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October 17, 2016

Laura Anderson
Deputy County Counsel, Napa County
1195 Third Street
Suite 301
Napa, CA 94559
By email to: Laura.Anderson@countyofnapa.org

**Re: Appeal of Walt Ranch Vineyard Conversion Project (ECP P11-00205-ECPA) -
New Evidence.**

Dear Ms Anderson:

This office represents Appellant Living Rivers Council (LRC) in this appeal.

I am writing in response to Board Chair Pedroza's request, at the October 12, 2016, pre-hearing conference, that appellants submit any additional information or argument regarding any request for the Board to consider newly discovered evidence or conduct a de novo hearing.

While LRC concedes that the Board may determine the order and time limits for the parties' presentations at the appeal hearing, neither the Board nor the Board Chair have the authority to impose on appellants the pre-hearing schedule discussed at the pre-hearing conference, including today's "deadline" for submitting new evidence or argument supporting "good cause" for the Board to consider any such new evidence.

LRC also contends that because County Code section 2.88.090.A requires the Board to exercise its "independent judgment" in deciding the appeal, the appeal hearing is by definition "de novo" and no request for "de novo" review is required to make it so.

Therefore, the only question addressed by subdivisions A and B of County Code section 2.88.090 is whether the Board will consider any evidence not presented to the Director of Planning before the close of his April 4, 2016, hearing.

LRC contends that the Board, as the legislative body responsible for the County's compliance with CEQA as a CEQA lead agency, must consider any evidence or arguments presented to it before the close of the Board's appeal hearing that are relevant to the informational sufficiency of the EIR. Therefore, to the extent this letter includes argument supporting "good cause" for the Board to consider any evidence not presented to the Director of Planning before the close of his April 4, 2016, hearing, LRC does so as a courtesy, and does not waive its right to present any evidence or

Laura Anderson
Re: Appeal of Walt Ranch Vineyard Conversion Project
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arguments before the close of the Board's appeal hearing that are relevant to the informational sufficiency of the EIR.

As you know, my August 29, 2016, appeal packet letter included several categories of evidence not presented to the Director of Planning before the close of his April 4, 2016, hearing and argument supporting "good cause" for the Board to consider such new evidence. At this time, LRC is not aware of any new evidence that it might additionally ask the Board to consider.

However, LRC now presents additional arguments supporting good cause for the Board to consider these categories of additional evidence. As noted above, the Board, as the legislative body responsible for the County's compliance with CEQA as a CEQA lead agency, must consider any evidence or arguments presented to it before the close of the Board's appeal hearing that are relevant to the informational sufficiency of the EIR.

As discussed in my August 29, 2016, appeal packet letter, Greg Kamman's letter attached as Exhibit 1 includes evidence relating to (1) Mr. Oster's June 2, 2016, letter regarding ripping and soil permeability, (2) Mr. Kamman's modeling of runoff increases with drainage facilities included in the analysis; (3) landslide risk; and (4) streamflow monitoring. These categories of evidence are highly relevant to the informational sufficiency of the EIR's analysis of project impacts on runoff, stream sedimentation, and listed fish species and landslide risk for the reasons set forth in Mr. Kamman's several comment letters and my August 29, 2016, letter.

Greg Kamman's letter also includes evidence relating to groundwater recharge. This evidence is highly relevant to the informational sufficiency of the EIR's analysis of project impacts on groundwater resources, for the reasons set forth in Mr. Kamman's several comment letters and my August 29, 2016, letter.

As discussed in my August 29, 2016, appeal packet letter, Ms Padgett-Flohr's letter attached as Exhibit 2 includes evidence relating to impacts on biological resources. This evidence is highly relevant to the informational sufficiency of the EIR's analysis of project impacts on biological resources for the reasons set forth in Ms Padgett-Flohr's several comment letters and my August 29, 2016, letter.

Thank you for your attention to this matter.

Very Truly Yours,



Thomas N. Lippe

cc: Alfredo Pedroza

\\Lgw-12-19-12\l\Napa4 Walt\Administrative Proceedings\LOTNL Docs\BOS Appeal\C102b New evidence letter.wpd

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Janis H. Grattan
Rachel Mansfield-Howlett
Roz Bateman Smith

October 17, 2016

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

Via Electronic Delivery

Re: Walt Ranch Vineyard Conversion Project
Appeal of the August 1, 2016, Planning Director's certification of the EIR
and approval of the Agricultural Erosion Control Plan No. P11-00205-
ECPA proposed by the Walt-Brambletree Corporation

Dear Ms. Coil,

Appellants, COHA and COCWD, and numerous concerned residents have repeatedly raised the issue of the Project's operational impacts to roads and the potential for complete road failure and collapse throughout the administrative and environmental review process for this Project.

Appellants and others have submitted substantial evidence showing the deteriorating road conditions proximate to the Project, especially on Circle Oak's Drive, and that the operation of the Project will worsen these conditions. As noted in Appellants September 1, 2016 appeal letter to the County citing to evidence in the record:

Impacts to Road Conditions and COCWD Water and Sewer Infrastructure
The EIR fails to adequately analyze and provide mitigation for impacts to roads, including road failure, due to the Walt Ranch operations. (Exhibit 1 at pgs. 26-27 and Exhibit 24 at pgs. 808-810, 813, Rachel Mansfield-Howlett comment letters; Exhibit 11 at pgs. 618-619 and Exhibit 30 at pg. 1269, April 3 and 4, 2016, Mark Billings letters; Exhibit 12a at pgs. 620-623 and Exhibit 31a at pgs. 1,269-1,270,

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November 21, 2014 and April 3, 2016, David Heitzman letters; Exhibit 14a at pg. 734 and Exhibit 14b at pg. 735, November 21, 2014, Stephen Gort, General Manager, Circle Oaks Homes Association Draft EIR comment letter; Exhibits 19a at pgs. 747-749 and Exhibit 19d at pg. 776, November 21, 2015, Sue Wagner Draft EIR comment letter; Exhibit 36 at pgs. 1,431-1,436, April 4, 2016, Sue Wagner comment letter; Exhibit 22 at pgs. 787-789, Bob McLeish Draft EIR comment letter; Exhibit 33 at pg. 1,413, July 22, 2014 Jack MacDonald, Circle Oaks County Water District Draft EIR comment letter; Exhibit 38 at pg. 1,455, March 23, 2016, Kathleen Maxim, Circle Oaks Homes Association, letter; Exhibit 39 at pgs. 1,458-1,461, April 4, 2016, Ron Tamarisk letter.)

Appellants noted that Mitigation 4.7-4 proposes no mitigation for the Project's operational impacts.

Mitigation 4.7-4 provides for repaving and damage to sub-surface infrastructure *during the construction phase of the Project only*, it does not address mitigation for road damage due to continuing operations of the Project. (Exhibits 1, 11, 24, and 30, Rachel Mansfield-Howlett and Mark Billings letters.)

Appellants now reference additional evidence to support these allegations. Expert, David V. Cymanski, G.E., KC Engineering Co. found that the reports relied upon in the EIR failed to perform specific geologic and/or geotechnical investigations for the portion of Circle Oaks Drive affected by the Project. (Attached, Exhibit 32, October 17, 2016 Report by David V. Cymanski, G.E., KC Engineering Co.) Mr. Cymanski provides substantial evidence that roads are failing in two specific areas within the Project's impact area on Circle Oaks Drive and that pavement damage and road subsidence will continue to worsen in both of these areas during the operation of the Project. (*Ibid.*) Furthermore, the report finds that the addition of heavy truck traffic from the proposed Walt Ranch Vineyard operations to the roadway will significantly exacerbate the damage and increase the design Traffic Index; due to the poor condition of the roadway, rainfall and runoff could lead to embankment and road failure; and the EIR's proposed mitigation 4.7-4 failed to provide for ongoing operational road impacts. (*Ibid.*)

In summary, the EIR is inadequate and incomplete because it failed to disclose the Project's significant effect on the environment; proposed mitigation 4.7-4 is inadequate to address the grave effects of foreseeable road deterioration and collapse due to the ongoing operations of the Walt Ranch Project; and the EIR failed to adequately respond to comments on these issues. Appellants underline the reason for their concern is that the Circle Oaks Water District's water and sewer system infrastructure is located under Circle Oaks drive; road deterioration and collapse will

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destroy these infrastructure systems, impacting both health and safety and roads and infrastructure.

Due to the EIR's failure to analyze and disclose these impacts, even if new mitigation is proposed, the Board must send the EIR back to planning to be revised and re-circulated prior to the Planning Director's further consideration of Project approval in order to comply with CEQA's informational and disclosure requirements. Mr. Cymanski noted, "It is assumed that all development traffic would be on Circle Oaks Drive, however, any alternative route should be evaluated for stability considering the historical instability of the roads in Circle Oaks Community." (Exhibit 32, page 3.) Therefore, if the applicant proposes an alternative access way, this too must be studied in a revised EIR and re-circulated for comment prior to further consideration of the Project.

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. Secondly, 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 the October 17, 2016, report by David V. Cymanski, G.E., KC Engineering Co. regarding road conditions and failure could not have been produced before April 4, 2016.
- Inclusion of the new information 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 the requested analysis in the EIR. Members of the public should not have to retain a geologist to conduct analyses that the lead agency should have provided in the EIR.

This information is therefore properly before the Board and should be of considerable

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value when considering the Project's significant environmental impacts. We respectfully request the Board uphold the appeal on the bases stated.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rachel Mansfield-Howlett", with a long horizontal flourish extending to the right.

Rachel Mansfield-Howlett
Attorney for Appellants COHA and COCWD

cc: Laura Anderson, Deputy County Counsel, <Laura.Anderson@countyofnapa.org>

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Letter to Napa Board of Supervisors from Appellants COHA and COCWD

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Redding, California 96002
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KC ENGINEERING COMPANY
A SUBSIDIARY OF MATERIALS TESTING, INC.

Project No. VV4147
17 October 2016

Mr. David Heitzman
Defenders of East Napa Watersheds
23 Rockrose Court
Napa, CA 94558

Subject: Circle Oaks Drive
Napa County, California
GEOLOGIC AND GEOTECHNICAL REVIEW & RECONNAISSANCE

- References:
- 1) Draft Environmental Impact Report
Walt Ranch Erosion Control Plan
By Analytical Environmental Services, dated July 2014
 - 2) Final Environmental Impact Report
Walt Ranch Erosion Control Plan
By Analytical Environmental Services, dated March 2016

Dear Mr. Heitzman:

INTRODUCTION

At your request, **KC ENGINEERING COMPANY** in association with Joyce Associates, have reviewed specific sections of the referenced Environmental Impact Reports (EIR) to determine whether Circle Oaks Drive was adequately evaluated with respect to the proposed impacts of heavy construction equipment traffic and future vineyard operations truck traffic. Our review summary and comments are presented herein.

In addition, we performed a geologic and geotechnical reconnaissance on 9/6/16 of portions of Circle Oaks Drive in the Circle Oaks Subdivision in Napa County, California. The subject areas are located on Circle Oaks Drive between the intersections with Rockrose Court and Sunnyhill Lane, as shown on the attached "Site Map" included in the Appendix of this report. The purpose of our services was to evaluate the current road conditions, as well as the potential impact from heavy construction equipment and truck traffic related to the proposed Walt Ranch Vineyard operations.

Two areas of extensive pavement distress were observed. The largest area (Area A) is along a straight portion of Circle Oaks Drive approximately 300 feet north of the intersection with

Sunnyhill Lane. The second area (Area B) is located along the inside of a bend approximately 300 feet south of the intersection with Rockrose Court.

EIR REVIEW

The referenced EIR reports provide detailed geologic and traffic study information regarding the Walt Ranch project. However, specific geologic and/or geotechnical investigations were not performed for the portion of Circle Oaks Drive that are proposed to be impacted by use of the road.

On page 2-43 of the Draft EIR, Environmental Impact Section 4.7-4 states that "Construction traffic and subsequent operational traffic of the Proposed Project could increase wear-and-tear of area roads; this would be a potentially significant impact." The second bullet of the Mitigation Measure for 4.7-4 states that "Circle Oaks Drive shall be assessed by an independent third party consultant prior to the start of construction and following completion of construction. If the third party determines that roadway deterioration has occurred as a result of construction traffic, the applicant shall pay to have the roadway resurfaced to restore the pavement to at least pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements." It is noted that page 5-39 of the Final EIR, Section 4.7-4 states the same mitigation measure, with the addition that the applicant shall repair damage to sub-surface infrastructure.

Based on our review of the EIR's and the County Planning Department's website, Circle Oaks Drive has not been assessed by an independent geotechnical or geologic consultant. In our opinion, the EIR is inadequate and incomplete because it did not perform an assessment, nor subsurface investigation and analysis of the significant impact to Circle Oaks Drive, and it did not propose adequate mitigation measures. The EIR failed to divulge the Vineyard operation impacts to roads and subsurface infrastructure. In addition, proposed mitigation measure 4.7-4 failed to address and provide mitigation measures for impacts to the road and subsurface infrastructure due to future operations of the vineyard project.

AREA A

Area A includes an area of extensive road settlement and cracking located along a linear portion of Circle Oaks Drive. The road in this area was constructed by cut/fill techniques and the eastern lane consists of a large fill embankment. The fill bank appears to extend down the slope approximately 25 vertical feet and has inclinations of about 1.5H:1V (horizontal to vertical). In this area we observed severe pavement cracks over a zone approximately 300 feet in length (see attached photographs). The cracks range up to approximately 1 inch in width and extend approximately to the centerline of the existing road. Some of these cracks have vertical offsets in excess of 1 inch. In addition, our observations found that the area has been repeatedly repaved to compensate for previous settlement in the area of more than 1 foot. Circle Oaks

Drive in this area is not adequately sloped into the hill, but rather towards the outer embankment fill slope.

Our observations also indicate that during times of high flow from heavy rainfall events, water coming down the road sheets flows onto the roadway reaching the area of the cracks and top of fill slope. According to Mr. Heitzman, water does flow across the roadway in this area during major storms. We also observed evidence of erosion on the slope below this area. In our opinion, the future stability of the road embankment in this area is a critical concern. The fill portion of the roadway roughly northeast of the centerline is already experiencing excessive movement with cumulative movement since construction of more than 12 inches. The numerous open cracks allow the infiltration of water into the subgrade and the underlying fill. Experience on previous projects has shown that embankments of this type can fail suddenly as a result of heavy rain and the infiltration of water into road cracks. The result can be failure of the fill embankment and loss of the road, as well as underground utilities.

AREA B

The second area of concern (Area B) is along the inside of the bend located approximately 300 feet south of the intersection with Rockrose Court. The area consists of a fill placed along the flank of a ravine. As shown on the attached photographs, extensive pavement cracking and some road subsidence is occurring in this area. Similar poor drainage concerns exist in this location, wherein collects rain water sheets down toward and into the cracks.

CONCLUSIONS

The addition of heavy truck traffic from the proposed Walt Ranch Vineyard operations to the roadway will significantly exacerbate the existing road damage and increase the design Traffic Index. The EIR failed to perform an adequate analysis of current and future road stability of Circle Oaks Drive, and it failed to divulge the impacts to the road and subsurface infrastructure. In addition, proposed mitigation measure 4.7-4 failed to address and provide mitigation measures for impacts to the road and subsurface infrastructure due to future operations of the vineyard project. It is assumed that all vineyard construction and future operations traffic would be on Circle Oaks Drive, however, any alternative route should also be evaluated for road impacts and slope stability considering the historical instability of the roads in the Circle Oaks Community.

Unless corrective actions are taken, pavement damage and road subsidence will continue to worsen in both Areas A and B. In our opinion, corrective measures should be implemented as soon as possible to avoid further damage and related safety hazards.

Of particular concern is the ongoing subsidence and pavement distress occurring in Area A. Our observations indicate that more than one foot of vertical movement has occurred in the area since construction of the road. The observed cracking indicates that soil creep, settlement and instability of the roadway fill is ongoing. Experience on similar projects has shown that

infiltration of water into roadway cracks can result in sudden failure of the fill embankment. Additional heavy equipment and truck traffic from the proposed uphill vineyard operations will likely result in additional distress to the road. Failure of the road embankment would result in a significant life safety hazard to vehicles traveling on the roadway. Failure of the fill embankment could also damage underground sewer and water facilities in the roadway.

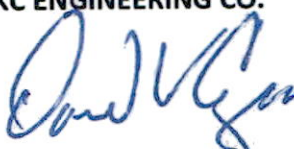
In our opinion, the County should retain a qualified Geotechnical Engineering consultant to perform an evaluation of both areas and provide recommendations for pavement rehabilitation and slope stabilization. The investigation should include test borings and laboratory shear strength and R-value testing to establish the subsurface soil conditions and to determine the embankment slope stability factor of safety. Geotechnical road stabilization and repair recommendations should be provided based on the findings of the field and lab investigation. A Civil Engineering consultant should also be retained to evaluate the site and road hydraulics, perform an analysis of surface water drainage and provide mitigative design drawings. A traffic study should also be performed to evaluate the appropriate traffic index and pavement section.

LIMITATION

Our services have been performed in accordance with generally accepted geologic and engineering principals and practices. This warranty is in lieu of all other warranties, either express or implied. Our services have been provided at the request of Mr. David Heitzman of the organization *Defenders of East Napa Watersheds*.


Should you have questions or require additional information, please contact our office at your convenience.

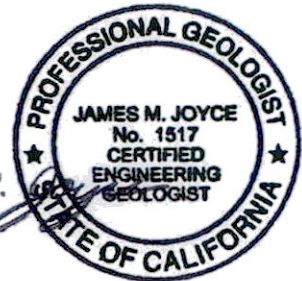
Respectfully Submitted,
KC ENGINEERING CO.


David V. Cymanski, G.E.
Principal Engineer



JOYCE ASSOCIATES


James M. Joyce, C.E.G.
Principal Engineering Geologist

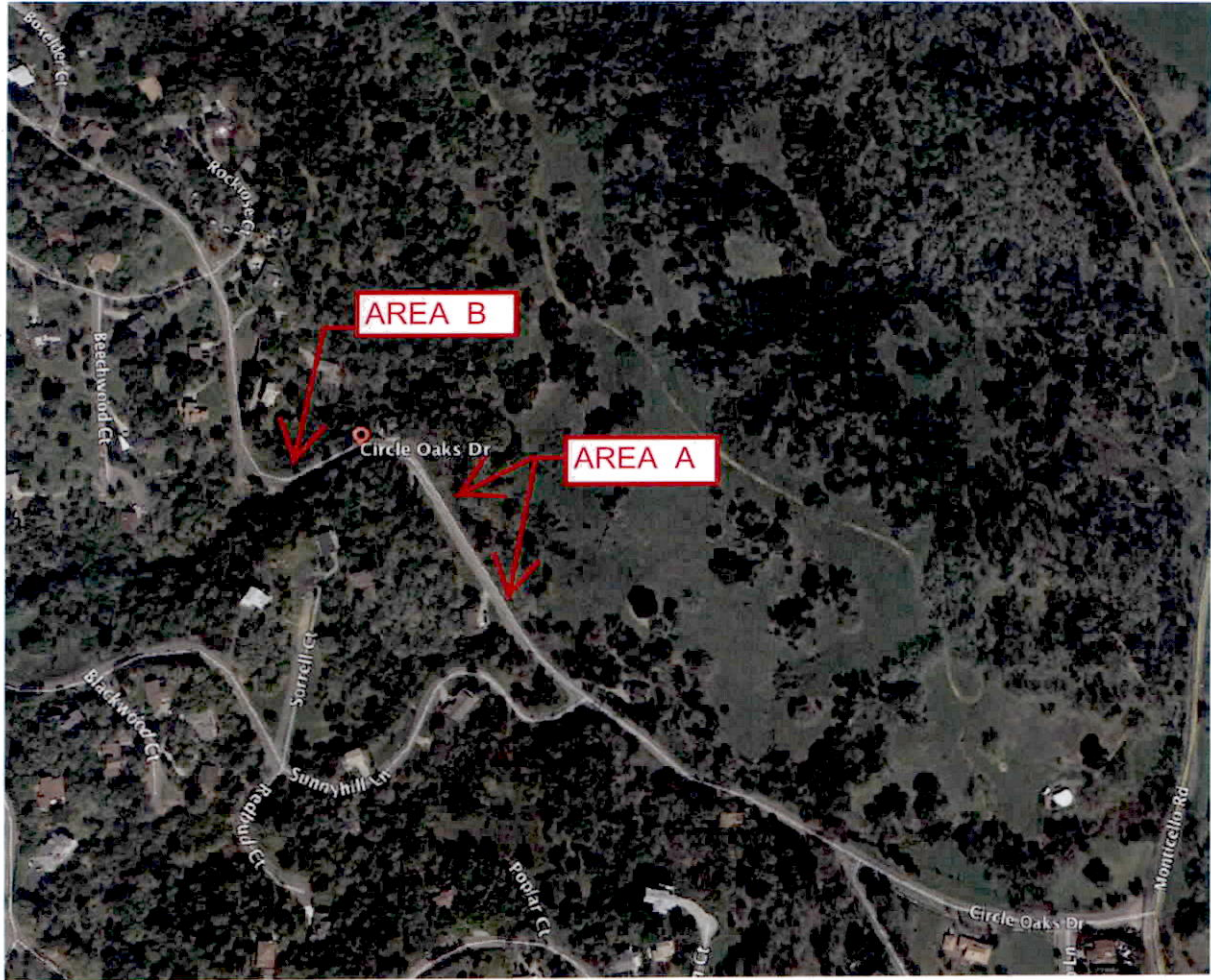


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APPENDIX

Aerial Site Map

Pavement Distress Photographs



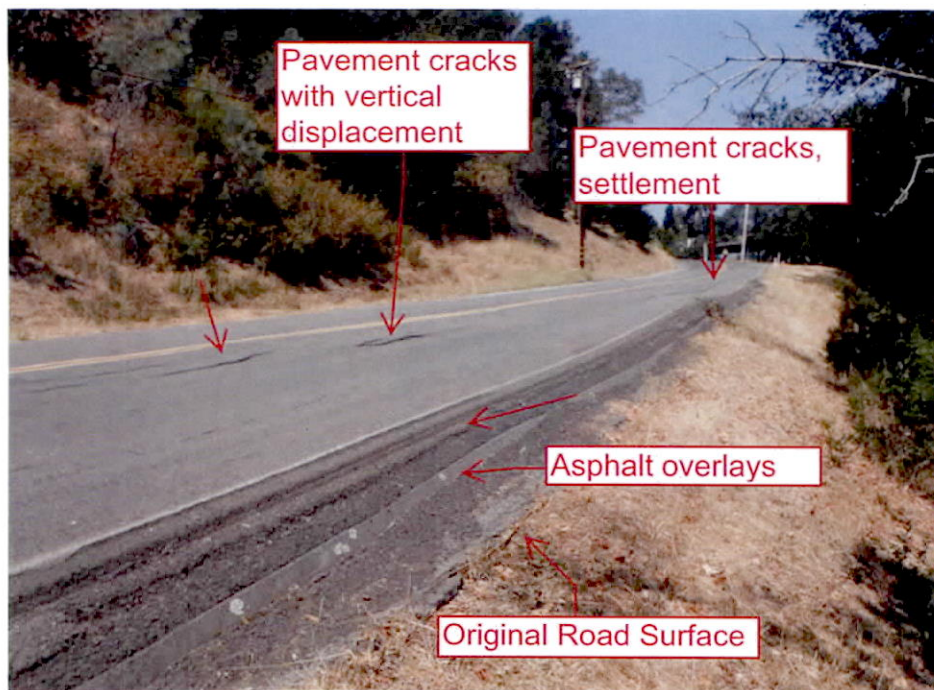
Photograph from Google Earth



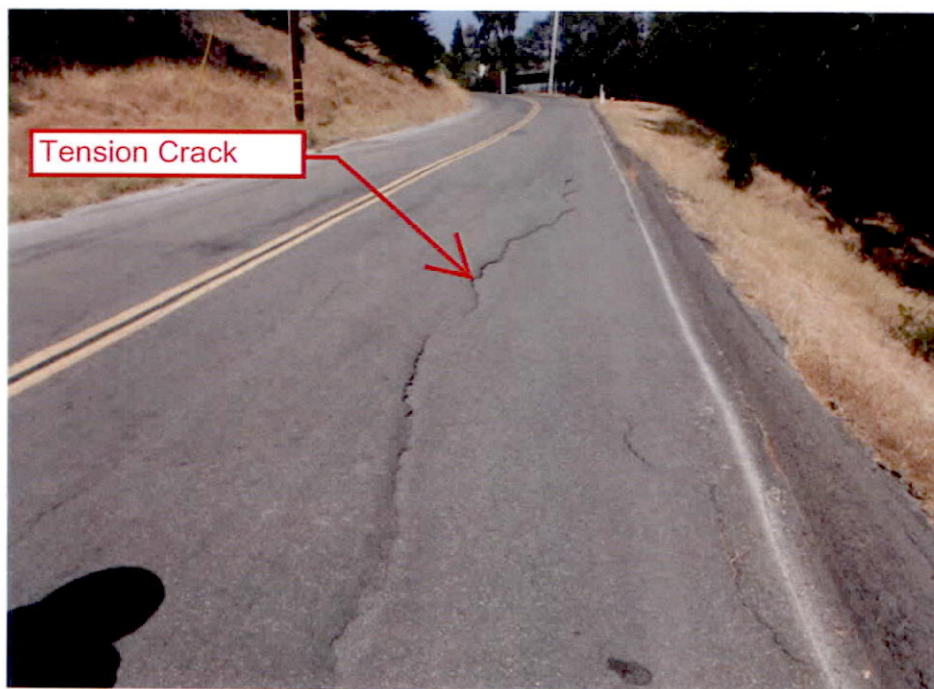
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Project No. VV4147
Circle Oaks Drive, Napa County
Site Map – Circle Oaks Drive Area

Date of all Photos 9/6/16



AREA A – looking northwest



AREA A – looking northwest

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Project No. VV4147
Circle Oaks Drive, Napa County
Area A Photographs



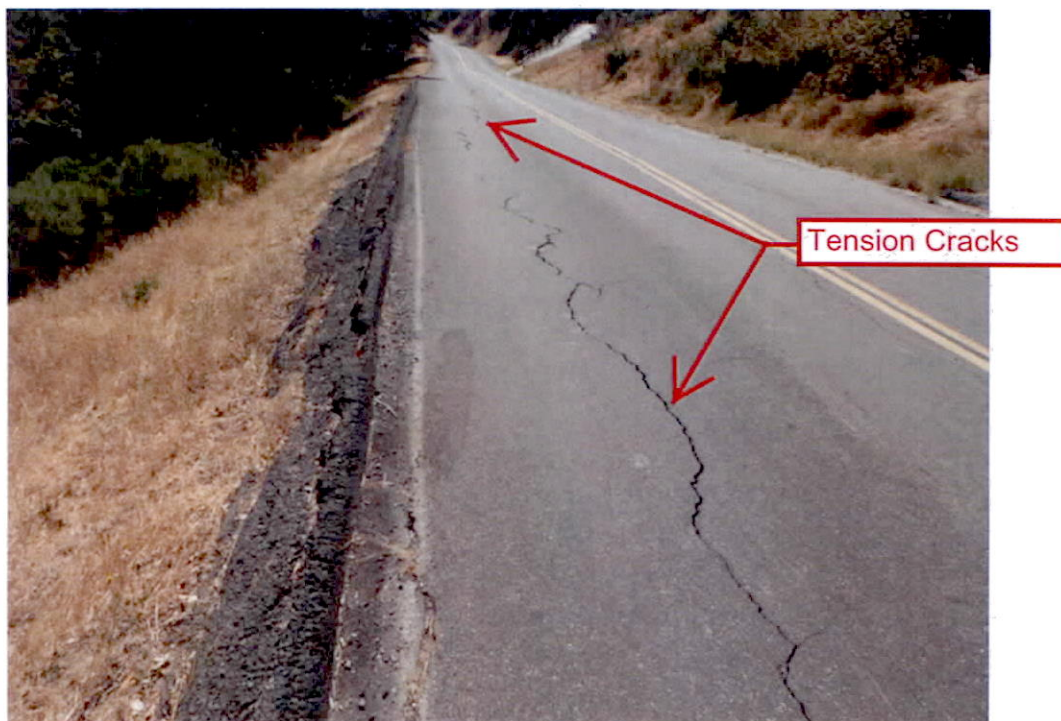
Area A – asphalt overlays indicate previous road settlement



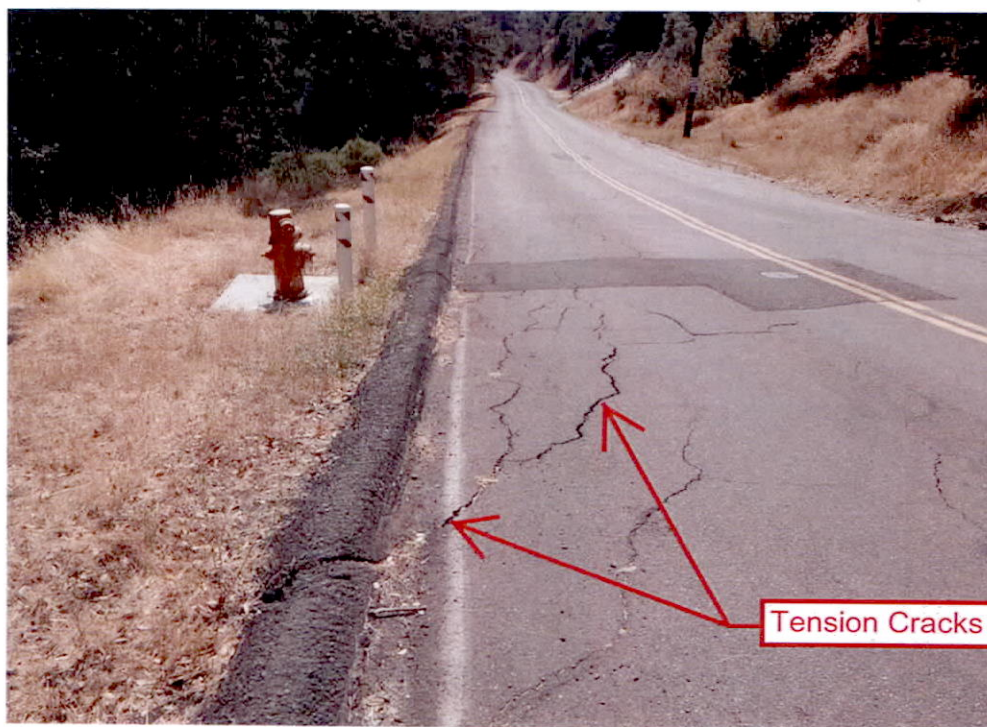
Area A – pavement cracks with vertical displacement

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Project No. VV4147
Circle Oaks Drive, Napa County
Area A Photographs



Area A – looking southeast



Area A – looking southeast

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Project No. VV4147
Circle Oaks Drive, Napa County
Area A Photographs



Area B – looking southwest



Area B – looking southwest

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Project No. VV4147
Circle Oaks Drive, Napa County
Area B Photographs

THOMAS S. ADAMS
tadams@dpf-law.com

October 17, 2016

VIA ELECTRONIC MAIL AND U.S. MAIL

Napa County Board of Supervisors
Attn: Alfredo Pedroza, Chair
1195 Third Street, Suite 310
Napa, California 94559
alfredo.pedroza@countyofnapa.org

**RE: Request for Presentation of Additional Evidence for Good Cause
Walt Ranch Erosion Control Plan (P11-00205-ECPA)**

Dear Chair Pedroza:

Our firm represents Applicant Hall Brambletree Associates, LP with respect to the Agricultural Erosion Control Plan ("ECP") (No. P11-00205-ECPA) for the Walt Ranch Vineyard Conversion Project (the "Project"). The Project was approved by Napa County Planning Director David Morrison (the "Director") on August 1, 2016. The Director's approval was subsequently appealed by the Living Rivers Council in addition to other appellants on August 29, 2016 (the "Appeal").

In connection with the Appeal, Applicant respectfully requests that you authorize the presentation of additional evidence in support of the Project pursuant to Section 2.88.090B of the Napa County Code ("Section 2.88.090B"). Section 2.88.090B states that upon a showing of good cause, the Chair of the Board may authorize the presentation of additional evidence which could not have been presented at the time of the decision appealed from.

The public hearing for the Project was closed by the Director on April 4, 2016. On June 2, 2016, Ken Oster, a soil scientist with the U.S. Department of Agriculture National Resources Conservation Services ("NRCS"), transmitted a letter to Charles Schembre of the Napa County Resource Conservation District that provides updated policy and recommendations with respect to the reclassification of certain Hydrologic Soil Groups ("HSG") based on deep ripping (the "June 2016 NRCS Letter"). Napa County has consistently assumed that deep ripping conducted in connection with vineyard development will result in the reclassification of certain soils. Napa County's approach was based on earlier guidance from NRCS. In the June 2016 NRCS Letter, however, Mr. Oster stated that actual HSG of the disturbed soil condition resulting from ripping should be verified by an on-site investigation. The June 2016 NRCS Letter is attached as Exhibit A.

The Environmental Impact Report ("EIR") for the Project relied on a hydrological analysis that, in part, included the assumption that deep ripping of certain soils will alter their HSG and associated runoff curve number in a manner that increases infiltration and reduces runoff

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Page 2

consistent with previous guidance from NRCS and common practice in Napa County since 2008. However, the June 2016 NRCS Letter now states that actual HSG of the disturbed soil condition from ripping should be verified by an on-site investigation.

In light of the June 2016 NRCS Letter and discussions with County Staff, Applicant has initiated field testing to verify the actual infiltration rate and soil depth within existing vineyard blocks. The methodology for such field testing is described in the Field Determination of Hydrologic Soil Group for the Walt Ranch Vineyard Development attached as Exhibit B (the "Field Determination"). Therefore, Applicant requests that it have the opportunity to present, and that the Board consider, the results of the Field Determination in connection with the Appeal.

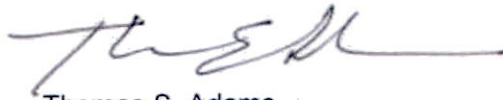
There is good cause for Applicant to present this information and for the Board to consider it under Section 2.88.090B because the June 2016 NRCS Letter clarifying NRCS's recommendations with respect to the reclassification of certain HSGs is relevant to the technical adequacy of the ECP and was not available at the conclusion of the public hearing for the Project on April 4, 2016 because it was not written until June of 2016. Further, Applicant was not made aware or provided any notice of its existence prior to the Appeal filed on August 29, 2016, which included the June 2016 NRCS Letter as an exhibit to the Kamman Hydrology & Engineering, Inc. letter dated August 26, 2016 ("Kamman Letter").

The Appeal by Living Rivers Council includes a request for the Chair of the Board to allow the Kamman Letter, along with the June 2016 NRCS Letter to be presented as additional evidence based on a finding of "good cause." Applicant believes that, if good cause exists to consider the Kamman Letter and the June 2016 NRCS Letter, then good cause also exists to consider the Field Determination, along with any recommendations that are made as a result of the Field Determination.

Please direct any questions about this matter to me. Thank you for your attention to this matter.

Sincerely,

DICKENSON, PEATMAN & FOGARTY



Thomas S. Adams

Enclosures

EXHIBIT A

JUNE 2016 NRCS LETTER

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

EXHIBIT B

FIELD DETERMINATION

Field Determination of Hydrologic Soil Group for the
Walt Ranch Vineyard Development

DRAFT

October 2016

Introduction & Background:

The Napa County General Plan requires that discretionary projects meet performance standards designed to ensure peak runoff following development is not greater than pre-development conditions (Policy CON-50). In order to meet this standard, Hydrologic Modeling of the pre-project and post-project conditions is performed by a qualified Professional and the results of the analysis are submitted to the County during the Erosion Control Plan (ECP) review process. The purpose of this memorandum is to set forth a protocol for performing field testing to determine the validity of certain assumptions included in the hydrologic modeling performed for the Walt Ranch ECP.

The Hydrologic Soil Group (HSG) is a parameter used to define a soil's ability to infiltrate surface water. HSG is a soil property dictated by the water-transmitting soil layer with the lowest saturated hydraulic conductivity and depth to the impermeable layer or depth to water table (whether that be clay barrier, rock layer, etc.). The Natural Resources Conservation Service (NRCS), which is the authority on HSG subject matter, states in the National Engineering Handbook (NEH) Part 630 Chapter 7 Section 630.0702 titled *Disturbed Soils*: "As a result of construction and other disturbances, the soil profile can be altered from its natural state and 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."

In Napa County, the HSG categorization has typically been revised to perform post-project modeling in specific rocky soil types. That is, for vineyard development in these rocky soil types, modeling has assumed that the HSG category should be revised because soil depth will increase as a result of vineyard development activities. This modification of HSG is based on the assumption that, as a result of the vineyard development process, deep ripping will fracture and remove portions of shallow bedrock and therefore will increase the soil depth to the impermeable layer. Theoretically, the change in HSG occurs based on the criteria given in part 630 Chapter 7 Table 7-1 of the NEH and in published soil survey data via the NRCS.

Concerns have been raised that any reduction in HSG due to deep ripping will be short lived because soils will reconsolidate after multiple wetting and drying cycles. The concern is that, while infiltration rates following deep ripping may increase over the short term, there will be no increase in infiltration rates over the long term. If this concern is correct, then modeling should not assume that the HSG categorization should change as a result of deep ripping in rocky soil types. However, infiltration rate alone is not the only factor used to assign HSG.

This concern may be warranted in fine-grained silt and clay soils. In this instance, however, the specific soils where credit for HSG reduction takes place are stony loam soils such as Hambright-Rock Outcrop complex. In these soils, the designation of HSG "D" is based solely on the shallow depth to bedrock, which causes moderate to rapid runoff rates. The soil constituent of this complex (Hambright) by itself contains infiltration properties that would place it in HSG "C" or HSG "B", which indicate more infiltration potential and lower runoff rates. Ripping and fracturing of the shallow bedrock layer will only add additional coarse aggregate to the existing Hambright part of the soil complex and is not expected to further reduce the inherent permeability of the Hambright portion in and of itself. Fractured volcanic rock remaining in the developed soil matrix will not reconsolidate and the increase of soil depth is permanent.

In an effort to provide scientific data that supports the claim of HSG modification, an additional condition of approval for the Walt Ranch ECP has been recommended that requires field testing to verify the infiltration rate and soil depth within vineyard blocks 2, 4 through 9, 11 through 16, 22 and 47 following vineyard preparation. Refer to Table 1 below for a list of blocks and sub-blocks requiring additional testing.

Table 1: Blocks Within or Partially Within HSG D

Block	1.0 acre or less within HSG D	More than 1.0 acre within HSG D	Block	1.0 acre or less within HSG D	More than 1.0 acre within HSG D
1A (partial, small portion)	X		9A5		X
2A1 (partial, small portion)	X		9A6 (partial, about half)	X	
2A2 (partial, about half)		X	9B (most of block)		X
2A3		X	11	X	
2B2 (most of block)		X	12A-2 (most of block)		X
2C	X		12B		X
3A (partial, small portion)	X		13 (most of block)		X
4A (partial, small portion)	X		14		X
4B (partial, more than half)		X	15B (most of block)		X
4C	X		16A		X
4E (most of block)		X	16B1-A		X
4F		X	16B1-B	X	
4G (most of block)	X		16B1-C (most of block)	X	
4H	X		16B2-A	X	
4I		X	16B2-B		X
5A1		X	16C1		X
5A2		X	16C2 (most of block)	X	
5A3		X	16D	X	
6		X	22B (partial, about half)	X	
7		X	22C	X	
8A		X	22D	X	
8B	X		22E	X	
8C	X		22F	X	
9A3-A (most of block)		X	47A1		X
9A3-B	X		47A2 (most of block)	X	
9A4		X	47B	X	

These are the only blocks in the Walt Ranch project containing soils that will have the HSG modified by vineyard development.

Additional information on testing protocol and procedures are provided in the subsequent sections.

Testing Guidelines:

On-site field testing to verify the Saturated Hydraulic Conductivity (K_{sat}) parameter for HSG determination shall follow methods and protocols described by Bagarello et al. (2013) or Nimmo et al. (2009). Field testing shall occur under the supervision of a Professional Engineer or Professional Geologist who is licensed to practice in the State of California. A minimum of 10 randomly placed samples shall be taken throughout each developed vineyard block where a credit for HSG modification has been incorporated into the Hydrologic Modeling. Vineyard blocks that are less than 1 acre will require a minimum of 5 field samples. All samples shall be taken between vine rows and will be spatially configured throughout the vineyard block in a manner that adequately represents the entire area being analyzed. Excavation of at least 5 sample locations per vineyard block shall be required to ensure the depth to an impermeable layer is greater than 24 inches from the developed ground surface. Testing shall take place for three to five years after development to confirm changes in HSG are not temporary.

Sample Methodology (Beerkan Estimation of Soil Transfer Method)

Materials Required

- Metal ring (6- or 8-inch diameter)
- Hook Gauge
- Stop watch
- Sledge hammer
- Shovel
- Water
- Measuring cup or graduated cylinder
- Scissors or cutting shears
- Tape measure

Sample Field Procedure

1. Carefully remove existing vegetation from the topsoil while minimizing disturbance of the soil profile.
2. Drive a 6-inch or 8-inch diameter metal ring into the ground a minimum of 2 inches below ground surface. The ring must be set plumb into the soil. Pack any remaining loose soil around the outside of the ring to ensure there is a good seal. If a sufficient seal cannot be obtained with the native material, bentonite clay may be used around the outside of the ring.
3. Pour a pre-measured volume of water into the ring so the ponding depth can be calculated. Typical ponding depths should be between 1 to 3 inches depending on soil and site conditions.
4. Measure the time it takes for the water to infiltrate into the soil using a stop watch. If infiltration is rapid (less than 15 minutes) the total time for all the water to infiltrate should be recorded. When infiltration is moderate to slow, a hook gauge will be used to take measurements of the descending water surface at 15 minute intervals. Record the results on the data sheet provided as **Attachment A**.
5. Repeat the test as necessary until the difference in infiltration time between three consecutive trials becomes negligible.

6. Excavate the investigation site to observe the depth of water infiltration and extent of lateral/radial spreading.
7. Confirm that no apparent impermeable layers are present at depths less than 24 inches from ground surface using a tape measure.

Changes or modifications to testing procedures may be required depending on site conditions. Any proposed changes to procedures must be documented and approved by the permitting authority.

Data Processing & Analysis

Field saturated hydraulic conductivity (K_{sat}) is then estimated with the following equation:

$$K_{sat} = \frac{b_1}{0.467 \left(\frac{2.92}{r\alpha} + 1 \right)}$$

Where b_1 is the slope of the linearized cumulative infiltration curve, estimated by a linear regression analysis of the data and r is the radius of the ring. The α parameter which is related to soil capillarity can be estimated on the basis of a general description of the soil textural and structural characteristics (Elrick and Reynolds, 1992).

Determining HSG

HSG shall be determined for each sample taken based on the criteria set forth in the NRCS NEH, Part 630 Chapter 7, and included here as **Attachment B**. If cumulative vineyard block results from field testing are in agreement and confirm the developed soil matrix falls within HSG "C" or any other group that would indicate higher infiltration rates, no further testing is necessary for that block in a given year.

If results are variable and indicate some samples have not changed from their original designation of HSG "D", additional samples shall be taken until a consensus has been reached. HSG boundaries shall be re-drawn as needed to accurately map the existing conditions at the time of testing.

Adaptive Management

In the event that field results indicate an increase of infiltration has not occurred or are found to be temporary, the Hydrologic Model will be updated to accurately represent the existing conditions. If results from an updated model predict increased runoff over pre-project conditions, a series of BMPs shall be utilized to attenuate the increases back to pre-project levels.

Potential BMPs to reduce runoff could include but are not limited to:

- Detention/retention structures;
- Improvements to land cover through revegetation of native species;
- Additional gravel berms throughout vineyard areas; and
- Installation of subsurface drainage, synthetic fiber rolls, and/or synthetic reinforced turf matting.

In the event additional BMPs are required, modeling shall be performed that includes the additional BMPs. The modeling shall be performed under the direction of the County. Such modeling shall demonstrate that peak runoff following development is not greater than pre-development conditions.

References Cited

Bagarello, V., M. Castellini, S. Di Prima, G. Giordano, and M. Iovino, 2013. Testing a simplified approach to determine field saturated soil hydraulic conductivity. *Procedia Environmental Sciences* 19 (2013) 599-608.

Elrick DE, Reynolds WD. Methods for analyzing constant-head well permeameter data. *Soil Sci Soc Am J* 1992; 56:320-323.

Nimmo, J.R., K. M. Schmidt, K. S. Perkins, and J. D. Stock, 2009. Rapid measurement of field-saturated hydraulic conductivity for areal characterization. *Vadose Zone Journal* (8): 142-149.

DRAFT

Attachment A

Data Sheet

DRAFT

Saturated Hydraulic Conductivity Field Testing Data Sheet

Test Site # _____

Ring Diameter: _____

Ring Area : _____

Depth of water : _____

Volume of water : _____

Depth to
impermeable layer: _____

Infiltration time

Time 1: _____

Time 2: _____

Time 3: _____

Time 4: _____

Time 5: _____

Time 6: _____

Time 7: _____

Time 8: _____

Time 9: _____

Time 10: _____

Time 11: _____

Time 12: _____

Test Site # _____

Ring Diameter: _____

Ring Area : _____

Depth of water : _____

Volume of water : _____

Depth to
impermeable layer: _____

Infiltration time

Time 1: _____

Time 2: _____

Time 3: _____

Time 4: _____

Time 5: _____

Time 6: _____

Time 7: _____

Time 8: _____

Time 9: _____

Time 10: _____

Time 11: _____

Time 12: _____

Attachment B

National Engineering Handbook Excerpt:
Table 7-1 for Assigning HSG

DRAFT

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 $\mu\text{m/s}$ (>5.67 in/h)	0 to 60 cm [0 to 24 in]	A/D
		>10.0 to ≤ 40.0 $\mu\text{m/s}$ (>1.42 to ≤ 5.67 in/h)	0 to 60 cm [0 to 24 in]	B/D
		>1.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.14 to ≤ 1.42 in/h)	0 to 60 cm [0 to 24 in]	C/D
		≤ 1.0 $\mu\text{m/s}$ (≤ 0.14 in/h)	0 to 60 cm [0 to 24 in]	D
	≥ 60 cm [≥ 24 in]	>40.0 $\mu\text{m/s}$ (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤ 40.0 $\mu\text{m/s}$ (>1.42 to ≤ 5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.14 to ≤ 1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤ 1.0 $\mu\text{m/s}$ (≤ 0.14 in/h)	0 to 50 cm [0 to 20 in]	D
>100 cm [>40 in]	<60 cm [<24 in]	>10.0 $\mu\text{m/s}$ (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A/D
		>4.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.57 to ≤ 1.42 in/h)	0 to 100 cm [0 to 40 in]	B/D
		>0.40 to ≤ 4.0 $\mu\text{m/s}$ (>0.06 to ≤ 0.57 in/h)	0 to 100 cm [0 to 40 in]	C/D
		≤ 0.40 $\mu\text{m/s}$ (≤ 0.06 in/h)	0 to 100 cm [0 to 40 in]	D
	60 to 100 cm [24 to 40 in]	>40.0 $\mu\text{m/s}$ (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤ 40.0 $\mu\text{m/s}$ (>1.42 to ≤ 5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.14 to ≤ 1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤ 1.0 $\mu\text{m/s}$ (≤ 0.14 in/h)	0 to 50 cm [0 to 20 in]	D
	>100 cm [>40 in]	>10.0 $\mu\text{m/s}$ (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A
		>4.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.57 to ≤ 1.42 in/h)	0 to 100 cm [0 to 40 in]	B
		>0.40 to ≤ 4.0 $\mu\text{m/s}$ (>0.06 to ≤ 0.57 in/h)	0 to 100 cm [0 to 40 in]	C
		≤ 0.40 $\mu\text{m/s}$ (≤ 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 $\mu\text{m/s}$ [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} .

Anderson, Laura

From: Rachel Mansfield-Howlett <rhowlettlaw@gmail.com>
Sent: Monday, October 17, 2016 1:16 PM
To: Anderson, Laura; Coil, Gladys
Subject: Appellant letter and report from COHA/COCWD re Walt Ranch Project
Attachments: 10-17-16 Walt appeal geotech-2-signed.pdf; Circle Oaks Dr GEO Eval 10-17-16, Exhibit 32.pdf

Dear Laura and Gladys,

Please find the attached files re the Walt Ranch Appeal:

- (1) Letter from counsel submitted on behalf of appellants COHA and COCWD
- (2) Geotechnical Report

Please confirm receipt.

Laura, on another topic: Tom Lippe sent you the order for appellants for the appeal presentations and rebuttals. His list stated I would be at the 11/22 hearing for rebuttal but I am sure I have made it abundantly clear, and you are aware, that I am not available on that date. Nevertheless we would like to reserve the time you allotted for COHA's/COCWD's rebuttal, it just won't be by me.

Thank you,
Rachel

Rachel Mansfield-Howlett
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October 17, 2016

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

Via Electronic Delivery

Re: Walt Ranch Vineyard Conversion Project
Appeal of the August 1, 2016, Planning Director's certification of the EIR
and approval of the Agricultural Erosion Control Plan No. P11-00205-
ECPA proposed by the Walt-Brambletree Corporation

Dear Ms. Coil,

Appellants, COHA and COCWD, and numerous concerned residents have repeatedly raised the issue of the Project's operational impacts to roads and the potential for complete road failure and collapse throughout the administrative and environmental review process for this Project.

Appellants and others have submitted substantial evidence showing the deteriorating road conditions proximate to the Project, especially on Circle Oak's Drive, and that the operation of the Project will worsen these conditions. As noted in Appellants September 1, 2016 appeal letter to the County citing to evidence in the record:

Impacts to Road Conditions and COCWD Water and Sewer Infrastructure
The EIR fails to adequately analyze and provide mitigation for impacts to roads, including road failure, due to the Walt Ranch operations. (Exhibit 1 at pgs. 26-27 and Exhibit 24 at pgs. 808-810, 813, Rachel Mansfield-Howlett comment letters; Exhibit 11 at pgs. 618-619 and Exhibit 30 at pg. 1269, April 3 and 4, 2016, Mark Billings letters; Exhibit 12a at pgs. 620-623 and Exhibit 31a at pgs. 1,269-1,270,

October 17, 2016
Letter to Napa Board of Supervisors from Appellants COHA and COCWD
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November 21, 2014 and April 3, 2016, David Heitzman letters; Exhibit 14a at pg. 734 and Exhibit 14b at pg. 735, November 21, 2014, Stephen Gort, General Manager, Circle Oaks Homes Association Draft EIR comment letter; Exhibits 19a at pgs. 747-749 and Exhibit 19d at pg. 776, November 21, 2015, Sue Wagner Draft EIR comment letter; Exhibit 36 at pgs. 1,431-1,436, April 4, 2016, Sue Wagner comment letter; Exhibit 22 at pgs. 787-789, Bob McLeish Draft EIR comment letter; Exhibit 33 at pg. 1,413, July 22, 2014 Jack MacDonald, Circle Oaks County Water District Draft EIR comment letter; Exhibit 38 at pg. 1,455, March 23, 2016, Kathleen Maxim, Circle Oaks Homes Association, letter; Exhibit 39 at pgs. 1,458-1,461, April 4, 2016, Ron Tamarisk letter.)

Appellants noted that Mitigation 4.7-4 proposes no mitigation for the Project's operational impacts.

Mitigation 4.7-4 provides for repaving and damage to sub-surface infrastructure *during the construction phase of the Project only*, it does not address mitigation for road damage due to continuing operations of the Project. (Exhibits 1, 11, 24, and 30, Rachel Mansfield-Howlett and Mark Billings letters.)

Appellants now reference additional evidence to support these allegations. Expert, David V. Cymanski, G.E., KC Engineering Co. found that the reports relied upon in the EIR failed to perform specific geologic and/or geotechnical investigations for the portion of Circle Oaks Drive affected by the Project. (Attached, Exhibit 32, October 17, 2016 Report by David V. Cymanski, G.E., KC Engineering Co.) Mr. Cymanski provides substantial evidence that roads are failing in two specific areas within the Project's impact area on Circle Oaks Drive and that pavement damage and road subsidence will continue to worsen in both of these areas during the operation of the Project. (*Ibid.*) Furthermore, the report finds that the addition of heavy truck traffic from the proposed Walt Ranch Vineyard operations to the roadway will significantly exacerbate the damage and increase the design Traffic Index; due to the poor condition of the roadway, rainfall and runoff could lead to embankment and road failure; and the EIR's proposed mitigation 4.7-4 failed to provide for ongoing operational road impacts. (*Ibid.*)

In summary, the EIR is inadequate and incomplete because it failed to disclose the Project's significant effect on the environment; proposed mitigation 4.7-4 is inadequate to address the grave effects of foreseeable road deterioration and collapse due to the ongoing operations of the Walt Ranch Project; and the EIR failed to adequately respond to comments on these issues. Appellants underline the reason for their concern is that the Circle Oaks Water District's water and sewer system infrastructure is located under Circle Oaks drive; road deterioration and collapse will

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Letter to Napa Board of Supervisors from Appellants COHA and COCWD
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destroy these infrastructure systems, impacting both health and safety and roads and infrastructure.

Due to the EIR's failure to analyze and disclose these impacts, even if new mitigation is proposed, the Board must send the EIR back to planning to be revised and re-circulated prior to the Planning Director's further consideration of Project approval in order to comply with CEQA's informational and disclosure requirements. Mr. Cymanski noted, "It is assumed that all development traffic would be on Circle Oaks Drive, however, any alternative route should be evaluated for stability considering the historical instability of the roads in Circle Oaks Community." (Exhibit 32, page 3.) Therefore, if the applicant proposes an alternative access way, this too must be studied in a revised EIR and re-circulated for comment prior to further consideration of the Project.

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. Secondly, 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 the October 17, 2016, report by David V. Cymanski, G.E., KC Engineering Co. regarding road conditions and failure could not have been produced before April 4, 2016.
- Inclusion of the new information 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 the requested analysis in the EIR. Members of the public should not have to retain a geologist to conduct analyses that the lead agency should have provided in the EIR.

This information is therefore properly before the Board and should be of considerable


October 17, 2016

Letter to Napa Board of Supervisors from Appellants COHA and COCWD

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value when considering the Project's significant environmental impacts. We respectfully request the Board uphold the appeal on the bases stated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rachel Mansfield-Howlett', with a long horizontal flourish extending to the right.

Rachel Mansfield-Howlett
Attorney for Appellants COHA and COCWD

cc: Laura Anderson, Deputy County Counsel, <Laura.Anderson@countyofnapa.org>

October 17, 2016

Letter to Napa Board of Supervisors from Appellants COHA and COCWD

Page 4 of 4

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KC ENGINEERING COMPANY
A SUBSIDIARY OF MATERIALS TESTING, INC.

Project No. VV4147
17 October 2016

Mr. David Heitzman
Defenders of East Napa Watersheds
23 Rockrose Court
Napa, CA 94558

Subject: Circle Oaks Drive
Napa County, California
GEOLOGIC AND GEOTECHNICAL REVIEW & RECONNAISSANCE

- References:
- 1) Draft Environmental Impact Report
Walt Ranch Erosion Control Plan
By Analytical Environmental Services, dated July 2014
 - 2) Final Environmental Impact Report
Walt Ranch Erosion Control Plan
By Analytical Environmental Services, dated March 2016

Dear Mr. Heitzman:

INTRODUCTION

At your request, **KC ENGINEERING COMPANY** in association with Joyce Associates, have reviewed specific sections of the referenced Environmental Impact Reports (EIR) to determine whether Circle Oaks Drive was adequately evaluated with respect to the proposed impacts of heavy construction equipment traffic and future vineyard operations truck traffic. Our review summary and comments are presented herein.

In addition, we performed a geologic and geotechnical reconnaissance on 9/6/16 of portions of Circle Oaks Drive in the Circle Oaks Subdivision in Napa County, California. The subject areas are located on Circle Oaks Drive between the intersections with Rockrose Court and Sunnyhill Lane, as shown on the attached "Site Map" included in the Appendix of this report. The purpose of our services was to evaluate the current road conditions, as well as the potential impact from heavy construction equipment and truck traffic related to the proposed Walt Ranch Vineyard operations.

Two areas of extensive pavement distress were observed. The largest area (Area A) is along a straight portion of Circle Oaks Drive approximately 300 feet north of the intersection with

Sunnyhill Lane. The second area (Area B) is located along the inside of a bend approximately 300 feet south of the intersection with Rockrose Court.

EIR REVIEW

The referenced EIR reports provide detailed geologic and traffic study information regarding the Walt Ranch project. However, specific geologic and/or geotechnical investigations were not performed for the portion of Circle Oaks Drive that are proposed to be impacted by use of the road.

On page 2-43 of the Draft EIR, Environmental Impact Section 4.7-4 states that "Construction traffic and subsequent operational traffic of the Proposed Project could increase wear-and-tear of area roads; this would be a potentially significant impact." The second bullet of the Mitigation Measure for 4.7-4 states that "Circle Oaks Drive shall be assessed by an independent third party consultant prior to the start of construction and following completion of construction. If the third party determines that roadway deterioration has occurred as a result of construction traffic, the applicant shall pay to have the roadway resurfaced to restore the pavement to at least pre-construction condition, unless the resurfacing is already expected to occur within a year or sooner in conjunction with other planned or proposed roadway improvements." It is noted that page 5-39 of the Final EIR, Section 4.7-4 states the same mitigation measure, with the addition that the applicant shall repair damage to sub-surface infrastructure.

Based on our review of the EIR's and the County Planning Department's website, Circle Oaks Drive has not been assessed by an independent geotechnical or geologic consultant. In our opinion, the EIR is inadequate and incomplete because it did not perform an assessment, nor subsurface investigation and analysis of the significant impact to Circle Oaks Drive, and it did not propose adequate mitigation measures. The EIR failed to divulge the Vineyard operation impacts to roads and subsurface infrastructure. In addition, proposed mitigation measure 4.7-4 failed to address and provide mitigation measures for impacts to the road and subsurface infrastructure due to future operations of the vineyard project.

AREA A

Area A includes an area of extensive road settlement and cracking located along a linear portion of Circle Oaks Drive. The road in this area was constructed by cut/fill techniques and the eastern lane consists of a large fill embankment. The fill bank appears to extend down the slope approximately 25 vertical feet and has inclinations of about 1.5H:1V (horizontal to vertical). In this area we observed severe pavement cracks over a zone approximately 300 feet in length (see attached photographs). The cracks range up to approximately 1 inch in width and extend approximately to the centerline of the existing road. Some of these cracks have vertical offsets in excess of 1 inch. In addition, our observations found that the area has been repeatedly repaved to compensate for previous settlement in the area of more than 1 foot. Circle Oaks

Drive in this area is not adequately sloped into the hill, but rather towards the outer embankment fill slope.

Our observations also indicate that during times of high flow from heavy rainfall events, water coming down the road sheets flows onto the roadway reaching the area of the cracks and top of fill slope. According to Mr. Heitzman, water does flow across the roadway in this area during major storms. We also observed evidence of erosion on the slope below this area. In our opinion, the future stability of the road embankment in this area is a critical concern. The fill portion of the roadway roughly northeast of the centerline is already experiencing excessive movement with cumulative movement since construction of more than 12 inches. The numerous open cracks allow the infiltration of water into the subgrade and the underlying fill. Experience on previous projects has shown that embankments of this type can fail suddenly as a result of heavy rain and the infiltration of water into road cracks. The result can be failure of the fill embankment and loss of the road, as well as underground utilities.

AREA B

The second area of concern (Area B) is along the inside of the bend located approximately 300 feet south of the intersection with Rockrose Court. The area consists of a fill placed along the flank of a ravine. As shown on the attached photographs, extensive pavement cracking and some road subsidence is occurring in this area. Similar poor drainage concerns exist in this location, wherein collects rain water sheets down toward and into the cracks.

CONCLUSIONS

The addition of heavy truck traffic from the proposed Walt Ranch Vineyard operations to the roadway will significantly exacerbate the existing road damage and increase the design Traffic Index. The EIR failed to perform an adequate analysis of current and future road stability of Circle Oaks Drive, and it failed to divulge the impacts to the road and subsurface infrastructure. In addition, proposed mitigation measure 4.7-4 failed to address and provide mitigation measures for impacts to the road and subsurface infrastructure due to future operations of the vineyard project. It is assumed that all vineyard construction and future operations traffic would be on Circle Oaks Drive, however, any alternative route should also be evaluated for road impacts and slope stability considering the historical instability of the roads in the Circle Oaks Community.

Unless corrective actions are taken, pavement damage and road subsidence will continue to worsen in both Areas A and B. In our opinion, corrective measures should be implemented as soon as possible to avoid further damage and related safety hazards.

Of particular concern is the ongoing subsidence and pavement distress occurring in Area A. Our observations indicate that more than one foot of vertical movement has occurred in the area since construction of the road. The observed cracking indicates that soil creep, settlement and instability of the roadway fill is ongoing. Experience on similar projects has shown that

infiltration of water into roadway cracks can result in sudden failure of the fill embankment. Additional heavy equipment and truck traffic from the proposed uphill vineyard operations will likely result in additional distress to the road. Failure of the road embankment would result in a significant life safety hazard to vehicles traveling on the roadway. Failure of the fill embankment could also damage underground sewer and water facilities in the roadway.

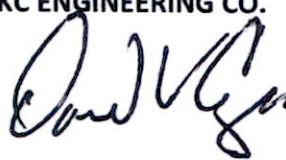
In our opinion, the County should retain a qualified Geotechnical Engineering consultant to perform an evaluation of both areas and provide recommendations for pavement rehabilitation and slope stabilization. The investigation should include test borings and laboratory shear strength and R-value testing to establish the subsurface soil conditions and to determine the embankment slope stability factor of safety. Geotechnical road stabilization and repair recommendations should be provided based on the findings of the field and lab investigation. A Civil Engineering consultant should also be retained to evaluate the site and road hydraulics, perform an analysis of surface water drainage and provide mitigative design drawings. A traffic study should also be performed to evaluate the appropriate traffic index and pavement section.

LIMITATION

Our services have been performed in accordance with generally accepted geologic and engineering principals and practices. This warranty is in lieu of all other warranties, either express or implied. Our services have been provided at the request of Mr. David Heitzman of the organization *Defenders of East Napa Watersheds*.


Should you have questions or require additional information, please contact our office at your convenience.

Respectfully Submitted,
KC ENGINEERING CO.


David V. Cymanski, G.E.
Principal Engineer



JOYCE ASSOCIATES


James M. Joyce, C.E.G.
Principal Engineering Geologist

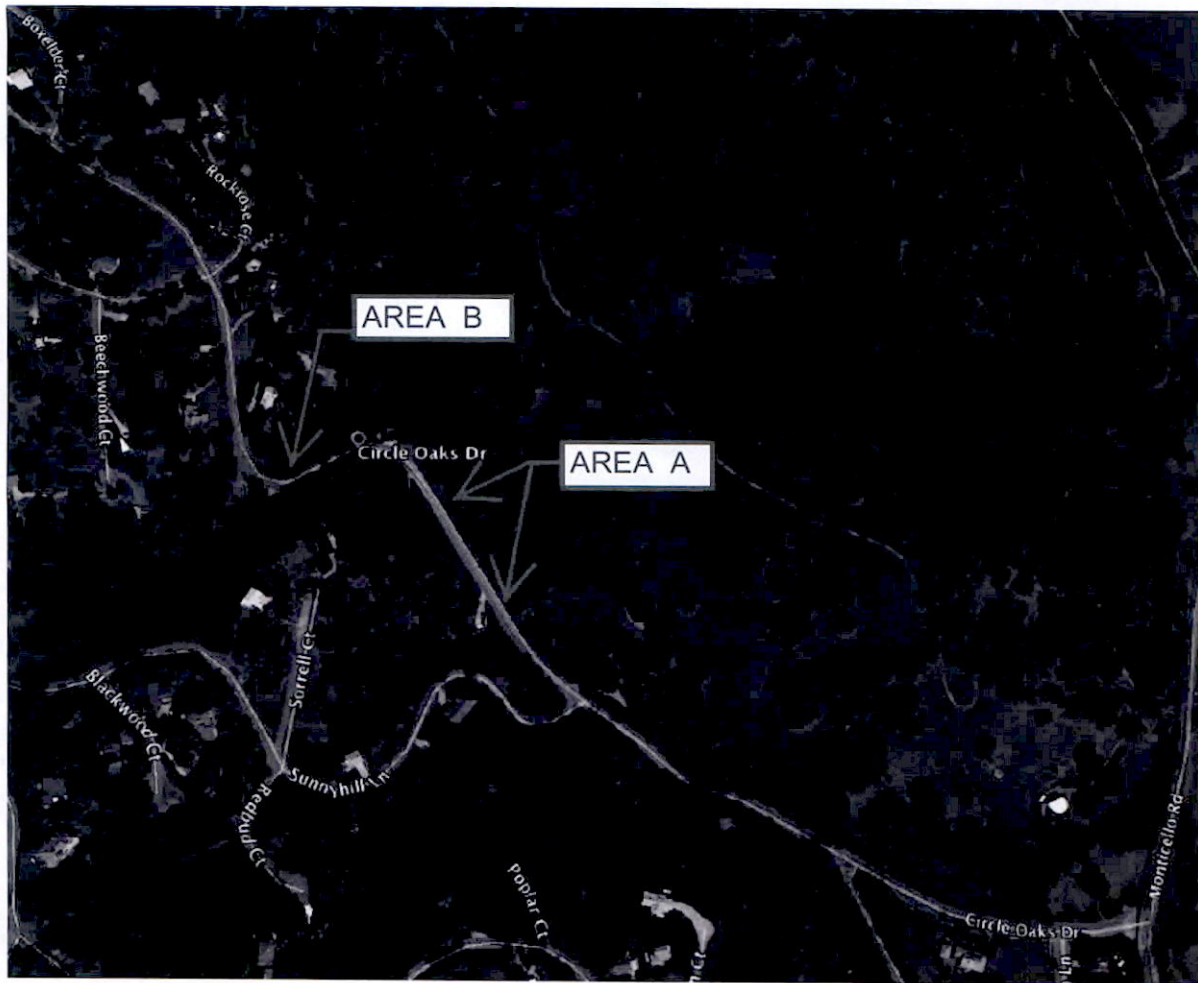


Copies: 1 email

APPENDIX

Aerial Site Map

Pavement Distress Photographs



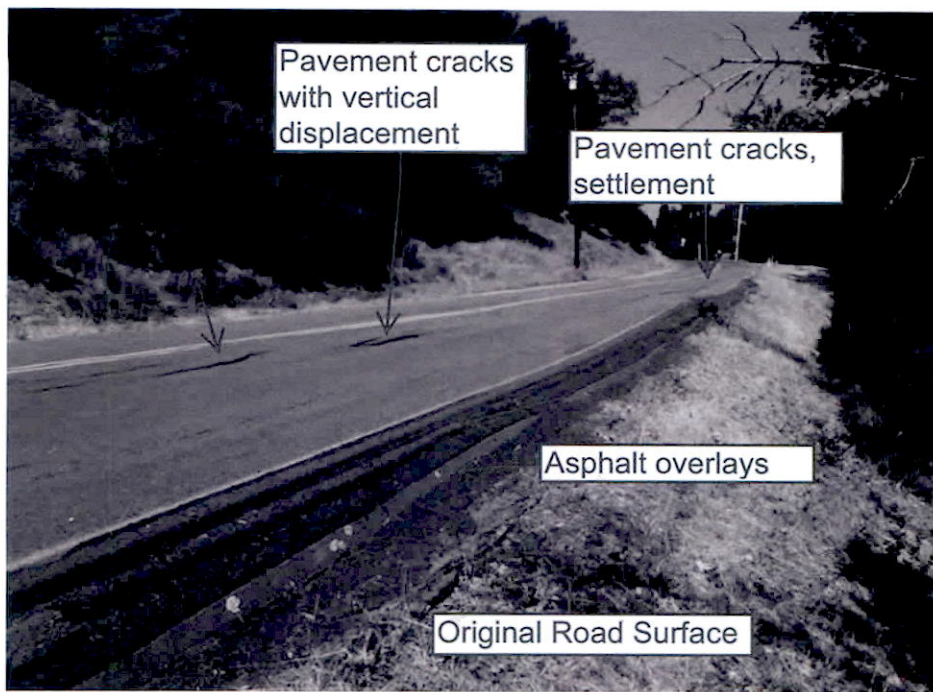
Photograph from Google Earth



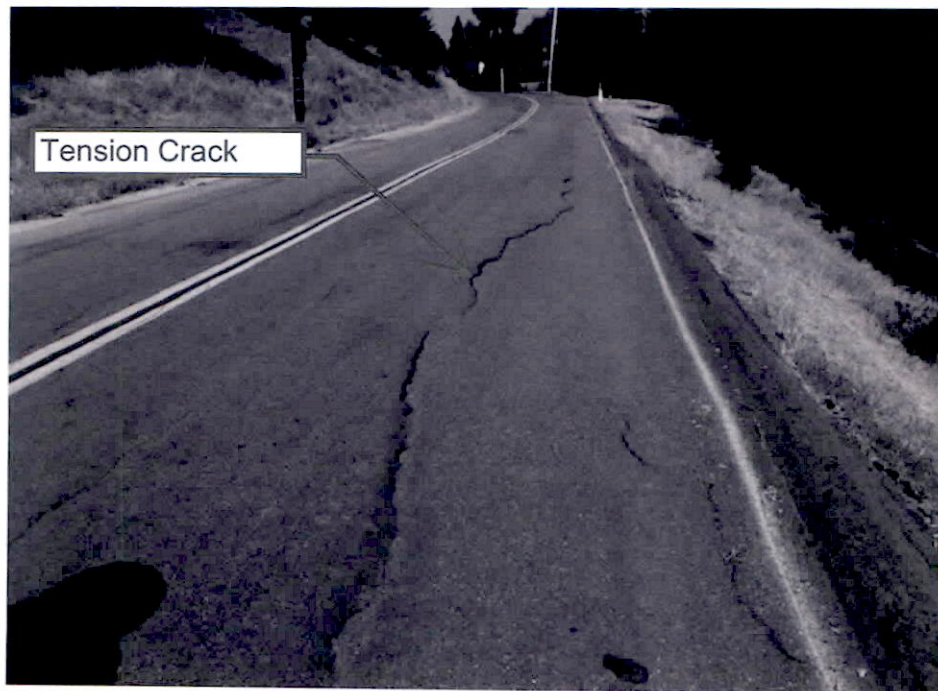
KC ENGINEERING COMPANY
865 Cotting Lane, Suite A
Vacaville, CA 95688
707-447-4025

Project No. VV4147
Circle Oaks Drive, Napa County
Site Map – Circle Oaks Drive Area

Date of all Photos 9/6/16



AREA A – looking northwest



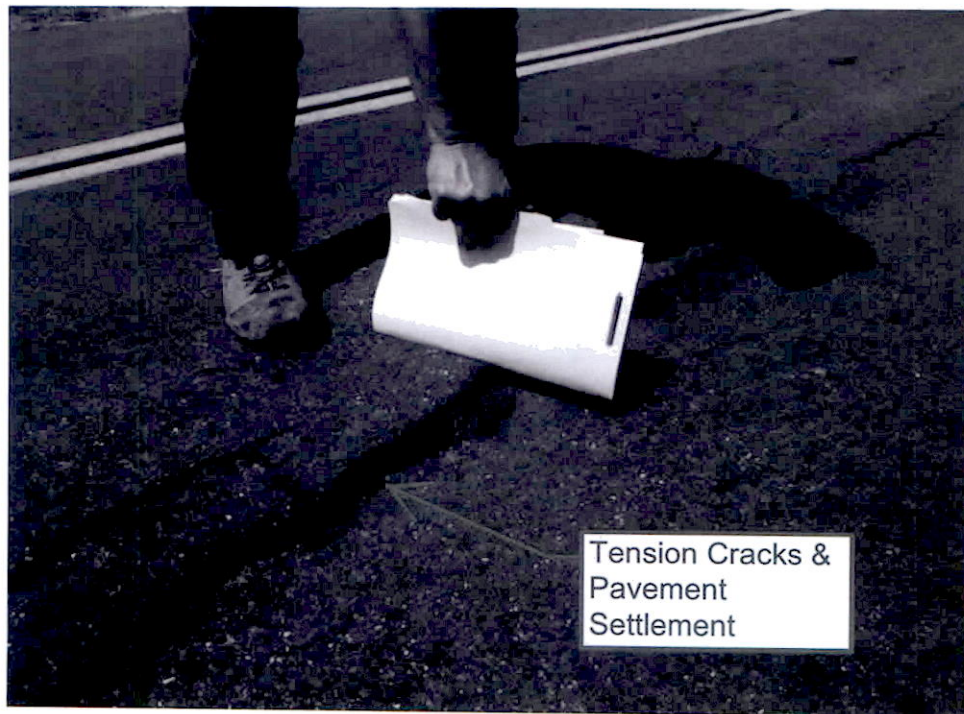
AREA A – looking northwest

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Vacaville, CA 95688

Project No. VV4147
Circle Oaks Drive, Napa County
Area A Photographs



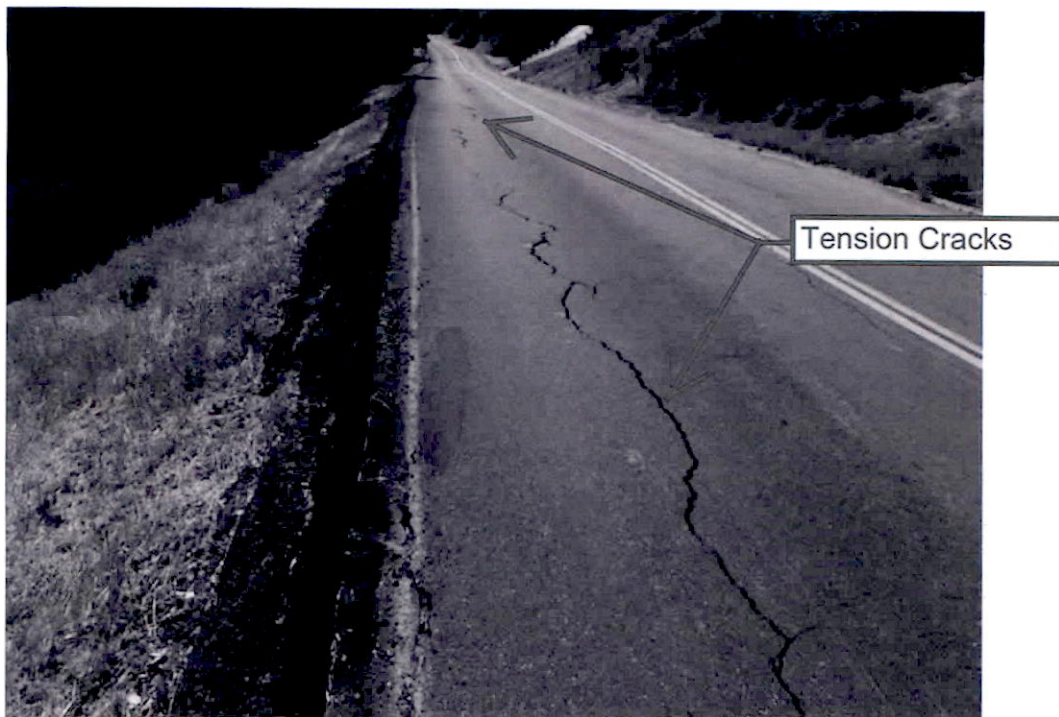
Area A – asphalt overlays indicate previous road settlement



Area A – pavement cracks with vertical displacement

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Project No. VV4147
 Circle Oaks Drive, Napa County
Area A Photographs



Area A – looking southeast



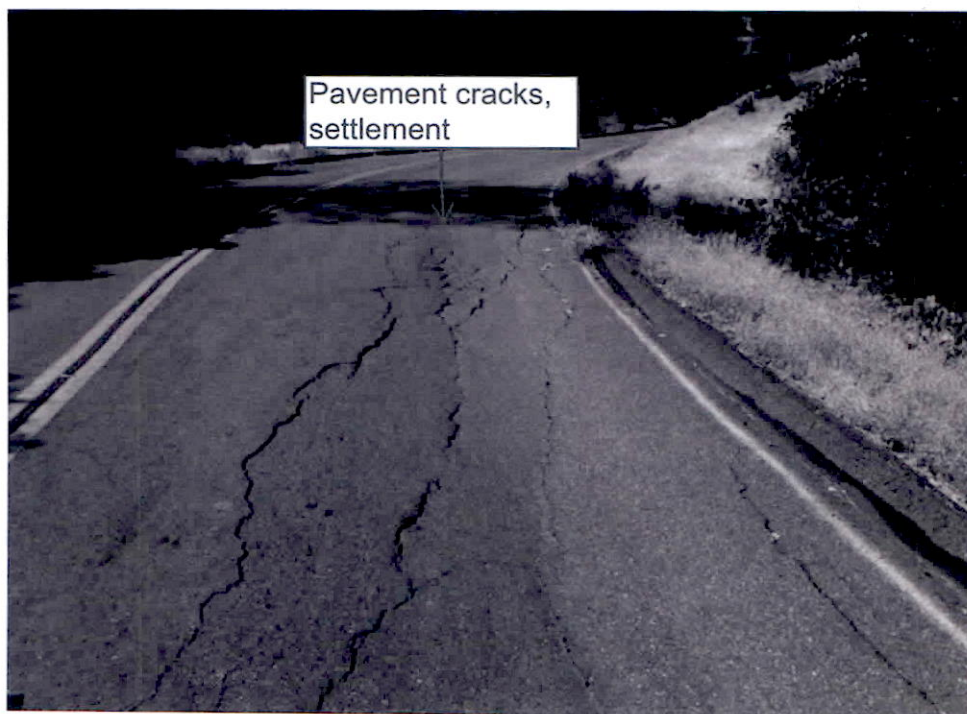
Area A – looking southeast

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 Vacaville, CA 95688

Project No. VV4147
 Circle Oaks Drive, Napa County
Area A Photographs



Area B – looking southwest



Area B – looking southwest

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865 Cotting Lane, Suite A
Vacaville, CA 95688

Project No. VV4147
Circle Oaks Drive, Napa County
Area B Photographs

THOMAS S. ADAMS
tadams@dpf-law.com

October 17, 2016

VIA ELECTRONIC MAIL AND U.S. MAIL

Napa County Board of Supervisors
Attn: Alfredo Pedroza, Chair
1195 Third Street, Suite 310
Napa, California 94559
alfredo.pedroza@countyofnapa.org

**RE: Request for Presentation of Additional Evidence for Good Cause
Walt Ranch Erosion Control Plan (P11-00205-ECPA)**

Dear Chair Pedroza:

Our firm represents Applicant Hall Brambletree Associates, LP with respect to the Agricultural Erosion Control Plan ("ECP") (No. P11-00205-ECPA) for the Walt Ranch Vineyard Conversion Project (the "Project"). The Project was approved by Napa County Planning Director David Morrison (the "Director") on August 1, 2016. The Director's approval was subsequently appealed by the Living Rivers Council in addition to other appellants on August 29, 2016 (the "Appeal").

In connection with the Appeal, Applicant respectfully requests that you authorize the presentation of additional evidence in support of the Project pursuant to Section 2.88.090B of the Napa County Code ("Section 2.88.090B"). Section 2.88.090B states that upon a showing of good cause, the Chair of the Board may authorize the presentation of additional evidence which could not have been presented at the time of the decision appealed from.

The public hearing for the Project was closed by the Director on April 4, 2016. On June 2, 2016, Ken Oster, a soil scientist with the U.S. Department of Agriculture National Resources Conservation Services ("NRCS"), transmitted a letter to Charles Schembre of the Napa County Resource Conservation District that provides updated policy and recommendations with respect to the reclassification of certain Hydrologic Soil Groups ("HSG") based on deep ripping (the "June 2016 NRCS Letter"). Napa County has consistently assumed that deep ripping conducted in connection with vineyard development will result in the reclassification of certain soils. Napa County's approach was based on earlier guidance from NRCS. In the June 2016 NRCS Letter, however, Mr. Oster stated that actual HSG of the disturbed soil condition resulting from ripping should be verified by an on-site investigation. The June 2016 NRCS Letter is attached as Exhibit A.

The Environmental Impact Report ("EIR") for the Project relied on a hydrological analysis that, in part, included the assumption that deep ripping of certain soils will alter their HSG and associated runoff curve number in a manner that increases infiltration and reduces runoff

October 17, 2016
Page 2

consistent with previous guidance from NRCS and common practice in Napa County since 2008. However, the June 2016 NRCS Letter now states that actual HSG of the disturbed soil condition from ripping should be verified by an on-site investigation.

In light of the June 2016 NRCS Letter and discussions with County Staff, Applicant has initiated field testing to verify the actual infiltration rate and soil depth within existing vineyard blocks. The methodology for such field testing is described in the Field Determination of Hydrologic Soil Group for the Walt Ranch Vineyard Development attached as Exhibit B (the "Field Determination"). Therefore, Applicant requests that it have the opportunity to present, and that the Board consider, the results of the Field Determination in connection with the Appeal.

There is good cause for Applicant to present this information and for the Board to consider it under Section 2.88.090B because the June 2016 NRCS Letter clarifying NRCS's recommendations with respect to the reclassification of certain HSGs is relevant to the technical adequacy of the ECP and was not available at the conclusion of the public hearing for the Project on April 4, 2016 because it was not written until June of 2016. Further, Applicant was not made aware or provided any notice of its existence prior to the Appeal filed on August 29, 2016, which included the June 2016 NRCS Letter as an exhibit to the Kamman Hydrology & Engineering, Inc. letter dated August 26, 2016 ("Kamman Letter").

The Appeal by Living Rivers Council includes a request for the Chair of the Board to allow the Kamman Letter, along with the June 2016 NRCS Letter to be presented as additional evidence based on a finding of "good cause." Applicant believes that, if good cause exists to consider the Kamman Letter and the June 2016 NRCS Letter, then good cause also exists to consider the Field Determination, along with any recommendations that are made as a result of the Field Determination.

Please direct any questions about this matter to me. Thank you for your attention to this matter.

Sincerely,

DICKENSON, PEATMAN & FOGARTY

A handwritten signature in dark ink, appearing to read 'T. Adams', written in a cursive style.

Thomas S. Adams

Enclosures

EXHIBIT A

JUNE 2016 NRCS LETTER

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

EXHIBIT B

FIELD DETERMINATION

Field Determination of Hydrologic Soil Group for the
Walt Ranch Vineyard Development

DRAFT

October 2016

Introduction & Background:

The Napa County General Plan requires that discretionary projects meet performance standards designed to ensure peak runoff following development is not greater than pre-development conditions (Policy CON-50). In order to meet this standard, Hydrologic Modeling of the pre-project and post-project conditions is performed by a qualified Professional and the results of the analysis are submitted to the County during the Erosion Control Plan (ECP) review process. The purpose of this memorandum is to set forth a protocol for performing field testing to determine the validity of certain assumptions included in the hydrologic modeling performed for the Walt Ranch ECP.

The Hydrologic Soil Group (HSG) is a parameter used to define a soil's ability to infiltrate surface water. HSG is a soil property dictated by the water-transmitting soil layer with the lowest saturated hydraulic conductivity and depth to the impermeable layer or depth to water table (whether that be clay barrier, rock layer, etc.). The Natural Resources Conservation Service (NRCS), which is the authority on HSG subject matter, states in the National Engineering Handbook (NEH) Part 630 Chapter 7 Section 630.0702 titled *Disturbed Soils*: "As a result of construction and other disturbances, the soil profile can be altered from its natural state and 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."

In Napa County, the HSG categorization has typically been revised to perform post-project modeling in specific rocky soil types. That is, for vineyard development in these rocky soil types, modeling has assumed that the HSG category should be revised because soil depth will increase as a result of vineyard development activities. This modification of HSG is based on the assumption that, as a result of the vineyard development process, deep ripping will fracture and remove portions of shallow bedrock and therefore will increase the soil depth to the impermeable layer. Theoretically, the change in HSG occurs based on the criteria given in part 630 Chapter 7 Table 7-1 of the NEH and in published soil survey data via the NRCS.

Concerns have been raised that any reduction in HSG due to deep ripping will be short lived because soils will reconsolidate after multiple wetting and drying cycles. The concern is that, while infiltration rates following deep ripping may increase over the short term, there will be no increase in infiltration rates over the long term. If this concern is correct, then modeling should not assume that the HSG categorization should change as a result of deep ripping in rocky soil types. However, infiltration rate alone is not the only factor used to assign HSG.

This concern may be warranted in fine-grained silt and clay soils. In this instance, however, the specific soils where credit for HSG reduction takes place are stony loam soils such as Hambright-Rock Outcrop complex. In these soils, the designation of HSG "D" is based solely on the shallow depth to bedrock, which causes moderate to rapid runoff rates. The soil constituent of this complex (Hambright) by itself contains infiltration properties that would place it in HSG "C" or HSG "B", which indicate more infiltration potential and lower runoff rates. Ripping and fracturing of the shallow bedrock layer will only add additional coarse aggregate to the existing Hambright part of the soil complex and is not expected to further reduce the inherent permeability of the Hambright portion in and of itself. Fractured volcanic rock remaining in the developed soil matrix will not reconsolidate and the increase of soil depth is permanent.

In an effort to provide scientific data that supports the claim of HSG modification, an additional condition of approval for the Walt Ranch ECP has been recommended that requires field testing to verify the infiltration rate and soil depth within vineyard blocks 2, 4 through 9, 11 through 16, 22 and 47 following vineyard preparation. Refer to Table 1 below for a list of blocks and sub-blocks requiring additional testing.

Table 1: Blocks Within or Partially Within HSG D

Block	1.0 acre or less within HSG D	More than 1.0 acre within HSG D	Block	1.0 acre or less within HSG D	More than 1.0 acre within HSG D
1A (partial, small portion)	X		9A5		X
2A1 (partial, small portion)	X		9A6 (partial, about half)	X	
2A2 (partial, about half)		X	9B (most of block)		X
2A3		X	11	X	
2B2 (most of block)		X	12A-2 (most of block)		X
2C	X		12B		X
3A (partial, small portion)	X		13 (most of block)		X
4A (partial, small portion)	X		14		X
4B (partial, more than half)		X	15B (most of block)		X
4C	X		16A		X
4E (most of block)		X	16B1-A		X
4F		X	16B1-B	X	
4G (most of block)	X		16B1-C (most of block)	X	
4H	X		16B2-A	X	
4I		X	16B2-B		X
5A1		X	16C1		X
5A2		X	16C2 (most of block)	X	
5A3		X	16D	X	
6		X	22B (partial, about half)	X	
7		X	22C	X	
8A		X	22D	X	
8B	X		22E	X	
8C	X		22F	X	
9A3-A (most of block)		X	47A1		X
9A3-B	X		47A2 (most of block)	X	
9A4		X	47B	X	

These are the only blocks in the Walt Ranch project containing soils that will have the HSG modified by vineyard development.

Additional information on testing protocol and procedures are provided in the subsequent sections.

Testing Guidelines:

On-site field testing to verify the Saturated Hydraulic Conductivity (Ksat) parameter for HSG determination shall follow methods and protocols described by Bagarello et al. (2013) or Nimmo et al. (2009). Field testing shall occur under the supervision of a Professional Engineer or Professional Geologist who is licensed to practice in the State of California. A minimum of 10 randomly placed samples shall be taken throughout each developed vineyard block where a credit for HSG modification has been incorporated into the Hydrologic Modeling. Vineyard blocks that are less than 1 acre will require a minimum of 5 field samples. All samples shall be taken between vine rows and will be spatially configured throughout the vineyard block in a manner that adequately represents the entire area being analyzed. Excavation of at least 5 sample locations per vineyard block shall be required to ensure the depth to an impermeable layer is greater than 24 inches from the developed ground surface. Testing shall take place for three to five years after development to confirm changes in HSG are not temporary.

Sample Methodology (Beerkan Estimation of Soil Transfer Method)

Materials Required

- Metal ring (6- or 8-inch diameter)
- Hook Gauge
- Stop watch
- Sledge hammer
- Shovel
- Water
- Measuring cup or graduated cylinder
- Scissors or cutting shears
- Tape measure

Sample Field Procedure

1. Carefully remove existing vegetation from the topsoil while minimizing disturbance of the soil profile.
2. Drive a 6-inch or 8-inch diameter metal ring into the ground a minimum of 2 inches below ground surface. The ring must be set plumb into the soil. Pack any remaining loose soil around the outside of the ring to ensure there is a good seal. If a sufficient seal cannot be obtained with the native material, bentonite clay may be used around the outside of the ring.
3. Pour a pre-measured volume of water into the ring so the ponding depth can be calculated. Typical ponding depths should be between 1 to 3 inches depending on soil and site conditions.
4. Measure the time it takes for the water to infiltrate into the soil using a stop watch. If infiltration is rapid (less than 15 minutes) the total time for all the water to infiltrate should be recorded. When infiltration is moderate to slow, a hook gauge will be used to take measurements of the descending water surface at 15 minute intervals. Record the results on the data sheet provided as **Attachment A**.
5. Repeat the test as necessary until the difference in infiltration time between three consecutive trials becomes negligible.

6. Excavate the investigation site to observe the depth of water infiltration and extent of lateral/radial spreading.
7. Confirm that no apparent impermeable layers are present at depths less than 24 inches from ground surface using a tape measure.

Changes or modifications to testing procedures may be required depending on site conditions. Any proposed changes to procedures must be documented and approved by the permitting authority.

Data Processing & Analysis

Field saturated hydraulic conductivity (Ksat) is then estimated with the following equation:

$$K_{sat} = \frac{b_1}{0.467\left(\frac{2.92}{r\alpha} + 1\right)}$$

Where b_1 is the slope of the linearized cumulative infiltration curve, estimated by a linear regression analysis of the data and r is the radius of the ring. The α parameter which is related to soil capillarity can be estimated on the basis of a general description of the soil textural and structural characteristics (Elrick and Reynolds, 1992).

Determining HSG

HSG shall be determined for each sample taken based on the criteria set forth in the NRCS NEH, Part 630 Chapter 7, and included here as **Attachment B**. If cumulative vineyard block results from field testing are in agreement and confirm the developed soil matrix falls within HSG "C" or any other group that would indicate higher infiltration rates, no further testing is necessary for that block in a given year.

If results are variable and indicate some samples have not changed from their original designation of HSG "D", additional samples shall be taken until a consensus has been reached. HSG boundaries shall be re-drawn as needed to accurately map the existing conditions at the time of testing.

Adaptive Management

In the event that field results indicate an increase of infiltration has not occurred or are found to be temporary, the Hydrologic Model will be updated to accurately represent the existing conditions. If results from an updated model predict increased runoff over pre-project conditions, a series of BMPs shall be utilized to attenuate the increases back to pre-project levels.

Potential BMPs to reduce runoff could include but are not limited to:

- Detention/retention structures;
- Improvements to land cover through revegetation of native species;
- Additional gravel berms throughout vineyard areas; and
- Installation of subsurface drainage, synthetic fiber rolls, and/or synthetic reinforced turf matting.

In the event additional BMPs are required, modeling shall be performed that includes the additional BMPs. The modeling shall be performed under the direction of the County. Such modeling shall demonstrate that peak runoff following development is not greater than pre-development conditions.

References Cited

Bagarello, V., M. Castellini, S. Di Prima, G. Giordano, and M. Iovino, 2013. Testing a simplified approach to determine field saturated soil hydraulic conductivity. *Procedia Environmental Sciences* 19 (2013) 599-608.

Elrick DE, Reynolds WD. Methods for analyzing constant-head well permeameter data. *Soil Sci Soc Am J* 1992; 56:320-323.

Nimmo, J.R., K. M. Schmidt, K. S. Perkins, and J. D. Stock, 2009. Rapid measurement of field-saturated hydraulic conductivity for areal characterization. *Vadose Zone Journal* (8): 142-149.

DRAFT

Attachment A

Data Sheet

DRAFT

Saturated Hydraulic Conductivity Field Testing Data Sheet

Test Site # _____

Ring Diameter: _____

Ring Area : _____

Depth of water : _____

Volume of water : _____

Depth to
impermeable layer: _____

Infiltration time

Time 1: _____

Time 2: _____

Time 3: _____

Time 4: _____

Time 5: _____

Time 6: _____

Time 7: _____

Time 8: _____

Time 9: _____

Time 10: _____

Time 11: _____

Time 12: _____

Test Site # _____

Ring Diameter: _____

Ring Area : _____

Depth of water : _____

Volume of water : _____

Depth to
impermeable layer: _____

Infiltration time

Time 1: _____

Time 2: _____

Time 3: _____

Time 4: _____

Time 5: _____

Time 6: _____

Time 7: _____

Time 8: _____

Time 9: _____

Time 10: _____

Time 11: _____

Time 12: _____

Attachment B

National Engineering Handbook Excerpt:
Table 7-1 for Assigning HSG

DRAFT

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 $\mu\text{m/s}$ (>5.67 in/h)	0 to 60 cm [0 to 24 in]	A/D
		>10.0 to ≤ 40.0 $\mu\text{m/s}$ (>1.42 to ≤ 5.67 in/h)	0 to 60 cm [0 to 24 in]	B/D
		>1.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.14 to ≤ 1.42 in/h)	0 to 60 cm [0 to 24 in]	C/D
		≤ 1.0 $\mu\text{m/s}$ (≤ 0.14 in/h)	0 to 60 cm [0 to 24 in]	D
	≥ 60 cm [≥ 24 in]	>40.0 $\mu\text{m/s}$ (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤ 40.0 $\mu\text{m/s}$ (>1.42 to ≤ 5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.14 to ≤ 1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤ 1.0 $\mu\text{m/s}$ (≤ 0.14 in/h)	0 to 50 cm [0 to 20 in]	D
>100 cm [>40 in]	<60 cm [<24 in]	>10.0 $\mu\text{m/s}$ (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A/D
		>4.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.57 to ≤ 1.42 in/h)	0 to 100 cm [0 to 40 in]	B/D
		>0.40 to ≤ 4.0 $\mu\text{m/s}$ (>0.06 to ≤ 0.57 in/h)	0 to 100 cm [0 to 40 in]	C/D
		≤ 0.40 $\mu\text{m/s}$ (≤ 0.06 in/h)	0 to 100 cm [0 to 40 in]	D
	60 to 100 cm [24 to 40 in]	>40.0 $\mu\text{m/s}$ (>5.67 in/h)	0 to 50 cm [0 to 20 in]	A
		>10.0 to ≤ 40.0 $\mu\text{m/s}$ (>1.42 to ≤ 5.67 in/h)	0 to 50 cm [0 to 20 in]	B
		>1.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.14 to ≤ 1.42 in/h)	0 to 50 cm [0 to 20 in]	C
		≤ 1.0 $\mu\text{m/s}$ (≤ 0.14 in/h)	0 to 50 cm [0 to 20 in]	D
	>100 cm [>40 in]	>10.0 $\mu\text{m/s}$ (>1.42 in/h)	0 to 100 cm [0 to 40 in]	A
		>4.0 to ≤ 10.0 $\mu\text{m/s}$ (>0.57 to ≤ 1.42 in/h)	0 to 100 cm [0 to 40 in]	B
		>0.40 to ≤ 4.0 $\mu\text{m/s}$ (>0.06 to ≤ 0.57 in/h)	0 to 100 cm [0 to 40 in]	C
		≤ 0.40 $\mu\text{m/s}$ (≤ 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 $\mu\text{m/s}$ [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} .