) and the California Stream Condition Index (CSCI). (Blue cells indicate USFS samples with low BMI counts, yellow cells indicate SNARL samples.)

Sample Year	Sample Date	HVC-1 Heavenly Valley Cr "Sky Meadows"		HVC-2 Heavenly Valley Cr "Below Patsy's"		HVC-3 Heavenly Valley Cr "Property Line"		LHC-1 (Lower) Hidden Valley Cr (control)	
		ESIBI	CSCI	ESIBI	CSCI	ESIBI	CSCI	ESIBI	CSCI
2001 - USFS	Jul-01	35.6	0.56	49.4	0.74	53.9	0.77	75.2	0.92
2001 - SNARL	Jul-01	-	-	-	-	84.2	1.08	93	0.95
2002 - SNARL	Jul-02	-	-	-	-	75.3	0.87	96.8	1.15
2002 - USFS	Jul-02	37.9	0.69	53.9	0.91	51.1	0.72	75.2	1.08
2003	Jul-03	49.6	0.84	56.6	0.85	48.7	0.93	78.2	1.06
2006	Sep-06	55.3	0.92	52.2	0.95	69.1	1.02	80.6	1.15
2007	Aug-07	23.6	0.44	67	0.98	74.7	1.1	93.3	1.04
2010	Aug-10	36.8	0.74	55.2	0.99	80.7	0.9	94.6	1.08
2011	Aug-11	49.8	0.69	75	0.86	83.5	1.02	87.8	0.86
2011	Oct-11	-	-	-	-	-	-	87.8	0.99

The Eastern Sierra IBI was developed by Drs. David Herbst and Erik Silldorff of the University of California's Sierra Nevada Aquatic Research Laboratory (SNARL). The thresholds applicable to the Eastern Sierra IBI (ESIBI) are presented below in Table 3 (reprinted from Herbst and Silldorff 2009).

Table 3. Thresholds applicable to Eastern Sierra IBI (from Herbst and Silldorff 2009)

Supporting (Unimpaired)			Impaired	
Acceptable		Intermediate supporting but uncertain	Partially-supporting	Not supporting
>89.7	89.7–80.4	80.4 – 63.2	63.2 – 42.2	<42.2
A	B	C	D	F
Very good	Good	Fair	Poor	Very poor
Good		Fair	Poor	

The thresholds applicable to the CSCI are not yet published. Our interpretation of the CSCI results was guided by Drs. Andrew Rehn and Peter Ode of DFW-ABL, who are co-authors of the pending CSCI manuscript (*see* Table 4, from: Mazor and others, in preparation).

Table 4. Thresholds used to define condition classes for the CSCI. Pending publication of the CSCI, the values shown below were used for this assessment. (Values in parentheses reflect the probability that scores in the condition class are within the reference distribution.)

Index	**Very likely intact** (≥0.50)	**Likely intact** (0.30 to 0.50)	**Possibly altered** (0.10 to 0.30)	**Likely altered** (0.01 to 0.10)	**Very likely altered** (<0.01)
CSCI	>1.00	1.00 – 0.92	0.91 – 0.79	0.78 – 0.63	0.62 – 0.00

Using the thresholds discussed above, biotic condition at site HVC-1 ("Sky Meadows") is consistently poor according to the ESIBI, and mostly poor according to the CSCI. Biotic condition at site HVC-2 ("Patsy's") is generally poor according to the IBI, and generally good according to the CSCI. Biotic condition at site HVC-3 ("Property Line") is variable (from poor to good, depending on the year) according to the ESIBI, and generally good according to the CSCI. Biotic condition at site LHC-1 (Hidden Valley Creek control site) is always good to very good according to both the IBI and the CSCI.

Discussion

There are several potentially confounding factors that make definitive interpretation of the current dataset difficult. Issues that we considered include: differences in field collection equipment (i.e., net mesh size), differences in area sampled, differences in collection methods (i.e., targeted-riffle methods vs. multi-habitat methods), and differences in field personnel that collected the samples (including poorly documented or undocumented expertise, training, and quality assurance procedures).

Based on prior bioassessment "methods comparison" studies (Rehn and others 2007, Gerth and Herlihy 2006, Herbst and Silldorff 2006 & 2004), we concluded that the effects of most of the methodological differences are relatively minor (e.g., targeted-riffle composite method vs. multi-habitat reachwide benthos method, area sampled, 250um mesh vs. 500um mesh), but three issues stand out:

1. Several USFS samples had very low benthic macroinvertebrate (BMI) counts, making them not good candidates for scoring with either the ESIBI or the CSCI. Both protocols expect at least 450- to 500-count samples, whereas these USFS data points had very low (i.e., <200) counts. Since SNARL samples from these same sites collected in the same time frame had large BMI counts, and SNARL has both more experience and better QA documentation, it seems likely that this discrepancy may reflect problems with the USFS's sample collection and/or processing techniques during that era. For these reasons, we recommend ignoring the data from three USFS samples with very low BMI counts (HVC-3 in 2001 and 2002, and LHC-1 in 2001).

2. The 2001 and 2002 SNARL samples stand out as having considerably higher scores than other data from the same sites in the 2001-2002 time period. Dr. Rehn observed that SNARL's taxa lists frequently had a higher frequency of taxa identified to genus level, whereas USFS identifications were more often left at the family level for a number of groups. This may have contributed to the difference. But whatever the cause, because SNARL has both more experience and better QA documentation than the USFS crews of that era, we trust the SNARL results.

3. Even when the USFS samples for 2001-03 had sufficient BMI counts, differences between USFS's and other crews' scores persisted. (See LHC-1 in 2002-03.) For example, we cannot definitively explain why the USFS crews consistently obtained lower IBI scores at the control site (LHC-1) than the other three crews (SNARL, Heavenly's consultants, and ABL).

Another key issue is that—given the variability in scores—there simply are not enough samples to permit a valid statistical comparison to demonstrate "improving trends over time" (as called for by the TMDLs). Even if we ignored the three issues above, statistical tests of early vs. later years would not demonstrate definitive trends because of the high variance in individual observations. While some (or all) of the HVC sites may be on an "upward" trend since the implementation of post-TMDL sediment control measures, we cannot conclude with a high degree of confidence whether any such trend is underway. At best, more data are needed to document any trend(s). At worst, the management measures installed to date may be insufficient to achieve the desired condition. Continued monitoring is needed to answer these questions.

If we exclude the questionable results, as discussed above, several generalizations about site condition can be made. Table 5, below, summarizes the results in narrative terms. The ESIBI and CSCI assessments generally agree for three of the four sites. We cannot explain why the assessments differ at the fourth site, HVC-2 (Heavenly Valley Creek below Patsy's), where the ESIBI scores indicated generally poor biotic condition, and the CSCI scores indicated generally good condition. That difference may be due, in whole or in part, to methods, sampling error, and/or the low number of samples. Additional sampling may shed light on this question.

Table 5. Narrative summary of biological condition scores
(excluding questionable samples; see discussion)

Site	CSCI	ESIBI
HVC-1 Sky Meadows	Biological scores generally poor (except 2003 & 2006 were fair to good)	Biological scores always poor
HVC-2 Below Patsy's	Biological scores generally good (except 2001 was fair)	Biological scores generally poor (except 2007 & 2011 were "fair")
HVC-3 Property Line	Biological scores generally good	Biological scores mixed ➢ poor in 2003 ➢ fair in 2002, 2006-07 ➢ borderline fair-good in 2010 ➢ good in 2001, 2011
LHC-1 Lower Hidden	Biological scores always good to very good	Biological scores always good to very good

Conclusions & Recommendations

In the decade since TMDLs were adopted for Heavenly Valley Creek (i.e., from 2001-2011), bioassessment monitoring was conducted at three sites along the Creek, and at a nearby "control" site (Hidden Valley Creek). Taken as a whole, the results indicate that the instream biotic condition of site HVC-1 ("Sky Meadows") is poor, and the biotic condition of sites HVC-2 ("Patsy's") and HVC-3 ("Property Line") is generally fair to good (but not yet *"approaching conditions in Hidden Valley Creek"* as called for in the TMDLs).

While nascent signs of recovery may be emerging, there is insufficient data at this time to determine whether biotic condition is improving significantly at any of the sites since the TMDLs were adopted.

Given the above findings, bioassessment monitoring should be continued (using SWAMP's Reachwide Benthos protocols and the existing 2-years-on, 2-years off schedule), at least until an improving trend can be definitively documented (i.e., conduct sampling in 2014-15, 2018-19, 2022-23, etc.).

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Memorandum

DATE: August 8, 2014

TO: Melanie Greene Armstrong, Hauge Brueck Associates
Chris Donley, CardnoENTRIX, Inc.
Andrew Strain, Heavenly Mountain Resort

FROM: Kristin Roaldson and Jill Sutherland

PROJECT: Heavenly Epic Discovery EIS/EIR/EIR

SUBJECT: BMP Monitoring Results 2006-2013

The following provides a discussion of the results from BMP Effectiveness Monitoring Program (Revised Environmental Monitoring Program, 2007) at Heavenly Mountain Resort (Heavenly), specifically for Permanent Best Management Practices (BMPs), for the period 2006 through 2013. In general, Permanent BMPs are BMPs used on a long-term basis to control erosion, reduce sediment transport, and prevent potential contaminant releases.

A description of the BMP monitoring protocol and data for the period 2006 through 2011 is found in the *Environmental Monitoring Program, Comprehensive Report, Heavenly Mountain Resort Water Years 2006 - 2011* (CardnoENTRIX, 2013). Per your request, this memo updates the evaluation with the monitoring results for 2012 and 2013 (BMP Effectiveness Monitoring annual reports, RCI, 2013, and RCI, 2014). Summaries for this period are presented below for the overall resort and, where feasible, on a watershed basis.

Resort Wide Evaluation

Permanent BMPs were routinely installed and monitored throughout the resort for both existing facilities and new projects during the monitoring period from 2006 to 2013. There were 346 separate permanent BMP evaluations completed at 117 separate sites. The number of inspections per year varied from 30 to 70 evaluations per year and averaged 43 per year. Variations are due to annual levels of activity at the Resort and the 3-year monitoring intervals. BMPS are monitored at 1, 3, 6, and 9-year intervals after they are installed, to evaluate both “implementation” and “effectiveness” over time.

Implementation

“Implementation” evaluates whether project design of BMPs are adequate for resource protection, and if BMP improvements are constructed according to the planning/management criteria. For 2006 through 2013, resort-wide Permanent BMP implementation ranged from 71 (2006) to 97 (2013) and 98 (2012) percent “fully implemented”. Evaluations averaged 47 per year with an average of only one (1) score of “not implemented” per year (Table 1). When design issues have been identified Heavenly has been responsive in correcting the situation. On the project level monitoring shows BMP implementation at Heavenly has been improving due to the following reasons.

- Completion of BMP retrofits at most existing facilities,
- Plans and specifications for BMPS for new construction projects have been prepared with increasing levels of detail during the eight year period, and
- Improved communication of BMP objectives, as well as training and experience of Heavenly's designated BMP field crews.

Table 1. Resort Wide Permanent BMP Implementation 2006 to 2013

Implementation Score	Average Number of Occurrences
Fully Implemented	42 per yr.
Minor Departure	3 per yr.
Not Implemented	1 per yr.
Total	47 per yr.

Overall Implementation is based on scores for two components: design and construction. To improve BMP design and construction at Heavenly, a review of the not "fully implemented" occurrences was made in the 5-year Comprehensive Reports (USDA Forest Service, 2003; CardnoENTRIX, 2006, CardnoENTRIX, 2013). For the eight year period (2006-2013), 19% of the small number of deviations from "fully implemented" were related to design or planning/management criteria and 81% were related to construction activities. The results are consistent with the comprehensive report for 2006 through 2011 (CardnoENTRIX, 2013). As technology and standards evolve, these results have been used by Heavenly to identify needs and adopt improved BMP design and construction techniques. In the last four years (2010 through 2013) no evaluations scored "not implemented".

Effectiveness

Resort-wide Permanent BMP effectiveness ranged from 84 to 98 percent on an annual basis from 2006 through 2013. The number of evaluations averaged 47 per year over the eight year period with an average of one (1) score of "not effective" and four scores of "at risk" per year (Table 2). The incidences of "at risk" scores decreased over the period, primarily related to implementation of new BMP techniques resulting in more effective long term soil stabilization.

Table 2. Permanent BMP Effectiveness Scores 2006 to 2013

Effectiveness Score	Average Number of Occurrences
Fully Effective	43 per yr.
At Risk	4 per yr.
Not Effective	1 per yr.
Total	47 per yr.

Overall "effectiveness" of permanent BMPs is evaluated using six criteria: Source Control/Soil Cover, Revegetation, Slope Protection, Drainage Systems/Infiltration, Ponding, and Hazardous Materials. The results for individual criteria help Heavenly to identify which types of BMPs are the most or least effective over an extended period of time (monitoring occurs at 1, 3, 6, and 9 years after installation). Of the six categories, Source Control/Soil Cover had more occurrences of not "fully effective". However, the transition to new revegetation techniques and soil amendments during 2006 through 2007 on many projects has resulted in improving effectiveness. Of the categories, Slope Protection had the second highest incidence of scores not "fully effective". This was primarily related to slope protection BMPs transitioning from erosion control fabrics to soil amendments or rock slope protection during the 2006

to 2013 period. As projects are monitored at 1, 3, 6 and 9 year intervals, results show whether BMP techniques are effective over the long term. If monitoring results identify BMPs that lose effectiveness over time, Heavenly has upgraded the BMPs with newer techniques.

Evaluation By Watershed

Heavenly Mountain Resort facilities are located in six different watersheds, as identified in the Master Plan. The two watersheds with majority of permanent BMP evaluations are the Heavenly Valley Creek watershed (46% of evaluations) in California and the Edgewood Creek watershed (18% of evaluations) in Nevada. Overall, 61% of evaluations were performed in California and 39% performed in Nevada. Monitoring varies with levels of activity in the various watersheds and the monitoring intervals specified in the protocol.

Monitoring results are summarized in Tables 3 and 4 for the following watersheds: Heavenly Valley Creek (CA-1), Edgewood Creek (NV-3), and South Fork Daggett Creek (NV-2+5). The Mott Canyon Creek (NV-1) and Tributary to Daggett Creek (NV-4) watersheds are not included since less than ten BMP evaluations were conducted within these watersheds, providing a limited data set for the 8-year period.

Implementation

Consistent with the overall "implementation" results for the resort (Table 1) and the 2011 comprehensive report (CardnoENTRIX 2013), departures from "fully implemented" on a watershed basis were infrequent (Table 3), and were more often construction then design concerns. If field monitoring identified design or construction concerns, Heavenly has been responsive in making corrections.

Table 3. Permanent BMP Implementation Results 2006 to 2013 For Watersheds

Average Number of Occurrences By Watershed	Heavenly Valley Creek Watershed (CA-1)	Edgewood Creek Watershed (NV-3)	South Fork of Daggett Creek Watershed (NV-2&5)
Fully Implemented	19 per yr.	7 per yr.	4 per yr.
Minor Departure	2 per yr.	0.88 per yr.	1.5 per yr.
Not Implemented	0.6 per yr.	0.13 per yr.	0.13 per yr
Total	21 per yr.	8 per yr.	6 per yr.

Effectiveness

"Effectiveness" monitoring result by watershed shown in Table 4, show similar results to the overall resort evaluation (Table 2) and the majority of Permanent BMPs rated "fully effective". Of BMPs found not fully effective, the Source Control/Soil Cover and Slope Stabilization criteria were again the most frequent in CA-1 and HV-3 watersheds, while Revegetation success criteria was more of a concern the NV 2&5 watershed.

Table 4. Permanent BMP Effectiveness Results 2006 to 2013 For Watersheds

Average Number of Occurrences By Watershed	Heavenly Valley Creek Watershed (CA-1)	Edgewood Creek Watershed (NV-3)	South Fork of Daggett Creek Watershed (NV-2&5)
Fully Effective	19 per yr.	7 per yr.	5 per yr.
At Risk	2 per yr.	0.50 per yr.	1.0 per yr.
Not Effective	0.5 per yr.	0.25 per yr.)	0.5 per yr
Total	21 per yr.	8 per yr.	6 per yr.

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/Hellwinkle'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

Summary of USFS %ERA analyses for Heavenly Ski Resort.

Basin	Area (ac)	MUSLE 2013 %ERA[1]	2013 %ERA[2]	MPA-07 %ERA[3]	MPA-07 + Epic/Disc. %ERA[4]
CA-1	1564	2.27	3.99	4.29	4.49
CA-4	139	4.57	2.44	2.44	2.44
CA-6	417	4.46	7.38	7.37	7.41
CA-7	305	0.23	0.71	1.09	1.19
NV-1	643	12.22	3.37	3.80	4.24
NV-1 w/o Mott Cyn	593	ND[5]	2.38	2.86	2.86
Edge-1	479	ND	0.53	ND	0.61
Edge-2	825	ND	4.72	ND	4.77
NV-2	652	3.16	4.04	4.79	4.79
NV-3	408	2.37	5.48	5.57	5.61
NV-4	79	9.52	9.43	9.86	9.86
NV-4A	237	0.23	0.96	1.11	1.11
NV-5	177	2.42	3.70	7.18	7.19
NV-2+5	829	3.06	3.92	5.30	5.70

[1] MUSLE program, or sediment-yield based estimate of %ERA for existing conditions (2013).
[2] Simple coefficient method for estimating %ERA for existing conditions in 2013.
[3] Simple coefficient method for estimating %ERA for the 2007 MPA anticipated buildout.
[4] Simple coefficient method for estimating %ERA for the 2007 MPA anticipated buildout including the EPIC/Discovery Park.
[5] Not determined.

ERA Coefficients	
Skiruns	0.15
Roads/parking	1.0
General Impervious	0.8

EPIC Trail development summary of impacts for ERA analysis

							ERA Coeff.							
Mtn Bike Trails - total coverage per watershed							Beg/Int	1.0	likely more traffic and steady use					
							Advanced	0.8	less traffic, more narrrow trail					
	Beg/Int	**Advanced**	**Beg/Int**	**Advanced**										
Basin	(sq ft)	(sq ft)	(ac)	(ac)			**ERA**							
CA-1	16176	0	0.37	0.00			0.37							
NV-1	85686	31776	1.97	0.73			2.55							
NvV-2+5	118362	488	2.72	0.01			2.73							
								ERA Coeff.						
Hiking Trails - total coverage per watershed (6' width)								Foot paths	0.8	Moderate traffic on mild slopes				
	Trails		**Trails**											
Basin	(sq ft)		(ac)				**ERA**							
CA-1	43434		1.00				0.80							
CA-7	1666		0.04				0.03							
NvV-2+5	17442		0.40				0.32							
										ERA Coeff.				
										Parking	1.0	Standard assumption		
		Structures, Hiking & Biking Trails impact ERA summary								Structures	0.8	Like commercial area, condos, horse areas etc at Kirkwood		
			Trails	Panorama	Structures	Parking/Rds		Total Additional						
		Basin	**ERA**	**ERA**	**ERA**	**ERA**		**ERA**						
		CA-1	2.52	0.30	0.12	0.19		3.14						
		CA-6		0.18				0.18						
		CA-7	0.03	0.26				0.29						
Edgewood	CA-7/NV-3	4021		0.42	0	0.06		0.42						
		4022		0.44	36.375	2.49		0.44						
		NV-1	2.55	0.23				2.78						
		NV-3		0.17				0.17						
		NV-4A		0.00				0.00						
		NV-2+5	3.05	0.33				3.37						
		NV-5		0.03				0.03						
					ERA Coefficients									
					Skiruns		0.15	Ranges from 0.1-0.2 depending on grading, stump cut etc, mixed runs so used midpt						
	2013 Existing Conditions				Roads/parking		1.0							
					Impervious		0.6-1.0	depends on type & BMP - see ERA summary						
	Basin											**2013 + EPIC+Panorama**		
Basin	**Area (ac)**	**SkiRuns**	**Roads**	**Undevelop**	**Imperv. Surface**		**ERA sum**	**MSL%ERA**		**2013 %ERA**		**%ERA**		
CA-1	1564	34.78	25.86	0	0.46		61.10	2.27		3.91%		4.11%	0.20	
CA-4	139	0.00	3.38	0	0		3.38	4.57		2.43%		2.43%	0.00	
CA-6	417	11.25	6.98	0	3.14		21.37	4.46		5.13%		5.17%	0.04	
CA-7	305	0.75	0.93	0	0.12		1.80	0.23		0.59%		0.68%	0.09	
Edge-1	479	2.46	0.06	0	0		2.52	NA		0.53%		0.61%	0.09	
Edge-2	825	0.075	2.49	0	36.375		38.94	NA		4.72%		4.77%	0.05	
NV-1	643	16.24	5.31	0	0.02		21.57	12.22		3.35%		3.79%	0.43	
NV-2	652	13.53	12.29	0	0.12		25.94	3.16		3.98%				
NV-3	408	12.31	5.03	0	1.25		18.59	2.37		4.56%		4.60%	0.04	
NV-4	79	1.10	2.84	0	4.29		8.23	9.52		10.42%		10.42%	0.00	
NV-4A	237	2.27	0.00	0	0		2.27	0.23		0.96%		0.96%	0.00	
NV-5	177	4.68	1.87	0	0		6.55	2.42		3.70%		3.72%	0.02	
NV-2+5	829	18.2145	14.16	0	0.12		32.49			3.92%		4.33%	0.41	

Heavenly Mountain Resort

Epic Discovery Activities Proposed Mountain Bike Trails by Watershed

13-May-14

Trail Segment	Segment Length (lineal feet)	Length in CA1	Length in NV1	Length in NV2+5	Trail Width
Beginner Trails					
B1-1	992		877	115	6
B1-2	3,146		3146		6
B1-3	822		822		6
B1-4	3,311		3311		6
B1-5	1,529		1074	455	6
B1-6	1,930			1930	6
B1-7	1,502			1502	6
B1-8	3,326			3326	6
B2	1,419		348	1071	6
B3-1	900	900			6
B3-2	1,624	1624			6
B4-1	2,172	172		2000	6
B4-2	1,543			1543	6
B4-3	2,783			2783	6
B4-4	1,094			1094	6
Subtotal	28,093	2,696	9,578	15,819	
Intermediate Trails					
I1-1	2,364		2364		6
I1-2	912		912		6
I1-3	1,684		798	886	6
I2	629		629		6
I3	934			934	6
I4	2,088			2088	6
Subtotal	8,611	0	4,703	3,908	
Advanced Trails					
A1-1	1,589		1589		3
A1-2	1,929		1929		4
A1-3	3,585		3585		3
A1-4	963		841	122	4
Subtotal	8,066		7,944	122	

Heavenly Mountain Resort
Epic Discovery Activities Proposed Trails by Watershed
13-May-14

Final Trail widths are 6' except 'advanced' at 4'

Adventure Peak Epic Discoveries

Trail Designation on Plans	Activity	Length	Length in CA1	Area in CA-1	Length in East Watershed	Length in CA7	Area in CA-7	Trail Width
P8	Alpine Coaster	60	60	360			0	6
P9	Alpine Coaster	75	75	450			0	6
P10	Mid Station Canopy Tour	787		0		787	1574	2
M11	Mid Station Canopy Tour	1196		0	1,150	46	92	2
M12	Mid Station Canopy Tour	163		0	163		0	2
M13	Mid Station Canopy Tour	387		0	387		0	2
M14	Mid Station Canopy Tour	547		0	547		0	2
M15	Mid Station Canopy Tour	194		0	194		0	2
M16	Mid Station Canopy Tour	755		0	755		0	2
M17	Mid Station Canopy Tour	221		0	221		0	2
M18	Mid Station Canopy Tour	298	194	388	104		0	2
P19	Mid Station Canopy Tour	75	34	68	41		0	2
P20	Mid Station Canopy Tour	617	617	2468			0	4
P21	Sky Cycle Canopy Tour	686	686	2744			0	4
M22	Sky Cycle Canopy Tour	3952	3331	6662	621		0	2
M23	Sky Cycle Canopy Tour	839		0	839		0	2
M24	Sky Cycle Canopy Tour	125	43	86	82		0	2
P25	Kiddie Zipline	34	34	136			0	4
P26	Kiddie Zipline	33	33	132			0	4
P27	Disc Golf	1835	1835	3670			0	2
Path Coverage Total		12,879	6,942	17,164	5,104	833	1,666	

East Peak Lake Basin Epic Discoveries

Trail Designation on Plans	Activity	Length (ft)	Length in CA1	Area in CA-1	Length in NV 2+5	Area in NV-2+5	
P28	East Peak Lodge Hiking Trail	605	605	1210		0	2
P29	East Peak Lodge Hiking Trail	2078		0	2,078	4156	2
P30	East Peak Lodge Hiking Trail	661		0	661	1322	2
P31	East Peak Lodge Hiking Trail	2650		0	2,650	5,300	2
P32	East Peak Canopy Tour	669		0	669	2676	4
P33	East Peak Canopy Tour	21		0	21	84	4
M34	East Peak Canopy Tour	529		0	529	1058	2
M35	East Peak Canopy Tour	371		0	371	742	2
P36	East Peak Canopy Tour	786		0	786	1572	2
P37	East Peak Water Activities	133		0	133	532	4
Path Coverage Total		8,503	605	1,210	7,898	17,442	

Sky Meadows Basin Epic Discoveries

Trail Designation on Plans	Activity	Length (ft)	Length in CA1	Area in CA-1	Out of Basin	
P1	Sky Basin Zip Tour	2301	2301	4602		2
M2	Sky Basin Zip Tour	2440	2440	4880		2
M3	Sky Basin Zip Tour	6402	6402	12804		2
P4	Sky Basin Zip Tour	450	450	1800		4
P5	Sky Meadows Challenge Course	150	150	600		4
P6	Sky Meadows Challenge Course	71	71	142		2
P7	Ridge Run Lookout Tower	164	58	232	106	4
Path Coverage Total		11,978	11,872	25,060	106	

Heavenly TRPA In-Basin Land Coverage Summary

Estimated New Land Coverage for Proposed Action and Alternatives

New Coverage	Proposed 1a	Proposed 1b	
Adventure Peak Epic Discoveries			CA-1
Alpine Coaster Forest Flyer			
Buildings (Terminal, bull wheels, attendant's shed)	3,170		
Coaster	1,256		
Trails	810		
Parking	432		
Sky Cycle			
Structures	1,511		
Trails and Queuing Areas	13,339		
Maintenance Road	4,898		
Mid Station Canopy Tour			
Trails and Queuing Areas	11,538		
Structures	80		
In-fill Activities			
Trails	3,938		
Mountain Bike Skills Park	15,182		
Concrete Pad for Bike Rental Area	2,000		
Total Adventure Peak Epic Discoveries	**58,154**		
East Peak Basin Epic Discoveries			CA-1
East Peak Lodge Hiking Trail (in Basin Segments)			
Trails	1,210		
Mountain Bike Park (in Basin Trail Segments B3-1 and B3-2)	15,144		already included from Mtn bike tab
Total East Peak Basin Epic Discoveries	16,354		
Sky Meadows Basin Epic Discoveries			CA-1
Sky Basin Coaster	6656	370	
Sky Basin Zip Line			
Trails and Queuing Areas	24,150	168	
Sky Meadows Challenge Course			
Trails	138	604	
Mountain Excursion Tour			
Parking/Pullouts	440		
Ridge Run Lookout Tower			
Sky Express Deck Expansion	1,000		
Structures	992		
Parking/Pullouts	440		
Trails	656		
Total Sky Meadows Basin Epic Discoveries	**27,816**		
Total New Land Coverage	**102,324**	**772**	

	Sq. Ft			
Basin	Trails	Parking/Rds	Structures	
CA-1	73,725	8,210	6,753	

	Acres		
Basin	Trails	Parking/Rds	Structures
CA-1	1.69	0.19	0.16

Panorama Trails	Length (ft)	Area (sq ft)
CA-1	5467	16401
CA-6/7	3208	9624
CA-7	4634	13902
Un-named between CA-7 & NV-3	15619	46857
NV-1	4139	12417
NV-3	3042	9126
NV-2+5	5917	17751
NV-4a	28	84
NV-5	576	1728

SKY BASIN (UPPER CA-1 WATERSHED) EROSION ASSESSMENT

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August 2014

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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
6		
7		
13		

30		
31		
32		
33		

34		
35		
36		
37		

38		
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42		
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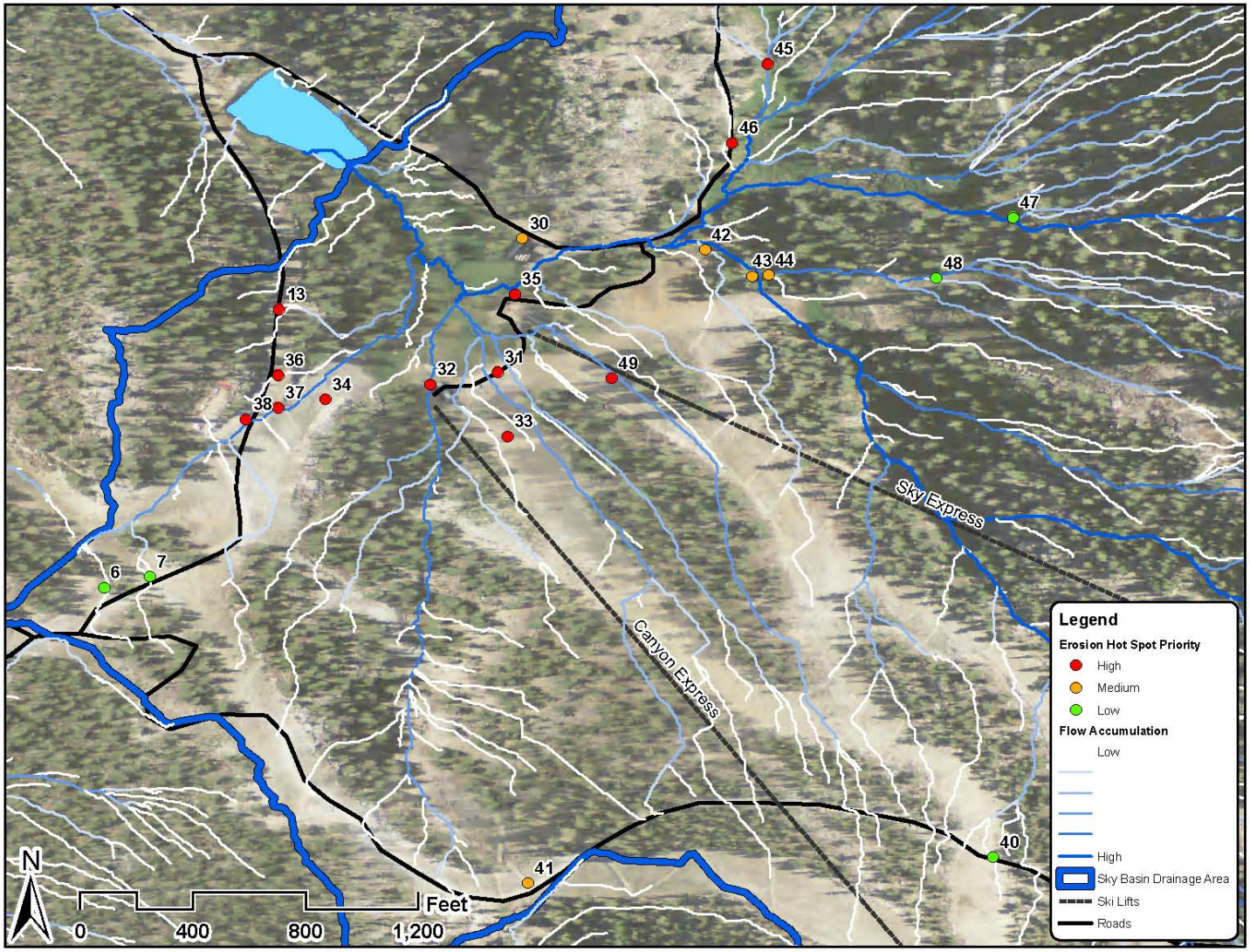
44		

45		
46		
47		
48		

49		

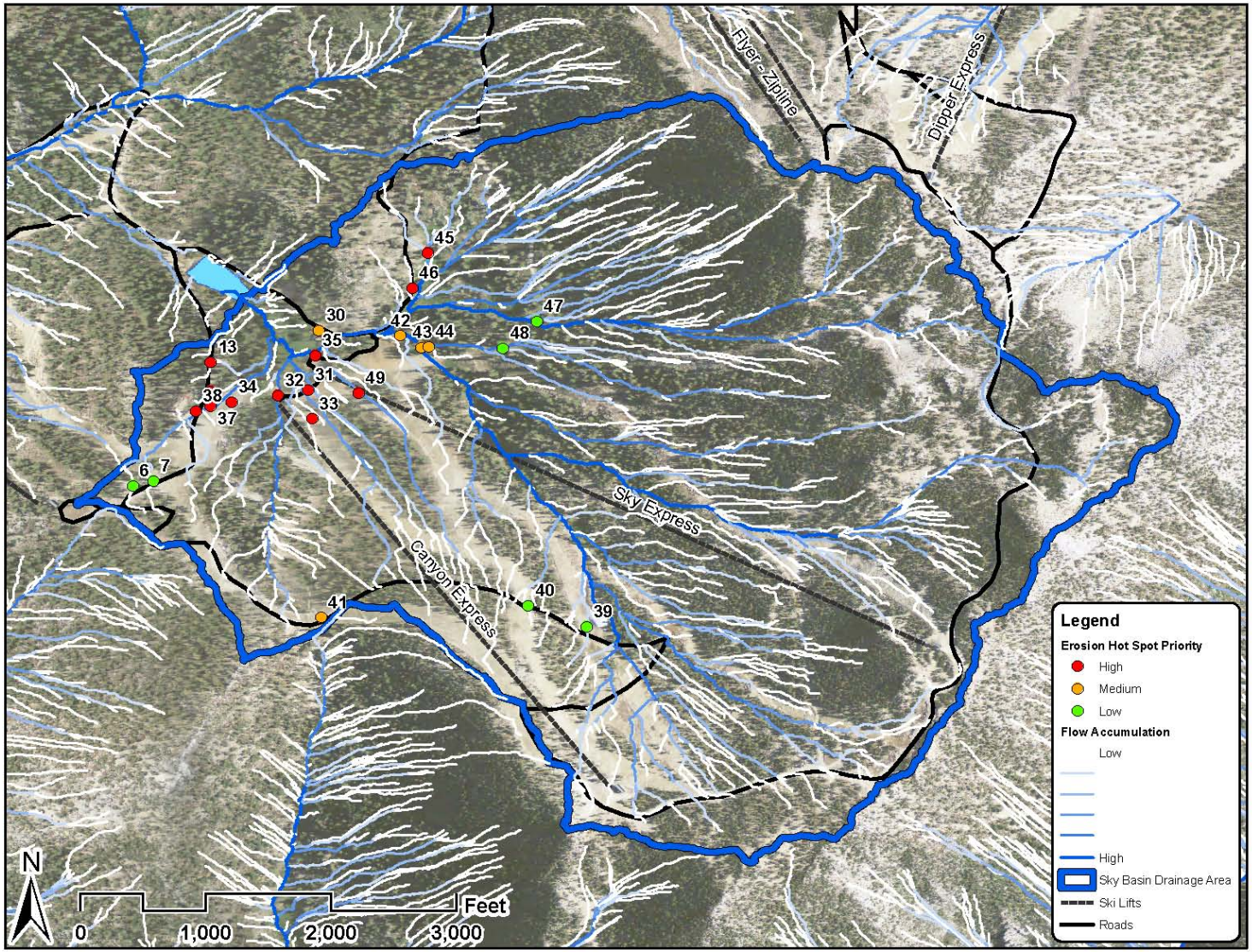
EROSION HOT SPOT MAPS

See next page.



Map Prepared by Kevin Drake, IERS, Inc. July 2014. Data Sources: Vail Corp, RCI, IERS, USGS

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

MOTT CANYON (NV-1) EROSION ASSESSMENT

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August 2014

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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. This assessment in the NV-1 watershed builds on erosion assessment work that began in the Heavenly Valley Creek watershed (CA-1) in 2013.

ASSESSMENT OVERVIEW

The Mott Canyon (NV-1 watershed) erosion assessment was conducted on June 24-25, 2014. The assessment utilized the erosion-focused rapid assessment (EfRA) process described in the *Watershed Management Guidebook* (Drake et al. 2012 - http://www.ierstahoe.com/pdf/research/watershed_management_guidebook.pdf). The EfRA methodology focuses on identifying the primary sources of erosion ("hot spots") through a simple GIS flow accumulation mapping exercise followed by on-the-ground assessment. The field assessment work focused on areas where new bike trails are proposed as part of the Heavenly Epic Discovery project, with the intention of identifying areas where proposed disturbance and existing erosion "hot spots" may intersect. The EfRA 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 primary drainages within the NV-1 watershed. Any erosion hot spots within the alignment of proposed bike trails automatically received a high priority (H) ranking.

Table 1. Erosion Hot Spot Summary Matrix (NV-1 Watershed)

Hot Spot #	Feature Type	Hot Spot-Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Overall Priority	Problem Description, Notes	Mitigation Recommendations
1	water bar	Y	L	Y	Y	L	M	H	trail crosses old low-gradient water bar	remove/decommission water bar using soil restoration treatment
2	water bar	N	H	Y	Y	L	M	M	water bar overtopped (WB #4 on Orion's); heavy rilling below	rebuild water bars and create infiltration capacity on the upslope side through soil restoration treatment; rake out rills downslope; construct mulch berms or infiltration strips on ski run to prevent further erosion by slowing/disbursing flow
3	rill/gully	Y	M	Y	Y	L	M	H	rilling through depositional area below steep rocky slope where proposed beginner trail crosses	restoration treatment to stabilize rilling area below rocks
4	rill/gully	Y	H	Y	Y	L	M	H	several rills and a big gully down Aries ski run; both beg and adv trails are proposed to cross erosion paths on ski run	address source of runoff (see HS#5); stabilize ski run with full restoration treatment and/or series of infiltration strips or mulch berms
5	ski run/road	Y	M	Y	Y	L	M	H	compacted ski run/old road below Comet lift top terminal sheds water onto Aries ski run, contributing to ski run erosion issues (linked to HS #4)	create infiltration/spreading area at top of Aries ski run (before ski run steepens)
6	rill/gully	Y	M	Y	Y	L	M	H	~4 distinct large rills on ski run at proposed trail crossing	soil restoration treatment to stabilize rilling area below rocks
7	water bar	Y	H	Y	Y	L	M	H	proposed trail crossing at water bar with erosion, which collects runoff from at least 150ft of dirt road	design stable drainage crossing for trail
8	propose d trail	Y	L	N	N	L	H	H	proposed trail switchback very near dipper drainage; lots of bare soil but no visible erosion	shift trail alignment so it doesn't drain to dipper drainage

Hot Spot #	Feature Type	Hot Spot-Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Overall Priority	Problem Description, Notes	Mitigation Recommendations
9	water bar	Y	M	Y	Y	L	M	H	proposed trail switchback at end of water bar (major depositional area)	shift trail alignment away from water bar depositional area
10	propose d trail	Y	M	Y	Y	L	H	H	proposed trail switchback very near dipper drainage with a few rills just upslope of proposed trail and connecting to dipper drainage	shift trail alignment away from dipper drainage and existing rills
11	water bar	Y	M	Y	Y	L	L	H	proposed trail switchback near water bar outlet with visible rilling	shift trail alignment away from water bar drainage area
12	road	N	L	N	N	L	M	L	old road - mitigation opportunity	decommission old road
13	propose d trail	Y	L	N	N	L	H	H	proposed trail switchback close to dipper drainage and in area with heavy Manzanita understory	shift trail alignment away from dipper drainage and out of heavily-vegetated area
14	water bar	N	H	Y	Y	L	H	M	several blown out water bars on Big Dipper ski run; mitigation opportunity - not in proposed trail alignment	rebuild water bars and create infiltration capacity on the upslope sides through soil restoration treatment; rake out rills downslope; construct mulch berms or infiltration strips on ski run to prevent further erosion by slowing/disbursing flow
15	depositio nal area	N	H	Y	Y	L	M	M	depositional area at lower end of dipper drainage	address erosion through source control upslope
16	drainage	Y	M	Y	Y	L	M	H	proposed trail alignment crosses defined drainage	shift proposed trail alignment (location of switchback) to avoid crossing drainage
17	road	N	M	Y	Y	L	M	L	old road to avalanche gun - mitigation opportunity	decommission old road (~8 ft avg width x 1290 ft length; northernmost 100 ft is ~20 ft width)
18	road	N	L	N	N	L	L	L	short loop/turnaround road - mitigation opportunity	decommission turnaround section of road (~12ft x 100ft)

Hot Spot #	Feature Type	Hot Spot-Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Overall Priority	Problem Description, Notes	Mitigation Recommendations
19	road-drainage crossing	N	H	Y	Y	M	M	M	lower end of dipper drainage crosses summer road; know to carry moderate flow during spring runoff	install mulch berms in channel above and below road; create infiltration/spreading area below road
20	drainage	Y	L	Y	Y	M	L	H	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
21	drainage	Y	M	Y	Y	M	L	H	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
22	drainage	Y	L	Y	Y	M	L	H	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
23	drainage	Y	H	Y	Y	M	L	H	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
24	drainage	Y	M	Y	Y	M	L	H	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing

Table 2. Points of Interest (NV-1 Watershed)

ID	Feature Type	Hot Spot-Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Problem Description, Notes	Mitigation Recommendations
1	proposed trail	N	L	N	N	L	M	no concentrated flow in proposed advanced trail alignment; steep rocky depositional area below	no action recommended
2	proposed trail	N	L	N	N	L	M	moderate slope; lots of rocks/logs; no obvious erosion or concentrated surface runoff	no action recommended

ID	Feature Type	Hot Spot-Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Problem Description, Notes	Mitigation Recommendations
3	proposed trail	N	L	N	N	L	L	proposed trail alignment - low erosion risk	no action recommended
4	drainage	N	H	Y	Y	L	H	dipper drainage (legacy impact)	no action recommended

EROSION HOT SPOT PHOTOS

Table 3. Erosion Hot Spot Photo Summary (NV-1 Watershed)

Hot Spot #	Photo 1	Photo 2
1		
2		
3		

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21		
22		

23		
24		

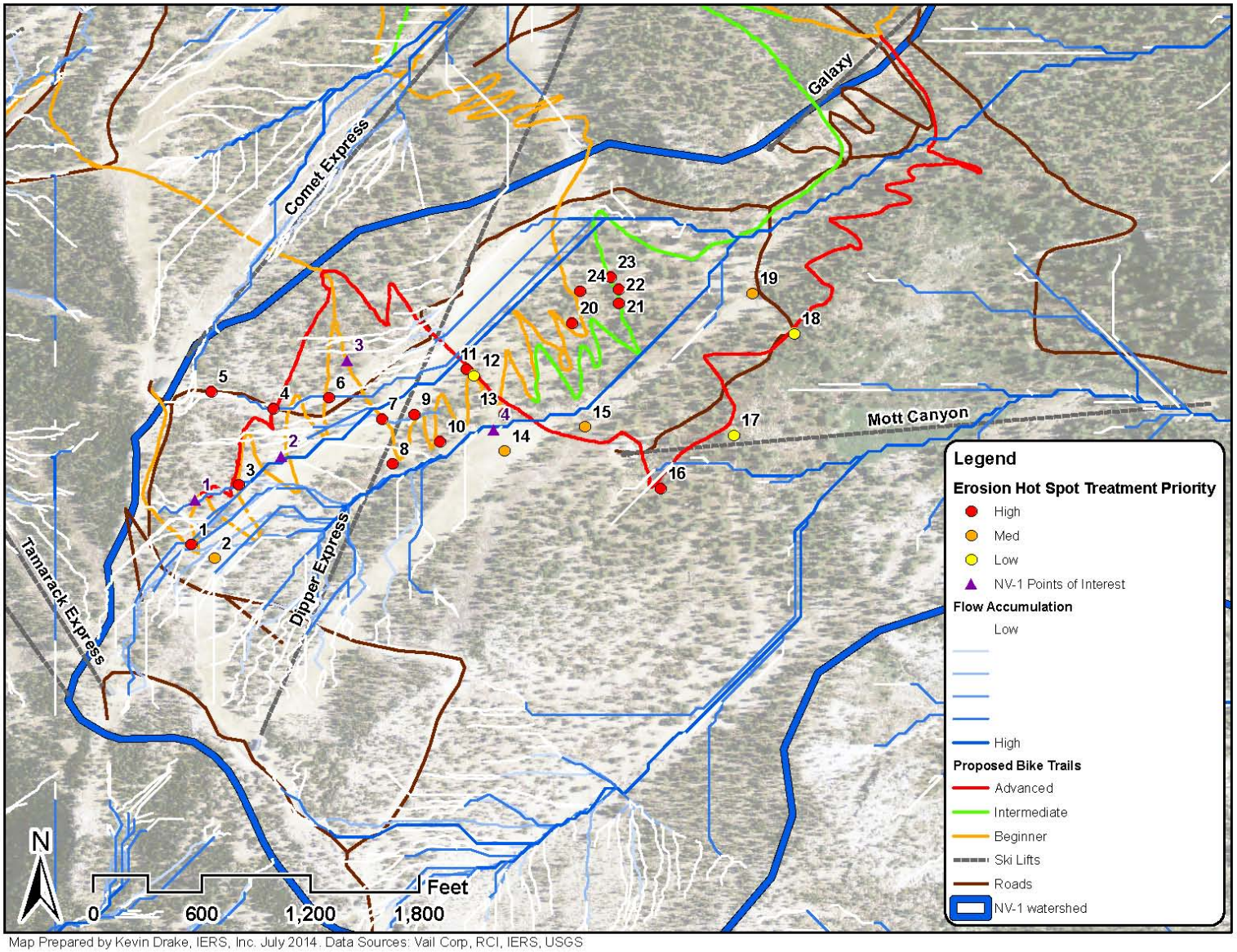
Table 4. Points of Interest Photo Summary (NV-1 Watershed)

ID	Photo 1	Photo 2
1		

2		
3		
4		

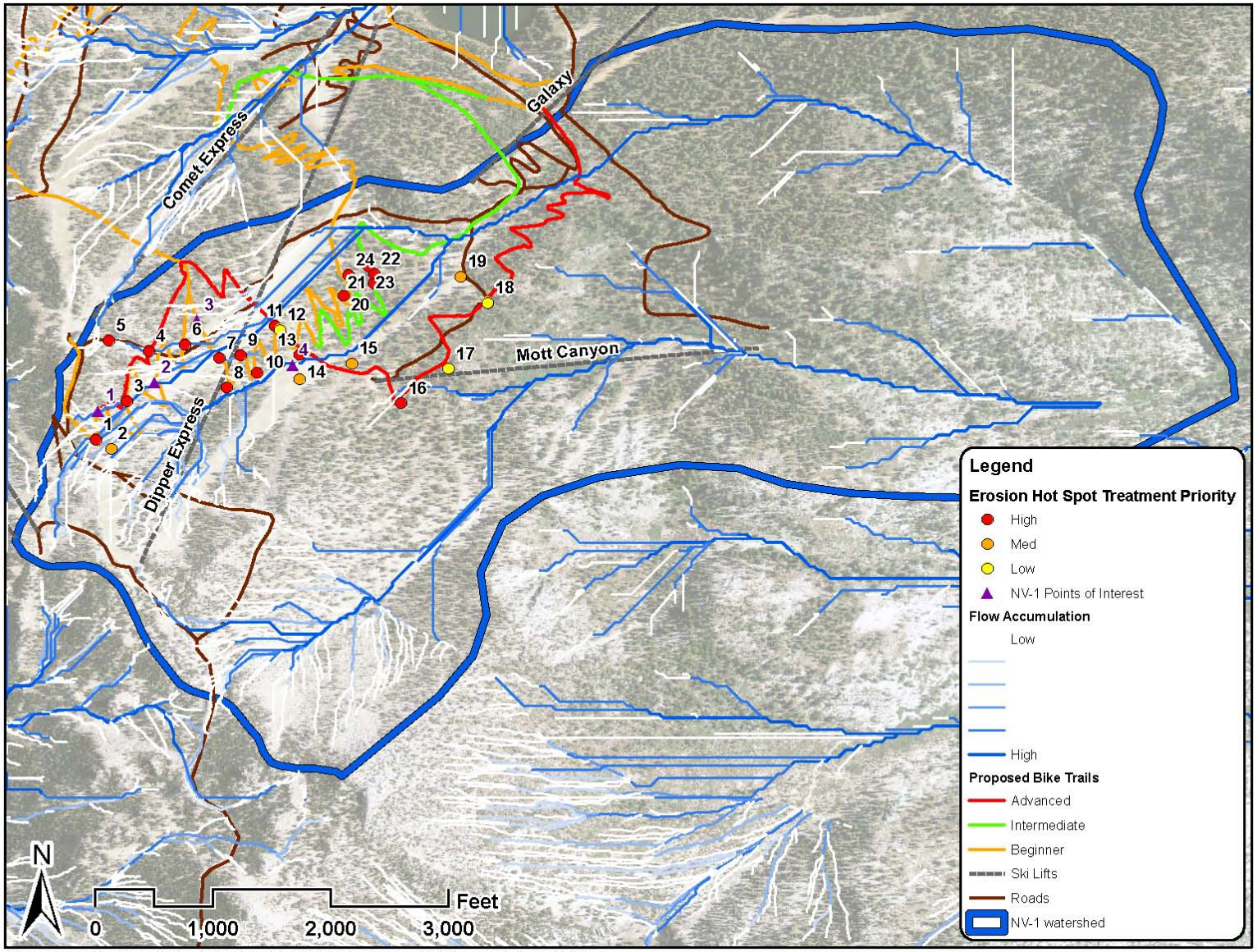
EROSION HOT SPOT MAPS

See next page.



Map Prepared by Kevin Drake, IERS, Inc. July 2014. Data Sources: Vail Corp, RCI, IERS, USGS

Figure 1. EfRA Summary Map showing hot spots in NV-1 watershed, zoomed in to hot spot locations.



Map Prepared by Kevin Drake, IERS, Inc. July 2014. Data Sources: Vail Corp, RCI, IERS, USGS

Figure 2. EfRA Summary Map showing hot spots in Mott Canyon (NV-1), zoomed out to show entire NV-1 watershed.

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

Appendix 3.4B Table 1
Construction Onsite Offroad Equipment Hours, Emission Factors, and Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Offroad Equipment Description	HP	Load Factor [1] ( )	Off-Road or On-Road?	Tier	Annual Use (hrs/yr)	Daily Use (hrs/day)	Average Speed[8] (mph)	Daily Distance Traveled (mi)	Annual Distance Traveled (mi)
Site Preparation									
Water truck, 2012 Model Year	381 (1)	0.57	On		52	4	5.0	20.0	260.0
Backhoe	75 (1)	0.55	Off	3	40	8	0.5	4.0	20.0
Wheeled Loader	87 (1)	0.54	Off	3	12	4	2.0	8.0	24.0
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (4)	0.57 (11)	Off	3?	156.0	12.0	7.5	90.0	1,170
Site Preparation Subtotal:	**-**	**-**	**-**	**-**	**260.0**	**28.8**		**-**	**-**
Grading									
Water truck, 2012 Model Year	381 (1)	0.57	On		52	4	5.0	20.0	260.0
Backhoe	75 (1)	0.55	Off	3	40	8	0.5	4.0	20.0
Wheeled Loader	87 (1)	0.54	Off	3	12	4	2.0	8.0	24.0
Mini-Excavator Cat 308E2 CR SB	65	0.57	Off	3	10.4	0.8	0.5	0.4	5.2
Drill Rig	82 (1)	0.75	Off		20	4	1.0	4.0	20.0
Sweyco Trail Dozer, tracked	80 (9)	0.64	Off	3	10.4	0.8	1.5	1.2	15.6
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (4)	0.57	Off	3	156.0	12.0	7.5	90.0	1,170
Grading Subtotal:	**-**	**-**	**-**	**-**	**300.8**	**33.6**		**-**	**-**
Structure Construction									
Water truck, 2012 Model Year	381 (1)	0.57	On		368	4	5.0	20.0	1840.0
Backhoe	75 (1)	0.55	Off	3	80	8	0.5	4.0	40.0
Wheeled Loader	87 (1)	0.54	Off	3	36	4	2.0	8.0	72.0
Boom truck with crane, 2013 Altec AC23-95B	300 (15)	0.57	On		40	4	1.5	6.0	200.0
Mini-Excavator Cat 308E2 CR SB	65	0.57	Off	3	49.6	0.8	0.5	0.4	24.8
Forklift	149 (1)	0.3	Off		40	1.6	2.0	3.2	80.0
Drill Rig	82 (1)	0.75	Off		60	4	1.0	4.0	60.0
Sweyco Trail Dozer, tracked	80 (9)	0.64	Off	3	49.6	0.8	1.5	1.2	74.4
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (4)	0.57	Off	3	1,840.0	20.0	7.5	150.0	13,800
Helicopter	300	-	-	-	40	8	-	-	-
Structural Construction Subtotal:	**-**	**-**	**-**	**-**	**2,603.2**	**55.2**		**-**	**-**
				Totals:	**3,164**	-			

Offroad Equipment Description	ARB Off-Road or EPA Nonroad[2] Emission Factors (g/bhp-hr) NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Site Preparation										
Water truck, 2012 Model Year	-	-	-	-	-	-	-	-	-	-
Backhoe	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	###########	593 (21,22)
Wheeled Loader	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	###########	457 (21,22)
Site Preparation Subtotal:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Grading										
Water truck, 2012 Model Year	-	-	-	-	-	-	-	-	-	-
Backhoe	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	###########	593 (21,22)
Wheeled Loader	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
Mini-Excavator Cat 308E2 CR SB	4.58 (4)	0.748 (2)	0.14 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
Drill Rig	4.32 (16)	1.24 (16)	0.25 (16)	0.0049 (16)	0.13 (16)	0.12 (16)	521 (16)	0.021 (18,19)	###########	523 (21,22)
Sweyco Trail Dozer, tracked	5.01 (4)	0.87 (2)	0.19 (4)	0.0050 (5)	0.24 (4)	0.22 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.060 (12)	0.055 (6)	456 (7)	0.018 (18,19)	###########	457 (21,22)
Grading Subtotal:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Structure Construction										
Water truck, 2012 Model Year	-	-	-	-	-	-	-	-	-	-
Backhoe	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	###########	593 (21,22)
Wheeled Loader	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
Boom truck with crane, 2013 Altec AC23-95B	-	-	-	-	-	-	-	-	-	-
Mini-Excavator Cat 308E2 CR SB	4.58 (4)	0.748 (2)	0.14 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
Forklift	7.43 (16)	4.13 (16)	0.86 (16)	0.0049 (16)	0.62 (16)	0.57 (16)	521 (16)	0.021 (18,19)	###########	523 (21,22)
Drill Rig	4.32 (16)	1.24 (16)	0.25 (16)	0.0049 (16)	0.13 (16)	0.12 (16)	521 (16)	0.021 (18,19)	###########	523 (21,22)
Sweyco Trail Dozer, tracked	5.01 (4)	0.867 (2)	0.19 (4)	0.0050 (5)	0.24 (4)	0.22 (6)	531 (7)	0.022 (18,19)	###########	533 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.060 (12)	0.055 (6)	456 (7)	0.018 (18,19)	###########	457 (21,22)
Helicopter	-	-	-	-	-	-	-	-	-	-
Structural Construction Subtotal:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Offroad Equipment Description	Onroad Emission Factors (lbs/VMT) (3) NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Site Preparation										
Water truck, 2012 Model Year	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	###########	9 (21,22)
Backhoe	-	-	-	-	-	-	-	-	-	-
Wheeled Loader	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	-	-	-	-	-	-	-	-	-	-
Site Preparation Subtotal:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Grading										
Water truck, 2012 Model Year	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	###########	9 (21,22)
Backhoe	-	-	-	-	-	-	-	-	-	-
Wheeled Loader	-	-	-	-	-	-	-	-	-	-
Mini-Excavator Cat 308E2 CR SB	-	-	-	-	-	-	-	-	-	-
Drill Rig	-	-	-	-	-	-	-	-	-	-
Sweyco Trail Dozer, tracked	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	-	-	-	-	-	-	-	-	-	-
Grading Subtotal:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Structure Construction										
Water truck, 2012 Model Year	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	###########	9 (21,22)
Backhoe	-	-	-	-	-	-	-	-	-	-
Wheeled Loader	-	-	-	-	-	-	-	-	-	-
Boom truck with crane, 2013 Altec AC23-95B	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	###########	9 (21,22)
Mini-Excavator Cat 308E2 CR SB	-	-	-	-	-	-	-	-	-	-
Forklift	-	-	-	-	-	-	-	-	-	-
Drill Rig	-	-	-	-	-	-	-	-	-	-
Sweyco Trail Dozer, tracked	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	-	-	-	-	-	-	-	-	-	-
Helicopter	-	-	-	-	-	-	-	-	-	-
Structural Construction Subtotal:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Offroad Equipment Description	Daily Offroad Equipment Emissions (lbs/day) NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Site Preparation										
Water truck, 2012 Model Year	2.55E-01	2.18E-01	1.10E-01	3.34E-01	3.16E-03	2.91E-03	1.70E+02	0.007 (18,19)	0.0014 (18,20)	171 (21,22)
Backhoe	5.02E+00	2.54E+00	1.31E+00	4.04E-03	5.53E-01	5.09E-01	4.30E+02	0.017 (18,19)	0.0035 (18,20)	431 (21,22)
Wheeled Loader	1.02E+00	3.49E-01	4.14E-02	2.07E-03	4.56E-02	4.19E-02	2.20E+02	0.009 (18,19)	0.0018 (18,20)	221 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	5.09E+00	6.47E-01	2.32E+00	6.02E-03	3.62E-02	3.33E-02	2.75E+02	0.011 (18,19)	0.0022 (18,20)	276 (21,22)
Site Preparation Subtotal:	**11.7**	**68**	**3.8**	**0.347**	**0.64**	**0.59**	**1,128**	**0.046 (18,19)**	**0.0092 (18,20)**	**##########**
Grading										
Water truck, 2012 Model Year	2.55E-01	2.18E-01	1.10E-01	3.34E-01	3.16E-03	2.91E-03	1.70E+02	0.007 (18,19)	0.0014 (18,20)	171 (21,22)
Backhoe	5.02E+00	2.54E+00	1.31E+00	4.04E-03	5.53E-01	5.09E-01	4.30E+02	0.017 (18,19)	0.0035 (18,20)	431 (21,22)
Wheeled Loader	1.02E+00	3.49E-01	4.14E-02	2.07E-03	4.56E-02	4.19E-02	2.20E+02	0.009 (18,19)	0.0018 (18,20)	221 (21,22)
Mini-Excavator Cat 308E2 CR SB	2.99E-01	4.89E-02	9.15E-03	3.26E-04	7.19E-03	6.61E-03	3.47E+01	0.00141 (18,19)	###########	35 (21,22)
Drill Rig	2.34E+00	6.71E-01	1.36E-01	2.66E-03	7.24E-02	6.66E-02	2.83E+02	0.011 (18,19)	0.0023 (18,20)	284 (21,22)
Sweyco Trail Dozer, tracked	4.52E-01	7.83E-02	1.72E-02	4.51E-04	2.17E-02	1.99E-02	4.80E+01	0.0019 (18,19)	###########	48 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	5.09E+00	6.47E-01	2.32E+00	6.02E-03	3.62E-02	3.33E-02	2.75E+02	0.011 (18,19)	0.0022 (18,20)	276 (21,22)
Grading Subtotal:	**14.5**	**69**	**3.9**	**0.3500**	**0.739**	**0.680**	**1,461**	**0.059 (18,19)**	**0.0118 (18,20)**	**##########**
Structure Construction										
Water truck, 2012 Model Year	2.55E-01	2.18E-01	1.10E-01	3.34E-01	3.16E-03	2.91E-03	1.70E+02	0.0069 (18,19)	0.0014 (18,20)	171 (21,22)
Backhoe	5.02E+00	2.54E+00	1.31E+00	4.04E-03	5.53E-01	5.09E-01	4.30E+02	0.017 (18,19)	0.0035 (18,20)	431 (21,22)
Wheeled Loader	1.02E+00	3.49E-01	4.14E-02	2.07E-03	4.56E-02	4.19E-02	2.20E+02	0.009 (18,19)	0.0018 (18,20)	221 (21,22)
Boom truck with crane, 2013 Altec AC23-95B	7.65E-02	6.54E-02	3.29E-02	1.00E-01	9.49E-04	8.73E-04	5.11E+01	0.0021 (18,19)	0.0004 (18,20)	51 (21,22)
Mini-Excavator Cat 308E2 CR SB	2.99E-01	4.89E-02	9.15E-03	3.26E-04	7.19E-03	6.61E-03	3.47E+01	0.00141 (18,19)	###########	35 (21,22)
Forklift	1.17E+00	6.51E-01	1.36E-01	7.73E-04	9.78E-02	9.00E-02	8.22E+01	0.0033 (18,19)	###########	82 (21,22)
Drill Rig	2.34E+00	6.71E-01	1.36E-01	2.66E-03	7.24E-02	6.66E-02	2.83E+02	0.011 (18,19)	0.0023 (18,20)	284 (21,22)
Sweyco Trail Dozer, tracked	4.52E-01	7.83E-02	1.72E-02	4.51E-04	2.17E-02	1.99E-02	4.80E+01	0.0019 (18,19)	###########	48 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	8.48E+00	1.08E+02	3.87E+00	1.00E-02	6.03E-02	5.55E-02	4.58E+02	0.019 (18,19)	0.0037 (18,20)	460 (21,22)
Helicopter	4.33 (17)	4.33 (17)	0.02 (17)	0.76 (17)	1.03 (17)	0.95 (6,17)	1,877 (17)	0.076 (18,19)	0.015 (18,20)	###########
Structural Construction Subtotal:	**23.4**	**116.8**	**5.7**	**1.22**	**1.9**	**1.7**	**3,654**	**0.15 (18,19)**	**0.030 (18,20)**	**##########**

Offroad Equipment Description	Annual Offroad Equipment Emissions (tpy) NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Site Preparation										
Water truck, 2012 Model Year	1.66E-03	1.42E-03	7.12E-04	2.17E-03	2.06E-05	1.89E-05	1.11E+00	0.000045 (18,19)	0.000009 (18,20)	1.11 (21,22)
Backhoe	1.26E-02	6.35E-03	3.27E-03	1.01E-05	1.38E-03	1.27E-03	1.07E+00	0.000044 (18,19)	0.000009 (18,20)	1.08 (21,22)
Wheeled Loader	1.52E-03	5.24E-04	6.22E-05	3.10E-06	6.84E-05	6.29E-05	3.30E-01	0.000013 (18,19)	###########	0.33 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	3.31E-02	4.20E-01	1.51E-02	3.92E-05	2.35E-04	2.16E-04	1.79E+00	0.000073 (18,19)	0.000015 (18,20)	1.79 (21,22)
Site Preparation Subtotal:	**0.049**	**0.43**	**0.019**	**0.002226**	**0.0017**	**0.0016**	**4.3**	**0.00017 (18,19)**	**0.000035 (18,20)**	**4.3 (21,22)**
Grading										
Water truck, 2012 Model Year	1.66E-03	1.42E-03	7.12E-04	2.17E-03	2.06E-05	1.89E-05	1.11E+00	0.000045 (18,19)	0.000009 (18,20)	1.11 (21,22)
Backhoe	1.26E-02	6.35E-03	3.27E-03	1.01E-05	1.38E-03	1.27E-03	1.07E+00	0.000044 (18,19)	0.000009 (18,20)	1.08 (21,22)
Wheeled Loader	1.52E-03	5.24E-04	6.22E-05	3.10E-06	6.84E-05	6.29E-05	3.30E-01	0.000013 (18,19)	###########	0.33 (21,22)
Mini-Excavator Cat 308E2 CR SB	1.95E-03	3.18E-04	5.95E-05	2.12E-06	4.67E-05	4.30E-05	2.20E-01	0.0000092 (18,19)	###########	0.23 (21,22)
Drill Rig	5.85E-03	1.68E-03	3.41E-04	6.64E-06	1.81E-04	1.67E-04	7.06E-01	0.000029 (18,19)	0.000006 (18,20)	0.71 (21,22)
Sweyco Trail Dozer, tracked	2.94E-03	5.09E-04	1.12E-04	2.93E-06	1.41E-04	1.30E-04	3.12E-01	0.0000127 (18,19)	###########	0.31 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	3.31E-02	4.20E-01	1.51E-02	3.92E-05	2.35E-04	2.16E-04	1.79E+00	0.000073 (18,19)	0.000015 (18,20)	1.79 (21,22)
Grading Subtotal:	**0.060**	**0.43**	**0.020**	**0.002238**	**0.00208**	**0.00191**	**5.5**	**0.00022 (18,19)**	**0.000045 (18,20)**	**5.6 (21,22)**
Structure Construction										
Water truck, 2012 Model Year	1.17E-02	1.00E-02	5.04E-03	1.54E-02	1.46E-04	1.34E-04	7.84E+00	0.000318 (18,19)	0.000064 (18,20)	7.87 (21,22)
Backhoe	2.51E-02	1.27E-02	6.55E-03	2.02E-05	2.76E-03	2.54E-03	2.15E+00	0.000087 (18,19)	0.000017 (18,20)	2.16 (21,22)
Wheeled Loader	4.57E-03	1.57E-03	1.86E-04	9.31E-06	2.05E-04	1.89E-04	9.91E-01	0.000040 (18,19)	0.000008 (18,20)	0.99 (21,22)
Boom truck with crane, 2013 Altec AC23-95B	1.28E-03	1.09E-03	5.48E-04	1.67E-02	1.58E-05	1.46E-05	8.52E-01	0.000035 (18,19)	0.000007 (18,20)	0.86 (21,22)
Mini-Excavator Cat 308E2 CR SB	9.28E-03	1.51E-03	2.84E-04	1.01E-05	2.23E-04	2.05E-04	1.08E+00	0.000044 (18,19)	0.000009 (18,20)	1.08 (21,22)
Forklift	1.46E-02	8.14E-03	1.70E-03	9.66E-06	1.22E-03	1.12E-03	1.03E+00	0.000042 (18,19)	0.000008 (18,20)	1.03 (21,22)
Drill Rig	1.76E-02	5.03E-03	1.02E-03	1.99E-05	5.43E-04	5.00E-04	2.12E+00	0.000086 (18,19)	0.000017 (18,20)	2.13 (21,22)
Sweyco Trail Dozer, tracked	1.40E-02	2.43E-03	5.32E-04	1.40E-05	6.72E-04	6.18E-04	1.49E+00	0.000060 (18,19)	0.000012 (18,20)	1.49 (21,22)
ATV, 2013 Yamaha Rhino 700 FI 4x4	3.90E-01	4.96E+00	1.78E-01	4.62E-04	2.77E-03	2.55E-03	2.11E+01	0.00086 (18,19)	0.00017 (18,20)	21.2 (21,22)
Helicopter	1.08E-02	1.08E-02	5.00E-05	1.90E-03	2.58E-03	2.37E-03	4.69E+00	0.000190 (18,19)	0.000038 (18,20)	4.71 (21,22)
Structural Construction Subtotal:	**0.50**	**5.0**	**0.19**	**0.0195**	**0.011**	**0.010**	**43.3**	**0.0018 (18,19)**	**0.00035 (18,20)**	**43.5 (21,22)**
	0.61	**5.87**	**0.23**	**0.0240**	**0.015**	**0.014**	**53.2**	**0.0022 (18,19)**	**0.00043 (18,20)**	**53.3 (21,22)**

1) CalEEMod (Version 2013.2.2) Appendix D Table 3.3 default value.
2) EPA, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition*, ReportNR-009d, EPA-420-R-10-018, Table A4, July 2010
3) EMFAC2011-LDV V2.50.57.246 and EMFAC2011-HD.
4) http://www.rhinoforums.net/engine/4/4719-how-much-horsepower-does-stock-rhino-700-fi-have.html
5) Calculated from BSFC assuming 15 ppmw sulfur in Diesel fuel.
6) OFFROAD2007 uses a $PM_{10}/PM_{2.5}$ ratio = 0.92
7) Density of Distillate Fuel No. 2 (metric tons fuel/bbl fuel) = 0.1346 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for Distillate Fuel No. 2 (metric tons CO2/bbl fuel) = 0.4296 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for gasoline (metric tons CO2/bbl fuel) = 0.3686 (CFR Part 98, Subpart MM, Table MM-1)
8) Estimated.
9) Sweyco Trail Dozer Model 480 specification
10) Specifications for Honda Model TRX420FE
11) Assumed same as off-highway trucks in CalEEMod Appendix D Table 3.3.
12) EPA, Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, Report NR-010e, EPA-420-R-05-019, Table 6, page 8, December 2005.
13) The sulfur concentration in gasoline is assumed to be 30 ppmw, based on EPA News Release*EPA Sets Cleaner Fuel and Car Standards, Slashing Air Pollution and Providing Health Benefits to Thousands,* March 3, 2014, "The final fuel standards will reduce gasoline sulfur levels by more than 60 percent – down from 30 to 10 parts per million (ppm) in 2017."
14) Caterpillar, *Lease a Cat Backhoe Loader* , http://www.catresourcecenter.com/construction-backhoe-loaders.asp?SRC=CATBC1630&utm_term=excavator&utm_content=MHEX#2
15) Example: 2013 Altec AC23-95B, 29-ton crane, 10-wheel
16) CalEEMod Appendix D Table 3.4 for 2012 Forklift with 51 - 120 hp
17) Tables 4 and 5 in Appendix A, authored by Panorama Environmental, Inc. for PG&E's CEQA document to the CPUC for the Santa Cruz 115kV Reinforcement Project, http://www.cpuc.ca.gov/environment/info/panoramaenv/SantaCruz_115kVReinforcement/SantaCruz_115%20Reinforcement%20Project.html#EIR
18) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
19) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
20) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
21) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
22) N_2O Global Warming Potential (-) = 298 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)

Appendix 3.4B Table 2
Construction Fugitive Dust Emission Summary in California
Heavenly Mountain Resort Epic Discovery Project

Daily Construction Fugitive Dust Emissions in California

$PM_{2.5}$ (lb/day)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	0.13	0.13	0.13
TRAIL DOZER	-	0.011	0.011
MINI-EXCAVATOR	-	0.0035	0.0035
BACKHOE	0.017	0.017	0.017
FORKLIFT	-	-	0.015
$PM_{2.5}$ Subtotal (lbs/day) =	0.15	0.16	0.18

PM_{10} (lb/day)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	1.33	1.33	1.33
TRAIL DOZER	-	0.019	0.019
MINI-EXCAVATOR	-	0.035	0.035
BACKHOE	0.17	0.17	0.17
FORKLIFT	-	-	0.15
PM_{10} Subtotal (lbs/day) =	1.50	1.55	1.70

$PM_{2.5}$ (lb/day)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.048
WHEELED LOADER	0.069	0.069	0.069
DRILL RIG	-	0.030	0.030
ATVs	0.15	0.15	0.25
$PM_{2.5}$ Subtotal (lbs/day) =	0.22	0.25	0.40
$PM_{2.5}$ Total (lbs/day) =	0.37	0.41	0.58

PM_{10} (lb/day)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.48
WHEELED LOADER	0.69	0.69	0.69
DRILL RIG	-	0.30	0.30
ATVs	1.5	1.5	2.5
PM_{10} Subtotal (lbs/day) =	2.2	2.5	4.0
PM_{10} Total (lbs/day) =	3.7	4.0	5.7

Annual Construction Fugitive Dust Emissions in California

$PM_{2.5}$ (tpy)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	0.00086	0.00086	0.0061
TRAIL DOZER	-	0.000069	0.00033
MINI-EXCAVATOR	-	0.000023	0.00011
BACKHOE	0.000043	0.000043	0.000086
FORKLIFT	-	-	0.00018
$PM_{2.5}$ Subtotal (tpy) =	0.00090	0.0010	0.0068

PM_{10} (tpy)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	0.0086	0.0086	0.061
TRAIL DOZER	-	0.0013	0.00060
MINI-EXCAVATOR	-	0.00023	0.0011
BACKHOE	0.00043	0.00043	0.00086
FORKLIFT	-	-	0.0018
PM_{10} Subtotal (tpy) =	0.0090	0.0105	0.065

$PM_{2.5}$ (tpy)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.00079
WHEELED LOADER	0.00010	0.00010	0.00031
DRILL RIG	-	0.000076	0.00023
ATVs	0.0010	0.0010	0.011
$PM_{2.5}$ Subtotal (tpy) =	0.0011	0.0012	0.0128
$PM_{2.5}$ Total (tpy) =	0.0020	0.0021	0.020

PM_{10} (tpy)			
	Daily Fugitive Dust Emission by Construction Phase		
Equipment Project Phase:	Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.0079
WHEELED LOADER	0.0010	0.0010	0.0031
DRILL RIG	-	0.00076	0.0023
ATVs	0.010	0.010	0.11
PM_{10} Subtotal (tpy) =	0.011	0.012	0.13
PM_{10} Total (tpy) =	0.020	0.022	0.19

Appendix 3.4 Table 3
Construction Offsite On-Road Vehicle Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Construction Offsite On-Road Vehicle Emissions in California [1]

Materials DeliveryTruck Emissions in California

Materials Delivery Truck Peak Daily Emissions in California

Maximum Number of Deliveries per Day	Average Round-Trip Haul Distance (miles)	Vehicle-Miles Traveled per Day	Emission Factors (lbs/VMT)									Daily Emissions (lbs/day)									
			NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4 [2,3]	N_2O [2,4]	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e [5,6]
1	200	200	0.0270	0.0036	0.00077	0.000037	0.00073	0.00055	3.86	0.00016	0.000031	5.47	0.746	0.161	0.0074	0.147	0.111	779	0.032	0.0063	781
Paved-Road Fugitive Dust							0.056	0.0049								11.3	1.0				

Materials Delivery Truck Annual Emissions in California

Number of Deliveries per Year	Average Round-Trip Haul Distance (miles)	Annual Vehicle-Miles Traveled	Emission Factors (lbs/VMT)									Annual Emissions (tons/yr)									
			NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e [5,6]
19	200	3,800	0.0270	0.0036	0.00077	0.000037	0.00073	0.00055	3.86	0.00016	0.000031	0.052	0.0071	0.00153	0.000071	0.00140	0.00106	7.40	0.00030	0.000060	7.4
Paved-Road Fugitive Dust							0.056	0.0049								0.11	0.0094				

1) Maximum emissions occur during Structure Construction phase.
2) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
3) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
4) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 Ibid
5) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
6) N_2O Global Warming Potential (-) = 298 Ibid

Appendix 3.4 Table 3
Construction Offsite On-Road Vehicle Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Construction Worker Vehicle Emissions in California

Worker Travel Daily Emissions in California (Maximum)																								
Max Number of Workers Per Day	Average Employee Round Trips Per Day	Number of Round Trips Per Day	Average Round Trip Distance (Miles)	Carpool Factor (No. People per Vehicle)	Vehicle Miles Traveled Per Day (Miles)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
15	1	15	40	3	200	0.00129	0.0096	0.00084	0.000011	0.000229	0.000159	1.13	0.000046	0.0000091	0.26	2.3	0.27	0.0023	0.046	0.032	232	0.0094	0.0019	233
Paved-Road Fugitive Dust										0.0047	0.0012								0.94	0.23				

Worker Travel Annual Emissions in California																									
Annual Average (Weighted) Number of Workers Per Day	Average Employee Round Trips Per Day	Total Number of Round Trips Per Day	Average Round Trip Distance (Miles)	Carpool Factor (No. People per Vehicle)	Number of Construction Days	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
13.3	1	13.3	40	3	118	21,000	0.00129	0.0096	0.00084	0.000011	0.000229	0.000159	1.13	0.000046	0.0000091	0.014	0.12	0.015	0.00012	0.0024	0.0017	12.2	0.00050	9.9E-05	12.3
Paved-Road Fugitive Dust											0.0047	0.0012								0.049	0.012				

Appendix 3.4 Table 4
Construction Onsite Offroad Equipment Hours, Emission Factors, and Emissions in California
Heavenly Mountain Resort Epic Discovery Project

										ARB Off-Road or EPA Nonroad[(2)] Emission Factors (g/bhp-hr)										Onroad Emission Factors (lbs/VMT) (3)									
Offroad Equipment Description	HP	Load Factor (-) [(1)]	Off-Road or On-Road?	Tier	Annual Use (hrs/yr)	Daily Use (hrs/day)	Average Speed[(4)] (mph)	Daily Distance Traveled (mi)	Annual Distance Traveled (mi)	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Site Preparation																															
Water truck, 2012 Model Year	381 (1)	0.57	On		104	8	5	40	520	-	-	-	-	-	-	-	-	-	-	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	0.000069 (18,20)	9 (21,22)
Backhoe, Cat 416F	75 (1)	0.55	Off	3	120	16	0.5	8	60	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	0.0048 (18,20)	593 (21,22)	-	-	-	-	-	-	-	-	-	-
Wheeled Loader, Cat 924K	87 (1)	0.54	Off	3	48	8	2.0	16	96	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (10)	0.57 (11)	Off	3	312.0	24.0	7.5	180	2,340	8.43 (12)	107.23 (12)	3.85 (12)	0.0100 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	0.0037 (18,20)	457 (21,22)	-	-	-	-	-	-	-	-	-	-
Site Preparation Subtotal:	**-**	**-**	**-**	**-**	**584.0**	**72.0**		-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Grading																															
Water truck, 2012 Model Year	381 (1)	0.57	On		104	8	5	40	520	-	-	-	-	-	-	-	-	-	-	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	0.000069 (18,20)	9 (21,22)
Backhoe, Cat 416F	75 (1)	0.55	Off	3	120	16	0.5	8	60	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	0.0048 (18,20)	593 (21,22)	-	-	-	-	-	-	-	-	-	-
Wheeled Loader, Cat 924K	87 (1)	0.54	Off	3	48	8	2.0	16	96	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Mini-Excavator Cat 308E2 CR SB	65	0.57	Off	3	104	8	0.5	4	52	4.58 (4)	0.748 (2)	0.14 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Drill Rig	82 (1)	0.75	Off		40	8	1.0	8	40	4.3157 (16)	1.2363 (16)	0.2513 (16)	0.0049 (16)	0.1335 (16)	0.1228 (16)	521 (16)	0.021 (18,19)	0.0042 (18,20)	523 (21,22)	-	-	-	-	-	-	-	-	-	-
Sweyco Trail Dozer, tracked	80 (9)	0.64	Off	3	104.0	8	1.5	12	156	5.01 (4)	0.867 (2)	0.19 (4)	0.0050 (5)	0.24 (4)	0.22 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (10)	0.57	Off	3	312.0	24.0	7.5	180	2,340	8.43 (12)	107.23 (12)	3.85 (12)	0.0100 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	0.0037 (18,20)	457 (21,22)	-	-	-	-	-	-	-	-	-	-
Grading Subtotal:	**-**	**-**	**-**	**-**	**832.0**	**80.0**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	**-**
Structure Construction																															
Water truck, 2012 Model Year	381 (1)	0.57	On		736	8	5	40	3,680	-	-	-	-	-	-	-	-	-	-	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	0.000069 (18,20)	9 (21,22)
Backhoe, Cat 416F	75 (1)	0.55	Off	3	240	16	0.5	8	120	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	0.0048 (18,20)	593 (21,22)	-	-	-	-	-	-	-	-	-	-
Wheeled Loader, Cat 924K	87 (1)	0.54	Off	3	144	8	2.0	16	288	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Boom truck with crane, 2013 Altec AC23-95B	300 (15)	0.57	On		80	8	1.5	12	400	-	-	-	-	-	-	-				1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	0.000069 (18,20)	9 (21,22)
Mini-Excavator Cat 308E2 CR SB	65	0.57	Off	3	496.0	8.0	0.5	4	248	4.58 (4)	0.748 (2)	0.14 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Forklift	149 (1)	0.3	Off		200	8.0	2.0	16	400	7.4307 (16)	4.1310 (16)	0.8626 (16)	0.0049 (16)	0.6201 (16)	0.5705 (16)	521 (16)	0.021 (18,19)	0.0042 (18,20)	523 (21,22)	-	-	-	-	-	-	-	-	-	-
Drill Rig	82 (1)	0.75	Off		120	4	1.0	8	120	4.3157 (16)	1.2363 (16)	0.2513 (16)	0.0049 (16)	0.1335 (16)	0.1228 (16)	521 (16)	0.021 (18,19)	0.0042 (18,20)	523 (21,22)	-	-	-	-	-	-	-	-	-	-
Sweyco Trail Dozer, tracked	80 (9)	0.64	Off	3	496.0	8.0	1.5	12	744	5.01 (4)	0.867 (2)	0.19 (4)	0.0050 (5)	0.24 (4)	0.22 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (10)	0.57	Off	3	3,680.0	40.0	7.5	300	27,600	8.43 (12)	107.23 (12)	3.85 (12)	0.0100 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	0.0037 (18,20)	457 (21,22)	-	-	-	-	-	-	-	-	-	-
Helicopter	300	-	-	-	40	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	**-**	**-**
Structural Construction Subtotal:	**-**	**-**	**-**	**-**	**6,232.0**	**40.0**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	**-**
				Totals:	7,648	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	-

1) CalEEMod (Version 2013.2.2) default value.
2) EPA, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition,* ReportNR-009d, EPA-420-R-10-018, Table A4, July 2010
3) EMFAC2011-LDV V2.50.57.246 and EMFAC2011-HD.
4) Estimated
5) Calculated from BSFC assuming 15 ppmw sulfur in Diesel fuel.
6) OFFROAD2007 uses a $PM_{2.5}/PM_{10}$ ratio = 0.92
7) Density of Distillate Fuel No. 2 (metric tons fuel/bbl fuel) = 0.1346 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for Distillate Fuel No. 2 (metric tons CO_2/bbl fuel) = 0.4296 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for gasoline (metric tons CO_2/bbl fuel) = 0.3686 (CFR Part 98, Subpart MM, Table MM-1)

9) Sweyco Trail Dozer Model 480 specification
10) Kawasaki Mule, http://www.kawasaki.com/Products/product-specifications.aspx?scid=15&id=753
11) Assumed same as above equipment, rounded.
12) EPA, Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, Report NR-010e, EPA-420-R-05-019, Table 6, page 8, December 2005.
13) The sulfur concentration in gasoline is assumed to be 30 ppmw, based on EPA News Release, *EPA Sets Cleaner Fuel and Car Standards, Slashing Air Pollution and Providing Health Benefits to Thousands,* March 3, 2014, "The final fuel standards will reduce gasoline sulfur levels by more than 60 percent – down from 30 to 10 parts per million (ppm) in 2017."
14) Caterpillar, *Lease a Cat Backhoe Loader* , http://www.catresourcecenter.com/construction-backhoe-loaders.asp?SRC=CATBC1630&utm_term=excavator&utm_content=MHEX#2
15) Example: 2013 Altec AC23-95B, 29-ton crane, 10-wheel
16) CalEEMod Appendix D Table 3.4 for 2012 Forklift with 51 - 120 hp
17) Tables 4 and 5 in Appendix A, authored by Panorama Environmental, Inc. for PG&E's CEQA document to the CPUC for the Santa Cruz 115kV Reinforcement Project, http://www.cpuc.ca.gov/environment/info/panoramaenv/SantaCruz_115kVReinforcement/SantaCruz_115%20Reinforcement%20Project.html#EIR
18) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
19) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
20) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
21) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
22) N_2O Global Warming Potential (-) = 298 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)

Appendix 3.4 Table 4
Construction Onsite Offroad Equipment Hours, Emission Factors, and Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Daily Offroad Equipment Emissions (lbs/day)										Annual Offroad Equipment Emissions (tpy)											
NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	Weight (tons)	Notes
5.10E-01	4.36E-01	2.19E-01	6.69E-01	6.33E-03	5.82E-03	3.41E+02	1.38E-02	2.77E-03	3.42E+02	3.32E-03	2.83E-03	1.42E-03	4.35E-03	4.11E-05	3.78E-05	2.22E+00	8.99E-05	1.80E-05	2.22E+00	2.22	
1.00E+01	5.08E+00	2.62E+00	8.08E-03	1.11E+00	1.02E+00	8.59E+02	3.49E-02	6.97E-03	8.62E+02	3.77E-02	1.90E-02	9.82E-03	3.03E-05	4.15E-03	3.82E-03	3.22E+00	1.31E-04	2.61E-05	3.23E+00	1.2 (14)	
2.03E+00	6.98E-01	8.29E-02	4.14E-03	9.12E-02	8.39E-02	4.40E+02	1.79E-02	3.57E-03	4.42E+02	6.09E-03	2.09E-03	2.49E-04	1.24E-05	2.73E-04	2.52E-04	1.32E+00	5.36E-05	1.07E-05	1.33E+00	14.18 (8)	
1.02E+01	1.29E+02	4.65E+00	1.20E-02	7.24E-02	6.66E-02	5.50E+02	2.23E-02	4.46E-03	5.52E+02	6.61E-02	8.41E-01	3.02E-02	7.83E-05	4.71E-04	4.33E-04	3.57E+00	1.45E-04	2.90E-05	3.59E+00	0.79	
25.6	**136**	**7.7**	**0.70**	**1.34**	**1.24**	**2,520**	**0.10 (18,19)**	**0.020 (18,20)**	**2,528 (21,22)**	**0.11**	**0.86**	**0.042**	**0.0045**	**0.005**	**0.0045**	**10.3**	**0.00042**	**0.000084**	**10.4**		
5.10E-01	4.36E-01	2.19E-01	6.69E-01	6.33E-03	5.82E-03	3.41E+02	1.38E-02	2.77E-03	3.42E+02	3.32E-03	2.83E-03	1.42E-03	4.35E-03	4.11E-05	3.78E-05	2.22E+00	8.99E-05	1.80E-05	2.22E+00		
1.00E+01	5.08E+00	2.62E+00	8.08E-03	1.11E+00	1.02E+00	8.59E+02	3.49E-02	6.97E-03	8.62E+02	3.77E-02	1.90E-02	9.82E-03	3.03E-05	4.15E-03	3.82E-03	3.22E+00	1.31E-04	2.61E-05	3.23E+00	1.2 (14)	
2.03E+00	6.98E-01	8.29E-02	4.14E-03	9.12E-02	8.39E-02	4.40E+02	1.79E-02	3.57E-03	4.42E+02	6.09E-03	2.09E-03	2.49E-04	1.24E-05	2.73E-04	2.52E-04	1.32E+00	5.36E-05	1.07E-05	1.33E+00	14.18 (8)	
2.99E+00	4.89E-01	9.15E-02	3.26E-03	7.19E-02	6.61E-02	3.47E+02	1.41E-02	2.82E-03	3.48E+02	1.95E-02	3.18E-03	5.95E-04	2.12E-05	4.67E-04	4.30E-04	2.26E+00	9.15E-05	1.83E-05	2.26E+00		
4.68E+00	1.34E+00	2.73E-01	5.32E-03	1.45E-01	1.33E-01	5.65E+02	2.29E-02	4.58E-03	5.67E+02	1.17E-02	3.35E-03	6.82E-04	1.33E-05	3.62E-04	3.33E-04	1.41E+00	5.73E-05	1.15E-05	1.42E+00		
4.52E+00	7.83E-01	1.72E-01	4.51E-03	2.17E-01	1.99E-01	4.80E+02	1.95E-02	3.89E-03	4.81E+02	2.94E-02	5.09E-03	1.12E-03	2.93E-05	1.41E-03	1.30E-03	3.12E+00	1.27E-04	2.53E-05	3.13E+00	4.5	
1.02E+01	1.29E+02	4.65E+00	1.20E-02	7.24E-02	6.66E-02	5.50E+02	2.23E-02	4.46E-03	5.52E+02	6.61E-02	8.41E-01	3.02E-02	7.83E-05	4.71E-04	4.33E-04	3.57E+00	1.45E-04	2.90E-05	3.59E+00	0.79	
35.0	**138**	**8.1**	**0.71**	**1.709**	**1.573**	**3,583**	**0.15 (18,19)**	**0.029 (18,20)**	**3,595 (21,22)**	**0.17**	**0.88**	**0.044**	**0.0045**	**0.007**	**0.0066**	**17.1**	**0.00069**	**0.00014**	**17.2**		
5.10E-01	4.36E-01	2.19E-01	6.69E-01	6.33E-03	5.82E-03	3.41E+02	1.38E-02	2.77E-03	3.42E+02	2.35E-02	2.01E-02	1.01E-02	3.08E-02	2.91E-04	2.68E-04	1.57E+01	6.36E-04	1.27E-04	1.57E+01		
1.00E+01	5.08E+00	2.62E+00	8.08E-03	1.11E+00	1.02E+00	8.59E+02	3.49E-02	6.97E-03	8.62E+02	7.53E-02	3.81E-02	1.96E-02	6.06E-05	8.29E-03	7.63E-03	6.45E+00	2.61E-04	5.23E-05	6.47E+00	1.2 (14)	
2.03E+00	6.98E-01	8.29E-02	4.14E-03	9.12E-02	8.39E-02	4.40E+02	1.79E-02	3.57E-03	4.42E+02	1.83E-02	6.28E-03	7.46E-04	3.72E-05	8.20E-04	7.55E-04	3.96E+00	1.61E-04	3.21E-05	3.98E+00	14.18 (8)	
1.53E-01	1.31E-01	6.57E-02	2.01E-01	1.90E-03	1.75E-03	1.02E+02	4.15E-03	8.30E-04	1.03E+02	2.55E-03	2.18E-03	1.10E-03	3.34E-03	3.16E-05	2.91E-05	1.70E+00	6.91E-05	1.38E-05	1.71E+00		
2.99E+00	4.89E-01	9.15E-02	3.26E-03	7.19E-02	6.61E-02	3.47E+02	1.41E-02	2.82E-03	3.48E+02	9.28E-02	1.51E-02	2.84E-03	1.01E-04	2.23E-03	2.05E-03	1.08E+01	4.37E-04	8.73E-05	1.08E+01		
5.86E+00	3.26E+00	6.80E-01	3.86E-03	4.89E-01	4.50E-01	4.11E+02	1.67E-02	3.33E-03	4.12E+02	7.32E-02	4.07E-02	8.50E-03	4.83E-05	6.11E-03	5.62E-03	5.14E+00	2.08E-04	4.17E-05	5.16E+00		
4.68E+00	1.34E+00	2.73E-01	5.32E-03	1.45E-01	1.33E-01	5.65E+02	2.29E-02	4.58E-03	5.67E+02	3.51E-02	1.01E-02	2.04E-03	3.99E-05	1.09E-03	9.99E-04	4.24E+00	1.72E-04	3.44E-05	4.25E+00		
4.52E+00	7.83E-01	1.72E-01	4.51E-03	2.17E-01	1.99E-01	4.80E+02	1.95E-02	3.89E-03	4.81E+02	1.40E-01	2.43E-02	5.32E-03	1.40E-04	6.72E-03	6.18E-03	1.49E+01	6.03E-04	1.21E-04	1.49E+01	4.5	
1.70E+01	2.16E+02	7.74E+00	2.01E-02	1.21E-01	1.11E-01	9.17E+02	3.72E-02	7.44E-03	9.20E+02	7.80E-01	9.92E+00	3.56E-01	9.24E-04	5.55E-03	5.11E-03	4.22E+01	1.71E-03	3.42E-04	4.23E+01	0.79	
4.33E+00	4.33E+00	2.00E-02	7.60E-01	1.03E+00	9.48E-01	1.88E+03	7.61E-02	1.52E-02	1.88E+03	1.08E-02	1.08E-02	5.00E-05	1.90E-03	2.58E-03	2.37E-03	4.69E+00	1.90E-04	3.81E-05	4.71E+00		
52.1	**232**	**12.0**	**1.7**	**3.3**	**3.0**	**6,340**	**0.26 (18,19)**	**0.051 (18,20)**	**6,362 (21,22)**	**1.3**	**10.1**	**0.41**	**0.037**	**0.034**	**0.031**	**110**	**0.0044**	**0.00089**	**110.0**		
-	**-**	**-**	**-**	**-**	**-**	**-**				**1.5**	**11.8**	**0.49**	**0.046**	**0.046**	**0.042**	**137.1**	**0.0056**	**0.0011**	**137.6**		

Appendix 3.4 Table 5
Total Project Construction Fugitive Dust Emission Summary
Heavenly Mountain Resort Epic Discovery Project

Total Project Construction Daily Fugitive Dust Emissions

$PM_{2.5}$ (lb/day)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	0.27	0.27	0.27
TRAIL DOZER	-	0.11	0.11
MINI-EXCAVATOR	-	0.035	0.035
BACKHOE	0.034	0.034	0.034
FORKLIFT	-	-	0.073
$PM_{2.5}$ Subtotal (lbs/day) =	0.30	0.44	0.51

PM_{10} (lb/day)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	2.7	2.7	2.7
TRAIL DOZER	-	0.19	0.19
MINI-EXCAVATOR	-	0.35	0.35
BACKHOE	0.34	0.34	0.34
FORKLIFT	-	-	0.73
PM_{10} Subtotal (lbs/day) =	3.0	3.5	4.3

$PM_{2.5}$ (lb/day)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.10
WHEELED LOADER	0.14	0.14	0.14
DRILL RIG	-	0.061	0.061
ATVs	0.30	0.30	0.50
$PM_{2.5}$ Subtotal (lbs/day) =	0.44	0.50	0.79
$PM_{2.5}$ Total (lbs/day) =	0.74	0.9	1.3

PM_{10} (lb/day)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	1.0
WHEELED LOADER	0.69	0.69	0.69
DRILL RIG	-	0.30	0.30
ATVs	1.5	1.5	2.5
PM_{10} Subtotal (lbs/day) =	2.2	2.5	4.4
PM_{10} Total (lbs/day) =	5.2	6.0	8.7

Total Project Construction Annual Fugitive Dust Emissions

$PM_{2.5}$ (tpy)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	0.0017	0.0017	0.012
TRAIL DOZER	-	0.00069	0.0033
MINI-EXCAVATOR	-	0.00023	0.0011
BACKHOE	0.00013	0.00013	0.00026
FORKLIFT	-	-	0.00057
$PM_{2.5}$ Subtotal (tpy) =	0.00185	0.0028	0.0174

PM_{10} (tpy)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	0.017	0.017	0.12
TRAIL DOZER	-	0.0013	0.0060
MINI-EXCAVATOR	-	0.0023	0.011
BACKHOE	0.0013	0.0013	0.0026
FORKLIFT	-	-	0.0091
PM_{10} Subtotal (tpy) =	0.019	0.022	0.15

$PM_{2.5}$ (tpy)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.0016
WHEELED LOADER	0.00042	0.00042	0.0012
DRILL RIG	-	0.00015	0.00046
ATVs	0.0019	0.0019	0.023
$PM_{2.5}$ Subtotal (tpy) =	0.0024	0.0025	0.026
$PM_{2.5}$ Total (tpy) =	0.0042	0.0053	0.044

PM_{10} (tpy)

Equipment / Project Phase:	Daily Fugitive Dust Emission by Construction Phase: Site Prep	Grading	Structure Construction
BOOM TRUCK WITH CRANE	-	-	0.0079
WHEELED LOADER	0.0010	0.0010	0.0031
DRILL RIG	-	0.00076	0.0023
ATVs	0.010	0.010	0.11
PM_{10} Subtotal (tpy) =	0.011	0.012	0.13
PM_{10} Total (tpy) =	0.029	0.034	0.28

Appendix 3.4 Table 6
Construction Offsite On-Road Vehicle Emissions in Nevada
Heavenly Mountain Resort Epic Discovery Project

Construction Offsite On-Road Vehicle Emissions in Nevada [1]

Materials DeliveryTruck Emissions in Nevada

Materials Delivery Truck Peak Daily Emissions in Nevada

Maximum Number of Deliveries per Day	Average Round-Trip Haul Distance (miles)	Vehicle-Miles Traveled per Day	Emission Factors (lbs/VMT)									Daily Emissions (lbs/day)									
			NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4 [2,3]	N_2O [2,4]	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e [5,6]
1	124	124	0.0270	0.0036	0.00077	0.000037	0.00073	0.00055	3.86	0.00016	0.000031	3.41	0.471	0.102	0.0046	0.092	0.069	485	0.020	0.0039	487
Paved-Road Fugitive Dust							0.056	0.0049								7.0	0.61				

Materials Delivery Truck Annual Emissions in Nevadaa

Number of Deliveries per Year	Average Round-Trip Haul Distance (miles)	Annual Vehicle-Miles Traveled	Emission Factors (lbs/VMT)									Annual Emissions (tons/yr)									
			NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e [5,6]
56	124	6,944	0.0270	0.0036	0.00077	0.000037	0.00073	0.00055	3.86	0.00016	0.000031	0.096	0.0132	0.00286	0.000130	0.00256	0.00194	13.58	0.00055	0.00011	13.6
Paved-Road Fugitive Dust							0.056	0.0049								0.20	0.017				

1) Maximum emissions occur during Structure Construction phase.
2) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78,
3) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78,
4) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 Ibid
5) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 23
6) N_2O Global Warming Potential (-) = 298 Ibid

Appendix 3.4 Table 6
Construction Offsite On-Road Vehicle Emissions in Nevada
Heavenly Mountain Resort Epic Discovery Project

Construction Worker Vehicle Emissions in Nevada

Worker Travel Daily Emissions in Nevada (Maximum)																								
Max Number of Workers Per Day	Average Employee Round Trips Per Day	Number of Round Trips Per Day	Average Round Trip Distance (Miles)	Carpool Factor (No. People per Vehicle)	Vehicle Miles Traveled Per Day (Miles)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4[2,3]	N_2O[2,4]	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
15	1	15	40	3	200	0.00129	0.0096	0.00084	0.000011	0.000229	0.000159	1.13	0.000046	0.0000091	0.26	2.3	0.27	0.0023	0.046	0.032	232.1	0.0094	0.00188	233
Paved-Road Fugitive Dust										0.0047	0.0012								0.94	0.23				

Worker Travel Annual Emissions in Nevada																									
Annual Average (Weighted) Number of Workers Per Day	Average Employee Round Trips Per Day	Total Number of Round Trips Per Day	Average Round Trip Distance (Miles)	Carpool Factor (No. People per Vehicle)	Number of Construction Days	Vehicle Miles Traveled Per Year	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
13.3	1	13.3	40	3	118	21,000	0.00129	0.0096	0.00084	0.000011	0.000229	0.000159	1.13	0.000046	0.0000091	0.014	0.123	0.015	0.00012	0.0024	0.0017	12.2	0.0005	9.9E-05	12.3
Paved-Road Fugitive Dust											0.0047	0.0012								0.049	0.012				

Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)

Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)

0, Table 2, p. 71909, November 29, 2013.)

Appendix 3.4 Table 7
EMFAC 2011 Emission Factors for Construction Water Truck
Heavenly Mountain Resort Epic Discovery Project

EMFAC2011 Emission
Rates 65
Region Type: Air District
Region: El Dorado County APCD
Calendar Year: 2015
Season: Summer
Vehicle Classification: EMFAC2011 Categories

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	VMT (miles/day)	ROG_RUNEX (gms/mile)	TOG_RUNEX (gms/mile)	CO_RUNEX (gms/mile)	NOX_RUNEX (gms/mile)	CO2_RUNEX (gms/mile)	CO2_RUNEX(Pavley I+LCFS) (gms/mile)	PM10_RUNEX (gms/mile)	PM2_5_RUNEX (gms/mile)
El Dorado County APCD	2015	Summer	T7 tractor construction	DSL	2012	5	0.080660226	2.484901928	2.828871691	4.943122468	5.785701879	3965.470115	3866.333362	0.071744549	0.066004985

Appendix 3.4 Table 8
Construction Equipment Speed
Heavenly Mountain Resort Epic Discovery Project

Construction Equipment Speeds

Equipment	Average Vehicle Speed[1] (mph)
TRUCK WATER 3600-4000G F-R SPR BAR / MONITOR 2AX D	5
TRAIL DOZER	1.5
MINI-EXCAVATOR	0.5
BACKHOE	0.5
FORKLIFT	2.0
BOOM TRUCK WITH CRANE	1.5
WHEELED LOADER	2.0
DRILL RIG	1.0
ATVs	7.5 (2)

1) Estimated

2) Assume overall average speed is half the construction area speed limit of 15 mph imposed to help control fugitive dust generation.

Appendix 3.4 Table 9
Onsite Fugitive Dust Emission Factors
Heavenly Mountain Resort Epic Discovery Project

Onsite Fugitive Dust Emission Factors

Equipment	Units	Uncontrolled $PM_{2.5}$ Emission Factor (lbs/unit)	Uncontrolled PM_{10} Emission Factor (lbs/unit)	Control Factor[1] (%)	Controlled $PM_{2.5}$ Emission Factor (lbs/unit)	Controlled PM_{10} Emission Factor (lbs/unit)
PICKUP 3/4 TON 4X4 CREW CAB	VMT	0.098	0.98	96.8%	0.0031	0.031
Mountain Tour F-350 Truck	VMT	0.115	1.15	96.8%	0.0037	0.037
TRAIL DOZER	HR	0.41	0.75	96.8%	0.013	0.024
MINI-EXCAVATOR	VMT	0.27	2.69	96.8%	0.0087	0.087
BACKHOE	VMT	0.13	1.33	96.8%	0.0043	0.043
FORKLIFT	VMT	0.14	1.42	96.8%	0.0046	0.046
BOOM TRUCK WITH CRANE	VMT	0.25	2.47	96.8%	0.0079	0.079
WHEELED LOADER	VMT	0.27	2.69	96.8%	0.0087	0.087
DRILL RIG	VMT	0.24	2.37	96.8%	0.0076	0.076
ATVs	VMT	0.052	0.52	96.8%	0.0017	0.017

1) Derived in Worksheet "DustEmissionFactorDerivations".

Appendix 3.4 Table 10
Fugitive Dust Emission Factor Derivations
Heavenly Mountain Resort Epic Discovery Project

Dust Emission Factor Derivation

Bulldozing Overburden - Source: AP-42, Table 11.9-1, 7/98 and CalEEMod Appendix A, page 9.

E_{PM10} = *(0.75)(s^1.5)/(M^1.4)* $E_{PM2.5}$ = *(0.105*5.7)(s^1.2)/(M^1.3)*

s = silt content =	6.9%	CalEEMod Appendix A, page 9 default value vs. 8.3% from EPA, *Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources),* Chapter 13.2.2 (Unpaved Roads), Table 13.2.2-1 (Typical Silt Content Values of Surface
M = moisture content =	7.9%	CalEEMod Appendix A, page 9 default value and EPA, *Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources),* Chapter 11.9 (Western Surface Coal Mining), Table 11.9-3 (Typical Silt Content Values for Correction Factors
E = emission factor =	0.75	PM_{10} lb/hr
E = emission factor =	0.41	$PM_{2.5}$ lb/hr

Finish Grading (Grader) - Source: AP-42, Table 11.9-1, 7/98

E_{PM10} = *(0.60)(0.051)(S^2.0)* $E_{PM2.5}$ = *(0.031)(0.04)(S^2.5)*

S = mean vehicle speed =	7.1	mph (CalEEMod default value from Appendix A, page 8)
E = emission factor =	1.54	PM_{10} lbs/VMT
E = emission factor =	0.167	$PM_{2.5}$ lbs/VMT

Appendix 3.4 Table 10
Fugitive Dust Emission Factor Derivations
Heavenly Mountain Resort Epic Discovery Project

Dust Emission Factor Derivation

Unpaved Road Travel - Source: AP-42, Section 13.2.2, 11/06.

E = (k)[(s/12)^0.9(W/3)^0.45*

k = particle size constant =	1.5	for PM_{10}
k = particle size constant =	0.15	for $PM_{2.5}$
s = silt content (%) =	6.9	(EPA, *Compilation of Air Pollutant Emission Factors, Volume 1 (Stationary Point and Area Sources),* Chapter 13.2.2 (Unpaved Roads), Table 13.2.2-1 (Typical Silt Content Values of Surface Material on Industrial Unpaved Roads, page 13.2.2-3, November

Vehicle Weights

W = water truck empty weight =	10.0	tons empty (estimated)
W = water truck loaded weight =	26.7	tons loaded (estimated with 4,000 gallon water capacity)
W = water truck average weight =	18.3	tons average
W = dump truck or transmixer empty weight =	15.0	tons (empty for heavy duty Diesel trucks)
W = dump truck or transmixer loaded weight =	40.0	tons (loaded for heavy duty Diesel trucks)
W = dump truck or transmixer average weight =	27.5	tons (average for heavy duty Diesel trucks)
W = forklift average weight =	8.0	tons empty (estimated)
W = auto/pickup average weight =	**2.4**	**tons (CARB Area Source Manual, 9/97)**
W = delivery truck average weight =	27.5	tons (for heavy duty Diesel trucks)
W = 3 ton truck average weight =	5.4	tons (estimate)
W = manlift =	25	tons (estimate from Terex Model RM75)
W = crawler crane	45	tons (estimate from Manitowoc Model 999)
W = rough terrain crane/picker =	88	tons (estimate from Grove RT 9130E)
W = farm tractor =	3.1	tons (estimate from New Holland Model T4050)
W = scraper average weight =	28.2	tons empty (615 scraper, Caterpillar Performance Handbook, 10/89)
W = weight backhoe =	7.0	tons (estimate from Caterpillar model 416)
	48.6	tons loaded (615 scraper, Caterpillar Performance Handbook, 10/89)
	27.9	tons mean weight
W = fuel truck avg. veh. weight =	8.0	tons empty (estimated)
=	18.2	tons loaded (estimated with 3,000 gallons Diesel fuel capacity)
=	13.1	tons average
W = loader avg. veh. Weight =	33.35	tons (avg. of loaded and unloaded weights, 980H loader, Caterpillar Performance Handbook, 2006)
W= compactor wt. =	15.00	tons (estimate from Caterpillar model Cp-433)
W = Cat 631B water pull scraper =	55.85	tons (avg. of loaded and unloaded weights, 631B with 10,000 gallons water, Caterpillar Performance Handbook 43, 2011)
W = Cat 641 water pull scraper =	68.5	tons (avg. of loaded and unloaded weights, 641 with 10,000 gallons water, Caterpillar Performance Handbook 43, 2011)
W = Cat 775E rock haul truck =	82.9	tons average
W = Wabco 50 rock haul truck =	66.7	tons average
W = Dresser 210M rock haulpak truck =	75.3	tons average
W = ATV	0.85	ton, assuming curb weight of 1,400 lbs plus driver and equipment weight of 300 lbs.
W = pickup average weight =	3.5	tons (estimate for Ford F-250 4WD)
W = materials delivery truck average weight =	10	tons (estimate for single-axle delivery truck)
W = F-350 Mountain Tour truck average weight =	5	tons (estimate for Ford F-350 4WD carrying 1 ton of visitors)

PM_{10} Emission Factors	**lb PM_{10}/VMT**
E = water truck emission factor =	**2.06**
E = dump truck emission factor =	2.47
E = forklift emission factor =	1.42

Appendix 3.4 Table 10
Fugitive Dust Emission Factor Derivations
Heavenly Mountain Resort Epic Discovery Project

Dust Emission Factor Derivation

E = auto/pickup emission factor =	0.82
E = delivery truck emission factor =	2.47
E = man-lift emission factor =	2.37
E = crawler crane emission factor =	3.08
E = rough terrain crane/picker emission factor =	4.17
E = farm tractor emission factor =	0.93
E = 3-ton truck emission factor =	1.19
E = scraper emission factor =	2.49
E = fuel truck emission factor =	1.77
E = loader emission factor =	2.69
E= backhoe emission factor =	1.33
E= compactor emission factor =	1.88
E = Caterpillar water pull 631B emission factor =	3.40
E = Caterpillar water pull 641 emission factor =	3.73
E = Cat 775E rock haul truck emission factor =	4.06
E = Wabco 50 rock haul truck emission factor =	3.68
E = Dresser 210M rock haulpak truck emission factor =	3.89
E = ATV emission factor =	0.52
E = pickup truck emission factor =	0.98
E = materials delivery truck emission factor =	1.57
E = F-350 Mountain Tour truck emission factor =	1.15

Appendix 3.4 Table 10
Fugitive Dust Emission Factor Derivations
Heavenly Mountain Resort Epic Discovery Project

Dust Emission Factor Derivation

$PM_{2.5}$ Emission Factors	**lb $PM_{2.5}$/VMT**
E = water truck emission factor =	0.21
E = dump truck emission factor =	0.25
E = forklift emission factor =	0.14
E = auto/pickup emission factor =	0.08
E = delivery truck emission factor =	0.25
E = man-lift emission factor =	0.24
E = crawler crane emission factor =	0.31
E = rough terrain crane/picker emission factor =	0.42
E = farm tractor emission factor =	0.09
E = 3-ton truck emission factor =	0.12
E = scraper emission factor =	0.25
E = fuel truck emission factor =	0.18
E = loader emission factor =	0.27
E= backhoe emission factor =	0.13
E= compactor emission factor =	0.19
E = Caterpillar water pull 631B emission factor =	0.34
E = Caterpillar water pull 641 emission factor =	0.37
E = Cat 775E rock haul truck emission factor =	0.41
E = Wabco 50 rock haul truck emission factor =	0.37
E = Dresser 210M rock haulpak truck emission factor =	0.39
E = ATV emission factor =	0.052
E = pickup truck emission factor	0.098
E = materials delivery truck emission factor =	0.157
E = F-350 Mountain Tour truck emission factor =	0.115

Gravel Road Travel - Source: AP-42, Section 13.2.2, 11/06.

E = (k)[(s/12)^0.9(W/3)^0.45*

k = particle size constant =	1.5	for PM10
k = particle size constant =	0.15	for PM2.5
s = silt fraction =	6.40	(AP-42, Table 13.2.2-1, 11/06, gravel road)

Vehicle Weights

W = water truck avg. veh. weight =	10.0	tons empty (estimated)
=	24.7	tons loaded (estimated with 4,000 gallon water capacity)
=	17.4	tons average
W = dump truck avg. veh. weight =	15.0	tons (for heavy duty Diesel trucks)
=	40.0	tons (for heavy duty Diesel trucks)
=	27.5	tons (for heavy duty Diesel trucks)
W = forklift avg. veh. weight =	8	tons empty (estimated)
W = auto/pickup avg. vehicle weight =	2.4	tons (CARB Area Source Manual, 9/97)
W = delivery truck avg. veh. wt. =	27.5	tons (for heavy duty Diesel trucks)

PM_{10} Emission Factors	**lb PM_{10}/VMT**
E = auto/pickup emiss. factor =	0.77
E = delivery truck emiss. factor =	2.31

Appendix 3.4 Table 10
Fugitive Dust Emission Factor Derivations
Heavenly Mountain Resort Epic Discovery Project

Dust Emission Factor Derivation

$PM_{2.5}$ Emission Factors	**lb $PM_{2.5}$/VMT**
E = auto/pickup emiss. factor =	0.077
E = delivery truck emiss. factor =	0.23

Paved Road Travel - Source AP-42, Section 13.2.1, 11/11

E = k(sL)^0.91*(W)^1.02

k = particle size constant =	0.0022	for PM_{10} (AP42, Table 13.2.1-1)
k = particle size constant =	0.00054	for $PM_{2.5}$ (AP42, Table 13.2.1-1)
sL = silt loading =	0.6	g/m^2 (AP42, Table 13.2.1-2)
sL = silt loading =	0.86	$grains/ft^2$

	Daily Emission Factors (lbs/day)		**Annual Emission Factors (tpy)**
PM_{10} Factor - Heavy Trucks	0.0564	lb PM_{10}/VMT	0.0529
$PM_{2.5}$ Factor - Heavy Trucks	0.0138	lb $PM_{2.5}$/VMT	0.0130
PM_{10} Factor - Materials Delivery Trucks	0.0201	lb PM_{10}/VMT	0.0189
$PM_{2.5}$ Factor - Materials Delivery Trucks	0.0049	lb $PM_{2.5}$/VMT	0.0046
PM_{10} Factor - Worker/Visitor/Employee Auto/Pickup Trucks	0.0047	lb PM_{10}/VMT	0.0044
$PM_{2.5}$ Factor - Worker/Visitor/EMployee Auto/Pickup Trucks	0.0012	lb $PM_{2.5}$/VMT	0.0011

Dust Control for Unpaved Road Travel and Active Excavation Area - Source: Control of Open Fugitive Dust Sources,Scraping, and Grading U.S EPA, 9/88

C = 100 - (0.8)(p)(d)(t)/(i)

p = potential average hourly daytime evaporation rate =	0.171	mm/hr, based on 26.3" during May-Oct during 1919-1979 (NOAA, *Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States,* NOAA Technical Report NWS 34, Table 1, December 1982,
evaporation rate =	0.129	mm/hr (Ibid)
d = average hourly daytime traffic rate =	8	vehicles/hr (estimated)
t = time between watering applications =	4	hr/application (1st application at start of construction day; 2nd application half-way through 8-hour construction day, or 1st application at start of operation day; 2nd application half-way through 10-hour operation day)
i = application intensity =	1.4	L/m^2 (typical level in EPA document, page 3-23)
C = average summer watering control efficiency =	96.8%	
C = average annual watering control efficiency =	97.6%	

Wind Erosion of Active Construction Area - Source: "Improvement of Specific Emission Factors (BACM Project No. 1), Final Report", prepared for South Coast AQMD by Midwest Research Institute, March 1996

Level 2 Emission Factor =	0.011	ton/acre-month
Construction Schedule =	26	days/month
=	0.85	lbs/acre-day
=	1.94E-05	PM_{10} lbs/scf-day
	7.76E-06	$PM_{2.5}$ lbs/scf-day

Appendix 3.4 Table 11
EMFAC2011 Emission Factors for Materials Delivery Trucks
Heavenly Mountain Resort Epic Discovery Project

EMFAC2011 Emission Rates
Region Type: Air District
Region: El Dorado County APCD
Calendar Year: 2015
Season: Summer
Vehicle Classification: EMFAC2011 Categories

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)	ROG_RUNEX (gms/mile)	ROG_IDLEX (gms/vehicle/day)	ROG_STREX (gms/vehicle/day)	ROG_DIURN (gms/vehicle/day)	ROG_HTSK (gms/vehicle/day)	ROG_RUNLS (gms/mile)
El Dorado County APCD	2015	Summer	T7 single construction	DSL	Aggregated	Aggregated	25.2	1561.2	0	0.34899641	3.043649612	0	0	0	0

Appendix 3.4 Table 11
EMFAC2011 Emission Factors for Materials Delivery Trucks
Heavenly Mountain Resort Epic Discovery Project

ROG_RESTL (gms/vehicle/day)	TOG_RUNEX (gms/mile)	TOG_IDLEX (gms/vehicle/day)	TOG_STREX (gms/vehicle/day)	TOG_DIURN (gms/vehicle/day)	TOG_HTSK (gms/vehicle/day)	TOG_RUNLS (gms/mile)	TOG_RESTL (gms/vehicle/day)	CO_RUNEX (gms/mile)	CO_IDLEX (gms/vehicle/day)	CO_STREX (gms/vehicle/day)	NOX_RUNEX (gms/mile)
0	0.397305847	3.464963396	0	0	0	0	0	1.64391862	9.796066101	0	12.25433958

Appendix 3.4 Table 11
EMFAC2011 Emission Factors for Materials Delivery Trucks
Heavenly Mountain Resort Epic Discovery Project

NOX_IDLEX (gms/vehicle/day)	NOX_STREX (gms/vehicle/day)	CO2_RUNEX (gms/mile)	CO2_IDLEX (gms/vehicle/day)	CO2_STREX (gms/vehicle/day)	CO2_RUNEX(Pavley I+LCFS) (gms/mile)	CO2_IDLEX(Pavley I+LCFS) (gms/vehicle/day)	CO2_STREX(Pavley I+LCFS) (gms/vehicle/day)	PM10_RUNEX (gms/mile)	PM10_IDLEX (gms/vehicle/day)
28.99646283	0	1752.856221	2582.641929	0	1709.034815	2518.075881	0	0.234302407	0.350342545

Appendix 3.4 Table 11
EMFAC2011 Emission Factors for Materials Delivery Trucks
Heavenly Mountain Resort Epic Discovery Project

PM10_STREX (gms/vehicle/day)	PM10_PMTW (gms/mile)	PM10_PMBW (gms/mile)	PM2_5_RUNEX (gms/mile)	PM2_5_IDLEX (gms/vehicle/day)	PM2_5_STREX (gms/vehicle/day)	PM2_5_PMTW (gms/mile)	PM2_5_PMBW (gms/mile)	SOX_RUNEX (gms/mile)	SOX_IDLEX (gms/vehicle/day)	SOX_STREX (gms/vehicle/day)
0	0.035999812	0.061739677	0.215558214	0.322315141	0	0.008999953	0.026459862	0.016723068	0.024639611	0

Appendix 3.4 Table 12
Construction Onsite Offroad Equipment Hours, Emission Factors, and Emissions in Nevada
Heavenly Mountain Resort Epic Discovery Project

Offroad Equipment Description	HP	Load Factor (-) (1)	Off-Road or On-Road?	Tier	Annual Use (hrs/yr)	Daily Use (hrs/day)	Average Speed(4) (mph)	Daily Distance Traveled (mi)	Annual Distance Traveled (mi)	ARB Off-Road or EPA Nonroad(2) Emission Factors (g/bhp-hr)										Onroad Emission Factors (lbs/VMT) (3)									
										NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Site Preparation																													
Water truck, 2012 Model Year	381 (1)	0.57	On		52	4	5.0	20.0	260.0	-	-	-	-	-	-	-	-	-	-	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	#############	9 (21,22)
Backhoe, Cat 416F	75 (1)	0.55	Off	3	80	8	0.5	4.0	40.0	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	0.0048 (18,20)	593 (21,22)	-	-	-	-	-	-	-	-	-	-
Wheeled Loader, Cat 924K	87 (1)	0.54	Off	3	36	4	2.0	8.0	72.0	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (10)	0.57 (11)	Off	3	156.0	12.0	7.5	90.0	1,170	8.43 (12)	107.23 (12)	3.85 (12)	0.010 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	0.0037 (18,20)	457 (21,22)	-	-	-	-	-	-	-	-	-	-
Site Preparation Subtotal:	**-**	**-**	**-**	**-**	**324.0**	**35.2**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Grading																													
Water truck, 2012 Model Year	381 (1)	0.57	On		52	4	5	20.0	260.0	-	-	-	-	-	-	-	-	-	-	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	#############	9 (21,22)
Backhoe, Cat 416F	75 (1)	0.55	Off	3	80	8	0.5	4.0	40.0	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	0.0048 (18,20)	593 (21,22)	-	-	-	-	-	-	-	-	-	-
Wheeled Loader, Cat 924K	87 (1)	0.54	Off	3	36	4	2.0	8.0	72.0	2.45 (4)	0.843 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Mini-Excavator Cat 308E2 CR SB	65	0.57	Off	3	93.6	7.2	0.5	3.6	46.8	4.58 (4)	0.748 (2)	0.14 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Drill Rig	82 (1)	0.75	Off		20	4	1.0	4.0	20.0	4.32 (16)	1.24 (16)	0.25 (16)	0.0049 (16)	0.13 (16)	0.12 (16)	521 (16)	0.021 (18,19)	0.0042 (18,20)	523 (21,22)	-	-	-	-	-	-	-	-	-	-
Sweyco Trail Dozer, tracked	80 (9)	0.64	Off	3	93.6	7.2	1.5	10.8	140.4	5.01 (4)	0.867 (2)	0.19 (4)	0.0050 (5)	0.24 (4)	0.22 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (10)	0.57	Off	3	156.0	12.0	7.5	90.0	1,170	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.060 (12)	0.055 (6)	456 (7)	0.018 (18,19)	0.0037 (18,20)	457 (21,22)	-	-	-	-	-	-	-	-	-	-
Grading Subtotal:	**-**	**-**	**-**	**-**	**531.2**	**46.4**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Structure Construction																													
Water truck, 2012 Model Year	381 (1)	0.57	On		368	4	5	20.0	1840.0	-	-	-	-	-	-	-	-	-	-	1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	#############	9 (21,22)
Backhoe, Cat 416F	75 (1)	0.55	Off	3	160	8	0.5	4.0	80.0	6.9 (4)	3.49 (2)	1.80 (4)	0.0056 (5)	0.76 (4)	0.70 (6)	591 (7)	0.024 (18,19)	0.0048 (18,20)	593 (21,22)	-	-	-	-	-	-	-	-	-	-
Wheeled Loader, Cat 924K	87 (1)	0.54	Off	3	108	4	2.0	8.0	216.0	2.45 (4)	0.84 (2)	0.10 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Boom truck with crane, 2013 Altec AC23-95B	300 (15)	0.57	On		40	4	1.5	6.0	200.0	-	-	-	-	-	-	-				1.28E-02	1.09E-02	5.48E-03	1.67E-02	1.58E-04	1.46E-04	8.52E+00	0.00035 (18,19)	#############	9 (21,22)
Mini-Excavator Cat 308E2 CR SB	65	0.57	Off	3	446.4	7.2	0.5	3.6	223.2	4.58 (4)	0.748 (2)	0.14 (4)	0.0050 (5)	0.11 (4)	0.10 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
Forklift	149 (1)	0.3	Off		160	6.4	2.0	12.8	320.0	7.43 (16)	4.13 (16)	0.86 (16)	0.0049 (16)	0.62 (16)	0.57 (16)	521 (16)	0.021 (18,19)	0.0042 (18,20)	523 (21,22)	-	-	-	-	-	-	-	-	-	-
Drill Rig	82 (1)	0.75	Off		60	4	1.0	4.0	60.0	4.32 (16)	1.24 (16)	0.25 (16)	0.0049 (16)	0.13 (16)	0.12 (16)	521 (16)	0.021 (18,19)	0.0042 (18,20)	523 (21,22)	-	-	-	-	-	-	-	-	-	-
Sweyco Trail Dozer, tracked	80 (9)	0.64	Off	3	446.4	7.2	1.5	10.8	669.6	5.01 (4)	0.87 (2)	0.19 (4)	0.0050 (5)	0.24 (4)	0.22 (6)	531 (7)	0.022 (18,19)	0.0043 (18,20)	533 (21,22)	-	-	-	-	-	-	-	-	-	-
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (10)	0.57	Off	3	1,840.0	20.0	7.5	150.0	13,800	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.060 (12)	0.055 (6)	456 (7)	0.018 (18,19)	0.0037 (18,20)	457 (21,22)	-	-	-	-	-	-	-	-	-	-
Helicopter	300	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Structural Construction Subtotal:	**-**	**-**	**-**	**-**	**3,628.8**	**64.8**		-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-
				Totals:	**4,484**	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

1) CalEEMod (Version 2013.2.2) default value.
2) EPA, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition,* ReportNR-009d, EPA-420-R-10-018, Table A4, July 2010
3) EMFAC2011-LDV V2.50.57.246 and EMFAC2011-HD.
4) Estimated
5) Calculated from BSFC assuming 15 ppmw sulfur in Diesel fuel.
6) OFFROAD2007 uses a $PM_{2.5}/PM_{10}$ ratio = 0.92
7) Density of Distillate Fuel No. 2 (metric tons fuel/bbl fuel) = 0.1346 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for Distillate Fuel No. 2 (metric tons CO_2/bbl fuel) = 0.4296 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for gasoline (metric tons CO_2/bbl fuel) = 0.3686 (CFR Part 98, Subpart MM, Table MM-1)

9) Sweyco Trail Dozer Model 480 specification
10) Kawasaki Mule, http://www.kawasaki.com/Products/product-specifications.aspx?scid=15&id=753
11) Assumed same as above equipment, rounded.
12) EPA, Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, Report NR-010e, EPA-420-R-05-019, Table 6, page 8, December 2005.
13) The sulfur concentration in gasoline is assumed to be 30 ppmw, based on EPA News Release, *EPA Sets Cleaner Fuel and Car Standards, Slashing Air Pollution and Providing Health Benefits to Thousands,* March 3, 2014, "The final fuel standards will reduce gasoline sulfur levels by more than 60 percent – down from 30 to 10 parts per million (ppm) in 2017."
14) Caterpillar, *Lease a Cat Backhoe Loader* , http://www.catresourcecenter.com/construction-backhoe-loaders.asp?SRC=CATBC1630&utm_term=excavator&utm_content=MHEX#2
15) Example: 2013 Altec AC23-95B, 29-ton crane, 10-wheel
16) CalEEMod Appendix D Table 3.4 for 2012 Forklift with 51 - 120 hp
17) Tables 4 and 5 in Appendix A, authored by Panorama Environmental, Inc. for PG&E's CEQA document to the CPUC for the Santa Cruz 115kV Reinforcement Project, http://www.cpuc.ca.gov/environment/info/panoramaenv/SantaCruz_115kVReinforcement/SantaCruz_115%20Reinforcement%20Project.html#EIR
18) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
19) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
20) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
21) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
22) N_2O Global Warming Potential (-) = 298 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)

Appendix 3.4 Table 12
Construction Onsite Offroad Equipment Hours, Emission Factors, and Emissions in Nevada
Heavenly Mountain Resort Epic Discovery Project

Daily Offroad Equipment Emissions (lbs/day)										Annual Offroad Equipment Emissions (tpy)										
NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	Weight (tons)
2.55E-01	2.18E-01	1.10E-01	3.34E-01	3.16E-03	2.91E-03	1.70E+02	0.0069 (18,19)	0.0014 (18,20)	171 (21,22)	1.66E-03	1.42E-03	7.12E-04	2.17E-03	2.06E-05	1.89E-05	1.11E+00	0.000045 (18,19)	0.0000090 (18,20)	1.11 (21,22)	
5.02E+00	2.54E+00	1.31E+00	4.04E-03	5.53E-01	5.09E-01	4.30E+02	0.017 (18,19)	0.0035 (18,20)	431 (21,22)	2.51E-02	1.27E-02	6.55E-03	2.02E-05	2.76E-03	2.54E-03	2.15E+00	0.000087 (18,19)	0.000017 (18,20)	2.16 (21,22)	1.2 (14)
1.02E+00	3.49E-01	4.14E-02	2.07E-03	4.56E-02	4.19E-02	2.20E+02	0.009 (18,19)	0.0018 (18,20)	221 (21,22)	4.57E-03	1.57E-03	1.86E-04	9.31E-06	2.05E-04	1.89E-04	9.91E-01	0.000040 (18,19)	0.0000080 (18,20)	0.99 (21,22)	14.18 (8)
5.09E+00	6.47E+01	2.32E+00	6.02E-03	3.62E-02	3.33E-02	2.75E+02	0.0112 (18,19)	0.0022 (18,20)	276 (21,22)	3.31E-02	4.20E-01	1.51E-02	3.92E-05	2.35E-04	2.16E-04	1.79E+00	0.000073 (18,19)	0.000015 (18,20)	1.79 (21,22)	0.79
13.9	**68**	**3.9**	**0.349**	**0.70**	**0.64**	**1,391**	**0.056 (18,19)**	**0.0113 (18,20)**	**1,396 (21,22)**	**0.064**	**0.44**	**0.023**	**0.002243**	**0.0032**	**0.0030**	**6.0**	**0.00024 (18,19)**	**0.000049 (18,20)**	**6.1 (21,22)**	
2.55E-01	2.18E-01	1.10E-01	3.34E-01	3.16E-03	2.91E-03	1.70E+02	0.0069 (18,19)	0.0014 (18,20)	171 (21,22)	1.66E-03	1.42E-03	7.12E-04	2.17E-03	2.06E-05	1.89E-05	1.11E+00	0.000045 (18,19)	0.0000090 (18,20)	1.11 (21,22)	
5.02E+00	2.54E+00	1.31E+00	4.04E-03	5.53E-01	5.09E-01	4.30E+02	0.017 (18,19)	0.0035 (18,20)	431 (21,22)	2.51E-02	1.27E-02	6.55E-03	2.02E-05	2.76E-03	2.54E-03	2.15E+00	0.000087 (18,19)	0.000017 (18,20)	2.16 (21,22)	1.2 (14)
1.02E+00	3.49E-01	4.14E-02	2.07E-03	4.56E-02	4.19E-02	2.20E+02	0.009 (18,19)	0.0018 (18,20)	221 (21,22)	4.57E-03	1.57E-03	1.86E-04	9.31E-06	2.05E-04	1.89E-04	9.91E-01	0.000040 (18,19)	0.0000080 (18,20)	0.99 (21,22)	14.18 (8)
2.69E+00	4.40E-01	8.23E-02	2.94E-03	6.47E-02	5.95E-02	3.12E+02	0.0127 (18,19)	0.0025 (18,20)	314 (21,22)	1.75E-02	2.86E-03	5.35E-04	1.91E-05	4.21E-04	3.87E-04	2.03E+00	0.000082 (18,19)	0.0000165 (18,20)	2.04 (21,22)	
2.34E+00	6.71E-01	1.36E-01	2.66E-03	7.24E-02	6.66E-02	2.83E+02	0.011 (18,19)	0.0023 (18,20)	284 (21,22)	5.85E-03	1.68E-03	3.41E-04	6.64E-06	1.81E-04	1.67E-04	7.06E-01	0.000029 (18,19)	0.000006 (18,20)	0.71 (21,22)	
4.07E+00	7.04E-01	1.54E-01	4.06E-03	1.95E-01	1.79E-01	4.32E+02	0.018 (18,19)	0.0035 (18,20)	433 (21,22)	2.65E-02	4.58E-03	1.00E-03	2.64E-05	1.27E-03	1.17E-03	2.81E+00	0.000114 (18,19)	0.000023 (18,19)	2.82 (21,22)	4.5
5.09E+00	6.47E+01	2.32E+00	6.02E-03	3.62E-02	3.33E-02	2.75E+02	0.0112 (18,19)	0.0022 (18,20)	276 (21,22)	3.31E-02	4.20E-01	1.51E-02	3.92E-05	2.35E-04	2.16E-04	1.79E+00	0.000073 (18,19)	0.000015 (18,20)	1.79 (21,22)	0.79
20.5	**70**	**4.2**	**0.3562**	**0.970**	**0.892**	**2,122**	**0.086 (18,19)**	**0.017 (18,20)**	**2,129 (21,22)**	**0.114**	**0.45**	**0.024**	**0.002295**	**0.00510**	**0.00469**	**11.6**	**0.00047 (18,19)**	**0.000094 (18,20)**	**11.6 (21,22)**	
2.55E-01	2.18E-01	1.10E-01	3.34E-01	3.16E-03	2.91E-03	1.70E+02	0.0069 (18,19)	0.0014 (18,20)	171 (21,22)	1.17E-02	1.00E-02	5.04E-03	1.54E-02	1.46E-04	1.34E-04	7.84E+00	0.00032 (18,19)	0.000064 (18,20)	7.87 (21,22)	
5.02E+00	2.54E+00	1.31E+00	4.04E-03	5.53E-01	5.09E-01	4.30E+02	0.017 (18,19)	0.0035 (18,20)	431 (21,22)	5.02E-02	2.54E-02	1.31E-02	4.04E-05	5.53E-03	5.09E-03	4.30E+00	0.00017 (18,19)	0.000035 (18,20)	4.31 (21,22)	1.2 (14)
1.02E+00	3.49E-01	4.14E-02	2.07E-03	4.56E-02	4.19E-02	2.20E+02	0.009 (18,19)	0.0018 (18,20)	221 (21,22)	1.37E-02	4.71E-03	5.59E-04	2.79E-05	6.15E-04	5.66E-04	2.97E+00	0.00012 (18,19)	0.000024 (18,20)	2.98 (21,22)	14.18 (8)
7.65E-02	6.54E-02	3.29E-02	1.00E-01	9.49E-04	8.73E-04	5.11E+01	0.0021 (18,19)	0.0004 (18,20)	51 (21,22)	1.28E-03	1.09E-03	5.48E-04	1.67E-03	1.58E-05	1.46E-05	8.52E-01	0.000035 (18,19)	0.0000069 (18,20)	0.86 (21,22)	
2.69E+00	4.40E-01	8.23E-02	2.94E-03	6.47E-02	5.95E-02	3.12E+02	0.0127 (18,19)	0.0025 (18,20)	314 (21,22)	8.35E-02	1.36E-02	2.55E-03	9.11E-05	2.01E-03	1.85E-03	9.69E+00	0.000393 (18,19)	0.000079 (18,20)	9.72 (21,22)	
4.69E+00	2.61E+00	5.44E-01	3.09E-03	3.91E-01	3.60E-01	3.29E+02	0.0133 (18,19)	0.0027 (18,20)	330 (21,22)	5.86E-02	3.26E-02	6.80E-03	3.86E-05	4.89E-03	4.50E-03	4.11E+00	0.000167 (18,19)	0.000033 (18,20)	4.12 (21,22)	
2.34E+00	6.71E-01	1.36E-01	2.66E-03	7.24E-02	6.66E-02	2.83E+02	0.011 (18,19)	0.0023 (18,20)	284 (21,22)	1.76E-02	5.03E-03	1.02E-03	1.99E-05	5.43E-04	5.00E-04	2.12E+00	0.00009 (18,19)	0.000017 (18,20)	2.13 (21,22)	
4.07E+00	7.04E-01	1.54E-01	4.06E-03	1.95E-01	1.79E-01	4.32E+02	0.018 (18,19)	0.0035 (18,20)	433 (21,22)	1.26E-01	2.18E-02	4.79E-03	1.26E-04	6.05E-03	5.56E-03	1.34E+01	0.00054 (18,19)	0.000109 (18,20)	13.43 (21,22)	4.5
8.48E+00	1.08E+02	3.87E+00	1.00E-02	6.03E-02	5.55E-02	4.58E+02	0.019 (18,19)	0.0037 (18,20)	460 (21,22)	3.90E-01	4.96E+00	1.78E-01	4.62E-04	2.77E-03	2.55E-03	2.11E+01	0.00086 (18,19)	0.00017 (18,20)	21.2 (21,22)	0.79
0.00 (17)	0.00 (17)	0.00 (17)	0.00 (17)	0.00 (17)	0.00 (6,17)	0 (17)	0.000 (18,19)	0.000 (18,20)	0 (21,22)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00000 (18,19)	0.000000 (18,20)	0.00 (21,22)	
28.6	**115.4**	**6.3**	**0.46**	**1.4**	**1.3**	**2,685**	**0.11 (18,19)**	**0.022 (18,20)**	**2,695 (21,22)**	**0.75**	**5.1**	**0.21**	**0.0179**	**0.023**	**0.021**	**66.3**	**0.0027 (18,19)**	**0.00054 (18,20)**	**66.6 (21,22)**	
-	**-**	**-**	**-**	**-**	**-**	**-**				**0.93**	**6.0**	**0.26**	**0.022**	**0.031**	**0.028**	**84.0**	**0.0034**	**0.00068**	**84.3**	

Appendix 3.4 Table 13
Operation Onsite Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Epic Discovery Operation Onsite Emissions in California

Epic Discovery Mountain Tour Vehicle Emissions in California

Mountain Tour Vehicle Travel Daily Emissions in California (Maximum)

Peak Day Number of Tour Vehicles	Tour Vehicle Trips Per Day	Number of Tours Per Day	Tour Distance in CA LTAB (miles)		Tour Vehicle Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2	2	2	**4.75**	1	28.4	0.00091	0.011	0.00072	0.000021	0.000011	0.000010	2.6	0.00011	0.000021	0.026	0.30	0.021	0.00061	0.00031	0.00028	75.1	0.0030	0.00061	75.3
Unpaved-Road Fugitive Dust:										0.98	0.098								27.7	2.8				

Mountain Tour Vehicle Travel Annual Emissions in California

Annual Average Number of Tour Vehicles	Tour Vehicle Trips Per Day	Number of Tours Per Day	Tour Distance in CA LTAB (miles)		Annual/ Season Number of Tour Operation Days	Annual/ Season Tour Vehicle VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2	2	2	**4.75**	1	90	1,710	0.00091	0.011	0.00072	0.0000213	0.000011	0.000010	2.6	0.00011	0.000021	0.00078	0.0090	0.00062	0.000018	0.0000092	0.0000085	2.3	0.000092	0.000018	2.3
Unpaved-Road Fugitive Dust:											0.98	0.098								0.84	0.084				

Epic Discovery General Operation and Maintenance Onroad Vehicle Emissions in California

Epic Discovery General Operation and Maintenance Onroad Vehicle Travel Daily Emissions in California (Maximum)

Peak Day Number of Epic Discovery General O&M Onroad Vehicles			Round-Trip Distance in CA LTAB (miles)	Carpool Factor (Employees per Vehicle)	O&M Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2	1	1	**5**	1	10	0.00091	0.011	0.00072	0.000021	0.000011	0.000010	2.64	0.00011	0.000021	0.009	0.11	0.007	0.00021	0.00011	0.00010	26.4	0.0011	0.00021	26.5
Unpaved-Road Fugitive Dust:										0.98	0.098								9.8	0.98				

Epic Discovery General O&M Onroad Vehicle Travel Annual Emissions in California

Annual Average Number of Epic Discovery General O&M Onroad Vehicles			Round-Trip Distance in CA LTAB (miles)	Carpool Factor (Employees per Vehicle)	Annual Number of O&M Days	Annual O&M Onroad Vehicle VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2.0	1	1	**5**	1	90	900	0.00091	0.011	0.00072	0.000021	0.000011	0.000010	2.64	0.00011	0.000021	0.0004	0.005	0.00033	0.000010	0.000005	0.000004	1.19	0.00005	0.000010	1.19
Unpaved-Road Fugitive Dust:											0.98	0.098								0.44	0.044				

1) The total distance is the twice daily tour distance plus the twice daily round trips to leave visitors off and pick them up, based on 1.5 miles one-way to end of East Peak Zipline and 0.85 mile to end of Sky Meadows Zipline Canopy Tour.
2) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
3) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
4) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 Ibid
5) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
6) N_2O Global Warming Potential (-) = 298 Ibid

Appendix 3.4 Table 14
Daily Operation Onsite Fugitive Dust Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Daily Operation Onsite Fugitive Dust Emissions in California

$PM_{2.5}$ (lb/day)			
	Daily Fugitive Dust Emission		
Equipment Project Phase:	Operation		
Mountain Tour F-350 Truck	0.105		
PICKUP 3/4 TON 4X4 CREW CAB	0.031		
ATVs	0.025		
$PM_{2.5}$ Subtotal (lbs/day) =	0.16		

PM_{10} (lb/day)			
	Daily Fugitive Dust Emission		
Equipment Project Phase:	Operation		
Mountain Tour F-350 Truck	1.05		
PICKUP 3/4 TON 4X4 CREW CAB	0.31		
ATVs	0.25		
PM_{10} Subtotal (lbs/day) =	1.61		

Appendix 3.4 Table 14
Daily Operation Onsite Fugitive Dust Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Daily Operation Onsite Fugitive Dust E

	$PM_{2.5}$ (l
Equipment	**Project Phase:**
Mountain Tour F-350 Truck	
PICKUP 3/4 TON 4X4 CREW CAB	
ATVs	
$PM_{2.5}$ Subtotal (lbs/day) =	

	PM_{10} (l
Equipment	**Project Phase:**
Mountain Tour F-350 Truck	
PICKUP 3/4 TON 4X4 CREW CAB	
ATVs	
PM_{10} Subtotal (lbs/day) =	

Appendix 3.4 Table 14
Daily Operation Onsite Fugitive Dust Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Daily Operation Onsite Fugitive Dust E

	$PM_{2.5}$ (l
Equipment	**Project Phase:**
Mountain Tour F-350 Truck	
PICKUP 3/4 TON 4X4 CREW CAB	
ATVs	
$PM_{2.5}$ Subtotal (lbs/day) =	

	PM_{10} (l
Equipment	**Project Phase:**
Mountain Tour F-350 Truck	
PICKUP 3/4 TON 4X4 CREW CAB	
ATVs	
PM_{10} Subtotal (lbs/day) =	

Annual Operation Onsite Fugitive Dust Emissions in California

$PM_{2.5}$ (tpy)			
	Daily Fugitive Dust Emission		
Equipment **Project Phase:**	**Operation**		
Mountain Tour F-350 Truck	0.0032		
PICKUP 3/4 TON 4X4 CREW CAB	0.0014		
ATVs	0.0011		
$PM_{2.5}$ Subtotal (tpy) =	0.0057		

PM_{10} (tpy)			
	Daily Fugitive Dust Emission		
Equipment **Project Phase:**	**Operation**		
Mountain Tour F-350 Truck	0.032		
PICKUP 3/4 TON 4X4 CREW CAB	0.014		
ATVs	0.011		
PM_{10} Subtotal (tpy) =	0.057		

Appendix 3.4 Table 15
Operation Onsite Offroad Equipment Hours, Emission Factors, and Emissions in California
Heavenly Mountain Resort Epic Discovery Project

										ARB Off-Road or EPA Nonroad[1(2)] Emission Factors (g/bhp-hr)										Onroad Emission Factors (lbs/VMT) (3)									
Offroad Equipment Description	HP	Load Factor (1) ( )	Off-Road or On-Road?	Tier	Annual Use (hrs/yr)	Daily Use (hrs/day)	Average Speed(8) (mph)	Daily Distance Traveled (mi)	Annual Distance Traveled (mi)	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
O&M																														
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (4)	0.57 (11)	Off	3?	90.0	1.00	15.0	15.0	1,350	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	###########	457 (21,22)	-	-	-	-	-	-	-	-	-	-	-

1) CalEEMod (Version 2013.2.2) Appendix D Table 3.3 default value.
2) EPA, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition,* ReportNR-009d, EPA-420-R-10-018, Table A4, July 2010
3) EMFAC2011-LDV V2.50.57.246 and EMFAC2011-HD.
4) http://www.rhinoforums.net/engine/44719-how-much-horsepower-does-stock-rhino-700-fi-have.html
5) Calculated from BSFC assuming 15 ppmw sulfur in Diesel fuel.
6) OFFROAD2007 uses a $PM_{2.5}/PM_{10}$ ratio = 0.92
7) Density of Distillate Fuel No. 2 (metric tons fuel/bbl fuel) = 0.1346 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for Distillate Fuel No. 2 (metric tons CO_2/bbl fuel) = 0.4296 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for gasoline (metric tons CO_2/bbl fuel) = 0.3686 (CFR Part 98, Subpart MM, Table MM-1)
8) Estimated.
9) Sweyco Trail Dozer Model 480 specification
10) Specifications for Honda Model TRX420FE
11) Assumed same as off-highway trucks in CalEEMod Appendix D Table 3.3.
12) EPA, Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, Report NR-010e, EPA-420-R-05-019, Table 6, page 8, December 2005.
13) The sulfur concentration in gasoline is assumed to be 30 ppmw, based on EPA News Release, *EPA Sets Cleaner Fuel and Car Standards, Slashing Air Pollution and Providing Health Benefits to Thousands,* March 3, 2014, "The final fuel standards will reduce gasoline sulfur levels by more than 60 percent – down from 30 to 10 parts per million (ppm) in 2017."
14) Caterpillar, *Lease a Cat Backhoe Loader* , http://www.catresourcecenter.com/construction-backhoe-loaders.asp?SRC=CATBC1630&utm_term=excavator&utm_content=MHEX#2
15) Example: 2013 Altec AC23-95B, 29-ton crane, 10-wheel
16) CalEEMod Appendix D Table 3.4 for 2012 Forklift with 51 - 120 hp
17) Tables 4 and 5 in Appendix A, authored by Panorama Environmental, Inc. for PG&E's CEQA document to the CPUC for the Santa Cruz 115kV Reinforcement Project, http://www.cpuc.ca.gov/environment/info/panoramaenv/SantaCruz_115kVReinforcement/SantaCruz_115%20Reinforcement%20Project.html#EIR
18) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
19) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
20) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
21) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
22) N_2O Global Warming Potential (-) = 298 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)

Appendix 3.4 Table 15
Operation Onsite Offroad Equipment Hours, Emission Factors, and Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Daily Offroad Equipment Emissions (lbs/day)										Annual Offroad Equipment Emissions (tpy)									
NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
4.24E-01	5.39E+00	1.94E-01	5.02E-04	3.02E-03	2.77E-03	2.29E+01	9.29E-04	1.86E-04	23 (21,22)	1.91E-02	2.43E-01	8.71E-03	2.26E-05	1.36E-04	1.25E-04	1.03E+00	4.18E-05	8.37E-06	1.03 (21,22)

Appendix 3.4 Table 16
Operation Offsite On-Road Vehicle Emissions in California
Heavenly Mountain Resort Epic Discovery Project

Epic Discovery Operation Offsite On-Road Vehicle Emissions in California

Epic Discovery Visitor Vehicle Emissions in California

Peak Visitor Travel Daily Emissions in California

Peak Day Number of Visitor Vehicles from California Driving to Epic Discovery	Visitor Vehicle Round Trips Per Day	California Visitor Vehicle Round Trips Per Day	Round-Trip Distance in CA LTAB[1] (miles)		California Visitor Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
137.9	1	137.9	18.0	1	2,476	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	0.97	12.7	2.0	0.023	0.26	0.11	2,246	0.091	0.018	2,254
										Paved-Road Fugitive Dust:	0.0012								11.6	2.8				

Visitor Travel Annual Emissions in California

Annual Average Number of Visitor Vehicles from California Driving to Epic Discovery Per Day	Visitor Vehicle Round Trips Per Day	California Visitor Vehicle Round Trips Per Day	Round-Trip Distance in CA LTAB[1] (miles)		Annual Number of Operation Days	California Annual Visitor VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
76.8	1	76.8	18.1	1	90	125,055	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	0.024	0.34	0.051	0.00057	0.0066	0.0029	56.7	0.0023	0.00046	56.9
											Paved-Road Fugitive Dust:	0.0012								0.29	0.072				

Epic Discovery Employee Vehicle Emissions in California

Peak Epic Discovery Employee Travel Daily Emissions in California

		California Employee Vehicle Round Trips Per Day	Employee Round-Trip Distance in CA LTAB[1] (miles)		Employee Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
		105.0	25.6	1	2,692	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	0.95	12.6	1.75	0.024	0.28	0.12	2,395	0.10	0.019	2,403
										Paved-Road Fugitive Dust:	0.0012								12.6	3.1				

Epic Discovery Employee Travel Annual Emissions in California

		California Employee Vehicle Round Trips Per Day	Employee Round-Trip Distance in CA LTAB[1] (miles)		Annual Number of Operation Days	Annual California Employee VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
		91.7	25.6	1	90	211,590	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	0.037	0.52	0.069	0.00095	0.011	0.0048	94.1	0.0038	0.00076	94.4
											Paved-Road Fugitive Dust:	0.0012								0.50	0.12				

1) From Fehr & Peers traffic analysis.
2) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
3) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
4) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 Ibid
5) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
6) N_2O Global Warming Potential (-) = 298 Ibid
7) Based on Fehr & Peers survey of visitors to resort parking garage.

Appendix 3.4 Table 17
Total Project Operation Onsite Emissions
Heavenly Mountain Resort Epic Discovery Project

Epic Discovery Operation Onsite Emissions, Total

Epic Discovery Mountain Tour Vehicle Emissions, Total

Mountain Tour Vehicle Travel Daily Emissions in LTAB (Maximum)

Peak Day Number of Tour Vehicles	Tour Vehicle Trips Per Day	Number of Tours Per Day	Tour Distance in LTAB (miles)		Tour Vehicle Daily VMT (miles/	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2	2	2	**7.50**	1	39.4	0.00091	0.011	0.00072	0.000021	0.000011	0.000010	2.6	0.00011	0.000021	0.036	0.42	0.028	0.00084	0.00042	0.00039	104.2	0.0042	0.00085	104.5
										Unpaved-Road Fugitive Dust:		0.98	0.098						38.5	3.8				

Mountain Tour Vehicle Travel Annual Emissions in LTAB

Annual Average Number of Tour Vehicles	Tour Vehicle Trips Per Day	Number of Tours Per Day	Tour Distance in LTAB (miles)		Annual/ Season Number of Tour Operation Days	Annual/ Season Tour Vehicle VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2	2	2	**7.50**	1	90	2,700	0.00091	0.011	0.00072	0.0000213	0.000011	0.000010	2.6	0.00011	0.000021	0.00123	0.0142	0.00098	0.000029	0.0000146	0.0000134	3.6	0.000145	0.000029	3.6
											Unpaved-Road Fugitive Dust:		0.98	0.098						1.32	0.132				

Epic Discovery General Operation and Maintenance Onroad Vehicle Emissions in LTAB

Epic Discovery General Operation and Maintenance Onroad Vehicle Travel Daily Emissions in LTAB (Maximum)

Peak Day Number of Epic Discovery General O&M Onroad Vehicles			Round-Trip Distance in LTAB (miles)	Carpool Factor (Employees per Vehicle)	O&M Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2	1	1	**10**	1	20	0.00091	0.011	0.00072	0.000021	0.000011	0.000010	2.64	0.00011	0.000021	0.018	0.21	0.014	0.00043	0.00022	0.00020	52.9	0.0021	0.00043	53.1
										Unpaved-Road Fugitive Dust:		0.98	0.098						19.5	1.95				

Epic Discovery General O&M Onroad Vehicle Travel Annual Emissions in LTAB

Annual Average Number of Epic Discovery General O&M Onroad Vehicles			Round-Trip Distance in LTAB (miles)	Carpool Factor (Employees per Vehicle)	Annual Number of O&M Days	Annual O&M Onroad Vehicle VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	$CO_2e^{(5,6)}$
2.0	1	1	**10**	1	90	1,800	0.00091	0.011	0.00072	0.000021	0.000011	0.000010	2.64	0.00011	0.000021	0.0008	0.009	0.00065	0.000019	0.000010	0.000009	2.38	0.00010	0.000019	2.39
											Unpaved-Road Fugitive Dust:		0.98	0.098						0.88	0.088				

1) The total distance is the twice daily tour distance plus the twice daily round trips to leave visitors off and pick them up, based on 1.5 miles one-way to end of East Peak Zipline and 0.85 mile to end of Sky Meadows Zipline Canopy Tour.
2) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
3) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
4) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 Ibid
5) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
6) N_2O Global Warming Potential (-) = 298 Ibid

Appendix 3.4 Table 18
Total Project Operation Onsite Fugitive Dust Emissions in the Basin
Heavenly Mountain Resort Epic Discovery Project

Daily Operation Onsite Fugitive Dust Emissions in the Basin

$PM_{2.5}$ (lb/day)			
	Daily Fugitive Dust Emission		
Equipment Project Phase:	Operation		
Mountain Tour F-350 Truck	0.145		
PICKUP 3/4 TON 4X4 CREW CAB	0.063		
ATVs	0.042		
$PM_{2.5}$ Subtotal (lbs/day) =	0.25		

PM_{10} (lb/day)			
	Daily Fugitive Dust Emission		
Equipment Project Phase:	Operation		
Mountain Tour F-350 Truck	1.45		
PICKUP 3/4 TON 4X4 CREW CAB	0.63		
ATVs	0.42		
PM_{10} Subtotal (lbs/day) =	2.50		

Annual Operation Onsite Fugitive Dust Emissions in the Basin

$PM_{2.5}$ (tpy)			
	Daily Fugitive Dust Emission		
Equipment Project Phase:	Operation		
Mountain Tour F-350 Truck	0.0050		
PICKUP 3/4 TON 4X4 CREW CAB	0.0028		
ATVs	0.0019		
$PM_{2.5}$ Subtotal (tpy) =	0.0097		

PM_{10} (tpy)			
	Daily Fugitive Dust Emission		
Equipment Project Phase:	Operation		
Mountain Tour F-350 Truck	0.050		
PICKUP 3/4 TON 4X4 CREW CAB	0.028		
ATVs	0.019		
PM_{10} Subtotal (tpy) =	0.097		

Appendix 3.4 Table 19
Total Project Operation Offsite Emissions in the Basin
Heavenly Mountain Resort Epic Discovery Project

Epic Discovery Operation Offsite On-Road Vehicle Emissions in the Basin

Epic Discovery Visitor Vehicle Emissions in the Basin

Peak Visitor Travel Daily Emissions in LTAB																								
Peak Day Total Number of Visitor Vehicles Driving to Epic Discovery	Visitor Vehicle Round Trips Per Day	Number of Visitor Vehicle Round Trips Per Day	Weighted Round-Trip Distance in LTAB[1] (miles)		Visitor Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
224	1	224	17.74	1	3,903	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	1.54	20.2	3.2	0.036	0.41	0.18	3,547	0.14	0.029	3,559
Paved-Road Fugitive Dust:										0.0047	0.0012								18.3	4.5				

Visitor Travel Annual Emissions in LTAB																									
Annual Average Number of Visitor Vehicles Driving to Epic Discovery Per Day	Visitor Vehicle Round Trips Per Day	Number of Visitor Vehicle Round Trips Per Day	Weighted Round-Trip Distance in LTAB[1] (miles)		Annual Number of Operation Days	Annual Visitor VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
247.0	1	249.6	8.73	1	90	196,020	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	0.052	0.73	0.14	0.00096	0.011	0.0048	94.9	0.0039	0.00077	95.3
Paved-Road Fugitive Dust:											0.0047	0.0012								0.46	0.113				

Epic Discovery Employee Vehicle Emissions in the Basin

Peak Epic Discovery Employee Travel Daily Emissions in LTAB																									
		Employee Vehicle Round Trips Per Day	Round-Trip Distance in LTAB[1] (miles)		Employee Daily VMT (miles/ day)	Emission Factors (lbs/vmt)									Daily Emissions (lbs/day)									
						NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
		140.0	25.6	1	3,589	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	1.26	16.7	2.33	0.032	0.38	0.16	3,193	0.13	0.026	3,204
Paved-Road Fugitive Dust:										0.0047	0.0012								16.8	4.13				

Epic Discovery Employee Travel Annual Emissions in California																									
		Employee Vehicle Round Trips Per Day	Round-Trip Distance in LTAB[1] (miles)		Annual Number of Operation Days	Annual Employee VMT (miles/ year)	Emission Factors (lbs/vmt)									Annual Emissions (tons/yr)									
							NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	NOx	CO	ROG	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e[5,6]
		122.3	25.6	1	90	282,150	0.00026	0.0036	0.00027	0.0000085	0.00010	0.000044	0.85	0.000034	0.0000069	0.050	0.69	0.092	0.0013	0.015	0.0064	125.5	0.0051	0.0010	125.9
Paved-Road Fugitive Dust:											0.0047	0.0012								0.66	0.16				

1) Weighted distance calculated in Fehr & Peers transportation analysis.
2) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
3) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
4) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 Ibid
5) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
6) N_2O Global Warming Potential (-) = 298 Ibid

Appendix 3.4 Table 20
GHG Emission Factors for Electric Energy Use
Heavenly Mountain Resort Epic Discovery Project

Utility = Sierra Pacific Resources

Pollutant	Emission Factors (lbs/MWh)	Reference	Maximum Daily Use (lbs)	Annual Emission (tons)
CO_2	1,328.16	CalEEMod, Version 2013.2.2	505	30.3
CH_4	0.029	CalEEMod, Version 2013.2.2	0.011	0.0007
N_2O	0.00617	CalEEMod, Version 2013.2.2	0.002	0.0001
CO_2e			506	30.4

Electric motor use =	120	days/season *	10	hrs/day max. =	1,200	hrs/season
Electric motor power (kW) =		38	= hp of	51		

Appendix 3.4 Table 21
Total Project Operation Onsite Offroad Equipment Hours, Emission Factors, and Emissions in the Basin
Heavenly Mountain Resort Epic Discovery Project

										ARB Off-Road or EPA Nonroad[2] Emission Factors (g/bhp-hr)										Onroad Emission Factors (lbs/VMT) (3)									
Offroad Equipment Description	HP	Load Factor [1] ( )	Off-Road or On-Road?	Tier	Annual Use (hrs/yr)	Daily Use (hrs/day)	Average Speed[8] (mph)	Daily Distance Traveled (mi)	Annual Distance Traveled (mi)	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
O&M																														
ATV, 2013 Yamaha Rhino 700 FI 4x4	40 (4)	0.57 (11)	Off	3?	150.0	1.67	15.0	25.0	2,250	8.43 (12)	107.2 (12)	3.85 (12)	0.010 (13)	0.06 (12)	0.055 (6)	456 (7)	0.018 (18,19)	###########	457 (21,22)	-	-	-	-	-	-	-	-	-	-

1) CalEEMod (Version 2013.2.2) Appendix D Table 3.3 default value.
2) EPA, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition,* ReportNR-009d, EPA-420-R-10-018, Table A4, July 2010
3) EMFAC2011-LDV V2.50.57.246 and EMFAC2011-HD.
4) http://www.rhinoforums.net/engine/44719-how-much-horsepower-does-stock-rhino-700-fi-have.html
5) Calculated from BSFC assuming 15 ppmw sulfur in Diesel fuel.
6) OFFROAD2007 uses a $PM_{2.5}/PM_{10}$ ratio = 0.92
7) Density of Distillate Fuel No. 2 (metric tons fuel/bbl fuel) = 0.1346 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for Distillate Fuel No. 2 (metric tons CO_2/bbl fuel) = 0.4296 (CFR Part 98, Subpart MM, Table MM-1)
CO_2 emission factor for gasoline (metric tons CO_2/bbl fuel) = 0.3686 (CFR Part 98, Subpart MM, Table MM-1)
8) Estimated.
9) Sweyco Trail Dozer Model 480 specification
10) Specifications for Honda Model TRX420FE
11) Assumed same as off-highway trucks in CalEEMod Appendix D Table 3.3.
12) EPA, Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, Report NR-010e, EPA-420-R-05-019, Table 6, page 8, December 2005.
13) The sulfur concentration in gasoline is assumed to be 30 ppmw, based on EPA News Release, *EPA Sets Cleaner Fuel and Car Standards, Slashing Air Pollution and Providing Health Benefits to Thousands,* March 3, 2014, "The final fuel standards will reduce gasoline sulfur levels by more than 60 percent – down from 30 to 10 parts per million (ppm) in 2017."
14) Caterpillar, *Lease a Cat Backhoe Loader* , http://www.catresourcecenter.com/construction-backhoe-loaders.asp?SRC=CATBC1630&utm_term=excavator&utm_content=MHEX#2
15) Example: 2013 Altec AC23-95B, 29-ton crane, 10-wheel
16) CalEEMod Appendix D Table 3.4 for 2012 Forklift with 51 - 120 hp
17) Tables 4 and 5 in Appendix A, authored by Panorama Environmental, Inc. for PG&E's CEQA document to the CPUC for the Santa Cruz 115kV Reinforcement Project, http://www.cpuc.ca.gov/environment/info/panoramaenv/SantaCruz_115kVReinforcement/SantaCruz_115%20Reinforcement%20Project.html#EIR
18) Diesel fuel CO_2 emission factor (kg CO_2/MMBtu) = 73.96 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-1 to Subpart C, p. 71951, November 29, 2013.)
19) Diesel fuel CH_4 emission factor (kg CH_4/MMBtu) = 0.003 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
20) Diesel fuel N_2O emission factor (kg N_2O/MMBtu) = 0.0006 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table C-2 to Subpart C, p. 71952, November 29, 2013.)
21) CH_4 Global Warming Potential (-) = 25 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)
22) N_2O Global Warming Potential (-) = 298 (EPA. 2013 Revisions to the Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantitally Revised Data Elements; Final Rule, Federal Register, Volume 78, Number 230, Table 2, p. 71909, November 29, 2013.)

Appendix 3.4 Table 21
Total Project Operation Onsite Offroad Equipment Hours, Emission Factors, and Emissions in the Basin
Heavenly Mountain Resort Epic Discovery Project

Daily Offroad Equipment Emissions (lbs/day)										Annual Offroad Equipment Emissions (tpy)										
NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	Weight (tons)
7.06E-01	8.98E+00	3.23E-01	8.37E-04	5.03E-03	4.62E-03	3.82E+01	1.55E-03	3.10E-04	38 (21,22)	3.18E-02	4.04E-01	1.45E-02	3.77E-05	2.26E-04	2.08E-04	1.72E+00	6.97E-05	1.39E-05	1.72 (21,22)	

Appendix A

Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three (+5 dB for TRPA calculations) and nighttime hours weighted by a factor of 10 (or +10 dB) prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-194
Description: Existing Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 50	Loop Road to Kingsbury Way	26,790	77	10	13	3	1	30	100	
2	US 50.	Loop Road to Casino Core	20,930	77	10	13	3	1	30	100	
3	US 50.	Casino Core to Stateline Ave	21,920	77	10	13	3	1	30	100	
4	US 50.	Stateline Ave to Friday Ave	24,170	77	10	13	3	1	30	100	
5	US 50.	Friday Ave to Park Ave	24,830	77	10	13	3	1	30	100	
6	US 50	Park Ave to Pioneer Trail	30,610	77	10	13	3	1	30	100	
7	US 50	Pioneer Trail to Ski Run Blvd	23,590	77	10	13	3	1	30	100	
8	Pioneer Trail	South of US 50	7,900	77	10	13	3	1	30	100	
9	Park Ave	West of US 50	2,560	77	10	13	2	1	25	100	
10	Park Ave	East of US 50	5,950	77	10	13	2	1	25	100	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2013-194
Description: Existing Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	Autos	Medium Trucks	Heavy Trucks	Total
1	US 50	Loop Road to Kingsbury Way	60.3	56.2	58.6	63
2	US 50.	Loop Road to Casino Core	59.2	55.1	57.5	62
3	US 50.	Casino Core to Stateline Ave	59.4	55.3	57.7	63
4	US 50.	Stateline Ave to Friday Ave	59.8	55.8	58.1	63
5	US 50.	Friday Ave to Park Ave	60.0	55.9	58.2	63
6	US 50	Park Ave to Pioneer Trail	60.9	56.8	59.1	64
7	US 50	Pioneer Trail to Ski Run Blvd	59.7	55.7	58.0	63
8	Pioneer Trail	South of US 50	55.0	50.9	53.3	58
9	Park Ave	West of US 50	47.9	43.0	47.6	51
10	Park Ave	East of US 50	51.5	46.7	51.3	55

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2013-194
Description: Existing Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment	75	70	65	60	55
1	US 50	Loop Road to Kingsbury Way	17	36	79	169	365
2	US 50.	Loop Road to Casino Core	14	31	67	144	309
3	US 50.	Casino Core to Stateline Ave	15	32	69	148	319
4	US 50.	Stateline Ave to Friday Ave	16	34	73	158	340
5	US 50.	Friday Ave to Park Ave	16	35	75	161	347
6	US 50	Park Ave to Pioneer Trail	18	40	86	185	398
7	US 50	Pioneer Trail to Ski Run Blvd	16	33	72	155	335
8	Pioneer Trail	South of US 50	7	16	35	75	162
9	Park Ave	West of US 50	3	6	12	27	58
10	Park Ave	East of US 50	5	10	22	47	101

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-194
Description: Existing Plus Project Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 50	Loop Road to Kingsbury Way	27,080	77	10	13	3	1	30	100	
2	US 50.	Loop Road to Casino Core	20,990	77	10	13	3	1	30	100	
3	US 50.	Casino Core to Stateline Ave	21,980	77	10	13	3	1	30	100	
4	US 50.	Stateline Ave to Friday Ave	24,230	77	10	13	3	1	30	100	
5	US 50.	Friday Ave to Park Ave	24,920	77	10	13	3	1	30	100	
6	US 50	Park Ave to Pioneer Trail	31,160	77	10	13	3	1	30	100	
7	US 50	Pioneer Trail to Ski Run Blvd	23,960	77	10	13	3	1	30	100	
8	Pioneer Trail	South of US 50	8,080	77	10	13	3	1	30	100	
9	Park Ave	West of US 50	2,600	77	10	13	2	1	25	100	
10	Park Ave	East of US 50	6,630	77	10	13	2	1	25	100	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

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FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2013-194
Description: Existing Plus Project Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	Autos	Medium Trucks	Heavy Trucks	Total
1	US 50	Loop Road to Kingsbury Way	60.3	56.2	58.6	63
2	US 50.	Loop Road to Casino Core	59.2	55.1	57.5	62
3	US 50.	Casino Core to Stateline Ave	59.4	55.3	57.7	63
4	US 50.	Stateline Ave to Friday Ave	59.8	55.8	58.1	63
5	US 50.	Friday Ave to Park Ave	60.0	55.9	58.2	63
6	US 50	Park Ave to Pioneer Trail	60.9	56.9	59.2	64
7	US 50	Pioneer Trail to Ski Run Blvd	59.8	55.7	58.1	63
8	Pioneer Trail	South of US 50	55.1	51.0	53.3	58
9	Park Ave	West of US 50	47.9	43.1	47.7	51
10	Park Ave	East of US 50	52.0	47.1	51.8	56

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Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2013-194
Description: Existing Plus Project Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment	75	70	65	60	55
1	US 50	Loop Road to Kingsbury Way	17	37	79	170	367
2	US 50.	Loop Road to Casino Core	14	31	67	144	310
3	US 50.	Casino Core to Stateline Ave	15	32	69	148	319
4	US 50.	Stateline Ave to Friday Ave	16	34	73	158	341
5	US 50.	Friday Ave to Park Ave	16	35	75	161	347
6	US 50	Park Ave to Pioneer Trail	19	40	87	187	403
7	US 50	Pioneer Trail to Ski Run Blvd	16	34	73	157	338
8	Pioneer Trail	South of US 50	8	16	35	76	164
9	Park Ave	West of US 50	3	6	13	27	58
10	Park Ave	East of US 50	5	11	23	51	109

Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-194
Description: Year 2035 Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 50	Loop Road to Kingsbury Way	29,600	77	10	13	3	1	30	100	
2	US 50.	Loop Road to Casino Core	23,100	77	10	13	3	1	30	100	
3	US 50.	Casino Core to Stateline Ave	24,300	77	10	13	3	1	30	100	
4	US 50.	Stateline Ave to Friday Ave	26,500	77	10	13	3	1	30	100	
5	US 50.	Friday Ave to Park Ave	26,400	77	10	13	3	1	30	100	
6	US 50	Park Ave to Pioneer Trail	32,800	77	10	13	3	1	30	100	
7	US 50	Pioneer Trail to Ski Run Blvd	24,800	77	10	13	3	1	30	100	
8	Pioneer Trail	South of US 50	9,000	77	10	13	3	1	30	100	
9	Park Ave	West of US 50	3,200	77	10	13	2	1	25	100	
10	Park Ave	East of US 50	6,600	77	10	13	2	1	25	100	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

j.c. brennan & associates
consultants in acoustics

Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2013-194
Description: Year 2035 Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	Autos	Medium Trucks	Heavy Trucks	Total
1	US 50	Loop Road to Kingsbury Way	60.7	56.6	59.0	64
2	US 50.	Loop Road to Casino Core	59.6	55.6	57.9	63
3	US 50.	Casino Core to Stateline Ave	59.9	55.8	58.1	63
4	US 50.	Stateline Ave to Friday Ave	60.2	56.2	58.5	63
5	US 50.	Friday Ave to Park Ave	60.2	56.1	58.5	63
6	US 50	Park Ave to Pioneer Trail	61.2	57.1	59.4	64
7	US 50	Pioneer Trail to Ski Run Blvd	59.9	55.9	58.2	63
8	Pioneer Trail	South of US 50	55.5	51.5	53.8	59
9	Park Ave	West of US 50	48.8	44.0	48.6	52
10	Park Ave	East of US 50	52.0	47.1	51.7	56

j.c. brennan & associates
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Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2013-194
Description: Year 2035 Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment	75	70	65	60	55
1	US 50	Loop Road to Kingsbury Way	18	39	84	181	390
2	US 50.	Loop Road to Casino Core	15	33	71	153	330
3	US 50.	Casino Core to Stateline Ave	16	34	74	159	342
4	US 50.	Stateline Ave to Friday Ave	17	36	78	168	362
5	US 50.	Friday Ave to Park Ave	17	36	78	168	361
6	US 50	Park Ave to Pioneer Trail	19	42	90	194	417
7	US 50	Pioneer Trail to Ski Run Blvd	16	35	75	161	346
8	Pioneer Trail	South of US 50	8	18	38	82	176
9	Park Ave	West of US 50	3	7	14	31	67
10	Park Ave	East of US 50	5	11	23	50	109

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Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 2013-194
Description: Cumulative Plus Project Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 50	Loop Road to Kingsbury Way	29,890	77	10	13	3	1	30	100	
2	US 50.	Loop Road to Casino Core	23,160	77	10	13	3	1	30	100	
3	US 50.	Casino Core to Stateline Ave	24,360	77	10	13	3	1	30	100	
4	US 50.	Stateline Ave to Friday Ave	26,580	77	10	13	3	1	30	100	
5	US 50.	Friday Ave to Park Ave	26,490	77	10	13	3	1	30	100	
6	US 50	Park Ave to Pioneer Trail	33,350	77	10	13	3	1	30	100	
7	US 50	Pioneer Trail to Ski Run Blvd	24,170	77	10	13	3	1	30	100	
8	Pioneer Trail	South of US 50	9,180	77	10	13	3	1	30	100	
9	Park Ave	West of US 50	3,240	77	10	13	2	1	25	100	
10	Park Ave	East of US 50	7,280	77	10	13	2	1	25	100	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											

j.c. brennan & associates
consultants in acoustics

Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Predicted Levels

Project #: 2013-194
Description: Cumulative Plus Project Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Name	Segment	Autos	Medium Trucks	Heavy Trucks	Total
1	US 50	Loop Road to Kingsbury Way	60.8	56.7	59.0	64
2	US 50.	Loop Road to Casino Core	59.6	55.6	57.9	63
3	US 50.	Casino Core to Stateline Ave	59.9	55.8	58.1	63
4	US 50.	Stateline Ave to Friday Ave	60.2	56.2	58.5	63
5	US 50.	Friday Ave to Park Ave	60.2	56.2	58.5	63
6	US 50	Park Ave to Pioneer Trail	61.2	57.2	59.5	64
7	US 50	Pioneer Trail to Ski Run Blvd	59.8	55.8	58.1	63
8	Pioneer Trail	South of US 50	55.6	51.6	53.9	59
9	Park Ave	West of US 50	48.9	44.0	48.7	52
10	Park Ave	East of US 50	52.4	47.5	52.2	56

j.c. brennan & associates
consultants in acoustics

Appendix B

FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Noise Contour Output

Project #: 2013-194
Description: Cumulative Plus Project Heavenly Summer Epic
Ldn/CNEL: CNEL
Hard/Soft: Soft

			-------- Distances to Traffic Noise Contours --------				
Segment	Roadway Name	Segment	75	70	65	60	55
1	US 50	Loop Road to Kingsbury Way	18	39	84	182	392
2	US 50.	Loop Road to Casino Core	15	33	71	154	331
3	US 50.	Casino Core to Stateline Ave	16	34	74	159	342
4	US 50.	Stateline Ave to Friday Ave	17	36	78	168	363
5	US 50.	Friday Ave to Park Ave	17	36	78	168	362
6	US 50	Park Ave to Pioneer Trail	20	42	91	196	422
7	US 50	Pioneer Trail to Ski Run Blvd	16	34	73	158	340
8	Pioneer Trail	South of US 50	8	18	38	83	179
9	Park Ave	West of US 50	3	7	15	31	68
10	Park Ave	East of US 50	5	12	25	54	116

3.7 TRANSPORTATION APPENDICES

Traffic Count Data

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-001 US-50-Lake Parkway.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Lake Parkway Southbound					US-50 Westbound					Lake Parkway Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	29	2	6	0	37	33	212	20	0	265	12	5	46	0	63	6	213	6	0	225	590	0
15:15	26	4	7	0	37	30	203	20	0	253	8	5	63	0	76	4	167	2	0	173	539	0
15:30	16	2	3	0	21	55	210	26	0	291	9	4	54	0	67	6	185	8	0	199	578	0
15:45	22	7	4	0	33	34	201	30	0	265	16	3	67	0	86	3	176	11	0	190	574	0
Total	93	15	20	0	128	152	826	96	0	1074	45	17	230	0	292	19	741	27	0	787	2281	0
16:00	32	2	8	0	42	33	205	20	0	258	12	2	62	0	76	9	217	8	0	234	610	0
16:15	38	3	11	0	52	51	212	12	0	275	9	4	66	0	79	5	226	4	0	235	641	0
16:30	27	3	2	0	32	38	247	24	0	309	16	6	78	0	100	5	191	6	0	202	643	0
16:45	21	0	2	0	23	35	214	12	0	261	4	3	57	0	64	1	195	7	0	203	551	0
Total	118	8	23	0	149	157	878	68	0	1103	41	15	263	0	319	20	829	25	0	874	2445	0
17:00	27	3	1	0	31	29	217	17	0	263	5	3	62	0	70	2	174	4	0	180	544	0
17:15	17	2	4	0	23	34	222	25	0	281	4	4	58	0	66	3	199	9	0	211	581	0
17:30	15	1	4	0	20	24	188	12	0	224	6	3	55	0	64	3	188	8	0	199	507	0
17:45	15	0	4	0	19	31	184	23	0	238	8	2	38	0	48	3	158	3	0	164	469	0
Total	74	6	13	0	93	118	811	77	0	1006	23	12	213	0	248	11	719	24	0	754	2101	0
Grand Total	285	29	56	0	370	427	2515	241	0	3183	109	44	706	0	859	50	2289	76	0	2415	6827	0
Apprch %	77.0%	7.8%	15.1%	0.0%		13.4%	79.0%	7.6%	0.0%		12.7%	5.1%	82.2%	0.0%		2.1%	94.8%	3.1%	0.0%			
Total %	4.2%	0.4%	0.8%	0.0%	5.4%	6.3%	36.8%	3.5%	0.0%	46.6%	1.6%	0.6%	10.3%	0.0%	12.6%	0.7%	33.5%	1.1%	0.0%	35.4%	100.0%	

PM PEAK HOUR	Lake Parkway Southbound					US-50 Westbound					Lake Parkway Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:45 to 16:45																					
Peak Hour For Entire Intersection Begins at 15:45																					
15:45	22	7	4	0	33	34	201	30	0	265	16	3	67	0	86	3	176	11	0	190	574
16:00	32	2	8	0	42	33	205	20	0	258	12	2	62	0	76	9	217	8	0	234	610
16:15	38	3	11	0	52	51	212	12	0	275	9	4	66	0	79	5	226	4	0	235	641
16:30	27	3	2	0	32	38	247	24	0	309	16	6	78	0	100	5	191	6	0	202	643
Total Volume	119	15	25	0	159	156	865	86	0	1107	53	15	273	0	341	22	810	29	0	861	2468
% App Total	74.8%	9.4%	15.7%	0.0%		14.1%	78.1%	7.8%	0.0%		15.5%	4.4%	80.1%	0.0%		2.6%	94.1%	3.4%	0.0%		
PHF	.783	.536	.568	.000	.764	.765	.876	.717	.000	.896	.828	.625	.875	.000	.853	.611	.896	.659	.000	.916	.960

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-002 US-50-Stateline Avenue.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Stateline Avenue Southbound					US-50 Westbound					Stateline Avenue Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	11	1	14	0	26	1	226	10	0	237	0	0	0	0	0	20	247	6	0	273	536	0
15:15	12	0	13	0	25	1	202	2	0	205	0	0	0	0	0	22	188	5	0	215	445	0
15:30	9	0	23	0	32	2	207	3	0	212	0	0	0	0	0	42	244	11	0	297	541	0
15:45	11	1	28	0	40	4	197	6	0	207	0	0	0	0	0	27	221	9	0	257	504	0
Total	43	2	78	0	123	8	832	21	0	861	0	0	0	0	0	111	900	31	0	1042	2026	0
16:00	10	1	49	0	60	1	214	5	0	220	0	0	0	0	0	21	242	4	0	267	547	0
16:15	6	0	21	0	27	2	214	6	0	222	0	0	0	0	0	19	252	4	0	275	524	0
16:30	6	0	9	0	15	1	247	1	0	249	0	0	0	0	0	19	232	3	0	254	518	0
16:45	5	0	12	0	17	2	223	3	0	228	0	0	0	0	0	15	238	7	0	260	505	0
Total	27	1	91	0	119	6	898	15	0	919	0	0	0	0	0	74	964	18	0	1056	2094	0
17:00	4	0	18	0	22	1	206	2	0	209	0	0	0	0	0	18	208	10	0	236	467	0
17:15	1	0	15	0	16	2	212	2	0	216	0	0	0	0	0	25	246	9	0	280	512	0
17:30	6	1	23	0	30	1	190	6	0	197	0	0	0	0	0	27	232	7	0	266	493	0
17:45	6	1	12	0	19	3	159	0	0	162	0	0	0	0	0	23	193	5	0	221	402	0
Total	17	2	68	0	87	7	767	10	0	784	0	0	0	0	0	93	879	31	0	1003	1874	0
Grand Total	87	5	237	0	329	21	2497	46	0	2564	0	0	0	0	0	278	2743	80	0	3101	5994	0
Apprch %	26.4%	1.5%	72.0%	0.0%		0.8%	97.4%	1.8%	0.0%		0.0%	0.0%	0.0%	0.0%		9.0%	88.5%	2.6%	0.0%			
Total %	1.5%	0.1%	4.0%	0.0%	5.5%	0.4%	41.7%	0.8%	0.0%	42.8%	0.0%	0.0%	0.0%	0.0%	0.0%	4.6%	45.8%	1.3%	0.0%	51.7%	100.0%	

PM PEAK HOUR	Stateline Avenue Southbound					US-50 Westbound					Stateline Avenue Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:30 to 16:30																					
Peak Hour For Entire Intersection Begins at 15:30																					
15:30	9	0	23	0	32	2	207	3	0	212	0	0	0	0	0	42	244	11	0	297	541
15:45	11	1	28	0	40	4	197	6	0	207	0	0	0	0	0	27	221	9	0	257	504
16:00	10	1	49	0	60	1	214	5	0	220	0	0	0	0	0	21	242	4	0	267	547
16:15	6	0	21	0	27	2	214	6	0	222	0	0	0	0	0	19	252	4	0	275	524
Total Volume	36	2	121	0	159	9	832	20	0	861	0	0	0	0	0	109	959	28	0	1096	2116
% App Total	22.6%	1.3%	76.1%	0.0%		1.0%	96.6%	2.3%	0.0%		0.0%	0.0%	0.0%	0.0%		9.9%	87.5%	2.6%	0.0%		
PHF	.818	.500	.617	.000	.663	.563	.972	.833	.000	.970	.000	.000	.000	.000	.000	.649	.951	.636	.000	.923	.967

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-003 US-50-Transit Way.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Southbound					US-50 Westbound					Transit Way Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	0	0	0	0	0	0	232	0	0	232	0	0	3	0	3	0	279	5	0	284	519	0
15:15	0	0	0	0	0	5	219	0	0	224	1	0	4	0	5	0	222	10	0	232	461	0
15:30	0	0	0	0	0	2	212	0	0	214	0	0	4	0	4	0	288	7	0	295	513	0
15:45	0	0	0	0	0	6	230	0	0	236	3	0	4	0	7	0	246	9	0	255	498	0
Total	0	0	0	0	0	13	893	0	0	906	4	0	15	0	19	0	1035	31	0	1066	1991	0
16:00	0	0	0	0	0	3	259	0	0	262	0	0	5	0	5	0	282	8	0	290	557	0
16:15	0	0	0	0	0	5	225	0	0	230	0	0	5	0	5	0	256	12	0	268	503	0
16:30	0	0	0	0	0	3	256	0	0	259	0	0	1	0	1	0	257	9	0	266	526	0
16:45	0	0	0	0	0	4	222	0	0	226	0	0	1	0	1	0	256	10	0	266	493	0
Total	0	0	0	0	0	15	962	0	0	977	0	0	12	0	12	0	1051	39	0	1090	2079	0
17:00	0	0	0	0	0	2	231	0	0	233	1	0	4	0	5	0	238	9	0	247	485	0
17:15	0	0	0	0	0	4	204	0	0	208	1	0	2	0	3	0	281	10	0	291	502	0
17:30	0	0	0	0	0	1	207	0	0	208	1	0	4	0	5	0	254	4	0	258	471	0
17:45	0	0	0	0	0	1	174	0	0	175	0	0	1	0	1	0	241	12	0	253	429	0
Total	0	0	0	0	0	8	816	0	0	824	3	0	11	0	14	0	1014	35	0	1049	1887	0
Grand Total	0	0	0	0	0	36	2671	0	0	2707	7	0	38	0	45	0	3100	105	0	3205	5957	0
Apprch %	0.0%	0.0%	0.0%	0.0%		1.3%	98.7%	0.0%	0.0%		15.6%	0.0%	84.4%	0.0%		0.0%	96.7%	3.3%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	44.8%	0.0%	0.0%	45.4%	0.1%	0.0%	0.6%	0.0%	0.8%	0.0%	52.0%	1.8%	0.0%	53.8%	100.0%	

PM PEAK HOUR	Southbound					US-50 Westbound					Transit Way Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:45 to 16:45																					
Peak Hour For Entire Intersection Begins at 15:45																					
15:45	0	0	0	0	0	6	230	0	0	236	3	0	4	0	7	0	246	9	0	255	498
16:00	0	0	0	0	0	3	259	0	0	262	0	0	5	0	5	0	282	8	0	290	557
16:15	0	0	0	0	0	5	225	0	0	230	0	0	5	0	5	0	256	12	0	268	503
16:30	0	0	0	0	0	3	256	0	0	259	0	0	1	0	1	0	257	9	0	266	526
Total Volume	0	0	0	0	0	17	970	0	0	987	3	0	15	0	18	0	1041	38	0	1079	2084
% App Total	0.0%	0.0%	0.0%	0.0%		1.7%	98.3%	0.0%	0.0%		16.7%	0.0%	83.3%	0.0%		0.0%	96.5%	3.5%	0.0%		
PHF	.000	.000	.000	.000	.000	.708	.936	.000	.000	.942	.250	.000	.750	.000	.643	.000	.923	.792	.000	.930	.935

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-004 US-50-Friday Avenue.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Friday Avenue Southbound					US-50 Westbound					Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	1	0	4	0	5	0	217	4	0	221	0	0	0	0	0	3	270	0	0	273	499	0
15:15	2	0	3	0	5	0	234	2	0	236	0	0	0	0	0	4	246	0	0	250	491	0
15:30	0	0	4	0	4	0	205	3	0	208	0	0	0	0	0	1	288	0	0	289	501	0
15:45	2	0	7	0	9	0	233	3	0	236	0	0	0	0	0	4	265	0	0	269	514	0
Total	5	0	18	0	23	0	889	12	0	901	0	0	0	0	0	12	1069	0	0	1081	2005	0
16:00	6	0	7	0	13	0	249	1	0	250	0	0	0	0	0	5	269	0	0	274	537	0
16:15	2	0	4	0	6	0	227	2	0	229	0	0	0	0	0	3	261	0	0	264	499	0
16:30	1	0	3	0	4	0	256	1	0	257	0	0	0	0	0	8	282	0	0	290	551	0
16:45	1	0	6	0	7	0	217	1	0	218	0	0	0	0	0	6	255	0	0	261	486	0
Total	10	0	20	0	30	0	949	5	0	954	0	0	0	0	0	22	1067	0	0	1089	2073	0
17:00	1	0	6	0	7	0	226	1	0	227	0	0	0	0	0	1	250	0	0	251	485	0
17:15	2	0	7	0	9	0	203	1	0	204	0	0	0	0	0	1	287	0	0	288	501	0
17:30	0	0	2	0	2	0	209	1	0	210	0	0	0	0	0	2	249	0	0	251	463	0
17:45	1	0	2	0	3	0	169	0	0	169	0	0	0	0	0	2	251	0	0	253	425	0
Total	4	0	17	0	21	0	807	3	0	810	0	0	0	0	0	6	1037	0	0	1043	1874	0
Grand Total	19	0	55	0	74	0	2645	20	0	2665	0	0	0	0	0	40	3173	0	0	3213	5952	0
Apprch %	25.7%	0.0%	74.3%	0.0%		0.0%	99.2%	0.8%	0.0%		0.0%	0.0%	0.0%	0.0%		1.2%	98.8%	0.0%	0.0%			
Total %	0.3%	0.0%	0.9%	0.0%	1.2%	0.0%	44.4%	0.3%	0.0%	44.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	53.3%	0.0%	0.0%	54.0%	100.0%	

PM PEAK HOUR	Friday Avenue Southbound					US-50 Westbound					Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:45 to 16:45																					
Peak Hour For Entire Intersection Begins at 15:45																					
15:45	2	0	7	0	9	0	233	3	0	236	0	0	0	0	0	4	265	0	0	269	514
16:00	6	0	7	0	13	0	249	1	0	250	0	0	0	0	0	5	269	0	0	274	537
16:15	2	0	4	0	6	0	227	2	0	229	0	0	0	0	0	3	261	0	0	264	499
16:30	1	0	3	0	4	0	256	1	0	257	0	0	0	0	0	8	282	0	0	290	551
Total Volume	11	0	21	0	32	0	965	7	0	972	0	0	0	0	0	20	1077	0	0	1097	2101
% App Total	34.4%	0.0%	65.6%	0.0%		0.0%	99.3%	0.7%	0.0%		0.0%	0.0%	0.0%	0.0%		1.8%	98.2%	0.0%	0.0%		
PHF	.458	.000	.750	.000	.615	.000	.942	.583	.000	.946	.000	.000	.000	.000	.000	.625	.955	.000	.000	.946	.953

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-005 US-50-Park Avenue.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Park Avenue Southbound					US-50 Westbound					Park Avenue Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	4	6	26	0	36	19	196	2	0	217	52	8	24	0	84	11	247	16	0	274	611	0
15:15	1	2	26	0	29	10	224	0	0	234	42	1	18	0	61	17	257	23	0	297	621	0
15:30	5	3	32	0	40	13	202	0	0	215	60	3	29	0	92	18	275	23	0	316	663	0
15:45	1	2	28	0	31	22	217	0	0	239	55	4	19	0	78	15	247	23	0	285	633	0
Total	11	13	112	0	136	64	839	2	0	905	209	16	90	0	315	61	1026	85	0	1172	2528	0
16:00	2	6	42	0	50	18	244	0	0	262	74	2	20	0	96	14	266	22	0	302	710	0
16:15	1	2	24	0	27	11	225	5	0	241	54	4	25	0	83	15	251	19	0	285	636	0
16:30	1	2	22	0	25	16	245	2	0	263	65	2	22	0	89	24	280	23	0	327	704	0
16:45	0	4	31	0	35	15	210	3	0	228	51	5	14	0	70	14	248	22	0	284	617	0
Total	4	14	119	0	137	60	924	10	0	994	244	13	81	0	338	67	1045	86	0	1198	2667	0
17:00	4	2	27	0	33	14	215	5	0	234	63	6	21	0	90	12	247	23	0	282	639	0
17:15	4	6	18	0	28	14	198	2	0	214	58	9	23	0	90	23	263	27	0	313	645	0
17:30	3	3	27	0	33	12	214	0	0	226	48	2	24	0	74	14	266	19	0	299	632	0
17:45	5	2	30	0	37	12	159	3	0	174	42	1	18	0	61	16	222	17	0	255	527	0
Total	16	13	102	0	131	52	786	10	0	848	211	18	86	0	315	65	998	86	0	1149	2443	0
Grand Total	31	40	333	0	404	176	2549	22	0	2747	664	47	257	0	968	193	3069	257	0	3519	7638	0
Apprch %	7.7%	9.9%	82.4%	0.0%		6.4%	92.8%	0.8%	0.0%		68.6%	4.9%	26.5%	0.0%		5.5%	87.2%	7.3%	0.0%			
Total %	0.4%	0.5%	4.4%	0.0%	5.3%	2.3%	33.4%	0.3%	0.0%	36.0%	8.7%	0.6%	3.4%	0.0%	12.7%	2.5%	40.2%	3.4%	0.0%	46.1%	100.0%	

PM PEAK HOUR	Park Avenue Southbound					US-50 Westbound					Park Avenue Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:45 to 16:45																					
Peak Hour For Entire Intersection Begins at 15:45																					
15:45	1	2	28	0	31	22	217	0	0	239	55	4	19	0	78	15	247	23	0	285	633
16:00	2	6	42	0	50	18	244	0	0	262	74	2	20	0	96	14	266	22	0	302	710
16:15	1	2	24	0	27	11	225	5	0	241	54	4	25	0	83	15	251	19	0	285	636
16:30	1	2	22	0	25	16	245	2	0	263	65	2	22	0	89	24	280	23	0	327	704
Total Volume	5	12	116	0	133	67	931	7	0	1005	248	12	86	0	346	68	1044	87	0	1199	2683
% App Total	3.8%	9.0%	87.2%	0.0%		6.7%	92.6%	0.7%	0.0%		71.7%	3.5%	24.9%	0.0%		5.7%	87.1%	7.3%	0.0%		
PHF	.625	.500	.690	.000	.665	.761	.950	.350	.000	.955	.838	.750	.860	.000	.901	.708	.932	.946	.000	.917	.945

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-006 US-50-Pioneer Trail.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Pioneer Trail Southbound					US-50 Westbound					Pioneer Trail Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	0	0	2	0	2	53	233	1	0	287	6	0	74	0	80	0	227	1	0	228	597	0
15:15	4	0	0	0	4	52	234	2	0	288	4	0	79	0	83	1	242	5	0	248	623	0
15:30	2	0	2	0	4	51	247	1	0	299	4	0	100	0	104	2	244	3	0	249	656	0
15:45	1	0	1	0	2	68	242	1	0	311	2	0	96	0	98	1	226	3	0	230	641	0
Total	7	0	5	0	12	224	956	5	0	1185	16	0	349	0	365	4	939	12	0	955	2517	0
16:00	2	0	1	0	3	66	288	1	0	355	3	0	84	0	87	0	252	6	0	258	703	0
16:15	0	1	2	0	3	73	249	2	0	324	5	0	104	0	109	5	193	3	0	201	637	0
16:30	0	0	4	0	4	60	267	0	0	327	4	0	92	0	96	1	272	4	0	277	704	0
16:45	0	1	2	0	3	58	243	0	0	301	8	0	89	0	97	3	233	4	0	240	641	0
Total	2	2	9	0	13	257	1047	3	0	1307	20	0	369	0	389	9	950	17	0	976	2685	0
17:00	2	2	2	0	6	61	260	3	0	324	6	1	82	0	89	0	237	2	0	239	658	0
17:15	0	0	1	0	1	46	236	0	0	282	3	0	86	0	89	5	261	2	0	268	640	0
17:30	2	0	5	0	7	53	238	3	0	294	2	0	89	0	91	4	255	6	0	265	657	0
17:45	1	0	0	0	1	55	185	1	0	241	2	1	95	0	98	1	198	4	0	203	543	0
Total	5	2	8	0	15	215	919	7	0	1141	13	2	352	0	367	10	951	14	0	975	2498	0
Grand Total	14	4	22	0	40	696	2922	15	0	3633	49	2	1070	0	1121	23	2840	43	0	2906	7700	0
Apprch %	35.0%	10.0%	55.0%	0.0%		19.2%	80.4%	0.4%	0.0%		4.4%	0.2%	95.5%	0.0%		0.8%	97.7%	1.5%	0.0%			
Total %	0.2%	0.1%	0.3%	0.0%	0.5%	9.0%	37.9%	0.2%	0.0%	47.2%	0.6%	0.0%	13.9%	0.0%	14.6%	0.3%	36.9%	0.6%	0.0%	37.7%	100.0%	

PM PEAK HOUR	Pioneer Trail Southbound					US-50 Westbound					Pioneer Trail Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:45 to 16:45																					
Peak Hour For Entire Intersection Begins at 15:45																					
15:45	1	0	1	0	2	68	242	1	0	311	2	0	96	0	98	1	226	3	0	230	641
16:00	2	0	1	0	3	66	288	1	0	355	3	0	84	0	87	0	252	6	0	258	703
16:15	0	1	2	0	3	73	249	2	0	324	5	0	104	0	109	5	193	3	0	201	637
16:30	0	0	4	0	4	60	267	0	0	327	4	0	92	0	96	1	272	4	0	277	704
Total Volume	3	1	8	0	12	267	1046	4	0	1317	14	0	376	0	390	7	943	16	0	966	2685
% App Total	25.0%	8.3%	66.7%	0.0%		20.3%	79.4%	0.3%	0.0%		3.6%	0.0%	96.4%	0.0%		0.7%	97.6%	1.7%	0.0%		
PHF	.375	.250	.500	.000	.750	.914	.908	.500	.000	.927	.700	.000	.904	.000	.894	.350	.867	.667	.000	.872	.953

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-007 Bellamy Court-Park Avenue.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Park Avenue Southbound					Bellamy Court Westbound					Park Avenue Northbound					Driveway Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	8	13	4	0	25	8	0	22	0	30	10	22	0	0	32	5	4	14	0	23	110	0
15:15	7	20	1	0	28	1	3	11	0	15	10	28	4	0	42	7	0	20	0	27	112	0
15:30	13	12	4	0	29	3	2	27	0	32	16	25	5	0	46	10	2	11	0	23	130	0
15:45	10	24	2	0	36	4	4	21	0	29	14	26	6	0	46	8	1	20	0	29	140	0
Total	38	69	11	0	118	16	9	81	0	106	50	101	15	0	166	30	7	65	0	102	492	0
16:00	6	20	4	0	30	5	1	30	0	36	11	32	6	0	49	6	0	23	0	29	144	0
16:15	6	15	2	0	23	1	1	28	0	30	13	24	3	0	40	11	0	22	0	33	126	0
16:30	6	18	5	0	29	11	0	34	0	45	8	26	7	0	41	9	3	24	0	36	151	0
16:45	7	17	5	0	29	5	2	21	0	28	9	17	4	0	30	8	0	16	0	24	111	0
Total	25	70	16	0	111	22	4	113	0	139	41	99	20	0	160	34	3	85	0	122	532	0
17:00	10	16	2	0	28	2	1	22	0	25	13	26	0	0	39	16	1	22	0	39	131	0
17:15	8	26	1	0	35	3	0	24	0	27	6	20	2	0	28	11	0	16	0	27	117	0
17:30	5	18	1	0	24	5	1	20	0	26	9	22	2	0	33	9	2	11	0	22	105	0
17:45	8	16	2	0	26	6	0	10	0	16	8	14	1	0	23	4	1	8	0	13	78	0
Total	31	76	6	0	113	16	2	76	0	94	36	82	5	0	123	40	4	57	0	101	431	0
Grand Total	94	215	33	0	342	54	15	270	0	339	127	282	40	0	449	104	14	207	0	325	1455	0
Apprch %	27.5%	62.9%	9.6%	0.0%		15.9%	4.4%	79.6%	0.0%		28.3%	62.8%	8.9%	0.0%		32.0%	4.3%	63.7%	0.0%			
Total %	6.5%	14.8%	2.3%	0.0%	23.5%	3.7%	1.0%	18.6%	0.0%	23.3%	8.7%	19.4%	2.7%	0.0%	30.9%	7.1%	1.0%	14.2%	0.0%	22.3%	100.0%	

PM PEAK HOUR	Park Avenue Southbound					Bellamy Court Westbound					Park Avenue Northbound					Driveway Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:45 to 16:45																					
Peak Hour For Entire Intersection Begins at 15:45																					
15:45	10	24	2	0	36	4	4	21	0	29	14	26	6	0	46	8	1	20	0	29	140
16:00	6	20	4	0	30	5	1	30	0	36	11	32	6	0	49	6	0	23	0	29	144
16:15	6	15	2	0	23	1	1	28	0	30	13	24	3	0	40	11	0	22	0	33	126
16:30	6	18	5	0	29	11	0	34	0	45	8	26	7	0	41	9	3	24	0	36	151
Total Volume	28	77	13	0	118	21	6	113	0	140	46	108	22	0	176	34	4	89	0	127	561
% App Total	23.7%	65.3%	11.0%	0.0%		15.0%	4.3%	80.7%	0.0%		26.1%	61.4%	12.5%	0.0%		26.8%	3.1%	70.1%	0.0%		
PHF	.700	.802	.650	.000	.819	.477	.375	.831	.000	.778	.821	.844	.786	.000	.898	.773	.333	.927	.000	.882	.929

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-008 Lake Parkway -Park Avenue.ppd
Date : 12/13/2013

Unshifted Count = All Vehicles

	Park Avenue Southbound					Lake Parkway Westbound					Park Avenue Northbound					Lake Parkway Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
15:00	19	0	19	0	38	0	50	27	0	77	0	0	0	0	0	6	29	0	0	35	150	0
15:15	29	1	11	0	41	0	37	34	0	71	1	0	0	0	1	8	39	0	0	47	160	0
15:30	17	0	8	0	25	0	60	36	0	96	0	0	0	0	0	10	46	0	0	56	177	0
15:45	32	0	15	0	47	1	42	40	0	83	0	0	2	0	2	6	51	0	0	57	189	0
Total	97	1	53	0	151	1	189	137	0	327	1	0	2	0	3	30	165	0	0	195	676	0
16:00	28	0	20	0	48	1	45	44	0	90	0	0	0	0	0	6	34	0	0	40	178	0
16:15	21	0	16	0	37	0	45	29	0	74	2	0	0	0	2	9	45	0	0	54	167	0
16:30	31	0	24	0	55	0	39	36	0	75	0	0	0	0	0	5	32	0	0	37	167	0
16:45	21	0	16	0	37	0	38	25	0	63	0	0	0	0	0	7	44	0	0	51	151	0
Total	101	0	76	0	177	1	167	134	0	302	2	0	0	0	2	27	155	0	0	182	663	0
17:00	24	0	17	0	41	0	31	33	0	64	0	0	0	0	0	4	28	0	0	32	137	0
17:15	30	0	15	0	45	1	27	22	0	50	0	0	0	0	0	7	40	0	0	47	142	0
17:30	22	1	10	0	33	0	26	24	0	50	0	1	0	0	1	6	35	0	0	41	125	0
17:45	19	0	11	0	30	0	25	21	0	46	0	0	0	0	0	1	36	0	0	37	113	0
Total	95	1	53	0	149	1	109	100	0	210	0	1	0	0	1	18	139	0	0	157	517	0
Grand Total	293	2	182	0	477	3	465	371	0	839	3	1	2	0	6	75	459	0	0	534	1856	0
Apprch %	61.4%	0.4%	38.2%	0.0%		0.4%	55.4%	44.2%	0.0%		50.0%	16.7%	33.3%	0.0%		14.0%	86.0%	0.0%	0.0%			
Total %	15.8%	0.1%	9.8%	0.0%	25.7%	0.2%	25.1%	20.0%	0.0%	45.2%	0.2%	0.1%	0.1%	0.0%	0.3%	4.0%	24.7%	0.0%	0.0%	28.8%	100.0%	

PM PEAK HOUR	Park Avenue Southbound					Lake Parkway Westbound					Park Avenue Northbound					Lake Parkway Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:30 to 16:30																					
Peak Hour For Entire Intersection Begins at 15:30																					
15:30	17	0	8	0	25	0	60	36	0	96	0	0	0	0	0	10	46	0	0	56	177
15:45	32	0	15	0	47	1	42	40	0	83	0	0	2	0	2	6	51	0	0	57	189
16:00	28	0	20	0	48	1	45	44	0	90	0	0	0	0	0	6	34	0	0	40	178
16:15	21	0	16	0	37	0	45	29	0	74	2	0	0	0	2	9	45	0	0	54	167
Total Volume	98	0	59	0	157	2	192	149	0	343	2	0	2	0	4	31	176	0	0	207	711
% App Total	62.4%	0.0%	37.6%	0.0%		0.6%	56.0%	43.4%	0.0%		50.0%	0.0%	50.0%	0.0%		15.0%	85.0%	0.0%	0.0%		
PHF	.766	.000	.738	.000	.818	.500	.800	.847	.000	.893	.250	.000	.250	.000	.500	.775	.863	.000	.000	.908	.940

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-001 US-50-Lake Parkway.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Lake Parkway Southbound					US-50 Westbound					Lake Parkway Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	16	3	4	0	23	27	148	13	0	188	11	8	44	0	63	8	147	12	0	167	441	0
12:15	27	2	4	0	33	30	158	9	0	197	15	2	41	0	58	3	166	9	0	178	466	0
12:30	16	4	8	0	28	34	194	10	0	238	8	3	41	0	52	5	143	11	0	159	477	0
12:45	17	1	9	0	27	17	141	8	0	166	13	4	38	0	55	10	146	4	0	160	408	0
Total	76	10	25	0	111	108	641	40	0	789	47	17	164	0	228	26	602	36	0	664	1792	0
13:00	10	0	1	0	11	32	168	9	0	209	16	4	37	0	57	3	166	8	0	177	454	0
13:15	14	2	3	0	19	35	174	18	0	227	7	3	44	0	54	0	171	6	0	177	477	0
13:30	7	0	6	0	13	34	153	12	0	199	8	4	46	0	58	3	140	12	0	155	425	0
13:45	13	3	7	0	23	26	180	14	0	220	8	0	42	0	50	5	154	8	0	167	460	0
Total	44	5	17	0	66	127	675	53	0	855	39	11	169	0	219	11	631	34	0	676	1816	0
Grand Total	120	15	42	0	177	235	1316	93	0	1644	86	28	333	0	447	37	1233	70	0	1340	3608	0
Apprch %	67.8%	8.5%	23.7%	0.0%		14.3%	80.0%	5.7%	0.0%		19.2%	6.3%	74.5%	0.0%		2.8%	92.0%	5.2%	0.0%			
Total %	3.3%	0.4%	1.2%	0.0%	4.9%	6.5%	36.5%	2.6%	0.0%	45.6%	2.4%	0.8%	9.2%	0.0%	12.4%	1.0%	34.2%	1.9%	0.0%	37.1%	100.0%	

NOON PEAK	Lake Parkway Southbound					US-50 Westbound					Lake Parkway Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:30 to 13:30																					
Peak Hour For Entire Intersection Begins at 12:30																					
12:30	16	4	8	0	28	34	194	10	0	238	8	3	41	0	52	5	143	11	0	159	477
12:45	17	1	9	0	27	17	141	8	0	166	13	4	38	0	55	10	146	4	0	160	408
13:00	10	0	1	0	11	32	168	9	0	209	16	4	37	0	57	3	166	8	0	177	454
13:15	14	2	3	0	19	35	174	18	0	227	7	3	44	0	54	0	171	6	0	177	477
Total Volume	57	7	21	0	85	118	677	45	0	840	44	14	160	0	218	18	626	29	0	673	1816
% App Total	67.1%	8.2%	24.7%	0.0%		14.0%	80.6%	5.4%	0.0%		20.2%	6.4%	73.4%	0.0%		2.7%	93.0%	4.3%	0.0%		
PHF	.838	.438	.583	.000	.759	.843	.872	.625	.000	.882	.688	.875	.909	.000	.956	.450	.915	.659	.000	.951	.952

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-002 US-50-Stateline Avenue.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Stateline Avenue Southbound					US-50 Westbound					Stateline Avenue Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	10	1	19	0	30	1	184	2	0	187	0	0	0	0	0	14	199	14	0	227	444	0
12:15	11	0	22	0	33	2	156	5	0	163	0	0	0	0	0	22	194	6	0	222	418	0
12:30	4	2	17	0	23	1	192	5	0	198	0	0	0	0	0	11	199	3	0	213	434	0
12:45	5	0	22	0	27	0	154	4	0	158	0	0	0	0	0	20	190	6	0	216	401	0
Total	30	3	80	0	113	4	686	16	0	706	0	0	0	0	0	67	782	29	0	878	1697	0
13:00	10	0	15	0	25	1	194	6	0	201	0	0	0	0	0	6	235	13	0	254	480	0
13:15	8	0	20	0	28	3	156	3	0	162	0	0	0	0	0	13	182	5	0	200	390	0
13:30	6	0	15	0	21	2	165	9	0	176	0	0	0	0	0	14	196	9	0	219	416	0
13:45	6	1	19	0	26	1	177	1	0	179	0	0	0	0	0	19	189	6	0	214	419	0
Total	30	1	69	0	100	7	692	19	0	718	0	0	0	0	0	52	802	33	0	887	1705	0
Grand Total	60	4	149	0	213	11	1378	35	0	1424	0	0	0	0	0	119	1584	62	0	1765	3402	0
Apprch %	28.2%	1.9%	70.0%	0.0%		0.8%	96.8%	2.5%	0.0%		0.0%	0.0%	0.0%	0.0%		6.7%	89.7%	3.5%	0.0%			
Total %	1.8%	0.1%	4.4%	0.0%	6.3%	0.3%	40.5%	1.0%	0.0%	41.9%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	46.6%	1.8%	0.0%	51.9%	100.0%	

NOON PEAK	Stateline Avenue Southbound					US-50 Westbound					Stateline Avenue Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:15 to 13:15																					
Peak Hour For Entire Intersection Begins at 12:15																					
12:15	11	0	22	0	33	2	156	5	0	163	0	0	0	0	0	22	194	6	0	222	418
12:30	4	2	17	0	23	1	192	5	0	198	0	0	0	0	0	11	199	3	0	213	434
12:45	5	0	22	0	27	0	154	4	0	158	0	0	0	0	0	20	190	6	0	216	401
13:00	10	0	15	0	25	1	194	6	0	201	0	0	0	0	0	6	235	13	0	254	480
Total Volume	30	2	76	0	108	4	696	20	0	720	0	0	0	0	0	59	818	28	0	905	1733
% App Total	27.8%	1.9%	70.4%	0.0%		0.6%	96.7%	2.8%	0.0%		0.0%	0.0%	0.0%	0.0%		6.5%	90.4%	3.1%	0.0%		
PHF	.682	.250	.864	.000	.818	.500	.897	.833	.000	.896	.000	.000	.000	.000	.000	.670	.870	.538	.000	.891	.903

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-003 US-50-Transit Way.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Southbound					US-50 Westbound					Transit Way Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	0	0	0	0	0	4	197	0	0	201	3	0	2	0	5	0	218	10	0	228	434	0
12:15	0	0	0	0	0	4	171	0	0	175	0	0	1	0	1	0	234	7	0	241	417	0
12:30	0	0	0	0	0	1	203	0	0	204	2	0	3	0	5	0	208	9	0	217	426	0
12:45	0	0	0	0	0	4	173	0	0	177	1	0	3	0	4	0	225	6	0	231	412	0
Total	0	0	0	0	0	13	744	0	0	757	6	0	9	0	15	0	885	32	0	917	1689	0
13:00	0	0	0	0	0	2	202	0	0	204	0	0	3	0	3	0	240	10	0	250	457	0
13:15	0	0	0	0	0	4	186	0	0	190	0	0	1	0	1	0	207	14	0	221	412	0
13:30	0	0	0	0	0	3	163	0	0	166	1	0	3	0	4	0	209	14	0	223	393	0
13:45	0	0	0	0	0	4	193	0	0	197	1	0	4	0	5	0	215	7	0	222	424	0
Total	0	0	0	0	0	13	744	0	0	757	2	0	11	0	13	0	871	45	0	916	1686	0
Grand Total	0	0	0	0	0	26	1488	0	0	1514	8	0	20	0	28	0	1756	77	0	1833	3375	0
Apprch %	0.0%	0.0%	0.0%	0.0%		1.7%	98.3%	0.0%	0.0%		28.6%	0.0%	71.4%	0.0%		0.0%	95.8%	4.2%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	44.1%	0.0%	0.0%	44.9%	0.2%	0.0%	0.6%	0.0%	0.8%	0.0%	52.0%	2.3%	0.0%	54.3%	100.0%	

NOON PEAK	Southbound					US-50 Westbound					Transit Way Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:15 to 13:15																					
Peak Hour For Entire Intersection Begins at 12:15																					
12:15	0	0	0	0	0	4	171	0	0	175	0	0	1	0	1	0	234	7	0	241	417
12:30	0	0	0	0	0	1	203	0	0	204	2	0	3	0	5	0	208	9	0	217	426
12:45	0	0	0	0	0	4	173	0	0	177	1	0	3	0	4	0	225	6	0	231	412
13:00	0	0	0	0	0	2	202	0	0	204	0	0	3	0	3	0	240	10	0	250	457
Total Volume	0	0	0	0	0	11	749	0	0	760	3	0	10	0	13	0	907	32	0	939	1712
% App Total	0.0%	0.0%	0.0%	0.0%		1.4%	98.6%	0.0%	0.0%		23.1%	0.0%	76.9%	0.0%		0.0%	96.6%	3.4%	0.0%		
PHF	.000	.000	.000	.000	.000	.688	.922	.000	.000	.931	.375	.000	.833	.000	.650	.000	.945	.800	.000	.939	.937

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-004 US-50-Friday Avenue.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Friday Avenue Southbound					US-50 Westbound					Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	2	0	4	0	6	0	194	7	0	201	0	0	0	0	0	3	221	0	0	224	431	0
12:15	0	0	2	0	2	0	173	0	0	173	0	0	0	0	0	5	248	0	0	253	428	0
12:30	0	0	2	0	2	0	211	0	0	211	0	0	0	0	0	5	205	0	0	210	423	0
12:45	1	0	2	0	3	0	172	4	0	176	0	0	0	0	0	7	243	0	0	250	429	0
Total	3	0	10	0	13	0	750	11	0	761	0	0	0	0	0	20	917	0	0	937	1711	0
13:00	1	0	8	0	9	0	207	1	0	208	0	0	0	0	0	4	253	0	0	257	474	0
13:15	2	0	6	0	8	0	176	3	0	179	0	0	0	0	0	1	214	0	0	215	402	0
13:30	0	0	7	0	7	0	172	2	0	174	0	0	0	0	0	2	237	0	0	239	420	0
13:45	1	0	7	0	8	0	194	1	0	195	0	0	0	0	0	3	215	0	0	218	421	0
Total	4	0	28	0	32	0	749	7	0	756	0	0	0	0	0	10	919	0	0	929	1717	0
Grand Total	7	0	38	0	45	0	1499	18	0	1517	0	0	0	0	0	30	1836	0	0	1866	3428	0
Apprch %	15.6%	0.0%	84.4%	0.0%		0.0%	98.8%	1.2%	0.0%		0.0%	0.0%	0.0%	0.0%		1.6%	98.4%	0.0%	0.0%			
Total %	0.2%	0.0%	1.1%	0.0%	1.3%	0.0%	43.7%	0.5%	0.0%	44.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	53.6%	0.0%	0.0%	54.4%	100.0%	

NOON PEAK	Friday Avenue Southbound					US-50 Westbound					Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:15 to 13:15																					
Peak Hour For Entire Intersection Begins at 12:15																					
12:15	0	0	2	0	2	0	173	0	0	173	0	0	0	0	0	5	248	0	0	253	428
12:30	0	0	2	0	2	0	211	0	0	211	0	0	0	0	0	5	205	0	0	210	423
12:45	1	0	2	0	3	0	172	4	0	176	0	0	0	0	0	7	243	0	0	250	429
13:00	1	0	8	0	9	0	207	1	0	208	0	0	0	0	0	4	253	0	0	257	474
Total Volume	2	0	14	0	16	0	763	5	0	768	0	0	0	0	0	21	949	0	0	970	1754
% App Total	12.5%	0.0%	87.5%	0.0%		0.0%	99.3%	0.7%	0.0%		0.0%	0.0%	0.0%	0.0%		2.2%	97.8%	0.0%	0.0%		
PHF	.500	.000	.438	.000	.444	.000	.904	.313	.000	.910	.000	.000	.000	.000	.000	.750	.938	.000	.000	.944	.925

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-005 US-50-Park Avenue.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Park Avenue Southbound					US-50 Westbound					Park Avenue Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	4	7	25	0	36	16	180	5	0	201	47	3	25	0	75	13	214	44	0	271	583	0
12:15	0	7	21	0	28	21	149	6	0	176	49	7	17	0	73	11	231	39	0	281	558	0
12:30	3	6	17	0	26	23	191	2	0	216	48	6	14	0	68	17	222	33	0	272	582	0
12:45	4	7	27	0	38	28	138	1	0	167	46	4	35	0	85	28	230	49	0	307	597	0
Total	11	27	90	0	128	88	658	14	0	760	190	20	91	0	301	69	897	165	0	1131	2320	0
13:00	3	5	19	0	27	27	195	2	0	224	48	4	30	0	82	22	219	40	0	281	614	0
13:15	3	4	30	0	37	25	155	0	0	180	40	8	28	0	76	8	198	30	0	236	529	0
13:30	1	6	19	0	26	20	157	2	0	179	76	9	25	0	110	17	210	33	0	260	575	0
13:45	6	4	27	0	37	20	181	0	0	201	56	4	21	0	81	20	218	47	0	285	604	0
Total	13	19	95	0	127	92	688	4	0	784	220	25	104	0	349	67	845	150	0	1062	2322	0
Grand Total	24	46	185	0	255	180	1346	18	0	1544	410	45	195	0	650	136	1742	315	0	2193	4642	0
Apprch %	9.4%	18.0%	72.5%	0.0%		11.7%	87.2%	1.2%	0.0%		63.1%	6.9%	30.0%	0.0%		6.2%	79.4%	14.4%	0.0%			
Total %	0.5%	1.0%	4.0%	0.0%	5.5%	3.9%	29.0%	0.4%	0.0%	33.3%	8.8%	1.0%	4.2%	0.0%	14.0%	2.9%	37.5%	6.8%	0.0%	47.2%	100.0%	

NOON PEAK	Park Avenue Southbound					US-50 Westbound					Park Avenue Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:15 to 13:15																					
Peak Hour For Entire Intersection Begins at 12:15																					
12:15	0	7	21	0	28	21	149	6	0	176	49	7	17	0	73	11	231	39	0	281	558
12:30	3	6	17	0	26	23	191	2	0	216	48	6	14	0	68	17	222	33	0	272	582
12:45	4	7	27	0	38	28	138	1	0	167	46	4	35	0	85	28	230	49	0	307	597
13:00	3	5	19	0	27	27	195	2	0	224	48	4	30	0	82	22	219	40	0	281	614
Total Volume	10	25	84	0	119	99	673	11	0	783	191	21	96	0	308	78	902	161	0	1141	2351
% App Total	8.4%	21.0%	70.6%	0.0%		12.6%	86.0%	1.4%	0.0%		62.0%	6.8%	31.2%	0.0%		6.8%	79.1%	14.1%	0.0%		
PHF	.625	.893	.778	.000	.783	.884	.863	.458	.000	.874	.974	.750	.686	.000	.906	.696	.976	.821	.000	.929	.957

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-006 US-50-Pioneer Trail.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Pioneer Trail Southbound					US-50 Westbound					Pioneer Trail Northbound					US-50 Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	0	0	1	0	1	47	192	0	0	239	4	0	82	0	86	1	203	3	0	207	533	0
12:15	1	0	3	0	4	31	189	0	0	220	4	0	85	0	89	1	229	4	0	234	547	0
12:30	0	1	1	0	2	43	182	0	0	225	6	0	82	0	88	2	197	1	0	200	515	0
12:45	1	0	2	0	3	33	196	1	0	230	5	2	75	0	82	3	258	8	0	269	584	0
Total	2	1	7	0	10	154	759	1	0	914	19	2	324	0	345	7	887	16	0	910	2179	0
13:00	2	1	0	0	3	51	186	1	0	238	7	1	92	0	100	4	201	3	0	208	549	0
13:15	2	0	0	0	2	32	198	0	0	230	5	0	50	0	55	0	212	4	0	216	503	0
13:30	1	0	3	0	4	31	210	0	0	241	3	0	71	0	74	1	217	4	0	222	541	0
13:45	2	0	2	0	4	50	207	2	0	259	3	0	56	0	59	1	268	5	0	274	596	0
Total	7	1	5	0	13	164	801	3	0	968	18	1	269	0	288	6	898	16	0	920	2189	0
Grand Total	9	2	12	0	23	318	1560	4	0	1882	37	3	593	0	633	13	1785	32	0	1830	4368	0
Apprch %	39.1%	8.7%	52.2%	0.0%		16.9%	82.9%	0.2%	0.0%		5.8%	0.5%	93.7%	0.0%		0.7%	97.5%	1.7%	0.0%			
Total %	0.2%	0.0%	0.3%	0.0%	0.5%	7.3%	35.7%	0.1%	0.0%	43.1%	0.8%	0.1%	13.6%	0.0%	14.5%	0.3%	40.9%	0.7%	0.0%	41.9%	100.0%	

NOON PEAK	Pioneer Trail Southbound					US-50 Westbound					Pioneer Trail Northbound					US-50 Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:15 to 13:15																					
Peak Hour For Entire Intersection Begins at 12:15																					
12:15	1	0	3	0	4	31	189	0	0	220	4	0	85	0	89	1	229	4	0	234	547
12:30	0	1	1	0	2	43	182	0	0	225	6	0	82	0	88	2	197	1	0	200	515
12:45	1	0	2	0	3	33	196	1	0	230	5	2	75	0	82	3	258	8	0	269	584
13:00	2	1	0	0	3	51	186	1	0	238	7	1	92	0	100	4	201	3	0	208	549
Total Volume	4	2	6	0	12	158	753	2	0	913	22	3	334	0	359	10	885	16	0	911	2195
% App Total	33.3%	16.7%	50.0%	0.0%		17.3%	82.5%	0.2%	0.0%		6.1%	0.8%	93.0%	0.0%		1.1%	97.1%	1.8%	0.0%		
PHF	.500	.500	.500	.000	.750	.775	.960	.500	.000	.959	.786	.375	.908	.000	.898	.625	.858	.500	.000	.847	.940

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-007 Bellamy Court-Park Avenue.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Park Avenue Southbound					Bellamy Court Westbound					Park Avenue Northbound					Driveway Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	26	23	5	0	54	4	3	24	0	31	8	28	7	0	43	5	3	13	0	21	149	0
12:15	19	23	8	0	50	2	3	18	0	23	8	18	6	0	32	3	6	11	0	20	125	0
12:30	22	31	2	0	55	7	2	18	0	27	11	19	5	0	35	6	3	12	0	21	138	0
12:45	23	23	8	0	54	5	5	27	0	37	9	20	10	0	39	5	3	13	0	21	151	0
Total	90	100	23	0	213	18	13	87	0	118	36	85	28	0	149	19	15	49	0	83	563	0
13:00	23	28	5	0	56	7	7	26	0	40	10	20	10	0	40	6	6	17	0	29	165	0
13:15	20	19	3	0	42	9	9	30	0	48	12	20	7	0	39	5	3	14	0	22	151	0
13:30	30	21	4	0	55	8	5	38	0	51	15	25	12	0	52	8	2	18	0	28	186	0
13:45	18	21	4	0	43	7	6	22	0	35	12	32	3	0	47	8	9	13	0	30	155	0
Total	91	89	16	0	196	31	27	116	0	174	49	97	32	0	178	27	20	62	0	109	657	0
Grand Total	181	189	39	0	409	49	40	203	0	292	85	182	60	0	327	46	35	111	0	192	1220	0
Apprch %	44.3%	46.2%	9.5%	0.0%		16.8%	13.7%	69.5%	0.0%		26.0%	55.7%	18.3%	0.0%		24.0%	18.2%	57.8%	0.0%			
Total %	14.8%	15.5%	3.2%	0.0%	33.5%	4.0%	3.3%	16.6%	0.0%	23.9%	7.0%	14.9%	4.9%	0.0%	26.8%	3.8%	2.9%	9.1%	0.0%	15.7%	100.0%	

NOON PEAK	Park Avenue Southbound					Bellamy Court Westbound					Park Avenue Northbound					Driveway Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 13:00 to 14:00																					
Peak Hour For Entire Intersection Begins at 13:00																					
13:00	23	28	5	0	56	7	7	26	0	40	10	20	10	0	40	6	6	17	0	29	165
13:15	20	19	3	0	42	9	9	30	0	48	12	20	7	0	39	5	3	14	0	22	151
13:30	30	21	4	0	55	8	5	38	0	51	15	25	12	0	52	8	2	18	0	28	186
13:45	18	21	4	0	43	7	6	22	0	35	12	32	3	0	47	8	9	13	0	30	155
Total Volume	91	89	16	0	196	31	27	116	0	174	49	97	32	0	178	27	20	62	0	109	657
% App Total	46.4%	45.4%	8.2%	0.0%		17.8%	15.5%	66.7%	0.0%		27.5%	54.5%	18.0%	0.0%		24.8%	18.3%	56.9%	0.0%		
PHF	.758	.795	.800	.000	.875	.861	.750	.763	.000	.853	.817	.758	.667	.000	.856	.844	.556	.861	.000	.908	.883

ALL TRAFFIC DATA

City of South Lake Tahoe
All Vehicles on Unshifted
Nothing on Bank 1
Nothing on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 13-7731-008 Lake Parkway -Park Avenue.ppd
Date : 12/14/2013

Unshifted Count = All Vehicles

	Park Avenue Southbound					Lake Parkway Westbound					Park Avenue Northbound					Lake Parkway Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
12:00	29	1	10	0	40	0	19	34	0	53	0	1	0	0	1	7	35	0	0	42	136	0
12:15	28	0	7	0	35	0	29	29	0	58	0	0	0	0	0	5	32	0	0	37	130	0
12:30	33	0	18	0	51	1	24	28	0	53	1	0	0	0	1	5	23	0	0	28	133	0
12:45	25	0	13	0	38	0	20	32	0	52	0	0	0	0	0	7	27	0	0	34	124	0
Total	115	1	48	0	164	1	92	123	0	216	1	1	0	0	2	24	117	0	0	141	523	0
13:00	41	0	13	0	54	0	30	33	0	63	0	0	0	0	0	7	32	0	0	39	156	0
13:15	30	0	12	0	42	0	29	33	0	62	0	0	0	0	0	6	33	0	0	39	143	0
13:30	27	0	18	0	45	0	25	42	0	67	0	0	0	0	0	11	32	0	0	43	155	0
13:45	31	0	12	0	43	0	35	42	0	77	0	0	0	0	0	4	22	0	0	26	146	0
Total	129	0	55	0	184	0	119	150	0	269	0	0	0	0	0	28	119	0	0	147	600	0
Grand Total	244	1	103	0	348	1	211	273	0	485	1	1	0	0	2	52	236	0	0	288	1123	0
Apprch %	70.1%	0.3%	29.6%	0.0%		0.2%	43.5%	56.3%	0.0%		50.0%	50.0%	0.0%	0.0%		18.1%	81.9%	0.0%	0.0%			
Total %	21.7%	0.1%	9.2%	0.0%	31.0%	0.1%	18.8%	24.3%	0.0%	43.2%	0.1%	0.1%	0.0%	0.0%	0.2%	4.6%	21.0%	0.0%	0.0%	25.6%	100.0%	

NOON PEAK	Park Avenue Southbound					Lake Parkway Westbound					Park Avenue Northbound					Lake Parkway Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 13:00 to 14:00																					
Peak Hour For Entire Intersection Begins at 13:00																					
13:00	41	0	13	0	54	0	30	33	0	63	0	0	0	0	0	7	32	0	0	39	156
13:15	30	0	12	0	42	0	29	33	0	62	0	0	0	0	0	6	33	0	0	39	143
13:30	27	0	18	0	45	0	25	42	0	67	0	0	0	0	0	11	32	0	0	43	155
13:45	31	0	12	0	43	0	35	42	0	77	0	0	0	0	0	4	22	0	0	26	146
Total Volume	129	0	55	0	184	0	119	150	0	269	0	0	0	0	0	28	119	0	0	147	600
% App Total	70.1%	0.0%	29.9%	0.0%		0.0%	44.2%	55.8%	0.0%		0.0%	0.0%	0.0%	0.0%		19.0%	81.0%	0.0%	0.0%		
PHF	.787	.000	.764	.000	.852	.000	.850	.893	.000	.873	.000	.000	.000	.000	.000	.636	.902	.000	.000	.855	.962

TRPA 2010 Summer Travel Mode Share Survey Data

Quest	Var Name	Variable Description	Data Type	Width	Values	Actual Question Text (Interviewers' Version)
1	SAMPN	Sample Number	N	7	Assigned unique identifier	
2	VPURPFLAG		N	1	1=VPURP=3 and O_VACLAX WAS IMPUTED WITH VACATION/RELAXATION 2=VPURP=2 and O_PERSBUS WAS IMPUTED WITH PERSONAL BUSINESS	
3	DAYFLAG		N	1	1=NIGHTS VS ABODE CONFLICT	
4	TRPPYFLAG		N	1	1=LARGE TRAVEL PARTY (>10)	
5	CONSENT	Consent to Survey	N	2	1= Yes 2= No 99= DK/RF	May I please conduct the survey with you?
6	STATUS	Residence Status (calculated)	N	2	1=Full time residence 2=Seasonal residence 3=Visitors	
7	FTRES	Full Time Residency	N	1	1=Yes 2=No	Are you a full time resident of the Tahoe Basin?
8	SEARES	Seasonal Residency [FTRES=2]	N	1	1=Yes 2=No	Are you a seasonal resident?
9	VIS	Not residence, visitor [SEARES=2]	N	1	1=Yes 2=No	Or are you visiting the Tahoe Basin on vacation or business?
10	VPURP	Visiting, trip purpose	N	1	1=Work 2=Personal Business, SPECIFY 3=Vacation/Relaxation, SPECIFY	IF VISITOR: What is your primary purpose for visiting the Tahoe Basin?
11	O_PERSBUS	Visiting, trip purpose [VPURP=2]	C	60	Open	Personal Business, Specify
12	O_VACLAX	Visiting, trip purpose [VPURP=3]	C	60	Open	Vacation/Relaxation, Specify
13	NIGHTS	Length of Stay	N	2	1= Day 2= 1 Night 3= 2 Nights 4= 3 Nights 5= 4-7 Nights 6=More than 1 week, SPECIFY 99=Refused	IF VISITOR/SEASONAL RESIDENT: How many nights will you be staying in the Tahoe Basin?
13	O_NIGHTS	Length of Stay [NIGHTS=6]	C	60	Open	Length of Stay, Specify
14	TIMES	Visits to Tahoe in 2009	N	2	1=1 time 2=2 - 3 times 3=4 - 6 times 4=Greater than 6 times 99=DK/RF	IF VISITOR/SEASONAL RESIDENT: How many times in 2009 will you or have you come to Lake Tahoe?
15	ABODE	Household structure type	N	2	1=Single family detached (includes cabin) 2=Duplex, 4-plex, townhome 3=Apartment 4=Mobile home 5=Motel/Hotel 6=Campground (including RV, tents and campers) 7=Not staying overnight 97=Other, SPECIFY	What best describes where you are staying?
15	O_ABODE	Household structure type [ABODE=97]	C	30	Open	What best describes where you are staying?, Specify
16	ANAME	Name	C	60	Open	What is the name and address of the place you are staying?
16	AADDR	Address	C	60	Open	What is the name and address of the place you are staying?
16	AAPT	Apartment	C	4	Open	What is the name and address of the place you are staying?
16	ACITY	City	C	60	Open	What is the name and address of the place you are staying?
16	AZIP	Zip	N	5	Open	What is the name and address of the place you are staying?
17	AXST1	Cross streets 1	C	60	Open	IF ADDRESS IS UNKNOWN: What are the nearest cross streets?
17	AXST2	Cross street 2	C	60	Open	IF ADDRESS IS UNKNOWN: What are the nearest cross streets?
18	STATUS_GEO	Arcview geocoding status	C	1	M = Matched O = Out of area U = Unmatched Z = Zip code centroid	
19	MATCH_ADDR	Address Used for Geocoding	C	60	Open	
19	TAZ	Traffic analysis zone	N	9		
20	X_COORD	Longitude	N	20.5		
20	Y_COORD	Latitude	N	20.5		
21	SITE	Site surveyed	N	2	See Tab 2: SITECODES	Site Location
22	SHORE	Shore of Survey Location	N	1	1= South Shore 2= North Shore	Site Location, Shore of Location
23	SITE_X_COORD	Longitude	N	20.5		
23	SITE_Y_COORD	Latitude	N	20.5		
24	SITE_TAZ	Traffic analysis zone	N	9		
24	SITE_STATUS	Arcview geocoding status	C	1	M = Matched O = Out of area U = Unmatched Z = Zip code centroid	
25	OPURP	Origin, trip purpose	N	2	0=Home 1= Lodging 2=Work 3=Shopping 4=School/College 5=Recreation/social visit 6=Personal business/errand 7=Medical 97=Other 99=DK/RF	Where are you coming from?
26	ONAME	Origin Name [IF OPURP<>0]	C	60	Open	What is the name of that place?

Quest	Var Name	Variable Description	Data Type	Width	Values	Actual Question Text (Interviewers' Version)
27	MODE1	Mode to activity	N	2	1=Car/Truck/Van (rented, owned, or leased) 2=Motorcycle/Moped 3=School Bus 4=Public Transit 5=Paratransit 6=Casino shuttle 7=Private shuttle 8=Taxi/Limousine 9=Gondola 10=Ferry or Boat 11=Bicycle 12=Walk 97= Other, SPECIFY 99=RF --> THANK AND TERMINATE	How did you get here? MULTIPLE RESPONSE - TERMINATE IF REFUSED
27	MODE2	Mode to activity	N	2	1=Car/Truck/Van (rented, owned, or leased) 2=Motorcycle/Moped 3=School Bus 4=Public Transit 5=Paratransit 6=Casino shuttle 7=Private shuttle 8=Taxi/Limousine 9=Gondola 10=Ferry or Boat 11=Bicycle 12=Walk 97= Other, SPECIFY 99=RF --> THANK AND TERMINATE	How did you get to the place? MULTIPLE CHOICE
27	MODE3	Mode to activity	N	2	1=Car/Truck/Van (rented, owned, or leased) 2=Motorcycle/Moped 3=School Bus 4=Public Transit 5=Paratransit 6=Casino shuttle 7=Private shuttle 8=Taxi/Limousine 9=Gondola 10=Ferry or Boat 11=Bicycle 12=Walk 97= Other, SPECIFY 99=RF --> THANK AND TERMINATE	How did you get to the place? MULTIPLE CHOICE
27	O_MODE	Mode to activity, OTHER	C	60	Open	Mode of Travel, Specify
28	DPURP	Main Purpose	N	2	1 = At home activities (sleeping, watching TV, eating, personal care, housework, etc.) 2 = At home - work related 3 = Work 4 = Work-related 5 = Eating or drinking at restaurant/bar 6 = Minor Shopping (frequent, grocery, clothes) 7 = Major Shopping (occasional, COSTCO, appliance, car, etc.) 8 = Quick stop (gas, ATM, coffee, newspaper) 9 = Medical 10 = Personal business (bank, pay bill, etc.) 11 = Outdoor recreation participation (skiing, snowmobiling, fishing, hiking, etc.) 12 = Indoor recreation participation (bowling, ice skating, etc.) 13 = Entertainment (movie, sports event, show, etc.) 14 = Casino Gaming 15 = Visiting friends or relatives 16 = Religious 17 = Community/Political meeting 18 = School 19 = Picking up someone 20 = Dropping off someone 21 = Loop Trip (walking dog around block) 22 = Riding along with someone on their trip 97 = Other, SPECIFY 99 = DK/RF	What is the primary purpose of this specific trip to this location?
28	O_DPURP	Main Purpose [DPURP=97]	C	60	Open	What is the primary purpose of this trip?, Specify

Quest	Var Name	Variable Description	Data Type	Width	Values	Actual Question Text (Interviewers' Version)
29	DPTM	Duration at Location	N	3	Open 999=DK/RF	How long will you stay at this trip location?
29	DPMH	Duration at Location	N	1	1= Minutes 2= Hours 99=DK/RF	How long will you stay at this trip location?
30	TRPPY	Members in Travel Party Inc. Self	N	2	99=DON'T KNOW/ REFUSED	How many people, including yourself, are in your immediate party and are traveling with you on this specific trip?
31	TOTPY	Party Size During Stay [IF VISITOR]	N	3	Open 99=DON'T KNOW/ REFUSED	IF VISITOR: How many people are you traveling with during your stay in the Tahoe region?
32	EMPLOY	Work Status, MULTIPLE RESPONSE	N	2	1= Employed full-time 2= Employed part-time 3= Regular Volunteer 4= Retired 5= Full-time homemaker 6= Full-time student, not working 7= Disabled 8= Unemployed, looking for work 9= Unemployed, not looking for work 97= Other, SPECIFY 99= DK/ RF	Which of the following currently describes your situation? MULTIPLE RESPONSE
32	EMPLOY2	Work Status, MULTIPLE RESPONSE	N	2	1= Employed full-time 2= Employed part-time 3= Regular Volunteer 4= Retired 5= Full-time homemaker 6= Full-time student, not working 7= Disabled 8= Unemployed, looking for work 9= Unemployed, not looking for work 97= Other, SPECIFY 99= DK/ RF	Which of the following currently describes your situation? MULTIPLE RESPONSE
32	EMPLOY3	Work Status, MULTIPLE RESPONSE	N	2	1= Employed full-time 2= Employed part-time 3= Regular Volunteer 4= Retired 5= Full-time homemaker 6= Full-time student, not working 7= Disabled 8= Unemployed, looking for work 9= Unemployed, not looking for work 97= Other, SPECIFY 99= DK/ RF	Which of the following currently describes your situation? MULTIPLE RESPONSE
32	O_EMPLOY	Work Status, Specify [EMPLOY=97 OR EMPLOY2=97 OR EMPLOY3=97]	C	60	Open	Which of the following currently describes your situation?, Specify
33	EMPTYPE	EMPLOYMENT TYPE	N	2	1=Retail 2=Service 3=Recreation 4=Gaming 5=Professional Services 6=Government 7=Construction 97=Other 99=DON'T KNOW/ REFUSED	IF EMPLOYED FULL OR PART TIME: Please describe your type of employment
33	EMPTYPE2	EMPLOYMENT TYPE	N	2	1=Retail 2=Service 3=Recreation 4=Gaming 5=Professional Services 6=Government 7=Construction 97=Other 99=DON'T KNOW/ REFUSED	IF EMPLOYED FULL OR PART TIME: Please describe your type of employment
33	EMPTYPE3	EMPLOYMENT TYPE	N	2	1=Retail 2=Service 3=Recreation 4=Gaming 5=Professional Services 6=Government 7=Construction 97=Other 99=DON'T KNOW/ REFUSED	IF EMPLOYED FULL OR PART TIME: Please describe your type of employment
34	AGE	Age	N	3	999=DK/RF	What is your age?
34	REC_AGE		N	2	1=17-24 2=25-34 3=35-44 4=45-54 5=55-64 6=65 or more 9=RF	What is your age in years?
35	INCOME	Total 2009 annual household income	N	2	1=Above $50K 2=Below $50K 3=Less than $10,000 4=$10,000 - $20,000 5=$20,000 - $35,000 6=$35,000 - $50,000 7=$50,000 - $75,000 8=$75,000 - $100,000 9=$100,000 - $150,000 10= $150,000 - $300,000 11= $300,000 - $500,000 12= Over $500,000 99=DON'T KNOW/ REFUSED	What was the total income by all members of your household in 2009?
36	SPEND	Spending money	N	2	1=Less than $500 2=$501 to $1,000 3=$1,001 to $2,000 4=Greater than $2,000 99=DK/RF	IF VISITOR: How much money do you anticipate that your traveling party will spend on this trip to Tahoe? (A guess is ok if you are not sure)
37	GENDER	Gender	N	1	1=Male 2=Female	Gender

SITE	CODE
274 KINGSBURY	1
276 KINGSBURY	2
376 KINGSBURY	3
64 ACRE	4
BALDWIN BEACH	5
BIJOU AL TAHOE CP	6
CAMP RICHARDSON	7
CARNELIAN BAY LAKE	57
CAVE ROCK	8
CHIMNEY BEACH	58
COMMONS BEACH	9
CRYSTAL BAY CASINO	59
DOLLAR HILL	10
EAGLE FALLS	11
EL DORADO BEACH	12
EL DORADO BEACH RAMP	13
GLEN ALPINE	14
SOUTH STATELINE - GONDOLA	15
SOUTH STATELINE - HEAVENLY VILLAGE	16
HOMEWOOD	17
INCLINE TENNIS	18
INCLINE VILLAGE	19
INCLINE VILLAGE TOURIST CENTER	20
INSPIRATION POINT	21
KAHLE COMMUNITY PARK AND CENTER	22
KINGS BEACH	23
KINGS BEACH COMMERCIAL	24
KINGS BEACH LAKE ACCESS	25
LAKE VALLEY STATE RECREATION AREA	26
LAKESIDE BEACH MARINA	27
LOGAN SHOALS VISTA	28
LTCC COMMUNITY BALL FIELDS	29
MEEKS BAY TRAIL	30
MEYERS	31
NORTH STATELINE	32
NORTH TAHOE REGIONAL PARK	33
SOUTH Y COMMERCIAL - OUTLET STORES Y	34
POPE BEACH	35
SOUTH Y COMMERCIAL - RALEYS Y	36
RECREATION CENTER	60
REGAN BEACH	37
ROUND HILL COMMUNITY	38
SAND HARBOR	39
SAWMILL POND	40
SIERRA TRACT	41

SKI RUN	42
SOUTH STATELINE	43
SOUTH STATELINE - HARRAHS	44
SOUTH STATELINE - HARVEYS	45
SOUTH Y COMMERCIAL	46
SPOONER LAKE	47
SUGAR PINE POINT	48
SUNNYSIDE	49
TAHOE CITY	50
TAHOE CITY LAKE BLVD	61
TAHOE CITY MARINA	51
PARADISE PARK	62
TAHOE STATE RECREATION AREA	52
TAHOE VISTA COMMERCIAL	53
TAHOMA COMMERCIAL	54
TAHOE STATE RECREATION AREA - WILLIAM KENT PARK	55
ZEPHYR COVE MARINA	56

Category 1a: Visitors that are Day Trips From Outside of the Basin (i.e. Reno, Sacramento, Carson City)

Visitor + Nights =1 (day)

SAMPN	VIS	NIGHTS	ANAME	AADDR	AAPT	ACITY	AZIP	AXST1	SITE	MODE_1	MODE_2	MODE_3	O_MODE	DPURP	O	DPURP	DPTM	DPMH	TRPPY
5358	1	1							16	1				5		003	2	5	
5357	1	1							16	1				5		002	2	1	
5167	1	1							43	1				5		001	2	4	
5157	1	1				GARDNERVILLE	89410	MASA DR	43	1				5		030	1	1	
4414	1	1							44	1				14		002	2	3	
4032	1	1				FOLSOM			44	1				5		005	2	3	
4416	1	5	RENO						44	4				14		005	2	30	

Total Surveys: 7

Travel Mode:

Car	6	86%
Public Transit	1	14%

Category 1b: Visitors from other Tahoe Basin Locations (i.e. Staying in North Shore or West Shore)

Visitor + location of stay outside of south shore

4430	1	5	HYATT			INCLINE VILLAGE	89451	INCLINE	15	1				97	BROWSIN	004	2	6	

Total Surveys: 1

Travel Mode:

Car	1	100%

Total Category 1

Total Surveys: 8

Travel Mode:

Car	7	88%
Public Transit	1	13%

Notes: This sample size is very small. Use overall day visitor numbers - see Day Visitor Tab.

Use:	**98%**	**Car/Motorcycle**
	2%	**Transit/Other**

Category 2a: Visitors staying in Southshore in Close Proximity to Gondola (w/in 1 mil Based on hotel or x-streets

4433	1	4	GRAND RESIDENCE			SOUTH LAKE TAI	96150	NEAR STATEL	15	1				6		001	2	4	
4435	1	5	HARVEY'S			STATELINE	89449		15	1				97	WATCHIN	001	2	2	
4434	1	5	ROADWAY INN			SOUTH LAKE TAI	96150	CEDAR	15	1				97	BREATH A	001	2	4	
4431	1	3	MARRIOTT GRAND			SOUTH LAKE TAI	96150	PINE	15	1				97	GOING TC	001	2	3	
4427	1	5	HARRAH'S			SOUTH LAKE TAI	96150	PIONEER TRA	15	1				11		002	2	2	
4428	1	4	BIG PINES					ACROSS FOR	15	1				11		002	2	6	
4425	1	4	BEST WESTERN			SOUTH LAKE TAI	96150	ACROSS FRO	15	1				97	BROWSE	001	2	2	
4424	1	5	HORIZON			SOUTH LAKE TAI	96150	PARK AVE	15	1				6		030	1	2	
4426	1	6				STATELINE	89449		16	1				97	GET INFO	002	2	1	
4422	1	5	FOREST SUITES			SOUTH LAKE TAI	96150		16	1				5		002	2	2	
4421	1	4				STATE LINE	89449		16	1				11		002	2	3	
4420	1	5	MARRIOTT			SOUTH LAKE TAI	96150		43	1				97	SANDALS	015	1	4	
4419	1	5	BEST WESTEF	TIMBER LODGE		SOUTH LAKE TAI	96150	BASE OF HEA	44	1				11		002	2	2	
4417	1	5	TIMBER LODGE			SOUTH LAKE TAI	96150		44	1				11		002	2	6	
4418	1	2	PARK AVE			STATELINE	89449		16	2				11		001	2	4	
4745	1	5	RIDGE TAHOE			STATELINE	89449		43	2				5		002	2	1	
4744	1	5	AMERICANA	PIONEER		STATELINE	89449		43	8	8			6		002	2	2	
4743	1	3	HARRAH'S			SOUTH LAKE TAI	96150	WEAR STATEI	15	12				6		002	2	2	
4742	1	3	MARRIOTT			STATELINE	89449	STATELINE	15	12				6		002	2	3	
4741	1	3	FOREST SUITES			SOUTH LAKE TAI	96150	NEAR STATEL	15	12				6		020	1	3	
4739	1	3	HORIZON	HWY 50		STATELINE	89449	STATELINE	15	12				5		003	2	2	
4738	1	5	BLUE LAKE MC	FRIDAY		SOUTH LAKE TAI	96150	S LAKE TAHOI	15	12				5		002	2	4	
4736	1	4	BEST WESTERN	STATION		SOUTH LAKE TAI	96150	TIMBER LODG	15	12				5		002	2	5	
4735	1	5	HARVEY'S	HWY 50		SOUTH LAKE TAI	96150	STATELINE	15	12				5		001	2	2	
4734	1	3	EMBASSY SUI	HWY 50		SOUTH LAKE TAI	96150		16	12				6		030	1	2	
5356	1	4		LAKE VILLAGE		STATELINE	89449		16	12				5		006	2	4	
5354	1	5	HARRAH'S			SOUTH LAKE TAI	96150		16	12				5		006	2	2	
5355	1	3	HARVEY'S			SOUTH LAKE TAI	96150		16	12				5		002	2	2	
5353	1	5	FOREST SUITES			STATELINE	89449		16	12				5		002	2	3	
5351	1	2	TAHOE INN			SOUTH LAKE TAI	96150		16	12				6		001	2	1	
5350	1	3	HARRAH'S			STATELINE	89449		16	12				5		003	2	1	
4749	1	5	HARRAH'S			SOUTH LAKE TAI	96150		16	12				5		002	2	1	
4748	1	3	HARVEY'S			STATE LINE	89449		16	12				8		010	1	2	
4747	1	2	HARRAH'S	HWY 50		STATE LINE	89449		16	12				5		002	2	2	
4746	1	3	CAPRI MOTEL			SOUTH LAKE TAI	96150		16	12				5		001	2	2	
5166	1	5	MARRIOTT			SOUTH LAKE TAI	96150		16	12				13		003	2	3	
5164	1	5	MONT BLEU	HWY 50		STATE LINE	89449		16	12				5		001	2	2	
5161	1	5	HARVEY'S			STATE LINE	89449		16	12				6		002	2	2	
5160	1	4	ROADWAY INN	PARK AVENUE		STATELINE	89449		16	12	1			5		003	2	2	
5158	1	4	HARRAH'S	HWY 50		SOUTH LAKE TAI	96150		16	12				5		030	1	2	
5156	1	5	GRAND RESIDENCE			SOUTH LAKE TAI	96150		43	12				6		030	1	10	
5154	1	5	HARRAH'S	HWY 50		STATELINE	89449		43	12				5		030	1	2	
4413	1	5	HARRAH'S			STATELINE	89449		43	12				97	OBSERVE	015	1	2	
4411	1	6	TIMBER LODGE			SOUTH LAKE TAI	96150		43	12				97	GAMBLE	002	2	1	
4409	1	5	HARRAH'S	HARVEY'S		STATELINE	89449	STATELINE	44	12				6		010	1	2	
4402	1	2	HORIZON			STATELINE	89449	STATELINE	44	12				97	VACATION	002	2	2	
4031	1	3	AMERICANA	PIONEER TRAIL		STATELINE	89449	STATELINE	44	12				5		002	2	2	
4033	1	3	HARVEY'S			SOUTH LAKE TAI	96150		44	12				14		005	1	2	
4035	1	3	HARRAH'S			STATELINE	89449		44	12				5		008	2	2	
4036	1	5	HARVEY'S			STATELINE	89449		44	12				11		002	2	2	
4037	1	3	MONT BLEU			STATELINE	89449		44	12				5		002	2	2	
4039	1	5	STARDUST	HWY 50		STATELINE	89449		44	12				5		002	2	2	
4041	1	3	HARRAH'S	HWY 50		STATELINE	89449		44	12				6		001	2	2	
4042	1	5	HARVEY'S			STATELINE	89449		44	12				14		002	2	2	
4043	1	6	ELIZABETH LC	PIONEER		SOUTH LAKE TAI	96150		44	12				14		002	2	1	
4044	1	5	MARRIOTT	HWY 50		SOUTH LAKE TAI	96150		44	12				14		002	2	1	
4045	1	5	EMBASSY SUITES			SOUTH LAKE TAI	96150		44	12				4		008	2	2	
4038	1	5	HARVEY'S	HWY 50		STATELINE	89449		45	12				14		005	2	2	

Total Surveys: 58

Travel Mode:

Car	14	24%
Motorcycle	2	3%
Taxi	1	2%
Walk	41	71%

Use:	**30%**	**Car/Motorcycle**
	70%	**Walk/Bike/Transit**

Category 2b: Visitors in Southshore that are farther away from Gondola (greater than 1 miles Based on hotel or x-streets

4438	1	5	KINGSBURY CROSSING			SOUTH LAKE TAI	96150	S LAKE TAHOI	15	1				5		015	1	2	
4436	1	5	TAHOE BEACH & SKI			SOUTH LAKE TAI	96150	TRAVERSE	15	1				6		001	2	2	
4432	1	5				SOUTH LAKE TAI	96150	KELLER	15	1				11		004	2	7	
4429	1	5	TAHOE SEASONS			SOUTH LAKE TAI	96150		16	1				6		001	2	2	
4740	1	4		NEEDLE PEAK		STATELINE	89449		16	1				5		001	2	3	
4737	1	4		MILKY WAY		SOUTH LAKE TAI	96150		43	1				5		090	1	4	

5359	1	5	LAKELAND VIL	LAKE TAHOE BLVD	STATELINE	89449	HWY 50	43	1		5	005	2	1
5352	1	3	LAKESHORE LODGE		SOUTH LAKE TAI	96150		43	1		5	002	2	2
5169	1	4	LAKELAND VILLAGE		SOUTH LAKE TAI	96150	BEACHER ST	43	1		13	003	2	2
5168	1	5			SOUTH LAKE TAI	96150		43	1		5	015	2	6
5162	1	5	SUPER 8 MOT	HWY 50	SOUTH LAKE TAI	96150		43	1		6	001	2	2
5159	1	5						44	1		6	001	2	4
5155	1	5	TAHOE SEASON		SOUTH LAKE TAI	96150	S LAKE TAHOI	44	1		5	030	1	2
5152	1	5	TAHOE BEACH	HWY 50	STATELINE	89449	KINGSBURY	44	1		5	001	2	2
4410	1	3	BLISS PARK		STATELINE	89449		44	1		11	010	1	7
4404	1	2	QUALITY INN		SOUTH LAKE TAI	96150		16	7		14	002	2	2
4415	1	5	ROYAL RIDGE		STATELINE	89449	207	15	12		15	005	1	7
4034	1	6	RIDGE TAHOE		SOUTH LAKE TAI	96150		16	12		5	003	2	2

Total Surveys: 18

Travel Mode:

Car	15	83%
Shuttle	1	6%
Walk	2	11%

Use:

98% Car/Motorcycle (Include with Category 1)
2% Transit/Other

Category 3: Locals

Based on Visitor vs. Local Question

4423	2			SOUTH LAKE TAI	96150	APACHE	15	1		11		001	2	2
5165	2			STATELINE	89449	COTTONWOO	43	1		6		020	1	1
5163	2			SOUTH LAKE TAI	96150	OSAGE CIR	43	1		6		020	1	99
5153	2			SOUTH LAKE TAI	96150	ELF LANE	43	1		3		010	2	1
5151	2			SOUTH LAKE TAI	96150	EMERALD BA	43	11	4	3		008	2	1
5150	2			SOUTH LAKE TAI	96150	SKI RUN	44	11		3		006	2	1
4408	2			SOUTH LAKE TAI	96150	MEADOW CRE	43	12		97	BICYCLE	002	2	1
4407	2			SOUTH LAKE TAI	96150	STATELINE	44	12		11		005	1	1
4406	2			SOUTH LAKE TAI	96150	SKI RUN	44	12		97	TRANSPO	005	1	3
4405	2			RENO	89523	SIMONS	44	12		97	CHECK R	010	1	2
4040	2		BARTON	STATELINE	89449		44	12		3		005	1	1

Total Surveys: 11

Travel Mode:

Car	4	36%
Bicycle	2	18%
Walk	5	45%

Notes: This sample size is very small. Use overall local numbers - see Locals Tab.

Use:

82% Car/Motorcycle/Taxi
10% Bicycle
6% Walk
2% Transit

Distribution of Visitor Types to South Shore Destinations

	Total Surveys	% of Total
Category 1a	7	7.4%
Category 1b	1	1.1%
Category 2a	58	61.1%
Category 2b	18	18.9%
Category 3	11	11.6%
	95	100.0%

Use:

27% Category 1a, 1b, and 2b
61% Category 2a
12% Category 3

All Day Visitors Tab

SAMPN	VIS	NIGHTS	ACITY	SITE	MODE_1
4313	1	1	POLLOCK	6	1
4374	1	1	SOUTH LA	6	1
4372	1	1	SOUTH LA	6	1
4220	1	1		41	1
4172	1	1		37	1
4167	1	1		37	1
4165	1	1		37	1
4164	1	1		37	1
4386	1	1		37	1
4381	1	1		37	1
4214	1	1		12	1
4209	1	1		12	1
4208	1	1		12	1
4203	1	1		12	1
4155	1	1		13	1
4153	1	1		13	1
4466	1	1		20	1
4471	1	1		20	1
4140	1	1		56	1
4095	1	1	SPANISH S	56	1
4003	1	1	GENOA	2	1
4019	1	1	GARDNER	2	1
5286	1	1		21	1
5296	1	1	RENO	21	1
5214	1	1		11	1
4032	1	1	FOLSOM	44	1
5556	1	1		5	1
5554	1	1		5	1
4622	1	1	CARSON C	38	1
4841	1	1	CARSON C	5	1
4826	1	1		5	1
4181	1	1	SOUTH LA	59	1
4347	1	1	MINDEN	22	1
4605	1	1	CARSON C	22	1
4333	1	1	RENO	19	1
5728	1	1	RENO	11	1
5720	1	1		11	1
5705	1	1	MINDEN	11	1
5245	1	1		11	1
5270	1	1	RENO	50	1
5265	1	1	RENO	50	1
5021	1	1	SACRAME	57	1
4946	2	1	RENO	25	1
5278	1	1	RENO	23	1
5272	1	1	OAKLAND	23	1
5105	1	1		42	1
5095	1	1		42	1
4123	1	1	SOUTH LA	33	1
4939	1	1		51	1
4856	1	1		46	1
4859	1	1		46	1
5258	1	1		48	1
4916	1	1		48	1

4981	1	1		39	1
4980	1	1		39	1
5118	1	1		58	1
5115	1	1	RENO	58	1
5112	1	1	RENO	58	1
5109	1	1	CARSON (	58	1
5563	1	1		5	1
4130	1	1		8	1
4131	1	1		8	1
4135	1	1		8	1
4137	1	1		8	1
4080	1	1		8	1
4520	1	1	SACRAME	14	1
4709	1	1		34	1
4899	1	1	CARSON (	32	1
4898	1	1		32	1
4897	1	1		32	1
5122	1	1	RENO	50	1
5167	1	1		43	1
5157	1	1	GARDNER	43	1
5147	1	1		50	1
5143	1	1		50	1
4247	1	1		20	1
4246	1	1		20	1
4243	1	1		20	1
4241	1	1	TRUCKEE	20	1
4240	1	1		20	1
4293	1	1	DAYTON	11	1
4952	1	1		7	1
4951	1	1	PLACERVI	7	1
4655	1	1		35	1
4654	1	1		35	1
4651	1	1		35	1
4914	1	1		32	1
4910	1	1		32	1
4689	1	1	CARSON (	58	1
4883	1	1		38	1
4806	1	1	TRUCKEE	24	1
4803	1	1	CARSON (	24	1
4446	1	1		24	1
4442	1	1	TRUCKEE	24	1
5174	1	1		47	1
5171	1	1		47	1
5170	1	1		47	1
5249	1	1		11	1
4678	1	1		42	1
4670	1	1		42	1
4667	1	1		42	1
5194	1	1	CARSON (	30	1
5358	1	1		16	1
5357	1	1		16	1
5211	1	1	SACRAME	11	1
5206	1	1	TAHOE CI	52	1
5204	1	1	RENO	52	1
5387	1	1		24	1

5375	1	1		24	1
5368	1	1		24	1
5371	1	1		24	1
4144	1	1		56	1
5058	1	1	ELDORAD	21	1
5053	1	1		21	1
4561	1	1	BAY AREA	11	1
4553	1	1		11	1
4526	1	1		21	1
5366	1	1		47	1
5364	1	1	CARSON (	47	1
5362	1	1		47	1
4414	1	1		44	1
5576	1	1		24	1
5579	1	1	CARSON (	24	1
5588	1	1	RENO	24	1
5595	1	1		24	1
4844	1	1		23	1
4848	1	1		23	1
5900	1	1		23	1
5903	1	1	MINDEN	23	1
5905	1	1	SHINGE S	23	1
5907	1	1	RENO	23	1
5311	1	1		19	1
5317	1	1	RENO	19	1
5742	1	1		50	1
5858	1	1	RENO	61	1
4467	1	1		20	2
5041	1	1	SACRAME	21	2
4338	1	1	SPARKS	19	2
4901	1	1	CARSON (	32	2
4401	1	1		20	2
4248	1	1		20	2
4244	1	1		20	2
4242	1	1		20	2
4680	1	1		58	2
4668	1	1		42	2
4070	1	1		8	10
5079	1	1		5	11

Total Surveys:	147	
Travel Mode:		
Car	135	92%
Motorcycle	10	7%
Ferry/Boat	1	1%
Bicycle	1	1%

All Locals Tab

SAMPN	STATUS	SITE	MODE_1
4310	1	6	1
4309	1	6	1
4378	1	6	1
4377	1	6	1
4376	1	6	1
4373	1	6	1
4371	1	6	1
4370	1	6	1
4367	1	6	1
4366	1	6	1
4364	1	6	1
4163	1	1	1
4162	1	3	1
4161	1	2	1
4160	1	2	1
4159	1	2	1
4158	1	2	1
4389	1	37	1
4385	1	37	1
4383	1	37	1
4100	1	31	1
4102	1	31	1
4105	1	31	1
4106	1	31	1
4107	1	31	1
4108	1	31	1
4110	1	31	1
4113	1	31	1
4363	1	26	1
4361	1	26	1
4360	1	26	1
4359	1	26	1
4355	1	26	1
4351	1	26	1
4307	1	26	1
4305	1	26	1
4308	1	26	1
4201	1	12	1
4323	1	6	1
4321	1	6	1
4319	1	6	1
4318	1	6	1
4315	1	6	1
4314	1	6	1
4463	1	20	1
4472	1	20	1
4473	1	20	1
4474	1	20	1
4476	1	20	1
4477	1	20	1
4141	1	56	1
4083	1	56	1
4085	1	56	1

4086	1	56	1
4087	1	56	1
4088	1	56	1
4090	1	56	1
4092	1	56	1
4096	1	56	1
4099	1	56	1
4342	1	22	1
4344	1	22	1
4345	1	22	1
4004	1	2	1
4005	1	2	1
4006	1	2	1
4007	1	2	1
4009	1	2	1
4013	1	2	1
4014	1	2	1
4016	1	2	1
4017	1	2	1
4020	1	2	1
5285	1	21	1
5289	1	21	1
5290	1	21	1
5292	1	21	1
5293	1	21	1
5295	1	21	1
5300	1	21	1
5049	1	21	1
5047	1	21	1
5046	1	21	1
5044	1	21	1
5043	1	21	1
5225	1	11	1
5221	1	11	1
5219	1	11	1
5217	1	11	1
4277	1	28	1
4002	1	2	1
5559	1	5	1
5551	1	5	1
4628	1	38	1
4625	1	38	1
4624	1	38	1
4623	1	38	1
4621	1	38	1
4620	1	38	1
4617	1	38	1
4616	1	38	1
4615	1	38	1
4614	1	38	1
4613	1	38	1
4612	1	38	1
4837	1	5	1
4834	1	5	1
4833	1	5	1

4830	1	5	1
4827	1	5	1
4824	1	5	1
4178	1	54	1
4348	1	22	1
4349	1	22	1
4600	1	22	1
4601	1	22	1
4603	1	22	1
4606	1	22	1
4274	1	22	1
4267	1	22	1
4271	1	22	1
4273	1	22	1
4334	1	19	1
4335	1	19	1
4336	1	19	1
4337	1	19	1
4340	1	19	1
4341	1	19	1
4186	1	20	1
4188	1	20	1
4190	1	20	1
4191	1	20	1
5730	1	11	1
5724	1	11	1
5712	1	11	1
5268	1	50	1
5266	1	50	1
5263	1	50	1
5260	1	50	1
5259	1	50	1
5027	1	9	1
5025	1	9	1
5018	1	57	1
4631	1	57	1
4630	1	57	1
5028	1	4	1
4948	1	25	1
4941	1	25	1
5279	1	23	1
5275	1	23	1
5273	1	23	1
5004	1	50	1
5003	1	50	1
4999	1	50	1
4998	1	50	1
4994	1	50	1
4993	1	50	1
4991	1	50	1
4990	1	50	1
4989	1	50	1
4988	1	50	1
5100	1	42	1
5092	1	42	1

5090	1	42	1
4229	1	18	1
4230	1	18	1
4231	1	18	1
4232	1	18	1
4236	1	18	1
4396	1	18	1
4399	1	18	1
4450	1	18	1
4452	1	18	1
4453	1	18	1
4455	1	18	1
4120	1	33	1
4125	1	33	1
4127	1	33	1
4061	1	33	1
4065	1	33	1
5034	1	21	1
4938	1	51	1
4934	1	51	1
4858	1	46	1
4860	1	46	1
4861	1	46	1
4864	1	46	1
4865	1	46	1
4870	1	46	1
5253	1	48	1
5251	1	48	1
5012	1	50	1
5011	1	50	1
5007	1	50	1
4987	1	39	1
4984	1	39	1
4983	1	39	1
4979	1	39	1
4978	1	39	1
4977	1	39	1
4636	1	9	1
5119	1	58	1
5111	1	58	1
5108	1	58	1
5573	1	5	1
5567	1	5	1
5566	1	5	1
4486	1	40	1
4487	1	40	1
4500	1	14	1
4507	1	14	1
4508	1	14	1
4133	1	8	1
4068	1	8	1
4069	1	8	1
4073	1	8	1
4075	1	8	1
4081	1	8	1

4147	1	14	1
4512	1	14	1
4517	1	14	1
4519	1	14	1
4521	1	14	1
4255	1	60	1
4257	1	60	1
4258	1	60	1
4259	1	60	1
4260	1	60	1
4261	1	60	1
4262	1	60	1
4263	1	60	1
4264	1	60	1
4265	1	60	1
4266	1	60	1
4712	1	36	1
4716	1	36	1
4718	1	36	1
4490	1	46	1
4903	1	32	1
4902	1	32	1
4894	1	32	1
4893	1	32	1
4975	1	42	1
4972	1	42	1
4968	1	42	1
4962	1	42	1
4961	1	42	1
5131	1	50	1
5125	1	50	1
5121	1	50	1
5165	1	43	1
5153	1	43	1
5148	1	50	1
5144	1	50	1
5141	1	50	1
5139	1	50	1
5138	1	50	1
5135	1	50	1
4332	1	53	1
4331	1	53	1
4329	1	53	1
4059	1	17	1
4054	1	17	1
4116	1	49	1
4117	1	49	1
4119	1	49	1
4254	1	41	1
4400	1	20	1
4249	1	20	1
4245	1	20	1
4238	1	20	1
4284	1	11	1
4278	1	11	1

4295	1	35	1
4913	1	32	1
4912	1	32	1
4911	1	32	1
4905	1	32	1
4904	1	32	1
4423	1	15	1
4685	1	58	1
4682	1	58	1
5083	1	38	1
5082	1	38	1
5081	1	38	1
5080	1	38	1
4891	1	38	1
4889	1	38	1
4888	1	38	1
4886	1	38	1
4882	1	38	1
4881	1	38	1
4880	1	38	1
4878	1	38	1
4877	1	38	1
4875	1	38	1
4874	1	38	1
4872	1	38	1
4871	1	38	1
5702	1	32	1
4698	1	32	1
4697	1	32	1
4693	1	32	1
4690	1	32	1
4733	1	29	1
4731	1	29	1
4730	1	29	1
4960	1	29	1
4957	1	29	1
4728	1	5	1
4443	1	24	1
5172	1	47	1
5151	1	43	1
4818	1	55	1
4671	1	42	1
4663	1	42	1
4662	1	42	1
4661	1	42	1
5196	1	30	1
5192	1	30	1
5181	1	30	1
5203	1	52	1
5201	1	52	1
5200	1	52	1
5386	1	24	1
5385	1	24	1
5383	1	24	1
5382	1	24	1

4812	1	24	1
4570	1	35	1
4564	1	35	1
5077	1	5	1
5076	1	5	1
5068	1	5	1
5066	1	21	1
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5054	1	21	1
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4529	1	21	1
5360	1	47	1
5577	1	24	1
5580	1	24	1
5584	1	24	1
5591	1	24	1
5593	1	24	1
5302	1	19	1
5303	1	19	1
5304	1	19	1
5306	1	19	1
5310	1	19	1
5312	1	19	1
5313	1	19	1
5316	1	19	1
5323	1	19	1
5326	1	19	1
5734	1	50	1
5738	1	50	1
5740	1	50	1
5851	1	61	1
5852	1	61	1
5853	1	61	1
5860	1	61	1
5861	1	61	1
5750	1	50	1
5756	1	50	1
5766	1	19	1
5772	1	19	1
5773	1	50	1
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4392	2	37	1
4391	2	37	1
4114	2	31	1
4101	2	31	1
4103	2	31	1
4104	2	31	1
4111	2	31	1
4112	2	31	1
4353	2	26	1
4302	2	26	1
4300	2	26	1
4211	2	12	1
4316	2	6	1
4465	2	20	1

4470	2	20	1
4139	2	56	1
4093	2	56	1
4097	2	56	1
4010	2	2	1
5297	2	21	1
5229	2	11	1
5216	2	11	1
4831	2	5	1
4828	2	5	1
4175	2	54	1
4602	2	22	1
4270	2	22	1
4182	2	20	1
4183	2	20	1
4184	2	20	1
4189	2	20	1
5716	2	11	1
5240	2	11	1
5239	2	11	1
5262	2	50	1
4946	2	25	1
4943	2	25	1
5281	2	23	1
4996	2	50	1
5089	2	42	1
4924	2	48	1
4235	2	18	1
4397	2	18	1
4064	2	33	1
4227	2	18	1
4491	2	46	1
4492	2	46	1
5255	2	48	1
5254	2	48	1
4919	2	48	1
4985	2	39	1
4635	2	9	1
5117	2	58	1
5574	2	5	1
5572	2	5	1
5571	2	5	1
5569	2	5	1
4483	2	40	1
4484	2	40	1
4504	2	14	1
4132	2	8	1
4523	2	14	1
4900	2	32	1
4896	2	32	1
5130	2	50	1
5123	2	50	1
4325	2	10	1
4327	2	53	1
4052	2	17	1

4285	2	11	1
4547	2	7	1
4543	2	7	1
4598	2	7	1
4297	2	35	1
4909	2	32	1
4907	2	32	1
5703	2	32	1
5701	2	32	1
4692	2	32	1
4805	2	24	1
5199	2	52	1
5191	2	30	1
5186	2	30	1
5184	2	30	1
5183	2	30	1
5182	2	30	1
5180	2	30	1
5179	2	30	1
5178	2	30	1
5384	2	24	1
4574	2	35	1
4566	2	35	1
4562	2	35	1
5075	2	5	1
5072	2	5	1
4193	2	11	1
4535	2	21	1
5363	2	47	1
5589	2	24	1
5305	2	19	1
5329	2	19	1
5732	2	50	1
5739	2	50	1
5855	2	61	1
5856	2	61	1
4464	1	20	2
5294	1	21	2
5048	1	21	2
4346	1	22	2
4121	1	33	2
5008	1	50	2
5116	1	58	2
5107	1	58	2
4522	1	14	2
4974	1	42	2
5127	1	50	2
4056	1	17	2
5373	1	24	2
5283	1	23	4
5277	1	23	4
4895	1	32	4
5126	1	50	4
4691	1	32	4
5320	1	19	4

5321	1	19	4
5735	1	50	4
5762	1	19	4
5146	2	50	4
4675	2	42	7
4324	1	10	8
4820	1	5	10
5016	1	50	10
4810	2	24	10
4375	1	6	11
4250	1	62	11
4213	1	12	11
4154	1	13	11
4317	1	6	11
4138	1	56	11
4008	1	2	11
4012	1	2	11
5560	1	5	11
5558	1	5	11
4836	1	5	11
4604	1	22	11
5022	1	57	11
5106	1	42	11
5104	1	42	11
5096	1	42	11
4863	1	46	11
5015	1	50	11
5009	1	50	11
4503	1	14	11
4715	1	36	11
4967	1	42	11
4964	1	42	11
5137	1	50	11
4328	1	53	11
4055	1	17	11
4053	1	17	11
4408	1	44	11
4587	1	7	11
4586	1	7	11
4298	1	35	11
4686	1	58	11
4884	1	38	11
4732	1	29	11
4956	1	29	11
5150	1	43	11
4674	1	42	11
4672	1	42	11
4669	1	42	11
5376	1	24	11
5069	1	5	11
5067	1	5	11
5056	1	21	11
4534	1	21	11
5906	1	23	11
5307	1	19	11

5318	1	19	11
5736	1	50	11
5763	1	50	11
5770	1	19	11
4216	2	12	11
4629	2	38	11
4174	2	54	11
5110	2	58	11
4058	2	17	11
5741	2	50	11
4051	1	62	12
4011	1	2	12
4040	1	44	12
4177	1	54	12
4268	1	22	12
5005	1	50	12
5103	1	42	12
4398	1	18	12
4868	1	46	12
4256	1	60	12
4971	1	42	12
4966	1	42	12
5163	1	43	12
4407	1	44	12
4406	1	44	12
4405	1	44	12
4885	1	38	12
4694	1	32	12
4958	1	29	12
4955	1	29	12
4809	1	24	12
4801	1	24	12
4447	1	24	12
4440	1	24	12
5389	1	24	12
5185	1	30	12
5380	1	24	12
4811	1	24	12
5910	1	23	12
5758	1	19	12
5769	1	19	12
4394	2	37	12
4513	2	14	12
4516	2	14	12
5190	2	30	12
5581	2	24	12
4000	1	2	97
4488	1	40	97
4320	2	6	97
4532	2	21	97

Total Surveys: 598

Travel Mode:

Car	474	79%	All Auto	82.3%
Motorcycle	13	2%	Transit/Boat	2.3%

Public Transit	10	2%	Bicycle	9.4%
Private Shuttle	1	0%	Walk	6.0%
Taxi	1	0%		100.0%
Ferry/boat	3	1%		
Bicycle	56	9%		
Walk	36	6%		
Other	4	1%		
	598			

US Census Data

Take Population in NV vs CA.

B01003

TOTAL POPULATION
: Total population
2008-2012 American Community Survey 5-Year Estimates

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

	South Lake Tahoe CCD, El Dorado County, California		Lake Tahoe CCD, Placer County, California		Zephyr Cove CCD, Douglas County, Nevada		Incline Village CCD, Washoe County, Nevada	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Total	29,655	+/-682	10,071	+/-968	4,269	+/-455	8,127	+/-708

Source: U.S. Census Bureau, 2008-2012 American Community Survey

Explanation of Symbols:
An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
An '(X)' means that the estimate is not applicable or not available.

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2008-2012 American Community Survey (ACS) data generally reflect the December 2009 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas, in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau | American FactFinder

Total: 52 122
CA - 39 826 75%
NV - 12 296 25%

B08603

TRAVEL TIME TO WORK FOR WORKPLACE GEOGRAPHY
Universe: Workers 16 years and over who did not work at home
2008-2012 American Community Survey 5-Year Estimates

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

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Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

1 - 13 of 13

	South Lake Tahoe city, California		Stateline CDP, Nevada	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	10,637	+/-725	3,908	+/-551
Less than 5 minutes	987	+/-230	279	+/-157
5 to 9 minutes	2,582	+/-431	994	+/-277
10 to 14 minutes	2,270	+/-261	671	+/-251
15 to 19 minutes	1,857	+/-339	510	+/-163
20 to 24 minutes	661	+/-185	664	+/-204
25 to 29 minutes	262	+/-119	125	+/-78
30 to 34 minutes	436	+/-136	270	+/-109
35 to 39 minutes	123	+/-102	130	+/-108
40 to 44 minutes	296	+/-140	88	+/-58
45 to 59 minutes	578	+/-163	85	+/-64
60 to 89 minutes	332	+/-127	28	+/-30
90 or more minutes	253	+/-126	64	+/-60

[see Excel spreadsheet "Employee Census Data - Used for Trip Gen"]

Source: U.S. Census Bureau, 2008-2012 American Community Survey

Explanation of Symbols:
An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
An '(X)' means that the estimate is not applicable or not available.

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

These tabulations are produced to provide estimates of workers at the location of their workplace. Estimates of counts of workers at the workplace may differ from those of other programs because of variations in definitions, coverage, methods of collection, reference periods, and estimation procedures. The ACS is a household survey which provides data that pertains to individuals, families, and households.

Workers include members of the Armed Forces and civilians who were at work last week.

While the 2008-2012 American Community Survey (ACS) data generally reflect the December 2009 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau | American FactFinder

Travel Time to Work for Workplace Geography

	South Lake	Stateline	Total	Max Travel Time (mins)	Average Travel Time (mins)	Total Travel Time (mins)	Travel Distance (miles) at max time (assume 40 mph average speed)	Average Travel Distance for speed bin (miles)	Total Distance Traveled by speed bin (miles)
Total	10637	3908	14545						
Less than 5 minutes	987	279	1266	5	2.5	3165	3.3	2	2532
5-9 mins	2582	994	3576	9	7	25032	6.0	5	17880
10-14 mins	2270	670	2940	14	11.5	33810	9.3	8	23520
15-19	1857	510	2367	19	16.5	39055.5	12.7	11	26037
20-24	661	664	1325	24	21.5	28487.5	16.0	14	18550
25-29	262	125	387	29	26.5	10255.5	19.3	18	6966
30-34	436	270	706	34	31.5	22239	22.7	21	14826
35-39	123	130	253	39	36.5	9234.5	26.0	24	6072
40-44	296	88	384	44	41.5	15936	29.3	28	10752
45-49	578	85	663	49	46.5	30829.5	32.7	31	20553
60-89	332	28	360	89	69	24840	59.3	46	16560
more than 90	253	64	317	120	104.5	33126.5	80.0	70	22190

US Census Bureau, 2008-2012 American Community Survey 5-year Estimates

Weighted Average Travel Distance	12.82	miles
Weighted Average Travel Time	18.98	minutes

Mode Split By Industry

B08126

MEANS OF TRANSPORTATION TO WORK BY INDUSTRY
Universe: Workers 16 years and over
2008-2012 American Community Survey 5-Year Estimates

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

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	South Lake Tahoe city, California		Stateline CDP, Nevada	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	10,462	+/-528	549	+/-203
Agriculture, forestry, fishing and hunting, and mining	100	+/-56	0	+/-13
Construction	655	+/-256	11	+/-19
Manufacturing	251	+/-117	0	+/-13
Wholesale trade	26	+/-26	0	+/-13
Retail trade	1,233	+/-273	38	+/-43
Transportation and warehousing, and utilities	408	+/-181	9	+/-14
Information	185	+/-102	0	+/-13
Finance and insurance, and real estate and rental and leasing	494	+/-171	61	+/-78
Professional, scientific, and management, and administrative and waste management services	1,006	+/-233	82	+/-77
Educational services, and health care and social assistance	1,027	+/-206	45	+/-41
Arts, entertainment, and recreation, and accommodation and food services	4,476	+/-391	303	+/-148
Other services (except public administration)	306	+/-120	0	+/-13
Public administration	279	+/-119	0	+/-13
Armed forces	18	+/-27	0	+/-13
Car, truck, or van - drove alone:	6,699	+/-459	296	+/-110
Agriculture, forestry, fishing and hunting, and mining	75	+/-43	0	+/-13
Construction	368	+/-190	11	+/-19
Manufacturing	199	+/-102	0	+/-13
Wholesale trade	6	+/-11	0	+/-13
Retail trade	830	+/-213	21	+/-34
Transportation and warehousing, and utilities	225	+/-106	9	+/-14
Information	114	+/-94	0	+/-13
Finance and insurance, and real estate and rental and leasing	309	+/-132	8	+/-13
Professional, scientific, and management, and administrative and waste management services	624	+/-168	6	+/-10
Educational services, and health care and social assistance	728	+/-159	45	+/-41
Arts, entertainment, and recreation, and accommodation and food services	2,722	+/-319	196	+/-95
Other services (except public administration)	255	+/-113	0	+/-13
Public administration	244	+/-112	0	+/-13
Armed forces	0	+/-24	0	+/-13
Car, truck, or van - carpooled:	1,736	+/-392	139	+/-105
Agriculture, forestry, fishing and hunting, and mining	0	+/-24	0	+/-13
Construction	212	+/-148	0	+/-13
Manufacturing	0	+/-24	0	+/-13
Wholesale trade	10	+/-15	0	+/-13
Retail trade	216	+/-95	17	+/-28
Transportation and warehousing, and utilities	88	+/-140	0	+/-13
Information	30	+/-33	0	+/-13
Finance and insurance, and real estate and rental and leasing	0	+/-24	53	+/-77
Professional, scientific, and management, and administrative and waste management services	139	+/-95	47	+/-65
Educational services, and health care and social assistance	174	+/-100	0	+/-13
Arts, entertainment, and recreation, and accommodation and food services	800	+/-273	22	+/-34
Other services (except public administration)	14	+/-22	0	+/-13
Public administration	35	+/-37	0	+/-13
Armed forces	18	+/-27	0	+/-13
Public transportation (excluding taxicab):	274	+/-130	24	+/-39
Agriculture, forestry, fishing and hunting, and mining	16	+/-31	0	+/-13
Construction	21	+/-33	0	+/-13
Manufacturing	8	+/-13	0	+/-13

4779

2968
62%

822
17%

Public Transp.

	South Lake Tahoe city, California		Stateline CDP, Nevada	
	Estimate	Margin of Error	Estimate	Margin of Error
Wholesale trade	0	+/-24	0	+/-13
Retail trade	49	+/-54	0	+/-13
Transportation and warehousing, and utilities	25	+/-41	0	+/-13
Information	0	+/-24	0	+/-13
Finance and insurance, and real estate and rental and leasing	0	+/-24	0	+/-13
Professional, scientific, and management, and administrative and waste management services	34	+/-36	0	+/-13
Educational services, and health care and social assistance	15	+/-23	0	+/-13
Arts, entertainment, and recreation, and accommodation and food services	106	+/-90	24	+/-39
Other services (except public administration)	0	+/-24	0	+/-13
Public administration	0	+/-24	0	+/-13
Armed forces	0	+/-24	0	+/-13
Walked:	863	+/-211	90	+/-59
Agriculture, forestry, fishing and hunting, and mining	0	+/-24	0	+/-13
Construction	9	+/-14	0	+/-13
Manufacturing	10	+/-17	0	+/-13
Wholesale trade	0	+/-24	0	+/-13
Retail trade	79	+/-67	0	+/-13
Transportation and warehousing, and utilities	7	+/-12	0	+/-13
Information	26	+/-39	0	+/-13
Finance and insurance, and real estate and rental and leasing	47	+/-55	0	+/-13
Professional, scientific, and management, and administrative and waste management services	30	+/-33	29	+/-42
Educational services, and health care and social assistance	46	+/-40	0	+/-13
Arts, entertainment, and recreation, and accommodation and food services	608	+/-177	61	+/-46
Other services (except public administration)	1	+/-2	0	+/-13
Public administration	0	+/-24	0	+/-13
Armed forces	0	+/-24	0	+/-13
Taxicab, motorcycle, bicycle, or other means:	532	+/-168	0	+/-13
Agriculture, forestry, fishing and hunting, and mining	9	+/-14	0	+/-13
Construction	45	+/-55	0	+/-13
Manufacturing	0	+/-24	0	+/-13
Wholesale trade	10	+/-15	0	+/-13
Retail trade	59	+/-69	0	+/-13
Transportation and warehousing, and utilities	61	+/-78	0	+/-13
Information	0	+/-24	0	+/-13
Finance and insurance, and real estate and rental and leasing	24	+/-39	0	+/-13
Professional, scientific, and management, and administrative and waste management services	69	+/-67	0	+/-13
Educational services, and health care and social assistance	37	+/-50	0	+/-13
Arts, entertainment, and recreation, and accommodation and food services	218	+/-116	0	+/-13
Other services (except public administration)	0	+/-24	0	+/-13
Public administration	0	+/-24	0	+/-13
Armed forces	0	+/-24	0	+/-13
Worked at home:	358	+/-123	0	+/-13
Agriculture, forestry, fishing and hunting, and mining	0	+/-24	0	+/-13
Construction	0	+/-24	0	+/-13
Manufacturing	34	+/-41	0	+/-13
Wholesale trade	0	+/-24	0	+/-13
Retail trade	0	+/-24	0	+/-13
Transportation and warehousing, and utilities	0	+/-24	0	+/-13
Information	15	+/-18	0	+/-13
Finance and insurance, and real estate and rental and leasing	114	+/-73	0	+/-13
Professional, scientific, and management, and administrative and waste management services	110	+/-77	0	+/-13
Educational services, and health care and social assistance	27	+/-28	0	+/-13
Arts, entertainment, and recreation, and accommodation and food services	22	+/-26	0	+/-13
Other services (except public administration)	36	+/-44	0	+/-13
Public administration	0	+/-24	0	+/-13
Armed forces	0	+/-24	0	+/-13

130
3%

Walk
669
14%

Bike/Motor
218
5%
→ 3% bike

~~82~~
.5%

Source: U.S. Census Bureau, 2008-2012 American Community Survey

Explanation of Symbols:
An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.

An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
An '******' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
An '(X)' means that the estimate is not applicable or not available.

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Workers include members of the Armed Forces and civilians who were at work last week.

Industry codes are 4-digit codes and are based on the North American Industry Classification System 2007. The Industry categories adhere to the guidelines issued in Clarification Memorandum No. 2, "NAICS Alternate Aggregation Structure for Use By U.S. Statistical Agencies," issued by the Office of Management and Budget.

While the 2008-2012 American Community Survey (ACS) data generally reflect the December 2009 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2000 data. Boundaries for urban areas have not been updated since Census 2000. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau | American FactFinder

Mode Split
For All Industries

Means of Transportation to Work for Workplace Geography

Stateline CDP, Nevada

Powered by The American Community Survey

	Total:*	One Race						Two or More Races	Hispanic or Latino (any race)
		White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race		
Total:	2,779	2,779	0	Z	Z	0	Z	Z	1,181
Car, truck, or van - drove alone	2,315	2,315	0	Z	Z	0	Z	Z	709
Car, truck, or van - carpooled	344	344	0	Z	Z	0	Z	Z	255
Public transportation (excluding taxicab)	53	53	0	Z	Z	0	Z	Z	57
Walked	56	56	0	Z	Z	0	Z	Z	109
Taxicab, motorcycle, bicycle, or other means	11	11	0	Z	Z	0	Z	Z	31
Worked at home	0	0	0	Z	Z	0	Z	Z	0

Source. U S Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

Except where noted, 'race' refers to people reporting only one race. 'Hispanic' refers to an ethnic category, Hispanics may be of any race

An entry of '+/-0' in the margin of error column indicates that the estimate is controlled A statistical test for sampling variability is not

Display Margin of Error

Back

MS Excel

Carpool = 12%
Walk = 2%
Bike = .3%
Public Transit = 2%

- 33% of employees are housed by Heavenly w/in South Lake / Stateline areas.
-

Stateline + South Lake Tahoe

Total 13048
Drive Alone - 9381 - 72%
Public Transp - 237 - 2%
Walk - 712 - 5%
Taxi, Motor, Bike - 539 - 4% (3% Bike - Assumption)
Work @ Home - 357 - 3%
Carpool - 1822 - 14%

Mode Split For All Industries

Means of Transportation to Work for Workplace Geography

South Lake Tahoe city, California

Powered by The American Community Survey

	Total:*	One Race					Two or More Races		
		White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race		Hispanic or Latino (any race)
Total:	10,289	9,033	Z	Z	Z	0	1,236	Z	2,579
Car, truck, or van - drove alone	7,066	6,420	Z	Z	Z	0	646	Z	1,282
Car, truck, or van - carpooled	1,478	1,236	Z	Z	Z	0	242	Z	635
Public transportation (excluding taxicab)	184	133	Z	Z	Z	0	51	Z	58
Walked	656	458	Z	Z	Z	0	198	Z	360
Taxicab, motorcycle, bicycle, or other means	528	429	Z	Z	Z	0	99	Z	209
Worked at home	357	357	Z	Z	Z	0	0	Z	35

Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

Except where noted, 'race' refers to people reporting only one race. 'Hispanic' refers to an ethnic category; Hispanics may be of any race.

An entry of '+/-0' in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not

Display Margin of Error

Back

MS Excel

Carpool = 14%

Bicycle = 5%

Walk = 6%

Public Transit = 2%

Travel Time to Work for Workplace Geography

	South Lake	Stateline	Total	Max Travel Time (mins)	Average Travel Time (mins)	Total Travel Time (mins)	Travel Distance (miles) at max time (assume 40 mph average speed)	Average Travel Distance for speed bin (miles)	Total Distance Traveled by speed bin (miles)
Total	10637	3908	14545						
Less than 5 minutes	987	279	1266	5	2.5	3165	3.3	2	2532
5-9 mins	2582	994	3576	9	7	25032	6.0	5	17880
10-14 mins	2270	670	2940	14	11.5	33810	9.3	8	23520
15-19	1857	510	2367	19	16.5	39055.5	12.7	11	26037
20-24	661	664	1325	24	21.5	28487.5	16.0	14	18550
25-29	262	125	387	29	26.5	10255.5	19.3	18	6966
30-34	436	270	706	34	31.5	22239	22.7	21	14826
35-39	123	130	253	39	36.5	9234.5	26.0	24	6072
40-44	296	88	384	44	41.5	15936	29.3	28	10752
45-49	578	85	663	49	46.5	30829.5	32.7	31	20553
60-89	332	28	360	89	69	24840	59.3	46	16560
more than 90	253	64	317	120	104.5	33126.5	80.0	70	22190

US Census Bureau, 2008-2012 American Community Survey 5-year Estimates

Weighted Average Travel Distance	12.82	miles
Weighted Average Travel Time	18.98	minutes

Trip Generation Calculations

Heavenly Trip Generation - Visitors Daily (Peak Day)

Prepared By Katy Cole
Date: 03/26/2014

Total Number of new seasonal visitors:	50000	Information from Heavenly		
Days in Summer Season	90	Based on June 15 - September 15 (from Vail EIS)		
Average Number of Visitors per Day	556			
Number of Visitors on a Peak Friday	1000	Information from Heavenly	Math Check	1000

Category 1: Day Visitors from outside of Stateline/Gondola Area (Includes outside of region and in the Basin but outside of the immediate Gondola/Stateline Area which is Cat 2b in survey data spreadsheet)

Percentage of Total Visitors	27%	
Total Category 1 Visitors	270	People Trips
Category 1 Mode Splits		
% of People Trips Via Car	98%	
% People Trips Via Bike/Walk/Transit	2%	
Category 1 Trip Generation		
Trips Via Car	265	People
Bike/Walk/Transit	5	People
Average Vehicle Occupancy	2.43	Based on survey data from the South Lake Tahoe Parking Garage
Category 1 Daily Vehicles Coming to Heavenly	**109**	
Category 1 Daily Vehicles Trips (Inbound and Outbound)	**218**	

Category 2: Visitors that are already in the immediate Gondola/Stateline Area (within 1 mile)

Percentage of Total Visitors	61%	
Total Category 2 Visitors	610	People Trips
Category 2 Mode Splits		
% of People Trips Via Car	30%	
% People Trips Via Bike/Walk/Transit	70%	
Category 2 Trip Generation		
Trips Via Car	183	People
Bike/Walk/Transit	427	People
Average Vehicle Occupancy	2.43	Based on survey data from the South Lake Tahoe Parking Garage
Category 2 Daily Vehicles Coming to Heavenly	**75**	
Category 2 Daily Vehicles Trips (Inbound and Outbound)	**150**	

Category 3: Locals

Percentage of Total Visitors	12%	
Total Category 3 Visitors	120	People Trips
Category 3 Mode Splits		
% of People Trips Via Car	82%	
% People Trips Via Bike/Walk/Transit	18%	
Category 3 Trip Generation		
Trips Via Car	98	People
Bike/Walk/Transit	22	People
Average Vehicle Occupancy	2.43	Based on survey data from the South Lake Tahoe Parking Garage
Category 3 Daily Vehicles Coming to Heavenly	**40**	
Category 3 Daily Vehicles Trips (Inbound and Outbound)	**80**	

Total Daily Vehicle Trips	**448**

Heavenly Trip Generation - Visitors Hourly

Epic Discovery Hours of Operation	9am-7pm	Based on information for Andrew Strain about employee shifts (March 30th email from Rob) and direction from Rob on 4/3/14
Total Hours of Operation	10	hours
Average Length of Stay	3	hours Based on average length of stay at activity from the 2010 Travel Survey (see Travel Survey Data Spreadsheet, Subset 1 Tab)
Arrival/Departure Assumptions	Generally uniform except for the first 3 and last 3 hours of the day. During the 1st 3 hours arrivals will be higher and departures will be minimal. During the last 3, departures will be higher and arrivals will be minimal. This is an assumption, there isn't any data to specifically address this issue. (Assumptions made by Katy)	

Assumed Arrival/Departure Pattern	9am-10am	10am-11am	11am-12pı	12pm-1pm	1pm-2pm	2pm-3pm	3pm-4pm	4pm-5pm (peak hour)	5pm-6pm	6pm-7pm			
% of arrivals occuring during this hour	15%	15%	15%	10%	10%	10%	10%	10%	5%	0%	100%		
% of departures occuring during this hour	0%	5%	10%	10%	10%	10%	10%	15%	15%	15%	100%	Math Check	
Vehicles Arriving	34	34	34	22	22	22	22	23	11	0	224	224	Total Inbound
Vehicles Departing	0	11	22	22	22	22	23	34	34	34	224	224	Total Outbound
Total Hourly Vehicles	34	45	56	44	44	44	45	57	45	34	448	448	Total Daily

Heavenly Trip Generation - Employees Daily (Peak Day)

Prepared By Katy Cole
Date: 03/26/2014

Total Number of New Employees	250	Information from Heavenly
Maximum Employees on-site at any given time	200	Information from Heavenly
Average Employees on-site	175	Information from Heavenly
Epic Discovery Hours of Operation	9am-7pm	Based on information for Andrew Strain about employee shifts (March 30th email from Rob) and direction from Rob on 4/3/14
Total Hours of Operation	10 hours	

Shifts

Assumption based on hours of operation and 8 hours shifts (with a 1 hour lunch)
Assumption that the employees will be split equally between the shifts

Shift	Shift start/end	AM Commute arrival period	PM Commute departure period	% of workforce in each shift	# of employees per shift (max)
1	7:30am-4:30pm	7:00-7:30am	4:30-5:00pm	25%	50
2	8:30am-5:30pm	8:00-8:30am	5:30-6:00pm	25%	50
3	9:30am-6:30pm	9:00-9:30am	6:30-7:00pm	25%	50
4	10:30am-7:30pm	10:00-10:30am	7:30-8:00pm	25%	50

Commute Characteristics

Based on Census Data Journey to Work information (2008-2012 American Community Survey). Information is for the "Arts, Entertainment, recreation, accommodation, and food service" industry specifically. See PDF Employee Census data sheets.

Daily Trips

Employee Travel Mode	% Based on Census Data	Heavenly Epic Disc Employees Mode (max daily emp)	Average Auto Occupancy	Number of Autos associated with employees per day	Number of Daily Trips per/auto	Total Daily Employee Trips	
Drive Alone	63%	126	1	126	2	252	
Carpool	17%	34	2.43	14	2	28	
Transit/Shuttle	3%	6	na	na	na	na	
Walk	14%	28	na	na	na	na	
Bicycle	3%	6	na	na	na	na	
Total	100%	200	na	na	na	280	140 inbound and 140 outbound

PM Peak Hour Trips

Employee Travel Mode	% Based on Census Data	Heavenly Epic Disc Employees Mode (max hourly emp)	Average Auto Occupancy	Number of Autos associated with employees during PM Peak Hour	Number of PM peak hour Trips per/auto	Total Peak Hour Employee Trips	
Drive Alone	63%	31.0	1	31	1	31	
Carpool	17%	8.0	2.43	3	1	3	
Transit/Shuttle	3%	2.0	na	na	na	na	
Walk	14%	7.0	na	na	na	na	
Bicycle	3%	2.0	na	na	na	na	
Total	100%	50	na	na	na	34	all outbound trips

Heavenly Visitor Trip Length Calculations and Distribution (Peak Day)

Category 1: Day Visitors from outside of Stateline/Gondola Area (Includes outside of region and in the Basin but outside of the immediate Gondola/Stateline Area)

Total Category 1 Visitors	**270**	**People Trips**
Trips Via Car	**265**	**People**
Bike/Walk/Transit	**5**	**People**
Category 1 Daily Vehicles Coming to Heavenly	**109**	**Cars**
Category 1 Daily Vehicles Trips (Inbound and Outbound)	**218**	**Cars**

1a: Visitors that are Day Trips From Outside of the Basin (i.e. Reno, Sacramento, Carson City)

30.00% of Cat 1 (based on category distributions shown on Subset1 tab of travel survey data spreadsheet)

CA Based 40% Percentages were assumed becase day visitors are more likely from NV due to proximity.

NV Based 60%

	Total	CA	NV
Total Category 1a Visitors	81	32	49
Trips Via Car	80	32	48
Bike/Walk/Transit	2	0	1
Category 1 Daily Vehicles Coming to Heavenly	33	13	20
Category 1 Daily Vehicles Trips (Inbound and Outbound)	66	26	40

Average Trip Length 13 miles distance to CA LTAB boundary on US 50

15 miles distance to NV LTAB boundary on US 50

Total Category 1 (1a + 2b)

Total	CA	NV
219	141	78

	CA	NV	
Total Basin VMT 1a Visitors	338	594	932

2b: Visitors in Southshore that are farther away from Gondola (greater than 1 miles)

70.00% of Cat 1 (based on category distributions shown on Subset1 tab of travel survey data spreadsheet

CA Based 75% Based on travel survey data

NV Based 25%

	CA	NV
Total Category 1b Visitors	189	142	47
Trips Via Car	186	140	47
Bike/Walk/Transit	4	3	1
Category 1 Daily Vehicles Coming to Heavenly	76	57	19
Category 1 Daily Vehicles Trips (Inbound and Outbound)	153	115	38

Average Trip Length 7 miles distance on US 50 to South Lake Tahoe Border (US 50/Airport Road) - conservative estimate, most will come from South Lake Tahoe

13 miles distance on US 50/SR 28 to mid-point of NV (which equates to the SR 28/South Carson City County line

	CA	NV	
Total Basin VMT 2b Visitors	803	497	1301

Category 2: Visitors that are already in the immediate Gondola/Stateline Area (within 1 mile)

Total Category 2 Visitors	**610**	**People Trips**
Trips Via Car	**183**	**People**
Bike/Walk/Transit	**427**	**People**
Category 2 Daily Vehicles Coming to	**75**	**Cars**
Category 2 Daily Vehicles Trips (Inb	**150**	**Cars**

CA Based 50% Based on travel survey data

NV Based 50%

	CA	NV
Total Category 2 Visitors	610	305	305
Trips Via Car	183	92	92
Bike/Walk/Transit	427	214	214
Category 2 Daily Vehicles Coming to Heavenly	75	38	38
Category 2 Daily Vehicles Trips (Inbound and Outbound)	150	75	75

Average Trip Length 1 miles based on farthest distance for this category

1 miles

	CA	NV	
Total Basin VMT 2 Visitors	75	75	150

Category 3: Locals

Total Category 3 Visitors	**120**	**People Trips**
Trips Via Car	**98**	**People**
Bike/Walk/Transit	**22**	**People**
Category 3 Daily Vehicles Coming t	**40**	**Cars**
Category 3 Daily Vehicles Trips (Inb	**80**	**Cars**

CA Based	75%	Based on population census data (2008-2012 American Community Survey 5-year estimates
NV Based	25%	

		CA	NV
Total Category 3 Visitors	120	90	30
Trips Via Car	98	74	25
Bike/Walk/Transit	22	17	6
Category 3 Daily Vehicles Coming to Heavenly	40	30	10
Category 3 Daily Vehicles Trips (Inbound and Outbound)	80	60	20

Average Trip Length	21	miles	distance on US 50/SR 89 to mid-point of CA around lake (which is around Tahoma
	13	miles	distance on US 50/SR 28 to mid-point of NV (which equates to the SR 28/South Carson City County line

	CA	NV	
Total Basin VMT 3 Visitors	1260	260	1520

Total VMT for Peak Day

	CA	NV	Total
Total Basin VMT (VMT within Lake Tahoe Air Basin (LTAB))	2476	1426	3903
Total Car Trips	276	173	449
	61%	39%	
Average Trip Length	9.0	8.3	8.7

	CA	NV	Total
Visitors - Peak Day	570	430	1000
	57%	43%	
Visitors - Season	29000	22000	50000

Heavenly Employee Trip Length Calculations and Distribution (Peak Day)

Peak Day Conditions (used to develop datily VMT Estimates)

Total Employees On Site (on max day)	200	
% of Employees that live in CA	75%	Based on Tahoe population split from Census data
% of Employees that live in NV	25%	
Employees that live in CA	150	
Employees that live in NV	50	

		Daily	PM Peak
Employees that live in CA Trips		210	26
Employees that live in NV Trips		70	9
	Total	280	34

Average Employee Trip Length	12.82	miles	(from EmployeeCensusData_UsedforTripGen Spreadsheet)
Total Daily CA VMT Generated By Employees	2692		
Total Daily NV VMT Generated By Employees	897		
	3589		

Intersection Level of Service Results

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 1 **US 50/Lake Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	26	22	84.2%	27.2	2.0	C
	Through	940	923	98.1%	22.7	2.4	C
	Right Turn	34	35	102.1%	22.8	3.6	C
	Subtotal	**1,000**	**979**	**97.9%**	**22.8**	**2.3**	**C**
SB	Left Turn	181	186	103.0%	24.8	4.3	C
	Through	1,003	997	99.4%	8.0	0.4	A
	Right Turn	100	98	98.1%	2.3	0.2	A
	Subtotal	**1,284**	**1,282**	**99.8%**	**10.0**	**0.8**	**A**
EB	Left Turn	138	139	100.4%	18.8	0.6	B
	Through	17	17	102.4%	14.6	2.0	B
	Right Turn	29	30	104.8%	13.8	2.3	B
	Subtotal	**184**	**186**	**101.3%**	**17.6**	**0.5**	**B**
WB	Left Turn	61	61	99.8%	16.9	1.6	B
	Through	17	21	120.6%	13.5	3.4	B
	Right Turn	317	320	101.0%	4.1	0.7	A
	Subtotal	**395**	**402**	**101.7%**	**6.5**	**0.6**	**A**
Total		**2,863**	**2,849**	**99.5%**	**14.4**	**1.1**	**B**

Intersection 2 **US 50/Stateline Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	126	116	92.2%	74.0	16.0	E
	Through	1,112	1,107	99.5%	17.9	1.4	B
	Right Turn	32	34	105.0%	13.1	3.0	B
	Subtotal	**1,270**	**1,256**	**98.9%**	**23.0**	**2.3**	**C**
SB	Left Turn	10	9	86.0%	58.9	17.7	E
	Through	1,005	1,005	100.0%	14.3	0.9	B
	Right Turn	23	28	120.0%	10.9	2.4	B
	Subtotal	**1,038**	**1,041**	**100.3%**	**14.6**	**0.9**	**B**
EB	Left Turn	42	39	92.9%	46.0	6.3	D
	Through	2	1	70.0%	27.0	25.9	C
	Right Turn	140	147	104.6%	12.5	1.7	B
	Subtotal	**184**	**187**	**101.6%**	**19.7**	**1.6**	**B**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,492**	**2,485**	**99.7%**	**19.3**	**1.2**	**B**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 3 **US 50/Transit Way** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through	1,255	1,237	98.5%	3.9	0.6	A
	Right Turn	38	40	105.0%	3.4	1.2	A
	Subtotal	**1,293**	**1,277**	**98.7%**	**3.9**	**0.6**	**A**
SB	Left Turn	17	19	111.8%	14.1	2.7	B
	Through	1,128	1,135	100.6%	1.4	0.9	A
	Right Turn						
	Subtotal	**1,145**	**1,154**	**100.8%**	**1.6**	**0.9**	**A**
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	3	3	93.3%	36.0	23.9	E
	Through						
	Right Turn	15	13	89.3%	21.5	8.8	C
	Subtotal	**18**	**16**	**90.0%**	**24.2**	**10.8**	**C**
Total		**2,456**	**2,447**	**99.6%**	**3.0**	**0.5**	**A**

Intersection 4 **US 50/Friday Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	23	20	87.4%	103.8	21.8	F
	Through	1,275	1,253	98.3%	3.0	0.7	A
	Right Turn						
	Subtotal	**1,298**	**1,273**	**98.1%**	**4.7**	**1.1**	**A**
SB	Left Turn						
	Through	1,119	1,111	99.3%	7.6	3.3	A
	Right Turn	8	9	115.0%	3.9	2.3	A
	Subtotal	**1,127**	**1,121**	**99.4%**	**7.6**	**3.2**	**A**
EB	Left Turn	13	14	103.8%	85.1	21.0	F
	Through						
	Right Turn	24	27	111.3%	33.1	13.0	C
	Subtotal	**37**	**40**	**108.6%**	**50.5**	**16.7**	**D**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,462**	**2,434**	**98.9%**	**6.8**	**2.1**	**A**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **US 50/Park Ave-Heavenly Village Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	79	75	94.6%	49.2	3.6	D
	Through	1,211	1,187	98.0%	17.0	1.5	B
	Right Turn	101	101	99.8%	4.6	0.9	A
	Subtotal	**1,391**	**1,362**	**97.9%**	**17.9**	**1.3**	**B**
SB	Left Turn	78	76	97.1%	79.8	10.2	E
	Through	1,080	1,060	98.1%	24.7	5.3	C
	Right Turn	8	6	76.3%	20.8	11.7	C
	Subtotal	**1,166**	**1,142**	**97.9%**	**28.3**	**5.4**	**C**
EB	Left Turn	6	6	103.3%	69.9	21.8	E
	Through	14	17	118.6%	55.0	12.1	D
	Right Turn	135	132	97.6%	33.5	20.9	C
	Subtotal	**155**	**155**	**99.7%**	**37.7**	**18.5**	**D**
WB	Left Turn	288	284	98.4%	74.8	29.4	E
	Through	14	12	85.0%	41.2	9.8	D
	Right Turn	100	99	98.9%	19.4	3.0	B
	Subtotal	**402**	**394**	**98.1%**	**60.1**	**22.7**	**E**
Total		**3,114**	**3,053**	**98.0%**	**28.2**	**5.7**	**C**

Intersection 6 **US 50/Pioneer Trail** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	8	7	91.3%	101.2	32.7	F
	Through	1,094	1,082	98.9%	15.9	1.3	B
	Right Turn	19	19	98.4%	11.6	2.7	B
	Subtotal	**1,121**	**1,108**	**98.8%**	**16.3**	**1.3**	**B**
SB	Left Turn	310	311	100.2%	92.2	16.5	F
	Through	1,213	1,174	96.8%	5.7	0.7	A
	Right Turn	5	5	98.0%	2.5	1.5	A
	Subtotal	**1,528**	**1,490**	**97.5%**	**23.6**	**2.9**	**C**
EB	Left Turn	3	2	63.3%	66.7	45.1	E
	Through						
	Right Turn	9	8	91.1%	21.3	7.5	C
	Subtotal	**12**	**10**	**84.2%**	**31.8**	**12.7**	**C**
WB	Left Turn	16	16	97.5%	82.0	14.8	F
	Through						
	Right Turn	436	433	99.3%	28.2	5.0	C
	Subtotal	**452**	**448**	**99.2%**	**30.0**	**5.1**	**C**
Total		**3,113**	**3,056**	**98.2%**	**21.9**	**2.0**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 7 **Bellamy Ct/Heavenly Village Pkwy** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	31	31	98.7%	8.3	4.3	A
	Through						
	Right Turn	131	124	94.3%	4.4	1.1	A
	Subtotal	**162**	**154**	**95.1%**	**5.1**	**1.5**	**A**
EB	Left Turn	32	35	109.7%	2.7	0.2	A
	Through	104	103	99.1%	0.6	0.1	A
	Right Turn						
	Subtotal	**136**	**138**	**101.6%**	**1.1**	**0.1**	**A**
WB	Left Turn						
	Through	125	120	95.6%	0.4	0.7	A
	Right Turn	26	26	98.8%	0.0	0.0	A
	Subtotal	**151**	**145**	**96.2%**	**0.3**	**0.6**	**A**
Total		**449**	**438**	**97.4%**	**2.3**	**0.8**	**A**

Intersection 8 **Lake Pkwy-Montreal Rd/** **All-way Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	36	32	88.6%	6.6	0.4	A
	Through	204	213	104.3%	7.8	0.4	A
	Right Turn	7	7	98.6%	4.2	1.2	A
	Subtotal	**247**	**252**	**101.8%**	**7.5**	**0.4**	**A**
SB	Left Turn	12	12	96.7%	8.0	1.2	A
	Through	223	212	95.2%	9.3	0.7	A
	Right Turn	173	171	98.6%	6.2	0.9	A
	Subtotal	**408**	**394**	**96.7%**	**7.9**	**0.8**	**A**
EB	Left Turn	114	114	100.4%	5.3	0.3	A
	Through	6	7	113.3%	5.5	1.1	A
	Right Turn	68	66	96.5%	3.4	0.2	A
	Subtotal	**188**	**187**	**99.4%**	**4.6**	**0.2**	**A**
WB	Left Turn	9	7	78.9%	4.3	0.9	A
	Through	6	5	85.0%	6.3	2.1	A
	Right Turn	10	11	113.0%	3.1	0.4	A
	Subtotal	**25**	**24**	**94.0%**	**4.2**	**0.9**	**A**
Total		**868**	**856**	**98.6%**	**7.0**	**0.5**	**A**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 1 **US 50/Lake Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	26	24	91.9%	32.6	3.5	C
	Through	943	945	100.3%	30.7	2.8	C
	Right Turn	34	34	100.9%	30.4	4.0	C
	Subtotal	**1,003**	**1,004**	**100.1%**	**30.7**	**2.8**	**C**
SB	Left Turn	187	189	101.2%	23.5	2.5	C
	Through	1,006	1,011	100.5%	8.4	0.5	A
	Right Turn	100	101	100.8%	2.4	0.2	A
	Subtotal	**1,293**	**1,301**	**100.6%**	**10.1**	**0.7**	**B**
EB	Left Turn	138	143	103.5%	19.0	0.8	B
	Through	17	17	99.4%	13.8	1.8	B
	Right Turn	29	33	112.1%	14.5	1.5	B
	Subtotal	**184**	**192**	**104.5%**	**17.8**	**0.7**	**B**
WB	Left Turn	61	60	98.0%	17.5	1.8	B
	Through	17	20	115.3%	14.1	1.3	B
	Right Turn	334	335	100.3%	4.5	0.7	A
	Subtotal	**412**	**414**	**100.6%**	**6.8**	**0.7**	**A**
Total		**2,892**	**2,911**	**100.7%**	**17.3**	**1.2**	**B**

Intersection 2 **US 50/Stateline Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	127	129	101.2%	73.4	4.1	E
	Through	1,115	1,136	101.9%	25.2	1.9	C
	Right Turn	32	34	105.3%	19.2	2.5	B
	Subtotal	**1,274**	**1,298**	**101.9%**	**29.8**	**1.9**	**C**
SB	Left Turn	10	9	87.0%	75.1	15.3	E
	Through	1,008	1,016	100.8%	15.8	1.8	B
	Right Turn	23	26	114.3%	12.3	2.8	B
	Subtotal	**1,041**	**1,051**	**101.0%**	**16.2**	**1.8**	**B**
EB	Left Turn	42	41	97.4%	43.7	3.7	D
	Through	2	3	145.0%	44.3	25.6	D
	Right Turn	141	146	103.4%	12.3	1.0	B
	Subtotal	**185**	**190**	**102.5%**	**19.6**	**2.3**	**B**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,500**	**2,539**	**101.5%**	**23.4**	**1.7**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 3 **US 50/Transit Way** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through	1,259	1,275	101.2%	10.3	1.3	B
	Right Turn	38	39	101.3%	10.0	2.3	A
	Subtotal	**1,297**	**1,313**	**101.2%**	**10.3**	**1.3**	**B**
SB	Left Turn	17	15	90.0%	14.4	3.3	B
	Through	1,132	1,150	101.6%	1.8	1.3	A
	Right Turn						
	Subtotal	**1,149**	**1,166**	**101.4%**	**2.0**	**1.3**	**A**
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	3	3	100.0%	38.9	32.3	E
	Through						
	Right Turn	15	17	110.7%	20.7	5.3	C
	Subtotal	**18**	**20**	**108.9%**	**23.6**	**3.9**	**C**
Total		**2,464**	**2,498**	**101.4%**	**6.5**	**1.0**	**A**

Intersection 4 **US 50/Friday Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	24	24	99.6%	106.0	10.3	F
	Through	1,279	1,290	100.9%	9.6	0.4	A
	Right Turn						
	Subtotal	**1,303**	**1,314**	**100.8%**	**11.4**	**0.6**	**B**
SB	Left Turn						
	Through	1,123	1,137	101.3%	9.7	3.6	A
	Right Turn	8	7	91.3%	7.3	9.4	A
	Subtotal	**1,131**	**1,145**	**101.2%**	**9.6**	**3.6**	**A**
EB	Left Turn	13	14	103.8%	76.7	10.0	E
	Through						
	Right Turn	24	24	99.2%	44.8	17.9	D
	Subtotal	**37**	**37**	**100.8%**	**56.4**	**10.2**	**E**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,471**	**2,496**	**101.0%**	**11.3**	**1.6**	**B**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **US 50/Park Ave-Heavenly Village Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	79	80	100.9%	56.3	5.6	E
	Through	1,211	1,226	101.2%	24.5	1.7	C
	Right Turn	114	112	97.9%	11.5	0.9	B
	Subtotal	**1,404**	**1,417**	**100.9%**	**25.3**	**1.8**	**C**
SB	Left Turn	82	84	102.9%	80.8	7.0	F
	Through	1,080	1,069	99.0%	27.8	4.3	C
	Right Turn	8	7	87.5%	24.8	6.7	C
	Subtotal	**1,170**	**1,161**	**99.2%**	**31.6**	**4.3**	**C**
EB	Left Turn	6	5	75.0%	68.2	21.9	E
	Through	14	15	106.4%	63.2	17.2	E
	Right Turn	135	131	96.8%	40.6	22.1	D
	Subtotal	**155**	**150**	**96.8%**	**43.3**	**20.6**	**D**
WB	Left Turn	330	327	99.2%	101.4	28.0	F
	Through	18	16	91.1%	44.0	8.2	D
	Right Turn	105	103	98.0%	24.0	4.3	C
	Subtotal	**453**	**447**	**98.6%**	**81.4**	**21.2**	**F**
Total		**3,182**	**3,175**	**99.8%**	**36.4**	**5.3**	**D**

Intersection 6 **US 50/Pioneer Trail** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	8	9	107.5%	96.9	17.0	F
	Through	1,103	1,120	101.5%	21.8	1.0	C
	Right Turn	19	19	98.4%	16.4	4.7	B
	Subtotal	**1,130**	**1,147**	**101.5%**	**22.2**	**1.1**	**C**
SB	Left Turn	324	304	93.9%	102.0	11.6	F
	Through	1,241	1,229	99.0%	6.1	0.8	A
	Right Turn	5	4	80.0%	2.6	2.0	A
	Subtotal	**1,570**	**1,537**	**97.9%**	**25.0**	**1.6**	**C**
EB	Left Turn	3	2	76.7%	64.1	18.2	E
	Through						
	Right Turn	9	10	115.6%	27.6	10.5	C
	Subtotal	**12**	**13**	**105.8%**	**33.7**	**11.9**	**C**
WB	Left Turn	16	15	95.6%	77.0	18.8	E
	Through						
	Right Turn	440	450	102.3%	34.0	5.3	C
	Subtotal	**456**	**465**	**102.0%**	**35.4**	**5.2**	**D**
Total		**3,168**	**3,162**	**99.8%**	**25.6**	**1.7**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Existing Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 7 **Bellamy Ct/Heavenly Village Pkwy** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	33	29	88.8%	8.0	1.3	A
	Through						
	Right Turn	143	138	96.2%	4.9	1.0	A
	Subtotal	**176**	**167**	**94.8%**	**5.4**	**1.0**	**A**
EB	Left Turn	40	41	101.5%	2.9	0.2	A
	Through	113	116	102.7%	0.6	0.1	A
	Right Turn						
	Subtotal	**153**	**157**	**102.4%**	**1.2**	**0.1**	**A**
WB	Left Turn						
	Through	164	163	99.5%	0.5	0.4	A
	Right Turn	27	28	101.9%	0.1	0.0	A
	Subtotal	**191**	**191**	**99.8%**	**0.4**	**0.3**	**A**
Total		**520**	**514**	**98.9%**	**2.3**	**0.5**	**A**

Intersection 8 **Lake Pkwy-Montreal Rd/** **All-way Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	36	38	105.3%	12.8	0.6	B
	Through	204	201	98.5%	13.8	0.4	B
	Right Turn	7	7	104.3%	10.4	0.8	B
	Subtotal	**247**	**246**	**99.7%**	**13.6**	**0.4**	**B**
SB	Left Turn	12	11	93.3%	8.1	1.3	A
	Through	223	223	100.0%	9.8	0.8	A
	Right Turn	188	188	100.1%	7.0	2.4	A
	Subtotal	**423**	**422**	**99.9%**	**8.5**	**1.4**	**A**
EB	Left Turn	134	127	94.8%	5.4	0.3	A
	Through	6	7	113.3%	6.7	1.2	A
	Right Turn	68	71	104.3%	3.8	0.4	A
	Subtotal	**208**	**205**	**98.4%**	**4.9**	**0.2**	**A**
WB	Left Turn	9	9	98.9%	4.4	0.4	A
	Through	6	7	116.7%	5.6	0.4	A
	Right Turn	10	11	114.0%	3.1	0.4	A
	Subtotal	**25**	**27**	**109.2%**	**4.1**	**0.3**	**A**
Total		**903**	**901**	**99.7%**	**8.9**	**0.7**	**A**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 1 **US 50/Lake Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	30	29	95.3%	35.3	2.3	D
	Through	990	1,010	102.1%	34.2	2.2	C
	Right Turn	40	43	108.0%	38.0	4.4	D
	Subtotal	**1,060**	**1,082**	**102.1%**	**34.4**	**2.3**	**C**
SB	Left Turn	220	222	101.0%	28.3	2.6	C
	Through	1,150	1,156	100.5%	9.7	0.7	A
	Right Turn	140	136	97.4%	2.8	0.2	A
	Subtotal	**1,510**	**1,515**	**100.3%**	**11.8**	**0.6**	**B**
EB	Left Turn	140	139	98.9%	19.7	1.0	B
	Through	20	18	91.0%	15.0	1.9	B
	Right Turn	30	30	100.3%	14.1	2.8	B
	Subtotal	**190**	**187**	**98.3%**	**18.3**	**0.7**	**B**
WB	Left Turn	70	68	97.4%	17.4	1.4	B
	Through	20	19	97.0%	13.9	2.5	B
	Right Turn	320	314	98.2%	4.2	0.4	A
	Subtotal	**410**	**402**	**98.0%**	**6.9**	**0.4**	**A**
Total		**3,170**	**3,185**	**100.5%**	**19.2**	**0.8**	**B**

Intersection 2 **US 50/Stateline Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	130	126	97.1%	80.1	11.6	F
	Through	1,180	1,211	102.6%	28.0	1.5	C
	Right Turn	40	42	105.0%	21.0	2.6	C
	Subtotal	**1,350**	**1,379**	**102.1%**	**32.5**	**2.1**	**C**
SB	Left Turn	20	20	99.5%	76.5	9.5	E
	Through	1,150	1,172	101.9%	21.3	6.9	C
	Right Turn	30	33	109.0%	18.4	8.5	B
	Subtotal	**1,200**	**1,225**	**102.1%**	**22.1**	**6.9**	**C**
EB	Left Turn	50	52	103.6%	41.1	3.0	D
	Through	10	10	96.0%	49.0	9.1	D
	Right Turn	150	144	95.7%	16.7	3.2	B
	Subtotal	**210**	**205**	**97.6%**	**24.4**	**2.1**	**C**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,760**	**2,809**	**101.8%**	**27.4**	**3.4**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 3 **US 50/Transit Way** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through	1,330	1,347	101.3%	12.1	1.4	B
	Right Turn	40	41	101.8%	10.4	1.9	B
	Subtotal	**1,370**	**1,387**	**101.3%**	**12.1**	**1.4**	**B**
SB	Left Turn	20	20	98.0%	16.6	2.7	C
	Through	1,280	1,293	101.0%	4.0	3.8	A
	Right Turn						
	Subtotal	**1,300**	**1,312**	**100.9%**	**4.2**	**3.8**	**A**
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	10	7	74.0%	62.6	26.7	F
	Through						
	Right Turn	20	22	110.5%	35.6	10.7	E
	Subtotal	**30**	**30**	**98.3%**	**42.2**	**11.9**	**E**
Total		**2,700**	**2,729**	**101.1%**	**8.6**	**2.2**	**A**

Intersection 4 **US 50/Friday Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	30	27	90.3%	106.1	15.9	F
	Through	1,290	1,308	101.4%	10.4	1.0	B
	Right Turn						
	Subtotal	**1,320**	**1,335**	**101.1%**	**12.3**	**1.3**	**B**
SB	Left Turn						
	Through	1,260	1,251	99.3%	14.0	5.4	B
	Right Turn	20	21	106.5%	11.9	6.2	B
	Subtotal	**1,280**	**1,272**	**99.4%**	**13.9**	**5.4**	**B**
EB	Left Turn	70	71	101.7%	108.5	23.2	F
	Through						
	Right Turn	30	34	111.7%	80.7	28.6	F
	Subtotal	**100**	**105**	**104.7%**	**99.7**	**23.9**	**F**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,700**	**2,712**	**100.4%**	**16.5**	**3.2**	**B**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **US 50/Park Ave-Heavenly Village Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	90	87	96.4%	58.5	3.9	E
	Through	1,220	1,234	101.1%	24.0	1.0	C
	Right Turn	110	117	106.2%	11.2	0.4	B
	Subtotal	**1,420**	**1,437**	**101.2%**	**25.0**	**0.9**	**C**
SB	Left Turn	80	81	101.8%	82.7	9.7	F
	Through	1,210	1,182	97.7%	26.9	5.3	C
	Right Turn	10	10	100.0%	19.6	7.5	B
	Subtotal	**1,300**	**1,273**	**97.9%**	**30.4**	**5.2**	**C**
EB	Left Turn	10	10	98.0%	61.3	7.2	E
	Through	40	37	92.3%	54.4	5.6	D
	Right Turn	150	148	98.9%	33.2	10.7	C
	Subtotal	**200**	**195**	**97.5%**	**38.7**	**8.2**	**D**
WB	Left Turn	300	304	101.5%	75.1	15.6	E
	Through	20	25	122.5%	35.0	9.2	C
	Right Turn	110	112	102.0%	23.7	6.5	C
	Subtotal	**430**	**441**	**102.6%**	**59.8**	**11.7**	**E**
Total		**3,350**	**3,347**	**99.9%**	**32.4**	**3.9**	**C**

Intersection 6 **US 50/Pioneer Trail** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	10	12	122.0%	97.3	16.0	F
	Through	1,100	1,115	101.4%	23.9	0.7	C
	Right Turn	20	22	111.5%	20.7	5.0	C
	Subtotal	**1,130**	**1,150**	**101.8%**	**24.6**	**0.9**	**C**
SB	Left Turn	350	328	93.7%	87.5	16.7	F
	Through	1,320	1,314	99.5%	7.6	0.8	A
	Right Turn	10	11	109.0%	5.0	1.5	A
	Subtotal	**1,680**	**1,652**	**98.4%**	**23.4**	**3.7**	**C**
EB	Left Turn	10	8	83.0%	80.1	35.2	F
	Through	10	10	96.0%	82.9	24.6	F
	Right Turn	10	14	137.0%	39.1	19.8	D
	Subtotal	**30**	**32**	**105.3%**	**62.8**	**23.8**	**E**
WB	Left Turn	20	20	98.0%	90.3	11.9	F
	Through	10	8	78.0%	88.3	29.5	F
	Right Turn	490	494	100.8%	35.4	4.4	D
	Subtotal	**520**	**522**	**100.3%**	**38.3**	**4.6**	**D**
Total		**3,360**	**3,355**	**99.9%**	**26.5**	**2.4**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 7 **Bellamy Ct/Heavenly Village Pkwy** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	40	36	89.3%	7.1	0.5	A
	Through						
	Right Turn	140	143	102.4%	4.6	0.4	A
	Subtotal	**180**	**179**	**99.4%**	**5.1**	**0.4**	**A**
EB	Left Turn	40	38	94.8%	2.8	0.3	A
	Through	130	135	103.9%	0.6	0.1	A
	Right Turn						
	Subtotal	**170**	**173**	**101.8%**	**1.1**	**0.2**	**A**
WB	Left Turn						
	Through	140	135	96.3%	0.2	0.0	A
	Right Turn	30	27	90.7%	0.0	0.0	A
	Subtotal	**170**	**162**	**95.3%**	**0.2**	**0.0**	**A**
Total		**520**	**514**	**98.8%**	**2.2**	**0.2**	**A**

Intersection 8 **Lake Pkwy-Montreal Rd/** **All-way Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	40	39	97.5%	13.0	0.5	B
	Through	210	215	102.3%	14.3	0.4	B
	Right Turn	10	8	75.0%	10.4	0.8	B
	Subtotal	**260**	**261**	**100.5%**	**14.0**	**0.4**	**B**
SB	Left Turn	20	19	96.0%	8.3	1.2	A
	Through	230	233	101.3%	9.8	0.6	A
	Right Turn	180	172	95.3%	6.7	0.5	A
	Subtotal	**430**	**424**	**98.6%**	**8.5**	**0.5**	**A**
EB	Left Turn	120	122	101.8%	5.8	0.5	A
	Through	10	12	116.0%	5.6	1.1	A
	Right Turn	70	67	95.6%	3.5	0.2	A
	Subtotal	**200**	**201**	**100.3%**	**5.0**	**0.3**	**A**
WB	Left Turn	10	9	90.0%	4.4	0.9	A
	Through	10	10	97.0%	6.0	0.8	A
	Right Turn	20	21	105.5%	3.4	0.5	A
	Subtotal	**40**	**40**	**99.5%**	**4.2**	**0.5**	**A**
Total		**930**	**926**	**99.5%**	**9.1**	**0.2**	**A**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 1 **US 50/Lake Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	30	27	89.7%	34.7	2.7	C
	Through	993	989	99.6%	33.0	3.6	C
	Right Turn	40	40	99.3%	34.8	4.1	C
	Subtotal	**1,063**	**1,056**	**99.3%**	**33.1**	**3.5**	**C**
SB	Left Turn	226	217	96.2%	28.8	4.6	C
	Through	1,153	1,165	101.0%	10.1	0.9	B
	Right Turn	140	140	99.9%	2.7	0.2	A
	Subtotal	**1,519**	**1,522**	**100.2%**	**12.1**	**1.1**	**B**
EB	Left Turn	140	141	100.4%	19.4	1.1	B
	Through	20	22	110.5%	14.5	2.8	B
	Right Turn	30	30	99.7%	15.7	1.4	B
	Subtotal	**190**	**193**	**101.3%**	**18.3**	**0.8**	**B**
WB	Left Turn	70	67	95.6%	17.9	1.9	B
	Through	20	22	111.5%	14.3	3.2	B
	Right Turn	337	335	99.4%	4.4	0.7	A
	Subtotal	**427**	**424**	**99.4%**	**7.1**	**0.5**	**A**
Total		**3,199**	**3,195**	**99.9%**	**18.8**	**1.3**	**B**

Intersection 2 **US 50/Stateline Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	131	124	94.5%	79.7	12.6	E
	Through	1,183	1,187	100.3%	26.5	2.2	C
	Right Turn	40	42	105.3%	20.7	3.9	C
	Subtotal	**1,354**	**1,352**	**99.9%**	**31.2**	**1.9**	**C**
SB	Left Turn	20	19	94.0%	80.6	19.0	F
	Through	1,153	1,189	103.1%	26.2	17.2	C
	Right Turn	30	29	97.3%	23.1	15.7	C
	Subtotal	**1,203**	**1,237**	**102.8%**	**27.0**	**17.1**	**C**
EB	Left Turn	50	50	100.0%	39.6	4.4	D
	Through	10	11	107.0%	42.8	9.3	D
	Right Turn	151	153	101.1%	17.8	2.5	B
	Subtotal	**211**	**213**	**101.1%**	**24.1**	**2.0**	**C**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,768**	**2,803**	**101.3%**	**28.8**	**7.8**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 3 **US 50/Transit Way** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through	1,334	1,319	98.9%	11.2	1.9	B
	Right Turn	40	42	104.5%	11.1	2.3	B
	Subtotal	**1,374**	**1,361**	**99.0%**	**11.2**	**1.9**	**B**
SB	Left Turn	20	21	103.0%	18.6	2.0	C
	Through	1,284	1,317	102.6%	5.9	4.0	A
	Right Turn						
	Subtotal	**1,304**	**1,338**	**102.6%**	**6.1**	**3.9**	**A**
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	10	10	96.0%	61.4	31.0	F
	Through						
	Right Turn	20	22	111.5%	35.1	18.1	E
	Subtotal	**30**	**32**	**106.3%**	**43.6**	**22.3**	**E**
Total		**2,708**	**2,730**	**100.8%**	**9.1**	**2.6**	**A**

Intersection 4 **US 50/Friday Ave** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	31	30	96.1%	102.2	16.0	F
	Through	1,294	1,285	99.3%	10.1	0.7	B
	Right Turn						
	Subtotal	**1,325**	**1,315**	**99.2%**	**12.2**	**0.8**	**B**
SB	Left Turn						
	Through	1,264	1,274	100.8%	17.4	4.8	B
	Right Turn	20	20	102.0%	14.2	6.8	B
	Subtotal	**1,284**	**1,294**	**100.8%**	**17.4**	**4.9**	**B**
EB	Left Turn	70	67	95.6%	103.2	32.4	F
	Through						
	Right Turn	30	29	95.3%	84.0	31.3	F
	Subtotal	**100**	**96**	**95.5%**	**97.4**	**30.0**	**F**
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		**2,709**	**2,704**	**99.8%**	**17.7**	**3.1**	**B**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 5 **US 50/Park Ave-Heavenly Village Pkwy** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	90	87	97.0%	60.3	6.6	E
	Through	1,220	1,202	98.5%	25.0	2.0	C
	Right Turn	123	122	99.0%	12.0	1.5	B
	Subtotal	**1,433**	**1,411**	**98.5%**	**26.1**	**1.8**	**C**
SB	Left Turn	84	83	98.8%	88.0	8.7	F
	Through	1,210	1,201	99.2%	30.5	4.3	C
	Right Turn	10	9	93.0%	19.7	7.6	B
	Subtotal	**1,304**	**1,293**	**99.1%**	**34.1**	**4.4**	**C**
EB	Left Turn	10	10	100.0%	60.0	15.4	E
	Through	40	35	87.0%	57.9	10.9	E
	Right Turn	150	150	100.1%	44.7	20.5	D
	Subtotal	**200**	**195**	**97.5%**	**47.8**	**17.9**	**D**
WB	Left Turn	342	335	98.0%	133.1	36.3	F
	Through	24	25	103.3%	43.3	13.9	D
	Right Turn	115	116	100.7%	28.9	6.0	C
	Subtotal	**481**	**476**	**98.9%**	**103.3**	**28.5**	**F**
Total		**3,418**	**3,374**	**98.7%**	**41.2**	**5.7**	**D**

Intersection 6 **US 50/Pioneer Trail** **Signal**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	10	10	96.0%	91.0	20.8	F
	Through	1,109	1,096	98.9%	24.2	1.2	C
	Right Turn	20	19	94.5%	22.6	3.0	C
	Subtotal	**1,139**	**1,125**	**98.8%**	**24.7**	**1.1**	**C**
SB	Left Turn	364	343	94.1%	93.8	10.7	F
	Through	1,348	1,348	100.0%	7.2	0.6	A
	Right Turn	10	11	109.0%	4.4	2.1	A
	Subtotal	**1,722**	**1,701**	**98.8%**	**24.5**	**1.8**	**C**
EB	Left Turn	10	11	110.0%	98.1	37.3	F
	Through	10	12	115.0%	77.5	26.5	E
	Right Turn	10	11	113.0%	39.9	11.2	D
	Subtotal	**30**	**34**	**112.7%**	**71.2**	**20.0**	**E**
WB	Left Turn	20	19	93.0%	85.3	18.0	F
	Through	10	9	94.0%	86.8	15.9	F
	Right Turn	494	478	96.8%	34.2	7.6	C
	Subtotal	**524**	**506**	**96.6%**	**37.1**	**7.4**	**D**
Total		**3,415**	**3,366**	**98.6%**	**27.0**	**1.6**	**C**

SimTraffic Post-Processor | **Heavenly Epic Discovery Project**
Average Results from 10 Runs | **Cumulative Plus Project Summer Friday Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 7 **Bellamy Ct/Heavenly Village Pkwy** **Side Street Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	42	42	99.5%	9.5	3.4	A
	Through						
	Right Turn	152	153	100.5%	6.6	3.5	A
	Subtotal	**194**	**195**	**100.3%**	**7.2**	**3.5**	**A**
EB	Left Turn	48	45	94.0%	3.2	0.3	A
	Through	139	136	97.6%	0.6	0.1	A
	Right Turn						
	Subtotal	**187**	**181**	**96.7%**	**1.2**	**0.1**	**A**
WB	Left Turn						
	Through	179	186	104.1%	0.6	0.5	A
	Right Turn	31	31	100.0%	0.1	0.1	A
	Subtotal	**210**	**217**	**103.5%**	**0.5**	**0.4**	**A**
Total		**591**	**593**	**100.3%**	**2.9**	**1.3**	**A**

Intersection 8 **Lake Pkwy-Montreal Rd/** **All-way Stop**

		Volume (vehicles)			Total Delay (sec/veh)		
Direction	**Movement**	**Demand**	**Served**	**% Served**	**Average**	**Std. Dev.**	**LOS**
NB	Left Turn	40	42	104.8%	14.8	5.2	B
	Through	210	205	97.6%	14.8	2.3	B
	Right Turn	10	11	107.0%	11.7	3.5	B
	Subtotal	**260**	**258**	**99.0%**	**14.6**	**2.8**	**B**
SB	Left Turn	20	19	96.0%	10.0	3.0	A
	Through	230	230	99.8%	11.1	2.9	B
	Right Turn	195	200	102.4%	7.7	2.5	A
	Subtotal	**445**	**448**	**100.8%**	**9.5**	**2.8**	**A**
EB	Left Turn	140	139	99.1%	5.9	0.4	A
	Through	10	12	116.0%	6.0	1.4	A
	Right Turn	70	71	101.0%	3.6	0.3	A
	Subtotal	**220**	**221**	**100.5%**	**5.2**	**0.4**	**A**
WB	Left Turn	10	9	92.0%	4.5	0.5	A
	Through	10	10	103.0%	6.1	0.7	A
	Right Turn	20	19	94.0%	3.1	0.4	A
	Subtotal	**40**	**38**	**95.8%**	**4.2**	**0.4**	**A**
Total		**965**	**965**	**100.0%**	**9.7**	**2.1**	**A**

SAROEA Consistency Review		**Heavenly Epic Discovery Project**					
		Activity					
Citation FSM 2343.14	Criteria	Mountain Bike Park	Mountain Coasters	Cable-Based Activities	Hiking and Connecting Trails	Infill Activities	Lookout Tower
1a	Will not change the primary purpose of the ski area to other than snow sports	This activity will supplement existing summer visitation and will only increase visitation by a small amount when compared to the winter use.	This activity will supplement existing summer and winter visitation and will only increase visitation by a small amount when compared to the snowsports use.	This activity will supplement existing summer and winter visitation and will only increase visitation by a small amount when compared to the snowsports use.	This activity will supplement existing summer visitation and will only increase visitation by a small amount when compared to the winter use.	This activity will supplement existing summer visitation and will only increase visitation by a small amount when compared to the winter use.	This activity will supplement existing summer and winter visitation and will only increase visitation by a small amount when compared to the snowsports use.
1b	Encourage outdoor recreation and enjoyment of nature and provide natural resource-based recreation opportunities	See 4	See 4	See 4	See 4	See 4	See 4
1c	To the extent practicable, be located within the portions of the ski area that are developed or that will be developed pursuant to the master development plan	All activities occur within the current operational boundary.	All activities occur within the current operational boundary.	All activities occur within the current operational boundary.	All activities occur within the current operational boundary with the exception of portions of the Panorama Trail. The Panorama Trail was developed to provide connectivity between these activities and the existing trail network.	All activities occur within the current operational boundary.	All activities occur within the current operational boundary.
1d	Not exceed the level of development for snow sports and be consistent with the zoning established in the applicable master development plan	This proposal represents an update to the master development plan and establishes the zoning for these additional seasonal and year-round recreational activities. This activity will supplement existing visitation and will not necessitate development of additional chairlifts, lodges, or parking lots.	This proposal represents an update to the master development plan and establishes the zoning for these additional seasonal and year-round recreational activities. This activity will supplement existing visitation and will not necessitate development of additional chairlifts, lodges, or parking lots.	This proposal represents an update to the master development plan and establishes the zoning for these additional seasonal and year-round recreational activities. This activity will supplement existing visitation and will not necessitate development of additional chairlifts, lodges, or parking lots.	This proposal represents an update to the master development plan and establishes the zoning for these additional seasonal and year-round recreational activities. This activity will supplement existing visitation and will not necessitate development of additional chairlifts, lodges, or parking lots.	This proposal represents an update to the master development plan and establishes the zoning for these additional seasonal and year-round recreational activities. This activity will supplement existing visitation and will not necessitate development of additional chairlifts, lodges, or parking lots.	This proposal represents an update to the master development plan and establishes the zoning for these additional seasonal and year-round recreational activities. This activity will supplement existing visitation and will not necessitate development of additional chairlifts, lodges, or parking lots.
1e	To the extent practicable, harmonize with the natural environment of the site where they would be located by:	N/A	N/A	N/A	N/A	N/A	N/A
1e1	Being visually consistent with or subordinate to the ski area's existing facilities, vegetation and landscape	Mountain bike trails will be designed and implemented to avoid tree removal unless necessary, incorporate natural rock outcroppings and appropriate BMPs. If necessary, BEIG concepts and criteria will be applied to design, layout, and construction.	Coasters would be designed to incorporate similar materials to existing ski area infrastructure (e.g. colored metal pipe) and would be situated in a less visibly prominent location which is on the periphery of existing snow sports infrastructure. Coasters will be designed and implemented to avoid tree removal unless necessary and incorporate natural rock outcroppings. BEIG concepts and criteria will be applied to design, layout, and construction.	Cable-Based Activities are designed to avoid tree removal, blend with the forest canopy, and utilize natural materials in their construction including the trees themselves. BEIG concepts and criteria will be applied to design, layout, and construction.	Hiking trails will be designed and implemented to avoid tree removal unless necessary, incorporate natural rock outcroppings and appropriate BMPs. If necessary, BEIG concepts and criteria will be applied to design, layout, and construction.	Infill activities are largely subordinate to facilities, vegetation, and landscape. If necessary, BEIG concepts and criteria will be applied to materials, branding, and color.	BEIG concepts and criteria will be applied to design, layout, and construction.
1e2	Not requiring significant modifications to topography to facilitate construction or operations	Will not require significant modification to topography and included in proposal.	Will not require significant modification to topography and included in proposal.	Will not require significant modification to topography and included in proposal.	Will not require significant modification to topography and included in proposal.	Will not require significant modification to topography and included in proposal.	Will not require significant modification to topography and included in proposal.
1f	Not compromise snow sports operations or functions	The activity is compatible with existing snow sports operations and will be covered by snow during winter operations. This activity will supplement existing visitation and Heavenly Mountain Resort will remain primarily a snow sports operation.	The Forest Flyer mountain coaster will be situated in a less visually prominent location which is on the periphery of existing snow sports infrastructure. The mountain coaster has been designed to not compromise snow sports operations. This activity will supplement existing visitation and Heavenly Mountain Resort will remain primarily a snow sports operation. The Sky Meadows mountain coaster will not interfere with existing snow sports operations including groomed runs, gladed runs, or base areas. The Sky Meadows will change tree skiing opportunities within the Sky Meadows basin.	Cable-Based Activities are situated outside or span existing ski runs and will result in no substantial change in snow sports operations. Infrastructure will have limited effect on tree skiing opportunities due to the fact that the poles are similar to trees and would be similarly avoided. This activity will supplement existing visitation and Heavenly Mountain Resort will remain primarily a snow sports operation. Where possible, trees will be incorporated into the layout and design of cable-based activities.	The activity is compatible with existing snow sports operations and will be covered by snow during winter operations. This activity will supplement existing visitation and Heavenly Mountain Resort will remain primarily a snow sports operation.	The activity is compatible with existing snow sports operations and will be covered by snow during winter operations. This activity will supplement existing visitation and Heavenly Mountain Resort will remain primarily a snow sports operation.	The lookout toward will be situated in a discrete location which is on the periphery of existing snow sports infrastructure. The lookout tower will enhance an existing winter overlook destination and not compromise snow sports operations. This activity will supplement existing visitation and Heavenly Mountain Resort will remain primarily a snow sports operation.

1g	Increase utilization of snow sports facilities and not require extensive new support facilities, such as parking lots, restaurants, and lifts.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack and Comet lifts. No new permanent roads will be constructed.
4	Factors that may affect whether other additional seasonal or year-round recreation activities and associated facilities besides those listed in paragraph 2 may be approved under paragraph 1 of this section include but are not limited to the degree to which visitors are able to engage with the natural setting, the extent to which the activities and facilities could be expected to lead to exploration and enjoyment of other NFS lands, and the similarity of the activities and associated facilities to those enumerated in paragraph 2 or paragraph 3 of this section.	N/A - Allowable under SAROEA	Degree of engagement - exposure to new clients (non-skiing). Lowest level on the progression/level of difficulty. Foreground and background views. The user has control over their speed. Lead to further exploration - Get there by walking. Located in adventure peak area, easy to access. Zone concept. Similarity to other activities - Adjacent to the sledding hill, The Coaster is designed to serpentine through rock outcroppings and forest area (similar to both tree skiing and mountain biking) which would place the rider in the natural setting and allow them to interact with these natural features. Ride would follow the contours of the landscape which would allow the user to have a gravity sports experience.	N/A (SAROEA describes ropes courses/zip lines as allowable. The design and operation of the sky cycle canopy tour is similar to these allowable activities and therefore consistent with SAROEA.)	N/A - Allowable under SAROEA	Frisbee Golf - N/A - Allowable under SAROEA. Jeep Tour - Visitors with physical disabilities will be accommodated, providing access to NFS lands throughout the SUP area to those who might not be able to experience it otherwise.	N/A
5	Do not approve additional seasonal or year-round recreation activities and associated facilities when the visitor's experience is not interdependent with attributes common in National Forest settings.	This activity are is? dependent on a change in elevation and engagement with a mountain forest setting. All of these activities allow the user to have a personal experience with the mountain forest setting. The unique flora and fauna of the mountain setting make the experience unique because of the scenery and landscape features. Mountain biking, and mountain bike parks have been authorized on NFS lands for decades and have proven to be compatible with the attributes and resources described above.	This activity is dependent on a change in elevation and engagement with a mountain forest setting. This activity allows the user to have a personal experience with the mountain forest setting, and to experience the slopes found within the resort. The unique flora and fauna of the mountain setting make the experience unique because of the scenery and landscape features. These activities remove a barrier of interaction by providing a unique perspective and engagement with aspects of the forest that not easily accessible to the majority of the public without these activities.	These activities are dependent on a change in elevation and engagement with a mountain forest setting. All of these activities allow the user to have a personal experience with the mountain forest setting. The unique flora and fauna of the mountain setting make the experience unique because of the scenery and landscape features. These activities remove a barrier of interaction by providing a unique perspective and engagement with aspects of the forest that not easily accessible to the majority of the public without these activities.	These activities are dependent on a change in elevation and engagement with a mountain forest setting. These activities allow the user to have a personal experience with the mountain forest setting. The unique flora and fauna of the mountain setting make the experience unique because of the scenery and landscape features. Hiking and trails have historically been the primary means by which human interact and travel through the forest environment. Hiking and trails are common to all National Forests, and are compatible with the attributes and resources described above.	The unique flora and fauna of the mountain setting make the experience unique because of the scenery and landscape features. In addition to being explicitly allowable under SAROEA, the challenge of frisbee golf includes navigating and avoiding natural obstacles such as trees and rocks. The proposed location utilizes the natural terrain to provide a challenging, yet enjoyable experience that is inter-dependent with the forested mountain setting. There are few opportunities in the Lake Tahoe basin for motorized access to the forested mountain setting. The proposed Jeep Tour will provide a unique perspective for visitors without the means or ability to access the forested mountain setting without guided assistance. The East Peak Lake is an accessible location for visitors to experience a forested mountain lake and related recreation opportunities.	A fire lookout tower is a common attribute within the National Forest System, and the proposed design mimics the design, location, and overlook opportunity found at all fire lookout towers. The lookout tower will be instantly recognizable as a common attribute of the National Forest setting.
6	Allow temporary activities that rely on existing facilities, such as concerts or weddings, even if they are not necessarily interdependent with a National Forest setting, provided they are enhanced by it. Do not authorize new permanent facilities solely for these activities.	N/A	N/A	N/A	N/A	N/A	N/A

7	Encourage holders to utilize existing facilities to provide additional seasonal or year-round recreation activities.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.	No additional parking lots, lifts, or lodges will be required for this activity. The primary access for all of these activities will be through the existing Gondola. Proposed activities will utilize existing lodges including Tamarack Lodge, East Peak Lodge, Sky Deck and the ski school building. Proposed activities will utilize the existing Tamarack, Big Easy and Comet lifts. No new permanent roads will be constructed.
8a	Establish zones to guide placement and design of additional seasonal or year-round recreation facilities, basing the zones on the existing natural setting and level of development to support snow sports	Establishing zones for placement and design of additional seasonal or year-round recreation facilities will be accomplished through this project and the master plan amendment. The Zones proposed include: Adventure Peak, East Peak Basin, Sky Meadows Basin, and Mountainwide.	Establishing zones for placement and design of additional seasonal or year-round recreation facilities will be accomplished through this project and the master plan amendment.	Establishing zones for placement and design of additional seasonal or year-round recreation facilities will be accomplished through this project and the master plan amendment.	Establishing zones for placement and design of additional seasonal or year-round recreation facilities will be accomplished through this project and the master plan amendment.	Establishing zones for placement and design of additional seasonal or year-round recreation facilities will be accomplished through this project and the master plan amendment.	Establishing zones for placement and design of additional seasonal or year-round recreation facilities will be accomplished through this project and the master plan amendment.
8b	Depict the general location of the facilities	Included in proposal	Included in proposal	Included in proposal	Included in proposal	Included in proposal	Included in proposal
8c	Establish an estimated timeframe for their construction.	Included in proposal	Included in proposal	Included in proposal	Included in proposal	Included in proposal	Included in proposal
9	Utilize the Scenery Management System (FSM 2380), Built Environment Image Guide (Publication FS-710), and the Recreation Opportunity Spectrum (FSM 2310) to ensure that additional seasonal or year-round recreation activities and associated facilities are located and constructed to harmonize with the surrounding natural environment.	Preliminary screening indicates substantial conformance with these planning tools. Detailed analysis and determinations will occur through the NEPA process.	Preliminary screening indicates substantial conformance with these planning tools. Detailed analysis and determinations will occur through the NEPA process.	Preliminary screening indicates substantial conformance with these planning tools. Detailed analysis and determinations will occur through the NEPA process.	Preliminary screening indicates substantial conformance with these planning tools. Detailed analysis and determinations will occur through the NEPA process.	Preliminary screening indicates substantial conformance with these planning tools. Detailed analysis and determinations will occur through the NEPA process.	Preliminary screening indicates substantial conformance with these planning tools. Detailed analysis and determinations will occur through the NEPA process.
10	Authorization of additional seasonal or year-round recreation activities and associated facilities is subject to terms and conditions deemed appropriate by the Authorized Officer.	Activty-specfic operating plans, operation manuals, training, and safety checks will be required, as appropriate, for all proposed activities.	Activty-specfic operating plans, operation manuals, training, and safety checks will be required, as appropriate, for all proposed activities.	Activty-specfic operating plans, operation manuals, training, and safety checks will be required, as appropriate, for all proposed activities.	Activty-specfic operating plans, operation manuals, training, and safety checks will be required, as appropriate, for all proposed activities.	Activty-specfic operating plans, operation manuals, training, and safety checks will be required, as appropriate, for all proposed activities.	Activty-specfic operating plans, operation manuals, training, and safety checks will be required, as appropriate, for all proposed activities.
11	The acreage necessary for additional seasonal or year-round recreation activities and associated facilities may not be considered in determining the acreage encompassed by a ski area permit. Permit area expansions must be based on needs related to snow sports rather than additional seasonal or year-round recreation.	All proposed activities occur within the existing special use permit boundary.	All proposed activities occur within the existing special use permit boundary.	All proposed activities occur within the existing special use permit boundary.	All proposed activities occur within the existing special use permit boundary.	All proposed activities occur within the existing special use permit boundary.	All proposed activities occur within the existing special use permit boundary.
12	Additional seasonal or year-round recreation activities and associated facilities that were authorized before November 7, 2011, and that do not meet the criteria in paragraphs 1 through 11 of this section may continue to be authorized during the term of the current permit. When that permit terminates or is revoked, do not reauthorize additional seasonal or year-round recreation activities and associated facilities that do not conform to paragraphs 1 through 11 of this section.	N/A	N/A	N/A	N/A	N/A	N/A
13	Notwithstanding FSM 2340.3, paragraph 3, and 2343.03, paragraph 1, a proposal that complies with paragraphs 1 through 12 of this section may be approved.	N/A	N/A	N/A	N/A	N/A	N/A
			Forest Flyer	Mid Station Canopy Tour	East Peak Lodge Hiking Trail	Disc Golf Course	
			Sky Meadows Coaster	Sky Cycle	Panorama Trail	Mountain Excursion Jeep Tour	
				East Peak Zipline Canopy Tour		East Peak Reservoir Water Activities	
				Sky Meadows Zipline Canopy Tour			
				Sky Meadows Challenge Course			