Appendix E

Written Comments

Written Comments Received

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July 6, 2009

Mike Napolitano
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By E-mail: mailto:mnapolitano@waterboards.ca.gov

Re: Comments on Establishing a Total Maximum Daily Load (TMDL) for Sediment in Napa River Watershed and Habitat Enhancement Plan

Dear Mr. Napolitano:

The California Department of Transportation (Caltrans) appreciates the opportunity to comment on the revised May 2009 Staff report and proposed Basin Plan Amendment (BPA) for the Napa River Sediment Total Maximum Daily Load (TMDL). Caltrans strongly supports efforts to protect human health and to achieve the best water quality possible. In addition, Caltrans has been proactive and committed to meeting TMDL goals within the San Francisco Bay Region. Caltrans is currently implementing numerous compliance measures discussed in the staff report as part of its MS4 permit requirements. Caltrans previously submitted comments to San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) on October 15, 2008 asking for clarifications regarding our contribution and actions needed. The SFBRWQCB posted a response in relation to Caltrans comments. One of the clarifications states:

> "To clarify, the Water Board directs Caltrans to achieve the performance standards and Actions specified in Table 4.4, consistent with requirements of the Statewide Stormwater NPDES Permit and Waste Discharge Requirements for Caltrans. Since all Caltrans roads in the watershed are paved, the primary focus of the inventory and actions to achieve the specified sediment delivery performance standard should be on opportunities for "stormwater drainage system retrofitting" (e.g., Provision F4, Order 99 06 DWQ), including the following: a) determine opportunities for retrofit and/or reconstruction of Road crossings, as needed to convey runoff from the 100 year 24 hour duration storm event, effectively treat road crossings prone to plugging, correct road crossings prone to diversion, and stabilize gully erosion and/or landslides at road crossing outlets; and b) submit a schedule for implementation of sediment reduction actions by the completion date specified in Table 4.4 of the Basin Plan amendment, as needed to achieve performance standards and support TMDL attainment by 2027."

In relation to the SFBRWQCB above clarification, Caltrans comments are as follows:

1. Caltrans is retrofitting various highway drainage facilities on an on-going basis following maintenance best management practices as the need arises, and in compliance with its statewide NPDES Permit Order number 99-06-DWQ. Whenever a section of right of way undergoes significant construction or reconstruction, through Resurface, Restoration and Rehabilitation (RRR) projects, Caltrans seeks opportunities to address drainage issues including water quality improvements. Caltrans follows policies and procedures consistent with provision F4 of the permit.

2. The SFBRWQCB specifies that Caltrans retrofit the stormwater drainage system to achieve the specified delivery performance set out in Table 4.4. Caltrans' goal in highway drainage design is to perpetuate natural drainage, insofar as practical and safe. Caltrans has established its highway drainage guidance based upon the federal design requirements and the state law regarding natural watercourses and drainage. Caltrans' drainage guidance is incorporated into the Highway Design Manual (HDM). Caltrans' designers, and many others engineers, follow this guidance while designing highway drainage to facilitate natural watercourse drainage to avoid inverse condemnation. By directing Caltrans to retrofit or reconstruct road crossings to convey runoff from the 100 year-24 hour storm event, and to implement certain other prescribed measures as reflected in the response to the previous Caltrans' comments, liability of inverse condemnation arising from conveyance of the runoff from such a design storm may be imputed to the SFBRWQCB in future litigation.

We strongly support the goals of the Napa River Sediment TMDL Staff Report and BPA. Thank you for the opportunity to voice our concerns on this topic and we are hoping our concerns will be addressed before the adoption of this TMDL and enhancement plan. If you have any questions, please contact me at 916-653-2512 or Jagjiwan Grewal of my staff at (916) 653-2115.

Sincerely,

for

JOYCE BRENNER
Office Chief
Stormwater Implementation

c: Jagjiwan Grewal, HQ Liaison SFBRWQCB

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Mark Luce
Chair

June 30, 2009

Mike Napolitano, Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

[Transmitted via email: mnapolitano@waterboards.ca.gov and Fax: (510) 622-2459]

RE: Comments on May 19, 2009 revisions to the proposed San Francisco Bay Water Quality Control Plan (Basin Plan) amendment, Napa River Sediment Total Maximum Daily Load (TMDL) Implementation Measures and Recommended Habitat Enhancement Plan

Dear Mr. Napolitano:

Thank you for reaching out to stakeholders in our community and meeting with our staff during the month of June to explain the extent and purpose of the newly proposed revisions to the Napa River Sediment TMDL.

The County is aware that the RWQCB staff is proposing these recent revisions based upon public comment received in October 2008 questioning the adequacy of the TMDL's compliance with the State Board's certified regulatory program requirements as they relate to the California Environmental Quality Act (CEQA). While we understand the proposed changes are intended to address CEQA issues, we are concerned that the RWQCB's environmental findings appear to overstate potential impacts of Basin Plan implementation actions on biological resources. This may place unintended burdens on implementing parties, with added costs, extended review/approvals, and uncertainty in some cases. As a result, we would like to request further explanation as to why the proposed revisions are necessary.

We understand that the development of Waste Discharge Requirement (WDR) waiver programs is the next step in this process, but we feel that there is an immediate and pressing need for more specific information about acceptable implementation measures, as well as recognition of the capacity of Napa County's rural landowners, vineyard owners/operators, and local municipalities. We urge you to address ambiguities in the proposed implementation plan so as to facilitate community understanding and compliance, and set the table for a WDR waiver program that both ensures successful implementation, and avoids overly burdensome requirements and costly individual Reports of Waste Discharge.

Comments on May 19, 2009 revision of the Sediment TMDL and Basin Plan Amendment

The County appreciates the responses you've provided to our prior comments and the comments of others. Although we found most of your responses helpful, others left us concerned that the proposed Performance Standards are subject to future interpretation – again, possibly holding responsible parties, both public and private, to unattainable compliance requirements and infeasible timeframes. Although some clarity has been offered through RWQCB responses to comments, we believe the proposed Basin Plan amendment remains vague, that it inappropriately references future development of unidentified requirements, and that it neglects to account for public and private costs associated with the proposed Implementation Measures.

As we have stated in our prior comments, the County supports the RWQCB's overall TMDL goals "to conserve the steelhead population, establish a self-sustaining Chinook salmon population, enhance the health of the native fish community and enhance the aesthetic and recreational values of the Napa River and its tributaries." Your staff report also acknowledges that the County, along with many watershed organizations, stakeholders and landowners, has been actively taking steps to better understand and steward the Napa River watershed. However, the current economic recession and the State's on-going fiscal problems have severely challenged the County's ability to allocate scarce funds in support of identified watershed and habitat enhancement goals. We would appreciate the RWQCB's acknowledgement of the new economic realities we are all contending with, as well as any assistance you can provide that would help us to secure funding to address our mutual goals for the Napa River watershed.

On behalf of Napa County, I would like to thank you again for the opportunity to provide comments on the proposed revisions to the Basin Plan amendment that will implement the sediment TMDL for the Napa River watershed. More specific comments are provided in the attachment to this letter. Please do not hesitate to contact Patrick Lowe, Deputy Planning Director at (707) 259-5937 or Jeff Sharp, Principal Planner, at (707) 259-5936 on our staff, should you have any questions or need additional information regarding our comments.

Sincerely,

Mark Luce,
Chair

cc: Nancy Watt, County Executive Officer
Rick Thomasser, Operations Manager, County Flood Control and Water Conservation District
Watershed Information Center and Conservancy Board of Napa County
Wil Bruhns and James Ponton, San Francisco Bay RWQCB, TMDL Division
California State Association of Counties
Regional Council of Rural Counties

Attachment: Napa County Comments

May 19, 2009 Revised Basin Plan amendments, incorporating a sediment TMDL, implementation plan, and Habitat Enhancement Plan for the Napa River watershed

1. We understand that the proposed implementation measures and performance measures in the proposed plan amendment would apply to all parts of the Napa River watershed except those areas upstream from municipal reservoirs (i.e., Kimball, Bell Canyon, Hennessey, Rector and Milliken). Can you please confirm this understanding?

2. The proposed implementation plan provides road-related sediment delivery source performance measures for the operation of all public and private roads, paved and unpaved. These roadways constitute a large area of the watershed. How will the Water Board assist the implementing parties to identify, prioritize, repair and monitor these facilities for effectiveness and compliance? When can we expect a WDR waiver program for these activities?

3. As mentioned in the supporting documents and responses to comments, it is possible that not all source category implementation actions outlined in the proposed implementation plan are governed under local regulations. Therefore, it is imperative that the Water Board have the capacity and means to effectively assist the public in those matters/actions outside of the local regulatory prevue to ensure understanding and compliance. How is the Water Board planning to build capacity to meet its role identified in the proposed implementation plan, particularly in light of the State's fiscal crisis?

4. In its response to comments, the Water Board mentions the establishment of minimum parcel sizes and/or pollutant discharge thresholds that would trigger the requirement to obtain a permit or waiver from the RWQCB. Please elaborate on what parcel size or threshold the Water Board is considering in this regard.

5. It was mentioned that the WDR waiver programs expected to be developed as a part of the Sediment TMDL may be broader in scope and geographic extent than just sediment control; and may cover other nonpoint source pollutant control priorities, including the attainment of water quality objectives for pathogens and nutrients, addressing hydro-modification (peak flow) impacts, and protection of other beneficial uses. Please explain the Water Board's authority and reasons for broadening a waiver program beyond sediment control and extending its geographic extent beyond the watershed areas mentioned in the TMDL.

6. Although we are pleased to see that the Water Board is planning to release a draft vineyard WDR waiver program in the winter of 2010, the County was hoping for a single WDR waiver program that would address each of the sediment source categories delineated in implementation plan. A single waiver program would alleviate confusion and duplication in Napa County and at the Water Board. Please explain why a unified WDR program can not be developed and how the Water Board plans to improve its capacity to effectively receive, review and approve the large volume of RoWDs and/or WDR waivers that will be required by each of the implementing parties identified, particularly given the large number of vineyard owners and/or operators and rural landowners in the watershed.

7. The County recognizes that there has been significant delay in approval of the Sediment TMDL, and that the Water Board has extended the completion dates for required implementation actions to October of 2014. Given the fact that the TMDL is still a year away from final 'approval' (barring any litigation delays that may occur) we request that the required

completion dates be established as "five years after final approval of the plan amendment by the EPA."

8. The Water Board states that "additional conditions may be required under a General WDR and/or waiver program consistent with the Water Board's Policy for Implementation and Enforcement of the Non-Point Source Control Program (State Board, 2004), and/or as needed to avoid potentially significant environmental impacts." Please provide some examples of these "additional conditions" to help reduce the ambiguity and misgivings associated with the actions required of implementing parties.

9. The Water Board proposes monitoring management practices to evaluate their effectiveness at addressing storm runoff peaks and volume, and changes in channel structure and sediment delivery rates to channels. Beyond on-site monitoring of implementation measures, how does the Water Board plan on monitoring and identifying downstream effectiveness and who is responsible for broader watershed scale monitoring? Is the State prepared to develop, administer and defend a watershed scale monitoring program that identifies the effectiveness of upstream implementation actions intended to meet performance measures under each source category? The County has been working towards developing a comprehensive watershed monitoring program supported by grant funding from the State. However, this effort has been delayed due to the State's ongoing fiscal issues, which resulted in a stop work order issued by the Department of Water Resources.

10. As stated in the Water Board's response to comments, a condition of a WDR waiver may require that landowners develop a stream and riparian corridor management plan to passively or actively recover geomorphic and ecological processes in unstable channel reaches. Can you please explain the nexus of these proposed "stream and riparian corridor management plan" to the TMDL and what these plans may demand of streamside property owners? Will the Department of Fish & Game also be required to approve these plans prior to the Water Board's issuance of a WDR waiver? Can broader more holistic basin-level stream and riparian corridor management plan suffice in lieu of plans developed on an individual landowner basis?

<<< End >>>

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July 6, 2009

California Regional Water Quality Control Board
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Napa River Watershed Sediment TMDL and Habitat Enhancement Plan
Revised amendment and supporting Staff Report of May 2009

We appreciate the opportunity to comment on the above revised report that the San Francisco Bay Regional Water Quality Control Board (Water Board) will consider to re-adopt as a proposed amendment to the Water Quality Control Plan for San Francisco Bay Basin (Basin Plan) to:

- Establish a total maximum daily load (TMDL) and numeric targets for sediment in the Napa River watershed
- Incorporate an implementation plan to achieve and support the TMDL
- Adopt a Habitat Enhancement Plan for the watershed

Friends of the Napa River commented on the original amendment in August 2006; on January 23, 2007, the Water Board took action to adopt a Basin Plan amendment. Subsequently, staff made changes to the amendment, which will be reconsidered at a Water Board hearing on September 9, 2009. The changes were presented to the FONR Board on June 1, 2009.

Comments by Friends of the Napa River:

We understand that the changes have been made to --

a) formally express expectations that vineyards be managed to not increase storm runoff by a significant amount;
b) revise and further describe potential environmental impacts of projects that could be implemented by landowners to comply with the TMDL; and
c) extend required dates for compliance with pollution control permits by two years, as a result of delays in approval of the plan, and to account for the impacts of the freeze in state bond spending on water quality grants.

We generally agree with the changes to the amendment that reflect the sensitive nature of land use regulations, emphasizing coordination and collaboration between local, state, and federal government agencies and through voluntary efforts. We are, however, concerned with some new restrictions in the implementation plan, e.g.

> “..to minimize potential impacts to sensitive natural communities that may not be fully protected through County regulations, Basin Plan amendment compliance actions will not be required or approved beyond the development footprint authorized by local land-use authorities in any of the following sensitive natural communities within the Napa River watershed: [list]”

These restrictions seem to be contradictory and can only be justified if County Planning authorities are sensitive to cumulative impacts in the geography and over the time frame of the “development footprints.”

Sincerely,

Bernhard Krevet
President, Friends of the Napa River

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Thomas N. Lippe
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Keith G. Wagner
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Kelly A. Franger

Via Electronic Mail

July 6, 2009

Mike Napolitano
Environmental Scientist
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Re: Proposed Basin Plan Amendment for the Napa River Sediment Total Maximum Daily Load

Dear Mr. Napolitano:

This office represents Living Rivers Council ("LRC"), a non-profit association, with respect to the proposed Basin Plan Amendment for the Napa River Sediment Total Maximum Daily Load ("TMDL"). I am writing to submit comments regarding the proposed TMDL on LRC's behalf. LRC objects to the Regional Board's adoption of the proposed TMDL on grounds that the Board has not complied with the California Environmental Quality Act ("CEQA"), the Clean Water Act, or the Porter-Cologne Water Quality Act.

As you know, LRC has previously submitted voluminous comments on this proposal. Consistent with your May 19, 2009 Notice, these previous comments will not be repeated, except as points of departure for additional comments.

LRC submits herewith letters dated July 2, 2009 from Dennis Jackson (Exhibit 9), and Patrick Higgins (Exhibit 10), which are incorporated herein by reference.

Project Description and Segmentation

1. The Implementation Measures for Sediment Discharges Associated with Vineyards set forth in Table 4.1 of the May 2009 proposed Basin Plan Amendment specify the following "Actions" for achieving the identified performance standards:

> "Submit a Report of Waste Discharge[2] (RoWD) to the Water Board that provides, at a minimum, the following: a description of the vineyard; identification of site-specific erosion control measures needed to achieve performance standard(s)

> specified in this table; and a schedule for implementation of identified erosion control measures.
> Or
> Implement farm plan certified under Fish Friendly Farming Environmental Certification Program or other farm plan certification program, as approved as part of a WDR waiver policy. All dischargers applying for coverage under a WDRs waiver policy also will be required to file a notice of intent (NOI) for coverage, and to comply with all conditions of the WDR waiver policy.[4]

LRC previously commented that the Board must evaluate the environmental effects of the TMDL's adoption of Napa County enforcement of its Conservation Regulations as a performance standard for controlling surface erosion. Apparently in response to this comment, the May 2009 Staff Report Environmental Checklist (at page 114) states:

> For reasonably foreseeable projects that may adversely effect special-status species, all are subject to discretionary approval by Napa County (Table 11a). In their review, county staff examines and queries a GIS-based biological database (Jones & Stokes, 2005, Chapter 4 Appendices), which includes three layers: a) land-cover; b) special-status species occurrence; and c) special-status species habitat. The land-cover layer identifies potential locations of sensitive natural communities. The land-cover layer, special-status species occurrence layer, and expert input were used to develop the special-status species habitat layer. Using the above described database, county staff examines the location of a proposed project, and if it overlaps with potential habitat for one-or-more special status species, then the county requires a biological resources evaluation and avoidance of impacts to the extent feasible (Policy Con-13, Napa County General Plan, 2008; County Code, Chapter 18.108.100). In cases where full avoidance is not feasible, effective mitigation measures are required to address impacts (Policies CON-16 and CON-17, Napa County General Plan, 2008).
>
> In addition to county review, we also note that it is the Water Board's statutory responsibility to protect water quality and its beneficial uses. In the course of exercising its duties, the Water Board would either: a) not approve compliance actions that could cause significant adverse impacts to any water-dependent special status species either directly or through habitat modification; or b) require avoidance and mitigation measures to reduce impacts to less than significant levels. Considering the above, we conclude that project-specific impacts to all special status species are less than significant with mitigation incorporated.

In sum, for purposes of both ensuring that the TMDL achieves Basin Plan water quality standards and avoiding significant adverse impacts from implementation of the TMDL, the Regional Board is essentially saying "Trust Us" based on the fact that future projects will either undergo project specific review through issuance of Waste Discharge Requirements ("WDRs"), or will have to meet conditions specified in a future WDR waiver policy to avoid project specific review through issuance of WDRs.

As LRC has previously pointed out, the problem here is that the Board has not published the future WDR waiver policy. Without the waiver policy, the public cannot evaluate whether the conditions that project applicants will be required to meet to avoid project specific review through issuance of WDRs will be stringent enough to ensure that only projects not needing additional analysis or mitigation measures are allowed within the WDR waiver.

Deferring development of the WDR waiver policy violates CEQA because it segments the environmental assessment of the current TMDL, its performance standards, and the measures necessary to meet these performance standards. All of these components constitute one project. Therefore, at this point, the project description is incomplete.

Increased Peak Flows

2. With respect to the TMDL's inclusion of a performance standard for "attenuating" increases in peak flows resulting from vineyard construction, LRC previously noted its concern that the "'Actions' portion of Table 4.1 and the Staff Report (at page 80) contains disturbing indications that the Board may be prepared to accept, as criterion for whether peak flow increases are deemed 'significant,' a 10% to 15% above pre-project rates, a number derived from ongoing discussions within the Fish Friendly Farming Program."

The Actions portion of Table 4.1 of the May 2009 proposed Basin Plan Amendment deletes the reference to the Fish Friendly Farming Program in footnote 4, but continues to include "farm plan[s] certified under Fish Friendly Farming Environmental Certification Program," and page 80 of the May 2009 Staff Report continues to reference a criterion for whether peak flow increases are deemed "significant" of 10% to 15% above pre-project rates. Therefore, LRC's previous comment remains unresolved.

An EIR Equivalent Analysis of Impacts Is Required

3. By continuing to use the environmental checklist approach, the Board continues to use the equivalent of a Negative Declaration for its compliance with CEQA. Therefore, LRC's previous comment that an EIR equivalent analysis of impacts is required, especially of the impact of the TMDL's adoption of Napa County enforcement of its Conservation Regulations as a performance standard for controlling surface erosion, remains unresolved.

4. In its May 2009 Response to Comments, the Board directly responds to LRC's comment that the Board "must perform an analysis of reasonably foreseeable means of compliance with any TMDL performance standards ... compliance with the County Conservation Regulations (Table 4.1 of the Basin Plan amendment)" stating:

> To clarify, we are not requiring the County Conservation Regulations, only acknowledging they are in effect. Please also note that the County Conservation Regulations (Chapter 18.108) do not specify means of compliance, only conditions with regard to effectiveness of erosion control and/or other goals (e.g., protection of drinking water supply, water quality, etc.).

This response defies the language of the TMDL and the facts on the ground in Napa County. The proposed TMDL most assuredly does require compliance with the County Conservation Regulations, stating in Table 4.1: "Surface erosion associated with vineyards: Comply with conservation regulations (County Code, Chapter 18.108)."

Also, the fact that the County Conservation Regulations "do not specify means of compliance" is immaterial. At this point, the "means of compliance" are a matter of readily available historical record. Since the Conservation Regulations took effect in 1991, an entire consulting industry has arisen to enable vineyard owners to comply, and the consultants who populate this industry have standard, indeed routine, methods of trying to achieve compliance. All of this material is public record and available for the Board to review and evaluate.

Submitted herewith are four comment letters (Exhibits 11-14) on the Rodgers/Upper Range Vineyard Conversion project as further examples of readily available information the Regional Board should use to evaluate the environmental impacts of adopting compliance with the Napa County Conservation Regulations as a performance standard.

Thank you for your attention to this matter.

Very truly yours,

Thomas N. Lippe

List of Attached Exhibits

1. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 1. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

2. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 2. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

3. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 3. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

4. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 4. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

5. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 5. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

6. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 6. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

7. West Yost & Associates, Gerry Nakano, J. J. Westra, October 19, 2005, TECHNICAL MEMORANDUM NO. 7. for Napa County Flood Control and Water Conservation District, http://www.napawatersheds.org/docs.php?ogid=10610.

8. Faye, Robert E., November 1973, Ground-Water Hydrology of the Northern Napa Valley, U.S. Geological Survey, Water-Resources Investigations 13-73.

9. Letter dated July 2, 2009 from Dennis Jackson re May 2009 Napa Sediment TMDL BPA.

10. Letter dated July 2, 2009 from Patrick Higgins re May 2009 Napa Sediment TMDL BPA.

11. Letter dated January 21, 2007 from Dennis Jackson re Rodgers/Upper Range Vineyard Conversion Project.

12. Letter dated January 21, 2007 from Dr. Robert Curry re Rodgers/Upper Range Vineyard Conversion Project.

13. Letter dated October 19, 2008 from Dennis Jackson re Rodgers/Upper Range Vineyard Conversion Project.

14. Letter dated October 20, 2008 from Dr. Tom Gaman re Rodgers/Upper Range Vineyard Conversion Project.

EXHIBITS 1-8

Note: These exhibits are not included here because they are effectively summarized in the other exhibits provided by the Living Rivers Council.

Exhibits 1-8 can be viewed and downloaded at:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napariversedimenttmdl.shtml or a hard copy can be requested by contacting Mike Napolitano at 510-622-2397 or James Ponton at 510-622-2492.

EXHIBIT 1-8

EXHIBIT 9

Dennis Jackson - Hydrologist
2096 Redwood Drive
Santa Cruz, CA 95060
(831) 295-4413
dennisjack01@att.net

July 2, 2009

Thomas N. Lippe
329 Bryant Street, Suite 3D
San Francisco, CA 94107

re: Napa River Sediment TMDL

Dear Mr. Lippe:

You have asked me to review and comment on the proposed Napa River Sediment TMDL. I have reviewed the following documents

a) the revised Proposed Basin Plan Amendment: Napa River Sediment Reduction and Habitat Enhancement Plan dated May 2009,
b) the revised Napa River Sediment Total Daily Maximum Load Staff Report dated September, 2008,
c) the Response to Comments dated May 2009.

These documents were obtained from the San Francisco Bay Regional Water Quality Control Board web site.

In my opinion, the Napa River Sediment TMDL, in its current form, will not be able to achieve its objective of reducing the sediment load of the Napa River to 125% of the natural background sediment load. There are two reasons why I believe the TMDL in its current form will not achieve its objective. First, the fundamental problems underlying the high sediment load should be re-framed to be in accord with fundamental fluvial geomorphic principles. Second, the performance standard and other details need be strengthened.

The portion of the TMDL and Basin Plan Amendment directed towards enhancing and protecting salmonid habitat can not succeed until it is recognized that the low flows in the Napa River are primarily the result of extensive groundwater pumping exacerbated by spring and summer surface water diversions.

Natural Hydrograph

The TMDL and Basin Plan Amendment (BPA) estimate that the current sediment load of the Napa River is 185% of the natural background sediment load. Leopold, Wolman, Miller, Emmett and many other researchers have established that a river constructs and maintains its channel. The water discharge delivered to the channel supplies the energy necessary to shape the channel. Merely reducing the sediment load supplied to the channel network is not sufficient to reduce the sediment transport capacity of the water flowing down the channel.

While it is important to reduce the sediment load delivered to the Napa River it is also important to reduce the peak stormwater discharge in the Napa River and its tributaries. Many of the land use changes that have resulted in an increase in sediment load in the Napa River system have also caused an increase in stormwater discharge. Reducing the sediment discharge from the altered land surface without simultaneously reducing the stormwater discharge will not achieve the objective of the TMDL and BPA but will only result in erosion of the channel network.

The TMDL and BPA do recognize that channel incision (progressive lowering of the streambed) is a significant source of the sediment load in the river. Instead of taking action to reduce the stormwater discharge in the Napa River system the TMDL and BPA seek to encourage voluntary projects to physically alter the shape of the channel. Projects to change the shape of the Napa River may be beneficial but they do not affect the channel elsewhere in the watershed. However, systematically reducing the stormwater discharge associated with human land use will reduce the magnitude of stormwater runoff throughout the watershed.

In the Response to Comments dated May 2009, in their discussion of *Comment 3.DJ5* (Napa County Conservation Regulations), the Regional Board staff acknowledges that various land uses have increased the discharge of the Napa River.

> We also concur it is likely that vineyard development, urban development, and roads have increased storm runoff and peak flow in the Napa River and its tributaries. The real question is by how much, and what is the significance of such changes? To address these questions, more field data collection and analysis is needed to determine how much runoff may be increasing and under what circumstances, and to evaluate potential consequences with regard to location(s) and effects on channel physical habitat structure.

The channel incision in the Napa River is the result of both the reservoirs capturing bedload and the increased discharge from vineyards, over grazed land, conversion of forests, roads, urban areas, and other impervious surfaces.

The goal of the TMDL and BPA is to reduce the current estimated sediment discharge from 185% of the natural sediment load down to 125% of natural sediment load. Reducing the sediment load of the Napa River to 125% of the natural sediment load will require bringing the stormwater discharge regime of the Napa River into alignment with the target sediment load. The discharge regime of the Napa River must be changed to resemble a natural hydrograph capable of transporting 125% of the natural background sediment load of the Napa River. The TMDL and the BPA should develop the parameters of the natural hydrograph (stormwater discharge regime) that will be in alignment with the goal of reducing the sediment load to 125% of the natural sediment load. Discharge load allocations could then be made for each source of increased discharge.

Failure to address the distorted discharge regime of the Napa River will undermine the effectiveness of the TMDL and BPA and prevent the sustainable obtainment of reducing the sediment load to 125% of the natural background sediment load.

Sources of Increased Discharge

The major land uses in the Napa River watershed are vineyards, grazing, rural residential, urban areas and undeveloped land in the form of open space, parks and forest. These land uses have altered the hydrologic response of the Napa River watershed. The observed changes in land use have contributed to an increase in the magnitude of the largest annual flood (instantaneous discharge event). The prediction of an increase in flood peaks appears to be supported by local perception.

Residents of the Napa River watershed believe that the magnitude and frequency of large flood events have increased during recent years. In 1998 residents of the Napa watershed passed Measure A to reduce flood hazards by using the “living river” approach instead of channelization. The Napa County Flood Control and Water Conservation District works with the Army Corps of Engineers to provide more channel storage and create bypass channels.

Intensive land use changes the vegetative cover and the ground surface. Reduction in vegetative cover is usually associated with an increase in stormwater discharge. For example, clearing a forest to create pasture will increase the stormwater runoff from the area. Changes in the ground surface from intensive land use usually reduce the infiltration rate and results in increases in stormwater runoff. For example, construction of buildings and roads creates impervious surfaces that increase the amount of surface runoff from the area. The cumulative impact of all the changes in the hydrologic characteristics of the land surface in the Napa River watershed is significant.

The scale of the problem of altered land surface can be estimated from some information posted on the Winebusiness.com web site (http://www.winebusiness.com/wbm/?go=getArticle&dataId=4903). I make no claims about the accuracy of the following data. I propose that the Regional Board use available Geographic Information System (GIS) data to create a dataset that more accurately addresses the issue of altered hydrologic properties leading to increased stormwater runoff.

Land Use Category	Area, acres	Percent of Watershed
protected status	110,000	41%
hardened pavement or rooftops	20,000	7%
vineyards	38,000	14%
range and grazing land	102,000	38%
Total acres of Land Uses	270,000	100%
watershed area, acres	270,000	

The land use of “protected status” is described on the Winebusiness.com web site as:

> There are currently 134,500 acres of Napa River watershed land in protected status in public or quasi-public ownership. This includes over 50,000 acres protected through fee title or conservation easement by the Napa County Land Trust.

The conservation easements probably include areas that are in the vineyard and range and grazing land categories. If this assumption is accurate there would be 110,000 acres (41% of the watershed) in the “protected status” category that are not already counted in the other categories. The above table has been changed to reflect the probable double counting of “protected status” land. Some of the area within the “protected status” category has been hydrologically altered.

The category of “hardened pavement or rooftops” represents impervious surfaces in the watershed. If the 20,000 acre estimate is accurate then about 7% of the watershed is covered by an impervious surface. Rain falling on an impervious surface would not be absorbed by the surface. Impervious surfaces generate the most stormwater runoff.

Vineyards account for 14% of the watershed. Vineyards increase the stormwater runoff of a land surface. The “range and grazing land” accounts for 38% of the watershed. The level of hydrologic alteration of grazing land depends on the intensity of the grazing. Vineyards and range and grazing would also include some areas of impervious surfaces such as roads and rooftops.

Water supply reservoirs with no flood control capacity are another source of impervious surface in the Napa watershed. The municipal and private reservoirs in the Napa River watershed are not capable of controlling flood releases, that is they are “fill-and-spill” reservoirs. Once a “fill-and-spill” reservoir is filled, any additional inflows are directly routed through the reservoir. In addition, once a reservoir is filled the surface acts as if it were impervious so any rain that falls on the surface of the reservoir is immediately routed to the channel network. An off-stream reservoir will have these impacts as long as it has a spillway. Only reservoirs that have sufficient storage capacity to contain the 100-year storm event will not exhibit these characteristics. The impacts of the reservoirs are discussed in more detail below.

The according to a GIS layer of major water bodies in Napa County, total surface area of the five municipal reservoirs in the Napa River watershed is 1,002 acres. Dietrich et al. (2004) estimated the number of reservoirs in the Napa River watershed to be more than 1,000. A recent aerial photo survey of private reservoirs in the Napa River watershed by Stetson Engineering located 269 ponds that had not filed with the Division of Water Rights. The total surface area of these 269 non-filer ponds is 677 acres. The average surface area is 2.52 acres. Assuming that the non-filer reservoirs are a representative sample of all private reservoirs the total surface area can be estimated by multiplying the estimated average surface area of 2.52 acres by the estimated 1,000 reservoirs to get a total surface area of 2,520 acres.

The total surface area of the reservoirs in the Napa River watershed is estimated to be 3,522 acres or 5.5 square-miles or 1.3% of the entire watershed (422 square-miles). Adding the surface area of the reservoirs to the estimate of impervious surfaces brings the total impervious surface area to 8.3% of the watershed. The reservoir surface area accounts for 15.6% of the impervious surfaces in the watershed.

Reservoirs

The municipal and private reservoirs in the Napa River watershed are not capable of controlling flood releases, that is they are “fill-and-spill” reservoirs. Once a “fill-and-spill” reservoir is filled, any additional inflows are directly routed through the reservoir. In addition, once a reservoir is filled, any rain that falls on the surface reservoir is immediately routed to the channel network and contributes to downstream flooding and to the erosion of the bed and banks of the mainstem of the Napa River. During a storm event, the surface of any reservoir that is spilling essentially acts as an impervious surface and actually contributes to the magnitude of downstream discharge. This impact occurs as long as the reservoir has no flood control storage and has a spillway. An off-stream reservoir with a spillway will contribute downstream increases in discharge once it is filled.

Once a reservoir is filled, any land use that increases the rate or volume of storm flow upstream of reservoir directly contributes to increased discharge downstream of the dam. Increasing the volume of stormwater runoff from land upstream of the reservoirs will cause the reservoirs to fill faster and thus increase the frequency of reservoir spilling and will also increase the magnitude of the reservoir spill events. These effects apply to municipal water supply reservoirs and to private reservoirs.

The proposed TMDL and BPA specifically exempt land use upstream of the municipal reservoirs from the performance standards of the TMDL and BPA. The resulting uncontrolled increases in storm water discharge from land uses upstream of the municipal reservoirs will be passed through the municipal reservoirs and contribute to increased storm water discharge downstream of the reservoirs. The increased stormwater discharges from land excluded from the performance standards of the TMDL and BPA upstream of the reservoirs will be passed through the reservoirs and will contribute to downstream flooding and erosion of the bed and banks of the mainstem of the Napa River. Rain falling on the surface of the municipal reservoirs will also contribute to downstream flooding and erosion.

The public and private reservoirs are typically drawn down by late summer or early fall. The runoff from land upstream of the reservoirs (estimated at 30% of the Napa watershed) from the first few storms are captured in the reservoirs and farm ponds. The reduction in the first few storm peaks has an adverse impact on the early season discharges that act to signal to salmonids that it is time to migrate upstream. Shaving the first few storm peaks by reservoirs and ponds also diminishes the magnitude of the discharge downstream and can create flow dependent barriers or impediments to upstream salmonid migration.

The numerous (more than 1,000) private reservoirs in the Napa River watershed have a profound effect on the environment. Over 30% of the watershed area of the Napa River is upstream of either private reservoirs or the municipal reservoirs. As discussed above, the private reservoirs and municipal reservoirs are typically drawn down through the summer. The cumulative available storage capacity of all the private reservoirs will capture the early fall stormwater runoff from the land upstream. The capture of this early season runoff delays the fall pulse of freshwater that salmonids use to signal upstream migration.

Once the private reservoirs are full, any rain that falls on them is immediately routed into the channel network that is, they act as impervious surfaces. The cumulative impact of rain falling on the combined surface of all spilling private reservoirs is a significant cumulative increase in the downstream flood magnitude. The “affective attenuation of downstream flood peaks” performance standard in the TMDL and BPA should be applied to the private reservoirs.

The use of sediment detention ponds will contribute to the creation of impervious surfaces during storm events when they are spilling and will resulting downstream increase in the magnitude of storm water runoff. Requiring or allowing the use of sediment detention ponds will result in increased off-site peak stormwater runoff and associated erosion of the channel. The increased stormwater runoff contributes to the magnitude the erosion of the bed and banks of the Napa River and its tributaries. The contribution of increased discharge from sediment detention ponds needs to be evaluated in the environmental assessment for the TMDL and BPA.

The TMDL and BPA need to provide a mechanism to bring the stormwater discharge regime of the Napa River system into alignment with the discharge regime that would produce 125% of natural sediment load.

Discharge Performance Standard

The May 2009 BPA sets performance standard to achieve reduction in non-point source sediment discharges to the Napa River for various land uses in Tables 4.1 through 4.4. Those performance standards are listed below.

BPA-Table 4.1 Vineyards:

- Surface erosion associated with vineyards: Comply with conservation regulations (County Code, Chapter 18.108); and
- Roads: Road-related sediment delivery to channels ≤ 500 cubic yards per mile per 20-year period; and
- Gullies and/or shallow landslides: Avoid and control human-caused increases in sediment delivery from unstable areas to a less than significant level; and
- Effectively attenuate significant increases in storm runoff. Runoff from vineyards shall not cause or contribute to downstream increases in rates of bank or bed erosion.

BPA-Table 4.2 Grazing:

- Surface erosion associated with livestock grazing: Attain or exceed minimal residual dry matter values consistent with University of California Division of Agriculture and Natural Resources guidelines and
- Roads: Road-related sediment delivery to channels ≤ 500 cubic yards per mile per 20-year period and
- Gullies and/or shallow landslides: Avoid and control human-caused increases in sediment delivery from unstable areas to a less than significant level

BPA-Table 4.3 Rural Lands:

- Roads: Road-related sediment delivery to channels ≤ 500 cubic yards per mile per 20-year period; and
- Gullies and/or shallow landslides: Avoid and control human-caused increases in sediment delivery from unstable areas to a less than significant level.

BPA-Table 4.4 Parks and Open Space and Public Works

- Roads: Road-related sediment delivery to channels ≤ 500 cubic yards per mile per 20-year period2; and
- Gullies and/or shallow landslides: Avoid and control human-caused increases in sediment delivery from unstable areas to a less than significant level.

The performance standards for each of the four classes of land use in BPA-Tables 4.1-4.4 seek to reduce human caused sediment. However vineyard is the only land use subject to a performance standard to "effectively attenuate significant increases in storm runoff". Overgrazing is typically associated with an increase in storm runoff. Roads typically increase storm runoff compared to the natural pre-road condition. Gullies and shallow landslides are often associated with increases in storm runoff. Controlling sediment from grazing, rural lands and Parks, open space and public works without also controlling storm discharge from these land uses will result in downstream erosion of the bed and banks of the stream channel. The discharge regime for these land-uses needs to be brought into alignment with the goal of reducing the sediment load to 125% of the natural load.

Therefore, I propose that the following performance standard be applied to all four land use categories listed in BPA Tables 4.1 through 4.4.

- Effectively attenuate significant increases in storm runoff. Runoff from all land uses listed in Tables 4.1 through 4.4 shall not cause or contribute to downstream increases in rates of bank or bed erosion relative to the discharge regime that carries 125% of the natural sediment load.

County Conservation Ordinance

The Napa County Conservation Ordinance is insufficient to ensure that projects in domestic water supply watersheds do not contribute increased stormwater runoff. Only the following section specifically deals with stormwater discharge from a project. The ordinance only asks that concentration of runoff be avoided whenever feasible. A much stricter standard needs to be applied to ensure that a project does not increase stormwater runoff.

> 18.108.027 Sensitive Domestic Water Supply Drainages.
>
> D. Drainage facilities. Concentration of runoff shall, wherever feasible, be avoided. Runoff shall instead be spread in small incremental doses into relatively flat buffer areas. Those drainage facilities and outfalls that unavoidably have to be installed shall be sized and designed to handle the runoff from a one hundred-year storm event without failure or

unintentional bypassing. Outlets shall be protected against erosion in the one hundred-year storm event.

The County Conservation Ordinance only applies to new projects and not to existing projects. In order to bring the discharge regime of the Napa River into alignment with the natural hydrograph that would transport no more than 125% of the natural background sediment load it is necessary to ensure that stormwater runoff from new projects does not contribute additional stormwater runoff and that excess stormwater runoff from past land uses is reduced.

The municipal reservoirs have no flood control capacity so once they are full they pass all stormwater flows generated upstream. In addition, once they are full they act as an impervious surface and actually increase stormwater discharge downstream.

Therefore, excluding land upstream of the municipal water supply reservoirs from the performance standards and other requires of Tables 4.1 through 4.4 of the BPA and the TMDL will undermine the achievement of reducing the sediment load of the Napa River to 125% of the natural sediment load.

All lands upstream of the municipal reservoirs should be subject to the proposed performance standard.

- Effectively attenuate significant increases in storm runoff. Runoff from all land uses listed in Tables 4.1 through 4.4 shall not cause or contribute to downstream increases in rates of bank or bed erosion relative to the discharge regime that carries 125% of the natural sediment load.

Low Flows

Regional Board staff has not adequately addressed my comments regarding low flows in the Napa River. Furthermore, I have found evidence, not previously discussed in the TMDL process, showing that groundwater pumping in the Napa Valley is having adverse impacts on streamflow during consecutive dry years. In the following text I repeat my comment on low flow and give staff's response. I then introduce the evidence for adverse impacts from groundwater pumping.

<u>Comment 3.DJ4</u> (Low flows): The revised Basin Plan amendment does not adequately address low flow problems that occur in dry years with a cold spring season. Minimum bypass flows for the frost protection period (March 15 through May 15) in the Napa River are too low. The Department of Fish and Game has demonstrated that diversions and on-stream reservoirs have played a significant role in the decline of salmonids in the watershed. Because diversions during the spring for frost protect impact baseflow, the Department of Water Resources Watermaster should be brought into the coordinated interagency process that you have proposed (Basin Plan amendment, Table 5.2, Action 2.1). What actions will the Water Board take, if the inter-agency plan is not implemented by the fall of 2010? Finally, the revised Basin Plan amendment and Staff Report do not address my earlier recommendation (attached as part of the comment letter submitted to the State Board in May of 2008) that near-stream wells should be examined to determine if they are impacting streamflow discharge.

<u>Staff Response</u>: All diversions during the March 15 through May 15 frost protection period are controlled by a court appointed Watermaster, who has enrolled all mainstem and tributary diverters, who withdraw between March 15 and May 15, in the frost protection program. With regard to increasing minimum bypass flows, it is our understanding that the Watermaster retains authority to modify the definition of "ample streamflow" and/or based on experience gained in administering the program, to suggest to the Superior Court that the definition of "available water supply" be refined or revised (Napa County Superior Court, 1976). By modifying one or both of these definitions, instream flows to protect fish could be increased. Key information needs to guide policy in this area may include: a) analyses of current

relationships between fish passage and streamflow at critical riffles and man-made structures in the Napa River and key tributary reaches; b) streamflow monitoring in key tributaries to protect critical baseflows for steelhead; and c) steelhead and Chinook salmon smolt trapping to determine the timing of outmigration, smolt fitness, and smolt population levels and trends. We actively support these data collection efforts, and their application to water rights policy and regulation.

With regard to the proposed inter-agency plan, please note that participation is voluntary and the plan would focus solely upon municipal water supply facilities in relation to opportunities to jointly enhance water supply reliability and native fish populations. The City of Napa previously has indicated its support for, and willingness to participate in development of the proposed plan (Brun, 2007). Perhaps the most significant obstacle to development of the proposed plan is the availability of staff and contract resources to conduct necessary studies, direct the process, and prepare the plan. The Water Board remains committed to helping to obtain necessary resources and to working cooperatively with other partners on the plan.

Finally with regard to the concern that near-stream wells need to be examined to determine if they are affecting streamflow, please note that as a condition of the WDR waivers, staff will propose that the Water Board require compliance with all water rights laws in order to obtain coverage. We also are open to receiving additional input regarding analytical approaches that could be used to determine whether well pumping affects streamflow.

My Response to the Staff Comment: Staff notes that the Watermaster has the authority to modify the definition of “ample streamflow” and recommend that the definition of “available water supply” be changed. My comment was actually a request for the Regional Board and its staff to actively include the Napa River Watermaster in all discussions regarding low flows in the Napa River. One way to include the Watermaster in discussions regarding low flows in the river would be to include them in the inter-agency cooperative partnership envisioned by Action 2.1 in BPA Table 5.2.

The staff response to my comment quoted above notes that the voluntary proposed inter-agency plan would focus solely upon municipal water supply facilities in relation to opportunities to jointly enhance water supply reliability and native fish populations. The proposed plan, as described in the staff response to my comment, fails to carry out Action 2.1 in Table 5.2 of the BPA which states that action 2.1 is:

> 2.1 Local, state, and federal agencies to participate in a cooperative partnership to develop a plan for joint resolution of water supply reliability and fisheries conservation concerns

The proposed inter-agency plan focuses solely on municipalities and apparently does not include the Watermaster or Fish and Game or the NMFS. This deficiency should be corrected.

Will the Regional Board or its staff send a memorandum to the Napa River Watermaster indicating that the minimum bypass discharge of 10 cfs during the frost protection season may be too low and that the “key information” listed by staff needs to be developed? Furthermore, the result of any low flow studies should be incorporated into the Watermaster’s policy.

Regarding the issue of the impact of near-stream wells, Staff is proposing that the Water Board require compliance with all water rights laws in order to obtain coverage. It is my understanding that in California water law that a well is presumed to tap “freely percolating water” and does not require a water right permit. Furthermore, I believe that the burden-of-proof to demonstrate otherwise is on the complaining party. If this is an accurate assessment of water law then, it would appear that the TMDL would leave the status quo unchanged and that interested citizens would be left with the task of demonstrating the affect of individual wells on flows in the Napa River.

Staff says that they are open to receiving additional input regarding analytical approaches that could be used to determine whether well pumping affects streamflow. I offer the following analysis to show that the current level of ground water extraction in the Napa Valley has changed the Napa River from a gaining stream to a losing stream during consecutive dry years. This means that, during consecutive dry years, the flow in the river diminishes in the downstream direction to recharge the groundwater table instead of being supplied by the groundwater table and increasing in the downstream direction as it did in the past.

Evidence for Impact of Wells on Streamflow

Faye (USGS, 1973) studied the ground water hydrology of the northern part of the Napa Valley from Oak Knoll Avenue just north of the City of Napa to the northern end of the valley. The area is a distinct topographic basin covering about 60 square miles of valley floor and is surrounded on three sides by foothills and mountains.

Faye (USGS, 1973) notes that;

> At the present time (1972), the Napa River is a gaining stream and contributes little recharge to the water table. Even during years of limited rainfall, when the river flows intermittently, water is discharged from the aquifer in those reaches where the river is flowing and water recharges the alluvium in reaches where the river channel is dry; thus net recharge to the alluvial aquifer is negligible.

Faye (USGS, 1973) simulated groundwater levels in the Napa Valley groundwater basin. His simulation model used the distributions of wells in 1970 and the estimated 1970 pumping rate of 5,900 acre-feet. Simulations of critical drought conditions with four times the 1970 pumping rate (23,600 af) showed that:

> The pumping depression near Maple Lane would expand and another depression would develop directly east of it. In the center of the valley, between Rutherford and Oakville, much of the upper 50 feet to 70 feet of the alluvial aquifer would be dewatered and a cone of depression would extend northward towards the periphery of the valley. Also, dewatering of the upper part of the alluvial aquifer would occur between Yountville and Oak Knoll Avenue. In the vicinity of Oak Knoll Avenue, large simulated withdrawals made between Highway 29 and the Napa River would cause a cone of depression to extend westward towards the periphery of the valley. South of St. Helena, relatively shallow wells having depths of 60 feet or less would be dry under such conditions.

Faye (USGS, 1973) concludes that:

> (1) groundwater levels should not decline significantly until groundwater pumpage exceeds 24,000 acre-feet per year; (2) after two consecutive years of little to no recharge, groundwater withdrawals in excess of 24,000 acre-feet per year could cause significant declines in groundwater levels and significantly redistribute the hydraulic gradients in the valley between Zinfandel Lane and Oak Knoll Avenue; and (3) the alluvial aquifer and the stream system can provide water sufficient to meet most projected groundwater requirements, even under protracted, adverse climatological conditions.

In 2005, West Yost and Associates produced a series of seven Technical Memorandums to report their assessment of the water supply situation for the Napa Valley for the years 2020 and 2050.

West Yost and Associates subdivided the Napa Valley floor into seven sub-regions, as described in their Table 1 of their TM-3 presented below. The Main Basin consists of sub-regions 1-4 and sub-region 7. The MST Study Area and the Carneros area are sub- regions 5 and 6, respectively. (West Yost & Assoc TM-3, 2005). The Main Basin roughly corresponds to Faye's (USGS, 1973) northern Napa Valley.

West Yost TM-3; Table 1. Sub-region Description:

Sub-region Number	Sub-region Name	Sub-region Description
1	Calistoga	North Study Area Boundary south to Lodi Lane
2	St. Helena	Lodi Lane south to Oakville Crossing
3	Yountville	Oakville Crossing south to Oak Knoll Road
4	Napa	Oak Knoll Road south to Imola Avenue
5	MST Study Area	Napa River east to Base of Howell Mountains
6	Carneros	Based upon the Carneros Appellation
7	American Canyon	Imola Avenue south to Napa County Line
8	Hillside	Outside of valley floor yet inside 2050 Study Area

West Yost and Associates (TM-7, 2005) draws the following conclusions from their 2050 study relative to groundwater use in the Napa Valley.

> Based on the findings of the 2050 Study, several conclusions can be made. These conclusions reflect the importance of cooperation between and among the municipalities and various interests within the Napa Valley to ensure that the Valley's valuable water resources will be available for use by existing and future generations.
>
> - Unincorporated area and agricultural water users are the primary users of groundwater in the County, with the exception of a very small quantity pumped by some of the municipal agencies. Unincorporated and agricultural demands will continue to grow and further increase extractions from the groundwater basin. As described in TM 5, based on the estimated perennial yield of the Main Basin and the existing agriculture demands, about 10 percent of the Main Basin's available storage capacity is currently being used for "working storage" or seasonal use (10 to 15 percent is fairly typical). However, as agricultural demands continue to increase in the future, a larger percentage of the Main Basin's storage capacity will be seasonally used.
> - Municipalities are also considering very small increases in the quantities of groundwater they pump. While municipalities may pursue individual project opportunities to increase the use of local groundwater resources, it is recommended that the groundwater basin be managed appropriately, if used as a supply source for M&I supply reliability during a drought condition. As municipalities are considering increases in groundwater pumpage, they should exercise caution as they move forward, so that they do not adversely impact existing groundwater users.

West Yost and Associates Technical Memorandum 6 (2005) estimates that the unincorporated groundwater extraction rate from the Main Basin in 2000 was 26,750 afa (acre-feet per annum) in normal years or 4.5 times the 1970 extraction rate reported by Faye (USGS, 1973). It is reasonable to assume that dry year pumping rates after 2000 would be higher than the normal year extraction rate estimate for 2000 by West Yost and Associates. Thus, the groundwater extraction rates during the dry years of 2001, 2007 and 2008, as measured at the Napa Fire Station, would have exceeded 26,750 afa (4.5 times the 1970 extraction rate).

Faye's (USGS, 1973) report predicts that groundwater extraction would have lowered the groundwater levels during 2007 and 2008 significantly below the bed of the Napa River. According to Faye's (USGS, 1973) simulation, lowering the groundwater levels in the Napa Valley during consecutive dry years would diminish the streamflow in the Napa River since the river would become a losing stream that is, the river would contribute water to the aquifer instead of receive water from the aquifer. The cumulative effects of groundwater pumping may have caused the channel to go dry in 2007 and 2008. In dry years, the impact of groundwater pumping on streamflow in the Napa River is not limited to wells adjacent to the river but is the result of the general lowering of the groundwater surface due to the combined pumping of all wells in the Napa Valley aquifer.

The West Yost and Associates technical memos note that agricultural water demand will continue to increase suggesting that the frequency and intensity low flows in the Napa River will increase over time. The number of days of zero flow may also increase in the Napa River in response to increased groundwater extraction during dry years.

Evidence of Groundwater Level Decline

In this section, a preliminary study of the record of the water surface elevation of a well is compared to the elevation of the bed of the Napa River to explore the relationship between the water in the river and the groundwater table. A more in depth version of this preliminary study could be done by making a contour map of the fall groundwater surface and comparing it to the elevation of the bed of the Napa River derived from LIDAR and ground surveying.

The California Department of Water Resources maintains a *Water Data Library* on their web site that stores the water surface observations from a large number of wells in the Napa Valley. The water level record of a well (State Well Number 07N05W09Q002M) near the confluence of Bale Slough and the Napa River is presented below. This well is in the vicinity of the depression in the groundwater surface predicted by Faye's (USGS, 1973) simulation of the groundwater surface at four times the 1970 extraction rate.

The well is reported as not being used so its record is not influenced by its own pumping. It is near two other wells. A total of 489 groundwater-surface-elevation observations were made between October 1949 and June 2009. Figure 1 shows the location of the well. The well is approximately 1,100 feet west of the confluence of Bale Slough with the Napa River. The ground surface elevation at the well is given as 155 feet above mean sea level (amsl). The 7.5-minute topographic map shows the elevation at the confluence of Bale Slough and the Napa River is about 140 feet amsl.

Figure 2 shows all of the groundwater surface elevation measurements. The elevation data has been adjusted by subtracting 140 feet from the water surface elevation. An elevation of zero on the graph occurs when the water surface in the well is at the same elevation as the estimated elevation of the bed of the Napa River at its confluence with Bales Slough. The elevation data shown in Figure 2 is *relative* to the estimated bed of the Napa River at its confluence with Bales Slough. When the relative elevation of the water surface in the well is greater than zero, groundwater from near the well is assumed to be flowing into the river. When the relative elevation of water surface in the well is less than zero, water is assumed to be flowing out of the river and entering the groundwater system. The Napa River at Bales Slough changes from a gaining-stream to a losing-stream when the relative water-surface-elevation in the well declines to zero.

Figure 3 shows the March water surface elevations in the well are declining over time. A linear regression line was fit to the data using the year of record as the independent variable. The year of record is used as an index of change over time. Both the coefficient and intercept are statistically significant at alpha = 0.05. The regression explains only 12% of the variation in the March water surface elevations. However, regression line indicates that the March water surface elevation is declining over time since the coefficient is negative. A stronger regression relationship can be obtained if the March 1977 observation is excluded.

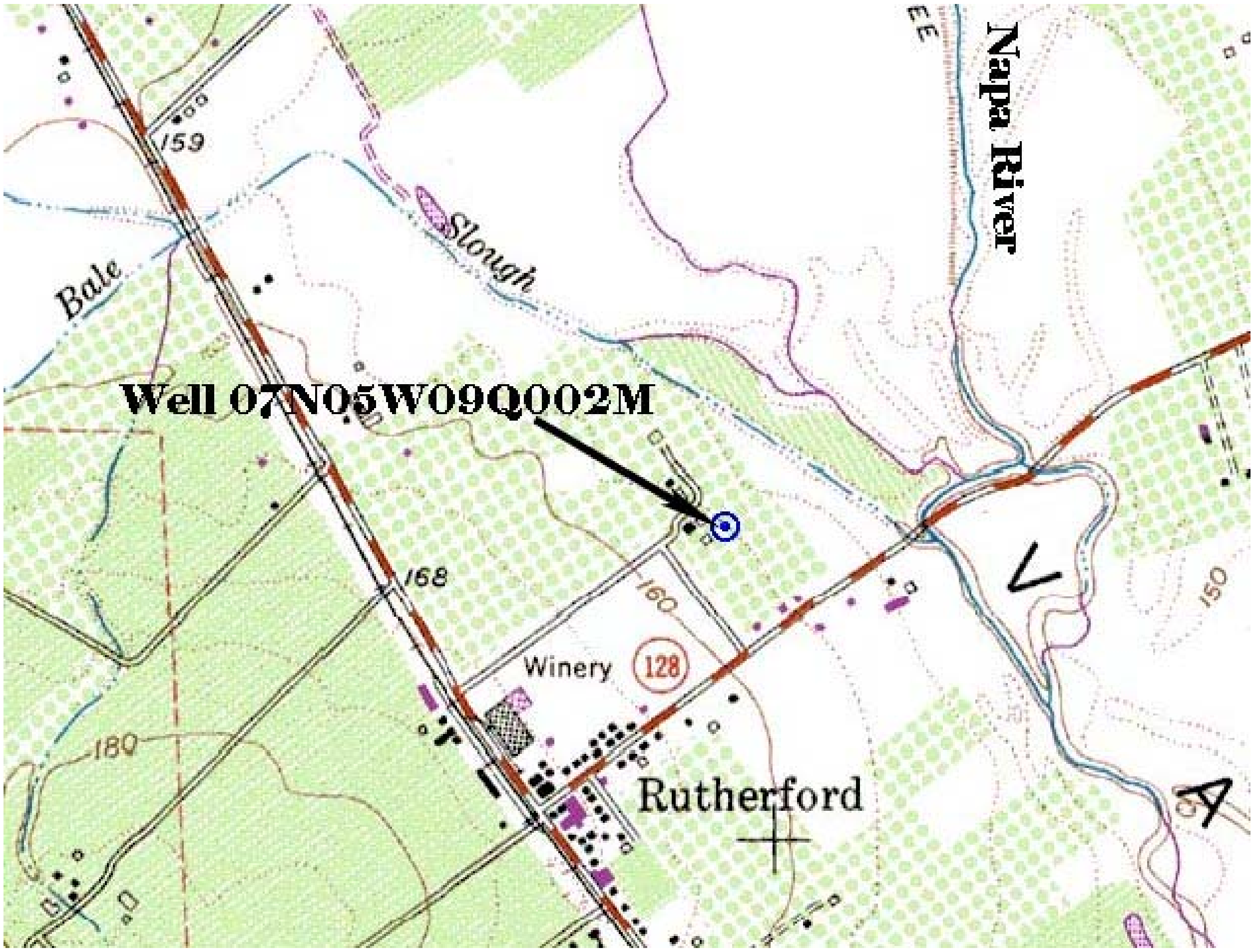

Figure 1. Location of Well 07N05W09Q002M near the confluence of Bale Slough and Rutherford.

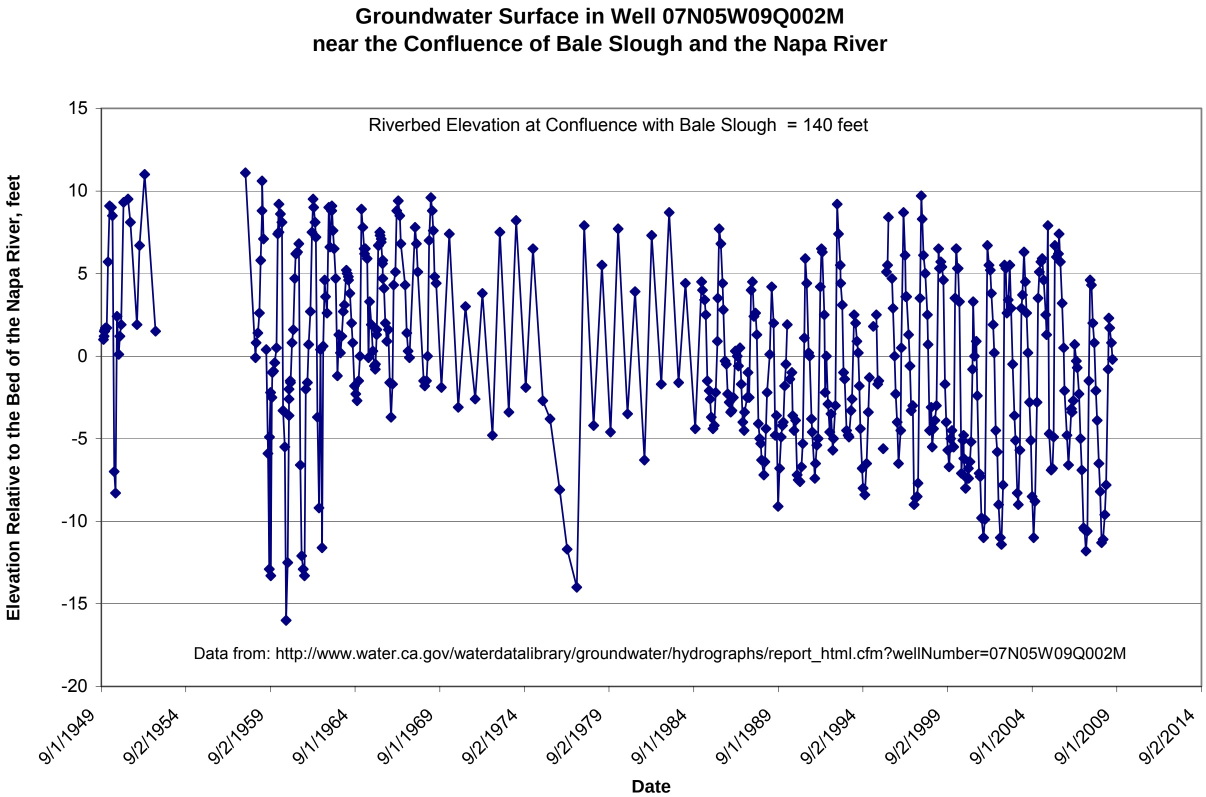

Figure 2. The complete record of groundwater surface elevations from Well 07N05W09Q002M. The elevation data has been adjusted by subtracting 140 feet from the water surface elevation. An elevation of zero on the graph occurs when the water surface in the well is at the same elevation as the estimated elevation of the bed of the Napa River at its confluence with Bales Slough. The well is about 1,100 feet from the confluence.

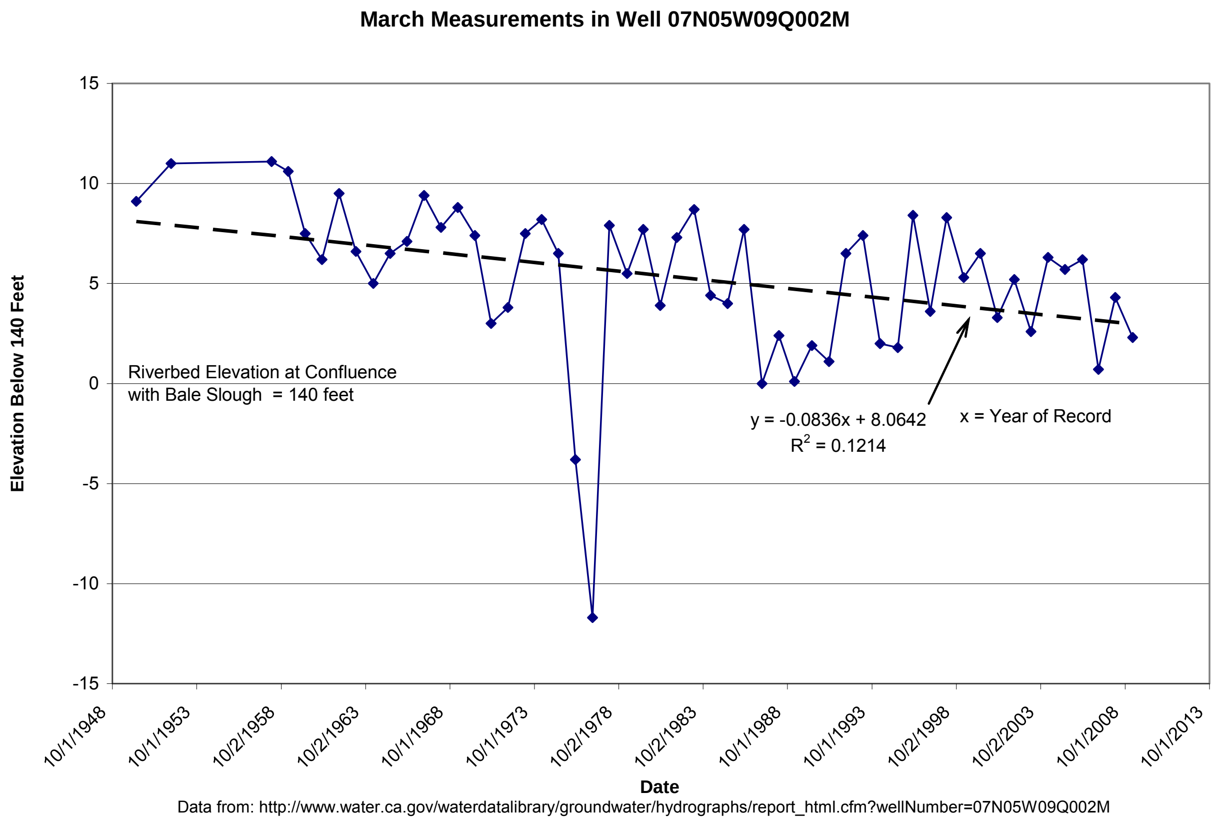

Figure 3. The March water surface elevations in the well are declining over time. A linear regression line was fit to the data using the year of record as the independent variable. The year of record is used as an index of change over time. Both the coefficient and intercept are statistically significant at alpha = 0.05. The regression explains only 12% of the variation in the March water surface elevations. However, regression line indicates that the March water surface elevation is declining over time since the coefficient is negative. A stronger regression relationship can be obtained if the March 1977 observation is excluded.

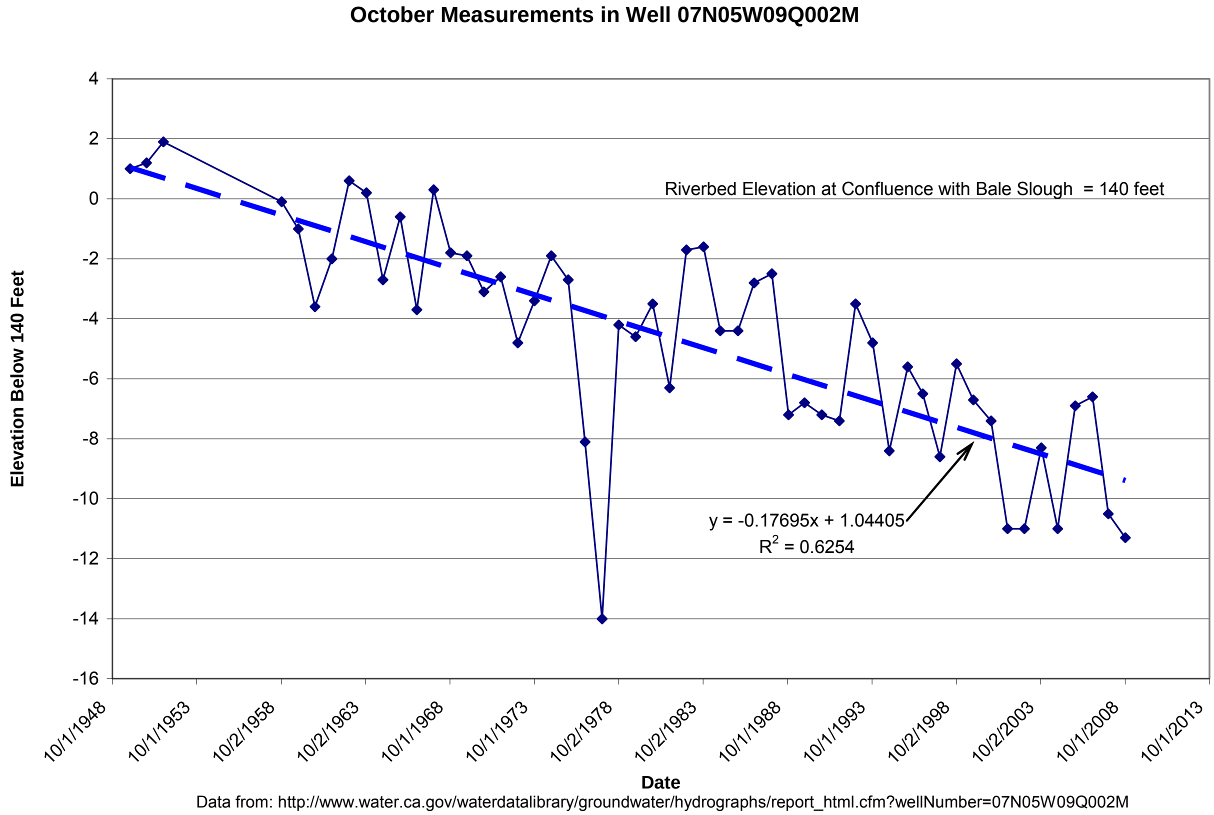

Figure 4. The October water surface elevations in the well are declining over time. A linear regression line was fit to the data using the year of record as the independent variable. The year of record is used as an index of change over time. Both the coefficient and intercept are statistically significant at alpha = 0.05. The regression explains 62% of the variation in the October water surface elevations. The regression line indicates that the October water surface elevation is declining over time since the coefficient is negative. In most years, the October water surface elevation in the well is below the estimated elevation of the bed of the Napa River at its confluence with Bales Slough (140 feet amsl).

Figure 4 shows that the October water surface elevations in the well are declining over time. A linear regression line was fit to the data using the year of record as the independent variable. The year of record is used as an index of change over time. Both the coefficient and intercept are statistically significant at alpha = 0.05. The regression explains 62% of the variation in the October water surface elevations. The regression line indicates that the October water surface elevation is declining over time since the coefficient is negative. In most years, the October water surface elevation in the well is below the estimated elevation of the bed of the Napa River at its confluence with Bales Slough (140 feet amsl).

The day that the relative water surface elevation in the well declines to zero (day of zero elevation) can be estimated by assuming that the change in the groundwater surface is linear. Dividing the total decline from the March reading to the October reading and dividing by the number of days between the readings gives the rate of daily decline of the groundwater surface.

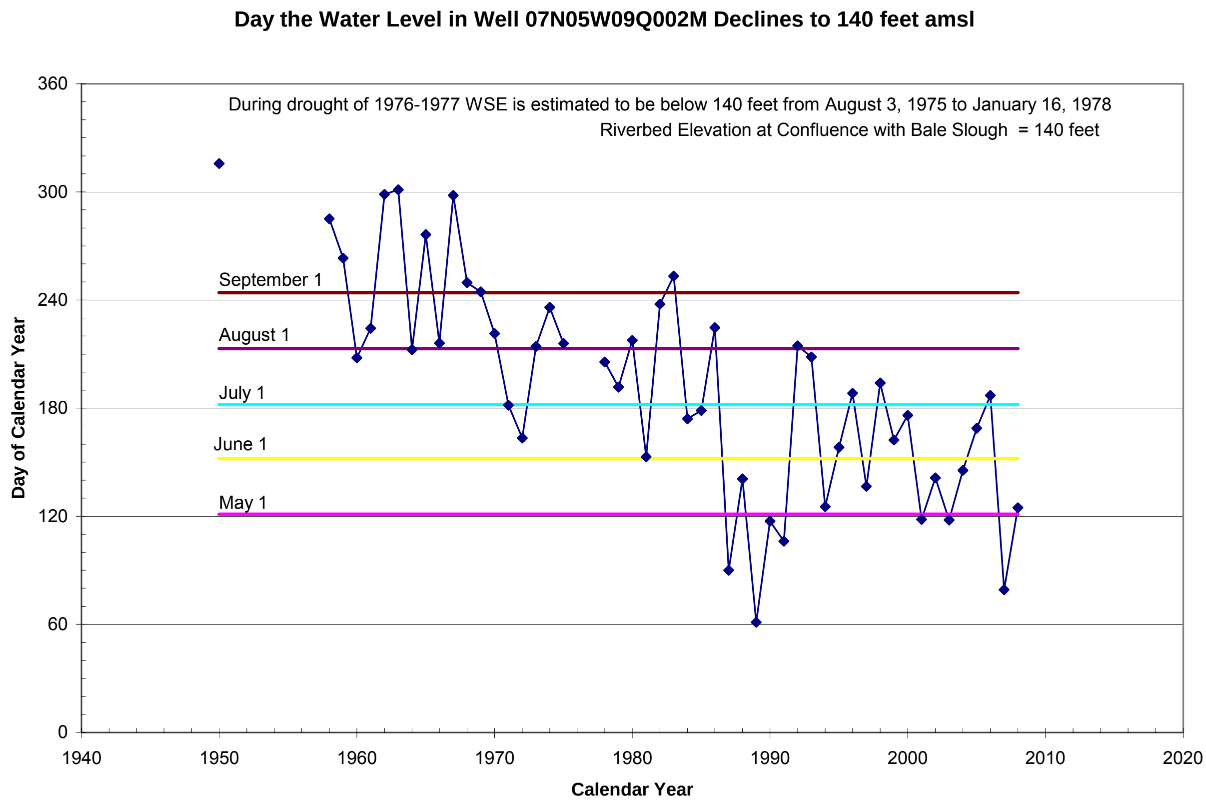

Figure 5. Estimate of the calendar day that the relative water surface elevation in the well declined to zero. The estimate was made by calculating the daily decline in the groundwater surface as explained in the text. Prior to 1970, the relative water surface in the well declined to zero sometime after August 1. In most years (17 out of 22) after 1986, the relative elevation of the water surface in the well declined to zero by July 1.

Table 1. The record was divided into three period, 1958 to 1970, 1971 to 1986 and 1987 to 2008. Two-sample t-Tests, assuming equal variances, were performed on the mean calendar day that the relative water surface elevation in the well declined to zero for each pair of periods. All three two-sample t-tests were statistically significant at the alpha = 0.05 level.

	1958 to 1970	1971 to 1986
Mean Calendar Day	253.7	203.4
Variance	1254.6	913.6
Observations	13	14
Pooled Variance	1077.3	
Hypothesized Mean Difference	0	
df	25	
t Stat	3.98	
t Critical one-tail	1.71	
t Critical two-tail	2.06	

	1958 to 1970	1987 to 2008
Mean Calendar Day	253.7	143.7
Variance	1254.6	1708.5
Observations	13	22
Pooled Variance	1543.4	
Hypothesized Mean Difference	0	
Df	33	
t Stat	8.01	
t Critical one-tail	1.69	
t Critical two-tail	2.03	

Table 1 Continued.

	1971 to 1986	*1987 to 2008*
Mean Calendar Day	203.4	143.7
Variance	913.6	1708.5
Observations	14	22
Pooled Variance	1404.6	
Hypothesized Mean Difference	0	
df	34	
t Stat	4.66	
t Critical one-tail	1.69	
t Critical two-tail	2.03	

Table 2. The mean calendar day that the relative water surface elevation in the well declines to zero is given as a month and day.

Time Period	Mean Calendar Day Relative Well Water Surface Elevation Declines to Zero
1958 to 1970	Day 253.7 = Sept 10
1971 to 1986	Day 203.4 = July 22
1987 to 2008	Day 143.7 = May 23

Figure 5 shows the estimate of the day-of-the-year that the relative water surface elevation in the well declined to zero (day of zero elevation). The estimate was made by calculating the daily decline in the groundwater surface as explained in the text. Prior to 1970, the day of zero elevation occurred sometime after August 1. In most years (17 out of 22) after 1986, the day of zero elevation occurred by July 1.

The record was divided into three period, 1958 to 1970, 1971 to 1986 and 1987 to 2008. The mean day of zero elevation (expressed as a number) was calculated for each of the three time periods. A set of t-Tests, assuming equal variances, were performed on the mean day of zero elevation for each pair of periods. All three two-sample t-tests were statistically significant at the alpha = 0.05 level. Table 2 converts the mean day-of-the-year to the month and day for the mean day of zero elevation for each time period.

Figures 4 and 5 and Tables 1 and 2 show that, prior to 1970, the day of zero elevation in the well would be expected to occur around September 10. Prior to 1970, the Napa River became a losing stream at Bales Slough in the late summer, if at all. However, during the 1987-2008 time period the day of zero elevation would be expected to occur on May 23. So, in the most recent time period, the Napa River at Bales Slough would be expected to be a losing stream from the late spring through fall.

The water surface elevation data from well 07N05W09Q002M show that groundwater extraction is progressively lowering the water table surface under the Napa River to the point where the Napa River loses water to the groundwater system each year. And that the date on which the Napa River changes from a gaining stream to a losing stream is happening at an earlier date. Since 1987, the date that the switch from a gaining to losing stream occurs is expected to be on or around May 23.

Faye's simulation of the groundwater surface when the pumping rate was four times the 1970 level demonstrated that in consecutive dry years the Napa River became a losing stream. West Yost and Associates estimated that the 2000 pumping rate was 4.5 times the 1970 rate referenced by Faye. So, according to Faye's simulation under present pumping levels the Napa River should become a losing stream. However, my analysis of the water level data from the well near the confluence of Bales Slough and the Napa River suggests that in most recent years the Napa River is a losing stream from late spring through early fall. These facts demonstrate that valley-wide groundwater extraction is having an adverse impact on streamflow in the Napa River.

Water Diversions

Margaret Lang (2008) submitted Peer Review Comments on the draft *Policy for Maintaining Instream Flows in Northern California Coastal Streams*. Lang observes that recent evidence shows that diversions decrease water velocity and that decreased water velocity adversely impacts juvenile salmonid growth. Reduction in juvenile salmonid growth has been shown to decrease the likelihood of survival in the ocean and results in a reduction in the number of salmonids that return to spawn. Lang's comments follow.

> 1. Setting seasonal limits on diversion
>
> The draft policy sets the seasonal limit on diversion as October 1 through March 31. DFG/NMFS and others recommended a seasonal limit of December 15 through March 31 because, in most years, reliable rainfall does not begin until late-November to mid-December. Thus, the December 15 start date is much more likely to prevent water diversion during the extreme low flows present before the onset of consistent rainfall.
>
> The minimum bypass flow requirements may prevent diversion before instream flows are sufficient to meet a diversion need, but the MBFs were selected to provide minimal flow requirements to meet spawning and upstream passage needs. There is new but very convincing evidence that there are other important benefits to instream flows (e.g. food production/availability, maintaining water quality) that are especially important to late summer/early fall conditions in Northern California coastal streams. As an example, Harvey et al. (2006) found that resident salmonids had growth rates 8.5 times greater over a 6-week period in undiverted reaches of the same stream, at a northern California coastal site. In these experiments, the flow diversion rate decreased the water velocity in the riffles but did not significantly decrease available habitat area or volume. The invertebrate drift, or food availability, was much higher in the undiverted stream reaches. The experimental stream reaches in the study were adjacent and within the same stream. Growth of salmonids is very highly related to survival; thus, the assumption that maintaining instream flows only for upstream passage and spawning is protective of anadromous salmonids may not be appropriate. Additional research on these issues is ongoing (Harvey, Pers. Comm 2008).
>
> There is also evidence that spring (March) flow is also important for similar reasons. Lobon-Cervia (2003) observed that in a northern Spanish stream "increased discharge in March apparently increased essential resources for brown trout at or just after emergence." The emergence timing of brown trout and Mediterranean climate of northern Spain are similar to California's hydrologic climate and anadromous salmonid emergence timing, respectively. As far as I am aware, local or regional research on these issues is not available.
>
> An additional concern is that for many diverters the likelihood of having water available for diversion in October is low. For most watersheds, the early fall storms replenish soil moisture but do not significantly increase instream flows. Thus, expectations should be clearly spelled out to applicants. A possible alternative is to tie diversion timing to actual and persistent flow increases.

Lang (2008) notes a connection between water velocity and juvenile salmonid growth. Surface water diversions are known to reduce water velocity downstream of the point of diversion. The numerous surface water diversions in the Napa watershed are likely reducing the growth rate of juvenile salmonids. The reduction in juvenile salmonid growth reduces the number of salmonid that return from the ocean to spawn. These two affects of surface water diversions are amplified in dry years because there is less streamflow in dry years. These affects are further amplified in the Napa River when valley-wide cumulative groundwater extraction causes the groundwater table to drop below the bed of the Napa River resulting in a discharge of streamflow into the groundwater table.

The actions to protect or enhance baseflow proposed by the TMDL and the BPA are not adequate to counter the adverse impact of groundwater extraction on streamflow. The proposed actions to protect or enhance baseflow from BPA Table 5.2 are listed below.

BPA-Table 5.2 Recommended actions to protect or enhance baseflow

Stressor: Low flows during dry season

Management Objective: Maintain suitable conditions for juvenile rearing, and smolt migration to Napa River estuary

Actions:

2.1 Local, state, and federal agencies to participate in a cooperative partnership to develop a plan for joint resolution of water supply reliability and fisheries conservation concerns

2.2 Install and maintain dial-up water-level gage programs and implement public education program in 10 key tributaries for steelhead

2.3 Develop water-level guidelines to support juvenile salmonid rearing and migration

2.4 Conduct water rights compliance survey to protect fish and water rights

The BPA and the TMDL can not achieve the goal of protecting or enhancing baseflow without; 1) including the Watermaster in the agency cooperative partnership, 2) address the impact of valley-wide groundwater extraction on flows in the Napa River and 3) address the impact of late spring and summer surface diversions on the flow in the Napa River.

Summary

In addition to reducing the sediment load to 125% of the natural background sediment load the TMDL and BPA should require that the stormwater discharge regime of the Napa River be brought into alignment with the natural hydrograph that would transport no more than 125% of the background sediment load.

The following performance standard shall be applied to all four land use categories listed in BPA Tables 4.1 through 4.4.

- Effectively attenuate significant increases in storm runoff. Runoff from all land uses listed in Tables 4.1 through 4.4 shall not cause or contribute to downstream increases in rates of bank or bed erosion relative to the discharge regime that carries 125% of the natural sediment load.

The above discharge performance standard should be applied to all lands upstream of the municipal water supply reservoirs. Reservoirs that lack flood control capacity (fill-and-spill) contribute to increased discharge during storm events when they are full. The increased discharge from rain falling on the surface of a filled reservoir contributes to downstream erosion of the stream channel. Any reservoir that has a spillway contributes to this effect even those reservoirs that are off-stream.

Valley-wide groundwater extraction rates are currently high enough to lower the groundwater table below the bed of the Napa River and change it into a losing stream. The loss of discharge to the groundwater system can adversely affect the growth of salmonid juveniles. In some locations, the loss of river discharge to the groundwater system may be sufficient to dry up portions of the riverbed.

The goal of enhancing salmonid habitat in the Napa River will not be achieved if the lowering of the groundwater surface by valley-wide groundwater pumping is not accounted for.

Sincerely,

Dennis Jackson
Hydrologist

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Redwood City Engineering Design Standards Attachment Q

http://www.redwoodcity.org/cds/engineering/standards/design/Attachment-Q.pdf

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Index of Wet Yost and Associates Technical Memorandums

TM 1: Review of 1991 and 1992 Studies
TM2: Napa County Municipal and Industrial Demands, Incorporated Areas
TM 3: Unincorporated Water Demands
TM 4: Napa County Incorporated Area Water Supplies
TM 5: Unincorporated Area Water Supplies
TM 6: Comparison of Demand Projections and Supply Capabilities
TM 7: Potential Local and Regional Water Supply Projects

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July 5, 2009

Thomas N. Lippe
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re: Addendum to Comments on the Napa River Sediment TMDL

Dear Mr. Lippe:

This letter report presents finding of a statistical analysis of the discharge of the Napa River near St. Helena stream gage operated by the USGS and annual rainfall for St Helena as reported in the historic rainfall records from the St. Helena Star. The discharge record is available for from 1930 to2009 with several missing years in the 1930's and in the 1990's. The rainfall record is available from 1850-2008.

I used the daily average discharge for the Napa River near St Helena to calculate the annual discharge from July 1 through the following June 30 which corresponds to the rainfall-year. I then converted the annual discharge volume in acre-feet to the equivalent volume in inches of water it would take to cover the 81.4 square mile watershed. I then subtracted the runoff in inches from the annual rainfall in inches to obtain the Annual Losses that is, the amount of rainfall that did not appear as runoff. The Annual Losses represent the total amount of water lost to the following: evaporation, used by native vegetation, diverted from the stream, and lost as recharge to the groundwater system.

I hypothesize that increases in groundwater extractions have lowered the water table below the Napa River during an increasingly longer period each year resulting in increased loss of streamflow to the groundwater system. I also speculate that the amount of surface water diversions have increased in recent years. To test these hypothesizes statistical tests comparing the mean of the Annual Loss from a pre-impact period to the mean of the Annual Loss during the impacted period were performed.

The period 1930-1979 is assumed to be a period of non-impact to the amount of losses from the Napa River. The period 1980-2008 is assumed to be the period of increased losses from the discharge of the Napa River due to progressive lowering of the groundwater table and presumed increases in surface water diversions. Table 1 shows the summary statistics for the annual loss for the two time periods for the Napa near St Helena.

Table 2 shows the t-Test demonstrating that the mean loss for the 1980-2008 time period is statistically greater than the loss for the 1930-1979 period for the Napa River near St Helena. The mean annual loss for the two time periods was statistically significant at alpha = 0.05. The variance of the losses for the 1980-2008 time period is statistically larger than the variance for the 1930-1979 period so a t-Test assuming unequal variances was used to test the mean losses. There was no statistically significant difference found between either the rainfall, discharge nor the ratio of discharge to rainfall for the two time periods.

Table 1. Summary statistics for the rainfall, discharge, ratio of discharge to rainfall and rainfall minus discharge or losses for the Napa River near St. Helena. The period 1930-1979 is assumed to be a period of non-impact to the amount of losses from the Napa River. The period 1980-2008 is assumed to be the period of increased losses from the discharge of the Napa River due to progressive lowering of the groundwater table and presumed increases in surface water diversions.

1930-1979	Rainfall inches	Discharge inches	Discharge/Rain	Losses inches
Count	44	44	44	44
Average	33.80	15.07	0.39	18.73
Stdev	11.697	10.402	0.178	3.023
Skew	0.320	0.509	-0.330	-0.020
Kurt	-0.719	-0.759	-0.463	-0.001
CV	0.346	0.690	0.455	0.161
Correlation with Year	0.107	0.139	0.127	-0.065

1980-2008	Rainfall inches	Discharge inches	Discharge/Rain	Losses inches
Count	24	24	24	24
Average	38.02	16.57	0.39	21.45
Stdev	15.199	12.323	0.158	5.296
Skew	0.637	0.879	0.299	1.177
Kurt	-0.825	-0.340	-1.098	1.760
CV	0.400	0.744	0.409	0.247
Correlation with Year	0.049	-0.141	-0.240	0.471

Table 2. The mean annual loss for the two time periods was statistically significant at alpha = 0.05. There was no statistically significant difference found between either the rainfall, discharge nor the ratio of discharge to rainfall for the two time periods. The variance of the losses for the 1980-2008 time period is statistically larger than the variance for the 1930-1979 period so a t-Test assuming unequal variances was used to test the mean losses.

t-Test: Two-Sample Assuming Unequal Variances		
Losses	**1930-1979**	**1980-2008**
Mean	18.733	21.453
Variance	9.138	28.051
Observations	44	24
Hypothesized Mean Difference	0	
df	31	
t Stat	-2.318	
P(T<=t) one-tail	0.014	
t Critical one-tail	1.696	
P(T<=t) two-tail	0.027	
t Critical two-tail	2.040	

F-Test Two-Sample for Variances		
Losses	**1980-2008**	**1930-1979**
Mean	21.453	18.733
Variance	28.051	9.138
Observations	24	44
df	23	43
F	3.070	
P(F<=f) one-tail	0.00073	
F Critical one-tail	1.784	

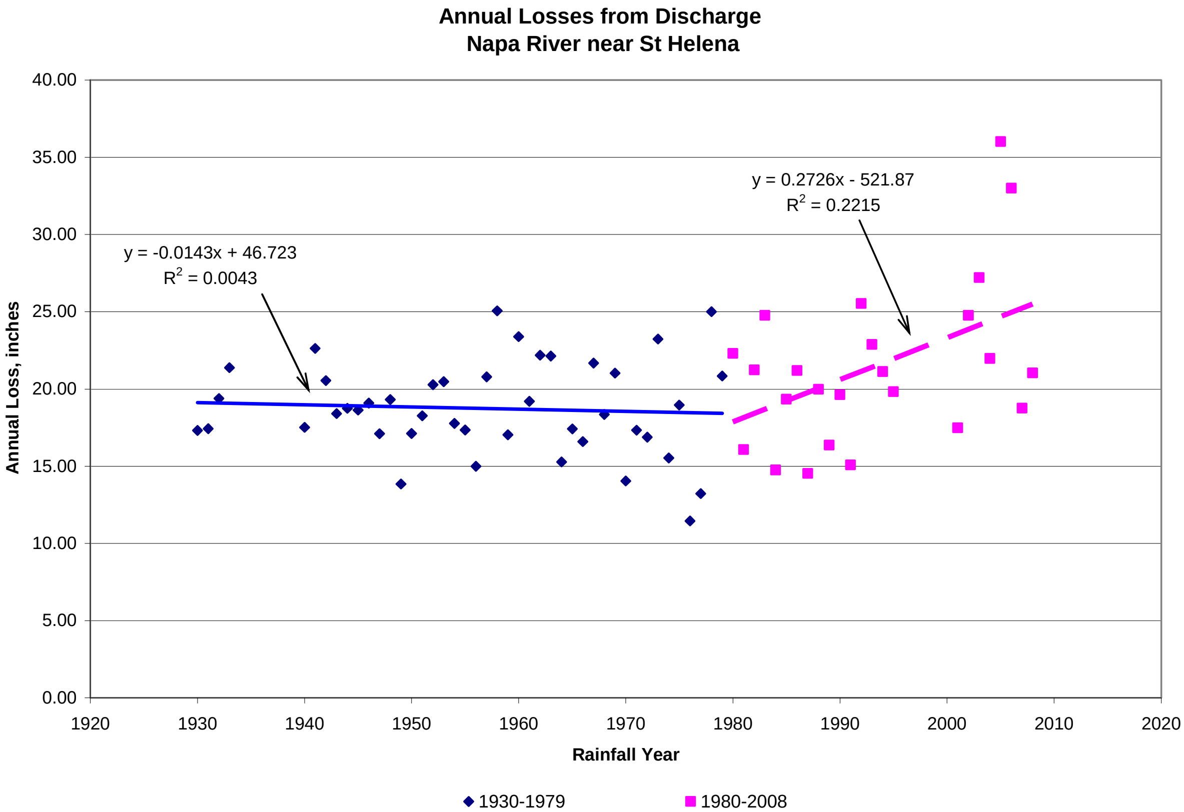

Figure 1. Regression lines were fit to the annual losses from discharge of the Napa River near St Helena versus the year of record for the 1930-1979 and 1980-2008 time periods. The R^2 of the regression line for the 1930-1980 period is essentially zero showing no correlation with the year. The R^2 of the regression line for the 1980-2008 period is statistically greater zero showing a weak correlation with the year of record that explains 22% of the variation in the data.

Figure 1 shows a graph of the annual loss. Regression lines were fit to the annual losses from discharge of the Napa River near St Helena versus the year of record for the 1930-1979 and 1980-2008 time periods. The R^2 of the regression line for the 1930-1980 period is essentially zero showing no correlation with the year. The R^2 of the regression line for the 1980-2008 period is statistically greater than zero showing a weak correlation with the year of record that explains 22% of the variation in the data. The positive slope of the 1980-2008 regression line indicates that the loss is increasing with time.

The mean annual loss of discharge at the Napa River near St. Helena is statistically greater than the mean annual loss for the 1930-1979 period. The slope of the regression line of loss versus year of record for the 1980-2008 time period is statistically significant (alpha = 0.05) and the regression explains 22% of the variation in the data. The positive slope of the regression line suggests that the loss is increasing with time.

In my opinion, this analysis shows that the losses of streamflow from the Napa River are increasing with time. It is unlikely that evaporation or native plant transpiration has increased during the 1979-2008 period relative to the 1930-1979period. The demonstrated losses of streamflow from the Napa River during the later time period are due to increased valley-wide groundwater extraction that has lowed the water table below the bed of the Napa River. Increased surface water diversions have also played a role in the increased loss of streamflow.

These facts support the analysis of the water level data for the well near the confluence of Bales Slough and the Napa River reported in my July 2, 2009 letter offering comments on the Napa River Sediment TMDL and Basin Plan Amendment. The habitat enhancement element of the Napa River sediment TMDL and Basin Plan Amendment can not achieve the goal of enhancing habitat if losses from the Napa River streamflow are not addressed.

Sincerely,

Dennis Jackson

Dennis Jackson
Hydrologist

EXHIBIT 10

Patrick Higgins
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July 3, 2009

Mr. Thomas Lippe
329 Bryant Street, Suite 3D
San Francisco, CA 94107

Re: Proposed Basin Plan Amendment and Napa River Sediment Total Maximum Daily Load TMDL and Adequacy of Implementation for Protecting and Restoring Pacific Salmon (Cold Water Beneficial Use)

Dear Mr. Lippe,

I provide the comments below at your request and on behalf of your client, the Living Rivers Council (LRC). My area of expertise is salmon and steelhead conservation and restoration; therefore, my comments regarding the *Napa River Watershed Sediment TMDL and Habitat Enhancement Plan: Staff Report* (Napolitano et al. 2009) (Napa TMDL) and Basin Plan Amendment or *Napa River Sediment Reduction and Habitat Enhancement Plan* (SFBRWQCB 2009) are focused on whether recommended actions are sufficient to maintain and restore Pacific salmon species. I will not restate my qualifications here because they are included previous comments that are being filed, however, between September 2008 and the present I have been assisting the National Marine Fisheries Service (NMFS) with coho salmon recovery planning in southwest Oregon and have become intimately familiar with scientific literature on Pacific salmon restoration (Reeves et al., 1995, Doppelt et al. 1993, Bradbury et al. 1995). The Napa TMDL implementation does not conform to “best science” on the subject and, consequently, has little chance of restoring Chinook salmon and steelhead trout.

I recommend that as you file these with the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) that you include previous comments that I have prepared for you on the Napa TMDL (Higgins 2006a, 2008a) and also on timber harvests and vineyard conversions (Higgins 2006b, 2007) within the Napa River watershed that are relevant because of discussion of cumulative watershed effects. I am also attaching my comments on the *Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams* (SWRCB 2008) prepared for the Redwood Chapter of the Sierra Club because they cover the Napa River watershed and the issues discussed have substantial overlap with TMDL implementation. Comments on a negative declaration proposed for a Sonoma County winery development project in the Maacama Creek watershed (Higgins 2009) are also attached because the creek shares its headwaters with the Napa River. Maacama Creek has similar water supply problems to the Napa River including widespread unpermitted water use, but impacts to fisheries and fish habitat are better studied.

Summary

Overall the response to my previous comments by SFBRWQCB staff (Napolitano et al. 2009) have been inadequate and major issues in the final TMDL and Basin Plan Amendment remain unresolved. The goals as stated in the Basin Plan Amendment (SFBRWQCB 2009) for the Napa River TMDL are to:

- Conserve the steelhead trout population
- Establish a self-sustaining Chinook salmon population
- Enhance the overall health of the native fish community

None of these goals are likely to be met unless watershed processes are restored (Reeves et al. 1995) and further watershed damage is limited (Kauffman et al. 1997). I have described cumulative effects in the Napa River basin due to upland management in past comments (Higgins 2006a), and will touch on this subject again below, but hydrologic cumulative effects on Chinook salmon and steelhead are even more profound and receive more emphasis here. Unless illegal impoundments and groundwater withdrawal are dramatically decreased, salmonid populations will not be recovered and other beneficial uses will continue to be compromised (i.e. recreation). Elevated peak flows due to profound alteration of watershed hydrology and channel confinement will continue to cause downcutting that will also confound abatement of sediment problems (SFEI 2007) under the Napa TMDL because recommended actions are insufficient (Jackson 2009). Bradbury et al. (1995) emphasize the importance of protecting viable Pacific salmon habitat because that is where functioning populations remain, but in the Napa River watershed all the State and federal agencies have failed in aggregate to perform this function. Monitoring is still deficient and would not support adaptive management, which is being invoked by the Napa TMDL (Napolitano et al. 2009) and Basin Plan Amendment (SFRWQCB 2009), but not practiced in a meaningful way (Walters and Hilborn 1978, Walters and Holling 1990, Waters 1997, NRC 2004).

Status of Napa Fish Populations and Re-Statement of Limiting Factors

As established by my previous comments (Higgins 2006a, 2006b, 2007, 2008b), Pacific salmon species are extirpated or at high risk of extinction in the Napa River basin. The Napa River watershed is now disturbed in a large percentage of its watershed area by a number of factors including urbanization, timber harvest, vineyard operation, dams for municipal water supply and ditching and diking of stream channels. There are no intact patches of watershed or stream to serve as habitat islands or refugia for Pacific salmon species (Bradbury et al. 1995) and unless some are established salmonid recovery will prove elusive. The following is a recap of species status and summary of factors that caused their decline or demise and that are not sufficiently addressed in the Napa TMDL to allow recovery.

Coho salmon (Oncorhynchus kisutch) were part of the fish community historically and USFWS (1969) estimated the past population at 2000-4000 adults. This species has been extirpated in the Napa River watershed likely due to reservoir construction for municipal water supply on east-side tributaries. As pointed out in my previous comments (Higgins 2006a), their range would have included alluvial valley reaches of the mainstem and tributaries prior to European colonization, but today these reaches are dry or warm and stagnant and wholly unsuitable for coho or even steelhead trout juvenile rearing. Coho were also early fall spawners and would have trouble getting adequate flows for passage, were the population at all functional at present.

Chinook salmon (Oncorhynchus tshawytscha) were thought to have been lost from the Napa River (Stillwater and Dietrich, 2002), but 100 or more spawning in the mainstem in some recent years (Stillwater 2006). The encouraging return of adult Chinook may not translate into an increasing population, however, due to the many ecological bottlenecks present in the Napa River. For example, the mainstem Napa River and larger tributaries have problems with bedload movement due to increased shear stress and channel confinement which likely causes redd scour or fill that decreases egg and alevin survival. Band (2008) and Gearhart (2008) point out that decreases in flow during the first rain events of fall and winter resulting from cumulative effects of operation of hundreds of impoundments and diversions can strand Chinook adults or prevent them from reaching spawning areas. Excessive fine sediment supply from roads and bank erosion is also likely to continue (see below) resulting in problems for successful egg incubation. Flow reduction during winter and spring for frost protection could strand Chinook salmon juveniles (Jackson 2009) even during their relatively short period of freshwater residence.

Steelhead trout (Oncorhynchus mykiss) require one to two years of residence in freshwater and the most substantial ecological bottleneck to population recovery is lack of viable winter and summer juvenile habitat. Flashy stream flow peaks during winter due to human alterations of watershed conditions tend to dislodge juvenile steelhead and prematurely flush them to the ocean before they are of an appropriate size to survive. Narrow, simplified channels have little habitat complexity such as connected wetlands, side channels and large woody debris that would provide shelter during high flows. The map from Stillwater and Dietrich (2002) used in previous comments is displayed again here as Figure 1 because it shows that there is virtually no viable summer habitat for steelhead juvenile rearing.

Barnhart (1986) points out that northern California steelhead that successfully reach adulthood are generally 2 years old when entering the ocean and from 18.6 to 21 cm (5.6" - 8.4") in length. There is currently virtually no viable habitat capable supporting older age steelhead at present in the Napa River basin. Anderson (1969) noted that the mainstem historically provided habitat for larger older age juveniles, while smaller juveniles resided in smaller tributaries. In summer, only Redwood Creek maintains continuous flow over long reaches and the mainstem Napa River now drops to 1 cubic foot per second at the USGS gauge, far too little to maintain cool water temperatures and to provide viable habitat for juvenile steelhead rearing (Figure 2 & 3). Stillwater and Dietrich (2002) noted that steelhead juveniles stranded in isolated pools in Redwood Creek lost weight during summer due to lack of insect drift delivered not being delivered by flows. Therefore, neither the mainstem nor tributaries provide habitat capable of supporting two year old steelhead that would attain the size needed for ocean survival.

Steelhead adults may experience problems with passage similar to those described above for Chinook salmon due to low flows in winter associated with diversion of surface and groundwater. Increased bed scour and fill associated with increased peak flows would negatively effect steelhead egg and alevin survival in Napa River mainstem, and tributaries such as Carneros Creek (SFEI 2007).

TMDL claims that the status of steelhead is unknown and that more data need to be collected, but available water quality and aquatic habitat data (Figure 1) clearly demonstrate that steelhead have no viable population centers and without prompt action will likely be extirpated. Also, Stillwater and Dietrich (2002) indicated that the current run of adult steelhead is less than 200

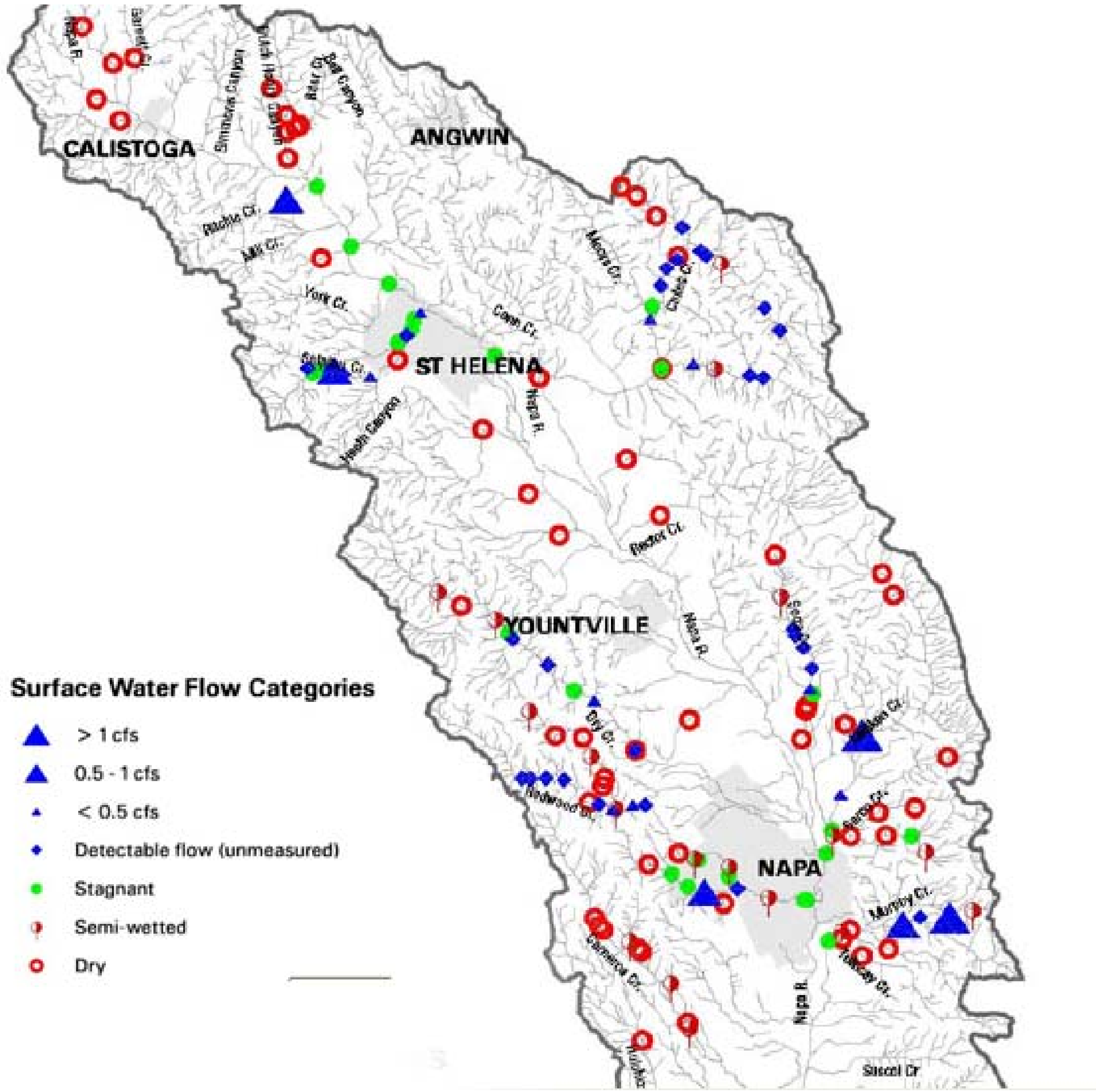

Figure 1. Map of Napa Rive based Stillwater and Dietrich (2002) field survey shows that alluvial valley reaches of Napa River tributaries were dry or had so little flow that they are warm, stagnant and unsuitable for steelhead juvenile rearing.

adults, which indicates high risk of loss of genetic diversity and potential for inbreeding depression that can make extirpation more rapid (Gilpin and Soule 1990). The extreme fragmentation of steelhead distribution and viable habitat is likely resulting in the Napa River population approaching an "extinction vortex" similar to that described by NMFS (2008) for Russian River coho salmon:

> "Based on its decline in abundance, restricted and fragmented distribution, and lack of genetic diversity, the Russian River population of coho salmon is likely in an extinction vortex, where the population has been reduced to a point where demographic instability and inbreeding lead to further declines in numbers, which in turn, feedback into further declines towards extinction."

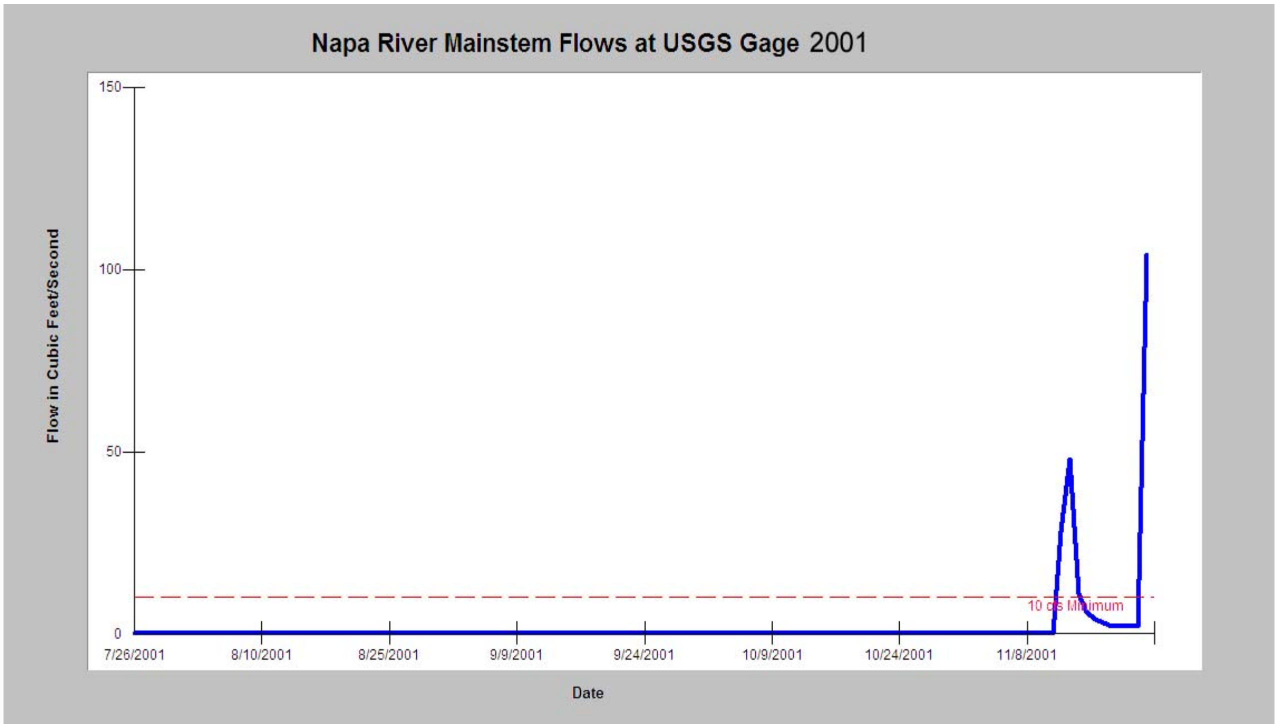

Figure 2. Flow at the USGS Napa River gauge near upstream of Napa show the loss of surface flow throughout the summer and fall of 2001. Data from the CA Data Exchange Center.

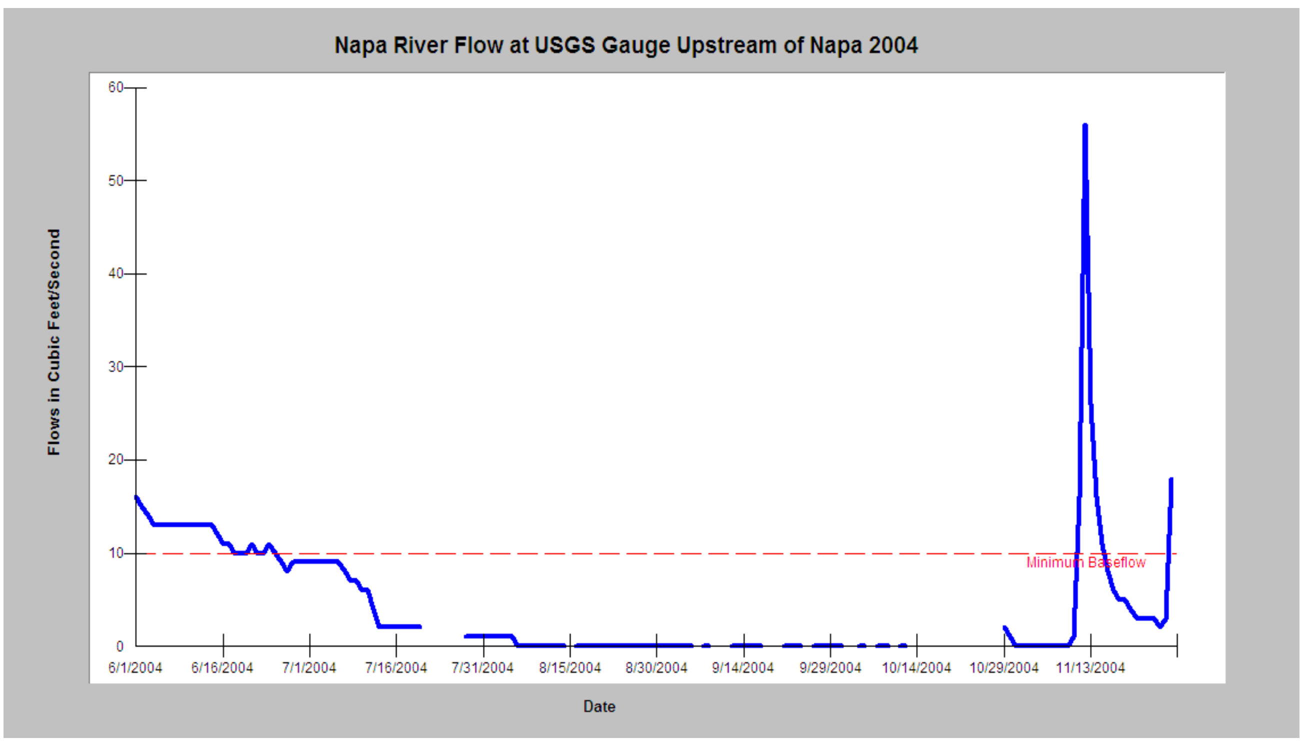

Figure 3. Flow at the USGS Napa River gauge near upstream of Napa shows the loss of surface flow from August through October. Data from the CA Data Exchange Center.

Data from nearby Maacama Creek (IFR 2003) on steelhead standing crops in spring and fall from 1993 to 2001 show problems with survival of juveniles that have increased in recent years and are indicative of water supply problems similar to the Napa River (see below).

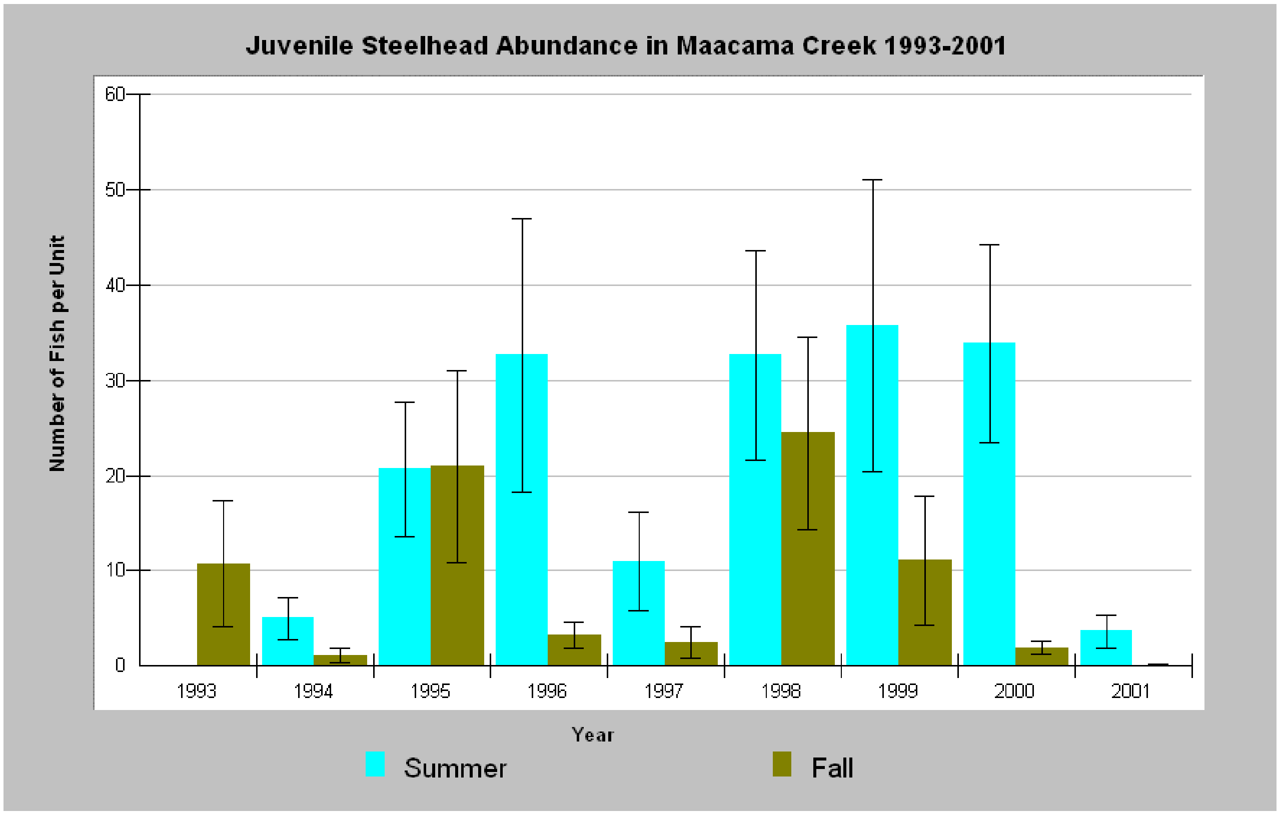

Figure 4. CDFG Maacama Creek electrofishing samples from 1993-2001 show summer and fall steelhead standing crops with substantial drops in all except the wettest years indicating poor survival due to reduction in carrying capacity due to flow depletion. From KRIS Russian River (IFR 2003).

Maacama Creek summer carrying capacity for steelhead is much greater in wet years, such as 1995, 1996, 1998 and 1999, but survival is variable and appears to be declining. The flow data from the mainstem Napa River (Figure 2 & 3) shows that the stream goes dry or nearly so and Stillwater and Dietrich (2002) found that similar conditions prevail in alluvial reaches of tributary channels that would have historically served as rearing habitat for yearling and older steelhead juveniles. Therefore, standing crops of steelhead juveniles in spring would be much higher before the irrigation season than afterward in fall, very similar to those displayed above for Maacama Creek.

Sediment Problems Not Likely to Be Remediated by TMDL

Steps recommended for sediment abatement in the final Napa TMDL are insufficient and lack of their effectiveness will likely confound recovery of Pacific salmon species. Four areas of deficiency with regard to this issue are addressed below: 1) sediment from roads, 2) sediment generated by downcutting due to increased peak flows and channel confinement, 3) interactions of agricultural diversions and changes in sediment deposition effecting salmonids and 4) continuing sediment pollution from areas upstream of dams that are exempted from the Napa TMDL.

<u>Sediment and Roads</u>: I provided evidence in previous comments (Higgins 2006a) from Klein (2003) that shows a linear relationship between turbidity and road density. The lack of provision

by the TMDL of specific road density information, failure to limit or prevent new road construction and lack of phased decommissioning of existing roads means that the Napa TMDL is not serious about remediation of the sediment problem. It also signifies that the TMDL is not using "best science" as required by the California Environmental Quality Act (CEQA) and is also failing to properly analyze and remedy cumulative watershed effects, which include increased peak flows from roads (Jones and Grant 1996) that are discussed further below.

Experts were convened as a Science Advice and Review Group (SARG) to discuss sediment processes in the Napa River basin as part of the Napa Agricultural Waivers Project (SFEI 2007). SFEI (2007) provides an estimate of 1400 miles of road in the Napa River basin, not including those associated with vineyard operation. With a watershed area of 422 square miles, one can derive a road density of approximately 3.3 miles of road per square mile of watershed (mi./mi.^{2}). The National Marine Fisheries Service (1995, 1996) required that the U.S. Forest Service limit road densities in the Columbia River Basin below 2.5 mi./mi.^{2} and sets that level for properly functioning watershed condition for Pacific salmon if there are few or no streamside roads. If Napa River watershed vineyard roads and abandoned or temporary roads associated with timber harvest were added to the total, it would likely be over 4 mi./mi.^{2} with urbanizing some sub-basins likely much higher. According to Klein's (2003) regression, this would likely cause 25-35% exceedance of turbidity over 25 ntu, which is a level known to inhibit steelhead juvenile growth (Sigler et al. 1985, Klein et al. 2008). The Napa TMDL denies that there are pervasive turbidity problems in the Napa River but has failed to collect data to substantiate this position through installation of continuous data recorders (see Monitoring). Without reduction of road densities and removal of stream side roads (Harr and Nichols 1993), chronic surface erosion and pulses of coarse sediment from episodic landslides triggered by roads will continue to pollute the Napa River.

<u>Downcutting Will Continue to Produce Sediment Under TMDL</u>: The Napa River channel (Figure 5) and those of tributaries like Carneros Creek (Figure 6) are confined by dikes or levees and straightened. The Napa TMDL (Napolitano et al. 2009) recognizes problems with increased shear stress in confined channels that causes sediment pollution from bed and bank erosion and is implementing appropriate action in the Rutherford reach of the mainstem Napa River. However, there is no mechanism described in the TMDL to insure timely re-connection in other reaches to adequately restore biological and hydrologic functions. As indicated by Jackson (2009) and Curry (2009), the Napa TMDL is also not adequately dealing with peak flows; therefore, downcutting and bank erosion will likely continue. SARG members estimated that the Napa River was downcutting 4-6 feet per decade and that sediment yield from this source is likely greater than from roads (SFEI 2007). Solutions to hydrologic cumulative effects problems are discussed below.

<u>Altered Sediment Processes Due to Cumulative Effects of Agricultural Impoundments</u>: SFBRWQCB staff did not adequately address the question (Higgins 2008a) of changes in sediment transport brought about by cumulative effects of multiple diversions and legal and illegal impoundments. Band (2008) notes that Chinook salmon or steelhead adults migration is limited by reduced flows from filling of hundreds of impoundments and fines sediment coming with the first storms would also travel a limited distance because of reduced flows. He postulates that fish would typically be congregated at points of convergence of tributaries where stream profiles widen and, therefore, deposition of fines will occur in spawning areas. The Carneros Creek watershed has vineyard development in over 50% of its area and dozens of impoundments resulting in significant sediment pollution as described by Pearce and Grossinger (2005):

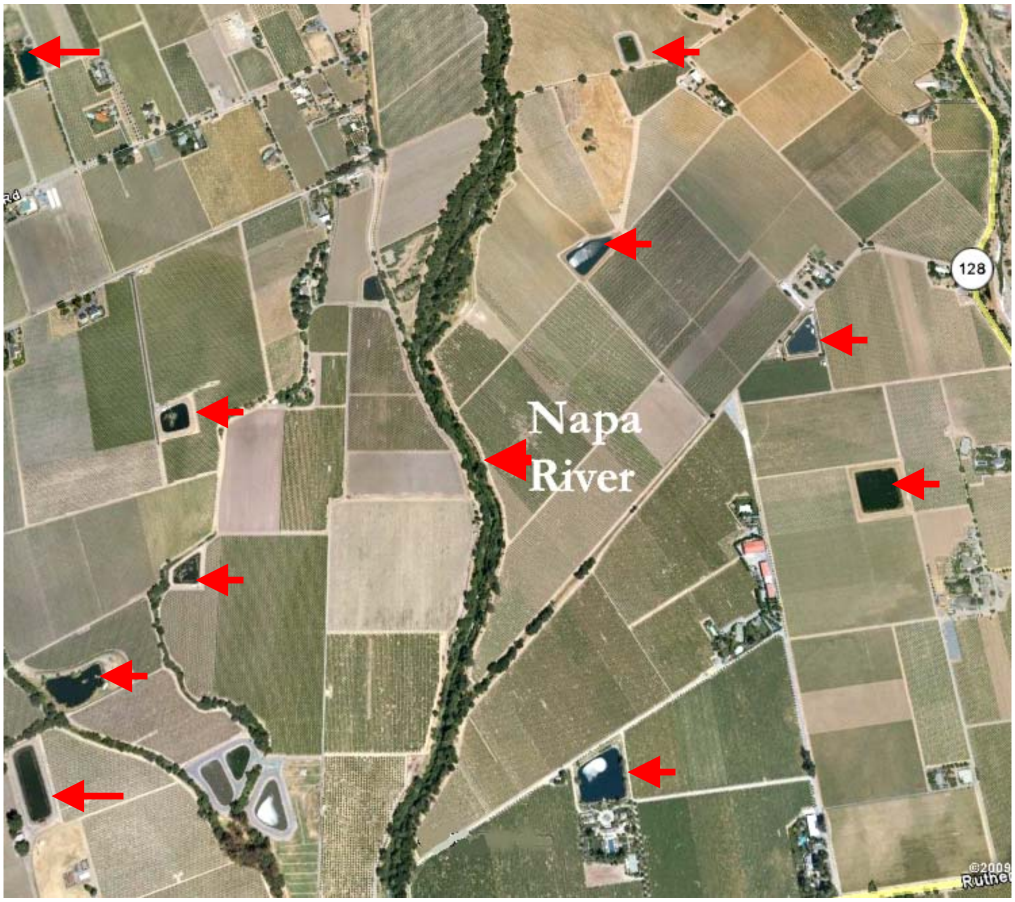

Figure 5. Napa River channelized and disconnected from its flood plain above Rutherford Rd. Note numerous impoundments (red arrows) and very narrow riparian zone. From Google Earth.

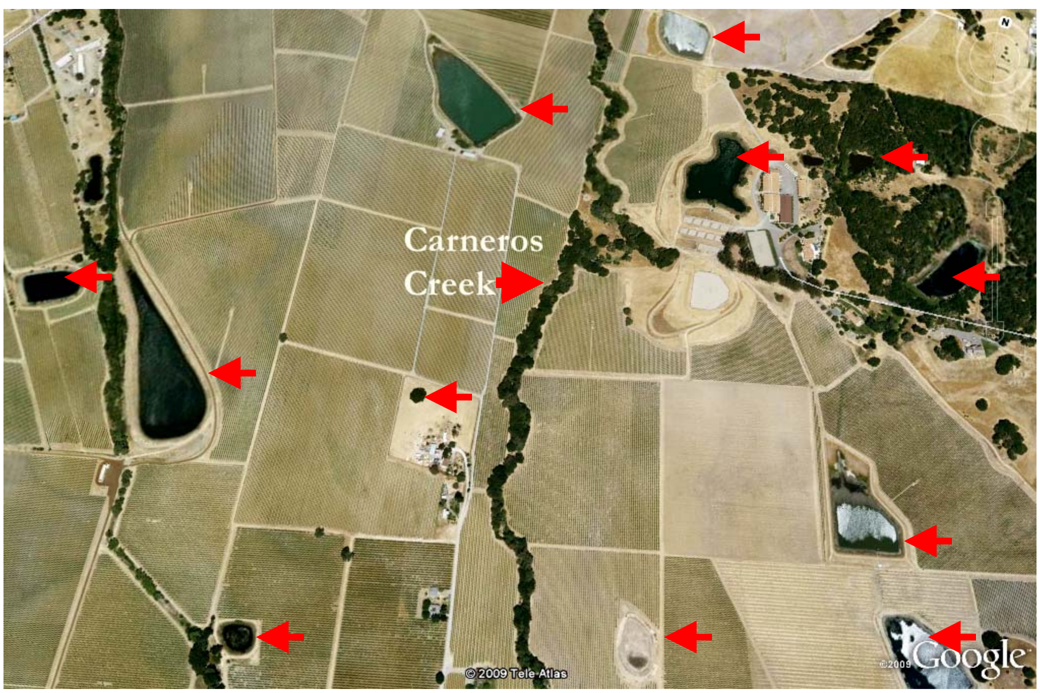

Figure 6. Carneros Creek with channel and riparian conditions similar to the mainstem Napa River. Note that a large number of impoundments (red arrows). From Google Earth.

> "Sediment storage occurs as active channel deposits (annually mobile sediment in riffles, glides and runs) in the upper middle reaches, large bars in the lower-middle reaches, and pool deposits in the lowest reaches, with volumes ranging from 0.5 to 3.2 m^3/m of channel. Shear stress analyses suggest the lowest reaches have a very low threshold shear stress, indicating that the stored volumes of fine sediment in the long, slow-velocity pools can be easily re-entrained."
>
> - Pearce and Grossinger (2005)

A major contributor to sediment over-supply is likely bank erosion due to channel confinement and increased peak flows that promote downcutting of the stream. Both altered vineyard drainage and agricultural impoundments may periodically contribute to elevated peak flows, as the latter may act as an equivalent to total impervious area when reservoirs are full (Jackson 2009). The disconnection of the stream channel from the flood plain in confined reaches (Figure 6) leaves no storage compartments for sediment. Consequently, pools in lower Carneros Creek that should be spawning and rearing habitat for steelhead are buried.

<u>Steelhead and Sediment Above Dams</u>: The final Napa TMDL (Napolitano et al. 2009) does not cover areas upstream of five municipal dams. In earlier comments (Higgins 2006a, Jackson 2006) we raised the issue of finer sediment particles (<1 mm) from tributaries passing through reservoirs and impacting downstream reaches accessed by anadromous salmonids. Although the SFBRWQCB staff has responded, they have not shown that sediment pollution in downstream reaches will not occur:

> "Because all municipal reservoirs are very large, essentially all sand discharged into them is deposited therein. Therefore, sand delivery to channels from land areas located upstream of the municipal reservoirs does not exert a measurable effect on the sand concentration in channel reaches downstream of these dams, and hence does not influence sand concentration in the Napa River or tributary reaches that provide potential habitat for anadromous salmonids."
>
> \- Napolitano et al. 2009

Particles less than 1 mm that can remain suspended are known to infiltrate redd pockets and smother salmonid eggs (McNeil and Ahnell 1964, McHenry et al. 1994). Additionally, problems with increased flood peaks due to hydrologic alteration of the landscape also occur upstream of reservoirs and can contribute to lower Napa River flood peaks once reservoirs are filled to capacity (Jackson 2009). For these reasons, the exclusion of areas upstream of dams in the Napa TMDL is capricious because of clear cumulative effects linkages to downstream pollution.

SFBRWQCB staff (Napolitano et al. 2009) also allege that "because all five municipal dams are complete barriers to steelhead and salmon migration, absent dam removal, there is no potential habitat for anadromous salmonids upstream of these dams." As explained in previous comments (Higgins 2006a), steelhead have the capacity to adapt and manifest a resident trout life history when migration routes are blocked. There is substantial evidence that land-locked steelhead are using reservoirs to grow to adulthood and then spawning in reservoir tributaries (Leidy et al. 2003). Given the lack of refugia and population centers for steelhead in the lower Napa River basin, these somewhat isolated populations should get special protection under the Napa TMDL in case gene resources are needed for restoration. This is especially true given the reduced steelhead population below the dam having fallen to levels known to potentially compromise genetic diversity and long term population viability (Gilpin and Soule 1991).

Deficiency of SFBRWQCB Staff Response to Previous Comments: Response to comments regarding sediment abatement by SFBRWQCB staff are largely rhetorical and not scientifically valid:

- To avoid and minimize potential adverse impacts of compliance actions, we have added mitigation measures including performance standards for vineyard stormwater runoff quantity.
- Please note instead that all significant upslope categories of sediment delivery to the Napa River ….. will be regulated by waste discharge requirements and/or conditional waivers.
- No recommendations/guidelines are needed to limit development or reduce impacts of roads. Please note that sediment allocations by their nature place a cap on total discharge.

Napolitano et al. (2009)

All these "solutions" ignore the fact that once cumulative effects thresholds are exceeded, damage to channels and aquatic habitat cannot be abated through on-site or even watershed-wide mitigations (Ligon et al. 1999, Dunne et al. 2001, Collison et al. 2003).

Chinook Salmon and Steelhead Recovery Cannot Be Achieved Without Restoration of Watershed Processes and More Active Protection

Aquatic habitat simplification associated with cumulative watershed effects disturbance is recognized as causing diminished species diversity (Reeves et al. 1993) and that is the case with the Napa River. Bradbury et al. (1995) point out that "protection can be effective in the absence of restoration, but restoration cannot be effective without protection." The TMDL does not include effective habitat protection measures and instead falls back on other authorities that have previously failed to prevent water pollution or protect and restore flows (Higgins 2008).

Historic Napa River Aquatic Habitat Cycles and Pacific Salmon Metapopulation Function: Salmon and steelhead thrived in the Napa River for tens of thousands of years despite a constantly changing freshwater ecosystem due to patterns of landscape disturbance related to fire, floods, droughts, volcanic eruptions, and other natural events. Disturbance would tend to occur in patches at a sub-basin scale leaving only a portion of the river system impacted at any given time (Reeves et al. 1995). Cataclysmic historic events such as volcanic eruptions might have caused all Napa River salmon and steelhead populations to stray into adjacent intact San Francisco Bay watersheds that retained healthy aquatic habitats. Once the Napa River channel was flushed sediment and habitat became suitable, the salmon and steelhead from intact basins would provide a source of colonists in what is recognized as metapopulation function (Rieman et al. 1993). Today many San Francisco Bay tributaries have very limited habitat and salmon and steelhead populations (Leidy et al. 2003). Therefore, there is no source of colonists to re-start the Napa River steelhead population in the event that the local population is lost.

Current Conditions Equate to "Press Disturbance" That Does Not Allow Salmonid Recovery: For example, steelhead only persist during summer in isolated headwaters where connectivity is often lost due to dewatering of upstream and downstream reaches (Higgins 2007). The pattern of land and water use does not mimic the natural "patch" disturbance regime that would have prevailed before European colonization. Such widespread development and land use is termed by scientists as a “press disturbance” (Reeves et al. 1995) where the timing and amount of sediment, large wood and water contributed to the Napa River have no resemblance to historic norms with which Pacific salmon co-evolved and; therefore, these animals cannot survive.

Lack of Limits to Disturbance Confound Abatement of Sediment Pollution and Salmonid Recovery: Cumulative watershed effects lead to channel changes over and above what would be predicted by each development action alone (Collison et al. 2003) and mitigations on a project by project basis do not work when disturbance passes a certain scale (Dunne et al. 2001). Reeves et al. (1993) found that aquatic habitat remained diverse and Pacific salmon communities were maintained when 25% of a watershed or less was logged in a 30 year period. More than 60% of the Napa River watershed is in active land use (Winter 2000) and many of the human activities are far more damaging than timber harvests. Approximately 7% of the watershed is paved or in total impervious area (Homer et al. 2004), which is known to cause the greatest changes in peak flows and is also associated with toxic runoff (Booth and Jackson 1997). The 38% of the land currently in grazing may contribute to elevated peak flow depending on the amount of soil compaction related to range management (Gifford and Hawkins 1978), but hydrologic alteration related to vineyards that cover 14% of the landscape are much greater (Figure 7). Tile drains under vineyards cause water to be shed from the landscape instead of percolating into the groundwater table and surface and groundwater extraction associated with their operation is drying up alluvial valley reaches of the mainstem Napa River and its tributaries. Changing sediment yield and flows to conform more closely to historic conditions and those required under the Clean Water Act cannot be achieved with increasing watershed disturbance with on-site mitigation.

Illegal Impoundments Must be Removed: There are over 1,000 agricultural ponds in the Napa River basin (Napolitano et al. 2009) and many do not have appropriate water right permits (Higgins 2008a, 2008b). Band (2008) points out that the: “cumulative impacts of water diversions from all areas of a drainage network require consideration of the network as an entity, and not just the sum of all individual reaches.” The SFBRWQCB staff did not respond substantively to our previous request (Higgins 2008a) to consider cumulative effects from multiple legal and illegal diversions. Therefore, the TMDL does not comply with CEQA requirements and many problems for salmonid species associated with operation of 1000 agricultural impoundments will remain unaddressed (Higgins 2008). When full, impoundments also increase peak flows because they act as total impervious area (Jackson 2009). Cumulative effects problems cannot be remedied without removing hundreds of unpermitted impoundments and putting an enforceable policy for operation in place for those that remain.

Groundwater Extraction Needs to be Controlled: Extraction of groundwater that is directly connected to surface water requires an appropriative water right and USGS (Frye 1973) pointed out that the lower Napa River valley aquifer is shallow and has such connections. Over-use of groundwater must be curtailed to prevent continued dewatering of Chinook salmon and steelhead habitat in alluvial valley floor reaches of the mainstem and key tributaries. Jackson (2009) showed that the mainstem Napa River has gone from a “gaining” stream, with groundwater contributions adding to the flow in a downstream direction, to one that is flow limited due to quadrupling of groundwater extraction since 1973 (Frye 1973). This results in a habitat bottleneck for older age juvenile steelhead that must find larger order streams to rear and grow to sufficient size to optimize chances for ocean survival. The science on this subject is very clear and water quality and beneficial uses of the Napa River cannot be restored unless excessive groundwater use is stopped.

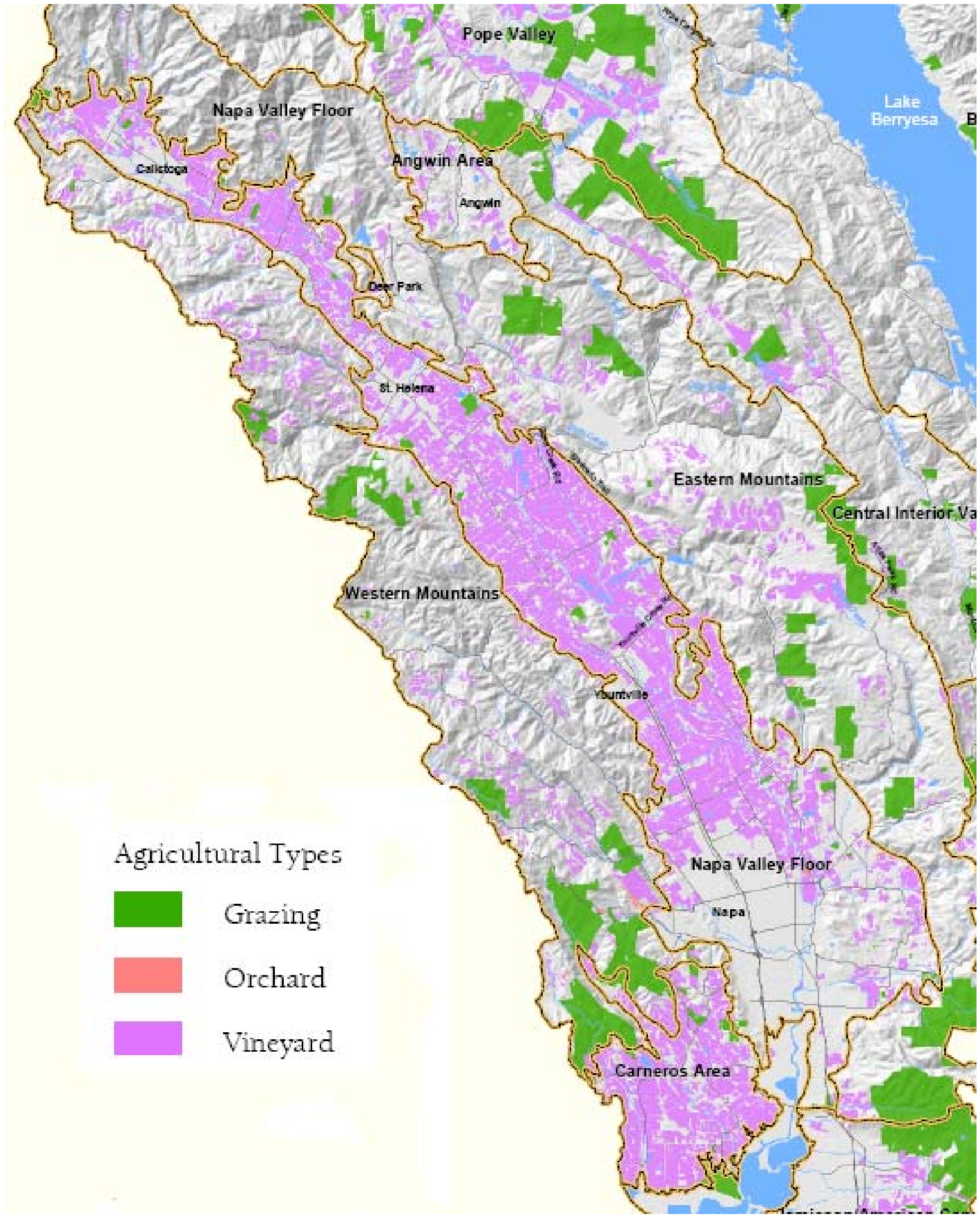

Figure 7. Land use map from the Napa Baseline Data (BDR) report and shows that virtually the entire Napa Valley floor is now in vineyards and areas like the Carneros Creek sub-basin appear to have more than half the watershed in land use of this type.

<u>Failure of State and Federal Agencies to Protect Pacific Salmon Species and Habitat:</u> The Napa TMDL invokes the authority of other agencies as an important part of the remediation of pollution when in fact it is the failure of these same State, federal and local agencies that has caused the need for the TMDL.

State Water Resources Control Board Water Rights Division: The SFBRWQCB staff invoke Waste Discharge Requirement (WDR) permits or group waivers as a method to insure that flows are restored:

> "Please note that as a condition of the WDR waivers, staff will propose that the Water Board require compliance with all water rights laws in order to obtain coverage."

The SWRCB WRD has shown no ability or inclination to enforce California Water Codes or to regulate use of groundwater in the Napa River (Higgins 2008a, 2008b); therefore, the SFBRWQCB action is insufficient and will likely be unsuccessful. The specific statutes in the California Water Codes that are failing to be enforced are:

§ 1052: No dams will be constructed without a permit
§ 1243: Sufficient water for remains for "recreation and the preservation and enhancement of fish and wildlife resources
§ 1375: Must establish surplus water exists before issuing new Appropriative Rights permits

The California legislature passed AB 2121 in 2004 in hopes of getting flows back in northern California Rivers and yet the SWRCB WRD has not taken action to remediate problems. Numerous reviewers of their *Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams* noted that the agency will not be able to take action until they have collected field data on flow throughout the region (Band 2008, Gearhart 2008, Lang 2008). As part of the study, Stetson Engineers (2007) mapped and enumerated permitted and unpermitted agricultural impoundments in the California North Coast region, including the Napa River (Figure 8). The cumulative effects of operation of all these legal and illegal agricultural reservoirs is having a profound impact on salmonids in the Napa River and adjacent basins like Maacama Creek (Higgins 2009) and problems will not be remedied unless the SFRWQCB takes direct action.

California Department of Fish and Game: Fish and Game Code § 5937 states that streamflow must be maintained, but CDFG fails to enforce this provision. After losing the battle to maintain stream flow below municipal reservoirs (Anderson 1969), it would seem that CDFG has given up on maintaining flow in the Napa River and there is no expectation it will invoke its authority to remediate continuing loss of streamflow and fish habitat.

County of Napa: The Napa TMDL states that "For reasonably foreseeable projects that may adversely effect special-status species, all are subject to discretionary approval by Napa County" and that when projects overlap with the habitat of such species that the county requires a "biological resources evaluation and avoidance of impacts to the extent feasible." Napa County has a goal to "prevent degradation of intact (i.e. unimpaired) waterbodies throughout the county" (Hoenicke and Hayworth 2005), but no functional aquatic habitat patches that support salmonids in the Napa River watershed have been protected. The reason is that mitigation measures imposed for each project are being overwhelmed due to cumulative watershed effects.

<u>SFBRWQCB Needs to Exercise Authority to Improve Flows</u>: The SWRCB WRD has failed to take any action on illegal impoundments and/or to regulate use of groundwater connected to surface water that are both leading to critical Napa River flow depletion (Higgins 2008). Consequently, U.S. Supreme Court (1994) precedent authorizes the SFBRWQCB to act to exert authority and take measures to increase flows because there is no other remedy to remediate pollution and restore beneficial uses.

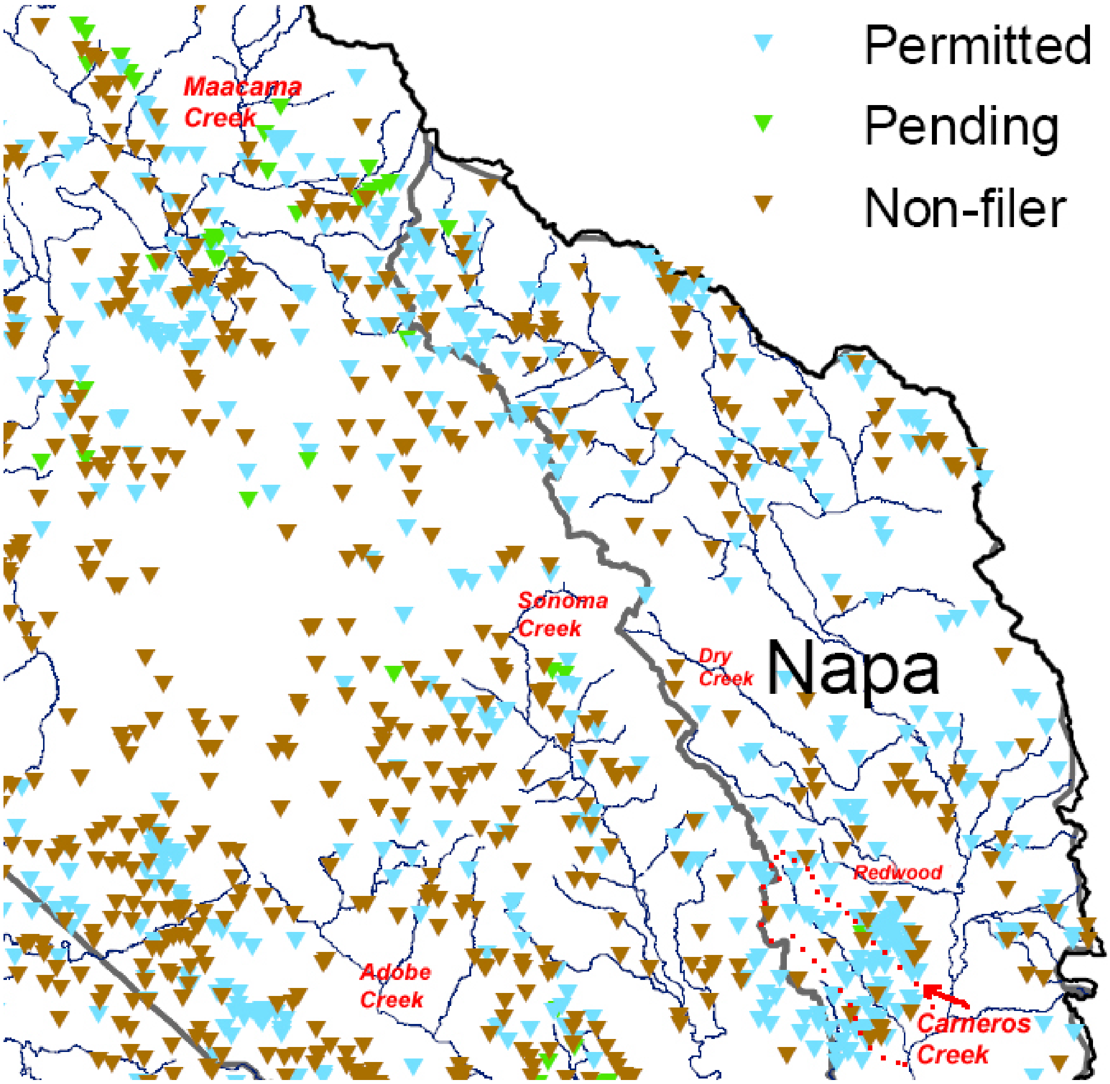

Figure 8. Map of permitted and unpermitted impoundments in the Napa River watershed and in adjacent basins to the west in Sonoma County. Taken from Stetson Engineers (2007).

Scale and Location of Refugia for Real Chinook Salmon and Steelhead Restoration

The best candidates for protection and restoration according to the Bradbury et al. (1995) method would be Redwood Creek, Dry Creek and Soda Creek on the west side of the Napa River basin, based on flow and habitat condition data collected by Stillwater and Dietrich (2002). Watersheds with high quality aquatic habitat are generally more intact and have lesser levels of human disturbance (Bradbury et al. 1995). If steelhead are to be restored in one or all of these sub-basins, then

- Vineyard conversion would cease and at least some in floodplains would be acquired for retirement,
- Timber harvest could only be done to improve forest health, such as thinning from below and using very low ground disturbance methods,
- Road densities would be strategically reduced and segments decommissioned or relocated to decrease streams side roads, road-stream crossings and roads on unstable slopes,

- No new road construction would be allowed unless offset by a greater amount of road decommissioning,
- New residential development would include maximum of water conservation measures, including systems of cisterns to catch rainwater,
- Any residential development would also minimize TIA,
- Illegal or unpermitted water impoundments in these sub-basins would be removed within five years, and
- Groundwater and surface water monitoring systems should be installed that control irrigation based on soil moisture and shut off supply when water levels in streams and wells reach a point defined as necessary to maintain fish and beneficial uses.

Reconnection of mainstem Napa River reaches to the floodplain is also needed to protect and restore Chinook salmon as well as to create older age steelhead rearing habitat. While the current Rutherford reach channel restoration project is a step in the right direction, an appropriate change in land use would require something on the order of half that mainstem channel on the Napa River valley floor to be reconnected. The TMDL acknowledges that downcutting of the stream channel cannot be abated without such action and additional benefits include recreation of sediment storage areas on terraces that would reduce sediment in the active channel. Connection to the floodplain reduces bed shear stress but could also help with attenuation of flood peaks that currently threaten downtown Napa. In Maine Atlantic salmon recovery efforts (NMFS and USFWS 2004), riparian easements sometimes extend for the entire length of the riparian zone in some watersheds and restoration on the mainstem will have to be scaled up if it is to succeed.

A major water temperature buffer mechanism in mainstem river environments is the connection between surface water and groundwater that is fostered by side channels or river meanders (ODEQ 2008). In order to recreate these connections, mainstem Napa River easements need to be 100-300 feet wide so that natural meander patterns can be re-established. Retiring near stream land use will help reduce sediment and easements could also help with retiring some water rights or use, such as near stream wells that currently cause a drop in groundwater levels and decreased cold water contributions to the mainstem. Equal consideration might be given to restoring alluvial valley reaches of any Westside tributaries chosen as refugia. Unless these reaches with very high intrinsic habitat potential are restored, restoration of salmon and steelhead in the Napa River basin will not likely succeed (Williams et al. 2008).

TMDL Monitoring Uses the Wrong Tools and Has No Identified Funding

Effectiveness monitoring under the TMDL relies most heavily on gravel permeability and streambed scour as indicators and these two parameters are the only ones for which targets are set. Instead the TMDL should have selected from recognized scientific tools that are more cost effective in diagnosing sediment problems and have been widely field tested (Barnard 1992, Knopp 1993, Klein 2003, Klein et al. 2008).

As noted before, permeability can be highly variable and is still somewhat experimental in its application in northwestern California (McBain and Trush, 2000). In recognition of this problem, the TMDL calls for permeability measurements at over 200 sites. Bulk gravel samples are a more recognized standard (McNeil and Ahnell 1964, Kondolf 2000) and targets for fine sediment (<0.85 mm) and sand size particles (<6.4 mm) have been set by the North Coast Regional Water Quality Control Board (NCRWQCB 2001) and accepted by the U.S. Environmental Protection

Agency (1998, 1999, 2000). Use of more standard bulk gravel samples would be comparable in cost, yield more reliable and meaningful results and would allow regional comparisons.

In response to previous comments (Higgins 2006a), the Napa TMDL has now states that turbidity and residual pool volume measurements should be taken in reaches monitored for permeability and bed scour. Klein (2003) demonstrated that turbidity shows immediate response to land management and it is an equally good tool for tracking response to implementation of erosion control measures. Similar to bulk gravel samples, the relationship of turbidity and negative effects on fish are well studied (Klein et al. 2008), which is another factor that argues in favor of its widespread use as a monitoring tool of choice. Grab samples for turbidity would not be useful and continuous recording turbidity devices should be deployed on the mainstem Napa River at least three location and above points of convergence with major tributaries such as Carneros, Redwood, Dry and Sulphur Creeks as well as below Eastside municipal reservoirs to determine different response to management at present and to track recovery of water quality over time as restoration measures are implemented.

The vague reference to measurement of trends in residual pool volume does not meet my concern for more widespread use of valid scientific techniques. Instead the Napa TMDL should have referenced Hilton and Lisle's (1993) V-Star (V*) method of measuring the volume of sediment in pools relative to the total volume of sediment and water. This should be used in response reaches (Montgomery and Buffington 1993) of all major Westside Napa River tributaries because of its cost-efficiency. A trained crew can measure ten pools in a day, which is a statistically valid sample (Knopp 1993) so trend monitoring could be accomplished with a two or three person crew in less than two weeks a year. Land use relationships to V* values have been tested and targets adopted for the region (NCRWQCB 2001, U.S. EPA 1998, 1999, 2000).

In response to comments, Napolitano et al (2009) stated: "We also are open to receiving additional input regarding analytical approaches that could be used to determine whether well pumping affects streamflow." What is needed is an interconnected system that monitors soil moisture, stream flow and groundwater levels capable of regulating use when the Napa River reaches critically low levels. This type of technology is not only readily available but could be installed in relatively short period of time. One purveyor of such systems is Groundswell Technologies, Inc and Dr. Mark Kram (Personal Communication) would be interested in doing a Napa River pilot project. See: www.groundswelltech.com/Groundswell/Groundswell_Technologies_Products_and_Services___Water_Resources_Management.html

Hoenicke and Hayworth (2005) point out that a "minimum level of locally based long-term and reliable funding is required to maintain a basic trend record and understanding of changes in core watershed health indicators." The TMDL has not identified such funding and without it trend monitoring will not be possible nor will adaptive management. Hoenicke and Hayworth (2005) recommend that monitoring take place as a priority where land owners are cooperative. Instead the TMDL should require monitoring access as part of WDR permits or waivers of WDR.

To meet legal requirements of CEQA, the Napa TMDL and Basin Plan Amendment need to explicitly state that all data collected to gauge the success of implementation will be available in raw form for scientific audit by the public and all regulatory agencies and that such data be made available within six months of collection and be shared on a publicly available website.

Adaptive Management Failure

Hoenicke and Hayworth (2005) explain the use of adaptive management (Walters and Hilborn 1978, Walters and Holling 1990) in the Napa TMDL process as follows:

> "Monitoring information will provide the basis for flexible and most cost-effective implementation for reductions in human-induced pollutant inputs. Monitoring will also allow managers to determine if they have reached their goal or if the goal needs to be adjusted based upon newly collected and more robust information and data about the watershed and how it functions."

The National Research Council (2004) described adaptive management as follows:

> "Adaptive management is a formal, systematic, and rigorous program of learning from the outcomes of management actions, accommodating change, and improving management (Holling, 1978). Its primary purpose is to establish a continuous, iterative process for increasing the probability that a plan for environmental restoration will be successful. In practice, adaptive management uses conceptual and numerical models and the scientific method to develop and

Dr. Carl Walters (1997) has followed 25 case studies of riparian and coastal ecosystem restoration projects around the world that claimed to be practicing adaptive management, but found "only seven of these have resulted in relatively large-scale management experiments, and only two of these experiments would be considered well planned in terms of statistical design." He notes that too little change in anthropogenic stressors is carried out in most cases so that natural variations are not distinguishable from project effects. Actions under the Napa River TMDL fall into the latter category where there is insufficient change in land and water use and too small an area likely to be restored to even be detected in monitoring results. Instead miles of alluvial valley reaches need to be re-connected to the floodplain and hundreds of unpermitted impoundments removed to significantly reduce pollution, restore salmonids and frame an interesting and valid adaptive management exercise.

Another requirement of successful adaptive management is that action is taken to correct restoration program direction, if data suggest current management is not achieving desired outcomes. Regulatory agencies such as the SWRCB WRD have shown no inclination to act even when there is ample evidence of violations of the law and decimation of public trust resources and beneficial uses. The actions needed to protect the last patches of viable habitat and to begin to restore flows are not forthcoming because the SFBRWQCB and other agencies are not willing to get in the way of development or to withstand the political pressure likely to be precipitated by enforcement actions. Instead the agencies will continue to violate the Clean water Act by allowing further vineyard development as described by Winter (2000):

> "Planning officials expect Pope Valley and the hillside areas of American Canyon, Jamison Canyon and the western side of the Napa Valley to be the primary vineyard expansion areas in the future. They anticipate that over 4,000 acres will be planted in the next 10 years, primarily on hillsides, since there is very little acreage left unplanted on the valley floor."

Conclusion

The pervasive Napa TMDL assumption that all potential for sediment yield and damage to aquatic ecosystems can be prevented through mitigation measures and use of best management practices has been demonstrated to be incorrect by numerous northern California studies (Ligon et al. 1999, Dunne et al. 2001, Collision et al. 2003). Consequently, the Napa River TMDL is scientifically flawed, insufficient to meet CEQA requirements and cannot possible attain its goals and objectives. The TMDL also ignores scientific methods for restoration of Pacific salmon (FEMAT 1993, Doppelt et al. 1994, Reeves et al. 1995, NRC 1996, 2004) and is not likely to be successful in bringing improving Chinook salmon and steelhead populations as a result.

The National Research Council (1996) noted that Pacific salmon species could not be recovered without restoration of low gradient habitats in landscapes that are often very developed:

> “Lower river valleys or coastal lowlands and estuaries lack refugia with high quality habitat for salmon, and there seems to be little hope of future establishment of such areas without considerable public resolve and financial commitment.”

At present the Napa River TMDL has failed to garner such support.

Sincerely,

Patrick Higgins

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EXHIBIT 11

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January 21, 2007

Tom Lippe
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Re: DEIR for Rodgers/Upper Range Vineyard Project Conversion #02454-ECPA

Dear Mr. Lippe:

You have asked me to comment on the potential impacts of the proposed Upper Range Vineyard Project (Rodgers) conversion from oak woodland and grassland to vineyard. A Draft Environmental Impact Report (DEIR) has been prepared, dated December 2006. The DEIR gives the following overview of the project on page 2-1.

> This EIR analyzes the potential environmental impacts of implementing an Erosion Control Plan (#02-454-ECPA) for earthmoving activities associated with a new vineyard in Napa County, California. The Upper Range Vineyard Project – Rodgers Property would involve installing erosion control features and measures and the subsequent operations for a new approximately 161-acre vineyard on privately owned properties. (APNs 030-200-002, 030-130-008, 030-220-009, and 030-220-027/028/029/030 (formerly 030-220-001). The new vineyard would be situated on seven contiguous parcels totaling approximately 678 acres.
>
> The project site is located in the hills between the Silverado Trail and Lake Hennessey, about 2 miles northeast of Rutherford and 13 miles north of the City of Napa. The erosion control measures would be implemented in the proposed vineyard area, which would cover 161 acres (approximately 24 percent of the total 678 acres), while the existing site conditions would remain as is on 517 acres (approximately 76 percent of the total 678 acres). The vineyard layout was designed by the property owners to minimize the need for grading and tree removal.
>
> A new 10,000-gallon water tank and irrigation line would be installed for the vineyard. Ground water would be pumped from an existing well and be stored in the water tank. The existing well would also be shared and provide water to the Rutherford Volunteer Fire Department facility on Silverado Trail. The Rutherford Volunteer Fire facility would have their own separate 10,000-gallon water tank that would be screened from view by existing trees.

Project Alternative

According to page 6-2 of the DEIR:

> The two alternatives to the Project discussed in this chapter include the following:

- The No Project Alternative, which assumes the continuation of existing conditions on the Project site; and
- The Resource Conservation Alternative, which would avoid disturbance of 0.26 acres native perennial grassland near Silverado Trail by reducing the size of Vineyard Block 14; and would avoid disturbance of 1.37 acres serpentine grassland by eliminating Vineyard Block 52 from development.

The project parcel is currently being grazed by cattle in spring and summer. Grazing will continue after installing the vineyards. (DEIR page 3-1).

> The Napa County Land Use Plan shows the project parcels in an area designated Agriculture, Watershed, and Open Space (AWOS) and zoned Agricultural Watershed (AW). The properties are currently grazed by cattle during spring and summer with some supplemental feed. The cattle are moved off the properties during the fall and winter to allow the vegetation to grow back. The grazing is mainly to keep vegetation in check, as the cattle provide a "natural lawn mower", and to reduce the potential for a wildfire. A reduced number of cattle would continue to be grazed on the non-vineyard portions of the properties

Trso (2006, page 15) evaluates two alternatives; ES Alternative 1 is the continuation of livestock grazing in addition to the vineyard installation; ES Alternative 2 is the phasing out of the grazing and installation of the vineyard. Trso's ES Alternative 1 is similar to the Resource Conservation Alternative discussed in the DEIR.

A reasonable project alternative, that has **not** been included in the DEIR, is the vineyard plus grazing with improved practices to reduce the water quality impacts of the grazing. TMDLs for sediment and nutrients are being prepared for the Napa River. A TMDL for pathogens was adopted by the San Francisco Bay Regional Water Quality Control Board in November 2006. Livestock grazing contributes to all three impairments, as noted on the RWQCB web page for each TMDL.

An example of an improved grazing practice would be to exclude livestock from all riparian zones. Excluding livestock from riparian zones reduces streambank erosion and reduces the chance of waste from livestock being delivered directly to a waterbody. Excluding livestock from riparian areas would be a step towards achieving the objectives of the sediment, nutrient and pathogen TMDLs. Improving the management of the livestock grazing would appear to be of significant environmental value and would improve water quality on and off-site.

By 2010, the pathogen TMDL seeks to have owners of grazing lands:

> Submit a Report of Waste Discharge to the Water Board that provides the following: a description of the facility; identification of necessary site-specific grazing management measures to reduce animal waste runoff; and an implementation schedule for identified management measures

In addition to livestock grazing being cited as a water quality problem in the three Napa River TMDLs, the DEIR notes that the Napa County Conservation and Space Element (1998) and the Napa River Watershed Owner's Manual (Napa County Resources Conservation District, 1996) call for improved grazing practices.

According to Trso (2006) three of the five drainage basins he identifies on the property are fully disconnected from the Conn Creek or Lake Hennessey. For example, the Rogers Southeast Gulch catchment is disconnected from Conn Creek by disbursing on the valley floor between Silverado Trail and Conn Creek. The flood waters of Rodgers Southeast Gulch soak into the valley floor and deposit any sediment load. However, contaminates such as nutrients and pathogens are then delivered to the subsurface where they may potentially be transported to Conn Creek. Therefore, improved grazing management practices should be implemented in all areas grazed by livestock.

The above discussion supports the claim that the environmentally superior alternative project would be the combination of improved grazing practices with the Resource Conservation Alternative identified in the DEIR. The Resource Conservation Alternative plus improved grazing practices is a reasonable project alternative since it will help the landowner comply with the pathogen TMDL by implementing improved grazing practices. In addition, it is presumed that the sediment and the nutrient TMDLs will also seek to improve grazing practices when they are adopted.

ECP Narrative

The ECP Narrative that is included in the DEIR is dated October 2002 and so does not accurately reflect changes in the project made since then. For example, the proposed mechanical contouring is not described in the ECP Narrative. The DEIR does not give any information about the specific details required to implement the proposed mechanical contouring. There is no indication of the maximum fill depth required to accomplish the,

> The mechanical contouring proposed here involves the construction of subtle cross-slope outsloped terrace benches.

Will cut or fill-slopes be created by the mechanical contouring? If so will the cut or fill-slopes be a source of sediment?

Water quality

The map on page 4.4-16 of the DEIR does not identify the location of the Napa-3 sampling site. Figure 4-1 in Appendix C, Hydrologic Evaluation, shows that Napa-3 is to the south east of Yountville.

The Napa-1 and Napa-2 sampling sites found 2, 4-DB a Chlorinated Herbicide in concentration of 0.25 ug/L and conclude that there is no problem since no standard has been set for this pollutant by the local RWQCB. However, page 4-3 of Appendix C by *HIS* notes that:

> These samples were collected near the end of the rainy season. Samples collected during the first few runoff events at the beginning of the rainy season may show more contaminants.

Besides showing more contaminates, it is likely that samples collected earlier in the rainy season would have higher concentrations of the detected contaminates. Furthermore, the fact that no standard has been set for 2, 4 DB does not demonstrate that there is no environmental impact from the chemical.

The water quality sampling methodology is not described. There is no indication of whether the samples were collected as surface grab samples or if a more rigorous sampling protocol was used. The samples are described as "storm water runoff samples" but there is no discussion of when the samples were collected relative to a storm event or the size of the storm event. For example, when were the samples collected relative to the peak in water discharge? When were they collected relative to the peak rainfall that generated the storm runoff event? There is no indication of the relative stream discharge when the samples were collected. Many contaminates have higher concentrations during flood events. Concentration of pollutants can also vary substantially during a storm event. The water quality samples that are presented in the DEIR can not be used to demonstrate that there are no water-quality problems associated with vineyards. The water quality samples do indicate that agricultural chemicals can travel from the application site to the stream channel network.

The chemical, pathogen and nutrient load of the water leaving the project property has not been discussed. Given the fact that the land is used for livestock grazing, it is likely that storm water runoff from the project property carries nutrients and pathogens in addition to sediment. After the vineyards are installed, runoff from the project may also carry agricultural chemicals. The surface flow disconnection in three of the streams may not prevent the chemical, nutrients and pathogens from the project property reaching Conn Creek. Some types of agricultural chemical, nutrients and pathogens can be transported by subsurface water. The general direction of groundwater flow is from the project property, across Silverado Trail, towards Conn Creek and the Napa River. The DEIR has not address the potential for subsurface delivery of chemicals, nutrients or pathogens to Conn Creek or the Napa River.

Flooding

Table 2-1 *Comparative Summary of Environmental Impacts* on page 2-23 notes that:

> Peak discharge increases are predicted in two catchments, Rodgers Southeast Gulch and Sage Canyon Road Gulch, under the post-project conditions. Because of natural landforms, the Rodgers Southeast Gulch Catchment is naturally disconnected from Conn Creek and Napa River. Therefore, there would be no runoff impacts to these waterbodies. Additionally, about 20% of the predicted increase in the catchment runoff would occur **above the Rodgers South Pond, and therefore would be stored on-site.** However, Sage Canyon Road Gulch is fully connected to Conn Creek for delivery of runoff and sediment. Unless mitigated, the predicted increases within the Sage Canyon Road Gulch Catchment would be transmitted to Conn Creek and the Napa River. **Since Napa County DPW conducted maintenance operations along Silverado Trail, stormwater drainage is not an immediate concern**. (Emphasis Added)
>
> These increases in peak discharge and volume were determined to be significant due to the proximity of Silverado Trail, Conn Creek and the Napa River.

The DEIR claims that South Rodgers Pond would be able to store increased runoff generated upslope of the pond. However, the pond volume is small and so it is reasonable to expect the pond to be full prior to significant runoff events. There is no justification given for the assumption that South Rodgers Pond would be able to store substantial volumes of runoff generated during significant flood events.

According to page 2-6 of the *Draft Hydrologic Evaluation* prepared by HIS dated October 2005:

> Any increase in runoff from the western half of the property would have an adverse impact to Silverado Trail, which already floods during storm events.

Napa County DPW appears to have cleaned the culverts and stream channels that cross Silverado Trail between October 2005 and December 2006 when the DEIR was published. Prior to the culvert/channel maintenance by Napa County DPW, there was flooding along Silverado Trail. Trso's Figure 8 on page F-65 and Figure 12 on page F-66 shows cobbles inside two 12" culverts under Silverado Trail. The presence of the cobble inside the small 12" culverts suggests that the culverts' capacity may have been significantly reduced by the cobble and may have contributed to the flooding on Silverado Trail, prior to maintenance by the County. Trso's Figure 5 on page F-65 shows a mix of gravel, sand and silt resting on the grate of a drop inlet along Silverado Trail suggesting that the pipe below the grate on the drop inlet may have lost capacity due to sediment deposition. Any increase in sediment or water discharge from the Upper Range Vineyard Project that is delivered to the culvert/channels under or near Silverado Trail are likely contribute to flooding on Silverado Trail, which would be a significant environmental impact.

Trso (2006) notes that:

> Due to the disconnectivity of the RS and RSE gulches, additional trapping of the sediment exported from the five watersheds **occurs to the west of Silverado Trail**, in the valley floor area of Napa River. The property runoff and sediment yield from these two watersheds do not reach Conn Creek. The RS Gulch runoff and sediment yield are fully disconnected from delivery to Conn Creek

> due to the presence of a wastewater treatment pond near Silverado Trail. The runoff and sediment yield from the RSE Gulch naturally fan out along the valley alluvial fan. An estimated 217.5 tons (17%) of the sediment yield from the RS and RSE gulch drainages are trapped annually to the west of Silverado Trail (Table 13). The additional 217.5 tons of sediment trapped amounts to 18.0% of the total property sediment delivery of 1,207.4 tons/yr. The combined sediment trapping by the Rodgers ponds and within the Napa River valley floor amounts to 302.1 tons/yr, or 25.0% of the total property sediment delivery, under the current conditions. (Emphasis Added)

The disconnectivity of the RS and RSE gulches currently occur downslope (to the west) of Silverado Trail. The maintenance of the culverts/channels by Napa County DPW has likely increased sediment trap efficiency of the channels where they cross Silverado Trail. Therefore, it is likely that the maintenance by Napa County DPW has shifted the site of sediment deposition from the west of Silverado Trail to the immediate vicinity of Silverado Trail: thereby increasing the potential for a project related flooding along Silverado Trail. A significant portion of the sediment load from the project will likely be trapped in the culverts/channels under or near Silverado Trail. Sediment deposition in the culverts/channels under or near Silverado Trail would decrease their capacity and eventually lead to flooding of Silverado Trail. The conclusion that stormwater drainage in the vicinity of Silverado Trail is not an immediate concern is misleading and gives the erroneous appearance that there is no environmental impact from the sediment load and storm runoff from the project.

Increased water and sediment discharge from the project would be an adverse environmental impact unless mitigated. The proposed mitigation 4.4-6 has not been adequately described and so it is not possible to determine if the mitigation is feasible or if the mitigation would cause adverse impacts. Until an adequate description is given for mitigation 4.6-6, mechanical contouring, it must be assumed that the increased water and sediment discharge from the project have not been mitigated.

There are two ponds on the property referred to as the North Rodgers Pond and the South Rodgers pond. Burke (Draft Hydrologic Evaluation, 2005) says, on page 1-3, that the two ponds each cover 0.25 acres. Trso (2006, page 13) states that:

> Additionally, about 20% of the predicted increase in the catchment runoff would occur above the Rodgers South Pond, and therefore would be stored on-site.

No proof is offered that South Rodgers Pond has sufficient volume to contain all flood runoff generated upslope of the pond under all conditions. In doing a flood analysis the conservative approach is to assume that the pond would be filled prior to significant storm events and that all flood runoff would be passed downstream. Significant storm events tend to occur in wet years with multiple events. Therefore, the conservative assumption of the pond being full at the start of a storm event is reasonable. The pond would capture coarse sediment from only 7% of the watershed area of Rodgers Southeast Gulch (Trso 2006, page 3).

Without mitigation, the project will result in increased water and sediment discharges at Silverado Trail. The DEIR proposes to use mechanical contouring as a mitigation to reduce runoff. Mechanical contouring is proposed for areas within the Sage Canyon Road Gulch and Rodgers Southeast Gulch watersheds, as shown on Figure 47 of Trso, 2006. No information is give about the design of the mechanical contouring. The maximum depth of fill or cuts required for the mechanical contouring is not presented, the grade of the planting surface is not given, the grade of the cut and fill faces are not given.

The DEIR (Table 2-1 on page 2-23 and on page 4.4-22) describes the mechanical contouring as follows; note the lack of design details.

Mitigation Measure 4.4-6. Mechanical Contouring

> To mitigate for increased volume and peak flow runoff within the Rodgers Southeast Gulch and the Sage Canyon Road Gulch Catchments, the applicant will incorporate mechanical contouring techniques for portions of the proposed vineyard blocks within the relevant catchments (Figure 4.4-3). Mechanical contouring involves the construction of subtle cross-slope, outsloped terrace benches. Such features prevent the concentration of runoff and promote infiltration. In addition, the soil would be amended to ensure the effectiveness of mechanical contouring in reducing volume and peak flow runoff. Assuming that the contouring would take place within the relevant catchment portions of the proposed vineyard blocks, two additional WinTR-55 model runs were performed. These model runs predicted there would be a zero increase in peak flow discharge within and off these two catchments, under the post-project conditions. The results of the peak flow discharge calculations, assuming installation of mitigation measures, are summarized in Tables 4.4-8 and 4.4-9.
>
> As Table 4.4-8 details, a slight decrease in peak flows would occur within the Rodgers Southeast Gulch Catchment, as the curve number for that catchment would decrease from 85 to 84 following the development of the vineyard. The decrease would range from 1.4% (the 100-year storm peak runoff) to 4.6% (the 2-year storm peak runoff). As shown in Table 4.4-9, within the Sage Canyon Road Gulch Catchment, peak flows would not change from existing conditions following the implementation of mitigation measures.

Footnote 10 on page 13 of Trso (2006) gives the area of the proposed mechanical contouring in the Sage Canyon Road Gulch and the Rodgers Southeast Gulch catchment:

> [10] The total acreages of the catchment portions of the relevant proposed vineyard blocks are: 6.1 acres within the Sage Canyon Road Gulch catchment, and 59.5 acres within the Rodgers Southeast Gulch catchment.

Mitigation measure 4.4-6 proposes to mechanically contour 59.5 acres of the 107.8 acres in the Rodgers Southeast Gulch watershed which represents 55% of the RSEG watershed. A total of 6.1 acres within the Sage Canyon Road Gulch watershed would be mechanically contoured which is about 30% of the Sage Canyon Gulch watershed. A total of 65.6 acres will be mechanically contoured which is about 54% of the entire 121 acre vineyard conversion. Thus the mechanical contouring represents a significant amount of grading, far more than is implied by the claim in the DEIR that grading would be minimized.

Page 2-2 and 2-3 of the DEIR state that:

> The vineyard layout was designed by the property owners to minimize the need for grading and tree removal.

Implementation of the proposed mechanical contouring mitigation would appear to nullify the claim that the vineyard layout minimizes the need for grading.

The total area that will be mechanically contoured suggests that significant adverse environmental impacts are likely to occur through implementation of Mitigation Measure 4.4-6. Mitigation 4.4-6 is not adequately described. The magnitude of any required cuts and fills are not given. A total of 65.6 acres of vineyard would be mechanically contoured or 54% of the total 121 acres of vineyard. It seems likely that such a significant amount of grading would have substantial cut and fill slopes which would be subject to erosion. It is likely that a significant volume of the material eroded from the cut and fill slopes would be delivered to the stream channel network. Therefore, the proposed mitigation is likely to have a significant adverse impact.

Groundwater Recharge Rates

Burke (Draft Hydrologic Evaluation, October 2005) estimates the annual groundwater recharge rate for the entire Rodgers parcel. The calculation is based on rainfall data from the Department of Water Resources; runoff data from the USGS and evaporation data from the UC Farm Advisor. Burke calculates that the annual groundwater recharge is 5.4 inches per year or 0.45 acre-feet per year per acre. The entire Rodgers parcel is 678 acres thus, the entire parcel provides 305 acre-feet of groundwater recharge per year.

Burke (2005) estimates that the annual consumptive water use for the project based on the Suscol Springs North Project estimated water use rates of 0.75 acre-feet per year for hillside vineyards. Burke uses 175 acres of vineyard and the 0.75 acre-feet per year per acre of hillside vineyard to estimate the project water demand of 131 acre-feet per year. The project analyzed in the DEIR has 161 acres of vineyard which results in consumptive water use of 121 acre-feet per year.

On the scale of the entire Rodgers property the groundwater recharge rate exceeds the annual consumptive use. However, only a small portion of the property will provide groundwater recharge to the Rodgers production well. Burke's Zone 1 drains to Lake Hennessey and his Zone 2 drains to the portion of Conn Creek that runs along the northwest edge of the property. Therefore, it is very unlikely that groundwater recharge from either Zone 1 or Zone 2 will supply the pumping demand from the Rodgers well which is located in Zone 3. Burke's Zone 3 is a series of small watersheds that drain to Silverado Trail. Only a fraction of Zone 3 will supply groundwater recharge to the project supply well.

The well appears to be located in Rodgers Southeast Gulch (RSEG) which has a drainage area of 107.8 acres (Trso, 2006, page 3). The expected groundwater recharge from the Rodgers Southeast Gulch, assuming that the entire RSEG watershed is upslope of the well, would be:

0.45 acre-feet per acre per year x 107.8 acres = 48.51 acre-feet per year.

The well is to supply all of the water for the entire 161 acres of vineyard which, was estimated to be 121 acre-feet per year. The annual water use for the 161 acres of vineyard is about 2.5 times the estimated annual groundwater recharge of the Rodgers Southeast Gulch watershed.

The water budget for the RSEG watershed, which will actually supply groundwater recharge to the well, suggests that groundwater pumping to supply the proposed vineyard will result in a decline in local groundwater levels and will substantially interfere with groundwater recharge. Lowering local groundwater levels and interfering with recharge are both significant adverse environmental impacts according to CEQA Appendix G. On page 2-4 of the *Draft Hydrologic Evaluation*, Burke notes:

> b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge?
>
> Significance Criteria
>
> Based on CEQA criteria, the project would have significant environmental impact if it were to:
>
> > 1) consume groundwater in excess of natural groundwater recharge rates, lowering local groundwater levels,

> 2) change recharge over large areas due to alteration of the infiltration characteristics of the land surface, lowering local groundwater levels,
>
> 3) reduce shallow flow to wetlands or summer base flows in nearby streams,
>
> 4) intercept shallow groundwater flow moving to seeps, wetlands, and waterways, or
>
> 5) affect the performance of nearby wells.

Burke's Figure 5-1 shows that there are three wells that appear to be located downslope of the Rodgers well. These wells appear to be at risk of significant adverse impact from the project since the Rodgers well is expected to pump about 2.5 times the estimated annual groundwater recharge delivered to the well from the RSEG watershed.

The DEIR does not present any mitigation to deal with the potential adverse environmental impacts from groundwater pumping.

Water Availability Test

The Department of Public Works *Water Availability Analysis: Policy Report*, August 2003 describes the Phase II Water Availability Analysis as follows:

> The phase two analysis is commonly called an aquifer test or well test. It requires the pumping of the project well(s) at the maximum rate needed to meet project water demands and at the same time requires the monitoring of the immediate effects of groundwater pumping on a neighboring or monitoring well(s). The following requirements must be met when performing a phase two analysis:
>
> - An approved hydrogeologist, a list of which is on file with the Department of Public Works, must develop the test procedure. Upon approval of test procedures, the hydrologist will supervise the test and submit a report to the Department evaluating the impacts to neighboring static water levels.
> - A licensed well drilling contractor must perform the actual testing and monitor static and dynamic water levels of the project well and monitoring wells during the duration of the test, including the recovery phase of the project well and monitoring wells.
> - The test must be conducted long enough to stabilize the dynamic water level of the project well or include an analysis of what the impact of the continued pumping would have.
> - The applicant or agent must notify the Department at least 48 hours prior to conducting the test.
>
> Impact is unique to each project and will be evaluated on a case by case basis by the Department of Public Works.
>
> Any projects requiring a phase two analysis may also be required to install water meters to measure the actual amount of water consumed, and be required to find alternate water sources if their actual groundwater use exceeds the threshold for their property (see Appendix D).

It is not clear if the test was done according to the above criteria. Page 5-1 of the Draft Hydrologic Evaluation (Burke, 2005) states that,

> The water levels in the Rodgers, Pina, and Riboli wells were monitored periodically by Mr. Lincoln of Lincoln Agriculture Engineer LLC.

It is not clear if Mr. Lincoln is a licensed well drilling contractor in addition to being an engineer.

Driscoll (1986, p 534) gives the following discussion of well tests and aquifer tests. Definitions of terms follow the quote from Driscoll.

> Pumping tests may be conducted to determine (1) the performance characteristics of a well and (2) the hydraulic parameters of the **aquifer**. For a well-performance test, yield and **drawdown** are recorded so that the **specific capacity** can be calculated. These data, taken under controlled conditions, give a measure of the productive capacity of the completed well and also provide information needed for the selection of pumping equipment. An accurate test of a well before the pump is purchased pays for itself by assuring selection of a pump that will minimize power and maintenance costs. Many times, high pumping costs and unsatisfactory pump performance are erroneously charged to the well when these conditions really stem from an improperly selected pump.
>
> The second purpose of pumping tests is to provide data from which the principal factors of aquifer performance – **transmissivity** and **storage coefficient** – can be calculated. This type of test is called an aquifer test because it is primarily the aquifer characteristics that are being determined, even though the specific capacity of the well can also be calculated. Aquifer tests will predict (1) the effect of new withdrawals on existing wells, (2) the drawdowns in a well at future times and different discharges, and (3) the **radius of the cone of influence** for individual or multiple wells.

The following definition of terms is taken from Driscoll (1986).

- **Aquifer**: An aquifer is a saturated bed, formation, or group of formations which yield water in sufficient quantity and quality to be economically useful.
- **Confined Aquifer**: A confined aquifer is a formation in which the groundwater is isolated from atmospheric pressure at the point of discharge by impermeable geologic formations; confined groundwater is generally subject to pressure greater than atmospheric.
- **Coefficient of Storage**: The coefficient of storage represents the volume of water released from storage per unit of aquifer storage area per unit change in head. Head is the energy contained in water from elevation, pressure or velocity. The coefficient of storage is dimensionless.
- **Drawdown**: Drawdown is the difference, measured in feet or meters, between the static water level and the pumping water level.
- **Radius of the Cone of Influence**: The radius of influence is the horizontal distance from the center of the pumping well to the point where the drawdown from the pumping well becomes negligible.
- **Static Water Level**: This is the level at which water stands in a well when no water is being removed from the aquifer either by pumping or free flow. Generally, it is expressed as the distance from the ground surface (or from a reference point near the ground surface) to the water level in the well.
- **Specific Capacity**: Specific capacity of a well is its yield per unit of drawdown, usually expressed as gallons per minute per foot of drawdown, after a given time has elapsed, usually 24 hours.
- **Transmissivity**: The rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient. Transmissivity values are given in gallons per minute through a vertical section of an aquifer one foot wide and extending the full saturated height of the aquifer under a hydraulic gradient of 1.0 in the English Engineering system.

- **Unconfined Aquifer**: The water table of an unconfined aquifer is exposed to the atmosphere through openings in the overlying materials. An unconfined aquifer is also called a water table aquifer.

A well test is done to select the proper pump for the well and to determine the specific capacity of the well. A well test can not determine if the pumping well will cause environmental impacts.

An aquifer test is done to determine the principle factors of aquifer performance, also called aquifer characteristics. These factors can then be used to estimate the drawdown in the pumping well for any discharge and at any time in the future and determine if aquifer boundaries are present within the radius of influence of the well. These calculations would show if the aquifer has a sufficient volume of water and a sufficient rate of delivery to the well to satisfy the project water demand. For example, a properly conducted aquifer test could determine the drawdown in the Rodgers well after 6 months of pumping at 200 gpm to supply irrigation water for the proposed vineyard between May and October. In addition, a properly conducted aquifer test would detect if there were any boundaries in the aquifer which would limit flow to the well indicating a potentially insufficient volume of water.

Aquifer characteristics can also be used to estimate the drawdown in neighboring wells, caused by the pumping well, at any time in the future. The aquifer characteristics can also be used to estimate the radius of influence of the pumping well at any time.

A constant-rate aquifer test is done by pumping the well at a constant rate of discharge for 24 hours for a confined aquifer or for 72 hours for an unconfined aquifer (Driscoll, 1986). During this time, periodic drawdown measurements are taken in the pumped well and in observation wells. Measurement of barometric pressure is also done if the aquifer is confined. Fluctuation in barometric (atmospheric) pressure causes the static water surface in a well in a confined aquifer to rise or fall. So, drawdown in a well that penetrates a confined aquifer must be corrected for changes in barometric pressure. Recovery of the water surface should also be recorded after the pump is shut off at the conclusion of the test. Drawdown data are plotted versus the time since pumping began. Drawdown data from observation wells can be plotted against time since pumping began or against distance from the pumped well.

A step-drawdown test is done by progressively increasing the pumping rate at regular intervals. For example, the well may be pumped at 100 gpm for 2 hours, then at 200 gpm for 2 hours and then at 300 gpm for 2 more hours. Typically, three different pumping levels are tried but more steps can be done. The aquifer characteristics can be determined from the first pumping step. Driscoll (1986) notes that,

> … the validity of these values may be doubtful because they are based on data taken over such a short time. The real value in a step-drawdown test is that it shows the reduction in specific capacity with increasing yields.

Walton (1987) suggests the following procedure for a typical aquifer test for a confined aquifer:

- Day 1. water level measurements to establish antecedent trend.
- Day 2. 1-hour trial test to adjust equipment followed by a 1-hour recovery period; 3-hour step drawdown test to determine production well well-loss coefficient followed by a 20-hour recovery period.
- Day 3. 24-hour constant rate test to determine aquifer system hydraulic characteristics and boundary conditions.

- Day 4. 24-hour recovery test to verify aquifer system hydraulic characteristics and boundary conditions.

For an unconfined aquifer (water table aquifer) Walton's procedure would be modified by changing the 24-hour constant discharge test and the 24-hour recovery test to 72-hour tests.

The Rodgers/Upper Range Vineyard groundwater pumping test was a mix of a step-drawdown test and a constant-rate discharge test. However, instead of progressively *increasing* discharge, as in a standard step-drawdown test, the step-drawdown portion of the Rodgers/Upper Range pumping test was done by successively *decreasing* the discharge.

Standard texts such as Driscoll (1986) or Walton (1987) recommend that the pumping should have stopped after the step-drawdown test to allow the water surface to recover to the pre-test level prior to conducting the constant-rate discharge test. Driscoll (1986) notes that:

> Beginning a pumping test when the static water level is below normal may eliminate early data that show discharge or recharge boundaries. Without the early drawdown data, it may be impossible to obtain the correct transmissivity and storage parameters for the aquifer.

The phrase, "when the static water level is below normal" means when the water level in the well has not recovered to the pre-pumping level.

The observed drawdown in one of the neighboring wells (Riboli) was about 1.5 feet at the end of the pump test, approximately 31 hours and 20 minutes after the end of pumping. The drawdown began in the Riboli well sometime between 28 and 48 hours after the start of pumping. It is unknown if this is the maximum drawdown in the Riboli well since no further measurements were made. The report compares the 1.5 foot drawdown in the neighboring well to the 260 foot drawdown in the production well and concludes that there is no problem but they do not cite any County criteria for their claim of no significance.

Burke's (2005) water balance procedure estimates that the 161 acres of vineyards would require 121 acre-feet of water per year. The constant-discharge portion of the well test was done at approximately 200 gpm. A pumping rate of 1.0 acre-feet per day is equivalent to 226.3 gpm. Therefore, to produce a total volume of 121 acre-feet would take:

Days to pump 121 ac-ft = (121 ac-ft)/ ((200gpm) x (1.0 ac-ft/day)/ (226.3 gpm)) = 136.9 days

which is equivalent to 4.6 months.

The question that needs to be answered is, "will the drawdown in the Riboli well, after 4.6-months of continuous pumping of the Rodgers well, be significant?"

The drawdown data from an aquifer test can be used to estimate the drawdown after several months of pumping. Such a procedure would give a much better indication of whether the Rodgers well would have an adverse impact on the neighboring wells. Why was this not done?

Furthermore, the significance of the drawdown in the Riboli well, induced by pumping the Rodgers well, needs to be considered in light of the total drawdown that the Riboli well currently experiences, including drawdown caused by the operation of the Beckstoffer well and the Pina well. No information is given concerning the total drawdown in the Riboli well when all the neighboring wells are pumping. In addition, no information is given on the depth to the pump in the Riboli well which determines the maximum drawdown the well can experience and still produce.

No discussion is presented to explain why the water level in Riboli well increased just prior to the end of the test.

Standard texts on the design and analysis of aquifer tests such as Driscoll (1986) and Walton (1987) recommend that drawdown data be collected at frequent intervals early in the test and then at progressively longer intervals during the course of the test.

Table 1. Driscoll, page 553, recommends the following measurement intervals for the pumping well.

Time Since Pumping Started	Time Interval Between Measurements minutes
0 - 10	0.5 - 1
10 - 15	1
15 - 60	5
60 -300	30
300 - 1440	60
1440 - end of test	480 (8 hours)

Table 2. Driscoll, page 553, recommends the following drawdown measurement intervals for observation wells.

Time Since Pumping Started	Time Interval Between Measurements minutes
0 - 60	2
60 - 120	5
120 - 240	10
240 -360	30
360 - 1440	60
1440 - end of test	480 (8 hours)

Appendix C of Burke (2005) presents data from the aquifer test. The exact time pumping began is not presented in Appendix C. The exact time when pumping stopped is not presented in Appendix C either. According to the drawdown data presented in Appendix C, the first measurement of the water level in the Rodgers production well, recorded by the pressure transducer attached to the data logger, was about 6.5 hours after pumping began. Failure to give the exact time pumping began makes it impossible for reviewers to construct graphs of drawdown versus time since start of pumping. The pressure transducer/data-logger then measured the water level above the sensor at 5 minute intervals. A total of 12 depth-to-water measurements were apparently made during the 6.5 hours between the start of pumping and the first measurement made by the pressure transducer/data-logger. Table 1 indicates that a minimum of 32 drawdown measurements should be made in the pumping well during the first 6 hours of a test. According to Driscoll, the most important drawdown data comes from the early part of the test. Therefore, the frequency of drawdown (which can be calculated from the depth-to-water measurements)

measurements was not sufficient to accurately characterize the production well drawdown in the early portion of the aquifer test.

A total of 15 spot measurements from the Riboli well are presented in Appendix C of Burke (2005). Table 2 indicates that a total of 57 measurements should be made in the observation well during the pumping portion of the test. The discussion of the aquifer test indicates that a pressure transducer/data-logger was installed in the Riboli well that was programmed to collect water level data every five minutes. The data from the pressure transducer/data-logger is not presented in Appendix C. The final water level measurement of the Riboli well that is presented in Appendix C is 36.5 feet which 1.5 feet below the initial water level in the Riboli well. Since no additional measurements were made in the Riboli well, it is unknown how long it took for the water level in the Riboli well to recover to pre-test levels.

Water level recovery data can be used to verify the results of an aquifer test. For water level recovery data, drawdown is graphed versus the time since pumping stopped. Drawdown data during the water level recovery period should be collected at the same frequency as shown in Table 1. The heading “Time Since Pumping Started” would be changed to “Time Since Pumping Stopped” for the water level recovery data.

Drawdown is calculated as the difference between the water level during pumping and the trend of the water surface defined by the before-pumping and after-pumping water level measurements. Therefore, several water level measurements should be made before and after the well is pumped to accurately define any trend in water surface. The water level measurements in Appendix C of Burke, 2005, only show two measurements were made prior to the start of the test and only one measurement was made after the cessation of pumping. Such few measurements are not enough to accurately establish if there is any trend in the water surface level.

Barometric pressure data should also have been presented in Appendix C since the Rodgers well apparently affected the drawdown in the Riboli well which is about 1,000 feet away, indicating that the aquifer tapped by the Rodgers well is not a water table aquifer.

The Groundwater Pumping Analysis section in Burke 2005 does not present the drawdown data in technically useful way such as a graph of the drawdown versus time in the pumping well and monitoring well with time on a logarithmic scale. Aquifer test theory assumes that the drawdown from the pumping well will fall on a straight line when presented on a semi-logarithmic graph with time on the logarithmic scale and drawdown on the arithmetic scale. Deviations from a straight line offer important clues about the nature of the aquifer. Also the distance between all the wells is not given.

The drawdown data presented in Appendix C of Burke (2005) show that the well test was done between November 14 and November 19 of 2004. Aquifer analysis theory assumes that there is no recharge to the well (Driscoll, 1986) during the period of the test. Since the test was conducted in November, precipitation records for the month prior to the aquifer test should have been included.

Much more information about the affect of the project well could be presented than is given in the DEIR. The analysis presented in the DEIR does not appear to be sufficiently rigorous, according to standard texts such as Driscoll (1986) and Walton (1987), to support the conclusion of no significant adverse impact. The pumping test data is presented in a way that makes it impossible for a reviewer to determine if there is a potential for impact.

The DEIR has not demonstrated that the project complies with Appendix G of the CEQA Guidelines regarding a lowering of the groundwater table or interfering with the operation of neighboring wells.

Cumulative Effects

On page 4.4-14 of the Draft EIR they discuss the criteria derived from Appendix G of the CEQA Guidelines. One of the criteria is:

> Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.

The discussion of *Groundwater Recharge Rates,* presented above, demonstrates that the project well has the potential to cause a net deficit of the aquifer underlying the RSEG watershed and lower the static water level in neighboring wells.

The analysis does not address the cumulative impact of groundwater pumping on the North Valley Groundwater Basin to the west centered along the Napa River. The aquifer that the project well is tapping has not been described and it is unknown if that aquifer is connected to the North Valley Groundwater Basin. No analysis has been presented in the DEIR to demonstrate if the project well would have a cumulative adverse impact on the North Valley Groundwater Basin.

Summary

The DEIR is seriously flawed. Review of the water budget calculation presented in Burke (2005) shows that the volume water needed to irrigate the vineyard is about 2.5 times the groundwater recharge expected from the Rodgers Southeast Gulch watershed which recharges the production well. The DEIR does not propose mitigation for this significant impact.

The Phase 2 Water Availability Analysis may not have been done to County standards since monitoring well data may have been collected by someone other than a licensed well drilling contractor.

The aquifer test data presented in Appendix C of Burke (2005) is incomplete. The data presented are not sufficient to support the aquifer test analysis as presented in standard texts such as Driscoll (1986) or Walton (1987). The analysis of the aquifer test data is not adequate to answer the question of whether pumping the Rodgers well at 200 gpm, for the 4.6 months required to produce the 121 acre-feet of water required to irrigate the proposed vineyard, will impact the neighboring wells.

The aquifer test analysis also does not establish if the aquifer can produce the required 121 acre-feet of water. That is, the test data were not analyzed to determine if there are any boundaries that would restrict the flow of groundwater near the well.

The DEIR did not consider the effect of the reduction of groundwater recharge from the property on the North Valley Groundwater Basin.

Mitigation 4.4-6 is not adequately described. The magnitude of any required cuts and fills are not given. A total of 65.6 acres of vineyard would be mechanically contoured or 54% of the total 121 acres of vineyard. It seems likely that such a significant amount of grading would have substantial cut and fill slopes which would be subject to erosion. It is likely that a significant volume of the material eroded from the cut and fill slopes would be delivered to the stream channel network. Therefore, the proposed mitigation is likely to have a significant adverse impact.

The DEIR says that the two ponds on the property will capture the storm runoff generated upslope. However, the small ponds on the property have not been demonstrated to have sufficient capacity, during significant storm events, to capture any storm runoff.

The water quality sampling demonstrates that agricultural chemicals can be transported to streams. The water quality sampling was done late in the rainy season. Therefore, it is likely that the concentration of the chemicals reported by the sampling may have been higher during earlier storms. Also, other pollutants may have been detected if the sampling was done during early season storms. Overall, the water quality sampling raises concern about the project contributing agricultural chemicals to the Napa River system.

Implementing improved grazing management practices, such as excluding riparian zones from grazing, in addition to the proposed vineyard was not considered. Implementation of improved grazing practices in addition to the proposed vineyard is an environmentally superior alternative to the project that was not considered by the DEIR.

Sincerely,

Dennis Jackson

Dennis Jackson
Hydrologist

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EXHIBIT 12

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October 19, 2008

Tom Lippe
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Re: DEIR for Rodgers/Upper Range Vineyard Project Conversion #02454-ECPA

Dear Mr. Lippe:
You have asked me to comment on Supplemental Draft Environmental Impact Report of the proposed Upper Range Vineyard Project (Rodgers) conversion from oak woodland and grassland to vineyard. The original Draft Environmental Impact Report (DEIR) was dated December 2006. The Supplemental DEIR is dated August 2008. The DEIR describes the project as follows.

> This EIR analyzes the potential environmental impacts of implementing an Erosion Control Plan (#02-454-ECPA) for earthmoving activities associated with a new vineyard in Napa County, California. The Upper Range Vineyard Project – Rodgers Property would involve installing erosion control features and measures and the subsequent operations for a new approximately 161-acre vineyard on privately owned properties. (APNs 030-200-002, 030-130-008, 030-220-009, and 030-220-027/028/029/030 (formerly 030-220-001). The new vineyard would be situated on seven contiguous parcels totaling approximately 678 acres.
>
> The project site is located in the hills between the Silverado Trail and Lake Hennessey, about 2 miles northeast of Rutherford and 13 miles north of the City of Napa. The erosion control measures would be implemented in the proposed vineyard area, which would cover 161 acres (approximately 24 percent of the total 678 acres), while the existing site conditions would remain as is on 517 acres (approximately 76 percent of the total 678 acres). The vineyard layout was designed by the property owners to minimize the need for grading and tree removal.
>
> A new 10,000-gallon water tank and irrigation line would be installed for the vineyard. Ground water would be pumped from an existing well and be stored in the water tank. The existing well would also be shared and provide water to the Rutherford Volunteer Fire Department facility on Silverado Trail. The Rutherford Volunteer Fire facility would have their own separate 10,000-gallon water tank that would be screened from view by existing trees.

The comments in my January 21, 2007 letter still apply and I incorporate those comments by reference.

WIN TR-55 Model

Mathematical models to estimate storm peak discharge are powerful tools but they need to be carefully calibrated before their results can be trusted. The Draft Hydrologic Evaluation Rodgers Upper Range Vineyard Conversion prepared by HIS, October 2005 page 2-6 concurs.

> Due to the potential for flooding of Silverado Trail, if there is any increase in runoff from the project, it is recommended that a hydraulic model of the project site be developed. **The model should be calibrated to measured data collected at the project site.** The runoff characteristics for the post-project condition should be collected from runoff measured from an adjacent vineyard with similar geology, soils, and topography. (Emphasis Added)

The WIN TR-55 model (Trso, November 2006) does not appear to have been calibrated to local pre-project conditions. The peak flood flows predicted by the WIN TR-55 model for pre-project conditions do not appear to agree with USGS data collected in a nearly adjacent Lake Hennessey Tributary watershed between 1959 and 1973. See Figure 1 for a map showing the location of the USGS Lake Hennessey Tributary gage watershed. Figure 2 shows the soil map from the Upper Range DEIR showing the stream that the USGS measured the flood peaks on. The Lake Hennessey Tributary stream gage (USGS Station Number 11456400) was operated to collect data on the flood response of small watersheds. The watershed area of the Lake Hennessey Tributary stream gage is 1.04 square miles (665 acres). The soils, land use, vegetation, and topography of the watershed of the Lake Hennessey Tributary stream gage are similar to those of Rodgers Upper Range, especially the Lake Hennessey Gulch sub-basin.

Figure 6 shows the soil map (Figure 3-8 of HIS' Draft Hydrologic Evaluation) with the location of the USGS Lake Hennessey Tributary stream gage. The soil types mapping symbol is a three-digit number.

Table 1 shows the predicted peak flood discharges for pre-project conditions from Table 2, page 12, of Trso's November 2006 report. Table 1 also shows the peak flood discharges for the USGS flood peak data for the same return period storms Trso estimated. Note that the predicted discharges for Lake Hennessey Gulch on the Upper Range project are much higher than the discharges estimated for the USGS Lake Hennessey Tributary data, even though the watershed area of the Lake Hennessey Gulch is 34.7% of the USGS watershed.

The peak storm discharges predicted by the WIN TR-55 model do not appear to agree with regional peak discharge data from other USGS stations in the Napa River watershed. Table 2 shows data about the location and length of record for the USGS gaging stations used to construct the regional peak discharge graphs shown in Figures 3 and 4. Table 3 shows watershed area and peak storm discharges for the same return period storms used by Trso (November 2006). Figure 3 shows the 2-year peak storm discharge for the Rodgers Upper Range watersheds and for the USGS stream gages versus the watershed area. Figure 4 shows the similar data for the 10-year storm.

In both Figure 3 and 4 the peak flood discharges predicted by the WIN TR-55 model plot higher than the data for the USGS stream gages indicating that the WIN TR-55 model predicts a greater storm peak discharge for a given watershed area than the storm discharges measured by the USGS. It is important to note that the Lake Hennessey Tributary gaging station discharges plot below the regression line for the USGS stations in the Napa River, indicating that the storm runoff from that station is lower than would be expected based on the other USGS Napa River stations.

The pre-project WIN TR-55 storm discharge model does not appear to have been adequately calibrated since it greatly overestimates the storm discharge relative to the regional USGS data, for all flood frequencies. Table 1 compares the Lake Hennessey Tributary storm discharges to the storm discharges for the Upper Range sub-basins. The predicted storm discharges for both the Rodgers Southeast Gulch and the Lake Hennessey Gulch are greater than the storm discharges measured by the USGS even though the watershed upstream of the USGS stream gage (665.6 acres) is much larger than either the Rodgers Southeast Gulch (107.8 acres) or the Lake Hennessy Gulch (231.2 acres)

Since the WIN TR-55 model does not appear to have been calibrated against locally available measured data that represent the pre-project condition its results for the post-project condition are highly suspect. In my opinion, all conclusions based on the WIN TR-55 model should be discarded.

Table 1. Estimated peak discharge for selected return period storms modeled by the WIN TR-55 model. Data from Martin Trso, November 2006, Table 2, page 12 for existing conditions. The Lake Hennessey Tributary stream gage peak discharges for the give return period events were calculated from measure runoff events between 1959 and 1973. Note that the predicted discharges for Lake Hennessey Gulch on the Upper Range project are much higher than the discharges estimated for the USGS Lake Hennessey Tributary data, even though the watershed area of the Lake Hennessey Gulch is 34.7% of the USGS watershed.

	Area acres	Area sq-mi	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Rodgers Southwest Gulch	24.4	0.038	14.7	20.7	26.7	38.8	44.9	51
Rodgers South Gulch	52.5	0.082	29.5	42.2	55.3	81.8	95.1	108.4
Rodgers Southeast Gulch	107.8	0.168	63.1	88.5	114.4	166.7	192.8	219.1
Lake Hennessey Gulch	231.2	0.361	134.4	188.6	243.8	355.5	411.3	467
Sage Canyon Gulch	20.4	0.032	11	15.8	20.9	31.2	36.4	41.5
USGS Lake Hennessey Trib	665.6	1.04	56	103	134	173	203	231

Table 2. Location and length of record for USGS gaging stations in the Napa River watershed with peak discharge records.

Napa River Streams	Station #	Latitude	Longitude	Start of Record	End of Record	Years of Record
Lake Hennessy Tributary	11456400	382900	1222115	1959	1973	14
Sulphur Creek Nr St Helena	11455950	382916	1222850	1956	1973	18
Redwood near Napa	14458200	381904	1222035	1959	1973	15
Tulucay Creek near Napa	11458350	381709	1221629	1972	1983	12
Napa Creek at Napa	11458300	381807	1221810	1971	1983	13
Milliken Creek near Napa	11458100	382019	1221606	1971	1983	13
Dry Creek near Napa	11457000	382123	1222150	1952	1966	15
Napa River near St. Helena	11456000	382952	1222537	1929	1996	58

Table 3. Peak storm discharge for selected return period events for USGS stream gages in the Napa River watershed listed in Table 2.

Napa River Streams	Watershed Area (sq-miles)	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Lake Hennessy Tributary	1.04	56	103	134	173	203	231
Sulphur Creek Near St Helena	4.5	528	724	854	1,018	1,140	1,261
Redwood near Napa	9.79	1,007	1,341	1,563	1,843	2,051	2,257
Tulucay Creek near Napa	12.6	898	1,682	2,201	2,857	3,343	3,826
Napa Creek at Napa	14.9	1,472	2,441	3,083	3,893	4,494	5,091
Milliken Creek near Napa	17.3	1,649	2,778	3,525	4,470	5,171	5,867
Dry Creek near Napa	17.4	1,456	2,308	2,872	3,585	4,114	4,639
Napa River near St. Helena	81.4	5,879	9,276	11,526	14,368	16,477	18,570

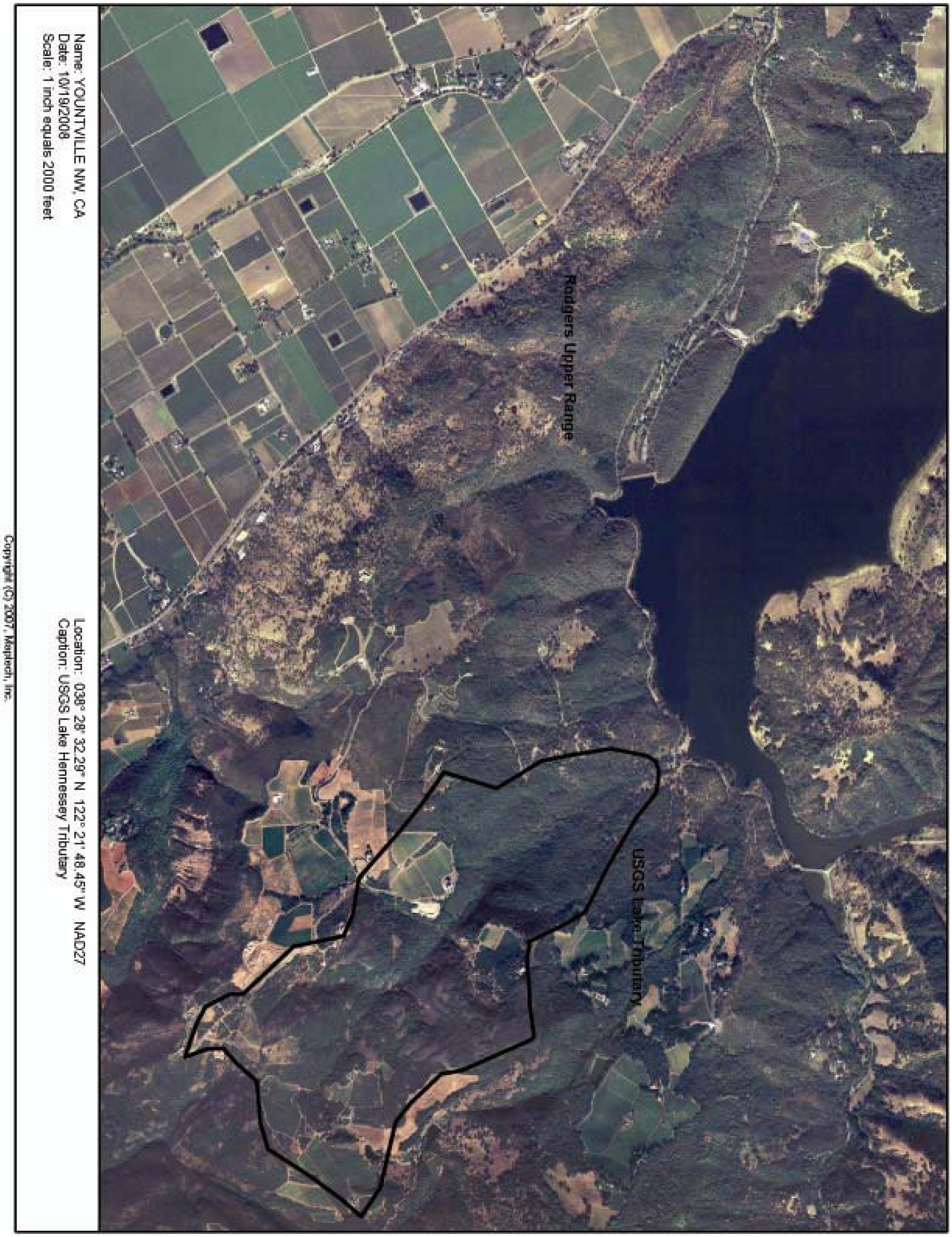

Figure 1. The USGS Lake Hennessy Tributary stream gage is almost adjacent to the Rodgers Upper Range project. The watershed area of the Lake Hennessey Tributary stream gage is 1.04 square miles.

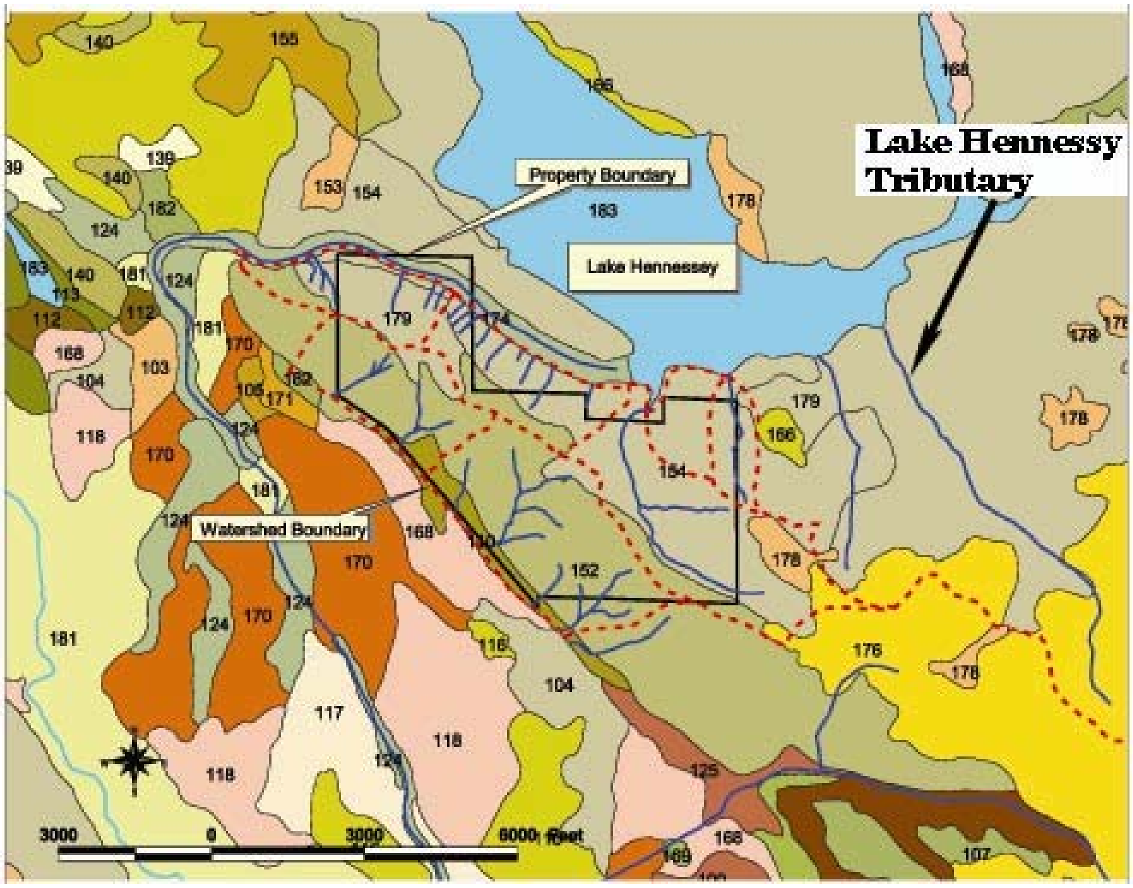

Figure 2. Soil map of the Rodgers Upper Range project showing the location of the stream that the USGS measured flood peaks on from 1959-1973. The stream gage name is Lake Hennessey Tributary and its station number is 11456400. The soil types in the watershed draining to the USGS gage are given below.

Napa County, California (CA055)
Map Unit Symbol Map Unit Name Acres

154 Henneke gravelly loam, 30 to 75 percent slopes.

176 Rock outcrop-Hambright complex, 50 to 75 percent slopes.

178 Sobrante loam, 5 to 30 percent slopes

179 Sobrante loam, 30 to 50 percent slopes

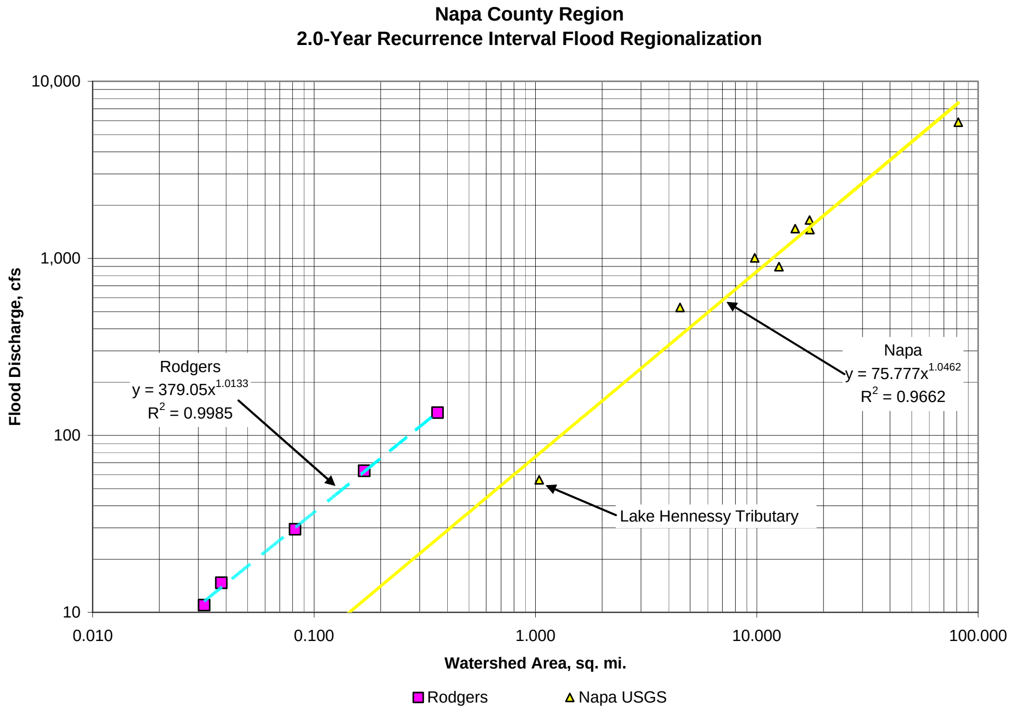

Figure 3. The estimated 2-year peak storm discharge for the Rodgers Upper Range watersheds do not agree with the 2-year storm discharge measured at USGS stream gages in the Napa River watershed.

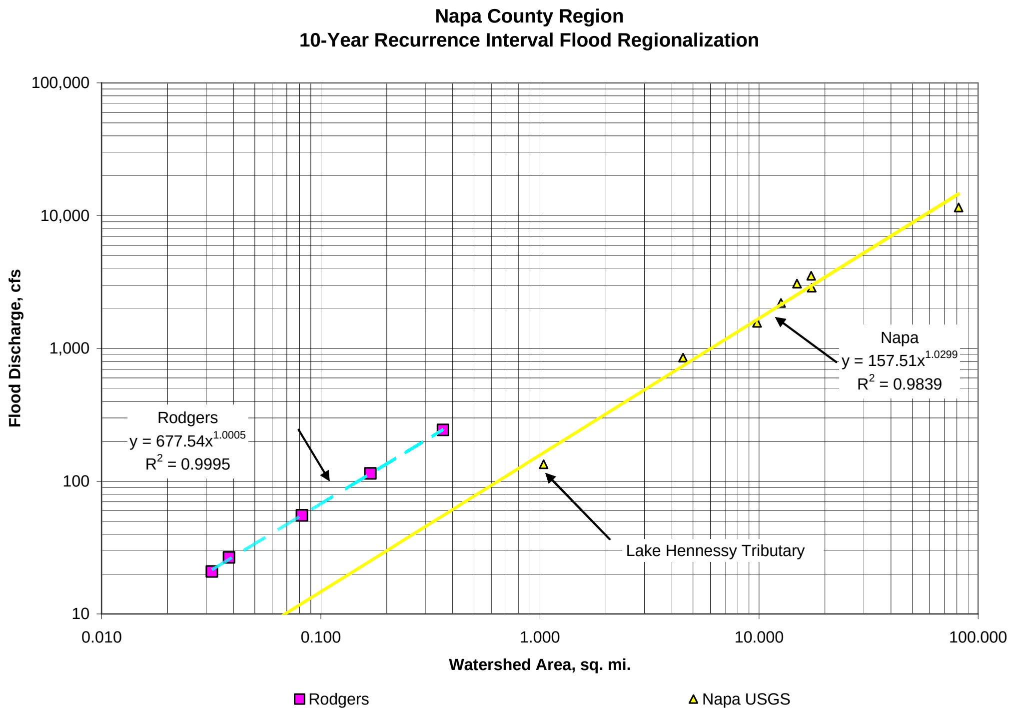

Figure 4. The estimated 10-year peak storm discharge for the Rodgers Upper Range watersheds do not agree with the 10-year storm discharge measured at USGS stream gages in the Napa River watershed.

Estimates of Mean Annual Rainfall

The December 2006 DEIR has three different estimates for the mean annual rainfall at the project site. Each of the mean annual rainfall values given in the DEIR are listed below. The mean annual rainfall is an important value since the groundwater recharge is estimated from it by subtraction estimates of evapotranspiration and annual runoff. The conclusions in the DEIR regarding groundwater recharge are suspect until a firm well-documented estimate of the mean annual rainfall is presented.

Author	Page	Mean Annual Precipitation	Reference
DEIR	4.4-4	24.28	City of Napa
HIS	2-4	26.40	Napa Hospital E30 607400
HIS	3-4	24.28	Table 3-1
HIS	3-6	27.08	ratio to Atlas Road Gage E20 0368

Groundwater Recharge Rates

The Supplemental DEIR does not include any discussion of groundwater recharge rates or water availability. The December 2007 DEIR discussion of Impact 4.4-3 on page 4.4-18 states:

> For CEQA purposes, the long term average natural rainfall recharge of the **groundwater body in question** should be greater than or equal to the estimated consumptive water use rate. (Emphasis Added)

The "groundwater body in question" is the groundwater body that the project production well is drawing water from. Figure 5 shows DEIR Figure 4.3-1, Soils, Fault Lines and Catchments. I have added the location of the project well from the Draft Hydrologic Evaluation (HSI, 2005) Figure 5-1. Figure 5 shows that the project well is in the Rodgers Southeast Gulch which drains an area of 107.8 acres. Only precipitation that falls on the Rodgers Southeast Gulch sub-basin is expected to recharge the well. The DEIR has not presented any information that demonstrates otherwise.

The December 2006 DEIR (page 4.4-4) gives the mean annual rainfall is 26.4 inches. As noted above, two other estimates of the mean annual rainfall are given in the DEIR. The true mean annual rainfall for the project area still needs to be determined and clearly presented.

Recognizing that the value of the mean annual rainfall in the following calculation may change, I proceed to go through the process used to estimate the groundwater recharge to show that it is flawed. The DEIR estimates that runoff is 7 inches per year and that evapotranspiration rate is 14 inches per year. The DEIR estimates the groundwater recharge by the following equation:

Groundwater Recharge = Rainfall – Evapotranspiration – Runoff

Putting in the numerical values gives:

Recharge = 26.4 inches rainfall – 14 inches evapotranspiration – 7 inches = 5.4 inches.

The estimated groundwater recharge is 20.45% of the mean annual precipitation. Groundwater recharge on the hillslopes in the Rodgers Upper Range project area is expected to only a fraction of the estimated 5.4 inches. Figure 5 shows that the runoff from both the Rodgers South Gulch and Rodgers Southeast Gulch soak into the valley floor to the west of Silverado Trail which is off the project property and upslope of the project well. The groundwater recharge estimated by the DEIR does not represent the level of recharge on the Rodgers Upper Range property. The estimated groundwater recharge may represent the recharge to the area that includes the area where the streams from Rodgers South Gulch and Rodgers Southeast Gulch soak into the valley floor west of Silverado Trail.

The Draft Hydrologic Evaluation (HIS, 2005) and the DEIR have not adequately defined the groundwater recharge to the project well. A significant portion of the Rodgers Upper Range property drains towards Lake Hennessey (HSI's Zone 1) and Conn Creek just downstream of Conn Dam (HSI's Zone 2). It is highly unlikely that any precipitation that falls on Zone 1 or Zone 2 would be able to provide recharge the project well. Solid geologic evidence needs to be presented that definitively shows where the recharge to the project well comes from. Until such evidence is presented it is reasonable to assume that the groundwater recharge that supplies the project well comes from the Rodgers Southeast Gulch sub-basin with an area of 107.8 acres. Assuming that the groundwater recharge to the Rodgers Southeast Gulch watershed is 10% of the mean annual rainfall and assuming that the actual mean annual rainfall for the project area is 26.4 inches we get a recharge of 2.64 inches (= 10% x 26.4") or 0.22 feet. Thus the total recharge from the Rodgers Southeast Gulch sub-basin is 0.22 feet x 107.8 acres = 23.7 acre-feet per year. This is far less than the estimated project water demand of 131 acre-feet per year (page 2-5 of HIS, 2005).

This indicates that the water production rate from the well (131 acre-feet) is over five times the estimated recharge rate from the Rodgers Southeast Gulch sub-basin.

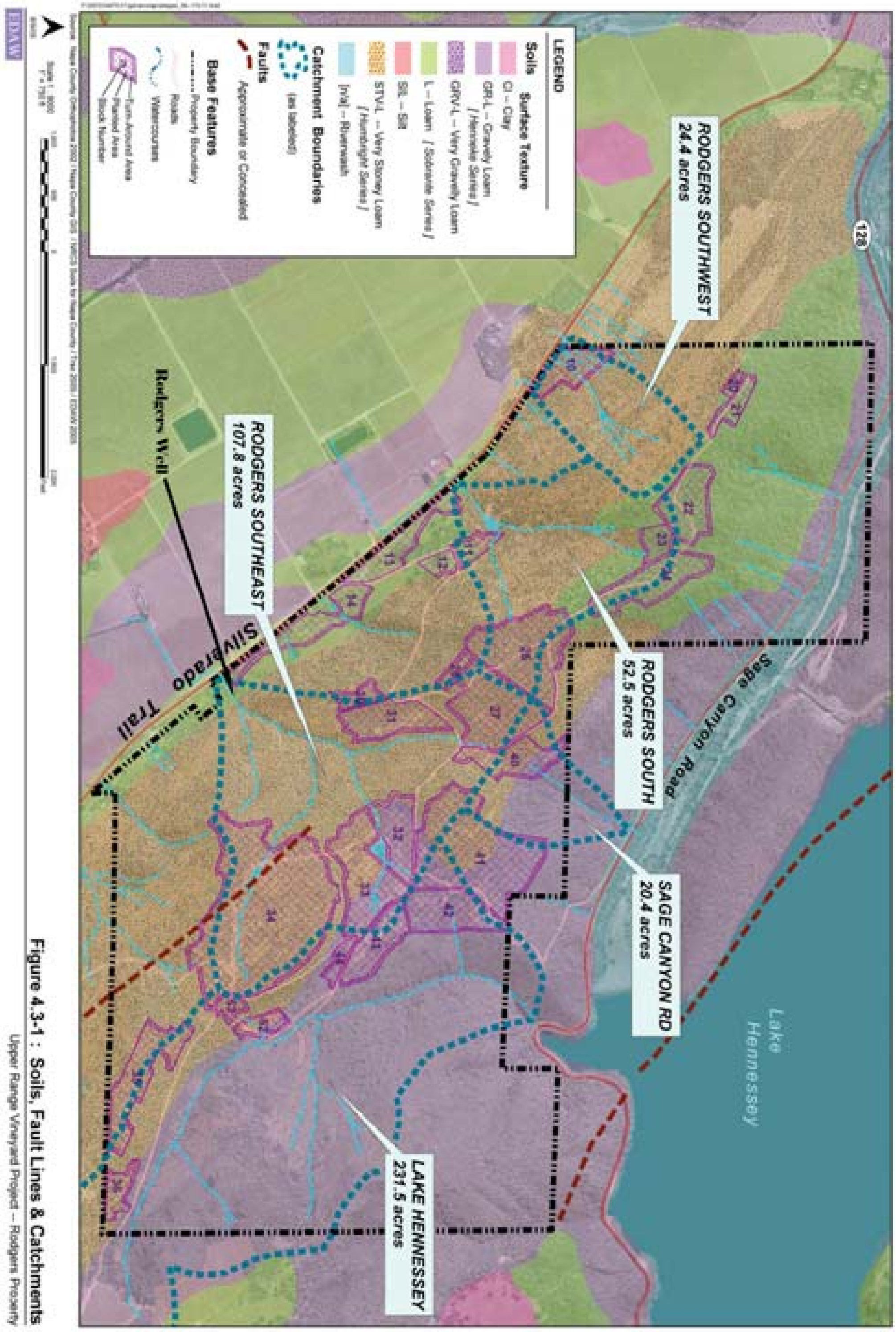

Figure 5. The Rodger Upper Range property boundaries, sub-basin boundaries and well location. Map is DEIR Figure 4.3-1. The location of the project well was taken from Figure 5-1 on page 5-2 of HSI's Draft Hydrologic Evaluation from the DEIR. The project well is in the Rodgers Southeast sub-basin and is east of Silverado Trail.

Well Test

The Rodgers/Upper Range Vineyard groundwater pumping test was a mix of a step-drawdown test and a constant-rate discharge test. However, instead of progressively *increasing* discharge, as in a standard step-drawdown test, the step-drawdown portion of the Rodgers/Upper Range pumping test was done by successively *decreasing* the discharge.

Standard texts such as Driscoll (1986) or Walton (1987) recommend that the pumping should have stopped after the step-drawdown test to allow the water surface to recover to the pre-test level prior to conducting the constant-rate discharge test. Driscoll (1986) notes that:

> Beginning a pumping test when the static water level is below normal may eliminate early data that show discharge or recharge boundaries. Without the early drawdown data, it may be impossible to obtain the correct transmissivity and storage parameters for the aquifer.

The phrase, “when the static water level is below normal” means when the water level in the well has not recovered to the pre-pumping level. In addition to conducting the well test in a way that clouds the value of the data collected. The first 6.5 hours of the actual pump test data for the Rodgers well (from 9:30 am on November 15, 2004 until 4 pm on November 15, 2004) are not reported in Appendix C of the Draft Hydrologic Evaluation (HIS, 2005). This prevents independent analysis of the well test data.

The observed drawdown in one of the neighboring wells (Riboli) was about 1.5 feet at the end of the pump test, approximately 31 hours and 20 minutes after the end of pumping. The drawdown began in the Riboli well sometime between 28 and 48 hours after the start of pumping. The report compares the 1.5 foot drawdown in the neighboring well to the 260 foot drawdown in the production well and concludes that there is no problem. The comparing the drawdown in a monitoring well (the Riboli well) to the drawdown in the production well is an absurd way to determine if the production well has the potential to adversely impact the neighbor’s well. The production well will always have a much larger drawdown than any nearby monitoring well. The other aspect of this comparison is that it looks at the drawdown in the neighbor’s well at the end of the 72-hour pump test. The real question is will the neighbor’s well be adversely impacted from the pumping of the project well at the end of the irrigation season. That is, what is the predicted drawdown in the Riboli well that can be attributed to the project pumping at the end of the irrigation season? The DEIR and the Draft Hydrologic Evaluation have not answered this question.

A new 72-hour constant-discharge test needs to be performed at a discharge rate of about 205 gpm which appears to be the sustainable pumping rate of the project well. The neighboring wells need to be monitored for at least 96 hours (24 hours after pumping ends) using recording water level equipment. The drawdown in the production well also needs to be record electronically. The resulting data should be analyzed by standard methods such as though presented in Driscoll (1986) to estimate the size of the zone of influence and the groundwater levels at the end of the pumping.

Given the fact that the realistic estimate of groundwater recharge to the Rodgers well is only a fraction of the project water demand, it is imperative that a new properly conducted 72-hour constant-discharge aquifer test be done to demonstrate that the aquifer supplying the well can adequately supply the project water demand and the water demand of the Rutherford Volunteer Fire facility and that the project will not progressively lower local groundwater levels over time in the and that pumping the project well does not adversely impact the neighboring wells.

The well test as conducted and analyzed does not support the conclusion that there will be no adverse impact to static groundwater levels or to the neighboring wells from pumping the project well.

Cumulative Impacts

Page 2-2 of the DEIR states that:

> A new 10,000-gallon water tank and irrigation line would be installed for the vineyard. Ground water would be pumped from an existing well and be stored in the water tank. The existing well would also be shared and provide water to the Rutherford Volunteer Fire Department facility on Silverado Trail. The Rutherford Volunteer Fire facility would have their own separate 10,000-gallon water tank that would be screened from view by existing trees.

Sharing the water pumped from the project well is a cumulative impact. The estimated annual water demand to supply the Rutherford Volunteer Fire facility needs to be estimated and included when determining if the project will adversely impact groundwater levels or neighboring wells.

Conclusion

The pre-project storm runoff peak discharges predicted by the WIN TR-55 model do not agree with USGS flood peak data collect just to the east of the Rodgers Upper Range project area. The predicted pre-project storm peaks also do not agree with regional USGS flood data. The WIN TR-55 model needs to be calibrated to the actual data collected by the USGS at the Lake Hennessey Tributary stream gauge. All conclusions about storm runoff and sediment loads in the project streams that use the uncalibrated WIN TR-55 model should be discarded.

The estimates of the mean annual rainfall are conflicting. The confusion regarding the true value makes it difficult to evaluate the merits of the Hydrologic Evaluation (HIS, 2005).

The groundwater recharge rates presented in the DEIR do not represent conditions on the Rodgers Upper Range project site. The groundwater recharge rates reflect the off-site recharge to the valley floor west of Silverado Trail.

I estimate that the groundwater recharge from the Rodgers Southeast Gulch sub-basin to the project well is on the order of 23.7 acre-feet per year. The DEIR does not present any solid geologic evidence that demonstrates that the project well would receive recharge from any other source other than the Rodgers Southeast Gulch sub-basin.

The well test was not performed or analyzed in a way that supports the conclusion that groundwater levels and the neighboring wells would not be adversely impacted at the end of the irrigation season from pumping the Rodgers well. A new 72-hour constant discharge test should be conducted at 205 gpm and the neighboring wells should be monitored for at least 96 hours. The drawdown data from the Rodgers well and all of the pertinent neighboring wells should be collected electronically with manual spot checking. The data should be analyzed by standard methods presented in Driscoll (1986).

Sharing water from the Rodgers well with the Rutherford Volunteer Fire facility is an unidentified cumulative impact of the project and should be analyzed. The water demand of the Rutherford Volunteer Fire facility should be included in the pumping demand and the impact of the combined pumping volume should be ascertained.

Sincerely,

Dennis Jackson
Hydrologist

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EXHIBIT 13

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January 21, 2007

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RE: Upper Range Vineyard Draft EIR of December, 2006
SCH # 2006022132

Dear Mr. Lippe:

You have asked me to evaluate the geologic and hydrologic sections of the dEIR for the Rodgers – Upper Range vineyard conversion in Napa County. I have coordinated with Dennis Jackson on parts of my response, and concur with his evaluation of the serious shortcomings of the groundwater impacts evaluation in this dEIR. I will briefly address this issue further and then address issues of impacts of increased runoff, increased sediment yield, and cumulative effects on the Napa River, Conn Creek and the Lake Hennessey reservoir.

1. The groundwater Impact evaluation is seriously flawed. The tests were not conducted for a sufficient time or under limiting summer drought conditions to establish that there were no significant reductions in static water tables in adjacent wells. The farther the “monitoring” wells away from the pumped well, the longer the time before a perturbation in water level is recorded. Assuming reasonable permeabilities out on the floodplain and porous alluvial fans, and noting that the single evaluated well on the subject property is much deeper than the domestic wells used as monitoring wells, I would estimate that no effects would be recorded in the most distant monitoring well for on the order of 5 days. The Rodgers well may even be in a totally different aquifer and/or substrate than the other observation wells. A further difficulty is that the single Rodgers well is so far from many of the vineyard blocks that it cannot reasonably serve all the projected water demands. We are not given any details of the design and well log for the primary Rodgers supply well. The testing was done in springtime when active recharge was occurring and the adjacent wells used for monitoring were probably not under significant stress. Basically, the testing was not in accord with fundamental principles of hydrogeological investigation. Further, as pointed out by Jackson, the water balance discussion seems to ignore the fact that the recharge area for the Rodgers supply well is but a small part of the total

Rodgers parcel and cannot supply the volume of water proposed in any sustainable fashion.

2. The “mechanical contouring” that Martin Trso reports is not described in any fashion that allows us to evaluate its impacts. The “ripping and tilling” that is described to prepare the vineyard blocks and remove stones greater than 4-inches in diameter is apparently different from the mechanical contouring, but I cannot be certain.

3. The site preparation by removing the very numerous stones in the dominant soil types (cf Henneke and Sobrante) is a serious concern. We have argued this case in Napa County vineyard conversions before. My discussions in the 2000 Pahlmeyer Vineyards [Napa Valley Hillside Vineyards] review and the 2001 Suscol Vineyard review should be incorporated herein by reference. The soils and conditions for those prior reports are similar to the Upper Range site under review today. To summarize those issues:

    a. The Soil Descriptions relied upon for the erosion control and erosion modeling are not adequate or accurate for soils that are ripped to 3 feet depth and raked to remove the stones. The stones armor the soil and have been moved to the surface and near the surface through long geologic time (18,000 to 200,000 years). Volcanic ash deposits that at one time mantled all of the various soil units have been incorporated into the subsoils through frost action, bioturbation, and many other soil processes. These fine grained volcanic materials have weathered to clays and have been washed out of some of the hilltop areas and most steep hillside sites. The photo on the cover of the EIR says it all to the geomorphologist. The surface stones need to be left in place or restored as stone mulch to achieve the projected reductions in erosion as was done at Suscol (South). Those projected estimates are based on the current soil descriptions and soil characteristics. The proposed actions will alter those conditions dramatically.

    b. The biggest concern that I have is the proposed deep ripping and raking of stone armor and the exposure of silt and clay rich subsoils derived from airfall volcanic ash. While eroding hillslopes may not deliver sediment to watercourses for many years to several decades, it will ultimately be transported by soil creep and sheetwash to the mainstem Napa River and Conn Creek. Short-term snapshots of sediment transport are useful but do not evaluate the long-term impacts of vineyard conversion. Erosion reduces site productivity. This is a one-way street. You cannot return to oak woodland and grazing with the exposed fine grained subsoils until those 10’s of thousands of years of accumulation of silt and clay are gone and a stony infertile bedrock remains. Yes, the present land uses are degrading the site and yes, the proposed vineyards may temporarily reverse the current trends. But without retransport of soils from the alluvial fans and rivers to the hilltops in the coming millennia, once we clear the protective stones from the surface soils, we are committed to energy and labor intensive site maintenance in perpetuity.

    c. Martin Trso argues that much of the proposed vineyard is “disconnected” from watercourses that lead to the Napa River, Conn Creek and Lake Hennessey. He thus discounts erosion from those vineyard blocks. It is important to realize that his approach is based on short-term geologic storage of sediments on- and off-site. By short-term, we mean decades but not millennia. Sediments delivered to vineyards and channels west of Silverado Trail may, indeed, be stored as accumulations of sediment in fields, grasslands, vineyards and drainage channels. Some of the eroded sediments will be deposited on the Rodgers property in low-gradient natural swales, grasslands, and the two on-site reservoirs. These are drainage systems that he considers as topographically isolated from the Napa County watercourses. But this concept is only valid from a short term perspective.

d. The proposed northern vineyard blocks drain directly to Conn Creek and thence into the Napa River. There are no low-gradient hillslopes or reservoirs that can temporarily capture sediments. The southeastern vineyard blocks will drain directly into Lake Hennessey. Only the western blocks and some of those near the ridgetop can be considered temporarily "disconnected". Because there is no closed internal drainage, all fine-grained sediments ultimately are discharged west of Silverado Trail or into the temporary North and South Rodgers ponds. Before extensive agricultural development of the Napa Valley floor, the ephemeral gullies carried infrequent runoff from the Rodgers property out onto the Napa River floodplain through small discontinuous gullies and swales. Most of these have been filled in and erased by intensive vineyard development. The culverts still exist under Silverado Trail and the soils eroded from the Rodgers hillsides are now supporting vineyards west of Silverado Trail. But the topographic map of the Valley Floor does not support the Trso contention that there are alluvial fans to capture sediments. For example, look at the drainages below proposed blocks 31-34. The 5-foot dotted contour intervals do not define an alluvial fan than can capture sediments and water from those proposed vineyard blocks.

e. Regrading or "mechanical contouring" and ripping and raking the protective stone cover will without doubt release fine-grained sediments from the vineyard blocks despite cover cropping and erosion control to capture those dislodged sediments. You can capture sediments on the property or close to it. But the only topographically "closed" portions of the parcel that can be seen on topographic maps are the two very small reservoirs. Those have limited capture capacity for the coarser sediment fractions only. Fine grained sediments pass directly through them under storm conditions. Even those ponds will fill and need to be emptied periodically, as will the capture capacities of hay bales and check-dams as proposed in the erosion control plans. Unless the sediments are routinely carried back to the specific sites of erosion, net site productivity will decrease. Ultimately, in 20-50 years, the ability to support cover crops declines so much that a new sediment yield equilibrium is reached and the so-called "disconnected" sediment storage sites on hillsides begin to be eroded to the watercourses below.

f. This loss of site productivity through erosive loss of subsoils has been observed widely in Europe, and has led to the mandate to preserve surface stones in vineyards and to bring in more stones from the river-beds where they are in short supply. The "stone-mulch" protected vineyards have much longer productivity, higher rainfall infiltration, and reduced sediment yield. The very act of ripping to 2-3 feet depth tears the carefully stratified soils apart. It may lead to short-term grape yield increases, and may facilitate some kinds of mechanized vineyard maintenance, but those gains are lost in 1-2 decades, and wine grape quality is permanently reduced thereafter. This is why smarter growers on the east side of Napa Valley reject the practices proposed for Upper Range.

4. The site is overgrazed and thus provides an opportunity to increase infiltration and reduce runoff as is modeled by HSI and Trso. But simply pulling the 50 cattle off the site would accomplish the same or better sediment reduction, without the need for a complex erosion control system that will demand continuous maintenance for millennia to come. Because the vineyard blocks are widely separated and the slopes are steep, maintenance during a 20-50 year interval intensity rainstorm will be next to impossible. It would require 20-30 people with shovels and emergency erosion control supplies to be on site throughout any intense rainfall.

5. The hydrologic evaluation (p. 3-22 and preceding tables) admits that a 31.5% increase in runoff at the Silverado Trail highway crossing is anticipated. Such a volume will possibly overwhelm any corrective actions that Napa County may have made recently to improve runoff capacity for this often flooded site. This increase is admitted but not considered further. The consequences of such increased runoff to the valley floor include a reduction in carrying capacity for floodwaters crossing Silverado Trail and increased maintenance costs for the County.

6. Unpaved roads will be constructed around the vineyard blocks. These will be seeded but may still be used for tractor and worker access, especially at fall harvest time when soils are dry. The EIR claims that the roads will reduce sediment yield (DEIR p 4.3-7). The reasoning escapes me. Apparently the assumption is that roads will break up sheet flow runoff and guide it to become infiltration. This simply violates all principles of hillslope soil hydrology. The roads comprise a restricted infiltration site surrounding each block that impedes infiltration before the water gets to the vineyard block where infiltration might be enhanced. I believe that this presumption may follow from incomplete use of the RUSLE equations that assume reduced slope lengths correspond to reduced erosion. But, in fact, the peripheral roads *increase* slope lengths by diverting runoff along the roads and around the vineyard blocks rather than directly down the slopes. The roads are purported to be “disconnected” from watercourses, thus not subject to increased sediment delivery. This, again, belies the short-term philosophical approach of Martin Trso who believes that sediments eroded from a hillside do no damage so long as they do not directly enter watercourses and can be stored indefinitely on the hillsides and in alluvial fans.

7. Cumulative Effects related to soils, sediments and runoff are of two general types, neither of which is adequately evaluated in the dEIR. First, the assimilative capacity of the region to accept increased sediment yield and/or runoff is reduced when the characteristics of the site are changed. For example, the west-flowing drainage ditches that carry runoff today from the Rodgers and adjacent hillsides toward Conn Creek and the Napa River are partly filled with sediment. These must be maintained by the valley-floor landowners and County

to carry runoff during times of high rainfall and local flooding. Increased sediment delivery to these drainage systems displaces runoff carrying capacity and leads to greater and longer saturation of the valley floor vineyards, which reduces quality of vines adjacent to these features or sites. Second, as soils erode on the hillside vineyard blocks, the finer silt and clay fractions that cannot be retained by the two ponds or other erosion control methods on-site ultimately reach the Napa River or Lake Hennessey. While the capacity of Lake Hennessey to capture silt and clay is high, the carrying capacity of Conn Creek below the reservoir and the Napa River itself are diminished. The models of sediment yield developed for this project separate the sediments that can be captured (sand and larger sizes) from the clay and fine silt particles that increase turbidity and pass off the Rodgers parcel. Not all of that increased turbidity can be captured in low-gradient hillsides or valley floor vineyards. Ultimately, over long times (centuries) soil creep rates increase to re-equilibrate the sediment transport capacity. This means that, on the hillside sites where runoff may spread out and allow sediments to be captured in vegetation, central controlling gullies ultimately reentrain those sediments in the 80 to 150 year time frame to deliver them to the trunk streams of the Napa River system. The more stone-armored hillsides that are cumulatively converted to unarmored vineyards, the more sediments are temporarily stored on hillsides and the deeper the mantle of soil that is creeping toward watercourses. Thus, ultimately, the more sediment is delivered to the Valley's trunk streams during high-intensity rainfall events of about a 20-year or greater return interval. Stormflow runoff increases cannot all be captured in the two tiny ponds or on the flat valley floor. Many of the hillsides of the present Rodgers parcel are deeply rilled and severely eroded. Conversion to vineyards can reduce sheet- and rill- flow and could lead to increased infiltration. However, subsoil properties are not discussed or demonstrated in the dEIR, so we cannot establish if, and for how long, increased infiltration can decrease storm runoff. Increased infiltration may change the frequency and character of storm flow runoff up to a limiting rainfall intensity. To model post-conversion cumulative hydrologic effects we need more thorough evaluation of post-conversion vineyard block soil hydrology.

8. My overall conclusions are that the draft EIR needs to be reconsidered and that better documentation and reasoning needs to be developed. Water resource demands may require new wells or different levels of application for temporally spaced new vineyard blocks. The implications of removal of surface stones and deep ripping must be modeled in light of the significant changes that such actions will make in soil properties. These changes will alter both the hydrology and sediment yield of the site for very long times (many centuries). These factors will create significant adverse impacts that have either not been evaluated or are not clearly discussed and revealed.

Robert R. Curry
Registered Professional Geologist

EXHIBIT 14

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www.forestdata.com tgaman@forestdata.com

Thomas Gaman, Registered Forester #1776

October 20, 2008

Memorandum to:

Tom Lippe, Attorney
329 Bryant St.; Ste D
San Francisco, CA 94107
Via email: lippelaw@sonic.net

Comments on the Supplemental Draft EIR for Upper Range Vineyard Project

1. Introduction.

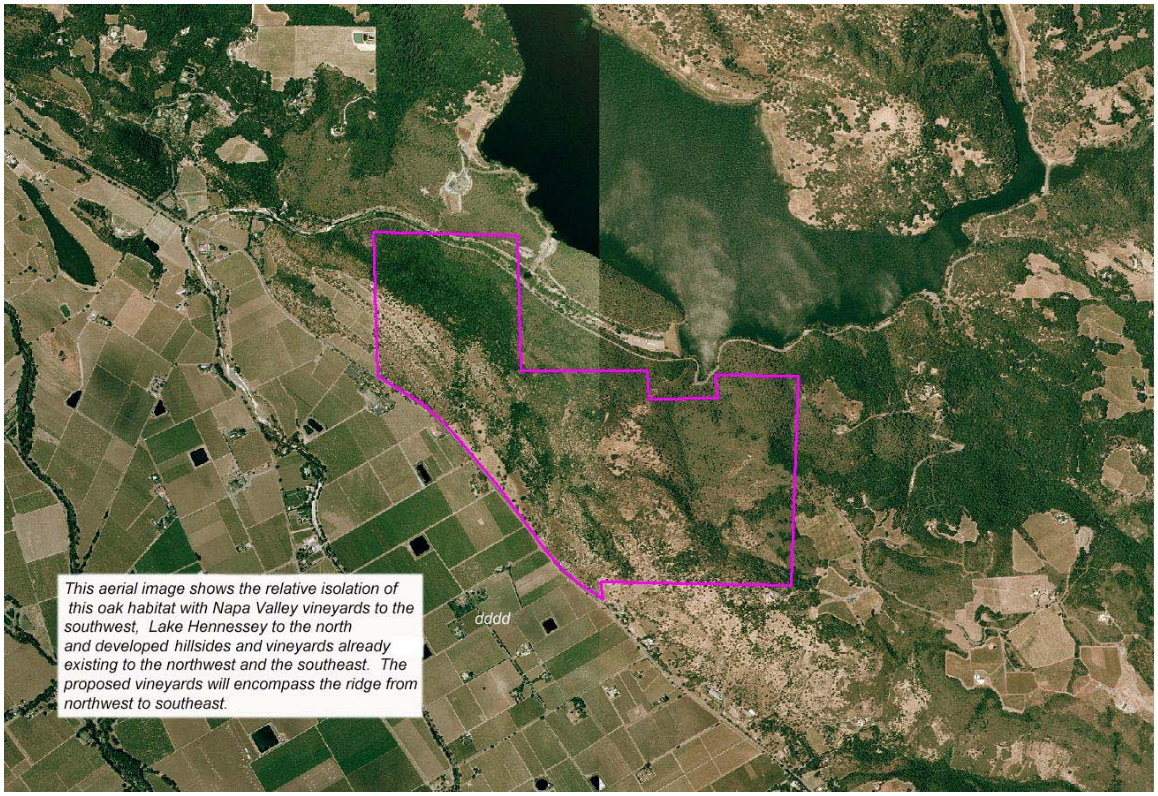
I have been asked by attorney Tom Lippe to provide a technical review and opinion of the DEIR for the Upper Range Vineyard Project. I have reviewed the Supplemental Draft EIR as available on the website and 3 project maps. My comments on the Supplemental DEIR address impacts of the 161-acre vineyard development as they relate to the following:

- significant project-level impacts of 121 acres of oak woodlands loss,
- loss of biodiversity, habitat corridors, open space and bald eagle winter habitat
- conflicts with Oak Woodlands Conservation Act
- climate impacts due to the loss of sequestered carbon.

2. Statement of Qualifications.

I have bachelors and masters degrees in forestry from University of California at Berkeley and from Yale University respectively. I am California Registered Professional Forester #1776, and have been an independent consulting forester since 1978. I am 100% owner of East-West Forestry Associates, Inc. and vice president of the California Oak Foundation. I have been active in oak woodlands inventory, management and conservation for many years. I have years of experience in virtually all forest and woodland associations throughout California. A resume is attached and a list of recent projects is available at our company website (*www.forestdata.com*).

3. Loss of Oak Woodlands. Oak woodlands to be removed include 46.2 acres of blue oak, 16.8 acres of coast live oak, and 57.9 acres of mixed blue/coastal oak. The loss of endemic blue oak woodlands is of great concern locally and throughout their range.



This aerial image shows the relative isolation of this oak habitat with Napa Valley vineyards to the southwest, Lake Hennessey to the north and developed hillsides and vineyards already existing to the northwest and the southeast. The proposed vineyards will encompass the ridge from northwest to southeast.

Map 1: Isolated oak woodlands will be lost at the edge of Napa Valley

Section 4.1.5 addresses "Potential Impacts and Mitigation Measures". Within that section Impact 4-1-1 identifies the loss of 121 acres of oak woodland habitat as "less than significant" at the project level. Apparently this assessment relies on an interpretation of the "Oak Woodland Impact Decision Guide – A Guide to Planners to Determine Significant Impacts". This document is not referenced in the bibliography of the DEIR or the Supplemental DEIR and so it is impossible to know what process was involved in making this determination.

The UC Integrated Hardwood Range Management Program has this year published the "Oak Woodlands Impact Decision Matrix"[1] which summarizes the thinking of 11 authors and a working group, all of whom are experts in the biology, inventory, management and other aspects of California oak woodlands science.

The authors of the decision matrix emphasize the importance of scientifically valid approaches and go on to cite the most important elements "for maintaining the integrity of oak woodlands, i.e. old trees/forests, maintaining rare and representative habitats, riparian corridors, water quality and quantity, ecosystem functions, and natural connectivity". Based upon evaluation of each of many biological factors the "Matrix" provides a methodology and standards for comparison, from which users can get an idea as to the level of significance of their projects. This is accomplished in 3 steps:

1. Establishing Site Condition;
2. Assessing Thresholds of Significance; and
3. Identifying Potential Mitigatory or Remedial Actions.

I used the Matrix to evaluate this project.

STEP1 -- Establishing Site Conditions: The current condition of the site is presently in a "'wild state' being managed for grazing, open space where all of the ecological functions are still being provided, i.e. , shade, ground water filtration, wildlife/fish habitat, nutrient cycling, wind/noise /dust abatement, carbon sequestration, etc". It easily meets the definition of "Intact Oak Woodland". As such it is of the highest ecological significance.

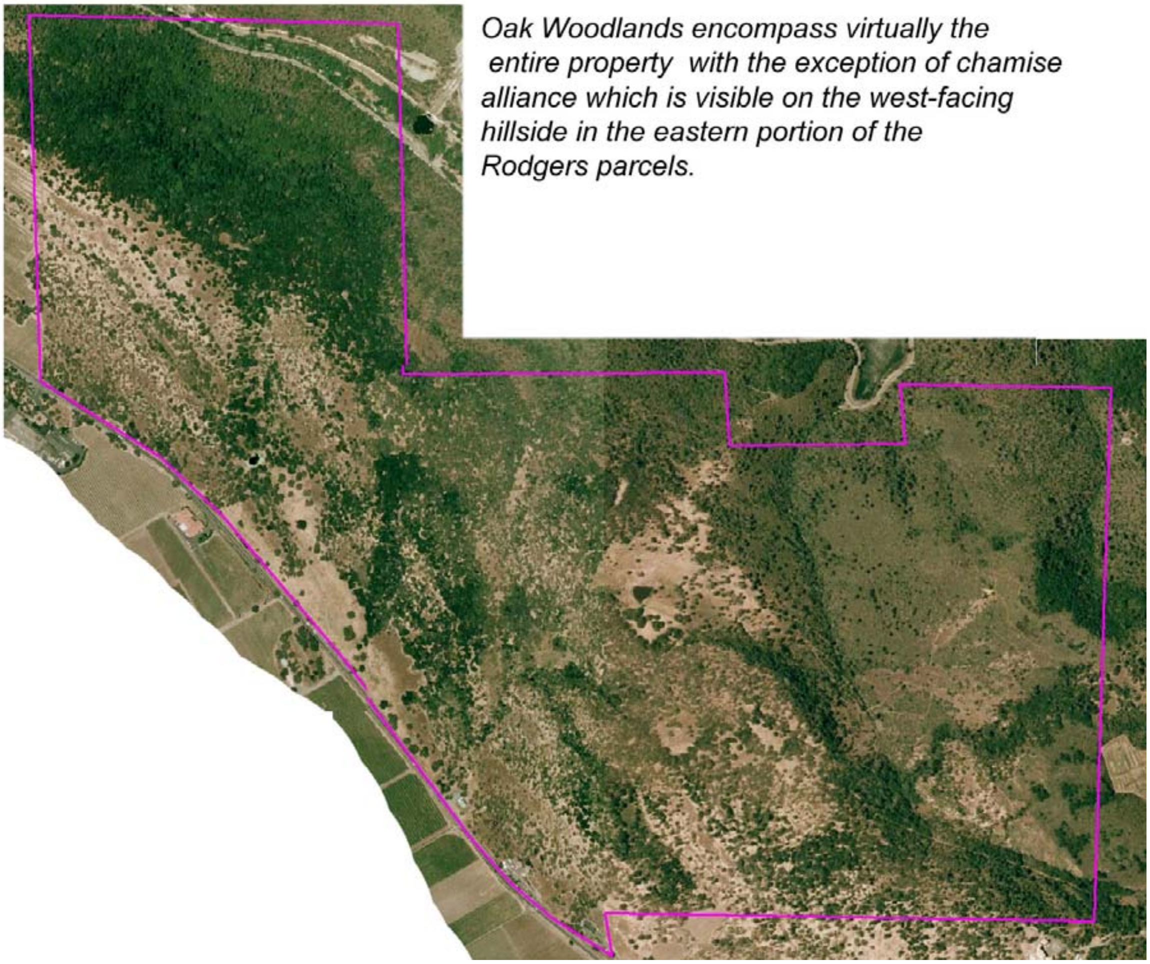
STEP 2 -- Threshold of Significance: The impacts of the project can be evaluated at 3 scales (landscape, site, and individual trees and groves). At the largest (landscape) scale the major factors for impact evaluation of the proposed "Upper Valley Range Vineyard Project" intact oak woodlands are listed below in Table 1.

[1] Giusti, Merenlender, Harris, Scott, Applebee, Marr, Stewart, Walker, Vance, McCreary and Motroni. **2008**. Oak Woodland Impact Decision Matrix: A Guide for Planner's to Determine Significant Impacts to Oaks as Required by SB1334 (Public Resources Code 21083.4). UC Integrated Hardwood Range Management Program, Berkeley, CA.

Table 1. Significance of Impacts on Intact Woodlands at the Landscape Scale

Impacts Prediction Matrix for Rodgers Intact Woodlands **Step 2: Assessing Thresholds of Significance**		**Degree of Impact**	
	high	***medium***	***low***
Checklist factor	*(Significant)*	*(Highly likely significant)*	*(Moderately significant)*
▪Net loss of oak woodland acreage.	√		
▪Increase habitat fragmentation.	√		
▪Loss of vertical and horizontal structural complexity.	√		
▪Loss of understory species diversity.	√		
▪Loss of food sources.	√		
▪Loss of nesting, denning, burrowing, hibernating, and roosting structures.	√		
▪Loss of habitats and refugia for sedentary species and those with special habitat requirements, i.e., mosses, lichens, rocks, native grasses and fungi.	√		
▪Net loss of oak woodland acreage.	√		
▪Road construction, grading, trenching, activities affecting changes in grade, other road-related impacts.	√		
▪Stream crossings, culverts, and road associated erosion and sediment inputs.	√		
Additional Considerations			
▪Loss of significant associated serpentine & perennial grassland types	√		
▪Loss of significant natural cover on an isolated hilltop ecosystem	√		

All of the items suggested by the Matrix (plus two additional considerations that I felt are relevant to this site) are listed in Table 1. I have evaluated each item to be of high impact and therefore significant. At the site (up to 3 acres) and individual tree or grove levels, they also remain significant impacts, each as a contributor to the loss of biodiversity.

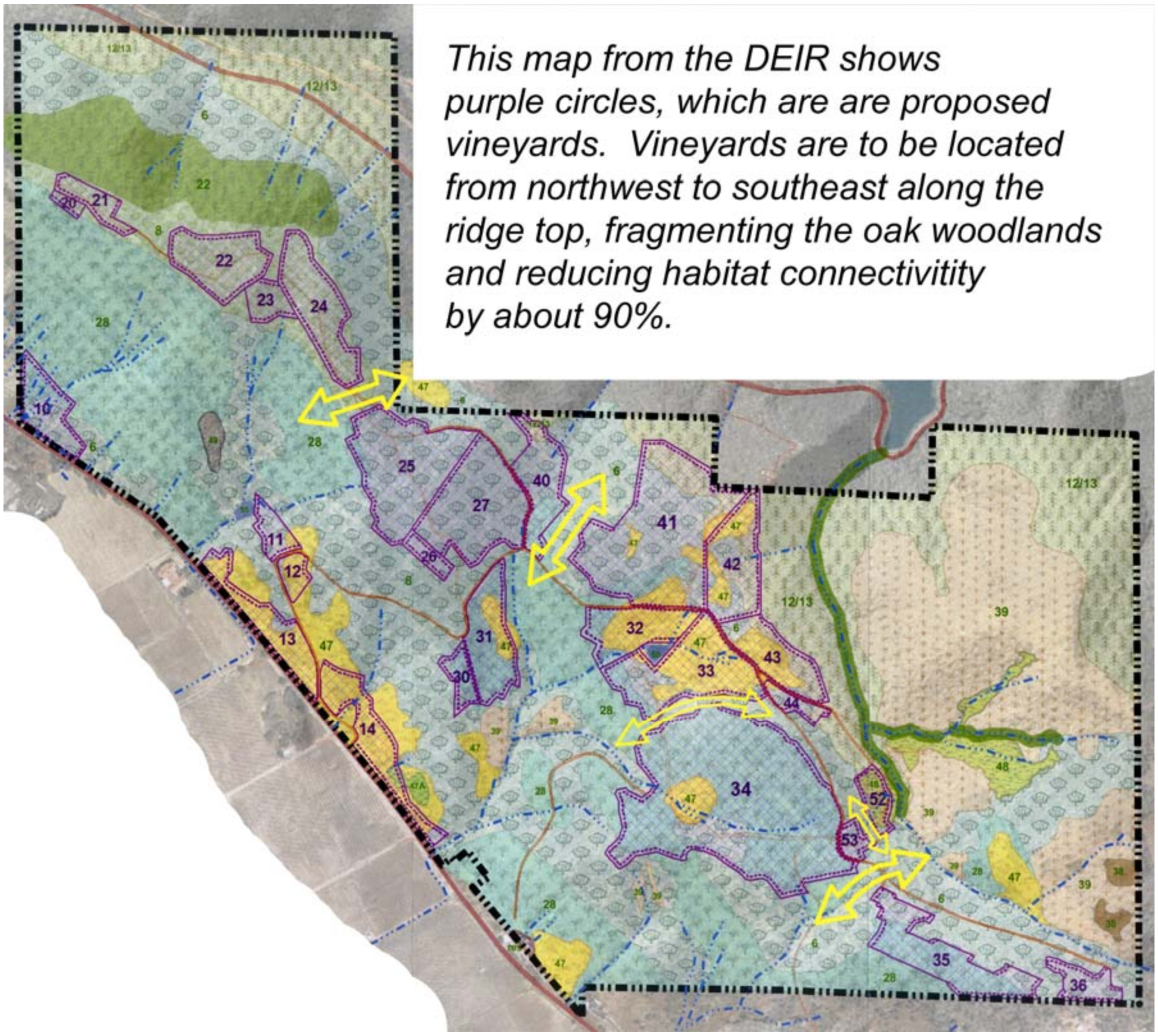


Map 2: Oak Woodlands of the Rodgers Parcels

Detailed examination of the imagery generalized in Map 2 above shows that most of the entire property is comprised of diverse oak woodland types. All of the above impacts will occur over the 121 acres of woodland to be removed per this project, and all will become significant project level losses on the east side of Napa Valley.

STEP3: Identifying Potential Mitigatory or Remedial Actions. Since there are significant impacts on oak woodlands the DEIR submitter "should include mitigation measures designed to avoid, minimize, or compensate the impacts"[2]. Since these are significant local project level impacts, avoidance and mitigation are preferably accomplished on site.

[2] Guisti et al. 2008. See Footnote #1



Map 3: Vineyards on the Ridge will fragment remaining woodlands

Analysis

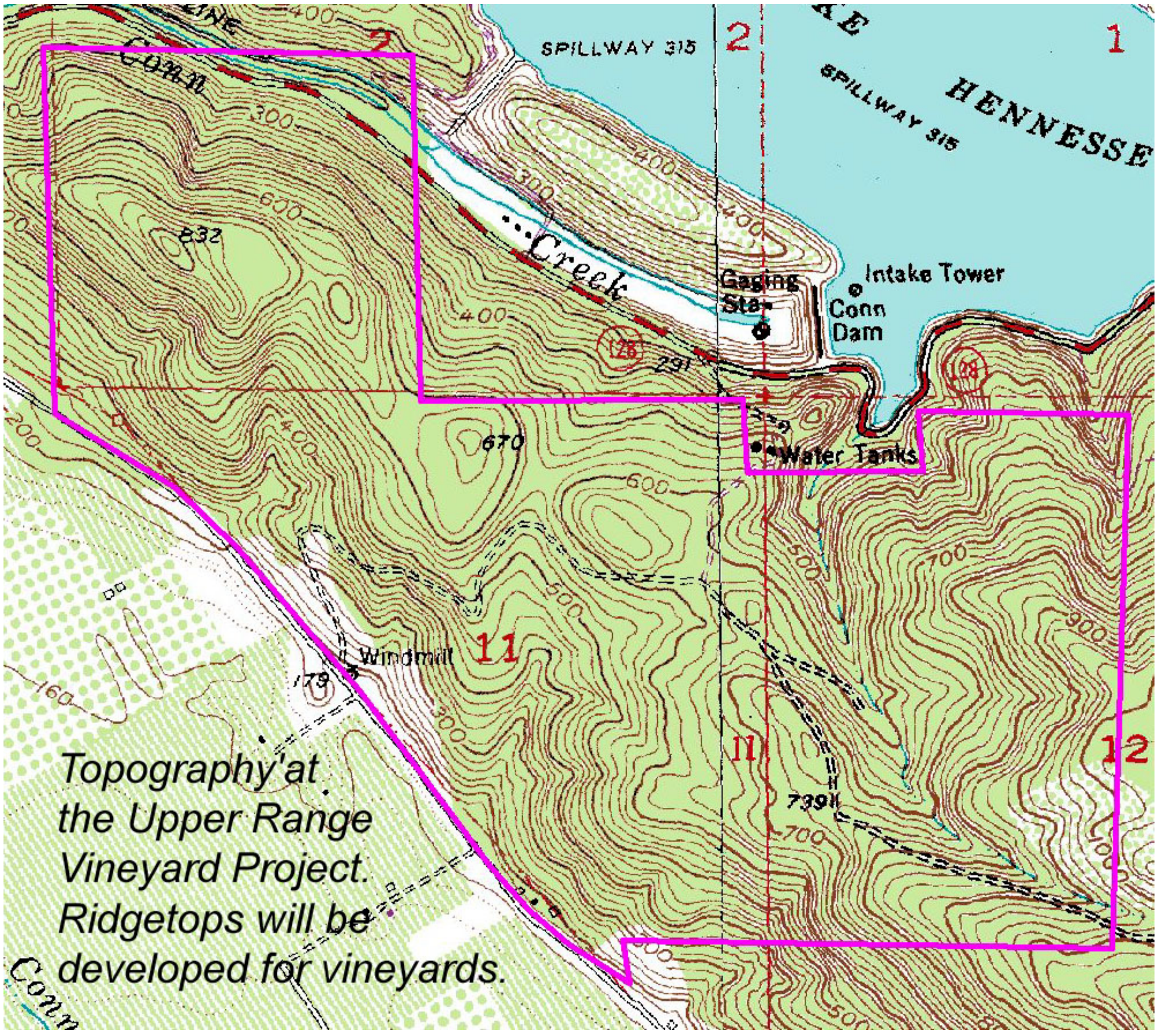
I obtained the satellite imagery and topographic maps, and reviewed the property and vineyard development plans in some detail. The vineyards will be located mostly along the ridgetop, as those are the only areas that are not limited by slope and include primary productive soils (PPS). I note there are 5 proposed habitat corridors, each 50 to 200 feet in width, which collectively appear to total a width about 700 feet along the 8000 ft. ridgeline.

The DEIR does acknowledge that the removal of oak woodlands is a significant regional cumulative effect. The plan proposes mitigation measure 5-2-1 which will preserve (on the steepest slopes) “242 acres of oak woodland habitat via a deed restriction or other covenant”. If this level of oak woodland conservation cannot be achieved then restoration of habitat on or off-site and in-lieu fees are otherwise proposed. The Oak Woodland Conservation Act of 2001 requires mitigation for loss of oak woodlands. Mitigation possibilities include conservation easements, planting and restoration of oak woodlands, and contributions to the Oak Woodlands Conservation Fund administered by the WCB. While some of these may be feasible and have been loosely proposed, the DEIR erroneously contends that the project is exempt from the Oak Woodlands Conservation Act because this is agricultural land. While it is true that PRC 21083.4.d(3) does exempt "Conversion of oak woodlands on agricultural land that includes land that is used to produce or process plant and animal products for commercial purposes", there is no evidence that this is agricultural land. It is oak woodland, chaparral, serpentine and grassland, and as such it is not exempt from the Oak Woodlands Conservation Act.

CONCLUSION: Oak habitat loss is of great concern and significance at the project level. This project area is an island of biodiversity surrounded by the Napa Valley monoculture of vineyards, Lake Hennessey, other cleared lands, and 2 highways. The proposed vineyard development will impact the entire hilltop landscape by eliminating much of the native oak woodland, serpentine, and native perennial grass habitat between Lake Hennessey and Napa Valley. Bald eagles and listed species are known to regularly utilize the area for winter habitat. Virtually all of the land in the lower slope categories will be converted to vineyards. Habitat will be dramatically fragmented and wildlife corridors will be reduced by 90%. There will be locally significant environmental impacts.

The DEIR chapter 4-1-1 provides no rationale for its determination that the impact of this extensive removal of oak woodland is "less than significant", and I simply do not understand how they arrived at that conclusion. Strict plans and measures should be put in place to assure that his proposed project, which has significant localized impacts and region wide cumulative effects, is designed to assure that its impacts are considered and mitigated at every level.

I do not know of a way to mitigate an impact of this magnitude except to dramatically reduce the project size and scope.



Map 4: Topography at the Upper Valley Vineyard

4. Carbon and Climate Change

Section 5 addresses the significant CEQA required discussion of Climate Change. While acknowledging that "it is thought that the removal of oak woodlands and soil disturbance associated with conversion of oak woodlands to vineyards results in releases of CO_2", the document goes on to suggest that such biological carbon losses will be mitigated by the existence of carbon in grape vines, cover crops and other organic matter. The report concludes that "Napa County does not consider the project's contribution to global climate change to be 'considerable'".

In fact, the California Climate Action Registry provides tools with which to quantify these emissions in its forest protocols[3]. Following those protocols The California Oak Foundation has published "An Inventory of Carbon and California Oaks"[4] which is part of its series Oaks2040, (which is referenced here and in the DEIR). The inventory uses

3 California Climate Action Registry. 2007. FOREST PROJECT PROTOCOL Version 2.1 September 2007 available at http://www.climateregistry.org/

4 Tom Gaman. 2008. An Inventory of Carbon and California Oaks. California Oak Foundation. Available at www.californiaoaks.org/2040.html

thousands of US Forest Service woodland monitoring points to demonstrate that California oak woodlands, if protected, enhanced and restored, could sequester up to a billion tons of carbon in this century.

The Carbon Inventory shows that, based upon an average of similar inventory plots in the Sacramento region, 1621 metric tons of carbon will be removed simply by clear cutting the trees; but that is only the beginning. An additional estimated 4098 tons of stored carbon in associated carbon pools (understory shrubbery, down woody debris, duff and litter and soil organics) will be mostly lost. My opinion is that 121 acres of mature grapevines can store nowhere near the 5700 tons of carbon presently stored in this woodland. These estimates do not take into account the emissions associated with constructing and ongoing maintenance of the proposed vineyards. Implementation of the project also means forfeiture of the natural capacity of at least 121 acres of woodland to sequester carbon dioxide and absorb auto emissions and atmospheric pollutants that are emitted in the nearby Napa Valley transportation corridors.

Respectfully submitted by:

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RESUME
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Forest Planning and Management
Natural Resources Inventory and Environmental Monitoring
Geographic Information Systems, Remote Sensing and Applications Programming
Urban and Community Forestry
Project Organization and Management

EDUCATION:

Yale University, New Haven, CT Master of Forestry May 1981
University of California, Berkeley, CA B.S. Forestry June 1972
Washington University, St. Louis, MO Biology 1968-70

PROFESSIONAL EXPERIENCE:

Forest and Land Management: Consultant forester since 1978. President of East-West Forestry Associates, Inc. Preparing management plans and compliance documents for private and public landowners, administering forest management and fire hazard mitigation activities in eastern and western US. Formerly Forest Stewardship Council "Smartwood" Certified. California Climate Action Registry carbon certifier for forest protocols.

Remote Sensing, Geographic Information Systems, Global Positioning Systems, Electronic Mapping, Software development/programming. Helped developed, maintain and own rights to BaseMap2000 GIS, Factal/Appraise Inventory Software. Also Arc-Info & ArcView GIS licensed. 7 Trimble and Garmin GPS Units. Developed numerous GIS databases for clients mostly in California, including Hoopa Reservation, Crane Mills, Marin Municipal Water District, Asilomar Conference Center, San Francisco Water District, Sierra Club, Tenana Chiefs and others. VB 6.0, Fortran 90, MapObjects, and html Programming. Authored "ForestServer" FIA analysis and other forst inventory software and numerous utilities.

Forest Inventory and Environmental Monitoring. Contract development and/or implementation of forest inventories for all Region 5 National. Inventoried Jackson State Forest and developed methodologies for inventory of Georgia-Pacific Corp.'s redwood forest lands. Developed numerous statistical inventory procedures. Extensive international experience.

Education: Active involvement as a volunteer in numerous educational programs. Active as vice-president of the California Oak Foundation, treasurer of the Environmental Action Commiteee of West Marin, California Urban Forest Advisory Council member, Amigos de las Americas (Marin Chapter) Board. Member of the Forest Guild and Society of American Foresters.

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Mike Napolitano
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San Francisco Bay
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July 5, 2009

Re: Proposed Basin Plan Amendment for the Napa River Sediment TMDL

Dear Mr. Napolitano:

Thank you for the opportunity to comment on the Napa River Sediment TMDL. The document is based on an impressive scientific review of the impairments to salmonid health in the river. We appreciate the attention to voluntary efforts, such as Rutherford DUST and the Fish Friendly Farming program, which lessen, but do not obliterate, the need for regulatory enforcement action. Our concerns and questions relate to effective implementation and monitoring of the plan.

1) Waste Discharge Requirement (WDR) standards. It is apparent that the WDR standards will be key to the success of this TMDL in achieving sediment loads hospitable to salmonid spawning. It is unfortunate that development of the WDR standards has been left to a later date. We request the Water Board to establish a short timeline to promptly develop these standards, as well as the waiver specifications, since the success of this TMDL program will depend largely on the adequacy of the standards along with effective implementation and monitoring . The Sierra Club plans to closely examine the upcoming WDR's and waivers to assure that they will provide effective remediation of sediment discharges.

2) The document does not do an adequate job of specifying numeric targets for the habitat enhancement goals. In addition, timeframes expected for both implementation of remediation measures and achievement of targets need to be made explicit. We would contrast the lack of numeric targets as well as implementation and review shedules with the Garcia River Sediment TMDL, where these items are both explicitly defined, and easily comprehended by being arranged in tables. We did not find schedules, numerical targets or standards for the following:

> a) The year 2025 is found in other documents as the goal for achieving the target sediment reductions, permeability standards, and collective stewardship efforts. But we could not find that 2025 goal in this document. It needs to be plainly cited. (Interim goals of for sediment reduction of 25% by 2017, and 37% by

2022 are listed.)

b) The plan calls for the State Dept. of Parks & Rec and the Napa County Stormwater Mgmt Program to develop standards for protection of large woody debris by the Fall of 2010 (Table 5.1), but there is no deadline for program implementation, nor are there scheduled assessment intervals for monitoring of the implementation In addition, no numeric or objective target is listed for improvement in woody debris, only "enhancing the quality of rearing habitat for juvenile salmonids".

c) Remediation of unimproved roads calls for adoption of "best management practices" by road managers (Table 4.4). However, there is no indication of acceptable sources for those "best management practices". Nor is there an indication of how frequently reports on implementation of road improvements will be required, nor any schedule for implementation (for example, a certain percentage of substandard stream crossings to be improved annually).

d) The time frame for removal of barriers for fish passage is to be established "by consultation with NOAA and DFG" (table 5.3), but there is no deadline for when that consultation will occur, nor for when the timeframe for removal of barriers will be established*.* The consultation and establishment of the timeframe for barrier removal should be accomplished and incorporated into this document.

e) Temperature is listed as a stressor, with action items (Table 5.4), but there is no plan for temperature monitoring or for measureable goals.

3) The delay inherent in development of such complex policies has left landowners uncertain how to proceed to meet regulatory requirements. Many are looking for ways to effectively manage their lands both for economic productivity, and to meet broader environmental concerns. We encourage the Board to engage in vigorous outreach to landowners to help them understand means of compliance with regulations.

We recognize that voluntary efforts can be effective in addressing stream restoration and performing other beneficial activities in a more coordinated and comprehensive, and therefore more effective and efficient manner, than having each individual landowner work in isolation. As a program participant, the Board is aware that the Napa Green Certification program for Fish Friendly Farming has been extremely successful in terms of the acreage covered.   Two stewardship groups along the Napa mainstem are expected to make substantial contributions to erosion control and riparian enhancement. The Garcia River sediment Action Plan "encourages groups of dischargers with similar land management activities to develop collective watershed based Erosion Control Plans…" that should be considered as an option here.

We would like to see a requirement for a no less than annual report card on progress toward meeting the goals of the Habitat Enforcement Plan. That report should include a discussion of the progress of the Napa Green program and cooperative riparian landowner groups, with total acreage covered, a watershed-wide parcel map showing which parcels are participating, what efforts are being made to expand participation, and an assessment of how effective the programs are in achieving goals that impact the TMDL.

4) The TMDL cites low base streamflows as the primary limiting factor in establishing sustainable steelhead populations.

We strongly support the Board's determination that waivers of the WDR's will not be granted unless applicants have cleared their water rights.

We would like the Water Board to emphasize the importance to achieving TMDL goals of investigating and sanctioning illegal water diversions/impoundments within the Napa River Watershed, and to work with the County to utilize GIS parcel overlays to identify and correct the problem.

We appreciate the SF Bay Board's submission of a comment letter to the North Coast Board regarding the Draft North Coast Instream Flow Policy (Wolfe, May 1, 2008). In that letter the SF Board calls for increased attention to compliance inspection and enforcement of water diversion law. They further call for the Napa River watershed to be scheduled for diversion survey and enforcement, and offer to assist in adding streamflow gaging sites on small streams. The Board further recognizes the goodwill of many landowners, who are ready to improve their diversion practices and would benefit from a streamlined petition process. These would all be helpful actions in improving baseflow.

5) Ongoing monitoring will be essential to judging the success of this BPA . We strongly support the addition of at least 10 low-flow tributary stream gauges to create a long-term water supply data base, and to assist in managing stream flow.

6) The responsible party for implementation monitoring of required sediment control and habitat enhancement actions are "landowners or their designated agents". Where is the effective oversight of the self-monitoring, to assure that it is reliable? It is imperative that oversight be maintained for implementation measures, not just for private landowners, but for state, county, and municipal agencies that either own land or are responsible for the maintenance of infrastructure such as roads which contribute to sediment pollution.

7) The Water Board is to monitor upslope effectiveness of sediment control actions. The monitoring plan needs greater specificity in monitoring protocols, definitions of effectiveness of control actions, and frequency and extent of monitoring. We note that the in-channel effectiveness monitoring plan is much more specific, for example, calling for examining at least 150 spawning sites and defining optimal frequency. A letter previously submitted by Dr. Curry spells out some of the components of an effective storm runoff monitoring program as follows:

> "there must be a provision for monitoring on the scale of small watersheds of 1 – 5 square miles area….Monitoring must include both the effectiveness of on-site cover-crop implementation and downstream offsite channel stability".

8) The Adaptive Implementation concept calls for "regular" updating of the plan, without specifying intervals. The year 2017 is too late for the first review of the implementation plan. The Garcia River TMDL calls for plan evaluation and update at three-year intervals and requires that these evaluations include both a review of the implementation measures which have been accomplished, and the progress toward achieving the numeric targets. These updates are to be open to public input. We would like to see assurance of similar timely, thorough, and open plan review. We second the Water Board in their calls for on-going study of the health of the salmonid population. It recognizes that the final outcome we are all striving for is not sediment or scour or incision targets, but rather a healthy ecology as measured by its living inhabitants.

9) Watershed rehabilitation is a developing science. Fish Friendly Farming and any other programs which are accepted for regulatory compliance should regularly assess the success of their protocols in light of both their own experience, and the most up to date watershed science, in order to continuously refine landowner practices.

10) Groundwater depletion may be contributing to lower flows in the river, as well as to channel incision. Dennis Jackson's most recent comments address this issue. Napa County has recently contracted with the firm of Luhdorff and Scalmanini to produce a "Comprehensive Groundwater Monitoring Program, Data Review, and Policy Recommendations for Napa County's Groundwater Resources". The first report, due in January of 2010, will include a comprehensive survey of the current knowledge base on Napa groundwater resources, as well as recommendations for new studies to remedy data gaps. We recommend that as part of the Adaptive Implementation of the TMDL plan, the Water Board review and incorporate the results of these studies, and also that the Board participate actively with the County in designing studies which will examine the contributions of groundwater extraction to channel incision and low flows. As the data base is improved, the implementation plan should be amended as indicated to remedy any effects of groundwater extraction on the salmonid habitat.

Respectfully submitted,

Nancy Tamarisk
Conservation Committee Chair
Sierra Club, Napa Group of Redwood Chapter

nancy@aya.yale.edu

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
777 Sonoma Avenue, Suite 325
Santa Rosa, California 95404

July 1, 2009

Mike Napolitano
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
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Dear Mr. Napolitano,

The National Marine Fisheries Service (NMFS) thanks you for the opportunity to comment on the revised Napa River Watershed Sediment Total Maximum Daily Load (TMDL) and Habitat Enhancement Plan dated May 2009. NMFS has followed this process since the limiting factors analysis report in 2002 identified excessive sedimentation as a factor limiting populations of Central California Coast (CCC) steelhead . CCC steelhead were listed as a threatened species under the Federal Endangered Species Act in 1996 (62 FR 43937). An updated status review of West Coast steelhead was completed in 2004 and this distinct population segment (DPS) of steelhead was reaffirmed as threatened on January 5, 2006 (71 FR 834). Portions of the Napa River and several of its tributaries are designated critical habitat (70 FR 52488).

NMFS continues its strong support for the TMDL and Habitat Enhancement Plan. We have previously commented on and supported earlier versions of the TMDL. We reviewed the latest version which significantly expands upon its California Environmental Quality Act (CEQA) analysis in response to public comments on the previous version. NMFS continues to believe that implementing actions called for in the TMDL will aid in the recovery of CCC steelhead in the watershed and benefit the river's Chinook salmon population.

The implementation plan continues to call upon NMFS to participate in forums related to: 1) addressing low flow/water supply and fisheries conservation concerns; 2) considering reservoir bypass flow requirements to protect salmonids; 3) to aid in planning a water rights compliance survey to be conducted by the County of Napa and the State Water Board Division of Water Rights; and 4) to help identify and remedy significant structural impediments to salmonid migration in ten tributaries. As stated previously, NMFS will participate in these forums as well as continuing our participation in other projects related to the implementation plan such as the Upper York Creek dam removal, the Napa Green Certification program and the Watershed Information Center and Conservancy technical advisory committee. We will also intersect with portions of the TMDL implementation plan in our ESA and the Magnuson Stevens Fishery Conservation and Management Act consultation capacities. NMFS has staff resources which may prove helpful including expertise in fish biology, engineering, fluvial geomorphology and water quality.

NMFS also supports other actions and/or concepts presented in the staff report such as sediment source-control cooperatives to maximize treatment efficacy while controlling costs, a census of steelhead and salmon populations, expansion of stewardship groups to achieve large-scale enhancements of stream and riparian conditions, the recognition of the Napa Green Certification Program as a TMDL compliance option, the development of residual dry matter targets on grazed land through cooperation with the University of California Cooperative Extension, the installation of dial-up stream flow gages for planning irrigation on at least ten tributaries, protection of ecologically significant large woody debris by public works and parks agency staff and the adoption of ecologically superior design alternatives for channel restoration projects.

In closing, NMFS thanks you for the coordination opportunities you provided as this TMDL was being developed. The ability to provide input was appreciated and NMFS is pleased to see many of our suggestions incorporated in this proposed plan. As the implementation goes forward, it is certain that new questions, concerns or approaches will emerge as information is gathered and discussions take place among the stakeholders. We will continue to participate as the Regional Board addresses these situations through adaptive management processes. NMFS strongly supports the proposed TMDL and believes it will aid in the recovery of the ESA listed CCC steelhead trout and benefit the fall-run Chinook salmon population in the system. We hope that the plan can finally be approved by the Regional Board and that the implementation actions called for in the plan can begin in earnest. Please call Joe Dillon of my staff at (707) 575-6093 with any questions.

Sincerely,

Steve Edmondson
Northern California Habitat Supervisor

cc: Dick Butler, NMFS, Santa Rosa, California
Gary Stern, NMFS, Santa Rosa, California
Charlotte Ambrose, NMFS, Santa Rosa, California
Sandia Potter, San Francisco Bay RWQCB, Oakland, California
Dyan Whyte, San Francisco Bay RWQCB, Oakland, California

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

June 22, 2009

Michael Napolitano
San Francisco Bay Regional
Water Quality Control Board
1515 Clay Street, Ste. 1400
Oakland, CA 94612

RE: Napa River Watershed Sediment TMDL and Habitat Enhancement Plan

Dear Mike:

Thank you for the opportunity to comment on the proposed revised Napa River Watershed Sediment TMDL and Habitat Enhancement Plan. We appreciate your hard work to develop this important TMDL for the Napa River Watershed. We have reviewed the revised documents, and find them detailed and appropriate. The analyses supporting the TMDL are robust and thorough. In particular, we find the numeric target and source analyses to be very clear, solid, technical analyses. We strongly support adoption of the package.

We have one minor comment concerning the TMDL analysis, as well as comments concerning the Implementation Plan for the TMDL. Concerning the TMDL analysis, the Napa River is the only currently listed 303(d) waterbody in the Napa River watershed, for sediment impairment. It is our understanding from reading the documents, that in order for the main stem of the Napa River to achieve water quality standards for sediment, allocations will apply throughout the watershed, i.e., to the Napa River as well as its tributaries. However, please clarify in the Basin Plan Amendment or supporting documents, whether the TMDL analysis is intended to also apply to new impairment findings for tributaries or other waterbodies within the watershed, that are not currently listed on the 303(d) list. If appropriate, the Basin Plan Amendment should describe any assessment decisions that will result in additional waterbodies on the 303(d) list for sediment impairment.

We appreciate your efforts to establish an implementation plan to achieve the specified load reductions within 20 years. Further, we recognize that the proposed Plan relies on California's regulatory authority to address nonpoint source pollution consistent with the State's Nonpoint Source (NPS) Program as approved by EPA.

EPA supports the watershed approach for restoring impaired waters as described in this Plan. We agree that an adaptive management, multi-objective restoration approach is necessary to meet the TMDL goals. We are supportive of both the regulatory and non-regulatory actions that will be supported with technical and financial assistance under the proposed Plan. We understand that a regulatory program for vineyards may be developed in the coming year and that the Fish Friendly Farming program is an important program to provide necessary technical assistance to meet the TMDL goals.

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EPA's national experience overseeing state NPS programs has lead us to the conclusion that significant environmental results are more likely where TMDLs, and associated assessments and plans, provide detailed information to identify priority activities to achieve water quality objectives and beneficial uses within a specific time frame. The most effective plans should contain sufficient accountability and feedback mechanisms to allow for adaptive management to ensure ongoing progress. Such specific information helps ensure that limited resources can be directed, and leveraged, to address the most significant pollutant sources. For this reason, EPA directs Clean Water Act Section 319 (NPS) funding to those watersheds that have adopted TMDLs and sound watershed plans as described in the Handbook for Developing Watershed Plans to Restore and Protect our Waters (March 2008, http://www.epa.gov/nps/watershed_handbook/).

We are confident that the proposed Napa River Sediment Reduction and Habitat Enhancement Plan establishes a foundation on which to build effective restoration efforts to meet the goals of the TMDL. We look forward to working with you to support the implementation of this Plan.

Thank you again for the opportunity to comment on the revised proposed documents for the Napa River Watershed Sediment TMDL package. We appreciate this exceptional work. If you have any questions concerning our comments, please contact Diane Fleck at (415) 972-3480 or Tina Yin at (415) 972-3579.

Sincerely,

Diane C. Fleck For

Peter Kozelka
TMDL Team Leader
Standards and TMDL Office

cc: Wil Bruhns, San Francisco Bay Regional Water Quality Control Board
Tom Mumley, San Francisco Bay Regional Water Quality Control Board
Bruce Wolfe, San Francisco Bay Regional Water Quality Control Board

WINEGROWERS OF NAPA COUNTY
P.O. Box 5937
Napa, CA 94581
(707) 258-8668

July 6, 2009

Bruce H. Wolf, Executive Director
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Re: Napa River Watershed – Basin Plan Amendment & Sediment TMDL

Dear Mr. Wolf:

Winegrowers of Napa County ("Winegrowers") is a non-profit trade group consisting of twenty-one winery and grape grower members. Overall our members produce a significant share of Napa County's total annual wine production and farm a sizeable portion of Napa County vineyards. The mission of Winegrowers is to promote and preserve Sustainable Agriculture as the highest and best use of the natural resources of Napa County. Winegrowers appreciates the opportunity to comment on the Napa River Basin Plan amendment ("Plan Amendment") scheduled for consideration by the San Francisco Bay Regional Water Quality Control Board ("Regional Board") in its September 9, 2009 meeting.

Winegrowers agrees with the conclusion of the Plan Amendment and accompanying Staff Report that the Fish Friendly Farming Environmental Certification Program is an effective mechanism to addresses sediment discharges from vineyards in the Napa River watershed.[1] Winegrowers also concurs that the Napa County Conservation Regulations are an effective means of reducing sediment delivery to the Napa River.[2] Winegrowers appreciates the Regional Board's recognition of the effectiveness of these local programs to promote the health of the Napa River watershed.

---

[1] These conclusions are reflected in Table 4.1 of the Plan Amendment and in the "Napa River Watershed Sediment TMDL and Habitat Enhancement Plan Staff Report" (Staff Report), September 2008, section 6.5, page 81.
[2] Staff Report, section 6.5, page 80.

Winegrowers understands that the Regional Board intends to adopt a conditional waiver program for vineyard discharges,[3] and we look forward to the Regional Board's development of such a waiver program. In developing a conditional waiver program for vineyards we encourage the Regional Board to remember its conclusion that the Fish Friendly Farming Program and Napa County's Conservation Regulations effectively address sedimentation. Winegrowers concurs with the past comment of the Natural Resource Conservation Service asserting that Napa County's existing regulatory framework and industry-sponsored initiatives could constitute a waiver program in and of itself.[4] If a reporting requirement is necessary to track the continued effectiveness of these local programs, Winegrowers believes that such a requirement should not be imposed on individual vineyard owners. Given the recognition of these local programs, Napa County and grape grower associations are better positioned to efficiently report on attainment of the Plan Amendment's goals.

Thank you for your consideration.

Sincerely,

Jack Cakebread,
President

cc: Mike Napolitano

[3] The language of the Plan Amendment indicates the potential for such a waiver program. The intent to create a waiver program was expressed in the Regional Board's response to a comment letter from the Natural Resources Conservation Service dated August 6, 2006. (*See* Response to Comments, Comment 11.1, page 71.)

[4] *See* NRCS comment letter dated August 15, 2006.

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October 15, 2008

Mr. Mike Napolitano
Regional Water Quality Control Board, San Francisco Bay Region
1515 Clay Street, Suite 1400
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By E-mail: :mnapolitano@waterboards.ca.gov

Re: Comments on Establishing a Total Maximum Daily Load (TMDL) for Sediment in Napa River and an Implementation Plan to Achieve the TMDL and Related Habitat Enhancement Objectives

Dear Mr. Napolitano:

The California Department of Transportation (Caltrans) appreciates the opportunity to comment on the staff report and proposed Basin Plan Amendment (BPA) for the Napa River Sediment Total Maximum Daily Load (TMDL). Caltrans strongly supports efforts to protect human health and achieve the best water quality possible. In addition, Caltrans has been proactive and committed to meeting TMDL goals within the San Francisco Bay Region. Caltrans is currently implementing numerous compliance measures discussed in the staff report. However, we have the following concerns with the TMDL documentation:

Caltrans Contribution

Table 2 of the BPA shows the annual sediment delivery to the Napa River from several sources. One of the major contributor categories is "Road-related sediment delivery (all processes)". It is our understanding that this pertains to mostly unpaved rural roads, and thus Caltrans is not a contributor. A separate category is "Urban Stormwater Runoff," which Caltrans falls under, based on values presented in Table 3b of the BPA. Later, Caltrans is addressed as part of the group contributing to urban storm water runoff (Table 4.4 of the BPA) and also as an owner of "Roads" as part of the *Parks and Open Space and Public Works* landowner type.

In summary, the BPA leads us to believe that the road-related sediment category referred to in Table 2 pertains to mostly unpaved rural roads and not to Caltrans; however, this should be clarified in the document.

TMDL Compliance Schedule

We encourage the Regional Board Staff to coordinate the compliance schedule for this TMDL to be compatible with the timing of other upcoming TMDLs in the region. This would help Caltrans, as well as other dischargers, with effective planning of resources and implementation of controls to meet the requirements of both TMDLs.

We strongly support the goals of the Napa River Sediment TMDL Staff Report and BPA. Thank you for the opportunity to voice our concerns on this topic. If you have any questions, please contact me at 916-653-2512, or Jagjiwan Grewal of my office at (916) 653-2115.

Sincerely,

Joyce Brenner

JOYCE BRENNER
Office Chief
Stormwater Implementation

c: Jagjiwan Grewal
Department of Transportation, Headquarters, Division of Environmental Analysis
Hardeep Takhar
Department of Transportation, District 4

A Tradition of Stewardship
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Brad Wagenknecht
Chair

October 14, 2008

Mike Napolitano, Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

[Transmitted via email: mnapolitano@waterboards.ca.gov and Fax: (510) 622-2459]

RE: Comments on September 5, 2008 revisions to the proposed San Francisco Bay Water Quality Control Plan (Basin Plan) amendment, Napa River Sediment Total Maximum Daily Load (TMDL) Required Implementation Measures and Recommended Habitat Enhancement Plan

Dear Mr. Napolitano:

Thank you for presenting the Regional Water Quality Control Board's (RWQCB) proposed revisions to the TMDL, and planned amendments to the Basin Plan, which includes changes to the Required Implementation Measures and Recommended Habitat Enhancement Plan, to the Watershed Information Center and Conservancy (WICC) Board on September 25, 2008.

It is our understanding that RWQCB staff has been reaching out to a number of watershed stakeholders during the month of September to explain the extent and purpose of the recently proposed revisions. The timely outreach and presentations by RWQCB staff are very instructive and we appreciate their efforts and willingness to discuss the recently proposed changes with our community. We look forward to working with RWQCB staff throughout the remaining TMDL and Basin Plan amendment process.

The County is aware that the RWQCB staff is proposing these revisions based upon public comment received by the State Water Resources Control Board (State Board) questioning the adequacy of the TMDL's compliance with the State Board's certified regulatory program requirements as they relate to the California Environmental Quality Act (CEQA). Although the proposed changes are to address CEQA deficiencies and were reported to be minor in scope, the County believes they require further explanation or modification to alleviate concerns regarding additional performance standards and required implementation actions/schedules.

As noted in our previous comments, the County supports the RWQCB's overall TMDL goals, "to conserve the steelhead population, establish a self-sustaining Chinook salmon population, enhance the health of the native fish community and enhance the aesthetic and recreational values of the Napa River and its tributaries." The County, alongside many watershed organizations, stakeholders and

Brad Wagenknecht District 1 | **Mark Luce** District 2 | **Diane Dillon** District 3 | **Bill Dodd** District 4 | **Harold Moskowite** District 5

landowners, is actively taking steps to better understand and conserve our watershed resources. We appreciate the RWQCB's support and assistance in these very important endeavors.

Although well intentioned, the newly proposed revisions to the Napa River Sediment TMDL are again cause for concern due to additional uncertainties, while not having fully addressed the County's earlier comments (see letter dated August 15, 2006). The proposed Basin Plan amendment remains vague, references future development of unidentified requirements, implicitly asserts responsibilities, and neglects to account for public and private costs associated with the proposed Implementation Measures (regulatory tools/actions). The County remains concerned that the proposed Basin Plan is ambiguous and will be subject to future interpretation - possibly holding responsible parties (public and private) to unattainable and infeasible compliance requirements and timeframes.

On behalf of Napa County, I would like to thank you for the opportunity to provide comments on the proposed revisions to the Basin Plan amendment that will implement the sediment TMDL for the Napa River watershed. More specific comments are provided in the attachment to this letter. We hope that RWQCB and staff find our comments both informative and constructive in your effort to develop a water quality policy that reflects the varied needs and values of Napa County.

We look forward to the opportunity to discuss our comments in more detail with you or your staff. Please do not hesitate to contact Patrick Lowe, Deputy Planning Director at (707) 259-5937 or Jeff Sharp, Principal Planner, at (707) 259-5936 on our staff, should you have any questions or need additional information regarding our comments.

Sincerely,

Brad Wagenknecht,
Chair

cc:

Hillary Gitelman, Conservation, Development and Planning Director
Robert Peterson, Director, and Donald Ridenhour, Assistant Director Public Works
Rick Thomasser, Flood and Water Control District Engineer
Patrick Lowe and Jeff Sharp, Conservation, Development and Planning
Steven Lederer, Environmental Management Director
Watershed Information Center and Conservancy Board of Napa County
Thomas Mumley and James Ponton, San Francisco Bay RWQCB, TMDL Division

Attachment: Napa County Comments

September 5, 2008 Revised Basin Plan amendments, incorporating a sediment TMDL, implementation plan, and Habitat Enhancement Plan for the Napa River watershed

1. The geographic scope of the TMDL remains vague and it is unclear as to where the proposed performance standards and regulatory actions apply. Greater clarification and justification on the geographic applicability of the proposed Basin Plan amendment is warranted, particularly as it relates to the Plan's required implementation actions.

2. The Basin Plan references the submittal of a Report of Waste Discharge (RoWD) as a means of documenting actions towards compliance and generally outlines the nature of the report's required contents. Until a comprehensive program of waivers for Waste Discharge Requirements (WDRs) is approved and implemented, please explain how the RWQCB will improve its capacity to effectively receive, review and approve the large volume of RoWDs that will be required for vineyard development as a result of the proposed Bain Plan amendment.

3. The Plan mentions the RWQCB's future intent to adopt a Waste Discharge Requirement (WDR) waiver policy for nonpoint source categories that "balance agricultural, environmental, recreational and residential needs of the watershed." However, the proposed Basin Plan amendment lacks any detail describing what those waiver conditions may entail or how and when they will be approved. It will likely take a great deal of time on the part of RWQCB staff to develop conditional waiver program requirements. We request that the RWQCB work towards developing a unified WDR waiver program that addresses multiple land use categories.

4. The compliance deadlines presented in the implementation tables are not sufficient to successfully develop an effective yet flexible WDR waiver program that addresses the varied needs of watershed. Please explain how the RWQCB envisions the waiver development process and detail what the waiver requirements will be.

5. The development of this TMDL has been an unusually long process burdened with data and legal challenges. Please consider extending the completion dates in tables 4.1 – 4.4 by two or more years, allowing ample time for developing and complying with applicable WDR waiver requirements.

6. Table 4.1 (Vineyards) of the Plan mentions third party "certification programs" as a means of developing "farm plans" to met future conditions associated with a WRD waiver. The County is concerned that there is not sufficient local and regional "third party" capacity to meet the vineyard owner/operator demand by the proposed completion date. As mentioned above, please consider extending the completion dates in the implementation tables by two or more years, allowing ample time to fully develop needed capacity of third party certification programs to meet the projected demand.

7. The suggested action items in Tables 5.1 – 5.4 are presumably part of the RWQCB's recommended Habitat Enhancement Plan. Although the action items in the tables appear to be voluntary (i.e., recommended), they have very specific completion dates associated with them. Please confirm that the listed actions are recommendations and not binding upon the implementing parties. We believe most of the completion dates listed cannot be met and should be eliminated or qualified based upon funding availability, staffing resources and stakeholder derived priorities for the watershed. Furthermore, please explain how the RWQCB intends to require the suggested deadlines be met.

8. The County, along with many stakeholders in the watershed, recognizes the value of the management objectives listed in Tables 5.1 – 5.4 and appreciates the RWQCB's efforts in identifying possible actions to obtain them. The County and others are presently working towards completing many of the recommended action items, including stream restoration, fisheries monitoring and watershed planning. One of "the highest priorities" noted in the TMDL Staff Report is monitoring the relative fitness of the juvenile steelhead population and timing of their outmigration (pg. 89). The Napa County Wildlife Conservation Commission and the Napa County Resource Conservation District recently allocated funding towards the purchase of a rotary screw trap to meet this identified need. The County would appreciate any assistance the RWQCB could provide in helping to fund and maintain the trap's operation as a key component in developing an informative long-term fisheries monitoring program for the watershed.

<<< End >>>

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October 20, 2008

Mike Napolitano
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1515 Clay St # 1400
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mnapolitano@waterboards.ca.gov

Re: Proposed Basin Plan Amendment for the Napa River Sediment Total Maximum Daily Load

Dear Mr. Napolitano:

This office represents Living Rivers Council ("LRC"), a non-profit association, with respect to the proposed Basin Plan Amendment for the Napa River Sediment Total Maximum Daily Load ("TMDL"). I am writing to submit comments regarding the proposed TMDL on LRC's behalf. LRC objects to the Regional Board's adoption of the proposed TMDL on grounds that the Board has not complied with California Environmental Quality Act ("CEQA"), the Clean Water Act or the Porter-Cologne Water Quality Act. I attach herewith my May 7, 2008 comment letter to the State Water Resources Control Board and fully incorporate by reference said letter and all of its attachments. If you need a copy of any of the attachments to that letter, please let me know.

LRC also submits herewith letters dated October 19, 2008 from Dr. Robert Curry (Exhibit 9) and October 17, 2008 from Dennis Jackson (Exhibit 10), which are incorporated herein by reference.

Increased Peak Flows

1. LRC appreciates the fact that the revised TMDL includes a performance standard for "attenuating" increases in peak flows resulting from vineyard construction. Nevertheless, the "Actions" portion of Table 4.1 and the Staff Report (at page 80) contains disturbing indications that the Board may be prepared to accept, as criterion for whether peak flow increases are deemed "significant," a 10% to 15% above pre-project rates, a number derived from ongoing discussions within the Fish Friendly Farming Program. LRC objects to the use of this criterion for several reasons.

2. First, this criterion does not account for the changes in the watershed's peak flow response to storm events that result from the cumulative effects of past closely related projects. For example, in watersheds with a number of past projects developed before implementation of this criterion, peak

flows resulting from storm events may be significantly damaging already. In fact, the evidence shows this is true across the entire Napa River basin. Therefore, a 10% to 15% increase over pre-project rates for any given new development will be exacerbating a condition of existing significant effects.

3. Also, this criterion does not take into account the fact that past peak flow impacts have rendered many of the stream beds and banks in the Napa Basin more sensitive to further damage. In other words, even leaving aside the problem described in paragraph 2 above, the assumption must be that only the flood runoff variable is changed. Other variables, such as riparian vegetation, depth of channel incision, and duration of storm flows would have to remain at pre-project levels to allow tolerance for a 15% increase in storm flood runoff without further damage. The problem is that for all of these conditions, the effects are additive and groundwater withdrawal, paving and urbanization, stream incision due to past storm-flow changes and dams on tributaries, loss of riparian protection, etc., etc. all are cumulative. For example, where local groundwater levels are drawn down below the level of the bed of the Napa River, then even a zero percent change in pre-project conditions may be too much to protect the exposed unvegetated channel banks from bank failure. See generally Dr. Curry's comment in Exhibit 1.

4. To the extent the may attempt to justify the 10% to 15% increase over pre-project rates criterion based on the notion that this degree of change is within the natural variability of the watershed response to storm events, this explanation does not account for the fact that you are replacing unknown probability the peak flow response reaching that level in natural condition, with a fair certainty of the peak flow response reaching whatever level is allowed by application of the criterion in a developed condition.

5. The revised Staff Report also references the Napa River Watershed Task Force Report Phase II Final Report. At page 32, this report adopts a "standard of <u>no net increase</u> in post-project peak runoff rates from pre-application conditions" on "sites with high vulnerability." See Exhibit 11.

Project Description

6. The Board apparently plans to grapple with this and similar issues in its development of WDR and WDR waiver guidelines. But this approach violates CEQA because it segments the environmental assessment of the current TMDL, its performance standards, and the measures necessary to meet these performance standards. But all of these components constitute one project. Therefore, at this point, the project description is incomplete.

An EIR Equivalent Analysis of Impacts is Required

7. The updated environmental checklist does not sufficiently respond to the comment I made in my May 7, 2008 comment letter to the State Water Resources Control Board that an EIR equivalent analysis of impacts is required.

8. The revised Staff Report, in Chapter 7, concedes that under CEQA section 21159, the Board must "perform ... an environmental analysis of the reasonably foreseeable methods of compliance" with any performance standards it includes in the TMDL. (Staff Report, p. 108.) The first "performance standard" for vineyards is compliance with the County Conservation Regulations. (Table 4.1.)

9. The Board also concedes that implementation of the TMDL may cause significant effects on biological resources, including sensitive fish and wildlife species. (Staff report 98, 107.) As I argued in my May 7, 2008 letter to the State Board, the Court of Appeal decision in *City of Arcadia v. State Water Resources Control Bd.* (2006) 135 Cal.App.4th 1392, 1422-1423 requires an EIR level analysis where TMDL implementation may cause significant impacts.

10. The new amendments to the Environmental Checklist apparently disclaim any obligation to perform an environmental analysis of the County Conservation Regulations/Erosion Control program ("ECP Program") based on the following assertion:

> although the probability is low, it is possible that some compliance projects could impact rare and endangered biological resources and their habitats. Without the details of specific compliance projects, it is impossible to determine the scope and extent of such impacts. If such impacts exist, however, when reviewing and acting on compliance projects, the Water Board is required to and will protect and minimize impacts to special status species which are beneficial uses of water, as required under the Water Code and the Basin Plan. For impacts to species and habitats not within the Water Board's jurisdiction, other responsible state and federal agencies can and should mitigate the impacts, but until such time as this occurs, such impacts remain significant and unavoidable.

Staff Report, p. 124.

11. The key sentence in that quote is "Without the details of specific compliance projects, it is impossible to determine the scope and extent of such impacts." With this finding, the Board apparently invokes the phrase in section 21159 that states: "the agency shall not be required to engage in speculation or conjecture."

12. I previously submitted Dr. Curry's and Dr. Jackson's comments on numerous Erosion Control Plans ("ECPs") on which EDEN has commented. I submit herewith a number of the actual ECPs on which EDEN has commented. (See exhibits 1 – 8 attached hereto.) These ECPs provide great detail regarding the nature and extent of engineered drainage facilities that are typically used to comply the with the ECP Program, including cross drains, terracing, drop inlets, underground culverts, energy dissipators, etc. Moreover, a day trip to the Napa County Planning Department would provide Board staff with access to files the many hundreds of ECPs approved for vineyard

conversion projects since the program began in 1991. The Board could also access County enforcement records or do its own effectiveness monitoring on past ECPs as part of its EIR level analysis of the environmental effects of the ECP program performance standard.

13. In short, there is a wealth of factual evidence which the Board can use to perform an environmental evaluation of using compliance with the ECP Program as a performance standard for this TMDL. To be sure, the task involves a lot of work, but it is in no way a matter of "speculation or conjecture."

14. Indeed, there are ECP projects in the pipeline at this moment that the Environmental Checklist's cumulative impacts analysis ignores. These include the Rodgers/Upper Range, Stagecoach, Abbot and Abreu ECPs.

15. The Environmental Checklist's cumulative impacts analysis includes only four other projects: "a) The Napa River Flood Control Project; b) The Saint Helena Flood Control Project; c) The Napa Salt Marsh Restoration Project; and d) The Upper York Creek Dam fish passage restoration project." (Revised Staff Report, p. 124.) The omission of the ECP program, which consists of numerous past, present and reasonably foreseeable future projects (including open projects at this time such as Stagecoach, Rodgers, Abbot and Abreu) from the cumulative impacts section is an unfortunate example of trying to ignore the elephant in the room.

16. Moreover, even for the four identified projects, the Environmental Checklist provides no useful information regarding how their effects will combine with the effects of TMDL implementation. All we are told is that "we have considered" the four projects. What information that consideration brought to light is not disclosed. CEQA requires more.

Thank you for your attention to this matter.

Very truly yours,

Tom Lippe

Thomas N. Lippe

List of Exhibits

1. Erosion Control Plan for the Terra Springs Vineyard Conversion Project.

2. Erosion Control Plan for Atwater Vineyard Conversion Project.

3. Erosion Control Plan for Cort/Goldman Vineyard Conversion Project.

4. Erosion Control Plan for Mondavi Vineyard Conversion Project.

5. Erosion Control Plan for Lewis Vineyard Conversion Project.

6. Erosion Control Plan for Abbot Vineyard Conversion Project.

7. Erosion Control Plan for Stagecoach Vineyard Conversion Project.

8. Erosion Control Plan for Rodgers Vineyard Conversion Project.

9. Comment letter dated October 19, 2008 from Dr. Robert Curry to Thomas Lippe re: Napa River Sediment TMDL.

10. Comment letter dated October 17, 2008 from Dennis Jackson to Thomas Lippe re: Napa River Sediment TMDL.

11. Napa River Watershed Task Force Report Phase II Final Report, pages 30-37.

p003 Comment Letter 3.wpd

Dennis Jackson - Hydrologist

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October 17, 2008

Tom Lippe
329 Bryant Street, Suite 3D
San Francisco, CA 94107

Re: Napa River Sediment TMDL

Dear Mr. Lippe:

You have asked me to review and comment on the following documents

a) the revised Proposed Basin Plan Amendment: Napa River Sediment Reduction and Habitat Enhancement Plan
b) the revised Napa River Sediment Total Daily Maximum Load Staff Report dated September, 2008
c) the environmental review document for the Proposed Basin Plan Amendment, pages 94-141 of the Staff Report.

These documents were obtained from the San Francisco Bay Regional Water Quality Control Board web site.

Your specific questions were:

1) To what extent do the amendments sufficiently address the concerns stated in your letter? For concerns that are not addressed at all, it may be most efficient to just point that out. For concerns that are addressed, either sufficiently or not sufficiently, please say why.

2) To what extent do the amendments raise new concerns?

3) The new performance standard for peak flow increases (i.e., "Effectively attenuate significant increases in storm runoff. Runoff from vineyards shall not cause or contribute to downstream increases in rates of bank or bed erosion." (Table 4.1)) is not stated in numerical terms, in your opinion, will the TMDL be able to achieve this?

   I do want you to review the CEQA part. I have asserted that the Board has a legal obligation to evaluate the environmental impacts of the TMDL implementation measures - e.g., using compliance with the Napa County Conservation Regulations as a performance standard. I am interested in your view of how well the Board has done so.

Apply TMDL to the Entire Watershed

The Basin Plan Amendment (BPA) gives the impression that the TMDL applies to the entire watershed including the area upstream of the municipal water supply reservoirs. Page 5 of the revised BPA states that:

> The Napa River sediment TMDL is established at 185,000 metric tons per year, which is approximately 125 percent of natural background load (based on sediment load estimates from the 1994-2004 period) calculated at Soda Creek. Natural background load depends upon natural processes, and varies significantly. Therefore, the TMDL and allocations are expressed both in terms of sediment mass and percent of natural background. The percentage based TMDL, 125% of natural background, **applies throughout the watershed**. In order to achieve the TMDL, controllable sediment delivery resulting from human actions needs to be reduced by approximately 50 percent from current proportion of the total load (Tables 3a and 3b). TMDL attainment will be evaluated at the confluence of Napa River with Soda Creek, which approximates the downstream boundary of freshwater habitat for salmon and steelhead. Attainment of the TMDL will be evaluated over a 5-to-10-year averaging period. (Emphasis Added)

The revised BPA shows deleted language in *strikeout*. The following sentence, which occurs in Tables 4.1 through 4.4, is printed in *strikeout* font in the revised BPA.

> ~~Does not apply to parcels upstream of municipal reservoirs, where measures required per Napa County Code (Chapter 18.108), are sufficient to achieve sediment load allocations, and/or parcels classified by Napa County as “rural residential” (2% of unincorporated area in Napa County), where Water Board will rely on education and outreach and participation in voluntary programs~~.

However, the Environmental Checklist (page 95 of the revised Staff Report) states:

> 9. Surrounding Land Uses and Setting:
>
> The proposed Basin Plan amendment would affect the entire Napa River watershed, **except for land areas upstream of municipal water supply reservoirs**. Implementation would involve specific land and water management actions throughout the watershed. Napa River watershed land uses include a mix of open space, agricultural, commercial, residential, and municipal uses. (Emphasis Added)

The discussion about the Project Description on page 108 of the revised Staff Report states that:

> The proposed Basin Plan amendment would affect all segments of Napa River and its tributaries located downstream of municipal water supply reservoirs.

It appears to me that the intent of the Water Board staff is to exclude the areas upstream of the municipal water supply reservoirs. I have repeatedly requested that the TMDL be applied to the entire Napa River Watershed. The following discussion explains why it is important for the Water Board to apply the TMDL to the entire Napa River watershed.

Page 10 of the revised staff report states:

> We note that four municipal reservoirs constructed on Kimball Canyon, Bell Canyon, Conn Creek, and Rector Creek drain 17 percent of the watershed. Prior to dam construction, each of these tributaries provided high quality spawning and rearing habitat up and downstream of these dams.

This acknowledges that high quality habitat was lost to anadromous fish with the construction of the dams. However, landlocked steelhead trout, known as rainbow trout still use the habitat upstream of the reservoirs.

Excluding the TMDL from the area upstream of the municipal water supply reservoirs is unjustified for the following reasons. First, the water supply reservoirs provide municipal drinking water which is a very important Beneficial Use of Water. The TMDL must take action to protect municipal water supplies. Second, sediment loads in excess of the natural background sediment load are being deposited in the reservoirs which diminish their life span. Reducing the sediment loads entering the municipal reservoirs will extend the operational life time of the reservoirs. Third, all of the streams above the municipal water supply reservoirs support populations of rainbow trout. Rainbow trout (Oncorhynchus mykiss) are considered to be landlocked steelhead trout (Oncorhynchus mykiss). Fourth, the construction of the municipal water supply reservoirs significantly reduced the habitat area available to support anadromous runs of steelhead and salmon.

Figure 1 shows the current status of steelhead trout in Napa County (Center for Ecosystem Management and Restoration, 2005). The locations of the four municipal water supply reservoirs have been marked on Figure 1. The map shows that rainbow trout (*Oncorhynchus mykiss*), the landlocked version of steelhead trout are found in all of the streams above the municipal water supply reservoirs. The map in Figure 1 was constructed from data in Leidy et al, 2005.

The rainbow trout (*Oncorhynchus mykiss*) upstream of the municipal water supply reservoirs are a valuable genetic reservoir in the event that the population of Napa River steelhead trout (*Oncorhynchus mykiss*) collapses. Therefore, it is very important to provide the rainbow trout upstream of the municipal water supply reservoirs the same level of protection as the steelhead trout (*Oncorhynchus mykiss*) downstream of the reservoirs.

Turbidity Monitoring

I have recommended that turbidity be continuously monitored in select streams with geologic conditions that are associated with chronic turbidity. I have also recommended that numeric targets for chronic turbidity be set in the TMDL.

The turbidity monitoring proposed by the Water Board is insufficient to assess the progress of the TMDL implementation. The revised BPA (page 18) states:

> In addition to the above described monitoring program to evaluate attainment of numeric targets for sediment, the Water Board will monitor turbidity and residual pool volume. Monitoring will be conducted in a subset of the channel reaches where spawning gravel permeability and/or redd scour are measured. Stream temperature and baseflow persistence will be monitored as part of the Surface Water Ambient Monitoring Program.

The Water Board is proposing to monitor turbidity and residual pool volume while they are assessing if the numeric targets for permeability and redd scour have been obtained. This suggests that the turbidity monitoring will be spot measurements and not continuous (e.g. every 15-minutes). Spot measurements of turbidity can not be expected to detect chronic turbidity problems. Repeated turbidity measurements should be done in watersheds that have soils types and rock types that are known to be capable of producing chronic turbidity.

In my opinion, the Water Board staff has been overly influenced by the dry year (2001) turbidity sampling conducted by Stillwater Science (2002). The USGS stream gauging record for their Napa River near St Helena station shows that only 15 of the 63 years (23%) of record had lower streamflow than 2001. During the turbidity study a near-bankfull storm in January 2002 was also sampled but the samples at most of the stations were taken 10 days after the event.

The geology of a watershed has a profound affect on the turbidity of the stream. The Stillwater Limiting Factor Analysis (2002) sampled only during a dry year and did not look at the relationship between geology and turbidity. Personal experience in the Napa River watershed suggests that Tertiary pyroclastic volcanic flows and mudflow deposits are capable of producing chronic turbidity.

On February 25, 2006 I observed elevated turbidity levels in Conn Creek near Angwin, see Figure 3. The photo in Figure 3 was taken 6 days after the last recorded daily rainfall of 0.32", at the Angwin rain gauge. Figure 4 shows the daily rainfall at the Angwin rain gauge prior to time of the photo in Figure 3. A total of 0.72 inches was recorded at the Angwin rain gauge between 2/17/2006 and 2/19/2006. Prior to 2/17/2006 there were 12 days with no recorded rainfall. The discharge, at the Napa River near St Helena gauge, on February 25, 2006 was 78 cfs, which is the median discharge for January and February over a 61 year period. The occurrence of turbidity in Conn Creek six days after a minor rainfall event suggests that chronic turbidity has the potential to occur in some of the tributaries to the Napa River.

Figure 2 is a geologic map of the Napa River (Stillwater Sciences, 2002). The location where I observed chronic turbidity on February 25, 2006 is marked on Figure 2. The geologic map shows that map units Tertiary volcanic flow rocks (Tv) and Tertiary pyroclastic volcanic and mudflow deposits (Tvp) occur upstream of where the chronic turbidity was observed. It is likely that the mudflow deposits or the tufts of the Tvp map unit were the source of the chronic turbidity I observed on February 25, 2006.

Comparing Figure 1, the map of the current distribution of steelhead trout (*Oncorhynchus mykiss*), with Figure 2, the geologic map, shows that the streams that cross the Tvp geologic mapping unit support steelhead trout. Chronic turbidity impairs the growth of steelhead trout (*Oncorhynchus mykiss*). Therefore, monitoring turbidity in watersheds with Tvp geology is reasonable step to help manage steelhead trout populations and to assess the effectiveness of implemented restoration actions.

Chronic turbidity may affect only some of the tributary watersheds. But when chronic turbidity occurs it reduces the growth rate of steelhead and salmon (Trush 2002). Therefore, chronic turbidity reduces the probability that juvenile fish will be able to successfully reach the ocean and return to spawn. Spawning success may not be the critical limiting factor in a stream impacted by chronic turbidity. Monitoring turbidity in the tributary watersheds whose geology has the potential to generate chronic turbidity will help guide restoration efforts in those watersheds.

The numeric target for chronic turbidity could be set to Trush's "chronic turbidity thresholds" for anadromous salmonid populations (Trush, 2002).

Dams

Dams play a significant role in channel incision. Dam owners should be encouraged to take actions to minimize the impact of their dams on the Napa River channel network. I recommended three things that could be done to reduce the impact of dams on the Napa River and its fisheries.

- Investigate winter release operations for dams that can control flood releases. Sustained releases near the bankfull discharge saturate banks and lead to failures often after the release is reduced.
- Start a program to use aerial photography and the high resolution digital elevation map (CALM) to find on-stream reservoirs that have not properly permitted and require the owner obtain a water right permit and to move the reservoir off the channel or to at least provide fish passage and passage of coarse sediment. Small dams will capture the coarse bed load need to build fish habitat but can pass fine sediment that can damage fish habitat. If the length of the reservoir is not

sufficiently long to allow all sands to settle out they will be passed through the reservoir. Small water supply reservoirs are not designed to be sediment retention basins.

- Use the high resolution digital elevation map (CALM) to find dams that would make sense to require a fish bypass.

The CEQA document contained in the revised Staff Report looked at alternatives to the proposed BPA.

> Alternative 5: Management of Coarse Sediment and Flow Releases from Municipal Reservoirs
>
> This alternative presents several questions regarding technical feasibility and efficacy, and potential environmental impacts (e.g., downstream flood risk, impacts to reservoir water quality, potential air quality, noise, and/or traffic impacts associated with reservoir dredging and/or transport and introduction of coarse sediment at downstream locations). Additionally, the management of reservoir flow releases to facilitate a balance between sediment supply and transport capacity downstream of the reservoirs has the potential to have a significant impact on municipal water supply and/or downstream flood risk.

I asked for an investigation into the operation of the dams because the impact of dam operations on the river channel network is a complex question. Alternative 5 raises questions about changing the way dams release winter runoff but the Water Board has not definitively answered the questions they posed. I request that the Water Board actually do the studies required to answer the questions I have raised and that their staff has raised.

I request that a carefully crafted study be undertaken to improve the operations of the reservoirs in respect to their impact on the channel. For example, can the effect of the four municipal water supply reservoirs be minimized by coordinating their flood releases? Dams often release water near the bankfull discharge for extended periods of time. Such releases saturate the bank materials and lead to bank collapse after the releases are reduced.

On-stream reservoirs play an important roll in both channel incision and blocking access to miles of spawning and rearing habitat. Therefore, owners should actively participate in mitigating the environmental effects of their on-stream reservoirs. This could take the form of contributing funds to improve spawning and rearing habitat downstream of the reservoirs. The Regional Board and State Board should develop a process that will allow the owners of on-stream reservoirs to either change the design of a reservoir to mitigate or reduce the environmental damage caused by the reservoir or to contribute monetarily to habitat restoration projects or find some other equitable way offset the problems created by the reservoirs.

My request to identify small dams that block fish passage may be addressed by the proposed program to identify fish passage barriers in the 10 key tributaries outlined in Table 5.3 of the revised BPA. It would depend on the how “barrier” is defined by the agencies doing the fish passage surveys.

Low Flows

The revised BPA and revised Staff Report do not adequately address the low-flow problem occurs in dry years with a cold spring. Many landowners protect crops from spring frosts by spraying water. The California Department of Water Resources was appointed the Frost Protection Watermaster for the Napa River. They have authority over pumping and streamflow from March 15 to May 15 each year. They have set 10 cfs as the minimum streamflow for fish and wildlife. This value may have been determined in the mid 1970’s and has not been adjusted since then. The California Department of Water Resources uses the

USGS stream gauge at Oak Knoll to set streamflow and pumping rates. I question whether the 10 cfs flow is sufficient to protect fish given the degraded condition of the channel.

The following excerpt is from my January 28, 2001 letter report to Tom Lippe describing the Cumulative Impacts to salmonids in the Napa River.

> The February 1972 report (Anderson, 1972) addressing the 25 water rights applications recommended minimum bypass flows on the mainstem of the Napa River for each season. A minimum flow of 15 cfs or the natural flow was set for the period of November 15 to February 29. A subsequent study found this "totally inadequate for the maintenance of a healthy steelhead run in the Napa River." (Cox and Ellison, 1982).
>
> Cox and Ellison studied 7 critical riffles (see Figure 1 of my 2001 letter) in the late 1970's. They reported their findings in June 1982. Their study showed that 58 cfs was needed in the Napa River below Sulphur Creek to provide steelhead passage over the critical riffles. Upstream of Sulphur Creek they found a flow of 50 cfs was required for passage. The minimum flow amount set in the February 1972 report is about one-fourth of the amount determined to be the minimum required for passage. Unfortunately, the inadequate minimum winter flows have been written into at least 38 water rights agreements on the Napa River (DWR Bulletin 216, 1982).
>
> Cox and Ellison observe that:
>
>> The environmental factor most important to the successful completion of the steelhead life cycle is sufficient water flow. Sufficient flow is needed for steelhead to ascend the river to their spawning grounds; sufficient flow is needed over the spawning gravels for completion of the spawning act; sufficient flow is needed to provide oxygen to the eggs and fry in the gravel; sufficient flow is needed for the downstream migration of both adults and juveniles to the ocean. Most critical of these needs in the Napa River at the present time is sufficient flow for the upstream spawning migration and the maintenance of nursery habitat in the summer and fall.
>>
>> The prime agricultural land of the Napa Valley requires a tremendous amount of water during the summer for irrigation and heat control, during the spring for frost control, and during the winter for refilling off-stream storage ponds. The source of much of this water is the Napa River. Domestic and municipal diversions also take substantial amounts from the Napa River drainage. As a result, the cumulative, unregulated demand for water is so great it appears possible for even winter flows to be entirely diverted in some years.
>
> DFG created a "Napa River Management Plan" in about 1982 or 1983. The document is not dated but its references indicate that it was written after February 1982 but prior to the juvenile steelhead sampling during the summer of 1983. The Management Plan describes the Napa River, notes the dramatic decline in steelhead, sets a management objective, lays out a plan to gather more information, and proposes to rear juvenile steelhead to offset the loss of nursery habitat. The Management Plan states,
>
>> The single most important impact has resulted from the cumulatively large diversions of surface waters for frost protection and irrigation. In all likelihood, there is currently no unappropriated surface water in the summer and fall in the Napa River system. There may be excess water in the winter; unfortunately, irrigation and frost protection are not necessary then.
>>
>> To better utilize excess winter water, many storage facilities have been built. The major impoundments, built for storage of municipal water, have been constructed at the expense of anadromous resources. Almost without exception, large dams built in the Napa Valley are blocking anadromous fish runs. The most obvious example is Conn Dam on Conn Creek, which impounds Lake Hennessey on Conn Creek. Built in 1946, Conn Dam blocks steelhead access to approximately 24 km (15 miles) of spawning and nursery habitat (Ellison, 1982).

The 1972 Fish and Game report found that the 15 cfs bypass flow for the November 15 through February 29 required in 25 appropriative water rights was inadequate to protect the fishery. Adequate flows of water are crucial for fish. The apparent need to modify existing water rights is a difficult legal issue but it should still be addressed.

Department of Fish and Game documents demonstrate that water diversions and on-stream reservoirs have played a significant role in the decline of salmonids in the Napa River watershed. Many appropriative water rights have bypass flows that are lower than those recommended by studies conducted by the Department of Fish and Game.

Surface water diversions, groundwater pumping and the process of channel incision can all decrease the flow in the Napa River and its tributaries. The actions of the Division of Water Rights (SWRCB) and of the Watermaster (California Department of Water Resources) should be considered under the cumulative impact discussion of the CEQA analysis for the sediment TMDL.

The revised BPA's approach to addressing low flows is laid out in Table 5.2. The action to deal with "Low flows during the dry season" is to have "

> Local, state, and federal agencies to participate in a cooperative partnership to develop a plan for joint resolution of water supply reliability and fisheries conservation concerns.

The implementing parties are listed as:

> Local municipalities working with Water Board, State Water Board (Division of Water Rights), National Oceanic and Atmospheric Administration Fisheries Service (NOAA), and California Department Fish and Game (DFG)

The TMDL schedule calls for the resulting plan to be implemented by fall of 2010.

The approach to low flows outlined in Table 5.2 of the revised BPA is incomplete since it does not recognize the impact of spring frost protection as a "stressor" and does not specifically name the Department of Water Resources Frost Protection Watermaster as one of the "Implementing Parties". The approach to low flows is also incomplete because it does not recognize that many water rights require bypass flows of 15 cfs during the November 15 through February 29 period which Fish and Game documents show as being inadequate. Low flows are not just a problem in the dry season but have the potential to occur any time of year.

Can the Water Board guarantee that the adverse impacts from insufficient flows, during anytime of year, to federally listed fish be solved by having agency representatives discuss the problem? The proposed inter-agency discussions may never result in a plan to effectively deal with low flows that are adversely impacting federally listed fish. What action will the Water Board take if the inter-agency plan to deal with low flows is not implemented by fall of 2010?

The revised BPA and Staff Report do not address my recommendation that near-stream wells should be examined to determine if they are impacting streamflow either by directly tapping the underflow of a stream or by contributing to lowering the water table.

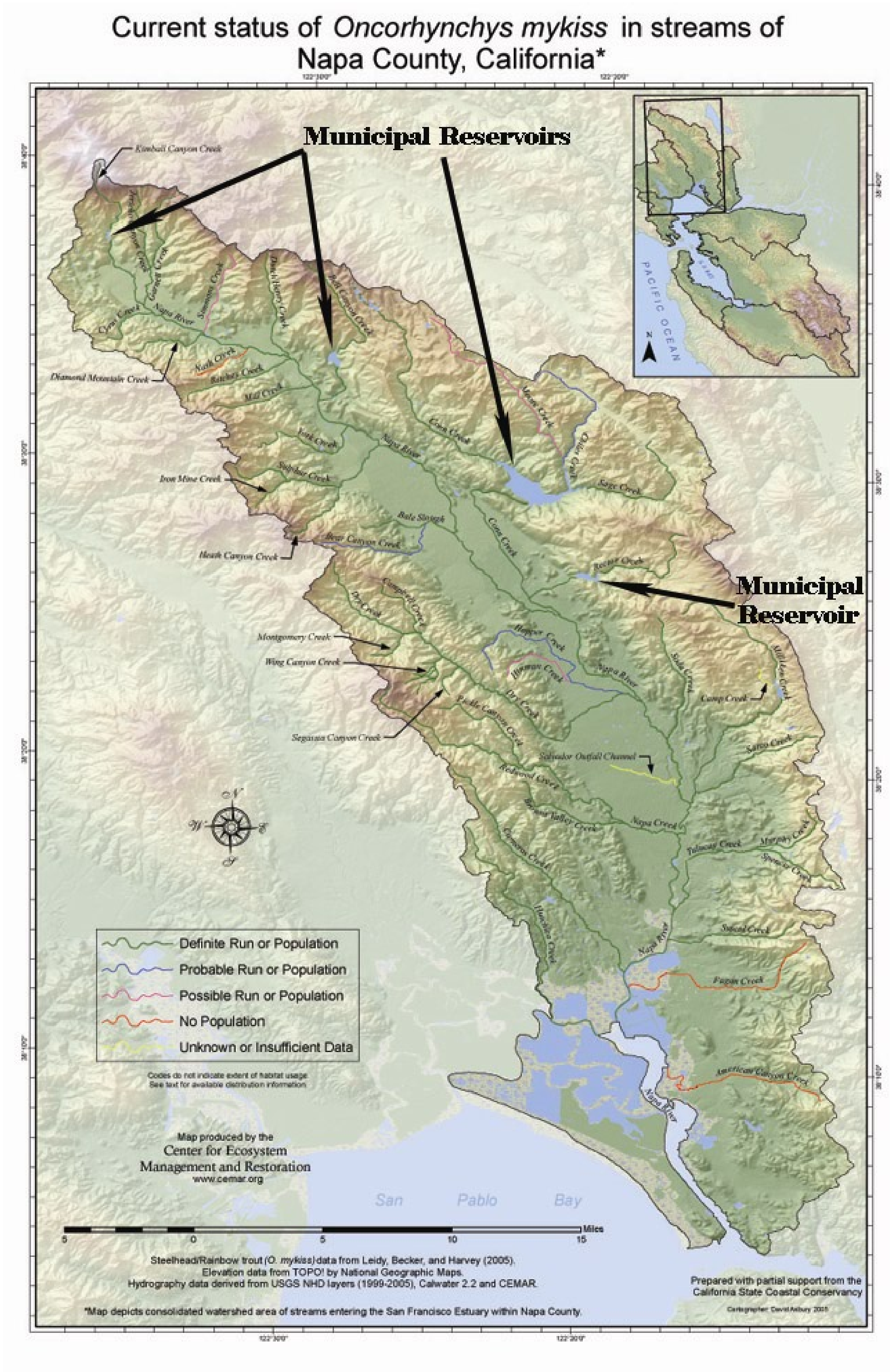

Figure 1. Current status of steelhead trout (*Oncorhynchus mykiss*) in the streams of Napa County. The locations of the four municipal water supply reservoirs are shown. The map shows that rainbow trout (*Oncorhynchus mykiss*), the landlocked version of steelhead trout are found in all of the streams above the water supply reservoirs. Map by Davis Asbury, 2005, obtained from CEMAR http://www.cemar.org/estuarystreamsreport/images/NewMaps/Napa_County_Current.pdf.

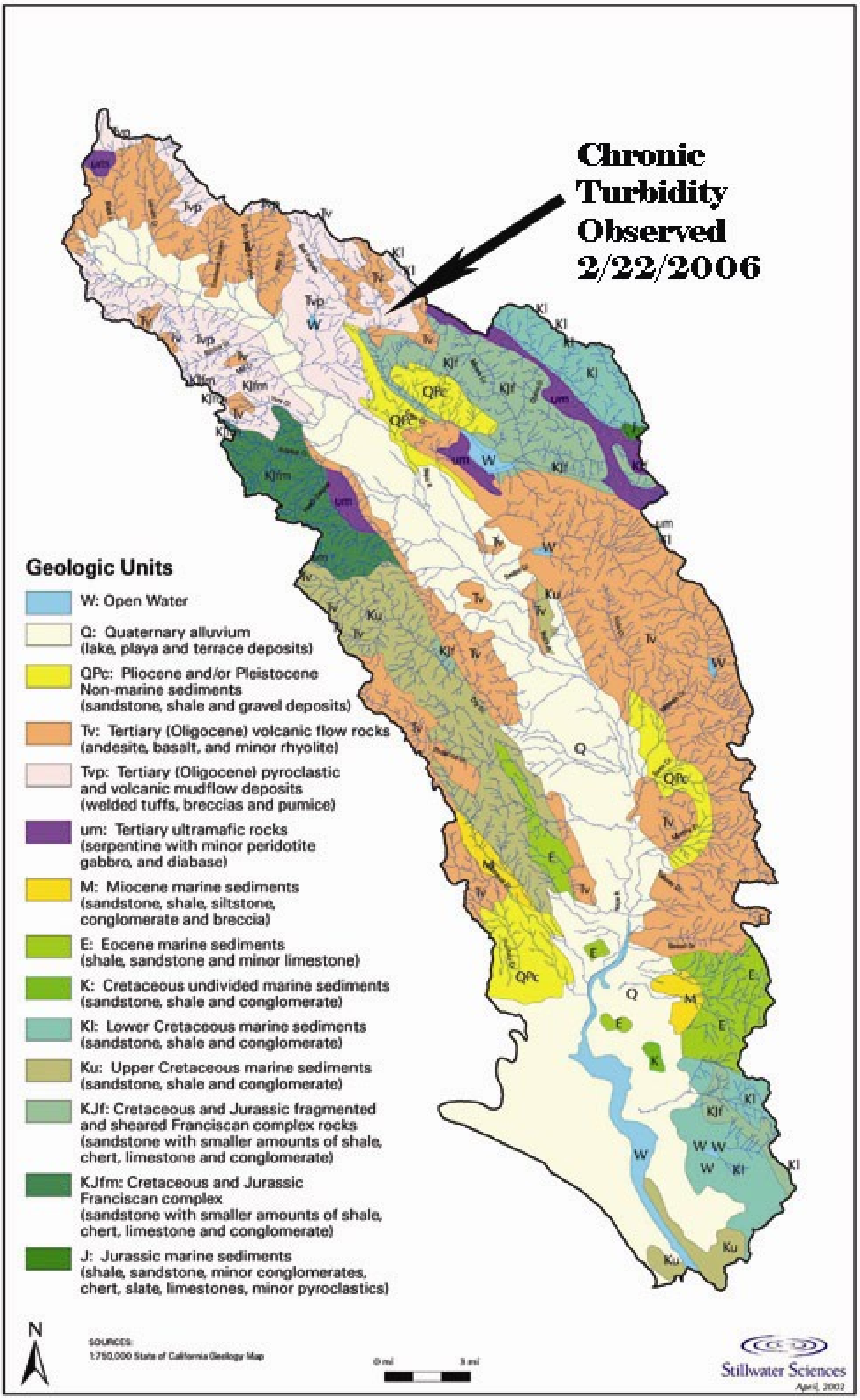

Figure 2. The Geology map from the Stillwater Sciences *Napa River Limiting Factors Analysis* report date June 14, 2002. On February 25, 2006 I noted that Con Creek was cloudy near Angwin, CA six days after the last recorded rainfall of 0.32”. The geology upstream of the point I observed the turbid water is listed as Tv and Tvp on the Geologic map. It is reasonable to expect that watersheds with a geology similar to upper Conn Creek to experience chronic turbidity.

Figure 3. Conn Creek downstream of Howell Mountain Road at Angwin on February 25, 2006. On February 19, 2006 a total of 0.32" of rain fell at the Angwin rain gauge. Note the elevated level of turbidity 6 days after the last rainfall. I estimate that the turbidity was in excess of 25 NTU. Figure 2 shows the rainfall at the Angwin rain gauge prior to the date of this photo.

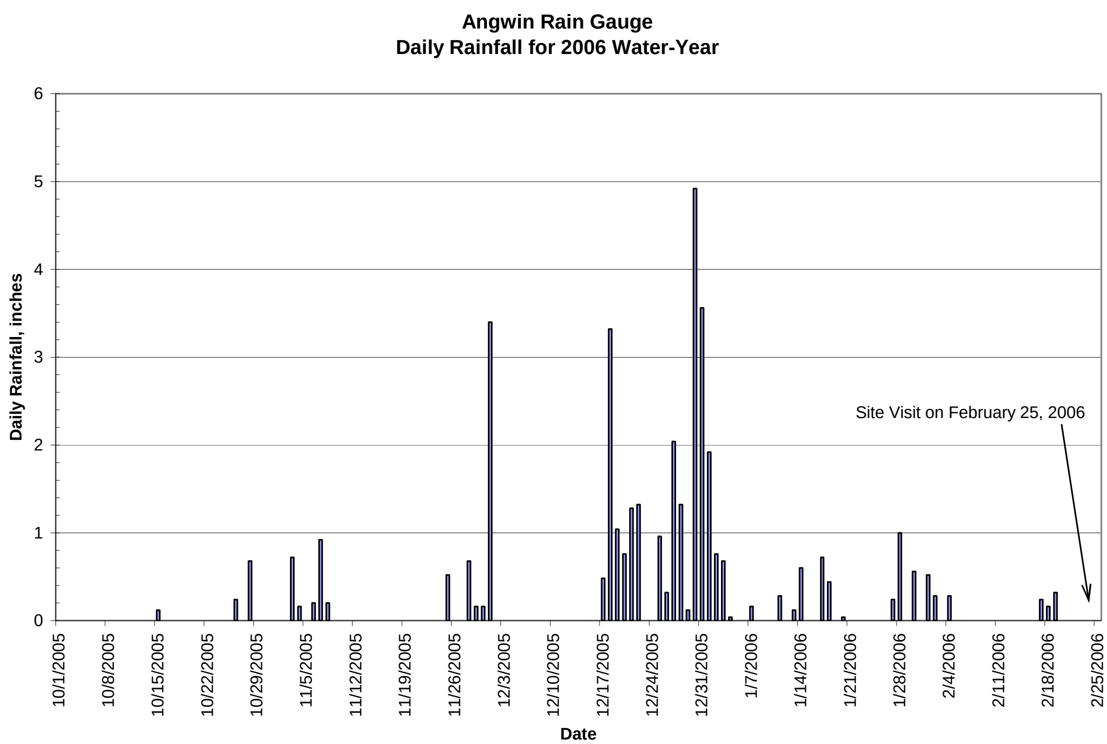

Figure 4. Daily rainfall at the Angwin rain gauge from the start of the 2006 water year to the date of the site visit to Conn Creek on February 25, 2006.=

Napa County Conservation Regulations

In my opinion, relying on the Napa County Conservation Regulations to prevent sediment related impacts from new projects is unsatisfactory. I have reviewed several vineyard conversion projects in Napa County. The hydrologic analysis for the projects I have reviewed was inadequate. County planners tend to have a superficial understanding of the complex hydrologic issues involved in significant changes in land use. The county planners have to rely on the reports prepared on behalf of the applicant.

My recent review of the Supplemental Draft EIR for the Rodgers Upper Range Vineyard Project is an example that demonstrates how difficult it will be to obtain the narrative performance standard in TMDL Table 4.1 and the less than satisfactory results of relying on the Napa County Conservation Regulations.

The narrative (non-numerical) standard for peak flow increases from TMDL Table 4.1 is:

> Effectively attenuate significant increases in storm runoff. Runoff from vineyards shall not cause or contribute to downstream increases in rates of bank or bed erosion.

To be effective in reducing sediment the TMDL must reduce the amount of sediment entering the stream channel network and must control the peak storm discharge and the duration of high discharges to avoid eroding the bed and banks of the stream. The TMDL assumes that Napa County will be able to successfully determine if the storm runoff from a given proposed development project will reduce the sediment load attributable to the project to acceptable levels and whether the project has the potential to erode the channel downstream. Napa County relies on outside experts to employ standard runoff models such as WIN TR-55 to estimate pre-project and post-project peak storm discharge. My experience indicates that, apparently, Napa County does not have the in-house expertise to evaluate the reliability of runoff models submitted in support of a project.

The following discussion of the WIN TR-55 modeling exercise submitted in support of the Rodgers Upper Range Vineyard Project Draft EIR demonstrates the problem of ensuring that the model reasonably represents real-world conditions. In the case of the Rodgers Upper Range DEIR the WIN TR-55 model was not calibrated against 14 years of peak storm discharge data collected by the USGS within a mile of the project.

WIN TR-55 Model

Mathematical models to estimate storm peak discharge are powerful tools but they need to be carefully calibrated before their results can be trusted. The Draft Hydrologic Evaluation Rodgers Upper Range Vineyard Conversion prepared by HIS, October 2005 page 2-6 concurs.

> Due to the potential for flooding of Silverado Trail, if there is any increase in runoff from the project, it is recommended that a hydraulic model of the project site be developed. **The model should be calibrated to measured data collected at the project site**. The runoff characteristics for the post-project condition should be collected from runoff measured from an adjacent vineyard with similar geology, soils, and topography. (Emphasis Added)

The WIN TR-55 model (Trso, November 2006) does not appear to have been calibrated to local pre-project conditions. The peak flood flows predicted by the WIN TR-55 model for pre-project conditions do not appear to agree with USGS data collected in a nearly adjacent Lake Hennessey Tributary watershed between 1959 and 1973. See Figure 5 for a map showing the location of the USGS Lake Hennessey Tributary gage watershed. Figure 6 shows the soil map from the Upper Range DEIR showing the stream that the USGS measured the flood peaks on. The Lake Hennessey Tributary stream gage (USGS Station Number 11456400) was operated to collect data on the flood response of small watersheds. The watershed area of the Lake Hennessey Tributary stream gage is 1.04 square miles (665 acres). The soils, land use, vegetation, and topography of the watershed of the Lake Hennessey Tributary stream gage are similar to those of Rodgers Upper Range, especially the Lake Hennessey Gulch sub-basin.

Figure 6 shows the soil map (Figure 3-8 of HIS' Draft Hydrologic Evaluation) with the location of the USGS Lake Hennessey Tributary stream gage. The soil types mapping symbol is a three-digit number.

Table 1 shows the predicted peak flood discharges for pre-project conditions from Table 2, page 12, of Trso's November 2006 report. Table 1 also shows the peak flood discharges for the USGS flood peak data for the same return period storms Trso estimated. Note that the predicted discharges for Lake Hennessey Gulch on the Upper Range project are much higher than the discharges estimated for the USGS Lake Hennessey Tributary data, even though the watershed area of the Lake Hennessey Gulch is 34.7% of the USGS watershed.

The peak storm discharges predicted by the WIN TR-55 model do not appear to agree with regional peak discharge data from other USGS stations in the Napa River watershed. Table 2 shows data about the location and length of record for the USGS gaging stations used to construct the regional peak discharge graphs shown in Figures 3 and 4. Table 3 shows watershed area and peak storm discharges for the same return period storms used by Trso (November 2006). Figure 7 shows the 2-year peak storm discharge for the Rodgers Upper Range watersheds and for the USGS stream gages versus the watershed area. Figure 8 shows the similar data for the 10-year storm.

In both Figure 7 and 8 the peak flood discharges predicted by the WIN TR-55 model plot higher than the data for the USGS stream gages indicating that the WIN TR-55 model predicts a greater storm peak discharge for a given watershed area than the storm discharges measured by the USGS. It is important to note that the Lake Hennessey Tributary gaging station discharges plot below the regression line for the USGS stations in the Napa River, indicating that the storm runoff from that station is lower than would be expected based on the other USGS Napa River stations.

The pre-project WIN TR-55 storm discharge model does not appear to have been adequately calibrated since it greatly overestimates the storm discharge relative to the regional USGS data, for all flood frequencies. Table 1 compares the Lake Hennessey Tributary storm discharges to the storm discharges for the Upper Range sub-basins. The predicted storm discharges for both the Rodgers Southeast Gulch and the Lake Hennessey Gulch are greater than the storm discharges measured by the USGS even though the watershed upstream of the USGS stream gage (665.6 acres) is much larger than either the Rodgers Southeast Gulch (107.8 acres) or the Lake Hennessy Gulch (231.2 acres)

Since the WIN TR-55 model does not appear to have been calibrated against locally available measured data that represent the pre-project condition its results for the post-project condition are highly suspect. In my opinion, all conclusions based on the WIN TR-55 model should be discarded.

Table 1. Estimated peak discharge for selected return period storms modeled by the WIN TR-55 model. Data from Martin Trso, November 2006, Table 2, page 12 for existing conditions. The Lake Hennessey Tributary stream gage peak discharges for the give return period events were calculated from measure runoff events between 1959 and 1973. Note that the predicted discharges for Lake Hennessey Gulch on the Upper Range project are much higher than the discharges estimated for the USGS Lake Hennessey Tributary data, even though the watershed area of the Lake Hennessey Gulch is 34.7% of the USGS watershed.

	Area acres	Area sq-mi	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Rodgers Southwest Gulch	24.4	0.038	14.7	20.7	26.7	38.8	44.9	51
Rodgers South Gulch	52.5	0.082	29.5	42.2	55.3	81.8	95.1	108.4
Rodgers Southeast Gulch	107.8	0.168	63.1	88.5	114.4	166.7	192.8	219.1
Lake Hennessey Gulch	231.2	0.361	134.4	188.6	243.8	355.5	411.3	467
Sage Canyon Gulch	20.4	0.032	11	15.8	20.9	31.2	36.4	41.5
USGS Lake Hennessey Trib	665.6	1.04	56	103	134	173	203	231

Table 2. Location and length of record for USGS gaging stations in the Napa River watershed with peak discharge records.

Napa River Streams	Station #	Latitude	Longitude	Start of Record	End of Record	Years of Record
Lake Hennessy Tributary	11456400	382900	1222115	1959	1973	14
Sulphur Creek Nr St Helena	11455950	382916	1222850	1956	1973	18
Redwood near Napa	14458200	381904	1222035	1959	1973	15
Tulucay Creek near Napa	11458350	381709	1221629	1972	1983	12
Napa Creek at Napa	11458300	381807	1221810	1971	1983	13
Milliken Creek near Napa	11458100	382019	1221606	1971	1983	13
Dry Creek near Napa	11457000	382123	1222150	1952	1966	15
Napa River near St. Helena	11456000	382952	1222537	1929	1996	58

Table 3. Peak storm discharge for selected return period events for USGS stream gages in the Napa River watershed listed in Table 2.

Napa River Streams	Watershed Area (sq-miles)	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Lake Hennessy Tributary	1.04	56	103	134	173	203	231
Sulphur Creek Near St Helena	4.5	528	724	854	1,018	1,140	1,261
Redwood near Napa	9.79	1,007	1,341	1,563	1,843	2,051	2,257
Tulucay Creek near Napa	12.6	898	1,682	2,201	2,857	3,343	3,826
Napa Creek at Napa	14.9	1,472	2,441	3,083	3,893	4,494	5,091
Milliken Creek near Napa	17.3	1,649	2,778	3,525	4,470	5,171	5,867
Dry Creek near Napa	17.4	1,456	2,308	2,872	3,585	4,114	4,639
Napa River near St. Helena	81.4	5,879	9,276	11,526	14,368	16,477	18,570

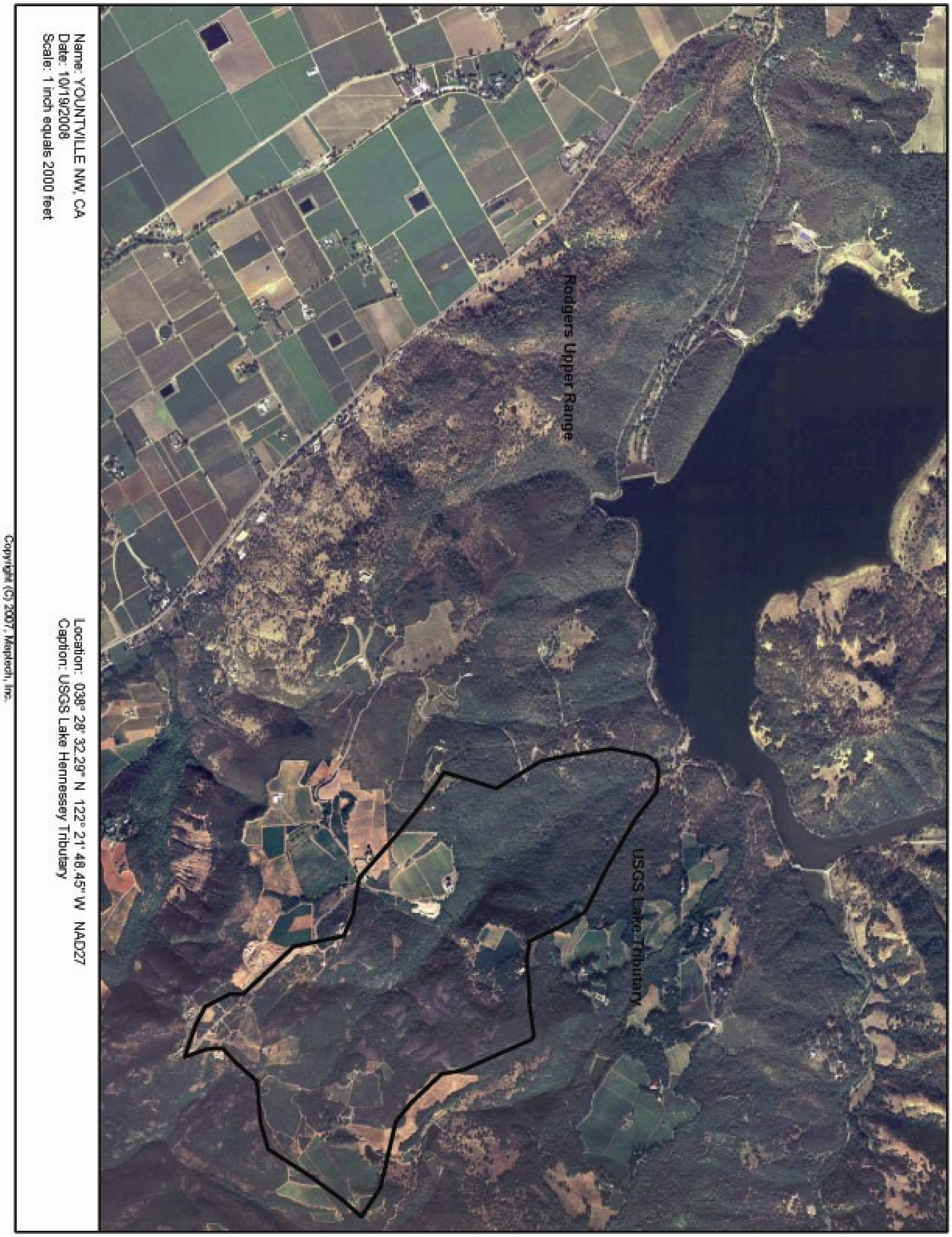

Figure 5. The USGS Lake Hennessy Tributary stream gage is almost adjacent to the Rodgers Upper Range project. The watershed area of the Lake Hennessey Tributary stream gage is 1.04 square miles.

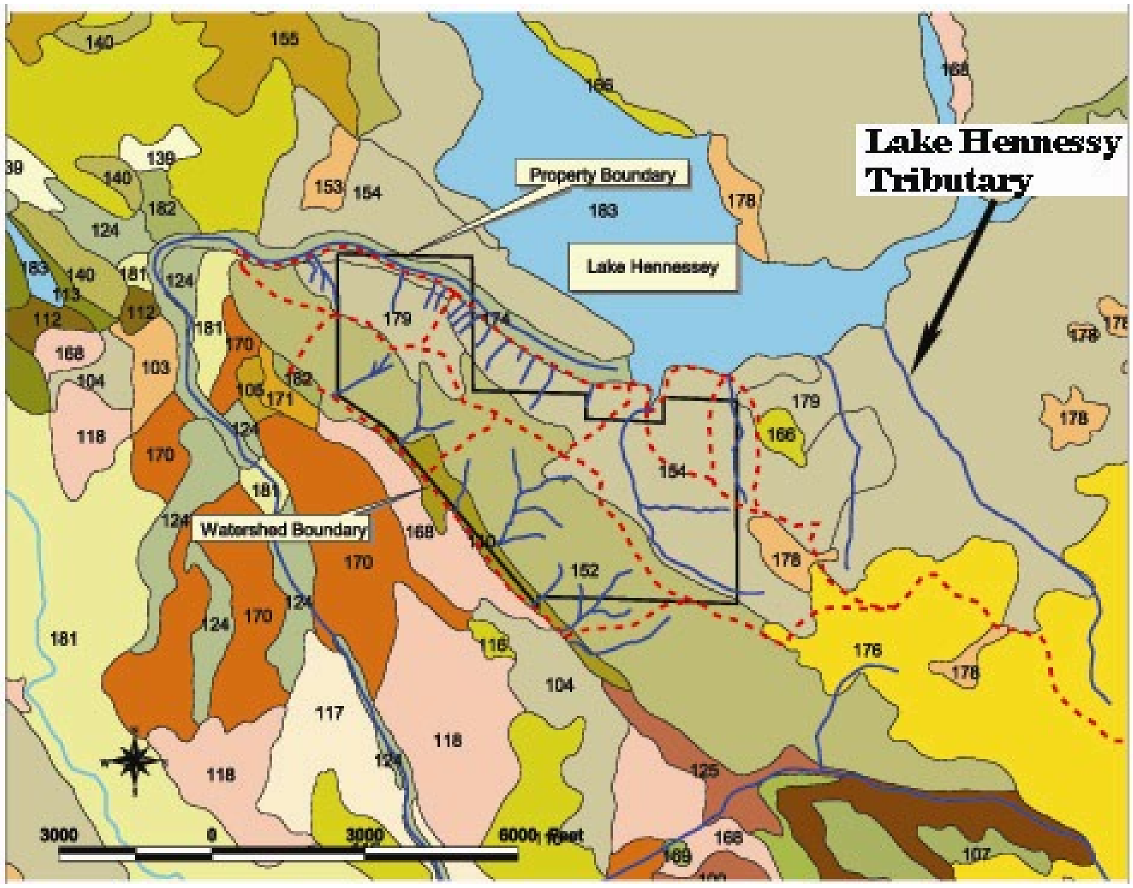

Figure 6. Soil map of the Rodgers Upper Range project showing the location of the stream that the USGS measured flood peaks on from 1959-1973. The stream gage name is Lake Hennessey Tributary and its station number is 11456400. The soil types in the watershed draining to the USGS gage are given below. Base map is Figure 3-8 of HIS' Draft Hydrologic Evaluation.

Napa County, California (CA055)
Map Unit Symbol Map Unit Name Acres

154 Henneke gravelly loam, 30 to 75 percent slopes.

176 Rock outcrop-Hambright complex, 50 to 75 percent slopes.

178 Sobrante loam, 5 to 30 percent slopes

179 Sobrante loam, 30 to 50 percent slopes

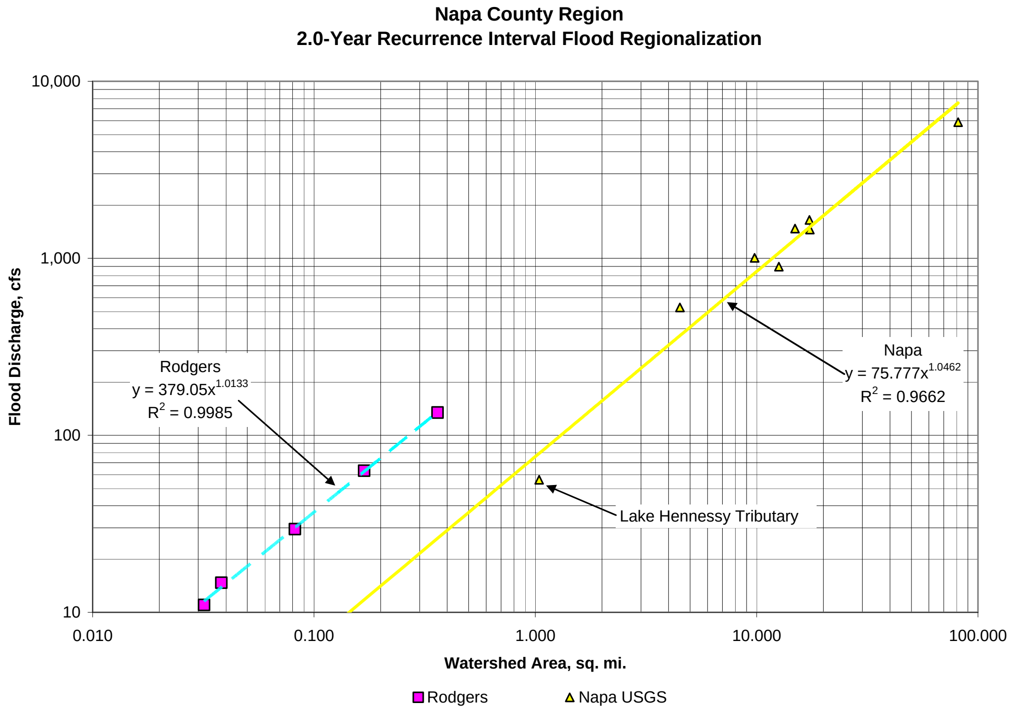

Figure 7. The estimated 2-year peak storm discharge for the Rodgers Upper Range watersheds do not agree with the 2-year storm discharge measured at USGS stream gages in the Napa River watershed.

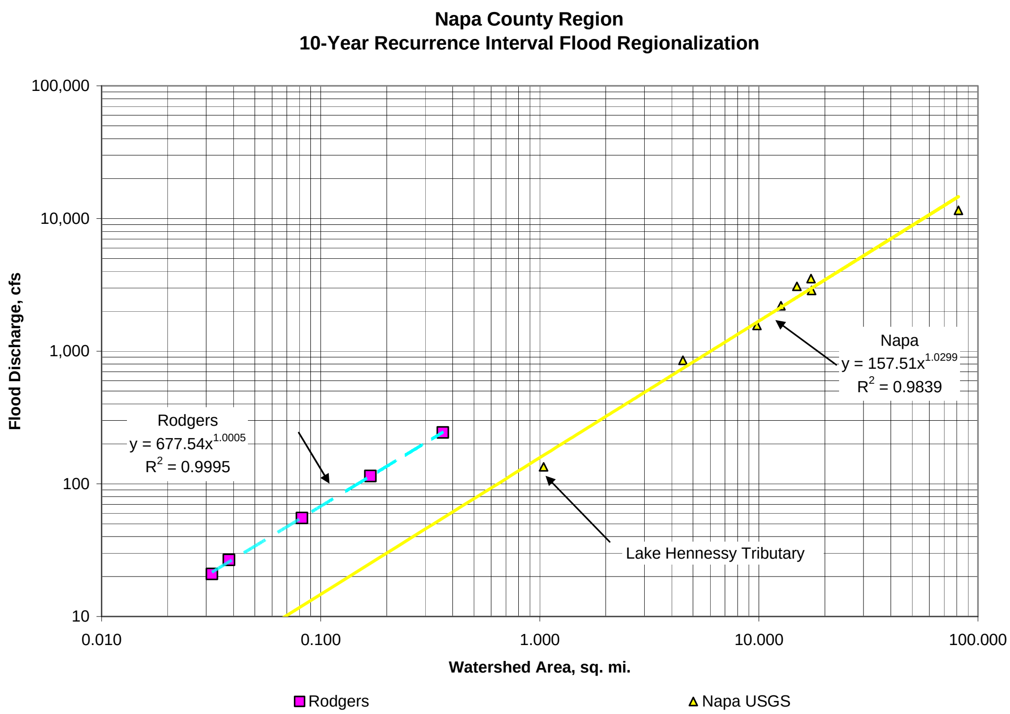

Figure 8. The estimated 10-year peak storm discharge for the Rodgers Upper Range watersheds do not agree with the 10-year storm discharge measured at USGS stream gages in the Napa River watershed.

Impacts of the TMDL Implementation

Many aspects of the TMDL rely on Napa County being able to apply their Conservation Regulations to proposed development projects. However, the Conservation Regulations have never been submitted to the CEQA process and therefore there is no guarantee that their application will not result in adverse environmental impacts.

As discussed above, Napa County lacks the technical resources to be able to ensure that proposed development projects will not generate sediment loads in excess of those specified by the TMDL and ensure that the proposed projects will, “Effectively attenuate significant increases in storm runoff”. Therefore, it is reasonable to assume that projects reviewed and approved by Napa County may have the potential to generate peak flow runoff that can contribute to downstream channel enlargement.

Conclusions

I personally observed chronic turbidity on Conn Creek near Angwin, CA in February 2006, six days after a minor rainfall event. It is likely that the source of the turbidity was the Tertiary Pyroclastic Volcanic flows and mudflows (geologic map symbol Tvp). Several watershed in the upper portion of the Napa River are underlain by the pyroclastic and mudflow units. These watersheds also support steelhead trout (Oncorhynchus mykiss) or rainbow trout (Oncorhynchus mykiss), the landlocked version of steelhead trout. These facts indicate that the TMDL should regulate the levels of turbidity to protect the Cold Water Fishery beneficial use and to protect the federally listed steelhead trout (Oncorhynchus mykiss). These facts also show that the TMDL should be applied above the municipal water supply reservoirs.

The TMDL should require studies to determine if the operation of the individual municipal water supply reservoirs can be changed in a way to decrease the erosive power of their winter storm releases or whether their collective winter releases can be beneficially coordinated.

Illegally constructed dams should be either removed or altered to allow free movement of sediment and fish.

The 1972 Fish and Game report found that the 15 cfs bypass flow for the November 15 through February 29 required in 25 appropriative water rights was inadequate to protect the fishery. Adequate flows of water are crucial for fish. The apparent need to modify existing water rights is a difficult legal issue but it should still be addressed.

The approach to low flows outlined in Table 5.2 of the revised BPA is incomplete since it does not recognize the impact of spring frost protection as a “stressor” and does not specifically name the Department of Water Resources Frost Protection Watermaster as one of the “Implementing Parties”.

I have demonstrated that Napa County does not the necessary in-house expertise to evaluate the validity of mathematical model output used to evaluate whether a project has the potential to increase peak storm discharge and sediment loads. It is crucial that mathematical models be carefully calibrated to real-world conditions.

Sincerely,

Dennis Jackson
Hydrologist

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Watershed Systems

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October 19, 2008

Tom Lippe
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San Francisco, CA 94107

You have asked that I evaluate the language of the Regional Water Quality Control Board's proposed performance standard that recommends "Effectively attenuate significant increases in storm runoff. Runoff from vineyards shall not cause or contribute to downstream increases in rates of bank or bed erosion." (Table 4.1). Specifically, you ask about the Staff Report's interpretation of that mandate specifying limits on peak storm-flow runoff of 10-15%.

Following are some analyses of this value and its enforceability.

Respectfully Submitted

Robert R. Curry
Registered Geologist and Hydrologist

Napa TMDL Suggested 10-15% Peak Flow Runoff Limitation

Robert R. Curry October 19, 2008

The 2007 version of the Regional Board Staff Report, on pp. 80-81 stated:

Hillside vineyard development at some sites, especially at those underlain by soft bedrock and/or where vineyards replace forest cover has also caused off-site channel enlargement (gully development) and associated shallow landslide failures31 (see source analysis this document; MIG, 2000). To avoid this problem when new hillside vineyards are proposed, the design review process should incorporate rigorous hydrological analysis (as appears to be the current practice by Napa County) to predict potential change in peak runoff rates, and the potential for off-site channel enlargement. Effective design features should then be incorporated to reduce off-site erosion risk to an acceptable level. A possible approach to this problem is outlined on pages 31- 37 of the *Phase II Final Report of the Napa River Watershed Task Force* (MIG, 2000).

Similarly, the Science Advisory Group to the Fish Friendly Farming Program has recommended that peak storm runoff rates following hillside vineyard development (at all sites) should not increase by more than 10-to-15 percent above pre-project rates to reduce the risk of off-site channel enlargement to an acceptable level (California Land Stewardship Institute, 2005). At all existing hillside vineyards, as part of a larger sediment source inventory and control plan, the potential for concentrated runoff from the vineyard or road network should be evaluated through site inspection and analysis by qualified registered professional scientists or engineers.

The goal for management of existing vineyards should be to reduce peak storm runoff rates into actively eroding gullies or landslides or other potentially unstable areas, as needed to accelerate natural recovery. Vineyard sediment control performance standards described above could be achieved through expanding the total vineyard acreage enrolled and independently certified under the Fish Friendly Farming Program32, by application of existing state regulatory authorities (Waste Discharge Requirements or Waivers thereof), and/or by adoption of some of the revisions to the Conservation Regulations that were recommended by the Napa River Watershed Task Force (MIG, 2000).

This language was revised somewhat to strengthen the reference to the Fish Friendly Farming efforts for the contemporary version (2008) of that Staff Report as follows:

Hillside vineyard development at some sites, especially at those underlain by soft bedrock and/or where vineyards replace forest cover has also caused off-site channel enlargement (gully development) and associated shallow landslide failures31 (see source analysis this document; MIG, 2000). To avoid this problem when new and/or replanted hillside vineyards are proposed and permitted, the design review process should needs to incorporate rigorous hydrological analysis (as appears to be the current practice by Napa County) to predict potential change in peak runoff rates, and the potential for off-site channel enlargement. Effective design features should then be incorporated to reduce off-site erosion risk to an acceptable level to a less than significant level. A possible approach to this problem is outlined on pages 31-37 of the *Phase II Final Report of the Napa River Watershed Task Force* (MIG, 2000).

Similarly, the Science Advisory Group to the Fish Friendly Farming Program has recommended that peak storm runoff rates following hillside vineyard development (at all sites) should not increase by more than 10-to-15 percent above pre-project rates to reduce the risk of off-site channel enlargement to an acceptable a less than significant level (California Land Stewardship Institute, 2005). At all existing hillside vineyards, as part of a larger sediment source inventory and control plan, the potential for concentrated runoff from the vineyard or road network should be evaluated through site inspection and analysis by qualified registered professional scientists or engineers. The goal for management of existing vineyards should be to reduce peak storm runoff rates into actively recovery avoid and control human-caused increase in sediment delivery from unstable areas.

In the Basin Plan amendment, we have formally recognized the Fish Friendly Farming Environmental Certification Program as an effective means of controlling pollutant discharges associated with vineyards. This recognition is based on farm plan reviews and site inspections completed by Water Board staff for approximately sixty vineyards in the Napa River watershed that have been Vineyard sediment control performance standards described above could be achieved through expanding the total vineyard acreage enrolled and independently certified under the Fish Friendly Farming Program32 during the past four years by application of existing state regulatory authorities (Waste Discharge Requirements or Waivers thereof), and/or by adoption of some of the revisions to the Conservation Regulations that were recommended by the Napa River Watershed Task Force (MIG, 2000).

You ask if we can avoid significant impacts if this 10-15% figure is adopted?

I have reviewed the basic peak-flow flood frequency data for the mainstem Napa River to see how this proposed constraint might affect bank stability and sediment transport issues below the hillside vineyard conversion areas. I note that the actual language of the proposed recommendation is focused not on the channels of the Napa River and its tributaries, but on the creeks and gullies that drain from the hillside areas undergoing vineyard conversions. In effect, the TMDL proposes to try to limit future runoff from hillside vineyards to 10-15% of pre-project conditions but does ***not*** directly address the “off-site channel enlargement” issues.

One question that is thus raised must be how control of individual vineyard developments may cumulatively affect downstream off-site channels
The value of 10-15% above pre-project conditions may be a rather arbitrary value that does not directly address downstream channel bank stability issues. Because channels in much of the Napa Watershed are already significantly disequilibrated, this proposed limitation on storm-flow runoff cannot be expected to do more that merely maintain current degraded conditions at best, and if it allows incremental increases of 10-15% for many new vineyard development projects, it can potentially lead to further cumulative degradation of the Napa River watershed. For example, if local groundwater levels are drawn down below the level of the bed of the Napa River or its valley-floor tributaries, as is commonly the case, then even a zero percent change in pre-project conditions may be too much to prevent further erosion of unvegetated channel banks. Pre-existing legacy conditions make channels more susceptible to erosion than they were in pre-development times.

The figure of 10-15% above background is commonly promoted in these kinds of natural phenomena cases based on the assumption that the natural variability from century to century in hydrologic conditions (flood flows, hurricane frequency, rainfall intensity, etc.) have that kind of natural variability. Thus, geomorphologists' reason that a site or condition must have experienced that level of variation naturally in the past and maybe it can handle it again in the future. In other words, it is within the statistical envelope of the range of past conditions.

But of course, the assumption must be that only the flood runoff variable is being changed. The riparian vegetation and depth of channel incision and duration of storm flows would have to remain at pre-project levels to allow tolerance for a 15% increase in storm flood runoff. The problem is that the effects are additive and groundwater withdrawal, paving and urbanization, stream incision due to past storm-flow changes and dams on tributaries, loss of riparian protection, etc., etc. all are cumulative. Hydrologically, you can't change only one thing.

A second concern is that by focusing only on the vineyard development sites for this part of the TMDL, legacy conditions in the channels, runoff generated from other non-vineyard developments, and indirect effects such as riparian community losses, changed channel form (incision), and reduced sediment supply (dams); all cumulatively reduce tolerance for increased storm runoff. Vineyards are a source of new sediment and runoff, but is a control of 85 to 90% of the new vineyard contributions adequate to meet the requirements of the TMDL?

I have considered what 15% change may mean to the mainstem Napa River. To look at this in perspective, we may consider what 15% of current (not-preproject) conditions may mean to the Napa River at St Helena. The attached graphic is a plot of flood magnitudes versus frequency for that site for the water- years 1982 to 2004. By focusing on this relatively recent peak flood flow record rather than the 60+ years of total record, we more realistically consider the cumulative effects of dams and urbanization from the 1980's to the present. Most hydrologists would agree that the proposed 15% hillside vineyard runoff constraints will most likely be locally effective for the smaller, more-frequent, storms in the vineyards themselves. However, the effects of long-duration (several-day) cumulative rainfall events that may have a recurrence magnitude of 50-100 years are much less predictable with the current models.

The TR-55 computer program used by conversion consultants easily calculates a runoff value for a 24-hour period for an isolated storm of these infrequent magnitudes but cannot in fact assess large-magnitude runoff events because they are almost always associated with multi-day storms of longer than 24-hours duration. The model is restricted to applications for small watershed areas only, without multiple contributing areas. For longer-duration storms, the soil infiltration capacity and ability of a site to temporarily store water on a hillslope are exceeded and the runoff generated by each added inch of rainfall is substantially greater than it was for the first 24-hours under natural field conditions. Thus, it is not possible to predict post-development runoff with the 24-hour small-watershed TR-55 model for large storms of multi-day duration, no mater how large the watershed. In practice, small watersheds at the vineyard scale must be assumed to fully saturate in 24-hours so that further rainfall does not change the runoff peak volume. This works well to calculate storm runoff from a shopping center, but not from a topographically complex 1000-acre vineyard where newly-constructed sediment basins and energy dissipaters may fill with water during an initial storm and then contribute runoff to a larger storm a few days later.

Looking only at 2-year (average annual) and 10-year return-period instantaneous peak runoff values for the Napa River at St. Helena, we calculate the following:

Two Year Return Flow: 5542 cfs; 15% is ±831 cfs; Standard Error of estimate 3928 cfs to 7818 cfs
Ten Year Return Flow   13210 cfs, 15% is ±1981 cfs; Stnd Error - 9761-17876 cfs

What this means is that a total 15% increase in peak flood-flow magnitude for 2-10 year magnitude events would be lost in the statistical noise by the time you looked at the mainstem Napa River.

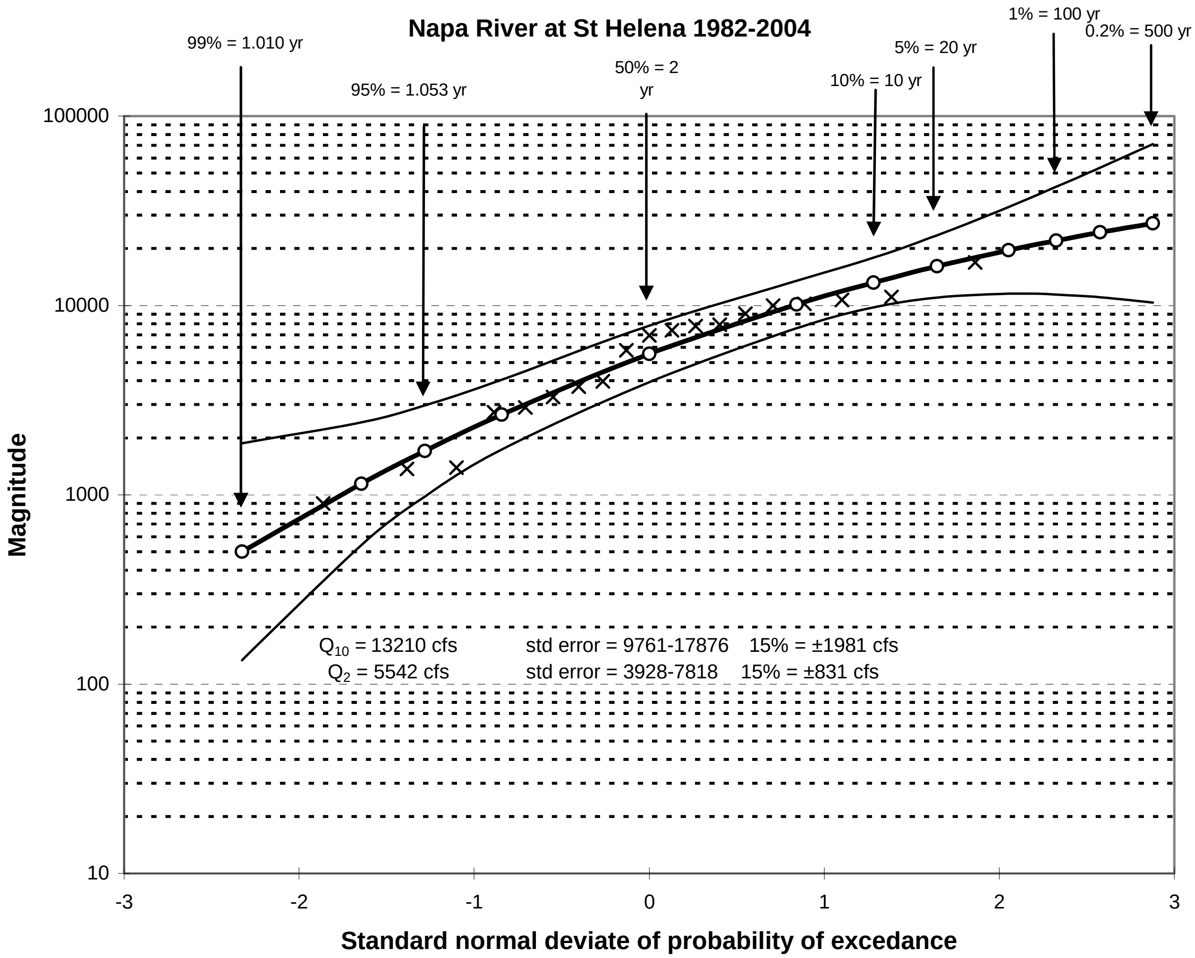

Figure 1. Mainstem Napa River peak flow frequency plot for Log-Pearson Type III analysis restricted to 1982-2004 water years.

Looking at the downstream receiving waters in the Napa River, we would have a difficult time proving that a cumulative 15% increase in peak flow values had occurred, based on the current stream gauging network. The Standard Error of the Log-Pearson extreme-value estimates is insufficiently precise to detect a 15% change. Even if we assumed a statistically normal distribution with a smaller standard deviation, net changes may not be detected. This is just the way that rivers and their complex alluvial flood plains work when storms of differing magnitudes, different durations, and different antecedent conditions result in runoff.

The 15% flood-flow limitation is a headwater target value only. It cannot protect downstream channels from bank erosion and/or channel scour when considered in combination with other similar vineyard developments and non-vineyard runoff increases. Using our current gauging station network that is located on main tributaries and the Napa River itself, we probably cannot expect to even detect direct increases of 10-15% in headwater hillslope runoff areas. New local stream gauging and erosion effectiveness monitoring will be necessary to assure that the 10-15% figure is in fact being met. The 10-15% limitation can only be expected to be effective at headwater source areas, not at downstream sites where the channel may already be incised or the riparian community already compromised. In general, where two or more ephemeral tributary watercourses join, the site is no longer considered a headwater. Drainage swales that only carry water during storms that reoccur every three or more years and the ephemeral channels that may carry runoff during annual winter storms are considered headwater channels, and it is these features that may be effectively protected with the 15% runoff limitation.

If the 15% standard is to be effectively implemented to *effectively attenuate significant increases in storm runoff*, there must be a provision for monitoring on the scale of small watersheds of 1-5 square miles area, and that monitoring must be able to be carried out for a sufficient time (perhaps 20 years) to provide defensible sound data collection. Meaningful data can be collected in a few years, but the program should attempt to capture the range of storm runoff conditions that can be expected in a longer period. Monitoring must include both the effectiveness of on-site cover-crop implementation and downstream offsite channel stability. A TMDL is incomplete without monitoring and validation.

The Napa County Hillside Vineyard Conversion issues have attracted many good scientists who can develop the necessary monitoring protocols.

Conclusion:

Control of 85-90% of the contributions storm runoff from new hillside vineyards cannot prevent exacerbation of pre-existing storm-flow runoff damage to receiving water channels, nor can it prevent future new damage where multiple conversions, development, or increased vineyard acreages are contemplated in a single watershed.

NAPA COUNTY FARM BUREAU
811 Jefferson Street Napa, California 94559 Telephone 707-224-5403 Fax 707-224-7836

October 17, 2008

Mike Napolitano, Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

RE: Comments on Napa River Sediment Total Maximum Daily Load (TMDL) Revisions

Dear Mr. Napolitano,

On behalf of Napa County Farm Bureau, we thank you for the opportunity to comment on the September 2008 revisions to the Napa River Sediment TMDL and draft amendments to the Basin Plan amendment. We very much appreciate your community outreach and briefing on these changes and acknowledge your excellent work in keeping us well informed about the TMDL public process.

For many years, we have worked with the San Francisco Regional Water Quality Control Board and followed the TMDL process of assessing the sediment problem and determining appropriate targets and implementation measures to reduce erosion and improve the health of the watershed. Within the framework of balancing beneficial uses, we support conservation and restoration efforts to improve native fish habitat for the steelhead and Chinook salmon populations and indeed are already working on such efforts with many volunteer programs and implementation of agricultural Best Management Practices.

As noted in our comment letter of August 11, 2006, we seek further clarity on the implementation measures and the specifics of the Waste Discharge Requirements (WDR) waiver policy. What will the waivers entail? Who will be responsible for identifying and notifying all the affected landowners? Who will oversee the administration of these WDRs? Coordinating the information flow to over 1700 grapegrowers and ranchers will be an enormous effort. We encourage the Board to allow enough time to thoughtfully develop a reasonable and comprehensive program which will achieve sediment reductions without creating bureaucratic confusion and undue burdens for landowners.

We appreciate your ongoing efforts and look forward to working with the RWQCB staff throughout the remaining TMDL and Basin Plan amendment process. Again, thank you for the opportunity to comment.

Sincerely,

Peter Nissen
President

Jim Lincoln
Natural Resources Chairperson