



California Regional Water Quality Control Board,  
Lahontan Region  
Attn: Andrea Stanley  
2501 Lake Tahoe Blvd.  
South Lake Tahoe, CA 96150

May 8, 2009

Dear Ms. Stanley:

We submit the following comments on behalf of the Sierra Forest Legacy, the Tahoe Group of the Sierra Club and the League to Save Lake Tahoe. We would like to thank the Lahontan Water Board (hereafter "Lahontan") for the opportunity to provide comments on the April 2009 Draft proposed Region-wide Timber Waiver ("2009 Waiver"). We agree that there is a need to better streamline the permitting process for fuels reduction projects and appreciate Lahontan's efforts to improve its Regional Timber Waiver. However, as discussed in previous letters and meetings with staff, we have concerns that the proposed changes to existing law portend a substantially reduced role for Lahontan in protecting water quality within its region, including a reduction in currently required monitoring for fuel reduction activities in the Tahoe Basin.

As stated in our 12/5/08 and 2/9/09 letters on previous drafts made available for public review, we expect Lahontan to complete a comprehensive environmental review for these proposed changes, as required by the California Environmental Quality Act ("CEQA"), Pub. Res. Code § 21000 *et seq.* Here, we do not believe that Lahontan has adequately addressed the potentially significant impacts from the monitoring changes proposed in the 2009 Waiver, nor has Lahontan provided the necessary and required documentation to support its proposed findings of no significant impacts as it relates to the entire Lahontan Region, and specifically the Lake Tahoe Basin, the only designated Outstanding National Resource Water (ONRW) in the Lahontan Region.

We continue to have an interest in working with Lahontan staff and other interested parties towards a win-win solution for Tahoe, in which needed fuel reduction activities may go forward in a manner that ensures that activities causing potentially significant impacts are quickly identified and promptly corrected. We have summarized the monitoring requirements we believe are necessary to protect Lake Tahoe in our letter to you dated April 24, 2009. We look forward to further discussions with staff regarding how best to protect the Lake and its surrounding environment through effective and feasible monitoring of the fuel projects planned for the Basin over the next decade.

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## A. Introduction

These comments are provided on the Conditional Waiver of Waste Discharge Requirements for Waste Discharges Resulting from Timber Harvest and Vegetation Management Activities in the LaHontan Region (“2009 Waiver”) proposed by Lahontan.

As you are aware, we have challenged Lahontan’s adoption in December 2008 of a waiver specific to the Tahoe Basin (2008 Waiver) through a Petition to the State Board. That Petition is currently pending. In the meantime, Lahontan is proposing to revise its regional waiver with the proposed 2009 Waiver. Based on statements in the 2009 Waiver and conversations with Lahontan staff and officials, we understand that should the 2008 Waiver be set aside or withdrawn, the proposed 2009 Waiver will be applied to the Tahoe Basin. As you are aware, we are primarily concerned with issues affecting Tahoe’s water quality and environment and thus these comments are primarily directed towards that possibility, that the 2009 Waiver may be applied in the Tahoe Basin.<sup>1</sup>

We remain concerned that the proposed 2009 Regional Waiver makes a number of substantial changes to the existing 2007 Waiver that have the potential for significant impacts. Under the California Environmental Quality Act (CEQA), this requires the preparation on an Environmental Impact Report (EIR) rather than a negative declaration, as Lahontan has prepared for this project. Further, we do not believe the overall reduction in monitoring complies with the Water Code’s requirement that waivers be accompanied by monitoring requirements to ensure that water quality and Basin Plan beneficial uses are protected.<sup>2</sup>

We also reiterate our prior comments that Lahontan’s discussion of the impacts of the 2009 Waiver are inadequate as applied to the Tahoe Basin, an area that was not initially intended to be covered by this project. For example, the project documents contain inadequate discussion of the environmental setting in Tahoe with regard to 1) the amount of fuel reduction projects planned over the next decade; 2) the current state of Lake Tahoe’s water quality, including Lake clarity and current findings of the TMDL process; 3) how past monitoring in Tahoe has been conducted and Lahontan’s review of that monitoring; 4) the impacts on water quality and Basin beneficial uses of recent fuel related projects such as Third Creek or the Angora fire restoration; 5) the Forest Service’s and Lahontan’s South Shore Project, and how the proposed 2009 Waiver requirements relate to how that project has been recently proposed in the draft EIS/EIR, particularly regarding monitoring issues; and 6) the current state of negotiations between the State Board and the Forest Service regarding amendments to the 1982 Management Agency Agreement (MAA) and updated monitoring requirements. As part of our comments on this plan, we incorporate by reference into the record public documents in Lahontan’s possession regarding each of these issues.

Finally, there continue to be a number of areas in which the proposed 2009 Waiver appears to reduce the monitoring required under the 2007 Waiver. As set forth below, we believe these changes have the potential for significant impacts, thereby making the approval of this waiver through a negative declaration under CEQA unlawful.

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<sup>1</sup> Many of these comments are also applicable to areas outside of the Basin as well. Thus, where applicable, please view these comments as applying to the Lahontan Region as a whole.

<sup>2</sup> On this issue, we hereby reiterate and incorporate by reference the our prior comment letters, State Board Petition and Exhibits regarding alleged Water Code violations in Lahontan’s approval of the 2008 Waiver, which also apply to this project.

## **B. Changes in How Forest Service Projects are Monitored**

The 2007 Waiver required effectiveness and forensic Monitoring according to the Monitoring and Reporting Program (MRP), included as Attachment 2 to the 2007 Waiver for a Forest Service projects in high risk areas such as steep slopes and stream zones. The 2007 Waiver allowed the Forest Service to request an alternative compliance approach to monitoring utilizing components of its BMP Evaluation Program (BMPEP.) *See* 2007 Waiver (“The USFS will collaborate with Water Board staff to determine which projects may use the BMPEP to satisfy effectiveness and forensic monitoring requirements.”)

The 2009 Waiver changes the default monitoring requirement for Forest Service projects from the MRP to the Forest Service’s BMPEP except for watersheds above the threshold of concern (TOC) or water quality impaired, as follows:

In watersheds that are at or above the TOC, or that will be elevated above TOC due to project implementation, or are in watersheds with 303(d) listed waters impaired for sediment, U.S. Forest Service watershed staff shall submit a monitoring report that utilizes the BMPEP protocols to evaluate the effectiveness of implemented BMPs for any Category 6 activities... BMPEP protocols shall be applied at focused "high risk" sites rather than on a random basis to assess the effectiveness of the applied BMPs.

Here, Lahontan is on record that the Forest Service’s BMPEP, which collects limited monitoring on a random basis in an annual Forest wide report, is inadequate to protect water quality, particularly in the Lake Tahoe Basin. *See* September 17, 2008 Comment Letter, Ex. 13.<sup>3</sup> Here, however, the 2009 Waiver appears to be relying on the BMPEP as a substitute for the MRP for all watersheds in the Basin that are not above current TOCs.

This language is also impermissibly vague for two reasons.

First, it is not clear how Lahontan intends to apply the second part of this provision requiring heightened BMP monitoring for watersheds with 303(d) listed waters impaired for sediment to the Tahoe Basin. Here, Lake Tahoe is a 303(d) listed sediment impaired waterbody and all streams within the Basin flow into the Lake. Thus, under a literal reading of this provision, heightened monitoring would be required for *all* Forest Service Projects falling under Category 6 that occur in the Basin. However, as recently demonstrated by the South Shore DEIS, and pp. 4-2 – 4-3, Lahontan’s and the Forest Service’s current approach to monitoring does *not* require heightened monitoring for all Basin watersheds, and in fact limits such monitoring in that project to only 3 out of 18 listed watersheds. *See* DEIS, p. 3-108, Table 3-68.

Prior to any action on this Waiver, Lahontan must clarify this discrepancy in current policy; otherwise Lahontan’s review process cannot satisfy the informational standards of CEQA. *See e.g., Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392 (“If CEQA is scrupulously followed, the public will know the basis on which its responsible officials either approve or reject environmentally significant action, and the public, being duly informed, can respond accordingly to action with which it disagrees. [citations omitted.] The EIR process protects not only the environment but also informed self-government.”)

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<sup>3</sup> We hereby incorporate all exhibits submitted in our prior comments on the 2007 Waiver as exhibits to this comment letter as well.

If in the alternative Lahontan intends to interpret the provisions discussed above as requiring heightened monitoring only in watersheds above the TOC, this would be a potentially significant impact. As discussed in our prior comments and in the Supplemental Declaration of Laurel Collins (“Supp. Collins Decl.”), fuel reduction activities, particularly on steep slopes and in stream zones, have the potential to cause significant amounts of sediment discharge, which has little or nothing to do with the overall percentage of equivalent impermeable surface area within the watershed:

In my experience working in the Sierra Nevada, I have observed that the logging activities on steep slopes and within stream zones have the potential to discharge substantial amounts of sediment. Sediment sources are not dependent upon the creation of impermeable surfaces, therefore establishing whether monitoring should occur or the type that is needed should not be based upon this calculation. For example, areas of landslides that are not necessarily steep, can be mobilized by changes in the drainage network that are caused by road ditches and stream crossings. Additionally, just the loss of interception can change the amount of groundwater in the soils and timing at which saturation occurs. These changes combined with loss in root strength that would be associated with logging or thinning operations can alter the soils resistance to sliding and to surface erosion.

*See* Sup. Collins Decl. Submitted with these Comments. Collins concludes: “Because of their limitations... in my opinion [TOC] calculations should not be the basis for determining whether monitoring is needed.”

Lahontan’s March 2008 Pollutant Reduction Opportunity (PRO) Report<sup>4</sup> supports the idea that sediment loading may occur from logging activities in sensitive areas, regardless of the relative TOC status within the watershed:

Developing and evaluating PCOs for forested areas (Setting C) was more difficult because there is very little measured data from the Tahoe region that could be used to assess the impacts of forest thinning and fuels management treatments. However, fuels-reduction treatments are planned for much of the forested portion of the Tahoe Basin in the near future. Fuels treatments range in intensity from hand crews, to prescribed fire, to mechanical harvesting systems; their potential impacts on runoff and erosion processes in the Tahoe Basin are poorly understood. PCOs for forested areas include many of the same treatments used on roads and ski slopes and are aimed at mitigating any impacts of forest management treatments and reducing loading from areas that have been disturbed by past logging activities (such as abandoned roads and trails).

PRO Report, p 176. The PRO Report makes an assumption that relatively undisturbed forested upland areas will not contribute substantially to overall sediment loading due to the existing restrictions on logging on steep slopes and in SEZs:

From a sediment or nutrient-loading analysis standpoint, forest management is wrought with uncertainty. Depending on the specific treatments applied and local physiographic factors (soil type, slope angle, soil moisture/seasonality), ground-based mechanized thinning and fuels treatments have the potential to increase runoff and erosion, at least at

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<sup>4</sup>See [http://www.waterboards.ca.gov/lahontan/water\\_issues/programs/tmdl/lake\\_tahoe/docs/presentations/pro\\_report\\_v2.pdf](http://www.waterboards.ca.gov/lahontan/water_issues/programs/tmdl/lake_tahoe/docs/presentations/pro_report_v2.pdf).



the local scale. However, given the types of low-impact treatments being employed and planned in Tahoe Basin fuels management efforts (primarily hand treatment and CTL systems) and regulatory limitations on mechanical treatment on steep slopes and SEZs, fuels treatments are unlikely to increase sediment and nutrient loading at the subwatershed scale (the scale of this analysis). Therefore, the main opportunities to reduce loading from forested areas are related to careful planning and implementation of BMPs/PCOs (e.g., obliteration of roads, landings and trails).

*Id.*, p 184.

The 2009 Waiver changes this calculation by allowing for mechanical treatments without the monitoring as previously required under the 2007 Waiver. In this way the 2009 Waiver not only violates CEQA, but undermines Lahontan's entire TMDL process and ability to comply with its own Basin Plan objectives.

A second problem is that, however the TOC issue is interpreted, no information is given as to how Lahontan and the Forest Service intend to conduct monitoring at "high risk" sites. No information is given as to how many sites this will entail, will it apply to all streamzones and steep slopes, or just a small subset, or what kind of monitoring will be conducted. Here, Lahontan appears to have waived its set forensic and effectiveness monitoring requirements for Category 5 and 6 projects in favor of vague proposals to work out some sort of agreement with the Forest Service, which the record shows has been recalcitrant in conducting monitoring beyond its BMPEP. This is a substantial change from the 2007 Waiver, which required affirmative action by Lahontan for the Forest Service to avoid the general monitoring obligations under the MRP. Thus, for this reason as well, the 2009 Waiver and accompanying documents fail as an adequate informational review under CEQA.

To correct these deficiencies, Lahontan must clearly indicate that the heightened monitoring requirements apply to the entire Lake Tahoe Basin Watershed. Further, Lahontan must clarify what heightened monitoring actually means in comparison to what is currently required under the 2007 Waiver.

### **C. Mechanical Treatments in Streamzones**

The 2009 Waiver proposes to dispense with forensic and effectiveness monitoring even for high risk projects utilizing mechanical treatments in streamzones in the Basin, so long as the equipment does not exceed 13 psi for granitic soils and 10 psi for all other soil types. This is a significant change from the 2007 Waiver, which required forensic and effectiveness monitoring for any mechanical treatments in SEZs.

The use of mechanical equipment in sensitive stream zones has the potential to cause erosion and pollution discharge. (See 2007 Waiver comments and attached Exhibits; Supp. Collins Decl.) Lahontan claims that it has assessed the impacts of projects utilizing mechanical equipment at these psi's and found that there is no potential for such impacts to occur. These findings are contradicted by the Supplemental Collins Declaration, which states:

In my opinion, this has the potential for significant impacts. It is common knowledge and well documented in the literature that ground-based equipment in sensitive stream zone areas has the potential to cause erosion and sediment discharge. More focus should be put on keeping equipment out of the stream zone or at least assessing what the equipment is actually doing in the stream zone that could cause impacts. Too much emphasis is placed

on potential changes in permeability rather than assessing all processes that could deliver sediment to the stream and route it to Lake Tahoe.

Collins notes that certain types of granitic soils have the potential for erosion and sediment deposition:

I do not agree that use of mechanical equipment on granitic soils makes impacts less than significant. In my experience, certain types of granitic soils are highly susceptible to erosion due to ground based equipment use, especially in areas with decomposed granitic bedrock and/or granitic soils that have abundant fine sediment, which are often referred to as *grus*.

Lahontan has also provided no evidence to support its assertions either for a 13 or a 10 psi limit. For example, on the overall 10 psi limit, we previously requested Lahontan to include the environmental documentation supporting its purported findings. The April 2009 Proposed Waiver includes references (Lake Valley Fire Protection District, 2006. *Christmas Valley 3 Defense Zone Project*), yet still fails to include the actual report that is referenced as the supporting information for this environmental criteria, nor any details regarding the project and why 10 psi is found to have no impact on sensitive areas.<sup>5</sup> The environmental document for the project must clearly explain the data supporting the selection of these criteria so the public can understand the proposal. Unfortunately the revised document still fails to do so.

Further, on the 13 psi limit applicable to granitic soils, the evidence simply does not exist to support a full approval of all equipment of this pressure in all areas of the Basin. Lahontan refers to the results of the Heavenly Creek Demo Project as such evidence but does not provide any data or even reference to the documentation that would support this conclusion. For example, the Heavenly Creek SEZ Demo Final Report (March 2008)<sup>6</sup> states that forensic and effectiveness monitoring will occur in 2008 when the snow has melted and the first major summer or fall rain storm event occurs, with photos to determine whether visible signs of erosion, sediment transport, or deposition has occurred as a result of project activities. However, the Forest Service's BMPEP Annual Report for 2008 does not include Heavenly Creek.<sup>7</sup> In addition, the Final Report states that data collections for Ksat, bulk density, and soil cover will be undertaken in 2012, to evaluate the recovery rates in these parameters, and follow-up. *Id.* p. 9. Clearly these follow-up evaluations, which go to the heart of the demo project's findings, have not occurred. Yet Lahontan appears nevertheless prepared not only to allow these activities in streamzones, but to waive any corresponding monitoring requirements.

The lack of presented information – as opposed to unsupported statements in the 2009 Waiver documents -- means that this review process does not satisfy CEQA standards for information. How is the public expected to evaluate these conclusions, or to assess whether Lahontan's conclusions are based on sound science as opposed to subjective opinion? Has the Forest Service continued to perform in-stream water quality monitoring on Heavenly Creek to confirm model predictions? Have soil quality and vegetation cover measurements continued to date to confirm conditions have not changed from immediate post-project measurements?

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<sup>5</sup> The references appear to refer to a 2006 Report (as found in the References section), however on page 25, the reference to LVFD is dated 2008.

<sup>6</sup> See [http://www.fs.fed.us/r5/lbmu/documents/ecd/2008/Heavenly\\_Creek\\_SEZ\\_Report\\_Final.pdf](http://www.fs.fed.us/r5/lbmu/documents/ecd/2008/Heavenly_Creek_SEZ_Report_Final.pdf). We incorporate this report by reference into the record for this project.

<sup>7</sup> See [http://www.fs.fed.us/r5/lbmu/documents/ecd/2009/LTBMU\\_2008\\_BMPEP\\_report\\_Final\\_2\\_2009.pdf](http://www.fs.fed.us/r5/lbmu/documents/ecd/2009/LTBMU_2008_BMPEP_report_Final_2_2009.pdf)

Given the lack of presented information and the clear incomplete status of the Heavenly demo project, it is entirely premature for Lahontan to waive monitoring requirements for mechanical operations in sensitive streamzone areas.

In sum, we agree that there were some promising results from the Heavenly Creek Demo project that can be used to minimize monitoring requirements for future projects with comparable conditions and methods. However, some level of monitoring is still necessary post-project. The Heavenly Creek Demo project tested out the impacts of the specified methods used in that project on soil quality, water quality and vegetation cover. These data can be used to help define the project design features/BMPs that are needed in future projects in comparable conditions. However, monitoring is needed to ensure those BMPs are implemented and effective. Without the long-term data from the Heavenly Creek Demo project to confirm the WEPP model predictions, it is not yet possible to confirm that actual conditions behaved as predicted by models, which are inherently uncertain. Lahontan itself has acknowledged this point in its comments on the Forest Service's BMPEP:

The BMPs should be re-evaluated after major storm events and years of use...to determine the true effectiveness of the management measure over the long term. BMPs are designed to minimize the effect of non-point source pollution long after the individual projects are completed. In order for the analysis to provide a true understanding of the effectiveness of an individual BMP, follow up inspections that evaluate the BMP's long term durability and applicability are necessary.

*See* September 17, 2008 Comment Letter, Ex. 13. <sup>8</sup>

#### **D. Elimination of Monitoring for Post-Fire Salvage and Rehabilitation Projects**

The 2009 Waiver eliminates all monitoring requirements for post-fire salvage and rehabilitation logging projects, which have the potential for significant impacts. However, this change has the potential for significant environmental impacts. As noted by Collins:

Salvage logging has the potential to cause erosion and discharge to watercourses. As stated above, the mechanical disturbance of the fine root network can make the bare surface soils much more susceptible to surface erosion. Soils influenced by hot fires, where most all the organic material near the surface has been removed are much more likely to experience erosion from raindrop impact and surface erosion. Sediment entrained by the processes by overland flow over the bare mineral surface soil has a much greater potential for being delivered to a stream. Further, post-fire rehabilitation projects are not necessarily benign and may in fact be the source of increased pollution. Many erosion control projects have created sediment sources, rather than reduce them.

*See* Supp. Collins Decl. Collins also notes:

Following fire, but even before the first rainfall, natural sediment supply rates into streams can be quite high from dry ravelling of soil from the inner gorge of stream canyons. After rainfall, especially in areas that have hydrophobic soils, pervasive rill networks can occur over vast portions of the hillsides and can directly supply fine surface

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<sup>8</sup>We note also that Lahontan's limit of 13 psi equipment to granitic soils under certain conditions does not apply to activities outside the Basin, even though Lahontan appears to lack any study to support the elimination of monitoring for such use on volcanic soils throughout the Region.

sediment to the stream network. Without effectiveness and forensic monitoring, these natural geomorphic responses might be difficult to distinguish from man-related project causes in areas that are treated for post fire erosion control.

*See Supp. Collins Decl.,*

An example of how post-fire salvage operations may have adverse effects to water quality in the absence of monitoring is provided by recent photos of the USFS System Road and Trail Hazard Tree Removal Project, which conducted tree removal operations following the Angora Fire. As these photos demonstrate, the lack of any follow-up monitoring by Lahontan has the potential for significant impacts to water quality and Basin beneficial uses that will not be identified. *See Attached photos 1-6 and accompanying map explaining location of photos.*

The 2009 Waiver also fails to include the 120 day timeline for post-fire emergency activities, which was previously part of the project proposal. Without the 120 day timeline, and without any criteria for what constitutes an “emergency” projects such as the USFS System Road and Trail Hazard Tree Removal Project, which did not pose an ‘imminent threat’ in the fall of 2008 when it was actually implemented, will be entitled to an exemption from even implementation monitoring, thereby leading to potentially significant water quality impacts.

Given the potential for such impacts, there does not appear to be a clear rationale for why effective monitoring cannot be conducted as part of all post fire projects. The requirement to conduct monitoring does not prevent the project from going forward. The project documents do not spell out the need to exempt these projects from monitoring review.<sup>9</sup>

#### **E. Elimination of Notification and Monitoring for Hand Thinning Projects in Sensitive Stream Zones**

The 2009 Waiver eliminates all notice and monitoring requirements for hand-thinning projects in stream zones, even for projects conducted in wet soil conditions. We do not believe that all such projects should be exempted from monitoring requirements, particularly if a high percentage of the fuel reduction that will occur in Tahoe is done in this manner. As the photos of 3<sup>rd</sup> Creek demonstrated, hand thinning projects in sensitive streamzones have the potential for significant impacts:

Although non-mechanical logging within stream zones is more benign than mechanical operations, it too has the potential to lead to significant sediment discharge due to the removal of vegetation that stabilizes the bank channel. After logging, thinning, salvage operations, or other fuel modification activities that cut trees there is a subsequent loss in soil strength to resist surface erosion and landsliding. This is caused by the decay and loss of small and large roots. For example, studies have shown that large roots of conifers decay in about 5-7 years (Coats and Collins, 1981). This is before roots of germinated seedlings can contribute significant added cohesion. At this point, forest soils dominated by conifers are at their weakest to resist mass wasting from landslides. Continued effectiveness monitoring is needed to capture the potential effects of these land use

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<sup>9</sup> At the least, the criteria for an emergency must be very clearly spelled out in the Waiver, and the Category must include very specific criteria and conditions that will limit projects in Category 3 to these actual types of emergency post-fire activities – within a designated time frame -- which aim to reduce environmental impacts without adding to them.

practices, otherwise significant negative impacts caused by land management might go undetected. These kinds of impacts that provide fine sediment to any portion of the stream network, even along small headwater ephemeral channels can influence any particular designated “class” or size of downstream channel.

*See Supp. Collins Decl.*

## **F. Additional Comments**

### **1. Hazard Trees**

The proposed Category 1 includes hazard trees posing an “imminent threat” to life or property. However, what is considered “imminent” is unclear. After the Angora Fire, burnt trees next to homes and roadways were cut fairly quickly, before they could fall on property or people. Although there are concerns with the extent of this cutting, many trees that were removed did pose an ‘imminent’ threat. However, hazard trees after a fire that will not pose a hazard for years or longer, and/or where alternatives are available in the meantime (e.g. closing a trail temporarily), may not pose “imminent threats.”

### **2. Pile Burning in Water Buffer Zones**

Lahontan has added new ‘parameters’ that define when burning in Water Buffer Zones in the Lake Tahoe Basin may be allowed under Category 2 (thus without monitoring requirements). These conditions include:

Piles must not be located within 100 year floodplain or any watercourse or within 25 feet of a watercourse. Piles must be limited in size to no more than 10 feet in diameter and 5 feet in height. No more than 10% of the area within the Waterbody Buffer Zone shall be covered in piles.

Lahontan fails to include the analysis that serves as the basis for these parameters. Upon what evidence does Lahontan find that pile burning within these values creates no impact in Waterbody Buffer Zones (WBZs)? Additionally, the parameters are unclear. What area is used to define “10% of the area...”? The entire area of the Waterbody Buffer Zone that falls within a project (including the collective sum if there are multiple WBZ’s)? Or will Lahontan define ‘tracks’ of WBZs that are environmentally similar and draw the boundary for the 10% determination around each like ‘segment’? Any such parameters must be clearly spelled out and the supporting evidence showing no impact from such burning in any areas that will qualify under this category must be presented.

We are opposed to allowing pile burning in WBZs through Category 2 given the absence of any evidence showing that such burning creates no impact in all areas in the Tahoe Basin. This appears to be a weakening of the existing rules, and those proposed in January, which did allow for some burning in WBZs based on consultation with Lahontan staff (and only when it is found to have less impact than the non-burning alternatives). In fact, we are only aware of one situation in recent years where burning in a WBZ was found to have less impact than removing by hand crew, and thus allowed by Lahontan based upon case-specific consideration.

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### **3. Watercourse Crossings**

The 2009 Waiver includes a new parameter which allows some discharge under Category 4 not previously proposed, and not analyzed in the environmental document. "...and up to one dry Class III crossing per five acres" has been included as an exception for the construction of new watercourse crossings. Upon what evidence has Lahontan determine that one dry Class III crossing per every 5 acres will have no impact? No such evidence is presented in the environmental document.

We are opposed to allowing the construction of new watercourse crossings through a Category which lacks adequate monitoring requirements, and do not find any evidence supporting this proposal.

### **4. Inconsistency on Approach to Steep Slopes**

The proposed Waiver now contains this new eligibility requirement "In the Tahoe H.U., equipment operations must be in compliance with the Basin Plan and TRPA regulations concerning steep slopes and high erosion hazard lands." (Category 4: Eligibility Criteria (10))

Either Lahontan specifically identify the source of the definition for these terms as defined by the Basin Plan and TRPA Regional Plan (and include the definitions in the Waiver) or Lahontan must clearly define these terms. The regulation of 'steep slopes' varies in different areas; in the Tahoe Basin, a slope greater than 30% is generally defined as a 'steep slope' however outside of the Basin this number is higher. Yet further, the Tahoe TMDL report (Sept. 2008) reviewed forest management with a steep slope determination of 20% and greater.

### **5. Categories 2-6: Over-the-snow operations**

As we have raised in previous conversations with Lahontan staff, we are concerned with the selection of over-the-snow operations with a 'back-up' plan does not exist. The Tahoe Basin's snowpack continues to decline as we see more rain and less snow; thus, conditions allowing over the snow operations are expected to occur less often. During the Fire Commission process, there were several discussions regarding the need for operations to have a 'backup' plan for their project in the event they can not complete over the snow operations. There appears to be no clear provisions for this in the Waiver. We have seen the consequence of poor planning recently in the USFS Angora Fire FS System Road and Trail Hazard Tree Removal Project, where over the snow operations began later in the year to thin SEZs and the snowpack melted before operations could be completed. What has been left is a very disturbed SEZ, filled with small biomass that not only causes disturbance in the SEZ, sending additional loading to Lake Tahoe, but also creates additional fire hazard due to the extent of downed small debris in the SEZ. As the attached pictures show (taken 4/29/09), the SEZ has been left in poor shape and now that the snow has melted and the SEZs are moist, there does not appear to be any environmentally sound way to remove this material from the SEZ anytime soon – certainly not before fire season picks up in Tahoe.

### **6. Categories 2-6: Tree Marking**

In response to comments, Lahontan has changed the proposed Conditions such that tree marking need not be performed if 'designated by written prescription.' The prescription for tree cutting is developed by natural resource experts, however when contractors or other operators are doing the work, they may not have the ecological understanding (or interest) to translate the tree marking

prescription accordingly. A common response to concerns raised by conservation community members regarding trees removed during a project has been that ‘the contractor made the decision.’ This is unacceptable. Therefore, we recommend that Lahontan remove the proposed language and instead incorporate the recommendation made by CA State Parks, 2/2/09:

“An alternative to the 3 inch DBH requirement is to increase the DBH of the marked trees in WBZs to 14” DBH to be consistent with the Tahoe Regional Planning Agency, Code of Ordinance Chapter 71.3.”

We agree that marking every tree above 3” dbh is very time and resource intensive, especially when the smaller trees are the targeted trees for removal for forest health and fire protection purposes. However, the other end of the scale - where no trees are marked but rather decisions made by a contractor during the operation - is not protective enough.

#### **7. Lack of Defined Triggers for Further Action**

The proposed waiver states that the discharger “*may also include project triggers or thresholds where activities will stop if threshold is reached.*” (See Category 6, Condition 5): We recommend Lahontan add “Lahontan will select appropriate, quantifiable trigger values if discharger fails to include triggers or proposed triggers are not adequate to prevent discharge.” The concept of triggers has been discussed a great deal among Tahoe Basin regulators, and there has been a general understanding that a ‘trigger value’ is a value that represents a measurement below or before a significant negative impact occurs, so that if the trigger value is reached (e.g. measured soil disturbance), operations causing the discharge are stopped and alternative actions taken. This prevents significant environmental impacts. (See also our April 24, 2009 Comment Letter.)

The USFS Proposed South Shore Fuels Reduction Project has used the term ‘trigger’ to define a model-based value that is instead used prior to project implementation as a means to decide where certain monitoring should occur (e.g. the USFS has said the ‘trigger’ for whether additional effectiveness and forensic monitoring is performed is whether a subwatershed is above the Threshold of Concern, will be pushed above the TOC, or whether the risk ratio in a watershed will increase by a specified amount [April 2009 So. Shore Project DEIS]). This interpretation is inconsistent with the general regulatory understanding of what a trigger value is. Thus, to avoid confusion, we recommend Lahontan incorporate an adequate definition of trigger, and include the above requirement that assigns Lahontan the responsibility of selecting adequate trigger values in the event a project proponent is relying on an inconsistent definition or has not selected an adequate trigger value. This will prevent project impacts by stopping harmful activities before they cause significant harm (as intended by the concepts of trigger values and adaptive management).

#### **G. Conclusion**

We remain hopeful that Lahontan can come up with a monitoring plan for the Tahoe Basin that protects water quality while also allowing for fuel reduction activities to go forward. Thank you for your consideration of these comments.

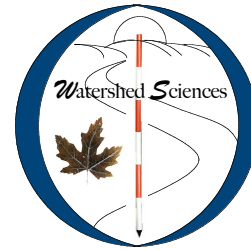
Sincerely,

**Jennifer Quashnick,**  
*Tahoe Area Sierra Club*

**Carl Young**  
*League to Save Lake Tahoe*

**Michael Graf**  
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TECHNICAL MEMO ON REVIEW OF Lahontan Waiver and MOU  
Laurel Collins, May 8, 2009

Dear Mr. Graf,

At your request, I have reviewed technical information regarding the potential impacts of the proposed Conditional Waiver of Waste Discharge Requirements for Waste Discharges Resulting from Timber Harvest and Vegetation Management Activities in the Lahontan Region ("2009 Timber Waiver") proposed by the Lahontan Regional Water Quality Control Board ("Lahontan").

I have been a geomorphologist since 1981 specializing in fluvial, hillslope, and tidal wetland geomorphology, sediment budgeting, landslide and stream mapping, and analysis of geomorphic change from natural and anthropogenic influences. My experience on the issues raised by the Waiver and MOU is based on my work on various sediment source assessment and monitoring projects for the US Forest Service, California Department of Forestry, US National Park Service at Point Reyes National Seashore, San Francisco Bay Regional Water Quality Control Board, Alameda County, Marin County, Contra Costa Clean Water Program, and the East Bay Regional Park District. I am the Owner/Director of Watershed Sciences consulting firm, which I established in 2001. Attached to this review is a copy of my current CV. A few examples of my experience follow.

For the California Department of Forestry (CDF) I was involved in a 5-year monitoring project for the Board of Forestry to assess the effectiveness of forest practice rules that were developed specifically to reduce erosion and sediment supply to streams in areas that had various silvicultural practices, ranging from clearcutting to selective helicopter logging. At numerous 10-acre study sites located throughout private and public California forestlands, effectiveness monitoring of erosion control practices was conducted by measuring sediment trapped behind erosion control structures (such as water bars and dissipation structures), by measuring the size of voids created by erosion from landslides, gullies, rills, and from failed road crossings associated with logging roads and tractor trails. Data were collected yearly, statistically analyzed, and total sediment supply on logged sites was compared to that from study sites that served as controls, where no silvicultural practices had been previously conducted. Photo



monitoring was an integral component of monitoring and used to document and verify conditions.

As a separate project later contracted by the CDF, I was a co-author of a report on a cautionary review of the effects of silvicultural activities on site quality. The report dealt particularly with the impact of logging on nutrient cycling and mass wasting.

For the Pacific Southwest Forest and Range Experiment Station, I established ten long-term monitoring sites of channel and erosion conditions in the Golden Trout Wilderness, Inyo National Forest, California. I produced detailed stream maps, with quantitative data on sediment size classes, longitudinal profiles, cross sections, and a methodology for monitoring and assessing future change.

For The Point Reyes National Seashore I monitored post fire sediment production and runoff following the 1995 Vision Fire. This involved stream gaging, measurement of sediment deposition in a developing alluvial fan, assessment of hydrophobic soil conditions, and monitoring stream and landscape response for over three years. Similarly, following the 1991 Tunnel fire in the Oakland Hills, California, I monitored erosion and sediment production as influenced by wildfire, as well as by post fire erosion control activities.

For Alameda County, I developed a preliminary sediment budget for Alameda Creek and protocols for developing a sediment budget by sampling and monitoring sediment load at key gaging stations along the stream network. Recently for a TMDL (total maximum daily loads) analysis for the San Francisco Regional Water Quality Control Board, I developed a methodology and performed an analysis of sediment supply from natural and land use-related stream and hillsides sources of the nearly 100 sq mi Sonoma Creek.

As part of this review, I have addressed specific changes that the 2009 Timber Waiver makes regarding previous monitoring requirements required under the current waiver for the Lahontan region enacted in February 2007 for the Lake Tahoe Basin. Based on my prior review of Lahontan's proposed 2008 Waiver and MOU with the Tahoe Regional Planning Agency ("TRPA"), I am generally familiar with the terms of the 2007 Waiver and also with Forest Service monitoring requirements.

## **1. Review of Existing Lahontan Waste Discharge Waiver and Monitoring Requirements**

As discussed in my prior comments (Technical Memo to Michael Graf, December 1, 2008), the 2007 Waiver applies to five categories of timber harvest and vegetation management activities. Category One projects are considered "minor timber harvest" activities. For projects that fall within this category, the existing Lahontan waiver does not generally require monitoring. For Category Two through Five projects, the Lahontan waiver requires implementation and effectiveness and forensic monitoring. If a project meets a number of criteria, the Lahontan waiver only requires implementation monitoring. These criteria include

no constructed watercourse crossings, no ground based equipment operations within stream zones or on slopes over 30%, no winter operations and no road or landing construction within 500 feet of stream zones.

Conversely, if a project contains any of these criteria, effectiveness and forensic monitoring is required. In this way, the existing Lahontan waiver recognizes the potential for projects with one or more of these criteria to discharge significant amounts of sediment into watercourses and the need for effectiveness and forensic monitoring to ensure that mitigation measures put in place to avoid these impacts are functioning effectively.

The 2007 Waiver requires all dischargers to conduct implementation, forensic, and effectiveness monitoring. The 2007 Waiver is designed to ensure that the management measures are installed and functioning prior to precipitation events (Implementation monitoring), that the measures were effective in controlling sediment discharge sources throughout the winter period (Effectiveness monitoring), and that no new sediment sources occur as a result of project implementation (Forensic monitoring).

Monitoring plans shall include a monitoring point site map, which shall include visual and photo-point monitoring points. Forensic photo-point monitoring shall include photos of sediment sources and streambed conditions immediately downstream of areas where sediment discharge occurred.

Implementation monitoring requires a discharger to take pre-project photos at specific locations to facilitate comparison of pre- and post- project site conditions. Implementation monitoring requires a pre-winter inspection following completion of the project to assure that mitigation measures are in place and secure prior to the winter period. Where winter operations are conducted, an implementation inspection shall be completed immediately following cessation of winter operations to assure that management measures are in place and secure.

If implementation monitoring reveals that management measures were not installed, or were installed but are determined to be ineffective, the discharger shall document the problem and any corrective actions to ensure that the project is in compliance with the applicable Waiver criteria and conditions.

Forensic monitoring requires sites to be inspected and photographs shall be taken following storm events based on significant amounts of precipitation. The goal of winter forensic monitoring is to locate sources of sediment delivery (or potential delivery) in a timely manner so that rapid corrective action can be taken where feasible and appropriate. Winter forensic monitoring may also assist in determining cause and effect relationships between hillslope activities, hydrologic triggers and instream conditions.

The waiver relies on forensic monitoring to correct ongoing problems with the effectiveness of mitigation measures installed to avoid adverse water quality impacts. The waiver states that follow-up forensic monitoring inspections and photo-point monitoring shall be conducted weekly until corrective action is completed to repair or replace failed management measures and/or significant

sediment discharges have ceased. Sites that are determined to be sediment sources during forensic monitoring shall be photographed prior to and following corrective action being implemented at the site.

The waiver also requires effectiveness monitoring to be conducted as soon as possible following the winter period. Effectiveness monitoring “shall be designed to determine the effectiveness of management measures in controlling discharges of sediment and in protecting water quality” and to “help to determine whether Waiver criteria and conditions, on a programmatic scale, are adequately protecting water quality and instream beneficial uses.”

The Effectiveness monitoring inspection shall include visual inspection and photo documentation of sites identified in the Inspection Plan. If the visual inspection reveals a significant management measure failure, a visual inspection of instream components (bank composition and apparent bank stability, water clarity and instream sediment deposition) shall also be conducted and the conditions shall be documented.

Effectiveness monitoring shall continue until the discharger submits a Final Certification compliance report to Lahontan demonstrating that the projected and any necessary mitigation measures were completed in compliance with the waiver and all requirements of the applicable water quality control plan. The waiver also requires semi-annual reporting. Dischargers shall submit an Implementation Monitoring Report on January 15 of each year, and an Effectiveness Monitoring Report on July 15 of each year.

As I commented in my earlier letter, the monitoring conditions contained in this waiver help to ensure that high risk projects do not lead to significant discharges of sediment and other pollutants. For monitoring to be effective, it must be timely and verifiable and must contain a mechanism that ensures that problems are corrected as soon as they are identified in the monitoring process. These components are each present in the existing waiver. In my opinion, the repeal of these components has the potential for substantial impacts on water quality because there may no longer be an effective mechanism to verify that mitigation designed to avoid pollutant discharge has been successful, or if not, has been immediately corrected.

## **2. Proposed Changes in 2009 Waiver**

My review focuses on several changes to the 2007 Waiver made by the 2009 Waiver. In my opinion these changes have the potential for creating significant impacts to water quality in the Tahoe basin due to the elimination of project specific implementation, and forensic and effectiveness monitoring, which are required for high risk project activities under the 2007 Waiver. Four issues are discussed to exemplify my concerns.

First, for Forest Service projects, the 2009 Waiver eliminates the 2007 Waiver’s monitoring requirements and replaces those requirements with the Forest Service’s BMPEP (Best Management Practice Evaluation Program) requirements for all watersheds below an assigned Threshold of Concern (TOC).

Second, the 2009 Waiver eliminates forensic and effectiveness monitoring for projects in stream zones using mechanical equipment up to 10 pounds per square inch (psi) on granitic soils and 13 psi on non-granitic soils.

Third, the 2009 Waiver eliminates all monitoring requirements for post-fire salvage and rehabilitation logging projects, which have the potential for significant impacts.

Fourth, the 2009 Waiver eliminates all notice and monitoring requirements for hand-thinning projects in stream zones, even for projects conducted in wet soil conditions.

In my opinion, each of these changes raise serious concern that monitoring of future fuel reduction and silvicultural activities will be inadequate to ensure that mitigation measures designed to avoid substantial pollutant discharge have been implemented and are effective, or, if not effective, will be quickly corrected. Without rigorous protocols for quantitative effectiveness and forensic monitoring it might not be possible to establish cause and effect of site deterioration or the linkages between impacts caused by land management activities versus those that are natural. Without this kind of information remediation efforts can often be useless or lead to more costly problems.

As discussed above, the existing Lahontan Waiver requires relatively comprehensive implementation, forensic and effectiveness monitoring for timber and fuel reduction projects falling within Categories 2-5 and not meeting all of the exemption criteria. These exemption criteria identify types of projects that have the potential for significant discharges of sediment due to steep slopes, sensitive and unstable areas (i.e., stream zones), sensitive times of year and use of ground-based equipment.

Below I provide my review of the potential for these changes to have significant environmental impacts. In my opinion, the elimination of existing monitoring requirements for the categories discussed above have the potential for significant environmental impacts because discharges that do occur due to higher risk activities might not be identified and corrected in a timely manner.

### **3. Forest Service Project Monitoring Limited to Watersheds Above an ERA Based Threshold of Concern**

The 2009 Waiver does not require project specific monitoring for Forest Service projects that occur on steep slopes or in stream zones, unless such projects also occur in watersheds above a calculated threshold of concern (TOC.) As applied to the Tahoe Basin, this change has the potential for significant impacts.

The TOC is based on the equivalent roaded area (ERA) calculation, which is used to estimate the impacts of various land use activities in a watershed. It relates magnitude of land use disturbances for different management practices to an acre of road disturbance. Land uses are assigned a coefficient based on

relative impact, ranging from 1.0 for roads, structures, and other impervious surfaces to 0.0 for land uses that have a negligible or positive impact on the soil hydrologic properties.

The TOC uses a calculation of the threshold value of equivalent impervious surface an area can tolerate before it is expected to have the potential for adverse impact. Impervious surface coverage (IC) must be calculated to determine TOC for each watershed. TOC does not represent the exact point at which cumulative watershed effects will occur; rather it serves as a “yellow flag” indicator of increasing susceptibility for adverse cumulative effects (page 3-101, DEIR, Lake Tahoe Basin Management Unit, South Shore Fuel Reduction and Healthy Forest Restoration EIS/EUR). The EIR indicates that the hydrologic response cannot be assessed based upon the percent reduction in permeability and that it does not account for whether treatments are near a stream course, hence it cannot be established if sediment is delivered to a stream course. The EIR states that ERAs provide useful comparisons of effects among alternatives. Because of their limitations as stated above, in my opinion these calculations should not be the basis for determining whether monitoring is needed.

In my experience working in the Sierra Nevada, I have observed that the logging activities on steep slopes and within stream zones have the potential to discharge substantial amounts of sediment. Sediment sources are not dependent upon the creation of impermeable surfaces, therefore establishing whether monitoring should occur or the type that is needed should not be based upon this calculation. For example, areas of landslides that are not necessarily steep, can be mobilized by changes in the drainage network that are caused by road ditches and stream crossings. Additionally, just the loss of interception can change the amount of groundwater in the soils and timing at which saturation occurs. These changes combined with loss in root strength that would be associated with logging or thinning operations can alter the soils resistance to sliding and to surface erosion.

#### **4. Elimination of Monitoring for Stream Zone Projects Using Ground Based Equipment**

As discussed, the 2009 Waiver eliminates forensic and effectiveness monitoring for projects in stream zones using mechanical equipment up to 10 pounds per square inch (psi) on granitic soils and 13 psi on non-granitic soils. In my opinion, this has the potential for significant impacts. It is common knowledge and well documented in the literature that ground-based equipment in sensitive stream zone areas has the potential to cause erosion and sediment discharge. More focus should be put on keeping equipment out of the stream zone or at least assessing what the equipment is actually doing in the stream zone that could cause impacts. Too much emphasis is placed on potential changes in permeability rather than assessing all processes that could deliver sediment to the stream and route it to Lake Tahoe..

Effectiveness and forensic monitoring is needed to determine the influences of large events such as rain on snow events that have been shown to

produce some of the largest flood impacts in the Sierra. In these extreme conditions it will be important to establish if BMPs and other erosion control remedies are able to perform. In my opinion, the absence of such monitoring could lead to substantial amounts of sediment discharge in flooding events because the problems would not be identified in a timely manner.

In areas that have not been influenced by fire that are undergoing fuel reduction activities and even on slopes less than 50 percent (as designated in the proposed Waiver on page 2 of Attachment A), mechanical disturbance of the soil surface can destroy the added soil cohesion that is provided by the fine roots of vegetation (Booker Dietrich and Collins, 1993) (see CV for cited references). This added soil cohesion is particularly critical in steep areas that are often found in or near (within 500 feet of) stream environment zones. With even light mechanical disturbance and creation of bare soils, some soils can create a series of rill networks similar to hydrophobic soils, especially during intense rainfall. These rill networks might later be covered by snow or destroyed as vegetation recovers. Without effectiveness and forensic monitoring, these land use-related sediment sources might go undetected yet create significant negative impacts.

The existing Lahontan waiver attempts to achieve the requirement that monitoring be timely in a number of ways. First, it requires that implementation monitoring be conducted immediately after project completion to ensure that BMPs have been properly put in place. Second, the waiver requires forensic monitoring conducted immediately after major storm events, which test the adequacy of mitigation measures designed to protect water quality. Third, the existing waiver requires comprehensive effectiveness monitoring following the winter season after the project has been completed and the BMP mitigation has been put in place.

Second, I do not agree that use of mechanical equipment on granitic soils makes impacts less than significant. In my experience, certain types of granitic soils are highly susceptible to erosion due to ground based equipment use, especially in areas with decomposed granitic bedrock and/or granitic soils that have abundant fine sediment, which are often referred to as *grus*. Following fire, but even before the first rainfall, natural sediment supply rates into streams can be quite high from dry raveling of soil from the inner gorge of stream canyons. After rainfall, especially in areas that have hydrophobic soils, pervasive rill networks can occur over vast portions of the hillsides and can directly supply fine surface sediment to the stream network. Without effectiveness and forensic monitoring, these natural geomorphic responses might be difficult to distinguish from man-related project causes in areas that are treated for post fire erosion control.

## **5. Elimination of Monitoring for Post-Fire Salvage and Rehabilitation Projects**

The 2009 Waiver eliminates all monitoring requirements for post-fire salvage and rehabilitation logging projects, which have the potential for significant impacts. In my opinion, this change has the potential for significant environmental impacts.

Salvage logging has the potential to cause erosion and discharge to watercourses. As stated above, the mechanical disturbance of the fine root network can make the bare surface soils much more susceptible to surface erosion. Soils influenced by hot fires, where most all the organic material near the surface has been removed are much more likely to experience erosion from raindrop impact and surface erosion. Sediment entrained by the processes by overland flow over the bare mineral surface soil has a much greater potential for being delivered to a stream.

Further, post-fire rehabilitation projects are not necessarily benign and may in fact be the source of increased pollution. Many erosion control projects have created sediment sources, rather than reduce them. Examples are cited in the post fire monitoring of the Tunnel Fire (Collins and Johnston, 1995). Data collected on the effectiveness of straw bale check dams at trapping sediment and preventing it from entering channel systems were shown to be only 50% effective at the Tunnel Fire (Booker, Dietrich, and Collins, 1993) and 60 percent effective at the 1993 Laguna Beach Fire (Collins and Johnston, 1995). If effectiveness and forensic monitoring does not occur it will be impossible to assess and ameliorate negative impacts.

It is important to note that even the process of implementing erosion control practices or the structures or applications themselves can sometimes be more damaging than if nothing had been done. For example, following the Tunnel Fire in the Oakland Hills, hydro mulching reduced vegetation recovery from soil disturbance, hay bale check dams in small water courses increased sediment production and delivery to streams, and on landslides hay bales increased the potential for landsliding by increasing the amount of soil saturation, and trampling by foot and mechanical disturbance of the soil during applications of erosion control caused the break down of the fine root network in the surface soils that lead to increased surface erosion from the development of rills and gullies (Collins and Johnston, 1995; Booker, Dietrich, and Collins, 1995). Trained experts are required to assess where erosion control remediation is necessary or could be potentially detrimental.

## **6. Elimination of Notification and Monitoring for Hand Thinning Projects in Sensitive Stream Zones**

The 2009 Waiver eliminates all notice and monitoring requirements for hand-thinning projects in stream zones, even for projects conducted in wet soil conditions. In my opinion, this change also has the potential for significant impacts.

Although non-mechanical logging within stream zones is more benign than mechanical operations, it too has the potential to lead to significant sediment discharge due to the removal of vegetation that stabilizes the bank channel.

After logging, thinning, salvage operations, or other fuel modification activities that cut trees there is a subsequent loss in soil strength to resist surface erosion and landsliding. This is caused by the decay and loss of small and large

roots. For example, studies have shown that large roots of conifers decay in about 5-7 years (Coats and Collins, 1981). This is before roots of germinated seedlings can contribute significant added cohesion. At this point, forest soils dominated by conifers are at their weakest to resist mass wasting from landslides. Continued effectiveness monitoring is needed to capture the potential effects of these land use practices, otherwise significant negative impacts caused by land management might go undetected. These kinds of impacts that provide fine sediment to any portion of the stream network, even along small headwater ephemeral channels can influence any particular designated "class" or size of downstream channel.

## **7. Additional Concerns Regarding 2009 Waiver**

Finally, I reiterate here several of my concerns raised in my comments on Lahontan's 2008 Waiver.

The 2007 Waiver has specific triggers to ensure that when BMPs have not been adequately implemented or are not operating effectively over time, the problems that are identified must be corrected, and that more intensive monitoring shall occur until that has been accomplished. In my opinion, the requirements of the existing Lahontan waiver represent a minimum level of monitoring that would be necessary to meet this objective. Where only implementation monitoring is required, and not project specific forensic and effectiveness monitoring, this would not ensure that adverse impacts would be avoided because mitigation measures put in place after logging projects are completed often fail or are not effective in avoiding sediment discharge.

The Lahontan waiver also is verifiable through its requirement of photo-point monitoring at the pre-project, post-project implementation, and forensic and effectiveness monitoring stages. Photo-monitoring ensures that the regulating entity – in this case Lahontan – maintain some ability to review the effectiveness of the waiver conditions and the BMPs that are being implemented to avoid adverse effects on water quality. In my experience, without this type of verification process, there is no way for an agency to ensure that BMPs are being adequately implemented and operating effectively.

Quantitative measurements can be conducted from photos when pictures are taken from the same vantage point and especially when something can be used as a scale, such as a survey rod. This was done in a project for Marin County where quantitative estimates of sediment supply from stream downcutting and bank erosion could be conducted from measurements made in the field and from photos taken 15 years earlier in Novato Creek (Collins, 1995). Protocols for adaptive management and reproducible quantitative assessment seem to be missing within the proposed waiver. Ideally, any photo taken of an erosion source should be accompanied with a quantitative description. In many cases an erosion site cannot be adequately conveyed in a photo, especially if recovering vegetation obscures the vantage point.

Without verifiable compliance using such techniques as pre and post project monitoring points, it is not possible for a regulatory agency to ensure that



adverse impacts to water quality are being avoided. Ideally, reproducible quantitative measurements of erosion sites should be made to establish the amount and size of the sediment supplied to the stream system and should be accompanied by qualitative information that assigns sediment supply to different source types and establishes cause and effect. Without this there cannot be sufficient adaptive management.

Finally, I re-observe that the 2009 Waiver set forth various means for Lahontan to be notified in the event a party violates the term of any permit or project authorization. In my opinion, this is not an adequate substitute for an effective monitoring program because projects can often be implemented according to the terms of the permit, yet still cause substantial discharge due to failed mitigation, or due to the application of measures that were inappropriate for the physical conditions on the ground. In my experience, coordination and discussion between the agencies will not ensure protection of water quality in the absence of a detailed monitoring program providing ongoing data about the effectiveness of mitigation that is implemented and whether water quality is being adversely affected. Such a program will allow us to continually learn and improve watershed management rather than sustain a certain level of water quality deterioration.

In sum, in my opinion, Lahontan's repeal of its existing 2007 Waiver and corresponding monitoring requirements for high risk projects has the potential for significant impacts on water quality in the Tahoe Basin.

Sincerely,

A handwritten signature in cursive script, appearing to read "Laurel Collins", with a long horizontal flourish extending to the right.

Laurel Collins

# **Laurel M. Collins**

***Owner/ Director Watershed Sciences***

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## **AREAS OF EXPERTISE**

- Fluvial Geomorphology
- Tidal Wetland Geomorphology
- Sediment Budgeting
- Landslide Mapping
- Landscape Aerial Photo Interpretation
- Geomorphic Effects of Wildfire and Land Use Impacts
- Stream Restoration Design

## **EDUCATION**

University of California, Berkeley B.A., Earth Sciences, 1981

## **PROFESSIONAL HISTORY**

Watershed Sciences, Owner/Director 2001-to date

San Francisco Estuary Institute, Environmental Scientist, 1999-2001

Independent Consultant, Environmental Sciences, 1989-2001

University of California, Staff Researcher, 1984-2001

Lawrence Berkeley Laboratory, Senior Research Associate,

## **REPRESENTATIVE EXPERIENCE**

Ms. Collins has been a geomorphologist since 1981 specializing in fluvial and tidal wetland geomorphology, sediment budgeting, landslide analysis, stream monitoring and mapping, and analysis of geomorphic change from natural and anthropogenic influences. Ms. Collins has conducted sediment budget and source analysis in Sonoma Watershed for the Regional Water Quality Control Board and has served as an Expert Witness for testimony pertaining to Geomorphology.

As Owner/Director of Watershed Sciences consulting firm established 2001, the following projects is a representative sampling of some of the projects that Ms. Collins has been directly involved in:

- Sediment source analysis and landslide mapping for development of a TMDL in Sonoma Creek watershed for the Sonoma Ecology Center and the San Francisco Regional Water Quality Control Board.
- Lidar and GIS analysis of logging road along the Eel River, Ca, for University of Minnesota and University of California.
- Expert Witness for San Francisco law firm of Murphy, Parson, Bradley, and Feeney on a case assessing causation of a landslide in Moraga.
- Development of action plan and methodologies for conducting a sediment budget analysis on Alameda Creek for Alameda County.
- Expert Witness for analysis of landslide causation within a development in Moraga, CA, for Murphy, Pearson, Bradley & Feeney, San Francisco, CA.
- Geomorphic analysis and landslide mapping of Crow Creek to assess impacts of land use practices and natural processes for Alameda County.
- Expert Witness for Determination of Natural versus Artificial conditions of the Mitchell Slough of the Bitterroot River, Montana, for Doney, Crowley, Bloomquist, Payne, Uda PC, Missoula Montana.
- Sediment source evaluation and conceptual plans for reducing sedimentation in Eden Creek for Alameda County.
- A sediment source analysis and sediment budget in Sonoma Watershed for Regional Water Quality Control Board and subcontractor for Sonoma Ecology Center.
- Assessment of flooding and geomorphic change in the lower Sonoma Creek Watershed for the Coastal Conservancy and Southern Sonoma Resource Conservation District.

1992-1993

East Bay Regional Park  
District District, Resource  
Analyst 1983-1986,  
Geologist, 1986-1991

Center for Natural  
Resource Studies, John  
Muir Institute,  
Environmental Scientist,  
1980-1983

U.S. Geological Survey,  
Hydrologic Field  
Assistant, 1980-1982

California Department of  
Forestry, Field Assistant,  
1979-1980

California Academy of  
Sciences, Paleontology  
Department Student  
Assistant, 1978.

## **AFFILIATIONS**

American Geophysical  
Union, 1986-to date

Geological Society of  
America, 1983-2001

California Forrest Soils  
Council, 1980-1991

## **TEACHING**

Watershed Analysis,  
Sierra Nevada Field  
Station, San Francisco  
State, 1998-2003

Hydrology Summer  
Field Course, Teton  
Science School, 1991  
and 1996

- Geomorphic assessment of long-term processes associated with reservoir stability and the maintenance of red-legged frog breeding habitat of Point Reyes National Seashore, U.S.N.P.S.
- Geologic, geomorphic, and landslide mapping of Strawberry Canyon in Berkeley, California, for the Committee to Minimize Toxic Waste and Urban Creeks Council.
- Preliminary assessment of opportunities and constraints for restoration and fish barrier removal in lower Ignacio Creek (Arroyo San Jose), Marin County for Friends of Ignacio Creek and City of Novato.
- Development of conceptual plans for restoration and geomorphic analysis of lower Wildcat Creek for City of San Pablo and Urban Creeks Council.
- Survey of longitudinal profile of lower Carriger Creek, Sonoma County, for the Southern Sonoma Resource Conservation District.
- Geomorphic analysis and landslide mapping of silvicultural impacts on sediment supply of Sulphur Creek, Plumas County, for the U.S.F.S. and Plumas Corp.
- Geomorphic analysis of lower Carriger Creek for the Klamath River Information System, William Kier Associates.
- Stratigraphic analysis, carbon dating, and history of geomorphic change at Last Chance Creek near Stone Dairy, Plumas County for the Plumas Corporation.

As Geomorphologist for the San Francisco Estuary Institute, Ms. Collins:

- Developed of a “Watershed Science Approach” for field methodologies to assess and analyze changes in the delivery of water and sediment as affected by Euro-American land use practices in California.
- Conducted a scientific study of physical processes and land use impacts in Wildcat Creek, Contra Costa County, for the San Francisco Estuary Institute. Developed a field-based methodology for quantifying natural versus man-related sediment supplies.
- Applied the Watershed Science Approach to San Antonio Creek, Marin County, for the Southern Sonoma Resource Conservation District.
- Applied the Watershed Science Approach to Carriger Creek, Sonoma County for the Southern Sonoma Resource Conservation District.

As an Independent Consultant, Ms. Collins was served as the following:

- Consulting Geomorphologist for the Napa Resource Conservation District to establish and help educate

## **SCIENTIFIC ADVISORY BOARDS**

Technical Advisory  
Committee for  
Management of Lagunitas  
Creek, Marin Municipal  
Water District

South Bay Salt Pond  
Restoration Project,  
Sediment Workshop  
Leader, County of  
Alameda

Science Review Group for  
Napa Watershed Project of  
the San Francisco Estuary  
Institute

Pescadero Creek Technical  
Advisory Committee, San  
Mateo Resource  
Conservation District

San Pablo/Wildcat  
Technical Design  
Advisory Council, City  
San Pablo

Hill Area Fuel Reduction  
Committee, University of  
California at Berkeley

Mayors Task Force of  
Forestry and Vegetation,  
City of Oakland

different stewardship groups and to develop protocols to collect data on stream geometry to monitor channel change.

- Consulting Fluvial Geomorphologist Geomorphology Consultant for AECOS and Institute for Sustainable Development to conduct a watershed analysis for Waimanalo Creek, Waimanalo, and Mokapu Channel, Marine Corps Base, Oahu.
- Fluvial and Tidal Geomorphology Consultant for Marin County Flood Control District to conduct a watershed analysis of Novato Creek, Marin County, with special focus on sedimentation and sediment sources to the Novato Flood Control Project.
- Fluvial Geomorphology Researcher contracting with the Point Reyes National Seashore, to conduct research and monitoring of the second and third year hydrologic and geomorphic effects of the 1995 Vision Fire on Muddy hollow Creek, Marin County.
- Fluvial Geomorphology Researcher for the West Marin Environmental Action Committee to conduct research and monitoring of the first year effects of the 1995 Vision Fire in the Inverness Ridge, Marin County.
- Teacher with Dr. Luna B. Leopold and Dr. Scott McBain for the Teton Science School, Jackson, Wyoming at the Hydrology Workshop on fluvial hydrology, field methods and watershed analysis.
- Fluvial Geomorphology Consultant to U. S. Department of Justice for research on Reserved Water Rights Case on the effects of water diversion on the Fraser River, Lostman Creek, and Indian Creek, Colorado, plus expert testimony.
- Fluvial Geomorphology Consultant to EA Engineering, to perform watershed analyses for a 100-Year Sustained Yield Program for the Noyo River, Mendocino County. Analyses included documentation of channel conditions, determining impacts of logging upon hydrology and fluvial geomorphology of coho salmon habitat, sediment production and landsliding; and advising policy makers on ways to reduce future impacts from timber harvesting.
- Fluvial Geomorphology Consultant to U.S.F.S., to determine the Holocene and recent geomorphic history of the South Fork Kern River in Monache Meadows, Southern Sierra Nevada, Inyo National Forest. Analysis was conducted of flood frequency; channel incision and sediment transport regimes and related to climate change and land use practices for the last 200 years.
- Geomorphology Consultant to law firm of Lossing and Elston, San Francisco, to prepare expert testimony on the effects of fire upon slope stability, landsliding, runoff and erosion.

As a Staff Researcher in the Department of Geology and Geophysics, University of California at Berkeley, Ms. Collins was involved with the following:

- Fluvial geomorphology research for the Pacific Southwest Forest and Range Experiment Station, U.S.F.S. to produce detailed stream maps, longitudinal profiles, and cross sections within and outside of cattle exclosures in the Golden Trout Wilderness, Inyo National Forest, California.
- Tidal marsh geomorphology and hydrology research in the Petaluma Marsh, Sonoma County.
- Fluvial hydrology research on braided channels in regions of Wyoming and Idaho.
- 

Senior Research Associate for Lawrence Berkeley National Laboratory to conduct geologic field mapping, analysis and report preparation of site characteristics for the LBNL Hazardous Waste Handling Storage Facility in Strawberry Canyon, Berkeley, California.

Teacher for San Francisco State Sierra Nevada Field Station for undergraduate course in stream restoration, watershed analysis, and stream monitoring techniques.

District Geologist for East Bay Regional Park District, Oakland, Ca. Responsibilities included identification and analysis of geological and landslide hazards; direction of geologic and hydrologic research programs; publication of research findings; formulation of District policy for fuel break management, and resource management relative to hydrologic and geologic issues; preparation of expert testimony; preparation and review of Environmental Impact Reports; assessment and restoration of steelhead habitat in Wildcat Creek, Berkeley Hills.

Geologist/Hydrologist for the Center for Natural Resource Studies, John Muir Institute, Inc., Berkeley, to conduct field study and analysis of flood effects and instream flow requirements of San Lorenzo River, Santa Cruz, California; assessment of geologic hazards and evaluation of fish habitat Grider Creek, Klamath National Forest; assessment of cumulative impacts of silvicultural practices in the Sierra National Forest; assessment of the effects of silvicultural practices on site productivity in California forest lands; and publication of research findings.

Hydrologic Field Assistant, for Water Resources Division, US Geological Survey, Menlo Park, to conduct field study and analysis of 1) earthflows in Redwood National Park,

California; 2) river morphology as effected by volcanic activity, Mt. St. Helens, Washington; 3) interactions among hillslope and stream processes in the San Lorenzo River, Santa Cruz, California; and 4) publication of findings.

Student Assistant for the California Department of Forestry, Sacramento, to conduct field study and analysis of the effects of logging activities and the effectiveness of the Forest Practice Regulations on rates of erosion in private forest lands throughout California.

Student Assistant for Geology Department, California Academy of Sciences, San Francisco assisting with the curation of fossil genera of ammonites and echinoids for Dr. Peter Rhoda.

### **PUBLICATIONS AND REPORTS**

1. Coats, R., and L. M. Collins, 1981. Effects of Silvicultural Activities on Site Productivity: a Cautionary Review, *published by* California Department of Forestry, 39 pp.
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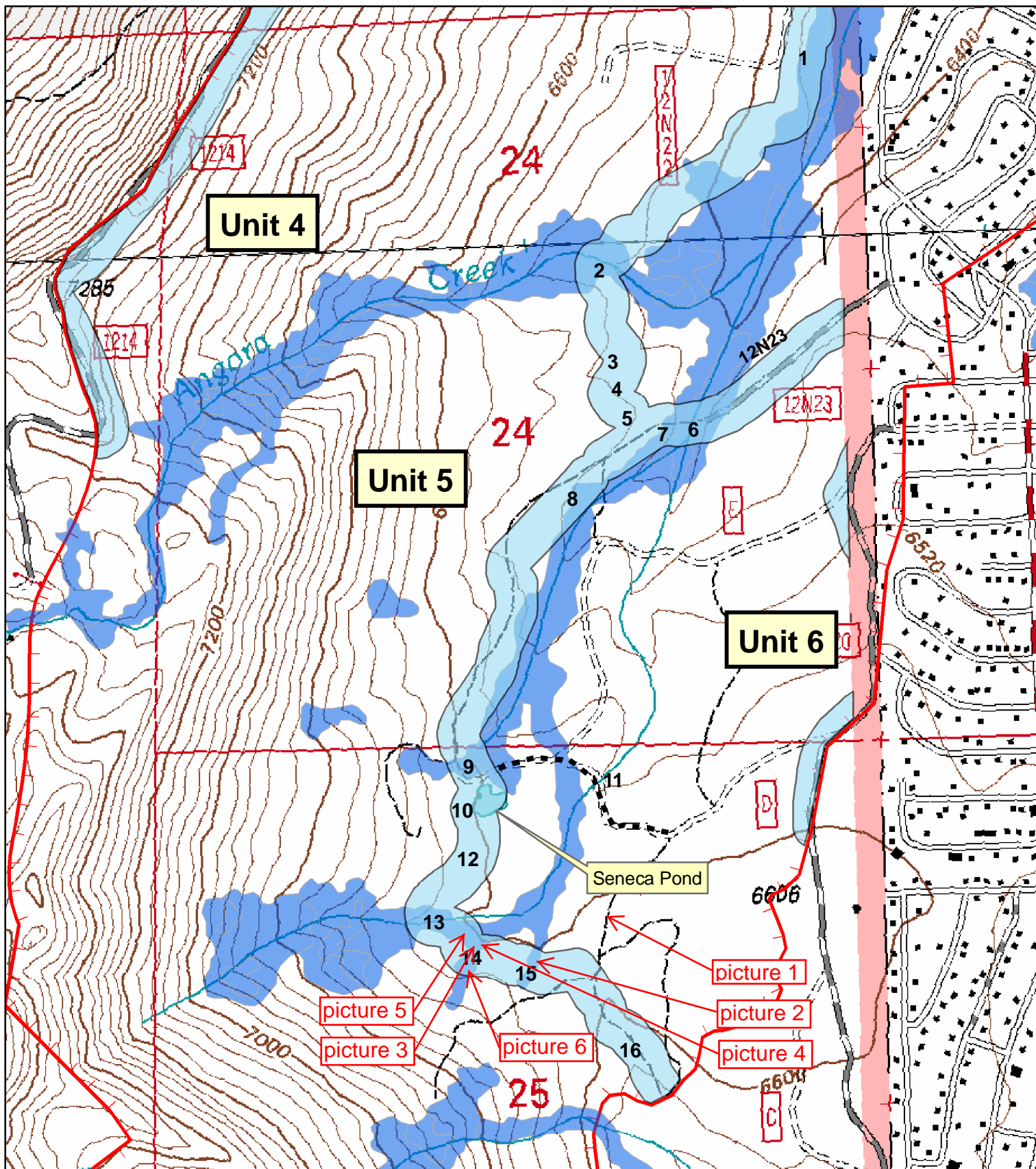
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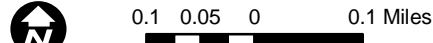
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# Angora Hazard Tree Removal



- Angora Fire Perimeter
- Project Area Boundary by Unit
- Riparian Vegetation - SEZ
- Re-construct Non-System Road

Note: Numbers depicted within project area boundary reference specific Design Features. For additional information refer to the Angora Hazard Tree Removal Decision Memo, Design Features by Unit, Unit 5.



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For more information, contact: Lana Tabor Drain Management Unit  
85 Corvado Blvd., South Lake Tahoe, CA 96150  
(530) 540-2569 (530) 541-6336 TTY



















**From:** <Mwgraf@aol.com>  
**To:** <aaholden@waterboards.ca.gov>, <astanley@waterboards.ca.gov>  
**Date:** 5/8/2009 4:22 PM  
**Subject:** Re: Sierra Forest Legacy et al comments on Regional Waiver  
**Attachments:** DSC\_0458.JPG; DSC\_0461.JPG; DSC\_0464.JPG; DSC\_0466.JPG; DSC\_0468.JPG

here are additional photos taken today by League staff of the USFS System Road and Trail Hazard Tree Removal Project following the Angora fire. Please include these photos with our comments.

thanks

Michael Graf

\*\*\*\*\*Remember Mom this Mother's Day! Find a florist near you now.  
(<http://yellowpages.aol.com/search?query=florist&ncid=emlcntusyelp00000006>)























**From:** <Mwgraf@aol.com>  
**To:** <aaholden@waterboards.ca.gov>, <astanley@waterboards.ca.gov>  
**Date:** 5/8/2009 4:25 PM  
**Subject:** Re: Sierra Forest Legacy et al comments on Regional Waiver  
**Attachments:** DSC\_0469.JPG; DSC\_0496.JPG; DSC\_0500.JPG; DSC\_0505.JPG

here is the 2nd set of additional photos taken today by League staff of the USFS System Road and Trail Hazard Tree Removal Project following the Angora fire. Please include these photos with our comments.

thanks

Michael Graf

\*\*\*\*\*Remember Mom this Mother's Day! Find a florist near you now.  
(<http://yellowpages.aol.com/search?query=florist&ncid=emlcntusyelp00000006>)















