50 HP
150 ft
150 days. JM
KMP

ORIGINAL

NAPA COUNTY CLERK OF THE BOARD'S OFFICE
1195 Third Street, Suite 310, Napa, California, 94559
(707) 253-4421

RECEIVED
AUG 29 2016
NAPA COUNTY EXECUTIVE OFFICE

A Tradition of Stewardship
A Commitment to Service

APPEAL PACKET FORM

(Chapter 2.88.050 of Napa County Code)

Please submit original plus two (2) copies of the entire Appeal Packet, including this form.

TO BE COMPLETED BY APPELLANT
(Please type or print legibly)

Appellant's Name: Living Rivers Council c/o Law Offices of Thomas N. Lippe, APC

Telephone #: (415) 777-5604 **Fax #:** (415) 77-5606

E-Mail Address: Lippelaw@sonic.net

Mailing Address: 201 Mission Street, 12th Floor (No. Street) San Francisco (City) CA (State) 94105 (Zip)

Status of Appellant's Interest in Property: ______
project applicant, adjacent property owner, other (describe)

Action Being Appealed: Approval of Walt Ranch Vineyards Agricultural ECP No. P11-00205-ECPA and certification of Final EIR

Permittee Name: Hall Brambletree Associates, LP c/o Mike Reynolds

Permittee Address: 401 St. Helena Hwy So. St. Helena, CA 94574

Permit Number: P11-00205-ECPA **Date of Decision:** August 1, 2016

Nature of Permit or Decision: Erosion Control Plan Chapter 18.108; EIR certification per CEQA

Reason for Appeal (Be Specific - If the basis of the appeal will be, in whole or in part, that there was a prejudicial abuse of discretion on the part of the approving authority, that there was a lack of a fair and impartial hearing, or that no facts were presented to the approving authority that support the decision, **factual or legal basis for such grounds of appeal must be expressly stated or they are waived.** *(attach additional sheet if necessary)*: See attached letter from Thomas N. Lippe dated August 29, 2016

Project Site Address/Location: Within the Milliken Reservoir and Capell Creek watershedswest of State Route 121 in south-central Napa; access located Circle Oaks Drive Township 7 North (Street City State Zip)

Assessor's Parcel No.: 032-120-028, 032-480-007 - 008, 011 - 024, 027 - 028, 032-490-004 - 006, 008 - 020

If the decision appealed from involves real property, the Appellant must also submit the original and two copies of 1) Title Insurance Report and 2) Assessor's Map Book Pages pursuant to County Code Section 2.88.050(B).

[signature] for LRC — 8/29/16 — THOMAS LIPPE
Signature of Appellant — Date — Print Name

TO BE COMPLETED BY CLERK OF THE BOARD

Appeal Packet Fee $ 91 deposit Receipt Nos. 795305

Received by: [signature] Date: 8/29/16

Law Offices of
THOMAS N. LIPPE, APC

201 Mission Street
12th Floor
San Francisco, California 94105

Telephone: 415-777-5604
Facsimile: 415-777-5606
Email: Lippelaw@sonic.net

August 29, 2016

Gladys I. Coil
Clerk of the Board of Supervisors
Board of Supervisors
County of Napa
1195 3rd Street
Napa, CA 94559

Re: Appeal of Approval of Agricultural Erosion Control Plan No. P11-00205-ECPA and certification of Final Environmental Impact Report under the California Environmental Quality Act for the Walt Ranch Vineyard Conversion Project.

Dear Ms Coil:

This office represents Appellant Living Rivers Council with respect to this appeal of the Napa County Conservation, Development and Planning Department Director's approval of Agricultural Erosion Control Plan No. P11-00205-ECPA and certification of a Final Environmental Impact Report ("EIR") under the California Environmental Quality Act ("CEQA") for the Walt Ranch Vineyard Conversion Project ("Project"). All correspondence or other communications relating to this appeal should be directed to this office.

Per County Code section 2.88.010.B, submitted herewith a is title insurance company report issued no earlier than six months prior to the date of the decision being appealed that certifies, by name, address and assessor's parcel number, the owners of all real property located within one thousand feet of any real property which is the subject of the appeal; mailing labels for all such property owners; and a copy of the assessor's map book pages current as of the date of the decision being appealed that shows all real property which is the subject of the appeal and all properties in the property owners list.

This letter provides the "Reasons for Appeal" information required by paragraphs 4 and 5 of subdivision A of County Code section 2.88.050.

The August 27, 2016 letter from Greg Kamman, attached hereto as Exhibit 1, provides additional support for the grounds for appeal related to impacts from increased runoff and groundwater extraction.

The August 27, 2016 letter from Gretchen E. Padgett-Flohr, attached hereto as Exhibit 2, provides additional support for the grounds for appeal related to impacts on wetlands, amphibians and reptiles.

The specific factual or legal determinations of the approving authority which are being appealed are:

1. The Director's August 1, 2016, decision approving the Project and its ECPA.

2. The Director's certification of the Final EIR for the Project pursuant to CEQA; and

3. The Director's "CEQA Findings" made pursuant to Public Resources Code section 21081.

The grounds for this appeal are set forth in sections 1, 2, and 3 of my office's November 21, 2014, comment letter on the Draft EIR, including the Exhibits to said letter pertinent to these sections, specifically including the November 20, 2014 letters from Greg Kamman, Pat Higgins, and Gretchen E. Padgett-Flohr, attached as Exhibits 7, 8, and 16, respectively, to said letter.

As specified in my November 21, 2014 letter, these grounds are:

1. The EIR fails as an informational document with respect to increased stream sedimentation in the Napa river drainage and associated impacts on the aquatic ecosystem.

   a. The EIR Fails as an Informational Document with Respect to Sediment Impacts on Special Status Fish Species Below Milliken Reservoir.

   b. The EIR Fails as an Informational Document with Respect to Sediment Impacts on Aquatic Ecosystems and Fish above Milliken Reservoir.

2. The EIR fails as an informational document with respect impacts on wetlands, amphibians and reptiles.

   a. Wetlands.

   b. California Red-Legged Frog and Foothill Yellow-Legged Frog.

3. The EIR fails as an informational document with respect to impacts on groundwater resources.

   a. The EIR fails to analyze the Project's use of groundwater in the environmental setting where this use will impact groundwater resources.

The grounds for this appeal are further set forth in my office's November 21, 2014 (Second of Two), comment letter on the Draft EIR, as follows:

4. The EIR Fails as an Informational Document with Respect To Project Impacts on Oak Woodlands.

5. The EIR Fails as an Informational Document with Respect to Cumulative Impacts.

a. The EIR fails to disclose relevant information regarding the environmental setting regarding and fails to use the best available information to assess the Project's cumulative impacts on biological resources.

b. The EIR's analysis of cumulative impacts fails to disclose all closely related past, present and reasonably foreseeable future projects.

The grounds for this appeal are further set forth in my office's April 4, 2016 comment letter on the Final EIR, including pertinent Exhibits to said letter, specifically including the April 3, 2016 letters from Greg Kamman and Gretchen E. Padgett-Flohr, attached as Exhibits 1 and 2, respectively, to said letter, as follows:

6. The EIR fails to provide an adequate description of the environmental setting. Examples include the following.

a. The EIR mischaracterizes the rate of groundwater recharge on the Project site. (Ex 1, pp. 2-7.)[1]

b. The EIR mischaracterizes the hydraulic connection between groundwater to be pumped for the Project and groundwater in the Milliken Sarco Tulocay ("MST") Groundwater Deficient Area. (Ex 1, pp. 7-11.)

c. The EIR mischaracterizes the direction of groundwater flow between the Project site and the MST Groundwater Deficient Area. (Ex 1, pp. 7-11.)

d. The EIR fails to include reliable surveys to determine the presence, absence, and location of threatened and sensitive wildlife species and their habitat, including California Red-Legged Frog ("CRLF"), Foothill Yellow Legged Frog ("FYLF"), and Western Pond Turtle ("WPT") (Ex 2, pp. 18-29.) The 2007 and 2008 surveys expired before the NOP issued for this EIR (See Ex 2, p. 20; Ex 14, p. 2), and the RTC admits the 2012 surveys were not to "protocol." The 2012 surveys are also now expired due the passage of time.

7. The EIR fails to assess the significance of impacts of all aspects of the Project description by ignoring specific mechanisms of impacts raised in comments on the Draft EIR. Examples include the following.

---

[1]References to Exhibits 1 and 2 in sections 6 - 10 of this letter refer to the April 3, 2016 letters from Greg Kamman and Gretchen E. Padgett-Flohr, attached as Exhibits 1 and 2, respectively, to my April 4, 2016 comment letter on the Final EIR.

a. The EIR fails to analyze the significance of pumping more groundwater than is recharged on-site on local groundwater supplies. (Ex 1, pp. 2-3.)

b. The EIR fails to analyze the significance of increased channel erosion and sediment production caused by increases in peak runoff caused by installing engineered drainage structures. (Ex 1, pp. 11-13.)

c. The EIR fails to analyze the significance of herbicide/pesticide drift on threatened and sensitive wildlife species and their habitat, including CRLF, FYLF, and WPT. (Ex 2, pp. 11-14, 31-32.) The SEIR relies on "compliance with all USEPA, CDPR, and Napa County regulations" governing the use of herbicides/pesticides to reduce impacts to less-than-significant. This is improper under CEQA.

8. The EIR unlawfully defers the development of mitigation measures until after Project approval. Examples include the following.

a. The EIR asserts that the Project's Integrated Pest Management Strategy will reduce potentially significant impacts on CRLF, FYLF, and WPT. (See Ex 2, p. 11 ["IPM is a strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties; strategies do not physically filter anything .... the DEIR failed to itemize the types of IPM that would be used; the combinations are endless and specific to the target species being controlled. If not listed, how can they be evaluated?"].)

9. The RTC ("RTC") fails to provide legally adequate responses to comments.

a. Examples are provided in Exhibits 1 and 2 to my April 4, 2016 comment letter on the Final EIR.

b. With respect to Oak Woodlands, the Draft EIR found impacts to be less-than-significant based on small reductions in the areas to the cleared. My November 21, 2014, (Second of Two) comment letter criticized this rationale. Rather than try to justify this flawed rationale, the Final EIR changes the rationale for the less-than-significant finding to referencing the acres of oak woodlands to be permanently preserved. This response is inadequate for two reasons.

First, a fundamental change in rationale of this nature reveals the Draft EIR was "so fundamentally and basically inadequate and conclusory in nature that public comment on the draft was in effect meaningless." (*Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112, 1130.) Therefore, the Draft EIR must be revised and recirculated for the full 445 days comment period with this new rationale available for public comment.

Second, the Draft EIR correctly recognized that the permanent loss of oak woodlands from the Project site is a significant impact absent mitigation to reduce the impact to less-than-significant. But the notion that preserving areas not slated for destruction, even in perpetuity, could reduce the impact to less-than-significant is illogical. The EIR's finding that the unmitgated impact is significant is based on the loss of oak woodlands in the areas to be converted to vineyard; it is not based on the possibility that oak woodlands not slated for destruction might be destroyed in the future. Therefore, preventing their destruction in the future does not reduce the significant impact identified in the EIR.

The grounds for this appeal also include the following.

10. **Inadequate Assessment and Mitigation of Groundwater Drawdown Impacts.** The EIR finds that the project will cause a significant groundwater drawdown impacts unless mitigation is adopted. (FEIR, 4.6-51: "After mitigation, impacts as a result of groundwater drawdown are less than significant.") But the EIR defers analysis of the degree of this significant groundwater drawdown impact and defers the development of specific measures to reduce such impacts until after project approval. (FEIR, 4.6-51-52; GMMP, FEIR, Appendix R, 13-14; August 1, 2016, Updated MMRP, p. 49.) Deferring the impact analysis is not allowed under CEQA. Deferring the development of mitigation measures is not allowed under CEQA unless it is impracticable to develop mitigation measures during the CEQA process, there is evidence that future mitigation is feasible, and the project is required to meet specific performance standards. (*CBE v. Richmond* (2010) 184 Cal.App.4th 70, 92-96.)

Mitigation measure 4.6-4 provides for well monitoring but does not specify what specific measures will be implemented to reduce identified impacts. Nor does it specify performance standards the project is required to meet. With respect to standards, MM 4.6-4 provides:

> "the Director of Environmental Management shall be authorized to require additional reasonable conditions on the Applicant, or revocation of this permit, as necessary to meet the requirements of the Napa County Groundwater Ordinance and protect public health, safety and welfare." (FEIR, 4.6-51-52.)

The FEIR fails, however, to explain whether the Napa County Groundwater Ordinance even applies to this project, given the exemption for agriculture at County Code § 13.15.040. Even if the Groundwater Ordinance applies, it does not provide a performance standard; it merely echoes CEQA's "significant effect" standard (see County Code § 13.15.070.C ["based on substantial evidence in the record, that the new water system, improvement or addition would not significantly affect the impacted groundwater basin in Napa County"].) MM 4.6-4's reference to protecting "public health, safety and welfare" is even vaguer.

The Groundwater Monitoring and Management Plan provides a standard for impacts on neighboring property owners' wells, i.e., "would drop to a level which would not support existing land uses or planned uses for which permits have been granted." (GMMP, FEIR, Appendix R, 13.) But this standard is not incorporated into the Updated Mitigation Monitoring and Reporting Plan, which in the column for "Performance Criteria" merely refers to "County standards." (August 1, 2016, Updated MMRP, p. 49.) Further, this GMMP standard only measures impacts on neighboring land uses, not on the groundwater resource as a whole.

Finally, as noted above, the Updated Mitigation Monitoring and Reporting Plan, in the column for "Performance Criteria" merely refers to "County standards." What these putative County standards might be is unknown.

11. **New Information Regarding Increased Runoff.** With respect to LRC's ground for appeal related to increases in precipitation runoff, the EIR's estimates of project-caused runoff increases are based on two informational deficiencies: its failure to include the project's many engineered drainage facilities in its estimate of project induced increases in runoff, and its assumption that deep ripping the soil causes a permanent increase in soil moisture permeability.

In his comments letters, Mr. Kamman repeatedly asked for the EIR's runoff analysis to include the project's many engineered drainage facilities in its estimate of project induced increases in runoff. But the County refused to include these components of the project in the EIR's impact analysis. As a result, Mr. Kamman estimating project-caused increases in runoff for one vineyard block, using the same parameters and assumptions used in the EIR's analysis, except Mr. Kamman included the runoff increase and concentration effects of the project's proposed drainage facilities in the analysis. The results show substantial increases in runoff as compared to the EIR's estimate. (See Exhibit 1.)

As explained by Mr. Kamman in Exhibit 1, the EIR's assertion that deep ripping the soil causes a permanent increase in soil moisture permeability, and therefore will reduce surface runoff as compared to pre-project conditions, is based on a 2014 letter from Dave Oster of the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). (FEIR, 4.6-7.) This letter was not included in the EIR. What it actually says is that any change in permeability may be temporary. (Exhibit 1, Attachment A.)

More importantly, Mr. Oster sent a new letter to the County, dated June 2, 2016 (i.e., well after the Director's April 4, 2016 hearing) to clarify that to conclude that ripping would increase soil permeability, a site-specific investigation of the kind described the NRCS' Soil Survey Manual is necessary. (Exhibit 1, Attachment A.) Here, no such investigations have been conducted.

As a result of the informational deficiencies, the EIR's assessment of the significance of project-caused increases in runoff, and of the many adverse environmental impacts associated with increased runoff, including stream sedimentation, degraded fish habitat, flooding, and landsliding does not comply with CEQA. (See *CBE v. City of Richmond* (2010) 184 Cal.App.4th 70, 82 ["the existence of substantial evidence supporting the agency's ultimate decision ... is not relevant when one is assessing a violation of [CEQA's] information disclosure provisions"]; accord, *Joy Road Area Forest and Watershed Ass'n v. California Dept. of Forestry & Fire Protection* (2006) 142 Cal.App.4th 656, 684.)

12. **New Information Regarding Landslide Risk.** The eruption of landsliding under Highway 121 about two miles south and east of the project site on March 13, 2016, caused LRC to expand Mr. Kamman scope of work to include the project's effects on landslide risk. (See Exhibit 3.) The results of Mr. Kamman's analysis are presented in Exhibit 1 to this letter. Mr. Kamman found that runoff in quantities that the EIR has never either calculated or reliably estimated (for the reasons discussed in section 12 above) will be captured in berms and detentions basins that the project proposes to construct on top of active landslides areas. (See Exhibit 1; Updated MMRP, 48, MM 4.6-1.)

The EIR makes no attempt to design these structures to ensure they have adequate design capacity. Instead this work is deferred until after project approval. This violates CEQA because there is no showing that it is impracticable to design these structures during the CEQA process and the project is not required to meet specific performance standards. (*CBE v. Richmond* (2010) 184 Cal.App.4th 70, 92-96.) Indeed, the Updated MMRP merely refers vaguely to "County standards" without specifying what those standards are.

Moreover, the EIR cannot design these structures yet, until it remedies the deficiencies in its assessment of the amount of runoff increases the project will cause, therefore, it is unknown—and unanalyzed in the EIR—whether using these structures as mitigation for increases in runoff is feasible or effective. (See *CBE v. Richmond* (2010) 184 Cal.App.4th 70, 92-96.)

Finally, the EIR utterly fails to assess the potentially significant landsliding impacts these structures could cause by allowing runoff to escape through overtopping or infiltration through the soil. This violates CEQA. (Guidelines, §15126.4(a)(1)(D).)

13. **New Information and De Novo Review.** The Board of Supervisors should consider the information contained in the attached letters from Greg Kamman and Gretchen E. Padgett-Flohr, attached hereto as Exhibits 1 and 2, respectively, and conduct de novo review of this appeal.

The Board must consider this new information and conduct de novo review of this appeal because notice of the April 4, 2016 Director's hearing was not "given in the manner set forth in Section 18.136.040" as provided in County Code section 2.88.090.A. Section 18.136.040 provides the "manner of notice" solely for matters decided by the Planning Commission, and the Planning Commission did not hold a hearing on or approve this ECP. Second, subdivision A of section 18.136.040 provides that the notice must include "the fact that the hearing will be held before the planning commission." The notice provided for the April 4, 2016 hearing held by the director did not include this information, nor could it.

Further, even if the April 4, 2016 Director's hearing "was recorded electronically or by a certified court reporter and notice of that hearing had been given in the manner set forth in Section 18.136.040" as provided in County Code section 2.88.090.A, there is good cause for the Board to consider this new information and conduct de novo review of this appeal as provided in County Code section 2.88.090.B.

The new information based on Mr Oster's June 2, 2016 letter regarding ripping and soil permeability could not have been produced before April 4, 2016.

The new information regarding Mr. Kamman modeling of runoff increases with drainage facilities included is a direct result of and response to the Director's Responses to Comments on the FEIR, issued on August 1, 2016, which again refused to include such an analysis in the EIR. Indeed, members of the public should not have to retain a hydrologist to conduct analyses that the lead agency should include in an EIR to begin with.

The new information regarding landslide risk is the direct result of the urgency given to this issue by the landsliding under Highway 121 about two miles south and east of the project site on March 13, 2016. There was not sufficient time for LRC to expand Mr. Kamman's scope of work and get his analysis done before the April 4, 2016 Director's hearing.

The new information from Mr. Kamman in Exhibit 1 regarding streamflow monitoring is the direct result of and response to new information regarding the July 2016 and proposed August 2016 Walt Ranch Water Quality Monitoring Program referenced in Exhibit 4 attached hereto.

The new information from Mr. Kamman in Exhibit 1 regarding groundwater recharge is the direct result of and response to new information regarding this topic included in the Director's August 1, 2016, decision, in particular Attachment C, Groundwater Memorandum.

The new information from Ms Padgett-Flohr in Exhibit 2 regarding impacts on biological resources is the direct result of and response to new information regarding this topic included in the Director's August 1, 2016 decision.

Thank you for your attention to this matter.

Very Truly Yours,

Tom Lippe

Thomas N. Lippe

List of Exhibits

1. August 26, 2016, letter from hydrologist Greg Kamman.

2. August 25, 2016, letter from biologist Gretchen Padgett-Flohr.

3. Caltrans Advisory Re closure of Highway 121 due to landsliding.

4. August 15, 2016 Memorandum from the City of Napa, enclosing August 2016 Walt Ranch Water Quality Monitoring Program.

Kamman Hydrology & Engineering, Inc.
7 Mt. Lassen Drive, Suite B250, San Rafael, CA 94903
Telephone: (415) 491-9600
Facsimile: (415) 680-1538
E-mail: Greg@KHE-Inc.com

August 26, 2016

Tomas Lippe
Law Offices of Thomas N. Lippe APC
201 Mission St., 12th Floor
San Francisco, CA 94105

Subject: Landslide Hazard Assessment
Walt Ranch Erosion Control Plan (P11-00205-ECPA)
Walt Ranch Project, Napa, CA

Dear Tom:

I have reviewed the Responses to Final EIR Comments report prepared by Analytical Environmental Services (July 2016) and don't feel there is anything presented that alters my conclusions provided in my prior 2014 and 2016 comment letters. Review of some responses has stimulated more thought and research on my part and I would like to share some new information in the following sections.

1.0 Runoff Curve Number Adjustments by Ripping Soil

A significant assumption made throughout the hydrologic analyses to quantify runoff from the project site is that deep ripping certain soils will alter their hydrologic soil group (HSG) and associated runoff curve number (CN) in a manner that increases infiltration and reduces runoff. This assumption results in reducing the CN and post-project storm runoff in many project areas. As reported in the EIR, this assumption comes from a letter prepared by Ken Oster, soil scientist with the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) to Dave Steiner of the Napa RCD dated February 28, 2014. Because I could not find Mr. Oster's letter in any of the EIR documents, I contacted him for a copy to review. He responded indicating that his 2014 letter gave only a theoretical effect of ripping and that he sent a clarifying letter to Charles Shembre, Dave Steiner's successor, on June 2, 2016 explaining that any change in HSG in response to ripping needs to be verified by an on-site investigation pursuant to NRCS guidelines. The 2016 letter states that it supersedes the opinion contained in the 2014 letter. Copies of both letters prepared by Mr. Oster are provided in Attachment A.

Having reviewed Mr. Oster's 2014 letter, it is important to point out that it contains a statement regarding the longevity of the assumed increase in infiltration rate that was not acknowledged in the EIR. He states, "*Ripping may not permanently change the K_{sat}[1] of soils. Ripping may shatter, but may not mix them. The increase in K_{sat} would then be temporary, because soils may*

[1] K_{sat} of soil is defined as the saturated hydraulic conductivity or permeability of the soil. The higher the K_{sat} value, the higher the rate of water movement through the soil. Soils with relatively high K_{sat} values have higher infiltration rates than soils with low K_{sat} values.

EXHIBIT 1

reconsolidate after a few wetting and drying cycles." I had repeatedly made this same statement in my 2014 and 2016 EIR review comments.

I have obtained and reviewed a number of papers/reports on studies pertaining to how tilling[2] of soil alters infiltration/runoff rates and soil CN. A common conclusion from these studies is that tilling increases runoff and the long-term effect of not tilling leads to higher infiltration and lower runoff (Deck, 2010; Rust and Williams, 2010; Bonta and Shipitalo, 2013; Volkmer, 2014; Endale et al., 2011). Licht and Al-Kaisi (2012) present findings that deep ripping results in the lowest infiltration rate over several less intrusive tilling methods and non-tilled soil had the highest infiltration rate. Some studies also conclude that tilling increases both runoff rates and soil erosion (Jin et al., 2008; Battany and Grismer, 2000; Delaune and Sij, 2012). A few studies point out that tilling can increase poor infiltration by breaking up surface crusts or other compacted layers by deep tillage (USDA-NRCS, 2008; Allen and Musick, 1997; Volkmer, 2014). However, these same studies stress that this is only a short-term phenomenon and bare soil subjected to the direct impact and erosive forces of raindrops dislodge soil particles that fill in and block surface pores, contributing to the development of surface crusts that restrict water movement into soil. Allen and Musick (1997) found the increased infiltration rates ceased after a single irrigation cycle. Thus, the authors recommend that long-term solutions for maintaining or improving infiltration include practices that decrease disturbance to the macropore network (predominantly created by earthworms), increase surface and soil organic matter and aggregation, and reduce soil disturbance and compaction.

The findings from these studies and statements in Oster's 2014 letter are clear. The increase in infiltration associated with deep ripping is short-lived and infiltration rates will revert back towards original pre-tillage values. Thus, the estimated project runoff rates will occur only immediately after vineyard construction and the EIR fails to accurately assess/quantify the long-term changes in runoff rates and the associated erosion potential. Regardless, pursuant to NRCS guidance provided in Mr. Oster's 2016 letter, assumed changes in soil HSG due to ripping are only justified if they are verified by an on-site investigation. In his 2016 letter, Mr. Oster indicates that the actual HSG of the disturbed soil condition resulting from ripping should be verified by an on-site investigation as required by the National Engineering Handbook, Part 630.0702 (USDA-NRCS 2009), which pertains to "Disturbed Soil." Chapter 7, entitled Hydrologic Soil Group of Part 630 of the Handbook is provided in Attachment A. The entire text of Part 630.0702 of the Handbook includes the following.

> *"As a result of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group. A general set of guidelines for*

[2] For the purposes of this letter, tilling refers to the mechanical preparation of land for growing crops by plowing, discing, chiseling and/or ripping. My understanding of the deep ripping process is that bull dozer's equipped long steel shank(s) break up the surface soil and rock to a desired depth in order to prepare fields for vineyard planting. After ripping, soil amendments may be added and the soil is disced, breaking the large chunks of earth into smaller chunks. Finally, the vineyard is planed smooth to level the soil in preparation of planting vines and installing irrigation.

estimating saturated hydraulic conductivity from field observable characteristics is presented in the Soil Survey Manual (Soil Survey Staff 1993)."

Pages 36 to 41 of the Soil Survey Manual (USDA-NRCS 1993) cited in Part 630.0702 Handbook contains a description of the field method to estimate saturated hydraulic conductivity (K_{sat}) based on observation and measurement of various soil properties. This section of the Soil Survey Manual pertaining to the guidelines for field estimates of K_{sat} is also provided in Attachment A. Pursuant to these guidelines, the project would need to complete the field estimate procedure on each of the different HSG's after they have been deep ripped. The EIR does not present the results of any on-site soil field tests on ripped soil types that verify deep ripping will alter site soil HSG's. Therefore, their hydraulic analyses using non-verified HSG designations to estimate peak storm runoff rates should be considered invalid.

2.0 Effect of Vineyard Drainage Elements on Storm Runoff Rates

A critique I have presented to you in the past is the lack of integrating the project vineyard drainage elements into the post-project storm water runoff estimates. The DEIR does not present storm water runoff estimates from vineyard blocks. Their peak storm runoff estimates are calculated for and representative of much larger drainage areas. However, they do conclude that runoff from 41 vineyard blocks will be higher because the representative runoff curve numbers for those blocks will be higher than pre-project conditions[3]. They base their erosion control measures and designs on this qualitative assessment of changes in vineyard block runoff curve number – they do not attempt to model or quantify peak storm runoff rates form vineyard blocks. They state (Appendix F of DEIR [pdf p. 588]), "*Where the proposed blocks are small (less than 5 acres) and the change in curve number less than 4, any increase in runoff will also be very small. However, all blocks with any increase in the developed curve numbers will have some recommended runoff mitigation measure even though the actual impact would be extremely difficult to corroborate by a numeric hydraulic model because the change is so small.*" Even more troubling is the fact that their qualitative conclusion for higher flows is based solely on a higher runoff curve number and they do not factor in the effect the drainage elements have on concentrating and increasing peak flow rates from individual vineyard blocks.

To better understand and quantify the different effect runoff curve number and drainage elements have on storm runoff, we completed a hydrologic modeling analysis on a proposed drainage outfall in Vineyard Block 21B. We chose this site because the EIR concludes that the drainage area to this outfall does not change between pre- and post-project conditions [cite to page number] and the vineyard block includes drainage elements including internal diversion ditches that feed into a surface drainage pipeline [cite to page number]. Figure 1 presents the 2.17-acre drainage area contributing to the outfall. Approximately two-thirds of the drainage area lies north of the proposed vineyard block while the lower third of the drainage area lies within the vineyard.

---

[3] Appendix F to the DEIR, presents a comparison of changes in curve numbers on a block by block basis and relates this to a relative change in runoff. RiverSmith states, "*In general, an increase in runoff curve number relates to less infiltration (more runoff) and a decrease in runoff curve number relates to an increase in infiltration (lower runoff).*"

Our hydrologic analysis follows the same modeling approach and methods, rainfall intensities, NRCS TR-55 travel time computation and other model assumptions as those used by RiverSmith in their hydrologic analysis. However, in lieu of using the same USACE HEC-HMS computer program, we used the StormCAD module integrated with our AutoCAD computer design program. The StormCAD program contains the same time of concentration and rainfall runoff equations/methods used in the RiverSmith hydraulic analysis. Using these tools, we developed three model scenarios as part of our analysis: 1) existing conditions (pre-project); 2) post-project without any drainage elements; and 3) post-project including the proposed drainage elements. Figure 2 depicts the model configuration of the third model scenario. Consistent with the curve numbers presented by RiverSmith in Appendix F of the DEIR, we assume a pre-project curve number of 78.2 for the entire water shed area, including vineyard. Under post-project conditions, we assume the curve number within the vineyard area is lowered to 75 while curve number for the rest of the watershed remains at 78.2. Thus, the composite curve number decreases under the post-project model scenarios. We simulated three of the RiverSmith 24-hour precipitation events for each model scenario including the 2-, 10- and 100-year storm events. The simulated peak storm runoff rates from this analysis are presented in Table 1.

TABLE 1: Simulated peak runoff rates (in cfs) for Vineyard Block 21B outfall.

	A	B	C
Storm Event	**Pre-Project Conditions**	**Post-Project Conditions (no drainage improvements)**	**Post-Project Conditions (with drainage improvements)**
2-year	6.94	6.71	7.80
10-year	10.73	10.47	12.18
100-year	21.02	20.79	24.32

As predicted by RiverSmith, simulated project runoff rates with no drainage improvements (column B, Table 1) are slightly lower than pre-project condition peak flow rates (column A, Table 1) due to a reduction in the composite runoff curve number. These changes equate to a 3%, 2.5% and 1% reduction in the 2-, 10- and 100-year peak storm flow rates, respectively. However, integrating the vineyard drainage elements into the runoff model results in peak flow rates that are notably higher (column C, Table 1) than those under pre-project conditions. Increases in post-project flow rates from the Block 21B outfall that also consider the internal drainage elements are 12.4%, 13.5% and 15.7% higher than pre-project 2-, 10- and 100-year peak storm flow rates, respectively This means that the flow reductions realized with a reduction in runoff curve number are negated and reversed by the effects of the internal drainage ditches and pipelines designed to collect, concentrate and accelerate flow off the vineyard block.

The results of our hydraulic analysis of Block 21B highlight the deficiencies of the EIR in accurately identifying areas of increased runoff and erosion potential. This example illustrates that a determination on the changes in runoff from vineyard blocks based solely on a qualitative analysis of runoff curve number can lead to incorrect conclusions and unmitigated impacts. This also calls into question the suitability of the EIR in identifying and evaluating the potential adverse impacts associated with project erosion control measures/structures as discussed below.

3.0 Project Effects on Landslide Potential

You have asked that I review the FEIR for the Walt Ranch project and evaluate if the project increases the potential for landslide hazards. This review comes in light of the recent landslide damage to Highway 121 a short distance south of the project site located approximately 0.9 miles north of Wooden Valley Road (Figure 3). The site of the Hwy 121 slide is located in an area mapped as "Mostly Landslide" by Wentworth et al. (1997), indicated by the red shading on Figure 4. The Mostly Landslide designated area presented on Figure 4, defined by drawing envelopes around groups of mapped landslides, extends northward into the Walt Ranch Project site. Wentworth et al. state, "The best available predictor of where movement of slides and earth flows might occur is the distribution of past movements." The Site Geologic Map, prepared by Gilpin (2013) and presented in Appendix F of the DEIR, maps the location of active and dormant landslides at the project site. A number of proposed vineyard blocks overlap and/or drain runoff to the landslides mapped by Gilpin as well as the "Mostly Landslide" areas mapped by Wentworth et al. The following text describes how project activities may increase the potential to reactivate these slides.

Results of the hydrologic analysis completed by RiverSmith (2013; Appendix G of DEIR) indicate that peak storm runoff from 41 of the 69 project vineyard blocks will be greater than pre-project conditions based on an increase in runoff curve number associated with the change in vegetation type and land use. RiverSmith (2013) along with PPI Engineering (2013) propose a number of drainage and erosion control measures to mitigate for this increase. One objective of the drainage and erosion control measures in vineyard blocks is to mitigate for the increased channel erosion potential associated with the increased storm runoff rates. This is accomplished by installing rock energy dissipaters and/or berms and detention basins to store water to reduce predicted increases in runoff to pre-project levels. Both slow the rate of runoff, while the berms and detention basins actually pond and store water. With respect to reducing the landslide potential associated with vineyard development, mitigation measures also include installing drainage elements that help dewater the vineyards and reduce soil saturation and associated pore water pressure. These drainage elements act to accelerate the drainage of surface water from the vineyards to a downstream discharge point further adding to increases over pre-project runoff rates that are solely associated with the increased vineyard runoff curve numbers.

In their engineering geology report, Gilpin (2013) provide the following statements.

- (Pages 8-9) *We mapped approximately 278 active landslides on the site. This does not include active creek bank failures. Of these 278 landslides we mapped approximately 149 (54%) active debris flows or slides. The folded bedrock, steep hillslopes and deeply weathered bedrock are susceptible to the erosion caused by intense storm-related runoff that causes debris slide failures. Typically the landslides are elongate and narrow, and often confined to pre-existing swales or drainage courses. We believe the Erosion Control Plan (ECP) for the proposed* *vineyard development will significantly reduce the new occurrence, as well as the reactivation of existing debris slides on the property.*

The ECP vineyard development process controls surface water flow, and addresses unwanted groundwater seepage and poor drainage with appropriate construction of subdrains. These two improvements reduce the debris slide hazard. In addition, vineyard block setbacks from large erosional gullies, combined with control of surface water runoff reduce the likelihood of future slope movement, and increased sediment yields from large storm events.

- (Page 16) *The ECP (PPI Engineering, Inc. 2013) adequately addresses erosion control issues on proposed Blocks 1-69. The ECP, in general, improves the existing runoff and erosion control of the site slopes on the proposed vineyard Blocks. However, because of the complex landslide deposits and history of slope instability additional precautions should be taken during vineyard construction on Blocks located on the east- and northeast –facing slopes of the two areas of the site: 1) the east edge of the volcanic upland; and, 2) the slopes rising from Monticello Road.*

- (Page 17) *We have reviewed the details shown for storm water drainage outlets and other water diversion facilities. These have appropriate armored, erosion-resistant surfaces that do not direct surface or subsurface runoff into slopes susceptible to landslide failure.*

Contrary to the statements by Gilpin, we have identified a number of vineyard blocks that discharge runoff from vineyard blocks directly onto mapped landslides. We identified these vineyards by georeferencing and overlaying project erosion control plans and the site geologic map. We evaluated a subset of the 69 vineyard blocks, focusing only on the 41 blocks where post-project storm runoff rates exceed pre-project rates as estimated by RiverSmith (2013). Of these blocks, we found that drainage from blocks 31A, 40B, 50, 52, 54, 57 and 61 will be directed directly onto mapped landslides. A comparison of erosion control plans[4] and landslide conditions at each of these vineyard blocks are presented in Figures 5 through 10. In order to mitigate for the increased flow rates from these blocks (i.e., reduce them to pre-project levels), the following mitigation measures are proposed: installation of small detention structure or gravel berm on downslope edge of the turnaround avenue at Blocks 31A and 40B; installation of localized detention structure of appropriate size at Blocks 50 and 52; and installation of a gravel berm on the downslope edge of the turnaround avenue at Blocks 54, 57, and 61. All of these proposed berm and detention structures will be located on mapped landslides (Figures 5-10). This will result in water being ponded and possible dispersed more widely on landslide deposits if a structure is overtopped. These mitigations will promote and concentrate infiltration into landslide deposits to a greater degree than would occur under pre-project conditions. Thus, proposed project mitigations are increasing the potential to reactive landslides in these seven specific areas. Although the remaining 34 berm and/or detention sites are not located on active or dormant landslides, they occur in geology and soils prone to sliding and also introduce an

[4] The quality of the Erosion Control plans provided in the EIR are poor and do not reproduce well. Thus, they are hard to read/interpret in Figures 5-10.

increased risk of landsliding. It is also important to point out that given the steep slopes and propensity for landslides to occur during large storm events, sediment mobilized by landslides at the project site would significantly increase sediment delivery to off-site creeks as well as the potential to adversely impact infrastructure downstream of the slides including, but not limited to: the Circle Oaks development; utilities; roadways including Highway 121; and by filling/plugging roadway drainage features such as ditches and culverts.

4.0 Stream Flow and Sediment Yield Monitoring

The Appendix to the Responses to Final EIR Comments report contains a memorandum from Whit Manley of Remy, Moose and Manley LLP (RMM) to Brian Bordona (dated December 18, 2015) which discusses the request from the City of Napa for post-project stream flow monitoring of Milliken Creek. On page 3 of this memorandum, he states, "*In order to obtain meaningful data, it would be necessary to install two in-stream check dams…*" The paragraph then continues to describe the adverse impacts, difficulties, delays, expense and permits associated with the installation of check dams to help rationalize eliminating the need for stream flow monitoring.

I have extensive experience in continuously measuring creek flows in California coastal mountain watersheds and disagree that check dams are required for stream flow gauging. It is my experience that, more times than not, check dams do not aid in stream flow monitoring. Monitoring of selected sections of undisturbed, stable channel is not only sufficient for monitoring but preferred, for many of the very reasons outlined in the RMM memorandum.

It is my opinion that the project Water Quality Monitoring Program should include the measurement of sediment yields entering and exiting the project site as a necessary approach at monitoring erosion from the site and potential impacts to aquatic and riparian resources in Milliken Creek downstream of the Project. The August 2016] version of the Water Quality Monitoring Program proposes to complete discrete measurements of turbidity as part of this Program to assist in evaluating potential impacts to the water quality entering Milliken Reservoir. Their proposed approach at monitoring turbidity (suspended solids) as discrete measurements only provides a snap-shot of concentrations at a single point in time. In order to quantify the changes in the volume of total sediment derived from the Project site, measurements of suspended (turbidity) <u>and</u> bedload sediment concentrations are required <u>in combination with</u> continuous stream flow monitoring. Continuous stream flow monitoring is required component in quantifying sediment yields. Similar to the groundwater monitoring component of the MMRP, pre-project stream flow and sediment monitoring would also provide a baseline for comparison to post-project conditions.

5.0 Recharge to the Sonoma Volcanics Groundwater Aquifer

The project wells will pump water solely from the Sonoma Volcanics groundwater aquifer to meet project demands across the site. This aquifer underlies less than half the project area. In their response to comments on the FEIR, Richard C. Slade & Associates (RCS) continue to defend using a recharge rate for the Sonoma Volcanics at the site based on a composite recharge rate derived from watershed areas that, in addition to Sonoma Volcanics, include large areas of alluvium and other rock types that have recharge rates far higher than that of the Sonoma Volcanics. As I've described in my previous 2014 and 2016 comment letters, this composite recharge rate is higher than that for the Sonoma Volcanics alone. Given the lack of recharge rate estimates specific to individual rock/aquifer types in the area, a measured or focused study recharge rate to the Sonoma Volcanics remains elusive.

In an effort to identify a recharge rate representative of the Sonoma Volcanics, I obtained and reviewed a number of studies focused on estimating recharge rates exclusive to volcanics in other parts of the Western United States. There are numerous studies that have been completed, but they tend to be focus on areas underlain by volcanics (dominated by lave flows) with very different physical and hydrogeologic properties than the Sonoma Volcanics or occur in arid regions (e.g., Columbia River Plateau in Washington, Oregon and Idaho; Upper Deschutes River Basin, Oregon; Goose Lake Basin, Oregon and California; Yakama River Basin, Washington; and Hanford Waste Disposal Site, Washington).

A study by the USGS to estimate groundwater recharge to volcanic bedrock aquifers in the San Juan Islands area of Washington is better suited for comparison to the Sonoma Volcanics (Orr, Bauer and Wayenberg, 2002). This water-balance modeling study focused on estimating recharge from precipitation to groundwater aquifers. They developed models for four independent drainage basins underlain by volcanic bedrock similar to the Sonoma Volcanics. The bedrock consists of sedimentary and volcanic rocks that is metamorphosed in many areas. Well yields are generally small, usually sufficient only for single-family domestic use. Most of the bedrock is nonporous and water occurs primarily in joints and fractures. The mean annual rainfall (ranging from 26 to 35 inches per year) characteristics are similar to Napa County. Based on two years of available meteorological and hydrologic data, the authors estimated annual groundwater recharge rates as 1.4%, 1.5%, 1.0% and 4.8% of average annual precipitation. These rates are more in keeping with the recharge rates I've previously estimated for the Sonoma Volcanics as presented in my prior comment letters. Based on available data and varying techniques, I estimated annual groundwater recharge rates of 2% (2016 letter) and 4% (2014 letter) of mean annual total rainfall, whereas The EIR uses an annual recharge rate 7%.

6.0 Conclusions

In closing, our continued review of EIR documents identifies deficiencies in a complete and accurate assessment of runoff rates and increased erosion potential from vineyard blocks. Therefore, the EIR should be considered inadequate at identifying potential adverse impacts from runoff and erosion. The Project has not implemented standard field analyses prescribed by the NRCS to justify the soil runoff coefficients applied to soil. Nor has it factored in the decrease in ripped soil infiltration rates (as informed by Mr. Oster, USDA-NRCS soil scientist) over the long-term. We have demonstrated that the incorporation of vineyard drainage elements into RiverSmith's hydrologic analyses reverse their results with respect to changes in runoff magnitude from vineyard blocks. Incorporating the proposed drainage elements of Vineyard Block 21B into the hydrologic model results in post-project storm runoff rates much higher than presented in the EIR. This calls into question the suitability of erosion control measures in mitigating (unquantified) impacts from increased runoff. The mitigation measures can't be designed to perform as desired without quantifying the flow magnitudes they are intended to treat. For example, proper sizing, design and function of a detention structure intended to reduce runoff to pre-project levels requires accurate quantification of the project flows it is intended to mitigate. We've also identified how some erosion control measures intended to mitigate the adverse effects of increased runoff rates from vineyard blocks lead to unintended increases in potential landslide hazards. I have not found any reference in the EIR pertaining to an evaluation of potential landslide impacts associated with installation of the erosion control elements (detention structures and gravel berms) in Mitigation Measure 4.6-1. This is another omission of the EIR fully evaluating potential impacts associated with the Project.

Please feel free to contact me with any questions regarding the material and conclusions contained in this letter report.

Sincerely,

Greg Kamman, PG, CHG
Principal Hydrologist

REGISTERED GEOLOGIST
GREGORY R. KAMMAN
NO. 360
CERTIFIED HYDROGEOLOGIST
Exp. 12/31/16
STATE OF CALIFORNIA

REFERENCES (by Section)

1.0 Runoff Curve Number Adjustments by Ripping Soil

Allen, R.R. and Musick, J.T., 1997, Tillage method and depth effects on furrow irrigation infiltration. Applied Engineering in Agriculture, American Society of Agricultural Engineers, vol. 13(6), pp. 737-742.

Battany, M.C. and Grismer, M.E., 2000, Rainfall runoff and erosion in Napa Valley vineyards: effects of slope, cover and surface runoff. Hydrological Processes, vol. 14, issue 7, May, pp. 1289-1304.

Bonta, J.V. and Shipitalo, M.J., 2013, Curve numbers for long-term no-till corn and agricultural practices with high watershed infiltration. Journal of Soil and Water Conservation, vol. 68, no. 6, pp. 487-500.

Deck, J.H., 2010, Hydraulic conductivity, infiltration, and runoff from no-till and tilled cropland. Environmental Engineering Theses and Graduate Student Research. Paper 1, University of Nebraska-Lincoln, 150p.

DeLaune, P.B. and Sij, J.W., 2012, Impact of tillage on runoff in long term no-till wheat systems. Soil & Tillage Research, vol. 124, pp. 32-35.

Endale, D.M., Schomberg, H.S., Fisher, D.S., and Jenkins, M.B., 2011, No-till and curve numbers – a closer look. Proceedings of 2011 Georgia Water Resources Conference, University of Georgia, April 11-13, 4p.

Jin, K., Cornelius, W.M., Gabriels, D., Schiettecatte, W., De Neve, S., Junji, L., Buysse, T., Wu, H., Cai, D., Jin, J., and Harmann, R., 2008, Soil management effects on runoff and soil loss from field rainfall simulation. Catena, vol. 75, pp. 191-199.

Licht, M. and Al-Kaisi, Mahdi, 2012, Less tillage for more water in 2013. Iowa State University Integrated Crop Management News, September 21, 3p.

Rust, B. and Williams, J.D., 2010, How tillage affects soil erosion and runoff. Technical Note, USDA/ARS Columbia Plateau Conservation Research Center, Pendleton, OR, 9p.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS), 2009, National Engineering Handbook, title 210-VI, Part 630 Hydrology, Chapter 7-Hydrologic Soil Groups. Washington D.C., January, 13p.

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS), 2008, Soil quality indicators: Infiltration. Soil Quality Indicator Sheets, 2008. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/health/assessment/?cid=stelprdb1237387

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS), 1993, Soil Survey manual, Agricultural Handbook No. 18, Chapter 3. U.S. Government Printing Office, Washington D.C., 315p.

Volkmer, A.J., 2014, Infiltration and runoff parameters for tilled and no-till row crop production. Biological Systems Engineering Dissertations, Theses and Graduate Student Research. Paper 43, University of Nebraska-Lincoln, 152p.

3.0 Project Effects on Landslide Potential

Gilpin Geosciences, Inc., 2013, Engineering geologic investigation, Walt Ranch Vineyard Development, Hall Brambletree Associates LP, Monticello Road (Hwy 121) & Circle Oaks Drive, Napa, CA. Prepared for: Mr. Jim Bushey, PPI Engineering, Inc., March 6, 20p.

PPI Engineering, 2013, Hall Brambletree Associates, LP, Walt Ranch Erosion Control Plan. Package 1 and 2, Revised February.

RiverSmith Engineering, 2013, Hydrologic analysis of proposed vineyard blocks within the Walt Ranch property, Napa County, California. Prepared for: PPI Engineering, March, 35p.

Wentworth, C.M., Graham, S.E., Pike, R.J., Beukelman, D.W.R. and Barron, A.D., 1997, Summary distribution of slides and earth flows in Napa County, California. U.S. Geological Survey, Open-File Report 97-745 C, sheet 5 of 11, San Francisco Bay Region Landslide Folio, Part C, single map scaled to 1:125,000.

5.0 Recharge to the Sonoma Volcanics Groundwater Aquifer

Orr, L.A., Bauer, H.H. and Wayenberg, J.A., 2002, Estimates of ground-water recharge from precipitation to glacial-deposit and bedrock aquifers on Lopez, San Juan, Orcas, and Shaw Islands, San Juan County, Washington. U.S. Geological Survey Water-Resources Investigations Report 02-4114, 122p.

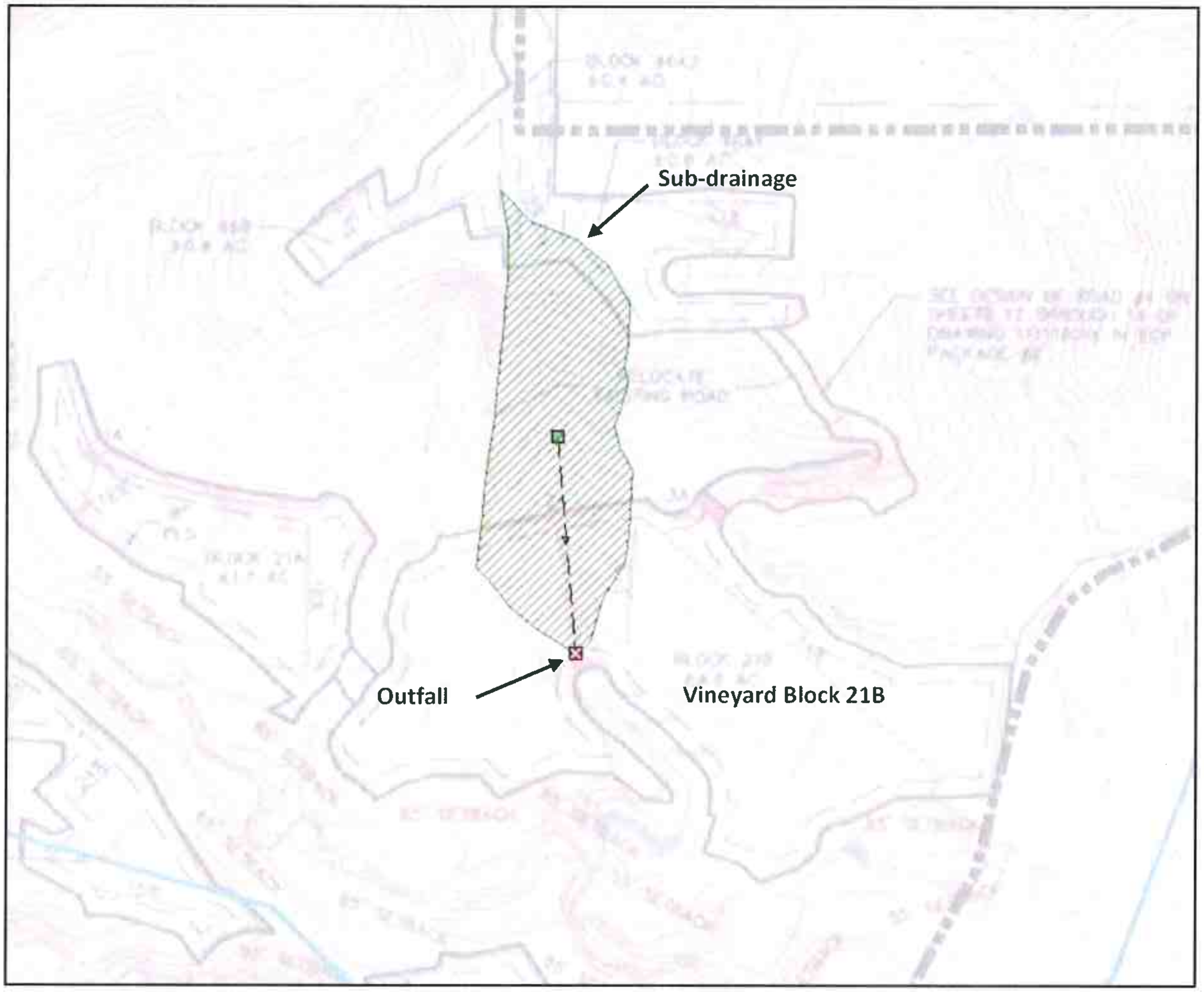


FIGURE 1: Hydrologic model configuration for existing conditions (no drainage improvements) drainage outfall from Vineyard Block 21B.

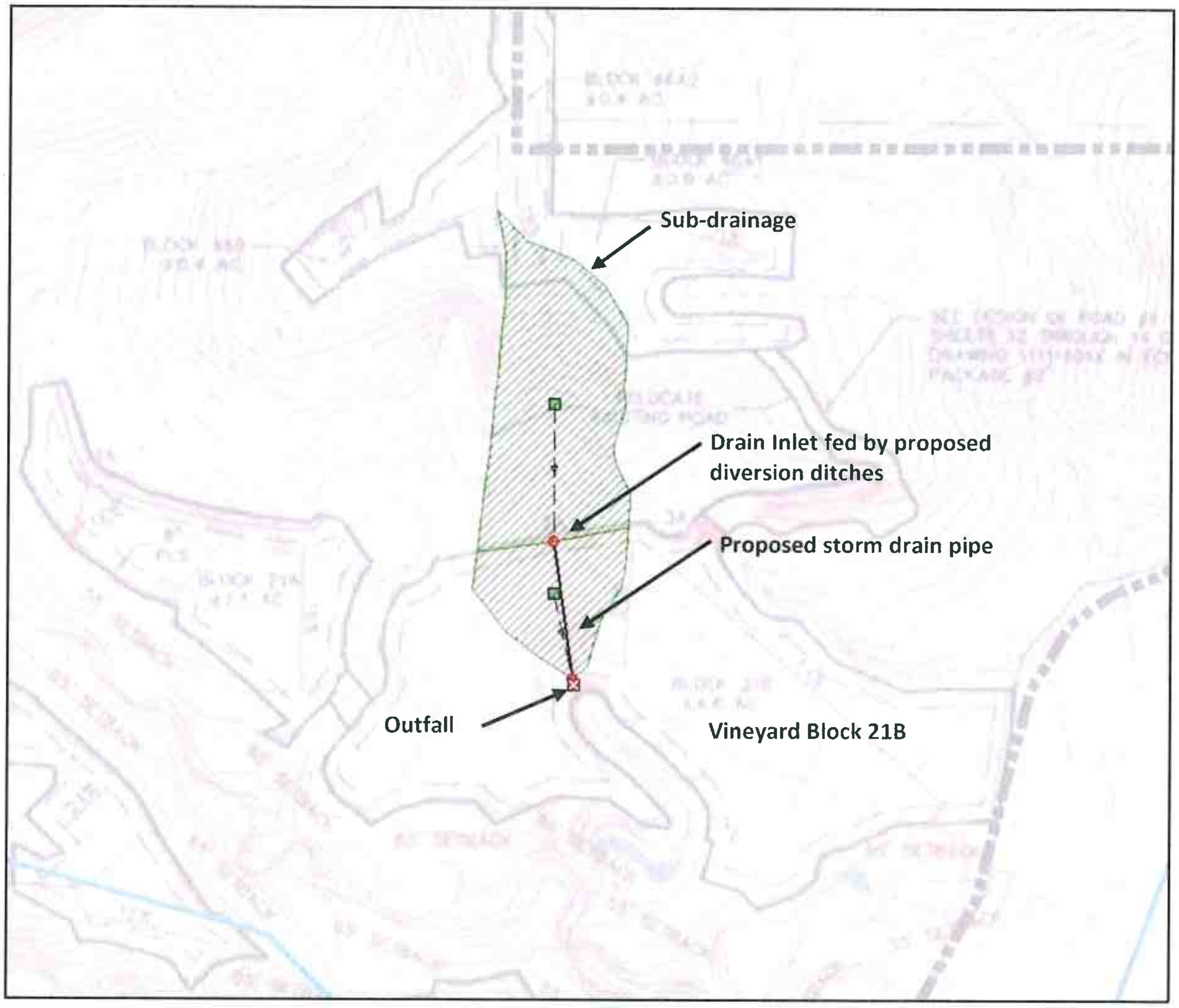


FIGURE 2: Hydrologic model configuration for proposed conditions (no drainage and with drainage improvements) drainage outfall from Vineyard Block 21B.

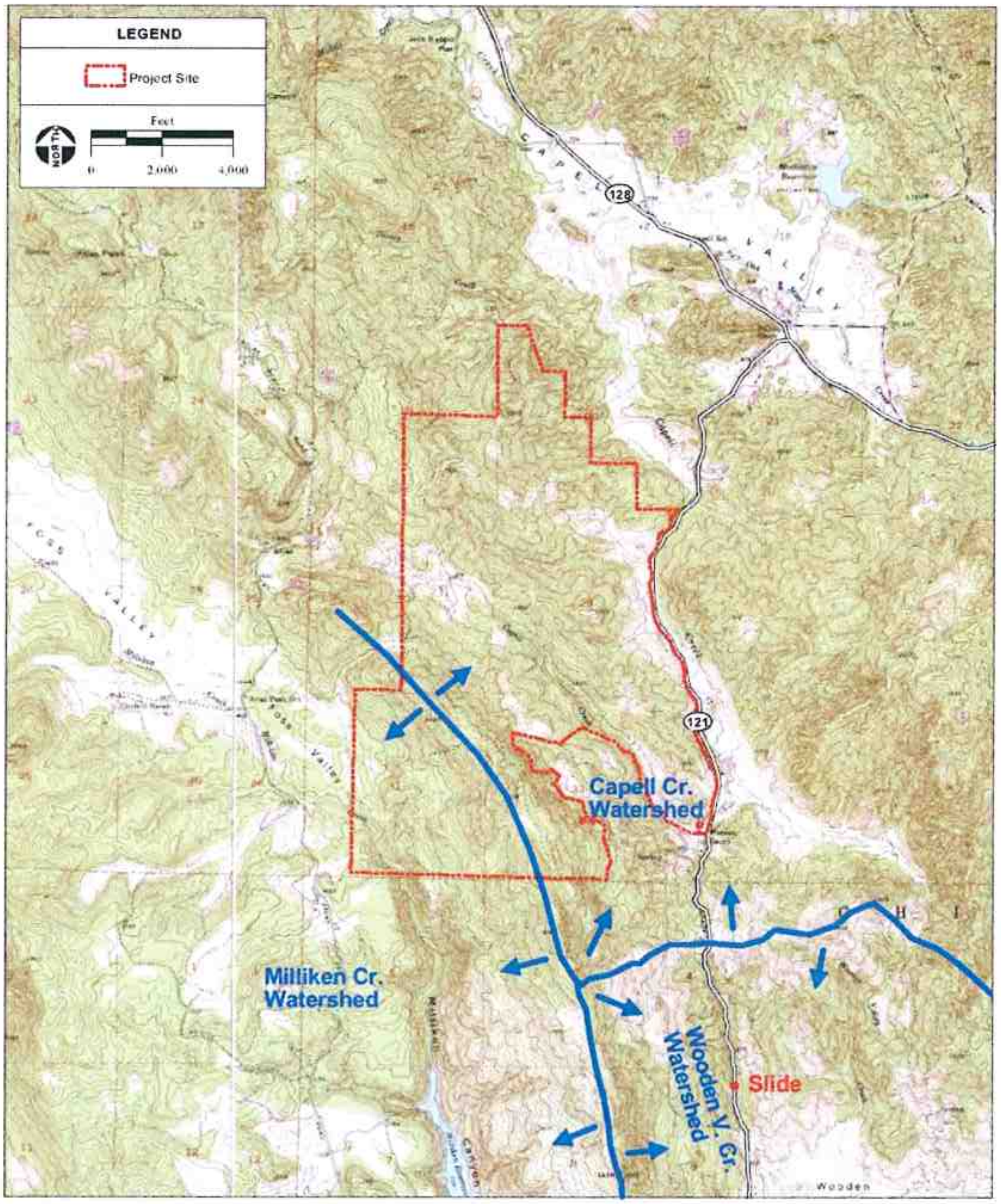


FIGURE 3: Location of recent landslide road failure on Highway 121.

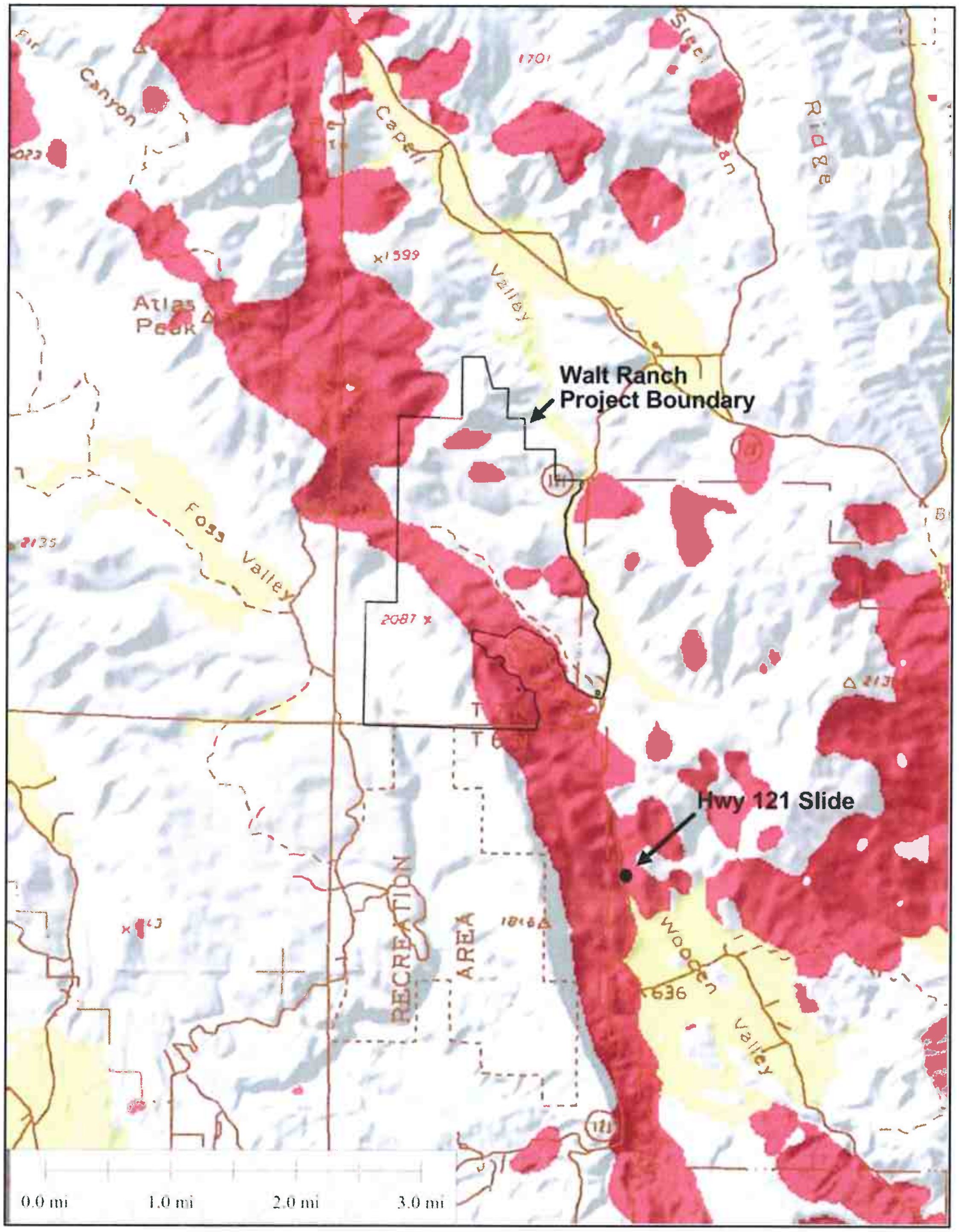


FIGURE 4: Distribution of slides and earth flows in Napa County, CA. Red shading indicates areas of mostly landslides. Source: Wentworth et al., 1997.

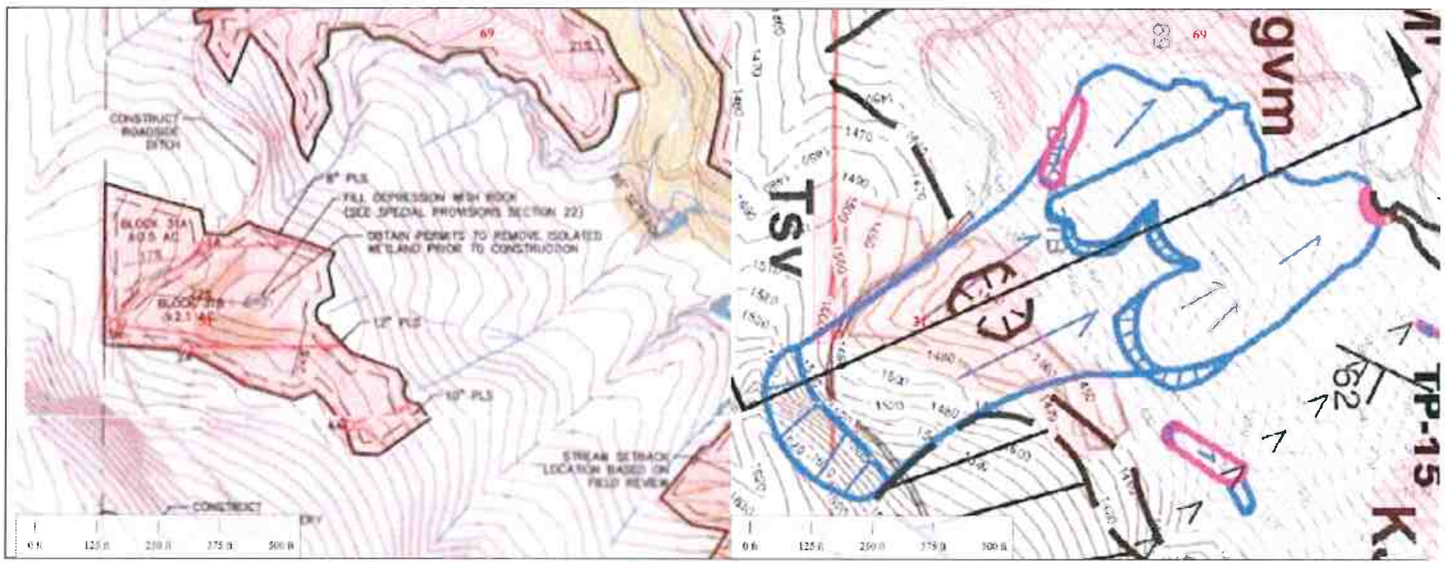


FIGURE 5: Vineyard Block 31A erosion control plan (left) and geologic map (right). Figures are aligned with north towards top of page. Vineyard blocks shaded red in both graphics. Dormant slides outlined in blue and active slides outlined in pink. Runoff flows from left to right (W-E) in vineyard block, discharging onto dormant landslide. Mitigation for increased runoff from Block 31A includes a small detention structure or gravel berm on downslope (right or East) edge of turnaround avenue. Sources: erosion control plans from PPI (2013) and geology map from Gilpin (2013).

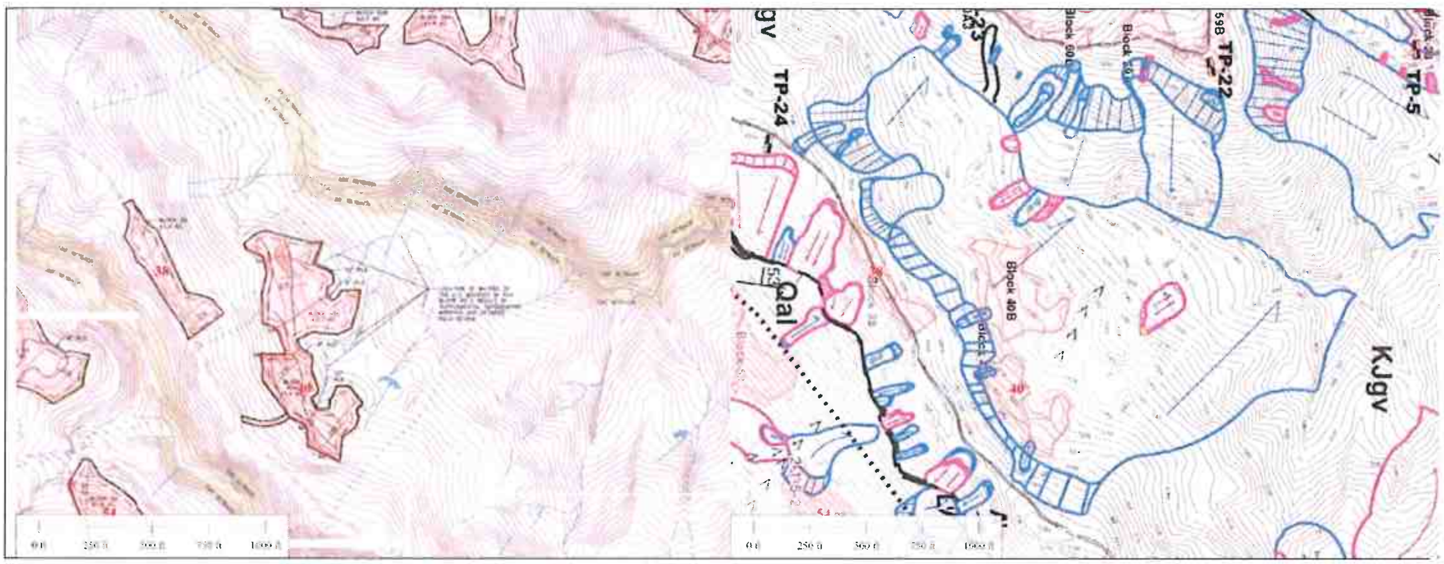


FIGURE 6: Vineyard Block 40B erosion control plan (left) and geologic map (right). Figures are aligned with north towards top of page. Vineyard blocks are shaded red in both graphics. Dormant slides outlined in blue and active slides outlined in pink. Runoff flows to the NE in vineyard block, discharging onto dormant landslide. Mitigation for increased runoff from Block 40B includes a small detention structure or gravel berm on downslope (right or East) edge of turnaround avenue. Sources: erosion control plans from PPI (2013) and geology map from Gilpin (2013).

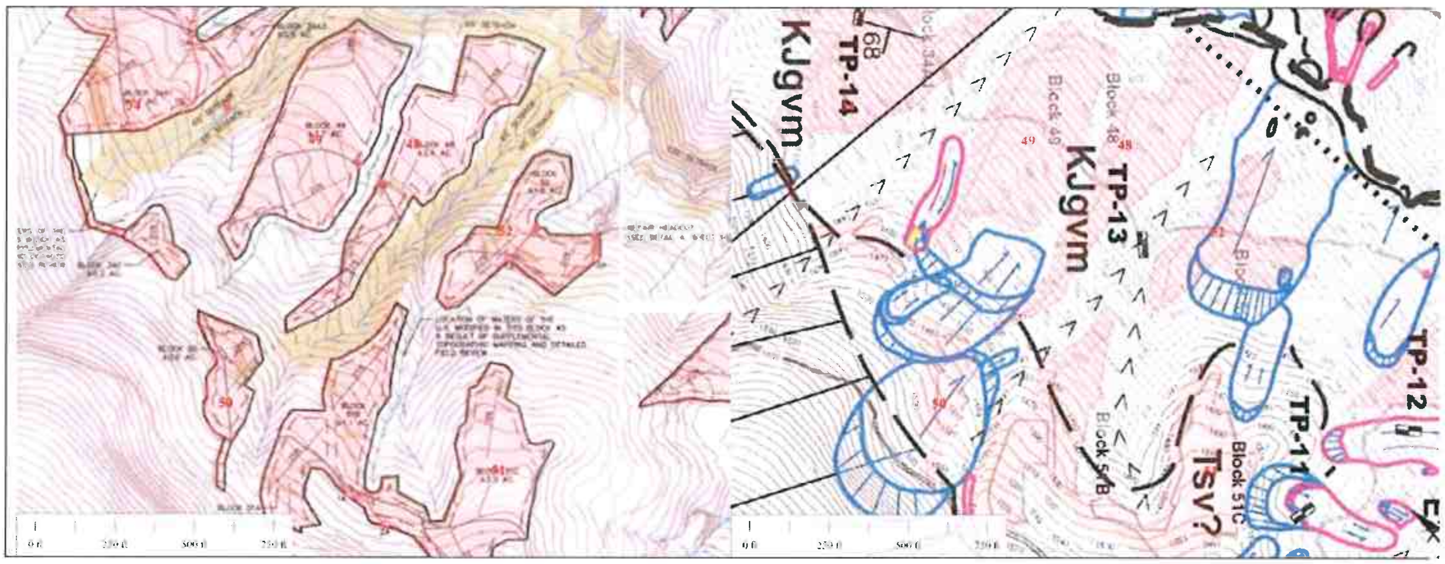


FIGURE 7: Vineyard Block 50 & 52 erosion control plans (left) and geologic map (right). Figures are aligned with north towards top of page. Vineyard blocks are shaded red in both graphics. Dormant slides outlined in blue and active slides outlined in pink. Runoff flows to the NE in both vineyard blocks, discharging onto dormant landslide. Mitigation measure at each block includes installation of localized detention structures of appropriate size to reduce predicted increases in runoff to pre-project levels. Sources: erosion control plans from PPI (2013) and geology map from Gilpin (2013).

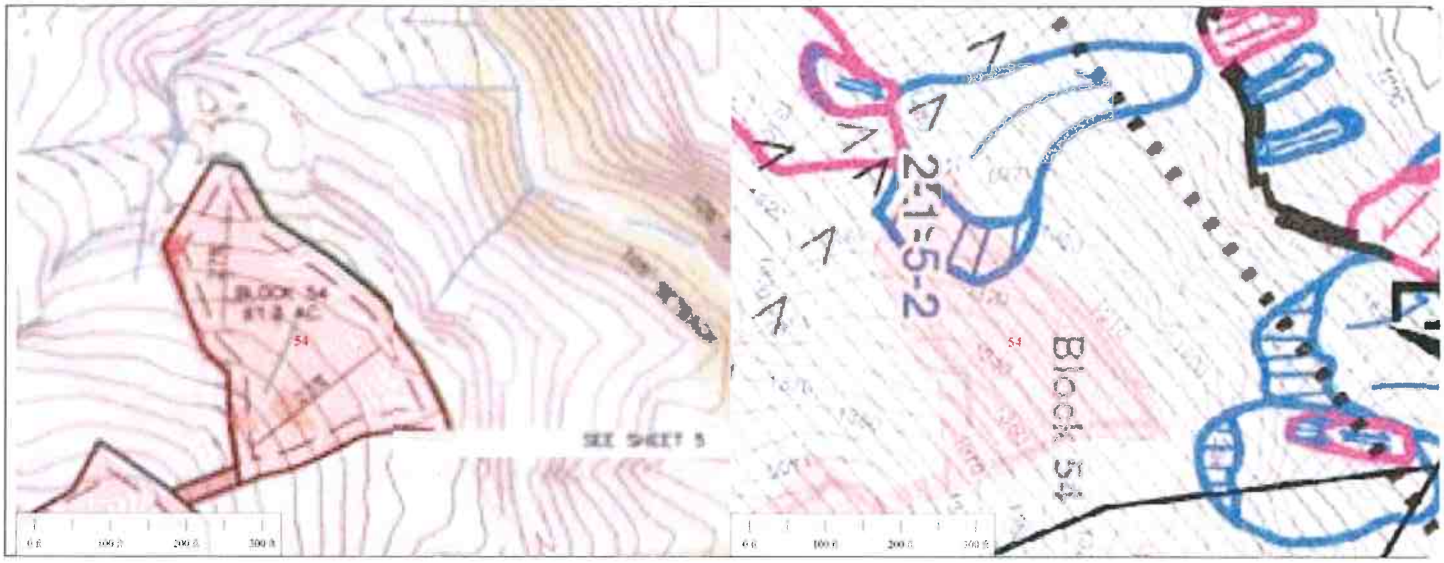


FIGURE 8: Vineyard Block 54 erosion control plan (left) and geologic map (right). Figures are aligned with north towards top of page. Vineyard blocks are shaded red in both graphics. Dormant slides outlined in blue and active slides outlined in pink. Runoff flows to the N-NE in vineyard block, discharging onto dormant landslide. Mitigation for increased runoff from Block 54 includes installing a small gravel berm on downslope (N-NE) edge of turnaround avenue. Sources: erosion control plans from PPI (2013) and geology map from Gilpin (2013).

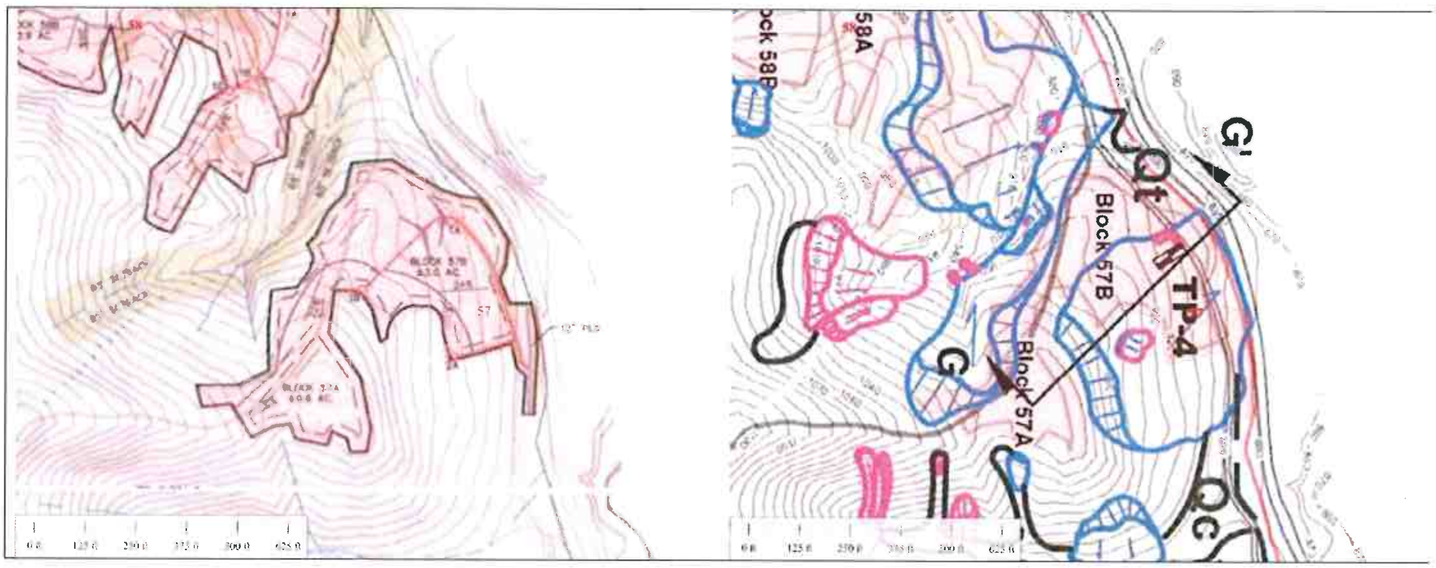


FIGURE 9: Vineyard Block 57 erosion control plan (left) and geologic map (right). Figures are aligned with north towards top of page. Vineyard blocks are shaded red in both graphics. Dormant slides outlined in blue and active slides outlined in pink. Runoff directed to the East in vineyard block, discharging at toe of dormant landslide. Mitigation for increased runoff from Block 57 includes installing a small gravel berm on downslope (East) edge of turnaround avenue. Sources: erosion control plans from PPI (2013) and geology map from Gilpin (2013).

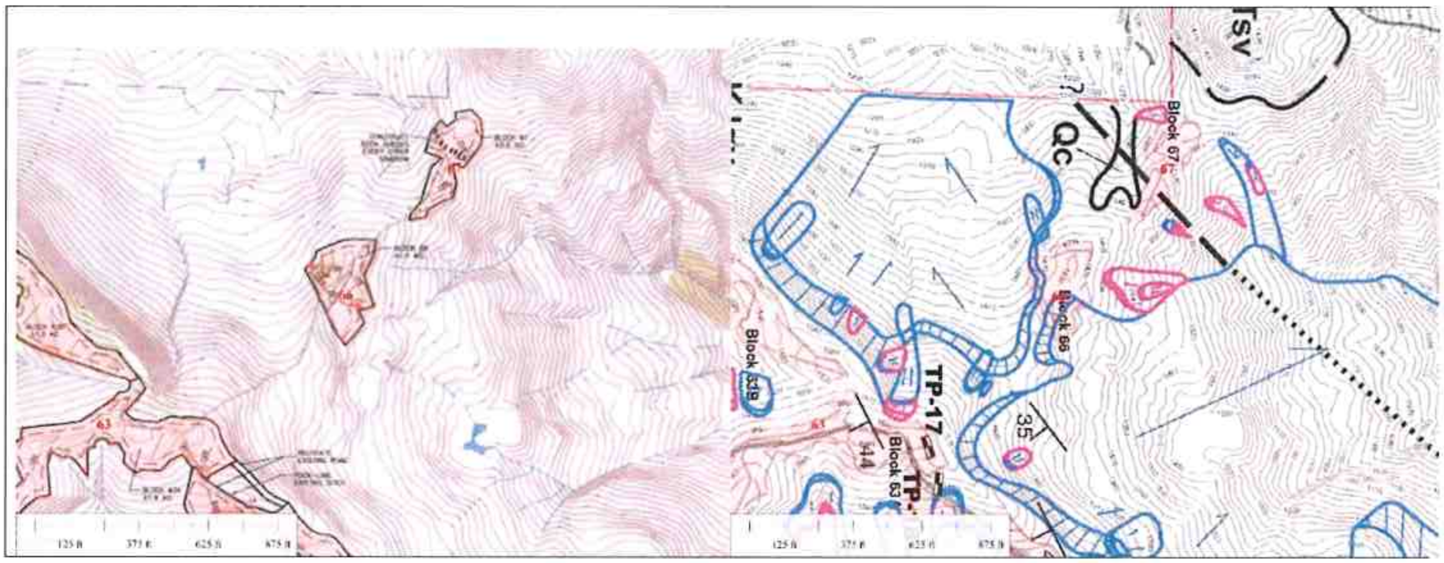


FIGURE 10: Vineyard Block 66 erosion control plan (left) and geologic map (right). Figures are aligned with north towards top of page. Vineyard blocks are shaded red in both graphics. Dormant slides outlined in blue and active slides outlined in pink. Block 66 centered on ridgeline and runoff is directed to the Northwest and Southeast sides of vineyard block, discharging onto bordering dormant landslides. Mitigation for increased runoff from Block 57 includes installing a small gravel berm on downslope edges of turnaround avenues on NW and SE sides of block. Sources: erosion control plans from PPI (2013) and geology map from Gilpin (2013).

ATTACHMENT A

- **USDA-NRCS Correspondence (2 letters)**
- **Part 630 Hydrology, Chapter 7 (Hydrologic Soil Groups) of National Engineering Handbook (USDA-NRCS, 2003)**
- **Excerpt from USDA-NRCS Soil Survey Manual (pg. 36-41, Chapter 3; 1993) Field Estimate Procedure for Estimating Saturated Hydraulic Conductivity.**

United States Department of Agriculture
NRCS Natural Resources Conservation Service

65 Main St., Suite 108
Templeton CA 93465
(805) 434-0396
FAX (805) 434-0284

June 2, 2016

Charles Schembre
Napa County Resource Conservation District
Napa, California

Subject: Effect of Ripping on Hydrologic Soil Groups, Updated

This letter gives policy and recommendations from NRCS on changing Hydrologic Soil Groups after the ripping of shallow soils.

On February 28, 2014 I wrote a letter to Dave Steiner describing how it was possible to change Hydrologic Soil Groups by ripping them. This letter supersedes that opinion.

1. The letter dated February 28, 2014 gives the theoretical effect of ripping based on the decision matrix in the NRCS National Engineering Handbook. Part 630, Chapter 7, page 7-4, Table 7-1 "Criteria for assignment of hydrologic soil groups (HSG)."

2. The actual HSG of the disturbed soil condition resulting from ripping should be verified by an on-site investigation as required by the National Engineering Handbook, Part 630.0702, which states: "Disturbed soils. As a result of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group."

3. When not using the hydrologic soil groups given in the current soil survey report for Napa County, the HSGs of the soils at the proposed vineyard sites should be determined on a case by case basis by the consultants.

I have attached the letter dated February 28, 2014.

Ken Oster
Area Resource Soil Scientist

cc: Rita Steiner, District Conservationist, NRCS, Napa, CA
Tony Rolfes, State Soil Scientist, NRCS, Davis, CA

United States Department of Agriculture
NRCS Natural Resources Conservation Service

65 Main St., Suite 108
Templeton CA 93465
(805) 434-0396
FAX (805) 434-0284

February 28, 2014

Dave Steiner
Napa County Resource Conservation District
Napa, California

Subject: Effect of Ripping on Hydrologic Soil Group, Updated

I have updated my analysis of data from the Soil Survey of Napa County to determine the effect of ripping soils to 36 inches depth on the Hydrologic Soils Group (HSG). This analysis replaces the letter written to Phill Blake on February 12, 2008.

Summary of Findings
I find that upon ripping to 36 inches deep the HSG of the following soils would change from D to C: Hambright, Lodo, Maymen and Millsholm. The HSG for the Kidd soil would change from D to B. Increases in soil depth from less than to more than 20 inches can change HSG even without changes in saturated hydrologic conductivity (Ksat).

Ripping through the lithic bedrock on the following soils may be difficult: Hambright, Kidd, Maymen and Millshlom. Ripping through paralithic bedrock on the following soils may be easier: Lodo.

Principles of Analysis
I determined HSG from the current criteria in the NRCS National Engineering Handbook dated January 2009. I have attached the criteria to this report. In some cases this does not agree with the data in the Soil Survey Reports.

Ripping may not permanently change the Ksat of soils. Ripping may shatter, but may not mix them. The increase in Ksat would then be temporary, because soils may reconsolidate after a few wetting and drying cycles. Nevertheless, the deepening of the soil alone would change the HSG.

I have no Ksat data for Rock Outcrop, and so cannot assess the effect of ripping on their HSG. Nevertheless I would expect water infiltration into bedrock to improve upon ripping.

I excluded the Henneke and Montara soils as candidates for vineyard development because of the infertility of soils developed from serpentinite.

Details of Findings
See the attached table "Effect of Ripping Soils on Hydrologic Soil Group."

Ken Oster
Area Resource Soil Scientist

United States Department of Agriculture

NRCS Natural Resources Conservation Service

65 Main St., Suite 108
Templeton CA 93465
(805) 434-0396
FAX (805) 434-0284

Effect of Ripping Soils on Hydrologic Soil Group

Map Unit Symbol	Soil Name	Natural or Ripped Soil?	Soil Texture least transmissive layer	% Clay in least transmissive layer	Depth to water impermeable layer (inches)	Depth to high water table (inches)	Saturated hydraulic conductivity (Ksat) of the least transmissive layer (micro m/sec)	Ksat Depth Range (inches)	HSG (1)
116, 117	Clear Lake	Natural	clay	40-60	>60	>36	.42-1.40	0	C
		Ripped to 36"	clay	40-60	>60	>36	.42-1.40	0	C
126, 127, 128, 129	Diablo	Natural	clay	35-60	40-80	None	.42-1.40	0	C
		Ripped to 36"	clay	35-60	40-80	None	.42-1.40	0	C
148, 149	Forward	Natural	loam	10-18	25-29	None	14-42	0	B
		Ripped to 36"	loam	10-18	36	None	14-42	0	B
143	Guenoc	Natural	clay loam	35-45	25-40	None	1.4-4	12	C
		Ripped to 36"	clay loam	35-45	36	None	1.4-4	12	C
151, 152, 176	Hambright	Natural	loam	20-27	10-20	None	4-14	0	D
		Ripped to 36"	loam	20-27	36	None	4-14	0	C
142, 153,	Henneke	Natural	clay loam - clay	35-55	10-20	None	1.4-4	7	D
		Ripped to 36"	clay loam - clay	35-55	36	None	1.4-4	7	C
134, 141, 148, 155, 156, 177	Kidd	Natural	sandy loam	10-20	13-20	None	14-42	0	D
		Ripped to 36"	sandy loam	10-20	36	None	14-42	0	B
157, 163	Lodo	Natural	loam	18-27	6-20	None	4-14	0	D
		Ripped to 36"	loam	18-27	36	None	4-14	0	C
161	Maxwell	Natural	clay	40-55	>60	None	.01-.42	0	D
		Ripped to 36"	clay	40-55	>60	None	.01-.42	0	D
157, 163	Maymen	Natural	loam	10-25	10-16	None	4-14	0	D
		Ripped to 36"	loam	10-25	36	None	4-14	0	C
163, 164, 165	Millsholm	Natural	loam	20-27	10-20	None	4-14	0	D
		Ripped to 36"	loam	20-27	36	None	4-14	0	C
166, 167	Montara	Natural	clay loam	27-35	10-15	None	1.4-4	0	D
		Ripped to 36"	clay loam	27-35	36	None	1.4-4	0	C
142	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
151	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
152	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
175	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
175	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
175	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
175	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data
176	Rock Outcrop	Natural			0	None			No Data
		Ripped to 36"				None			No Data

(1) January 2009 criteria in National Engineering Handbook, Chapter 7
http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?cid=stelprdb1043063

by Ken Oster, Area Resource Soil Scientist, USDA-NRCS, 2/28/2014

United States Department of Agriculture

NRCS Natural Resources Conservation Service

65 Main St., Suite 108
Templeton CA 93465
(805) 434-0396
FAX (805) 434-0284

Table 7-1 Criteria for assignment of hydrologic soil group (HSG)

Depth to water impermeable layer [1]	Depth to high water table [2]	K_{sat} of least transmissive layer in depth range	K_{sat} depth range	HSG [3]
<50 cm [<20 in]	—	—	—	D
50 to 100 cm [20 to 40 in]	<60 cm [<24 in]	>40.0 μm/s (>5.67 in/h)	0 to 60 cm [0 to 24 in]	A/D
		>10.0 to ≤40.0 μm/s (>1.42 to ≤5.67 in/h)	0 to 60 cm [0 to 24 in]	B/D
		>1.0 to ≤10.0 μm/s (>0.14 to ≤1.42 in/h)	0 to 60 cm [0 to 24 in]	C/D
		≤1.0 μm/s (≤0.14 in/h)	0 to 60 cm [0 to 24 in]	D
	>60 cm [>24 in]	>40.0 μm/s (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤40.0 μm/s (>1.42 to ≤5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤10.0 μm/s (>0.14 to ≤1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤1.0 μm/s (≤0.14 in/h)	0 to 50 cm [0 to 20 in]	D
>100 cm [>40 in]	<60 cm [<24 in]	>10.0 μm/s (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A/D
		>4.0 to ≤10.0 μm/s (>0.57 to ≤1.42 in/h)	0 to 100 cm [0 to 40 in]	B/D
		>0.40 to ≤4.0 μm/s (>0.06 to ≤0.57 in/h)	0 to 100 cm [0 to 40 in]	C/D
		≤0.40 μm/s (≤0.06 in/h)	0 to 100 cm [0 to 40 in]	D
	60 to 100 cm [24 to 40 in]	>40.0 μm/s (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤40.0 μm/s (>1.42 to ≤5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤10.0 μm/s (>0.14 to ≤1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤1.0 μm/s (≤0.14 in/h)	0 to 50 cm [0 to 20 in]	D
	>100 cm [>40 in]	>10.0 μm/s (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A
		>4.0 to ≤10.0 μm/s (>0.57 to ≤1.42 in/h)	0 to 100 cm [0 to 40 in]	B
		>0.40 to ≤4.0 μm/s (>0.06 to ≤0.57 in/h)	0 to 100 cm [0 to 40 in]	C
		≤0.40 μm/s (≤0.06 in/h)	0 to 100 cm [0 to 40 in]	D

1/ An impermeable layer has a K_{sat} less than 0.01 μm/s [0.0014 in/h] or a component restriction of fragipan; duripan; petrocalcic; orstein; petrogypsic; cemented horizon; densic material; placic; bedrock, paralithic; bedrock, lithic; bedrock, densic; or permafrost.

2/ High water table during any month during the year.

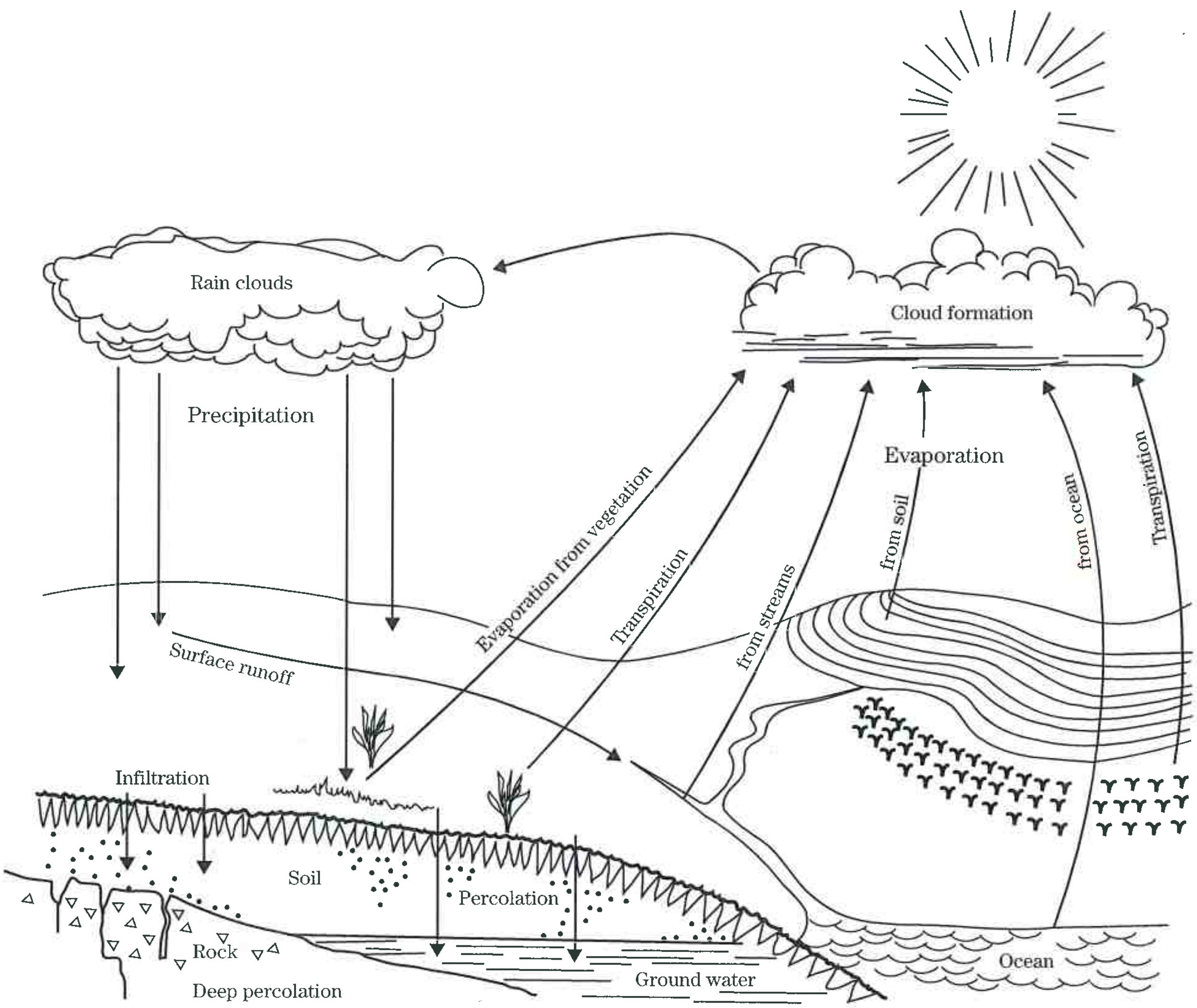
3/ Dual HSG classes are applied only for wet soils (water table less than 60 cm [24 in]). If these soils can be drained, a less restrictive HSG can be assigned, depending on the K_{sat}.

United States
Department of
Agriculture

Natural Resources Conservation Service

Part 630 Hydrology
National Engineering Handbook

Chapter 7 Hydrologic Soil Groups



Issued January 2009

Acknowledgments

Chapter 7 was originally prepared by **Victor Mockus** (retired) and reprinted with minor revisions in 1972. This version was prepared by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) under guidance of **Jon Werner** (retired), NRCS; with assistance from **Donald E. Woodward** (retired), NRCS; **Robert Nielsen** (retired), NRCS; **Robert Dobos**, soil scientist, NRCS; and **Allen Hjelmfelt** (retired), Agricultural Research Service. It was finalized under the guidance of **Claudia C. Hoeft**, national hydraulic engineer.

Preface

This chapter of the National Engineering Handbook (NEH) Part 630, Hydrology, represents a multi-year collaboration between soil scientists at the National Soil Survey Center (NSSC) and engineers in the Conservation Engineering Division (CED) at National Headquarters to develop an agreed upon model for classifying hydrologic soil groups.

This chapter contains the official definitions of the various hydrologic soil groups. The National Soil Survey Handbook (NSSH) references and refers users to NEH630.07 as the official hydrologic soil group (HSG) reference. Updating the hydrologic soil groups was originally planned and developed based on this perspective.

Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, no such lists will be maintained. All such references are obsolete and their use should be discontinued.

Instructions for obtaining HSG information can be found in the introduction of this chapter.

Chapter 7 Hydrologic Soil Groups

Contents:

Tables

Chapter 7 Hydrologic Soil Groups

630.0700 Introduction

This chapter defines four hydrologic soil groups, or HSGs, that, along with land use, management practices, and hydrologic conditions, determine a soil's associated runoff curve number (NEH630.09). Runoff curve numbers are used to estimate direct runoff from rainfall (NEH630.10).

A map unit is a collection of areas defined and named the same in terms of their soil components or miscellaneous areas or both (NSSH 627.03). Soil scientists assign map unit components to hydrologic soil groups. Map unit components assigned to a specific hydrologic soil group have similar physical and runoff characteristics. Soils in the United States, its territories, and Puerto Rico have been assigned to hydrologic soil groups. The assigned groups can be found by consulting the Natural Resources Conservation Service's (NRCS) Field Office Technical Guide; published soil survey data bases; the NRCS Soil Data Mart Web site (*http://soildatamart.nrcs.usda.gov/*); and/or the Web Soil Survey Web site (*http://websoilsurvey.nrcs.usda.gov/*).

The NRCS State soil scientist should be contacted if a soil survey does not exist for a given area or where the soils within a watershed have not been assigned to hydrologic groups.

630.0701 Hydrologic soil groups

Soils were originally assigned to hydrologic soil groups based on measured rainfall, runoff, and infiltrometer data (Musgrave 1955). Since the initial work was done to establish these groupings, assignment of soils to hydrologic soil groups has been based on the judgment of soil scientists. Assignments are made based on comparison of the characteristics of unclassified soil profiles with profiles of soils already placed into hydrologic soil groups. Most of the groupings are based on the premise that soils found within a climatic region that are similar in depth to a restrictive layer or water table, transmission rate of water, texture, structure, and degree of swelling when saturated, will have similar runoff responses. The classes are based on the following factors:

- intake and transmission of water under the conditions of maximum yearly wetness (thoroughly wet)
- soil not frozen
- bare soil surface
- maximum swelling of expansive clays

The slope of the soil surface is not considered when assigning hydrologic soil groups.

In its simplest form, hydrologic soil group is determined by the water transmitting soil layer with the lowest saturated hydraulic conductivity and depth to any layer that is more or less water impermeable (such as a fragipan or duripan) or depth to a water table (if present). The least transmissive layer can be any soil horizon that transmits water at a slower rate relative to those horizons above or below it. For example, a layer having a saturated hydraulic conductivity of 9.0 micrometers per second (1.3 inches per hour) is the least transmissive layer in a soil if the layers above and below it have a saturated hydraulic conductivity of 23 micrometers per second (3.3 inches per hour).

Water impermeable soil layers are among those types of layers recorded in the component restriction table of the National Soil Information System (NASIS) database. The saturated hydraulic conductivity of an impermeable or nearly impermeable layer may range from essentially 0 micrometers per second (0 inches per hour) to 0.9 micrometers per second (0.1 inches per hour). For simplicity, either case is considered impermeable for hydrologic soil group purposes. In some cases, saturated hydraulic conductivity (a quantitatively measured characteristic) data are not always readily available or obtainable. In these situations, other soil properties such as texture, compaction (bulk density), strength of soil structure, clay mineralogy, and organic matter are used to estimate water movement. Table 7–1 relates saturated hydraulic conductivity to hydrologic soil group.

The four hydrologic soil groups (HSGs) are described as:

Group A—Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

The limits on the diagnostic physical characteristics of group A are as follows. The saturated hydraulic conductivity of all soil layers exceeds 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer and a water table are in group A if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 10 micrometers per second (1.42 inches per hour).

Group B—Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

The limits on the diagnostic physical characteristics of group B are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] ranges from 10.0 micrometers per second (1.42 inches per hour) to 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a water impermeable layer and a water table are in group B if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 4.0 micrometers per second (0.57 inches per hour) but is less than 10.0 micrometers per second (1.42 inches per hour).

Group C—Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

The limits on the diagnostic physical characteristics of group C are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters [20 inches] is between 1.0 micrometers per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters [20 inches]. The depth to the water table is greater than 60 centimeters [24 inches]. Soils that are deeper than 100 centimeters [40 inches] to a restriction and a water table are in group C if the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface exceeds 0.40 micrometers per second (0.06 inches per hour) but is less than 4.0 micrometers per second (0.57 inches per hour).

Group D—Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 50 centimeters [20 inches] and all soils with a water table within 60 centimeters [24 inches] of the surface are in this group, although some may have a dual classification, as described in the next section, if they can be adequately drained.

The limits on the physical diagnostic characteristics of group D are as follows. For soils with a water impermeable layer at a depth between 50 centimeters and 100 centimeters [20 and 40 inches], the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 1.0 micrometers per second (0.14 inches per hour). For soils that are deeper than 100 centimeters [40 inches] to a restriction or water table, the saturated hydraulic conductivity of all soil layers within 100 centimeters [40 inches] of the surface is less than or equal to 0.40 micrometers per second (0.06 inches per hour).

Dual hydrologic soil groups—Certain wet soils are placed in group D based solely on the presence of a water table within 60 centimeters [24 inches] of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups (A/D, B/D, and C/D) based on their saturated hydraulic conductivity and the water table depth when drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters [24 inches] below the surface in a soil where it would be higher in a natural state.

Matrix of hydrologic soil group assignment criteria—The decision matrix in table 7–1 can be used to determine a soil's hydrologic soil group. If saturated hydraulic conductivity data are available and deemed to be reliable, then these data, along with water table depth information, should be used to place the soil into the appropriate hydrologic soil group. If these data are not available, the hydrologic soil group is determined by observing the properties of the soil in the field. Factors such as texture, compaction (bulk density), strength of soil structure, clay mineralogy, and organic matter are considered in estimating the hydraulic conductivity of each layer in the soil profile. The depth and hydraulic conductivity of any water impermeable layer and the depth to any high water table are used to determine correct hydrologic soil group for the soil. The property that is most limiting to water movement generally determines the soil's hydrologic group. In anomalous situations, when adjustments to hydrologic soil group become necessary, they shall be made by the NRCS State soil scientist in consultation with the State conservation engineer.

Table 7–1 Criteria for assignment of hydrologic soil group (HSG)

Depth to water impermeable layer [1/]	Depth to high water table [2/]	K_{sat} of least transmissive layer in depth range	K_{sat} depth range	HSG [3/]
<50 cm [<20 in]	—	—	—	D
50 to 100 cm [20 to 40 in]	<60 cm [<24 in]	>40.0 µm/s (>5.67 in/h)	0 to 60 cm [0 to 24 in]	A/D
		>10.0 to ≤40.0 µm/s (>1.42 to ≤5.67 in/h)	0 to 60 cm [0 to 24 in]	B/D
		>1.0 to ≤10.0 µm/s (>0.14 to ≤1.42 in/h)	0 to 60 cm [0 to 24 in]	C/D
		≤1.0 µm/s (≤0.14 in/h)	0 to 60 cm [0 to 24 in]	D
	≥60 cm [≥24 in]	>40.0 µm/s (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤40.0 µm/s (>1.42 to ≤5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤10.0 µm/s (>0.14 to ≤1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤1.0 µm/s (≤0.14 in/h)	0 to 50 cm [0 to 20 in]	D
>100 cm [>40 in]	<60 cm [<24 in]	>10.0 µm/s (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A/D
		>4.0 to ≤10.0 µm/s (>0.57 to ≤1.42 in/h)	0 to 100 cm [0 to 40 in]	B/D
		>0.40 to ≤4.0 µm/s (>0.06 to ≤0.57 in/h)	0 to 100 cm [0 to 40 in]	C/D
		≤0.40 µm/s (≤0.06 in/h)	0 to 100 cm [0 to 40 in]	D
	60 to 100 cm [24 to 40 in]	>40.0 µm/s (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤40.0 µm/s (>1.42 to ≤5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤10.0 µm/s (>0.14 to ≤1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤1.0 µm/s (≤0.14 in/h)	0 to 50 cm [0 to 20 in]	D
	>100 cm [>40 in]	>10.0 µm/s (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A
		>4.0 to ≤ 10.0 µm/s (>0.57 to ≤1.42 in/h)	0 to 100 cm [0 to 40 in]	B
		>0.40 to ≤4.0 µm/s (>0.06 to ≤0.57 in/h)	0 to 100 cm [0 to 40 in]	C
		≤0.40 µm/s (≤0.06 in/h)	0 to 100 cm [0 to 40 in]	D

1/ An impermeable layer has a K_{sat} less than 0.01 µm/s [0.0014 in/h] or a component restriction of fragipan; duripan; petrocalcic; orstein; petrogypsic; cemented horizon; densic material; placic; bedrock, paralithic; bedrock, lithic; bedrock, densic; or permafrost.

2/ High water table during any month during the year.

3/ Dual HSG classes are applied only for wet soils (water table less than 60 cm [24 in]). If these soils can be drained, a less restrictive HSG can be assigned, depending on the K_{sat}.

630.0702 Disturbed soils

As a result of construction and other disturbances, the soil profile can be altered from its natural state and the listed group assignments generally no longer apply, nor can any supposition based on the natural soil be made that will accurately describe the hydrologic properties of the disturbed soil. In these circumstances, an onsite investigation should be made to determine the hydrologic soil group. A general set of guidelines for estimating saturated hydraulic conductivity from field observable characteristics is presented in the Soil Survey Manual (Soil Survey Staff 1993).

630.0703 References

Musgrave, G.W. 1955. How much of the rain enters the soil? *In* Water: U.S. Department of Agriculture. Yearbook. Washington, DC. pp. 151–159.

Nielsen, R.D., and A.T. Hjelmfelt. 1998. Hydrologic soil group assessment. Water Resources Engineering 98. *In* Abt, Young-Pezeshk, and Watson (eds.), Proc. of Internat. Water Resources Eng. Conf., Am. Soc. Civil Engr: pp. 1297–1302.

Rawls, W.J., and D.L. Brakensiek. 1983. A procedure to predict Green-Ampt infiltration parameters. In Advances in infiltration. Proc. of the National Conference on Advances in Infiltration. Chicago, IL.

U.S. Department of Agriculture, Natural Resources Conservation Service. 1993. Soil Survey Manual. Agricultural Handbook No. 18, chapter 3. U.S. Government Printing Office, Washington, DC.

U.S. Department of Agriculture, Natural Resources Conservation Service. 1993. National Engineering Handbook, title 210–VI. Part 630, chapters 9 and 10. Washington, DC. Available online at *http://directives.sc.egov.usda.gov/*.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2005. National Soil Survey Handbook, title 430–VI. Washington, DC. Available online at *http://soils.usda.gov/technical/handbook/*.

Water Movement

Water movement concerns rates of flow into and within the soil and the related amount of water that runs off and does not enter the soil. Saturated hydraulic conductivity, infiltration rate, and surface runoff are part of the evaluation.

Saturated Hydraulic Conductivity

Water movement in soil is controlled by two factors: 1) the resistance of the soil matrix to water flow and 2) the forces acting on each element or unit of soil water. Darcy's law, the fundamental equation describing water movement in soil, relates the flow rate to these two factors. Mathematically, the general statement of Darcy's law for vertical, saturated flow is:

$$Q/At = -K_{sat}\, dH/dz$$

where the flow rate Q/At is what soil physicists call the flux density, i.e., the quantity of water Q moving past an area A, perpendicular to the direction of flow, in a time t. The vertical saturated hydraulic conductivity K_{sat} is the reciprocal, or inverse, of the resistance of the soil matrix to water flow. The term dH/dz is the hydraulic gradient, the driving force causing water to move in soil, the net result of all forces acting on the soil water. Rate of water movement is the product of the hydraulic conductivity and the hydraulic gradient.

A distinction is made between saturated and unsaturated hydraulic conductivity. Saturated flow occurs when the soil water pressure is positive; that is, when the soil matric potential is zero (satiated wet condition). In most soils this situation takes place when about 95 percent of the total pore space is filled with water. The remaining 5 percent is filled with entrapped air. If the soil remains saturated for a long time (several months or longer) the percent of the total pore space filled with water may approach 100. Saturated hydraulic conductivity cannot be used to describe water movement under unsaturated conditions.

The vertical saturated hydraulic conductivity K_{sat} is of interest here; it is the factor relating soil water flow rate (flux density) to the hydraulic gradient and is a measure of the ease of water movement in soil. K_{sat} is the reciprocal of the resistance of soil to water movement. As the resistance increases, the hydraulic conductivity decreases. Resistance to water movement in saturated soil is primarily a function of the arrangement and size distribution of pores. Large, continuous pores have a lower resistance to flow (and thus a higher conductivity) than small or discontinuous pores. Soils with high clay content generally have lower hydraulic conductivities than sandy soils because the pore size distribution in sandy soil favors large pores even though sandy soils usually have higher bulk densities and lower total porosities (total pore space) than clayey soils. As illustrated by Poiseuille's law, the resistance to flow in a tube varies as the square of the radius. Thus, as a soil pore or channel doubles in size, its resistance to flow is reduced by a factor of 4; in other words its hydraulic conductivity increases 4-fold.

Hydraulic conductivity is a highly variable soil property. Measured values easily may vary by 10-fold or more for a particular soil series. Values measured on soil samples taken within centimeters of one another may vary by 10-fold or more. In addition, measured hydraulic conductivity values for a soil may vary dramatically with the method used for measurement. Laboratory determined values rarely agree with field measurements, the differences often being on the order of 100-fold or more. Field methods generally are more reliable than laboratory methods.

Because of the highly variable nature of soil hydraulic conductivity, a single measured value is an unreliable indicator of the hydraulic conductivity of a soil. An average of several values will give a reliable estimate which can be used to place the soil in a particular hydraulic conductivity class. Log averages (geometric means) should be used rather than arithmetic averages because hydraulic conductivity is a log normally distributed property. The antilog of the average of the logarithms of individual conductivity values is the log average, or geometric mean, and should be used to place a soil into the appropriate hydraulic conductivity class. Log averages are lower than arithmetic averages.

Hydraulic conductivity classes in this manual are defined in terms of vertical, saturated hydraulic conductivity. Table 3-7 defines the vertical, saturated hydraulic conductivity classes. The saturated hydraulic conductivity classes in this manual have a wider range of values than the classes of either the 1951 *Soil Survey Manual* or the 1971 *Engineering Guide*. The dimensions of hydraulic conductivity vary depending on whether the hydraulic gradient and flux density have mass, weight, or volume bases. Values can be converted from one basis to another with the appropriate conversion factor. Usually, the hydraulic gradient is given on a weight basis and the flux density on a volume basis and the dimensions of K_{sat} are length per time. The correct SI units thus are meters per second.[6] Micrometers per second are also acceptable SI units and are more convenient (table 3-7). Table 3-8 gives the class limits in commonly used units.

Table 3-7. Saturated hydraulic conductivity classes

Class	Ksat (µm/s)
Very High	≥100
High	10 - 100
Moderately High	1 - 10
Moderately Low	0.1 - 1
Low	0.01 - 0.1
Very Low	< 0.01

Hydraulic conductivity does not describe the capacity of soils in their natural setting to dispose of water internally. A soil placed in a very high class may contain free water because there are restricting layers below the soil or because the soil is in a depression where water from

[6] The Soil Science Society of America prefers that all quantities be expressed on a mass basis. This results in Ksat units of kg s m-3. Other units acceptable to their society are m3 s kg-1, the result of expressing all quantities on a volume basis, and m s -1, the result of expressing the hydraulic gradient on a weight basis and flux density on a volume basis.

surrounding areas accumulates faster than it can pass through the soil. The water may actually move very slowly despite a high K_{sat}.

Table 3-8. Saturated hydraulic conductivity class limits in equivalent units

µm/s		m/s	cm/day	in/hr	cm/hr	kg s m^{-3}	m3 s kg^{-3}
100	=	10^{-4}	864.	14.17	36.0	$1.02X10^{-2}$	$1.02X10^{-8}$
10	=	10^{-5}	86.4	1.417	3.60	$1.02X10^{-3}$	$1.02X10^{-9}$
1	=	10^{-6}	8.64	0.1417	0.360	$1.02X10^{-4}$	$1.02X10^{-10}$
0.1	=	10^{-7}	0.864	0.01417	0.0360	$1.02X10^{-5}$	$1.02X10^{-11}$
0.01	=	10^{-8}	0.0864	0.001417	0.00360	$1.02X10^{-6}$	$1.02X10^{-12}$

Guidelines for K_{sat} Class Placement

Measured values of K_{sat} are available from the literature or from researchers working on the same or similar soils. If measured values are available, their geometric means should be used for class placement.

Saturated hydraulic conductivity is a fairly easy, inexpensive, and straightforward measurement. If measured values are unavailable, a project to make measurements should be considered. Field methods are the most reliable. Standard methods for measurement of K_{sat} are described in Agronomy Monograph No. 9 (Klute and Dirksen, 1986, and Amoozegar and Warrick, 1986) and in SSIR 38 (Bouma et al., 1982).

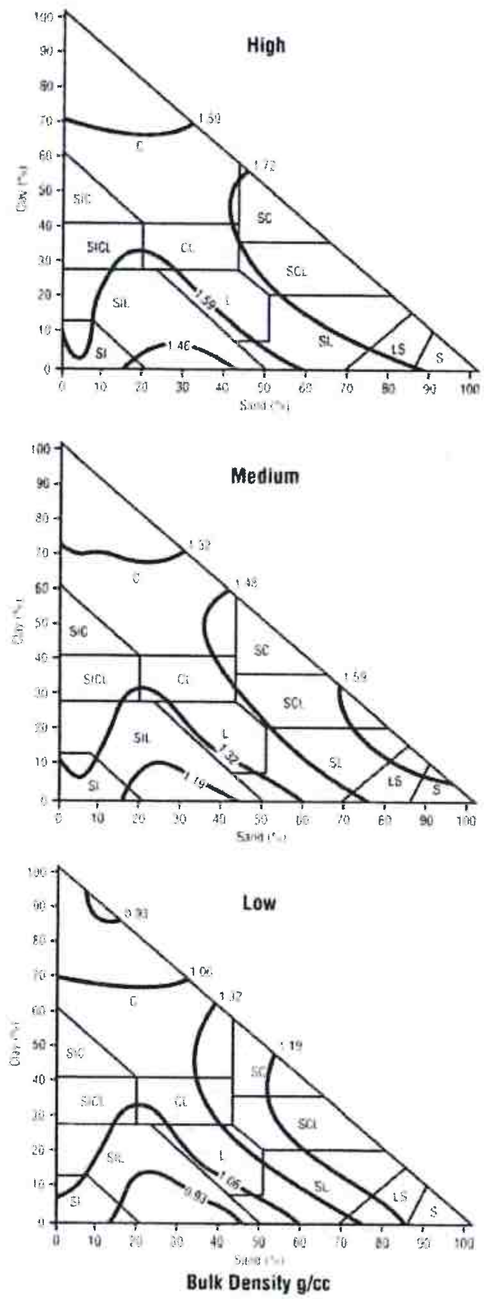
Various researchers have attempted to estimate K_{sat} based on various soil properties. These estimation methods usually use one or more of the following soil physical properties: surface area, texture, structure, bulk density, and micromorphology. The success of the individual methods varies. Often a method does fairly well in a localized area. No one method works really well for all soils. Sometimes, measurement of the predictor variables is more difficult than measurement of hydraulic conductivity. Generally, adjustments must be made for "unusual" circumstances such as high sodium concentrations, certain clay mineralogies, and the presence of coarse fragments, fragipans, and other miscellaneous features.

The method presented here is very general (Rawls and Brakensiek, 1983). It has been developed from a statistical analysis of several thousand measurements in a variety of soils. Because the method is intended for a wide application, it must be used locally with caution. The results, often, must be adjusted based on experience and local conditions.

Figure 3-11 consists of three textural triangles that can be used for K_{sat} class placement, based on soil bulk density and texture. The center triangle is for use with soils having medium or average bulk densities. The triangles above and below are for soils with high and low bulk densities, respectively.

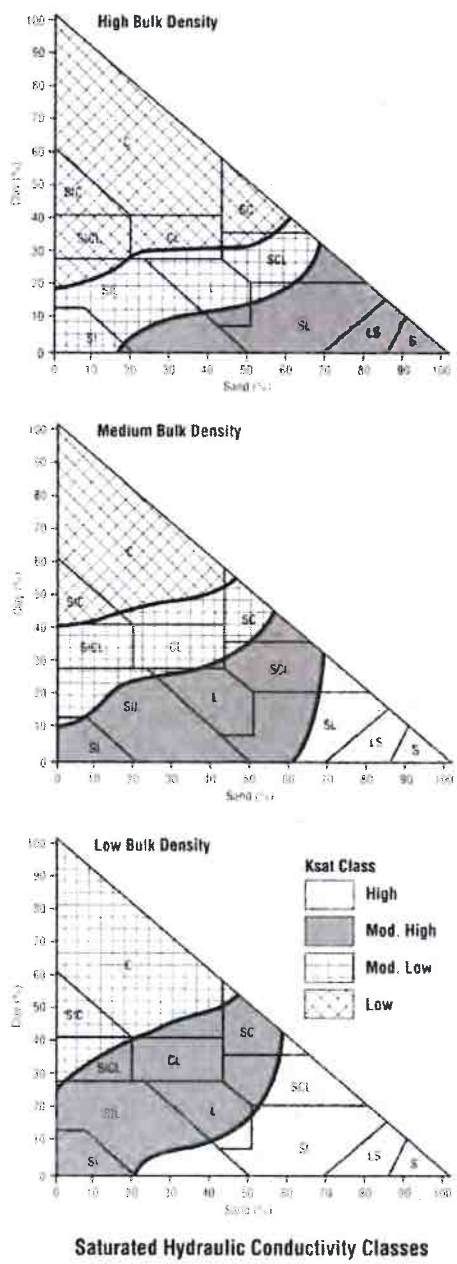
Figure 3-12 can be used to help determine which triangle in figure 3-11 to use. In each of the triangles, interpolation of the iso-bulk density lines yields a bulk density value for the particular soil texture. The triangle that provides the value closest to the measured or estimated bulk density determines the corresponding triangle in figure 3-11 that should be used.

FIGURE 3-11



Saturated hydraulic conductivity classes (Rawls and Brakensiek, 1983). A clay loam with a bulk density of 1.40 g/cc and 35 percent both sand and clay falls in the medium bulk density class.

FIGURE 3-12



Bulk density and texture relationships.

The hydraulic conductivity of a particular soil horizon is estimated by finding the triangle (fig. 3-11), based on texture and bulk density, to which the horizon belongs. The bulk density class to which the horizon belongs in Fig. 3-11 determines the triangle to be used in Fig. 3-12. The K_{sat} class can be determined immediately from the shading of the triangle. A numerical value of K_{sat} can be estimated by interpolating between the iso-K_{sat} lines; however, the values should be used with caution. The values should be used only to compare classes of soils and not as an indication of the K_{sat} of a particular site. If site values are needed, it is always best to make several measurements at the site.

The K_{sat} values given by the above procedure may need to be adjusted based on other known soil properties. Currently, there is little information available to provide adequate guidelines for adjusting the estimated K_{sat}. The soil scientist must use best judgement based on experience and the observed behavior of the particular soil.

Hydraulic conductivity can be given for the soil as a whole, for a particular horizon, or for a combination of horizons. The horizon with the lowest value determines the hydraulic conductivity classification for the whole soil. If an appreciable thickness of soil above or below the horizon with the lowest value has significantly higher conductivity, then estimates for both parts are usually given.

Infiltration

Infiltration is the process of downward water entry into the soil. The values are usually sensitive to near surface conditions as well as to the antecedent water state. Hence, they are subject to significant change with soil use and management and time.

Infiltration stages.—Three stages of infiltration may be recognized—preponded, transient ponded, and steady ponded. *Preponded infiltration* pertains to downward water entry into the soil under conditions that free water is absent on the land surface. The rate of water addition determines the rate of water entry. If rainfall intensity increases twofold, then the infiltration increases twofold. In this stage, surface-connected macropores are relatively ineffective in transporting water downward. No runoff occurs during this stage.

As water addition continues, the point may be reached where free water occurs on the ground surface. This condition is called ponding. The term in this context is less restrictive than its use in inundation. The free water may be restricted to depressions and be absent from the majority of the ground surface. Once ponding has taken place, the control over the infiltration shifts from the rate of water addition to characteristics of the soil. Surface-connected nonmatrix and subsurface-initiated cracks then become effective in transporting water downward.

Infiltration under conditions where free water is present on the ground surface is referred to as ponded infiltration. In the initial stages of *ponded infiltration*, the rate of water entry usually decreases appreciably with time because of the deeper wetting of the soil, which results in a reduced suction gradient, and the closing of cracks and other surface-connected macropores. *Transient ponded infiltration* is the stage at which the ponded infiltration decreases markedly with time. After long continued wetting under ponded conditions, the rate of infiltration becomes steady. This stage is referred to as *steady ponded infiltration*. Surface-connected cracks would be closed, if reversible. The suction gradient would be small and the driving force reduced to near that of the gravitational gradient. Assuming the absence of ice and of zones of free water within moderate depths and that surface or near surface features (crust, for example) do not control

Californian Environmental Services, Inc.

4127 Bay Street, Ste. B
Fremont, CA 94538-439
Phone: (925) 789-7459 Fax: (510) 573-2184

Project: FEIR Walt Ranch, Napa County, California

TO Mr. Thomas N. Lippe
LIPPE, GAFFNEY, AND WAGNER LLP
329 Bryant Street, Suite 3D
San Francisco, California 94107

August 25, 2016

RE: My Response to Comments on my Comments to Reponses Addressed in the Final Environmental Impact Report (FEIR) prepared for Walt Ranch, Napa County, California

Dear Mr. Lippe,

I have thoroughly and comprehensively reviewed the responses to my comments on the FEIR prepared for the proposed vineyard development at Walt Ranch located in Napa County, California. What is most striking about the responses provided (I assume) by Analytical Environmental Services to my comments on the FEIR, is that - as with their previous responses to my comments on the DEIR – there is no true response. As with all previous responses, the authors merely point me back to the original text in the DEIR and their non-responses to my original comments on the DEIR.

Throughout this CEQA process, the project proponent has taken the stand of "we stated XYZ therefore XYZ is true". The authors consistently respond to my comments by directing me to go back and read what they wrote in the DEIR. The authors made statements and reached conclusions in the DEIR that they did not have the data to support and their analyses are not in fact analyses, but are opinions unsupported by the facts. In some cases, conclusions in the DEIR and FEIR are clearly made by individuals that are not qualified to be rendering opinions. Their responses to my comments on the DEIR did not address the issues I raised, but instead simply directed me back to the very comments that I found to be unsupported. The authors have done exactly the same thing relative to my comments on the FEIR. No new information was provided and in fact, the issues I raised early in this CEQA process were trivialized and have never been adequately addressed.

Only one item was microscopically modified in the Updated MMRP based on my comments and that was to require that a qualified biologist be involved during bullfrog eradication efforts for eggs, larvae, and sub-adult bullfrogs: (Page 20 of Responses to Final ERI Comments) *"As such, Mitigation Measure 4.2-11 has been revised to restrict egg, larva, and sub-adult removal to qualified biologists only;"* **however, even this compromise was rendered inadequate by adding the language** (Page 20 of Responses to Final EIR Comments): *"Adult bullfrogs are easily distinguishable from CRLF and FYLF...." Mitigation Measure 4.2-11 continues to allow persons knowledgeable in the identification of the species (i.e. a worker who has been trained by a qualified biologist and has obtained the appropriate fishing license) to capture and remove adult bullfrogs.*

In this portion of the Responses to Final EIR Comments, the authors demonstrate their lack of knowledge regarding the species of which they are writing. Differentiating between bullfrogs,

EXHIBIT 2

Californian Environmental Services, Inc.

4127 Bay Street, Ste. B
Fremont, CA 94538-439
Phone: (925) 789-7459 Fax: (510) 573-2184

foothill yellow-legged frogs, and California red-legged frogs *of any lifestage* is NOT easy. I have been conducting published research on these species for over 20 years and was mentored by some of the most highly respected and renowned herpetologists in the state. Dr. Norman Scott, who is now almost 80, has spent over 50 years working with these species and was the senior petitioner for the federal listing of CRLF. His colleague, Dr. Galen Rathbun, has a similar record - I have been present on surveys with these two very senior herpetologists and listened to them argue over whether the sighting was a CRLF or a bullfrog. Therefore, the arrogance of the authors in deciding that a manual laborer or unidentified "worker" can be trained to differentiate between two species is astounding. With this logic, I assume that I can be trained in one day to run a large excavator and put out my shingle as a heavy equipment operator the next day. I would like to know the qualifications of the individuals writing that *"adult bullfrogs are easily distinguishable from CRLF and FYLF,"* because no qualified herpetologist would make that statement as it is patently false.

The consistently inadequate responses to the comments and issues I repeatedly raised has fatally undermined the CEQA process, which was enacted to identify the significant environmental impacts of state and local agencies' actions and to avoid or mitigate those impacts. Many of these issues are listed again below and have not been rectified or addressed. Data collection, survey methods, reports, and data interpretation relative to biological resources were wholly inadequate and conducted by personnel whose qualifications in most casesweare not available for review, but a review of their written reports demonstrates they were patently unqualified.

1. Surveys for biological resources were completely inadequate and do not provide sufficient nor comprehensive data that support the conclusions in the DEIR and FEIR.
2. The DEIR and FEIR did not identify and address all potential impacts to special-status species and their habitats.
3. The mitigation measures are entirely inadequate and pay lip service at best to mitigating the very few impacts identified.
4. There is a distinct lack of treatment of the special-status amphibian species, particularly as the MMRP contains no monitoring measures for CRLF and FYLF, and in fact, these species are not even mentioned in that document. There is no plan to manage for these species.
5. The DEIR and FEIR do not represent good faith efforts, do not use the best available science, and in general, make conclusory statements that are not supported by the peer-reviewed literature or in fact, even the small amount of data they did collect.
6. The written responses did not describe the disposition of the significant environmental issues that I raised other than to indicate that - with the exception of the poorly written and dangerous bullfrog control measure - there have been no changes to the DEIR or FEIR. The respondent did not offer additional factual information or analyses to support the decision to disregard the points I have raised.
7. The major environmental issues I raised were not addressed in detail nor were reasons articulated as to why specific comments and suggestions were rejected.

Signed,

Gretchen Padgett-Flohr

Dr. Gretchen E. Padgett-Flohr

Herpetologist and *Certified Wildlife Biologist*

Peer Reviewed Publications

Wilcox, J.T., **G.E. Padgett-Flohr**, J.A. Alvarez, and J.R. Johnson. 2015. Possible Phenotypic Influence of Superinvasive Alleles on Larval California Tiger Salamanders (*Ambystoma californiense*). American Midland Naturalist 173(1):168-175.

Brem, F.M.R., M.J. Parris, and **G.E. Padgett-Flohr**. 2013. Re-Isolating *Batrachochytrium dendrobatidis* from an Amphibian Host Increases Pathogenicity in a Subsequent Exposure. PLoS One 8(5): e61260. DOI: 10.1371/journal.pone.0061260.

Alvarez, J.A., M.A. Shea, J.T. Wilcox, M.L. Allaback, S.M. Foster, **G.E. Padgett-Flohr**, and J.L. Haire. 2013. Sympatry in California tiger salamander and California red-legged frog breeding habitat within their overlapping range. California Fish and Game 99(1): 42-48.

Conlon, J.M., L. K. Reinert, M. Mechkarska, M. Prajeep, M. A. Meetani, L. Coquet, T. Jouenne, M.P. Hayes, **G. Padgett-Flohr**, and L. A. Rollins-Smith. 2013. Evaluation of the skin peptide defenses of the Oregon spotted frog *Rana pretiosa* against infection by the chytrid fungus *Batrachochytrium dendrobatidis*. Chemical Ecology 39: 797–805. DOI 10.1007/s10886-013-0294-z.

Padgett-Flohr, G.E. and M.P. Hayes. 2011. Assessment of the Vulnerability of the Oregon spotted frog (*Rana pretiosa*) to the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*). *Herpetological Conservation and Biology* 6(2): 99-106.

Conlon, J.M., M. Mechkarska, E. Ahmed, L. Coquet, T. Jouenne, J. Leprince, H. Vaudry, M. P. Hayes, **G. Padgett-Flohr**. 2011. Host defense peptides in skin secretions of the Oregon spotted frog *Rana pretiosa*: implications for species resistance to chytridiomycosis. *Developmental and Comparative Immunology* 35: 644-649.

Bowerman, J., C. Rombough, S. Petrakis, and **G.E. Padgett-Flohr**. 2011. Terbinafine hydrochloride as a treatment for *Batrachochytrium dendrobatidis* infection. *Journal of Herpetological Medicine and Surgery*, 20(1): 24-28.

Padgett-Flohr, G.E. and R.L. Hopkins, II. 2010. Landscape epidemiology of *Batrachochytrium dendrobatidis* in Central California. *Ecography*, 33: 1-10.

Hayes, M.P., C.J. Rombough, **G.E. Padgett-Flohr**, L.A. Hallock, J.E. Johnson, R.S. Wagner, and J.D. Engler. 2009. Detection of *Batrachochytrium dendrobatidis* in a wild population of *Rana pretiosa*. *Northwestern Naturalist*, 90: 148-151.

Padgett-Flohr, G.E. and R.L. Hopkins, II. 2009. *Batrachochytrium dendrobatidis*: A Novel Pathogen Approaching Endemism in Central California. *Diseases of Aquatic Organisms*, 83(1): 1-9.

Kolby, J.E., **G.E. Padgett-Flohr**, and R. Field. 2009. Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) in Cusuco National Park, Honduras. *Diseases of Aquatic Organisms* Special Issue 4:pp3; DOI: 10-3354/dao02055.

Kolby, J.E. and **G.E. Padgett-Flohr**. 2009. Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) in Honduras: Historical Exposure in *Plectrohyla dasypus* and Subsequent Decline. *Herpetological Review*, 40(3): 307-308.

Padgett-Flohr, G.E. 2008. Pathogenicity of *Batrachochytrium dendrobatidis* in two threatened California amphibians: *Rana draytonii* and *Ambystoma californiense*. *Herpetological Conservation and Biology* 3(2): 182-191.

Padgett-Flohr, G.E. and M.E. Goble. 2007. Evaluation of Tadpole Mouthparts Depigmentation as a Diagnostic Test for Infection by *Batrachochytrium dendrobatidis* for Four California Anurans. *Journal of Wildlife Diseases*, 43(4): 600-699.

Padgett-Flohr, G.E. and J.E. Longcore. 2007. Detection of *Batrachochytrium dendrobatidis* in a wild population of *Taricha torosa*. *Herpetological Review*, 38(2): 176-177.

Padgett-Flohr, G.E. 2007. Chytridiomycosis: An Informational Brochure for the Field Biologist. Peer-reviewed by Rick Speare, Lee Berger and Joyce Longcore. Used in workshops on sensitive amphibians; distributed amongst the agencies for internal use.

Padgett-Flohr, G.E., T. Bommarito, and D. Sparling. 2007. Amphibian Chytridiomycosis in Commercially Purchased Research Amphibians. *Herpetological Review*, 38(4): 390-393.

Padgett-Flohr, G.E. 2006. A Field Biologist's Guide to Amphibian Diseases. Chapter in: Guide to Amphibians and Reptiles of San Diego County. U.C Press, Berkeley, CA.

Padgett-Flohr, G.E. and J.E. Longcore. 2005. Detection of *Batrachochytrium dendrobatidis* in a wild population of *Ambystoma californiense*. *Herpetological Review*, 36(1): 50-51.

Padgett-Flohr, G.E. and L. Isakson. 2003. A Random Sampling of Salt Marsh Harvest Mice in a Muted Tidal Marsh. *Journal of Wildlife Management*, 67(3): 646-653.

Padgett-Flohr, G.E. and M.R. Jennings. 2002. An economical safe house for small mammals in pitfall traps. *California Fish and Game*, 87(2): 72-7.

Padgett-Flohr, G.E. 2002. Survey Protocol for Salt Marsh Harvest Mice and Other Small Mammals. For: P.R. Olofson (ed). Baylands Ecosystem Species Protocols for Key Plants, Fish and Wildlife. San Francisco Bay Area Wetland Goals Project, San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Padgett-Flohr, G.E and M.R. Jennings. 2002. Survey Protocol for California Red-legged Frog, *Rana aurora draytonii*. For: P. R. Olofson (ed). Baylands Ecosystem Species Protocols for Key Plants, Fish and Wildlife. San Francisco Bay Area Wetland Goals Project, San Francisco Bay Regional Water Quality Control Board, Oakland, California.

Padgett-Flohr, G.E. and J.D. Reeve. ***In prep***. Modeling pathogen geo-diffusion for *Batrachochytrium dendrobatidis* in Central California.

State of California • Department of Transportation

TRAFFIC ADVISORY

Caltrans

Date: March 18, 2016
District: 4 - Oakland
Contact: Vince Jacala
Phone: (510) 286-5206

FOR IMMEDIATE RELEASE

State Route 121-Between State Route 128 and Wooden Valley Road
Update-Closure Continues-Further Roadway Erosion

NAPA COUNTY– State Route 121 (SR-121) in Napa County remains closed until further notice for emergency roadway repairs. The closure is located on SR-121 between SR-128/Capell Valley Road and Wooden Valley Road. SR-121 was originally closed during last weekend's storm on Sunday, March 13.

Since that time, the northbound SR-121 roadway has eroded further. Depending on weather and if no further roadway erosion occurs, Caltrans is tentatively scheduled to begin permanent repairs and install temporary one-way traffic signals near the site the week of March 28.

Temporary traffic signals will allow northbound and southbound SR-121 motorists to pass the erosion site by alternating use of the existing southbound SR-121 lane. Caltrans will continue to closely monitor the erosion site. At this time, the following detours remain in effect:

SR-121 Detours
Westbound SR-128 motorists headed to southbound SR-121 will be detoured to westbound SR-128 to SR-29. Motorists from Napa wanting to avoid the closure are advised to use northbound SR-29 to eastbound SR-128. Motorists from Wooden Valley Road will be detoured to southbound SR-121 to northbound SR-29, then eastbound SR-128. Local access only beyond SR-128/SR-121 intersection.

For 24/7 updates check 511.org
Or follow us on Twitter: https://mobile.twitter.com/CaltransD4

SR-121 roadway in Napa County damaged during weekend storm.

(Photo courtesy of Caltrans, March 16, 2016)

# # #

EXHIBIT 3

BE WORK ZONE ALERT

MOVE OVER

MEMO

TO:	**Leanne Link, Napa County CEO** **David Morrison, County Planning Director** **Brian Bordona, Principal Planner**
FROM:	**Mike Parness, City Manager**
CC:	**Jacques LaRochelle, Public Works Director** **Phil Brun, Deputy Public Works Director, Operations** **Joy Eldredge, Water General Manager** **Erin Kebbas, Water Quality Manager** **Michael Barrett, City Attorney** **Eric Robinson, KMTG**
DATE:	**August 15, 2016**
SUBJECT:	**Update to Conditions of Approval for Water Quality Monitoring Program** **Walt Ranch Vineyard Conversion Project** **Agricultural Erosion Control Plan No. #P11-00205-ECPA**

The City of Napa operates Milliken Reservoir as a water supply source for City and County residents. The reservoir is fed by Milliken Creek which serves as the drainage for a portion of the proposed Walt Ranch Vineyard Project. The City has previously documented its concerns regarding the importance of monitoring the impacts of the Project on water quality, and requiring the Project Permittee to implement appropriate corrective actions, in order to ensure that the quality of drinking water is not adversely impacted by the Project. As a result of productive discussions between City staff and representatives of the Permittee over the past several months, the City and the Permittee have agreed that the updated Water Quality Monitoring Program dated August 2016 (Attachment 1) represents a reasonable approach in addressing the City's concerns. Therefore, as described in this memo, the City requests that the County update the conditions of approval for the Project to require the developer to comply with the attached Program.

On April 4, 2016, the City of Napa (City) submitted a comment letter to the County Planning Director in response to the Environmental Impact Report (EIR) for the proposed Walt Ranch Vineyard Erosion Control Plan (Project). The letter requested that the County impose conditions of approval on the Project to monitor the water quality leaving the Project site to avoid or reduce water quality impacts in Milliken Creek and implement corrective actions to modify or increase best management practices (BMPs) to address observed impacts.

EXHIBIT 4

On August 1, 2016 the County Director of Planning, Building, & Environmental Services Department filed a notice of decision approving the Walt Ranch Erosion Control Plan including the following **Condition of Approval:**

> "10. The Walt Ranch Water Quality Monitoring Program prepared by Analytical Environmental Services, dated July 2016 shall be implemented by the permittee and any subsequent property owners."

However, the July 2016 version of the Program was a draft version that had not addressed all of the concerns identified by the City. After the issuance of the notice of decision on August 1, 2016, City staff continued discussions with the Permittee to update and refine the processes for monitoring water quality for the site, and establishing criteria for implementing corrective actions and best management practices to address any discharges that exceed identified thresholds. On Wednesday, August 10, 2016, the City and the Permittee agreed to the final Program dated **August 2016** (Attachment 1) and transmitted it to the County Director of Planning, Building, & Environmental Services Department on August 11, 2016.

The City understands that a Notice of Intent to Appeal was filed by the Napa Sierra Club on August 15, 2016, challenging the County's approval of the Walt Ranch Erosion Control Plan, and that appeal will be heard by the Napa County Board of Supervisors, pursuant to Napa County Code Chapter 2.88.

As a part of the appeal hearing for the Erosion Control Plan, the City of Napa requests that the County update Condition of Approval 10 to reflect the final Program as agreed to by the City and Permittee as follows:

> "10. The Walt Ranch Water Quality Monitoring Program prepared by Analytical Environmental Services, dated **August 2016** shall be implemented by the permittee and any subsequent property owners."

On August 10, 2016, the County Director of Planning, Building, & Environmental Services sent an email correspondence to City staff pledging to recommend to the Board of Supervisors that Condition of Approval No. 10 be corrected as a part of the appeal process for the Project (Attachment 2).

If the August 2016 Walt Ranch Water Quality Monitoring Program is imposed on the Project via a corrected version of Condition of Approval 10 as referenced above, then the City's concerns regarding the Project, as documented in the letter dated April 4, 2016, will be addressed.

Thank you for your attention to this matter.

Sincerely,

Mike Parness
Napa City Manager

Attachments:

Attachment 1. Walt Ranch Water Quality Monitoring Program, August 2016
Attachment 2. Email from David Morrison dated August 10, 2016

ATTACHMENT 1

WALT RANCH

WATER QUALITY MONITORING PROGRAM

AUGUST 2016

PREPARED FOR:

Hall Brambletree Associates, Ltd.
401 St. Helena Highway South
St. Helena, CA 94574
www.hallwines.com

City of Napa
PO Box 660
Napa, CA
www.CiytofNapa.org/Water

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811
www.analyticalcorp.com

TABLE OF CONTENTS

WALT RANCH
WATER QUALITY MONITORING PROGRAM

FIGURES

Appendix

1.0 INTRODUCTION

Brambletree Associates, LTD (Brambletree) is the applicant for the Walt Ranch vineyard development project. Brambletree has requested that AES prepare a program to perform water quality monitoring for the Milliken Creek Watershed. This document sets forth that program.

1.1 BACKGROUND AND PURPOSE OF THE WATER QUALITY MONITORING PROGRAM

In July 2014, Napa County (County) released a Draft Environmental Impact Report (EIR) to analyze the environmental impacts of a proposed vineyard development project (Proposed Project) on the Walt Ranch property (AES, 2014). The Proposed Project proposed to develop 356 net acres of vineyards within an approximately 507-acre cleared area (project site) on the portions of the property suitable for the cultivation of high-quality wine grapes under erosion control plan (ECP) #P11-00205-ECPA. The Draft EIR was released on July 11, 2014 for a 133-day public comment period that ended on November 21, 2014. The EIR concluded that potential impacts to surface water quality would be reduced to less-than-significant levels via the implementation of an Integrated Pest Management (IPM) Plan and various best management practices (BMPs) required by the Draft EIR. The Final EIR was released by Napa County in March 2016. The City of Napa (City) submitted comments requesting that Brambletree monitor surface water quality in the Milliken Creek Watershed, including nutrients and take corrective actions.

On August 1, 2016, the County approved the Proposed Project. The project, as approved, consists of approximately 209 net acres of vineyard (±316 gross acres) (Project).

The City and Brambletree have met and discussed the City's comments. Based on these discussions, Brambletree has requested that AES prepare this program as a means of accommodating the City's comments.

Under this program, baseline and operational water quality samples will be collected upstream and downstream of the Walt Ranch property, as well as from locations along the tributaries on the Walt Ranch property that feed Milliken Creek. As detailed below, those samples will be taken prior to Project construction (baseline samples) and during Project implementation (operational samples). This Water Quality Monitoring Program (Program) described herein shall be carried out by Brambletree, at its cost, and is intended to provide information concerning the existing nutrient concentrations, seasonal fluctuations of Milliken Creek, to determine the contribution of nutrients from Project implementation, and to take corrective actions.

1.2 PROJECT LOCATION

The 2,300-acre Walt Ranch (property) is located west of State Route 121 (Monticello Road) in the Capell Creek and Milliken Reservoir watersheds in south-central Napa County, California. Access to the project site is located at Circle Oaks Drive within Township 7 North, Range 3 West, Sections 19, 20, 29, 30, 31, 32, and un-sectioned areas of the U.S. Geological Survey (USGS) 7.5-minute "Capell Valley, California" topographic quadrangle.

1.3 Project Site and Vicinity

The Project site is located in south-central Napa County in part of the hilly to steep mountains of the interior Northern California Coast Range. Foss Valley lies to the west of the project site, Wooden Valley lies to the southeast, and Capell Valley lies to the northeast. A number of northwesterly parallel mountain ridges and intervening valleys of varying widths characterize this area. The Circle Oaks subdivision is located to the southeast of the project site and rural residential uses occur to the southwest. An aerial photograph with Napa County parcel boundaries is shown in **Figure 1**.

The Project site is located in the Capell Creek and Milliken Reservoir watersheds. The Milliken Reservoir watershed is designated by Napa County as a Sensitive Domestic Water Supply Drainage, which is maintained with the goal of protecting the drinking water supply from sediment, turbidity, and other water quality impacts. Milliken Creek bisects the southwestern corner of the property and the Project site. This Program is intended to provide additional monitoring and protection of surface water quality for Milliken Creek and Reservoir.

1.4 Milliken Creek and Milliken Reservoir

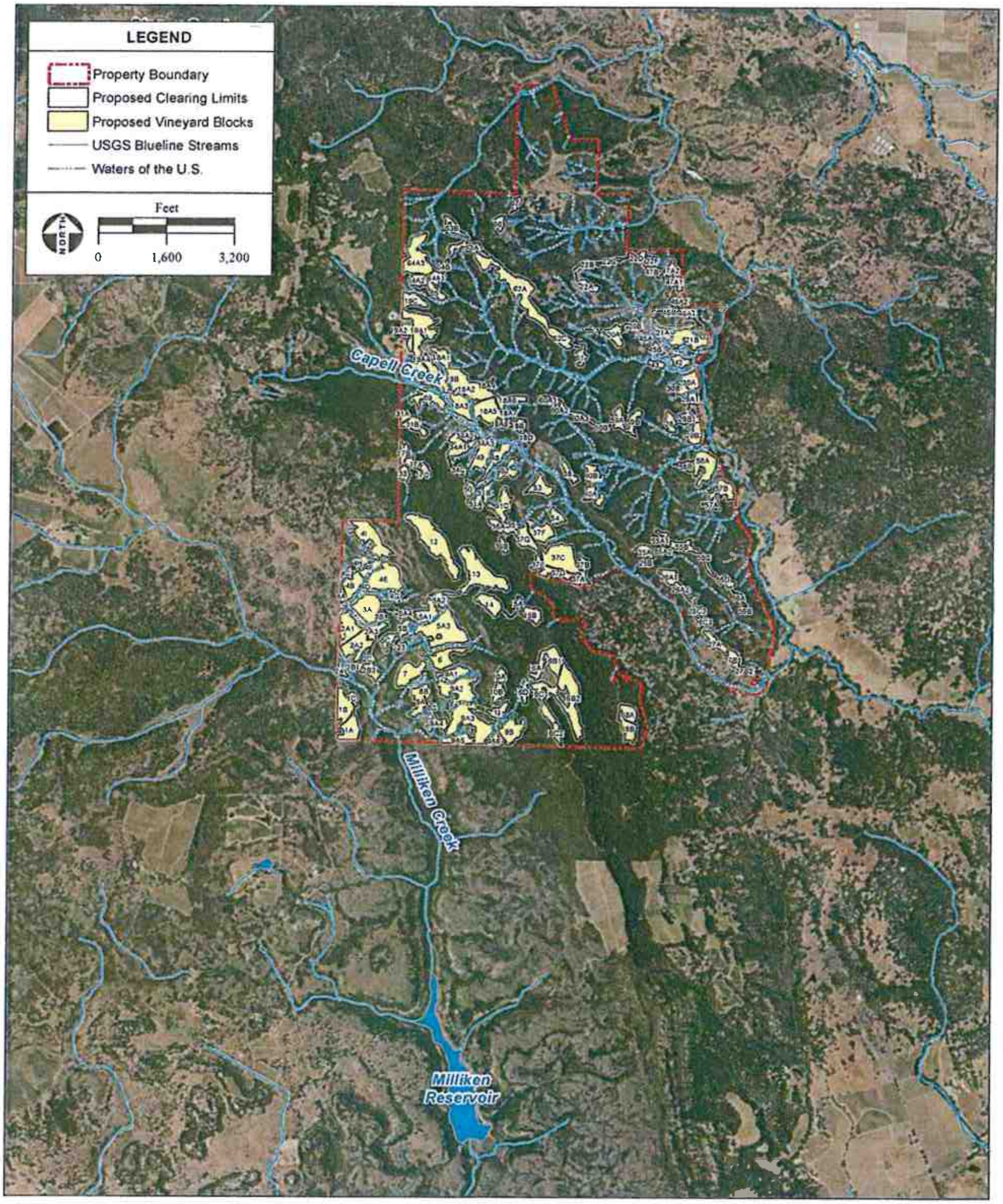
The southwestern portion of the Project site is drained by Milliken Creek and an unnamed annual tributary to Milliken Creek. Milliken Creek is the major drainage through the Foss Valley floor, originating at the northern end of the valley and running south, crossing beneath Atlas Peak Road, before entering the project site. Milliken Creek flows south into the City's Milliken Reservoir, northeast of the City of Napa, which is a municipal water source for the City. Waters from Milliken Creek drain into Napa River thence south into San Pablo Bay thence to San Francisco Bay and the Pacific Ocean. Although Milliken Creek is a perennial stream downstream of the reservoir due to reservoir releases for treatment operations and to support fisheries, the approximately 0.5-mile stretch of Milliken Creek on the subject property is an intermittent stream that flows during the winter, spring and most summer months in response to precipitation events and natural springs.

Water quality in the Milliken Reservoir is the highest in the City of Napa's Water Division supply. The Milliken Water Treatment Plant employs direct filtration only and does not have the capability to remove nutrients (i.e., fertilizers,) pesticides, excess sediment or heavy metals. Milliken Reservoir is located approximately 1.25 miles downstream from the subject property.

2.0 METHODOLOGY

2.1 Timing of Sample Collection

Baseline water quality monitoring shall occur for a minimum of one year prior to the planting of vines on the portion of the Walt Ranch property in Milliken Creek watershed and will continue until the portion of Walt Ranch located within the Milliken Creek watershed is ready for planting. Such monitoring shall also be performed during pre-planting preparation activities (such as access roadway development and clearing activities). All monitoring shall be performed in the Milliken Reservoir watershed portion of the property. Baseline monitoring shall begin in the winter prior to commencement of vineyard development (currently anticipated to be no sooner than the spring of 2017). Baseline monitoring shall continue through



SOURCE: PPI Engineering, 2013; USGS DOQQ
Aerial Photograph, 6/2014; AES, 12/11/2015

Walt Ranch Water Quality Monitoring Program / 207543

Figure 1
Aerial Photograph

completion of vineyard construction within the Milliken Creek watershed and terminate upon the commencement of planting operations. Operational water quality monitoring will then be conducted within one year of 33 percent, 66 percent, and 100 percent of the approved vines having been planted within the Milliken Creek watershed. For each such operational milestone, water quality monitoring will be conducted for a two year continual cycle with a minimum of four years of monitoring if milestones are implemented simultaneously. For both baseline and operations water quality sampling, manual samples shall be taken at least three times during the winter period (October 1-April 30) with at least one sample being taken for each of the following events/periods:

- Within 48 hours after the first significant rain event (defined as 0.25 or more inches of rainfall within 24 hours) of the wet season (October 1 to April 30);
- Within the period January 1 through January 31; and
- Within the period May 1 through May 30.
- Conditional: Within the period May 30 through September 30, one additional sample shall be taken if a significant rain event occurs.

Because Milliken Creek is intermittent on the property, sampling for significant rain events should be timed to follow within 1 to 2 days after rain events over 0.25 inches to capture runoff. Samples shall be taken as soon as reasonably possible after the start of a significant rain event.

If unexpected site discharge is observed in otherwise dry/non discharge period (May – October), immediate monitoring of such discharge must commence.

2.2 CONSTITUENTS OF CONCERN

As requested by the City of Napa Public Works Department, Water Division, samples collected in the field shall be analyzed in a certified laboratory or by direct read field instrument that is properly maintained and calibrated for the following constituents:

- Temperature
- Dissolved Oxygen
- pH
- Phosphate
- Ammonia
- Sulfate
- Turbidity*
- Non – Organic Pesticides**

*Turbidity may be measured in the field if the proper turbidimeter is available and maintained and calibrated as per the manufacturer recommendation. Otherwise, a sample shall be collected and measured in the laboratory with the other constituents listed above.

** If Non-organic Pesticides are applied in the Milliken Watershed, then sampling of a readily-identifiable constituent representative of all pesticide application must be analyzed.

Measurements should be taken in the field with a YSI Multi-Parameter Meter (or equivalent) to measure dissolved oxygen (DO), pH, and temperature. For temperature and DO concentration, measurements must be taken directly (in situ) within the water body immediately upon collection. Other properties such as pH and turbidity may be measured either in situ or from a sample withdrawn from the source. All samples will be analyzed by the laboratory using method detection limits and proper preservation and hold times consistent with environmental sampling for comparison with raw drinking water supply water quality monitoring.

2.3 SAMPLING LOCATIONS

At each sampling visit, samples should be taken at 9 locations on the property as shown preliminarily in **Confidential Figure 2**. The 9 locations will be where tributaries to Milliken Creek and Milliken Creek enter the property (two locations), where tributaries to Milliken Creek and Milliken Creek leave the property (three locations), and four locations in tributaries/drainages on the property near the proposed development of vineyard blocks. Two sampling locations on the property will be located on the western boundary, two will be located on the southern boundary approximately 400 feet from the west side, and one will be located on the southern boundary approximately 1,500 feet from the west side. Prior to commencement of baseline monitoring, the proposed sampling sites will be confirmed for safe accessibility and the actual sample areas will be identified via global positioning system (GPS) data points. This monitoring program and **Figure 2** will be updated accordingly. Should any changes be required to the sampling sites at the planting milestones for the operational water quality sampling, the new sample sites will be confirmed and the actual sample areas will be identified via global positioning system (GPS) data points. This monitoring program and **Figure 2** will be updated accordingly.

2.4 SAMPLING PROCEDURES

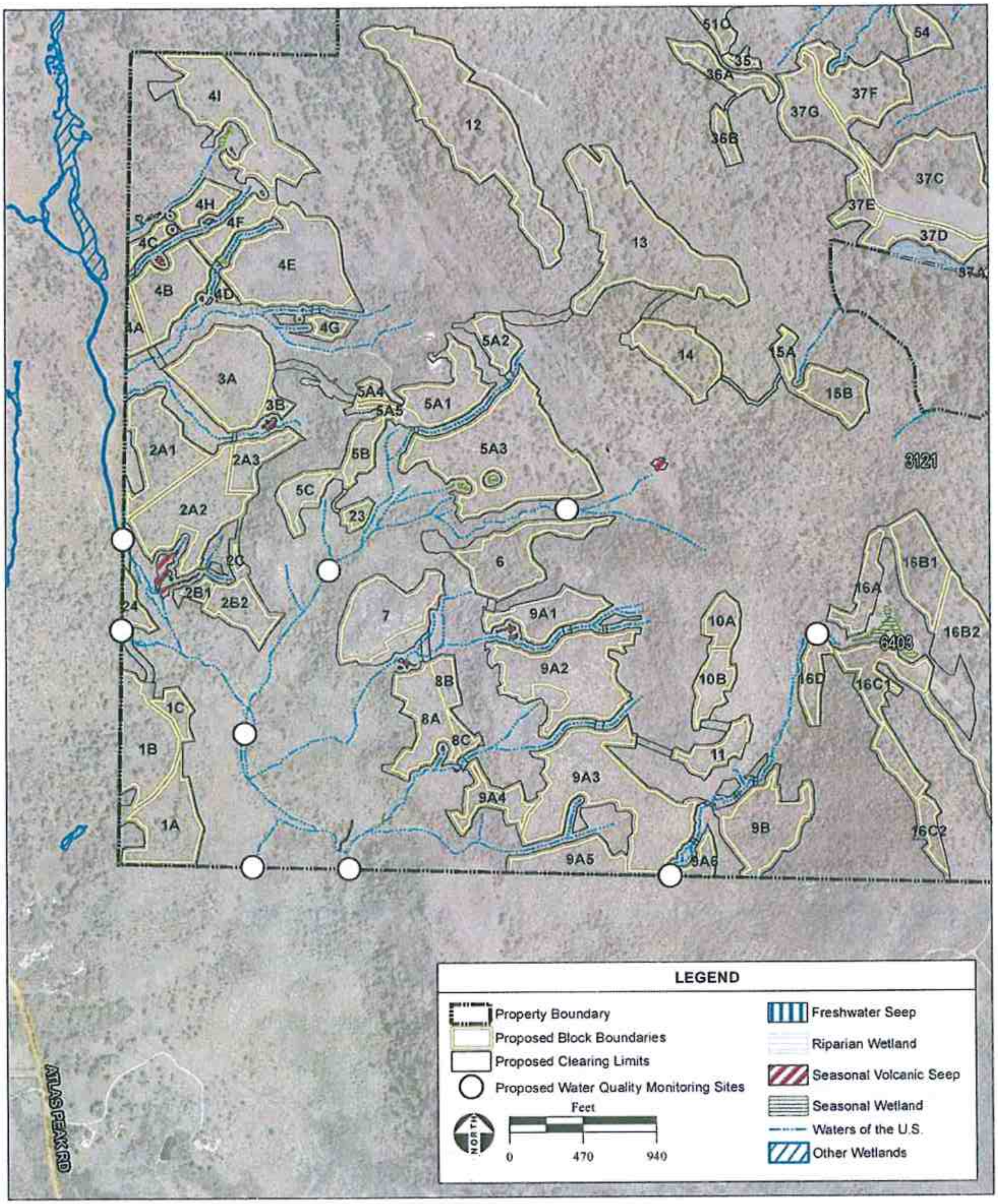
Equipment

will sample locations and testing procedures be allowed to change?

- Nitrile (or equivalent) gloves
- Sample labels
- Sample containers
- YSI Multi-Parameter Meter (or equivalent)
- Data sheets/ Chain of Custody (COC) Forms
- Cooler for samples
- Ice or cold packs for coolers

Set-Up

1. Prepare sample labels.
2. Handle sample bottles using nitrile gloves.
3. Ensure preservative is not lost prior, during, and after sample.



SOURCE: PPI Engineering, 2016; USGS DOQQ Aerial Photograph, 6/2014; AES, 5/9/2016

Figure 2
Preliminary Baseline Monitoring Locations

Brambletree will provide the permission necessary to carry out the sampling called for by the Water Quality Monitoring Program. Samples should be analyzed in a laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP), such as Caltest Analytical Laboratory or the City of Napa Water Division. If the samples are to be analyzed by the City of Napa, then 24-hour notice is recommended with a 6-hour minimum. Notice should be made to: Water Quality Manager, Barwick Jamieson Treatment Plant (707) 253-0822. For at least the first winter following vineyard operation, samples should continue to be taken by the qualified environmental scientist, hydrologist, or toxicologist with access to a calibrated YSI (or equivalent) multi-parameter testing meter.

2.6 Sample Handling and Transport

Samples will be handled with nitrile gloves at all times to prevent cross contamination. Samples will be labeled with distinct sample numbers, location identification, collection time and date. Labels will also contain the sampler's information (sampler, company name, address, and contact information), analysis, preservative, project location, and Chain-of-Custody (COC) number. Samples will be stored on ice in a cooler until the laboratory accepts custody of the samples. Samples will be hand delivered to the laboratory the same day as the sampling event.

2.7 Chain of Custody

Samples will be handled following strict COC protocols. The COC document contains the sample identification number, sampling technician, date, time and location of sample collection, analyses requested, preservatives used in the samples, turn-around-times, and contact information for the laboratory reports. The COC document provides the ownership information of the samples handled during transportation from the sampling site to the laboratory. An example of a COC form from a local laboratory is provided as **Appendix B**. The laboratory COC is carbon-copied in replicate to provide one copy for the lab, the lab file, the original, and the field personnel. The field personnel delivering the samples to the laboratory will assume COC responsibility. This person will sign the COC over to the laboratory for custody transfer when samples are delivered.

— City sample same 9 locations

3.0 REPORTING REQUIREMENTS

Within ten (10) days following the receipt of the laboratory test results following each sampling event, a complete copy shall be submitted to the City of Napa Water Division. A technical memorandum will be included with the sample results to present the sample logs and any observations that may be integral in assessing the data such as weather conditions, visual observation of water quality (such as clarity), or any other observations pertinent to understanding conditions on Walt Ranch and within the stretch of Milliken Creek that traverses through Walt Ranch.

— what about immediate rechecks for OOS ?

4.0 ESTABLISHMENT OF THRESHOLDS

As described in Section 2.1, water samples will be collected prior to commencement of construction. Because construction is expected to commence in spring 2017, it is anticipated that samples will be collected in Winter 2016/2017. The City of Napa and Brambletree shall meet after this baseline sampling

In-Field Sampling

To collect laboratory samples:

1. Label the bottle with the sample ID, sampled by, date, time, location, preservative, and analysis.
2. Remove cap from the bottle just before sampling. Avoid touching the inside of the bottle or cap. If the inside of the bottle or cap is accidentally touched, discard the bottle or cap and replace with one that is sterile.
3. Sample downstream sites first to avoid inadvertent contamination from bottom disturbance or other factors.
4. Disturb as little of the bottom stream sediment as possible. Do not collect water that has sediment from bottom disturbance. Stand facing upstream and collect water sample on the upstream side, in front of sampler's body.
5. Hold the bottle or a sample grab bottle near its base and plunge it (opening downward) below the water surface. Turn the bottle underwater into the current and away from sampler.
6. If a sample grab bottle is used, transfer the sample into the appropriate sample bottle, being careful not to touch the inside of the bottle or cap.
7. Leave approximately a 1-inch air space in each bottle (unless directed otherwise on a sample-by-sample basis). Recap the bottle carefully, remembering not to touch the inside.
8. Store all sample containers in a cooler on ice until drop off at the laboratory. Store the COC and field sheets on the cooler or with the cooler at all times.

For in-field measurements (DO, pH, temperature, and/or turbidity):

1. Sample downstream sites first to avoid inadvertent contamination from bottom disturbance or other factors.
2. Disturb as little of the bottom stream sediment as possible. Do not collect water that has sediment from bottom disturbance. Stand facing upstream and measure water sample on the upstream side, in front of your body.
3. Take measurements at multiple locations across the stream width and at multiple water depths. No less than 5 measurements per monitoring point is recommended (if less are taken, an explanation shall be provided). Individual measurements should be taken at a number of equally spaced intervals across the cross-section, and at a number of water depths at each interval. This should be repeated at the upstream and downstream monitoring points.
4. The final in-field measurement value is the mean of the sample values.

For in-field measurements of DO, pH, and temperature (and/or turbidity), several measurements shall be taken in the field to encompass variability in water quality parameters across stream depth and the channel cross-section. Any observations that may affect the results of the samples will be noted on the data sheets. One data sheet will be used for each of the sample sites. A sample data sheet is provided in **Appendix A**.

2.5 AUTHORIZED COLLECTORS

Monitoring samples should be taken by a qualified environmental scientist, hydrologist, or toxicologist hired by Brambletree. Those entering the site must obtain advance written permission from Brambletree.

each time or for annual testing?

Hell has a say? How muc

is performed to establish thresholds of each constituent, based on this baseline data. These thresholds will incorporate the variability in the sample values due to the following variables; sample site, sample timing, sampling error, Milliken Reservoir samples, and annual variability observed in the Milliken Reservoir historic data.

The City of Napa (at their own expense) will simultaneously be performing monitoring of these same parameters in Milliken Creek in locations representative of natural watershed settings and locations representative of similar land use. This data will be available to provide additional background information with respect to seasonal variation in the data.

Seasonal Variations.

Seasonal variations are expected. The data may prove to be inconsistent throughout the early and late storms of the wet season. If so, accommodations for variations within the wet season will be made in the development of Thresholds. Early season runoff may show higher values of the tested parameters as the first storms soak the ground, dissolve naturally occurring nutrients, and mobilize them in the runoff flowing into the creek and reservoir.

Additional Data for Threshold development.

The City's Water Division has ten years of existing data in the reservoir at the downstream/outlet and in Milliken Creek where it flows into the head of Milliken Reservoir to help guide the development of Thresholds. A summary of that data is presented in **Table 1**.

Table 1

Milliken Reservoir Water Quality	Feb – Oct 2007- 2016	
	Average	Observed High
Specific conductance (conductivity)	94 uS/cm	178 uS/cm
Phosphate (as o-PO_4)	0.016 ppm	0.035 ppm
Nitrates (NO_3 as N)	0.021 ppm	0.040 ppm
Sulfate (as SO_4)	≤2.6 ppm	32 ppm (July 2007)
Turbidity (@ 5 ft)	1.98 NTU	6.3 NTU (July 2014)
		5.4 NTU (Feb 2014

In addition, in 2016 the City of Napa took two samples in Milliken Creek for mid-to-late wet season. One sample was taken upstream from the Walt Ranch Monitoring sites, and the other was downstream. This data, presented in **Table 2** below, is of interest, however seasonal differences in the constituents are expected which will cause deviations from the numbers below. In fact, there is variability in some constituents in the reported data.

Table 2

Milliken Creek 2016 Water Samples	March 9*, & April 5, 2016 highest observed results (after consecutive 1-inch storms)	
	Upstream	Downstream
Specific conductance (conductivity)	100 uS/cm	91 uS/cm
Phosphate*(as o-PO_4)	0.02 ppm	0.02 ppm

Nitrates (NO_3 as N)	0.27 ppm	0.13 ppm
Ammonia (NH_3 as N)	0.02 ppm	0.02 ppm
Sulfate (as SO_4)	20.6 ppm	3.6 ppm
Turbidity*	11.2 NTU	7.3 NTU

The City of Napa and Brambletree will work to develop the following Table based on the observed baseline data collected from the baseline sampling:

Table 3

Water Quality	Observed 2016/2017	Thresholds
Specific conductance (conductivity)	xx uS/cm	xx
Phosphate (as o-PO_4)	xx ppm	xx
Nitrates (NO_3 as N)	xx ppm	xx
Ammonia (NH_3 as N)	xx ppm	xx
Sulfate (as SO_4)	xx ppm	xx
Turbidity	xx NTU	xx

Variability - Tolerances for normal fluctuations of natural elements expected due to frequency and intensity of rainfall will be acknowledged and taken into consideration in the development of these thresholds. Variability from seasonal effects, site to site variability, existing creek data, as well as ten years of Milliken Reservoir data will be used to assist in the development of the Threshold values for each constituent.

5.0 PROJECT OPERATIONS

Once the project construction begins, water sampling will take place as described in Section 2.1. Sample test results from the post-project monitoring shall be compared to the Thresholds.

– over what time period.

If sample test results exceed the preceding Threshold parameters, the BMPs will be inspected and improved. The site will be assessed for cause(s) of constituents for which samples exceed the applicable Threshold. Effectiveness of the BMPs will be assessed by the subsequent scheduled monitoring events. Project operations will be assessed and adapted to reduce the impacts the following year. Monitoring will be extended until consecutive annual sets of monitoring data show levels equivalent to or below the Threshold levels.

– If they don't return to threshold levels?
– what constitutes "return" to "equivalent or below"?

Pesticide Applications.

If non-organic Pesticides are applied in the Milliken Creek Watershed, then one sample above and below the Walt Ranch will be taken and analyzed for pesticides following the first rain event in the following winter. The sampling will be representative of a readily-identifiable constituent of the pesticide applications.

Corrective Actions

If any Threshold is exceeded, Brambletree shall examine the BMPs it is implementing to control discharge of waste from the Project site. They shall try to identify the actual or suspected cause of the Threshold exceedance, and shall either modify relevant BMPs or add one or more new BMPs in order to eliminate the cause of the exceedance(s). Brambletree shall make every effort to complete the BMP review within 72 hours of notification of the Threshold exceedance.

Brambletree shall provide the City Water Division with a Corrective Action Memorandum describing its BMP review and modification(s) within 30 days after receiving a sample test result exceeding a Threshold for a constituent parameter.

If analytical data from the proposed Project sampling data is below the threshold levels the sampling requirement may be concluded upon two years after each development stage (as described in Section 2.1) of the Project, with a minimum of four years of monitoring should development stages be implemented simultaneously.

If future monitoring performed by the City indicates runoff from Project operations is causing an exceedance of a Threshold, then the monitoring and reporting requirements by Brambletree shall resume for an additional two-year period.

If unexpected site discharge due to draining of a pond, production of agricultural tailwater or site run-off caused for any reason other than natural rainfall is observed in otherwise dry/non-discharge period (typically May – October), immediate monitoring of such discharge must commence.

What enforcement role does County have? — penalty for non-compliance?

6.0 REFERENCES

AES, 2014. Draft Environmental Impact Report, Walt Ranch Erosion Control Plan Application #P11-00205-ECPA. Prepared by AES. July 2014.

City of Napa, 2014. Comment Letter to Walt Ranch Draft EIR. November 21, 2014. From Joy Eldredge, P.E. City of Napa Public Works Department, Water Division. To Kelli Cahill, Napa County Planning, Building, and Environmental Services Department.

State Water Resources Control Board (SWRCB), 2006. CCR Title 22, Division 4. Environmental Health. Chapter 15: Domestic Water Quality and Monitoring Regulations. Adopted May 2, 2006. Available online at: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Documents/Recentlyadoptedregulations/R-21-03-finalregtext.pdf.

SWRCB, 2014. Maximum Contaminant Levels and Regulatory Dates for Drinking Water: USEPA vs California. State Water Resources Control Board, Division of Drinking water. Last updated July 2014. Available online at: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Documents/DWdocuments/MCLsEPAvsDWP-2014-07-01.pdf

SWRCB, 2015. Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin. Last updated March 2015. Available online at: http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml.

USEPA, 2016a. Table of Regulated Drinking Water Contaminants. Last updated February 16, 2016. Available online at: http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants.

USEPA, 2016b. Secondary Drinking Water Standards: Guidance for Nuisance Chemicals. Last updated January 6, 2016. Available online at: https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals.

Wilde, F.D., 2008. Guidelines for Field-Measured Water-Quality Properties. U.S. Geological Survey TWRI Book 9: October 2008.

APPENDIX A

SAMPLE DATA SHEETS

Project Name: Walt Ranch Vineyard Development Project– Milliken Creek Water Quality Monitoring

Project Location Milliken Creek Date: / / Time: : AM / PM

Sampling Crew:

Water Depth: Last Precipitation Event: / /

Weather Conditions:

In-Field Sample Measurements

Monitoring Location (US/DS)	Sample Number	Time	Temp (°C)	DO (mg/l)	pH (units)	Turbidity (NTU)
		Average				
		Average				

Constituents Sampled

☐ Specific Conductance
☐ Phosphates
☐ Ammonia
☐ Sulfate
☐ Turbidity

Other:

Sample Delivered to:

Sample I.D./C.O.C. #

Comments:

APPENDIX B

CHAIN OF CUSTODY FORM

Caltest
ANALYTICAL LABORATORY

1885 N. KELLY ROAD NAPA, CA 94558 (707) 258-4000 FAX (707) 226-1001

SAMPLE CHAIN OF CUSTODY

PROJECT NAME / PROJECT NUMBER:
P.O. NUMBER
LAB ORDER #

CLIENT:
REPORT ATTN:
ANALYSES REQUESTED

MAILING ADDRESS:
STATE:
ZIP

BILLING ADDRESS:
ATTN:

PHONE NUMBER:
FAX PHONE NUMBER:
SAMPLER (PRINT & SIGN NAME):

TURN-AROUND TIME
☐ STANDARD
☐ RUSH
DUE DATE:

CALTEST LAB #	DATE SAMPLED	TIME SAMPLED	SAMPLE MATRIX*	CONTAINER TYPE/ AMOUNT**	PRESERVATIVE	SAMPLE IDENTIFICATION / SITE	CLIENT LAB #	COMP. or GRAB										REMARKS

RELINQUISHED BY	DATE/TIME	RECEIVED BY	RELINQUISHED BY	DATE/TIME	RECEIVED BY
	/			/	
	/			/	

FOR LAB USE ONLY

Samples WC ___ MICRO ___ BIO ___ AA ___ SV ___ VOA ___ pH? Y/N TEMP: SEALED: Y/N INTACT: Y/N

BC: BIO ___ WC ___ AA ___

CC: AA ___ SV ___ VOA ___

SL: HP ___ PT ___ QT ___ VOA ___

W/HNO$_3$ ___ H_2SO_4 ___ NaOH ___

PL: HNO$_3$ ___ H_2SO_4 ___ NaOH ___ HCL ___

COMMENTS:

*MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil Sludge, Solid ; FP = Free Product

**CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4oz. BACT; BT = Brass Tube; VOA = 40mL VOA; OTC - Other Type Container

R ___ PR ___ M ___ F ___

WHITE - LABORATORY YELLOW - CLIENT COPY TO ACCOMPANY FINAL REPORT PINK - CLIENT COPY AS RECEIPT

ATTACHMENT 2

From: Morrison, David
To: Brun, Philip
Subject: Walt Ranch
Date: Wednesday, August 10, 2016 10:02:52 AM

Phil,

In our conversation yesterday, you indicated that the City's goals were to: (1) revise Condition of Approval No. 10 in the Final Decision to refer to "August, 2016" instead of "July, 2016;" and (2) ensure that the revision was made either through an errata or a rescission and re-issuance of the decision.

Unfortunately, the County cannot issue an errata to reference the Final Plan. The Final Plan would have been submitted after the Final Decision had been issued, which would open the door to other interested parties also wanting to amend the administrative record by introducing new information not in evidence at the time of the decision. This could seriously impair both the appeal proceedings and affect our successful defense in case the matter is litigated.

Similarly, the County is unable to rescind the decision and issue a new decision including the revised condition of approval. This action would reset the appeal period, allowing appellants more time in which to prepare their arguments, and would also unnecessarily delay the applicant in reaching conclusion of the project. It would also open the door for other parties to follow suit and submit new information in hopes of getting the Final Decision to be rescinded yet again. This approach could lead to constant lobbying and dispute over the Final Decision, which could instead be dealt with more efficiently and effectively through the appeal process.

You also asked several questions during our conversation last Friday. Here are my responses:

1. How would the Final Water Quality Monitoring Plan be included in the administrative record, since the decision has already been issued?

   I suggest that the applicant send the Final Plan to both you and me in PDF format as soon as possible. I would acknowledge and receive the revised document. The revised document would then be the basis whereby I would recommend to the Board of Supervisor as a part of the response to any appeal(s) filed that Condition of Approval No. 10 be corrected to reflect the final agreement.

2. How much latitude does the Board of Supervisors have to revise the condition of approval when the hearing is based solely on the grounds filed in the appeal (not a de novo hearing)?

   The Board of Supervisors has the right to affirm, reverse, remand or modify the decision being appealed regardless of the standard of review (de novo or based on the records).

3. If the City does not file an appeal, what assurances do they have that the County will make the changes as requested as a part of one of the other appeals?

The Final Plan will be part of the packet presented to the Board of Supervisors for consideration during the appeal. As stated above, I will recommend that the condition be amended to reference the Final plan. This is consistent with the County's actions over the past several months whereby we have been receptive and responsive to the City's concerns.

In summary, I must stand by the Final Decision, as it was approved without any further changes. This is not intended to minimize the voluntary efforts of the applicant and City to resolve their concerns, which I fully support. As a measure of that support, I pledge to recommend to the Board of Supervisors that Condition of Approval No. 10 be corrected as a part of the appeal process.

Although I am unable to accommodate the City's desire to have the correction resolved now, I don't believe that an appeal is needed. After all, the City still retains primary enforcement power through the Memorandum of Understanding. The inclusion of the Condition of Approval in the Erosion Control Plan is recognition by the County of the importance of this issue to the City and applicant, but does not provide any additional enforcement authority beyond what the City already enjoys. More importantly, as a part of the County's ongoing efforts to address the City's concerns, staff strongly recommends making the necessary correction as a part of the appeal process.

I am available to discuss these issues and to answer any questions you may have regarding the above information.

Respectfully,

David