DRAFT
ENVIRONMENTAL IMPACT REPORT

LUCIA ABREU VINEYARD
HOWELL MOUNTAIN CONVERSION PROJECT

AUGUST 2013

LEAD AGENCY:

California Department of
Forestry and Fire Protection
P.O. Box 944246
Sacramento, CA 94244-2460

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SECTION 1.0

Introduction

SECTION 1.0
INTRODUCTION

This Lucia Abreu Vineyard Howell Mountain Conversion Project (Proposed Project) Draft Environmental Impact Report (Draft EIR) was prepared in accordance with the California Environmental Quality Act (CEQA) of 1970, as amended, and the CEQA *Guidelines* (CEQA, 2011). The California Department of Forestry and Fire Protection (CAL FIRE) is the Lead Agency for the environmental review of the Proposed Project evaluated herein and has the principal responsibility for approving the Proposed Project. The County of Napa, which must approve an Erosion Control Plan (ECP) for the planting of the vineyard to finalize the conversion from timberland to agricultural use, is a Responsible Agency and will use this Draft EIR in evaluating its decision on the ECP. The harvest of the timber on this parcel is the subject of a Timber Harvest Plan (THP) which is approved separately by CAL FIRE under a CEQA-equivalent process. The timber conversion is evaluated in this Draft EIR and may be approved by CAL FIRE under a Timber Conversion Plan (TCP). The THP, TCP, and ECP are attached to this Draft EIR to facilitate readers and decision makers in their reviews. As required by CEQA *Guidelines* § 15121, this Draft EIR will: (a) inform public agency decision-makers, (b) identify possible ways to minimize any potential adverse environmental effects of the Proposed Project, and (c) describe reasonable and feasible project alternatives.

1.1 PROJECT SUMMARY

The Proposed Project will occur within Napa County assessor's parcel number (APN) 024-080-028. The total project site is 17± acres (herein referred to as the THP area), of which 12.8± acres are forested and will be converted (TCP area). The balance of the 17± acres (4.2± acres) is composed of grass, brush, and ruderal acreage. The net acres of the vineyard will be 15.3± acres within the THP area. The actions making up the Proposed Project are as follows:

- the timber harvest will occur first under a separate CAL FIRE process;
- the 12.8± acres that will be converted from timber land to agricultural use will be processed under a TCP under the authority of CAL FIRE; and
- the County will process the ECP that will allow the subsequent installation of the vineyard and erosion control measures within the THP area.

Both the TCP and ECP are the enabling documents for the respective components of the Proposed Project and trigger the preparation of this Draft EIR under CEQA.

In general, agricultural activities are not subject to County discretionary approval under CEQA due to a statutory exemption; however, projects involving grading, earthmoving, or land disturbance activities on slopes greater than five percent require preparation and approval of an ECP, which is subject to review under CEQA by the County to ensure protection of waterways such as the Napa River, which is a 303(d) listed impaired waterway for sediment by the U.S. Environmental Protection Agency (EPA) and State Water Resources Control Board (SWRCB). Since the vineyard development portion of the Proposed Project qualifies under County requirements for an ECP, the ECP for the Proposed Project (#P05-0376-ECPA) will be reviewed using this CEQA document and is included as **Appendix B** to this Draft EIR. The subject property is zoned for agricultural use and the proposed vineyard is consistent with the Napa County General Plan (2008) designation Agriculture Watershed district.

1.2 PURPOSE OF THE EIR

As described in CEQA *Guidelines* § 15121(a), an EIR is an informational document that assesses potential environmental impacts of a proposed project, as well as identifies mitigation measures and alternatives to the proposed project that could reduce or avoid adverse environmental impacts. As the CEQA Lead Agency for this project, CAL FIRE is required to consider the information in this EIR along with any other available information in deciding whether to approve the project. The basic requirements for an EIR include discussions of the environmental setting, environmental impacts, mitigation measures, alternatives, growth-inducing impacts, and cumulative impacts. The EIR is an informational document used in the planning and decision-making process. It is not the intent of an EIR to recommend either approval or denial of a project.

1.2.1 TYPE OF DOCUMENT

This Draft EIR is a “Project EIR,” pursuant to CEQA *Guidelines* § 15161. A Project EIR examines the environmental impacts of a specific project. This type of EIR focuses on the changes in the environment that would result from implementation of the project, including construction and operation.

This EIR describes the environmental impacts of the various components of the Proposed Project and suggests mitigation measures to avoid or reduce impacts to less-than-significant levels. The impact analyses in this report are based on a variety of sources, including agency consultation, various technical reports prepared by others, and field surveys.

1.2.2 ENVIRONMENTAL BASELINE

The subject property as it existed at the time of the Notice of Preparation (July 31, 2012) is considered the baseline condition for analyzing the effects of the Proposed Project (**Appendix A**). **Section 4.0** includes detailed descriptions of the existing environmental baseline by resource area, as well as other relevant historical land use information.

1.2.3 EIR DESIGN

This Draft EIR considers the entirety of the Proposed Project, which includes approval of the documents that would authorize the conversion of timberland to vineyard. In addition, the Draft EIR analyzes the effectiveness of the erosion control measures as designed in #P05-0376-ECPA to control short- and long-term erosion and attenuate runoff as a result of the Proposed Project. The Proposed Project as described in **Section 3.0** is designed to avoid significant impacts wherever possible and **Section 4.0** includes mitigation measures in addition to those found in the THP and ECP to reduce any impacts to less than significant.

Potential cumulative effects of the Proposed Project, when combined with other past, present, or probable future projects, are also considered in this Draft EIR (see **Section 6.0**). Specific project elements considered in the review of cumulative effects of the Proposed Project are described in **Section 3.0**, and include: the timber harvest and site-specific THP and TCP for the proposed 17± acre cleared area of the property; the conversion from timberland to vineyard for 15.3± net acres within the cleared portion of the property; and the installation of erosion control measures as part of the ECP for the cleared area. These elements are cumulative effects of the Proposed Project and are analyzed in **Section 6.0**.

1.3 EIR PROCESS

1.3.1 LEAD AGENCY

In accordance with CEQA *Guidelines* § 15050 and 15367, CAL FIRE is the Lead Agency, which is defined as the "public agency which has the principal responsibility for carrying out or approving a project." The Lead Agency is also responsible for determining the scope of the environmental analysis, preparing the EIR, and responding to comments received on the Draft EIR. Prior to making a decision on whether to approve a project, the Lead Agency is required to certify that the EIR has been completed in compliance with CEQA, that the decision-making body reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the Lead Agency.

1.3.2 NOTICE OF PREPARATION

In accordance with CEQA *Guidelines* § 15082, a Notice of Preparation (NOP) was circulated to the public, local, state, and federal agencies, and other known interested parties for a 30-day public and agency review period from July 31, 2012 to August 29, 2012 (**Appendix A**). The purpose of the NOP was to provide notification that an EIR for the Proposed Project was being prepared and to solicit public input on the scope and content of the document.

Comments from agencies and the public submitted in response to the NOP are included within **Appendix A**. Issues raised in these comments on the NOP are summarized in **Section 1.5**.

1.3.3 DRAFT EIR AND PUBLIC REVIEW

This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and agencies can submit comments to the Lead Agency on the Draft EIR's accuracy and completeness. Release of the Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA *Guidelines* § 15105.

1.3.4 FINAL EIR AND EIR CERTIFICATION

Upon completion of the public review period, a Final EIR will be prepared that will include the written comments on the Draft EIR received during the public review period and responses to those comments. The Final EIR will address any revisions to the Draft EIR made in response to public comments. The Draft EIR and Final EIR together will comprise the EIR for the Proposed Project. Before CAL FIRE can approve the Proposed Project, it must first certify that the EIR has been completed in compliance with CEQA, that the Lead and Responsible Agencies have reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of CAL FIRE. CAL FIRE also will be required to adopt Findings of Fact, and for any impacts determined to be significant and unavoidable, adopt a Statement of Overriding Considerations.

1.4 COMMENTS ON THE NOTICE OF PREPARATION

CAL FIRE received five comment letters on the NOP. These comment letters were considered during preparation of the Draft EIR and are presented in **Appendix A**. The following is a list of commenting agencies and organizations, a summary of the concerns raised, and the corresponding section of the EIR where these concerns are addressed.

- Earth Defense for the Environment Now (EDEN) – two letters relate to procedural issues associated with obtaining copies of the full Public Notice. A third letter expresses concerns including the Universal Soil Loss Equation model, addressed in **Section 4.6**; the source of irrigation water and its potential impacts to neighboring wells, addressed in **Section 4.9**; and aspects of the ECP, which can be viewed in **Appendix B**;
- California Department of Fish and Wildlife (CDFW) – states the necessity for a complete assessment of project-related impacts to special-status species and habitats, as well as streams and riparian resources. Information is included on CDFW-recommended survey and monitoring methodology. CDFW states that appropriate permits must be obtained if the project could result in take of listed species. These comments are addressed primarily in **Section 4.4**;
- State Water Resources Control Board (SWRCB) – recommends that the applicant contact the SWRCB to determine whether a water right permit or other water right approval is required. This comment is addressed in **Section 4.9**.

1.5 SCOPE OF THE EIR

In accordance with CEQA *Guidelines* § 15063 and in conjunction with comments received on the NOP (**Appendix A**), the issues discussed within this Draft EIR are those that have been identified within the NOP as having potentially significant impacts. The following environmental issue areas were found to have the potential to be significantly affected by the Proposed Project and are therefore addressed in greater detail in this Draft EIR.

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Noise
- Transportation and Circulation

1.6 EFFECTS NOT FOUND TO BE SIGNIFICANT

CEQA *Guidelines* § 15128 states that an "EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR." Potential impacts of the Proposed Project to the following environmental resource areas were identified as being less than significant and therefore are not evaluated in this Draft EIR: Mineral Resources, Population and Housing, Public Services, Recreation, and Utilities and Service Systems. The Proposed Project would result in either no impact or a less-than-significant impact to these issue areas for the following reasons:

- **Mineral Resources**: Mineral resources have not been identified within the property according to Napa County Resource Maps. No impact would occur.
- **Population and Housing**: The Proposed Project does not involve the construction of new homes or businesses. Existing roads will be used during construction, project operation activities, and for fire/emergency equipment access to the property as needed. The Proposed Project would not induce substantial population growth either directly or indirectly or create a significant need for additional housing. While an average of approximately three seasonal workers are anticipated for the timber harvest phase, construction of the vineyard, and operation of the vineyard, this will not impact the housing supply in the area by causing an increased need for additional housing. Therefore, no new housing would be required as a result of the Proposed Project. Also, no residences or people would be displaced by the Proposed Project. Therefore, impacts to population and housing are considered less than significant.
- **Public Services**: The Proposed Project would not result in substantial growth that would require additional public services. The Proposed Project would not adversely impact the County's ability to provide fire and police protection or impact the maintenance of schools, parks, or other public facilities. No impact would occur.
- **Recreation**: The Proposed Project would not result in substantial population growth or the associated increased use of recreational facilities and does not include the construction or expansion of recreational facilities. The Proposed Project would also not adversely impact recreational opportunities or prohibit the maintenance of existing recreational opportunities. No impact would occur.
- **Utilities and Service Systems**: The Proposed Project would not exceed water treatment requirements or result in the construction of new water or wastewater treatment facilities. The Proposed Project would rely on groundwater to establish the proposed vineyard from an existing well on the property. It is anticipated that the Proposed Project would not require additional water supplies, such as connection to

a public water supply, since once the vineyard is established it will be dry farmed. The proven capacity of the well is sufficient to meet all anticipated project demand, even during the first establishment years of the vineyard (refer to **Section 4.9**). Therefore, no need for use of public services for water is anticipated. To the degree needed during the timber harvest or peak periods of vineyard labor use, portable toilets would be used onsite, so no impacts to public wastewater systems would occur. Construction and operation of the Proposed Project would generate a minimum amount of construction waste or other solid waste; therefore, a less-than-significant impact is expected on the landfill capacity in the area. The Proposed Project would not conflict with any statutes or regulations related to solid waste. No significant increase in energy demand, which would cause an impact on public services, is anticipated from the Proposed Project. Impacts to utilities and service systems are considered less than significant.

1.7 TERMINOLOGY USED IN THE EIR

This EIR uses the following terminology to describe environmental effects of the Proposed Project and Alternatives:

- **Significance Criteria:** A set of criteria used by the Lead Agency to determine at what level or "threshold" an impact would be considered significant. Significance criteria used in this Draft EIR include factual or scientific information; regulatory standards of local, state, and federal agencies; and/or guiding and implementing goals and policies identified in local or state plans.
- **Less-Than-Significant Impact:** A less-than-significant impact would cause no substantial change in the environment (no mitigation required).
- **Less-Than-Significant Level:** The level below which an impact would cause no substantial change in the environment (no mitigation required).
- **Potentially Significant Impact:** A potentially significant impact may cause a substantial change in the environment; however, it is not certain that effects would exceed specified significance criteria. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures and/or project alternatives are identified to reduce project effects to the environment.
- **Significant Impact:** A significant impact would cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of effects using specified significance criteria. Mitigation measures and/or project alternatives are identified to reduce or avoid project effects to the environment.

- **Significant and Unavoidable Impact:** A significant and unavoidable impact would result in a substantial change in the environment that cannot be avoided or mitigated to a less than significant level if the project is implemented.
- **Cumulative Significant Impact:** A cumulative significant impact would result in a substantial change in the environment from effects of the project, as well as surrounding projects and reasonably foreseeable development in the surrounding area. To be considered significant, a project's impact must make a cumulatively considerable contribution to a substantial change in the environment.
- **Mitigation**: Mitigation includes measures recommended in the Draft EIR and imposed as condition of approval by the Lead Agency that:
    - avoid the impact altogether by not taking a certain action or parts of an action;
    - minimize impacts by limiting the degree or magnitude of the action and its implementation;
    - rectify the impact by repairing, rehabilitating, or restoring the affected environment;
    - reduce or eliminate the impact over time by preservation and maintenance operations during the life of the project (for example, onsite retention of forest habitat for the remaining 16.5± acres of non-vineyard areas not impacted by the Proposed Project is proposed in **Section 4.4**); and
    - compensate for the impact by replacing or providing substitute resources or environments.

This Draft EIR uses the following project-specific terminology to describe the various components of the Proposed Project:

- **Proposed Project**: Approval by CAL FIRE of the TCP, which will allow the conversion of the timberland within the *TCP area* (see below), and approval of ECP by Napa County for the *ECP area* (see below), as defined in **Section 1.2** and **Section 3.0**.
- **Property**: The entire property owned by the project applicant, which is made up of two parcels totaling approximately 76 acres.
- **Project Parcel:** The 42.3-acre parcel within which the Proposed Vineyard Block B will be located. This parcel contains existing vineyards to the north, steep forested hillsides, and hilltop grasslands and timberlands (biological survey area), which includes the portion that is the project site.
- **Project Site:** The same 17± acre area of the THP and ECP. This area will have 15.3 acres net vineyard, with the balance made up of internal farm avenues.

- **Proposed Vineyard Block B:** A 17± acre proposed vineyard that will be installed on the hilltop consistent with and following approval of the ECP.
- **THP area:** Timber harvest plan area. The 17± acres of the hilltop that include both grassland and timberland. The timber will be harvested consistent with the THP under a CEQA-equivalent process led by CAL FIRE separately from this TCP/ECP process. Within this *THP area*, approximately 12.8± acres are timberland, 3.7± acres are non-native grassland, and 0.5± acres are ruderal.
- **TCP area**: Timber conversion plan area. Describes the 12.8± acres of actual timberland within the *THP area* that will be removed from future timber uses upon conversion into vineyard.
- **ECP area**: Erosion control plan area. The area where the erosion control measures will be installed; occurs primarily within the same 17± acres of the *THP area*. Some erosion control measures may occur outside the disturbed area, as shown in the ECP (**Appendix B**).

1.8 EIR ORGANIZATION

- **Section 1, Introduction and Scope of the Draft EIR** - Provides an introduction and overview of the EIR, describes the intended use of the EIR, and describes the review and certification process.
- **Section 2, Executive Summary** - Summarizes the elements of the Proposed Project and the environmental impacts that could result from implementation of the Proposed Project, and provides a table which lists impacts, describes proposed mitigation measures, and indicates the level of significance of impacts after mitigation.
- **Section 3, Project Description** - Provides a detailed description of the Proposed Project, including its location, background information, major objectives, and technical characteristics.
- **Section 4, Environmental Setting, Impacts, and Mitigation Measures** - Describes the baseline environmental setting and provides an assessment of impacts for each issue area presented in **Section 1.4**. Each section is typically divided into three sub-sections: Existing Environmental Setting, Regulatory Framework, and Impacts and Mitigation Measures.
- **Section 5, Alternatives** - Describes and compares alternatives to the Proposed Project and associated environmental consequences.
- **Section 6, Other CEQA-Required Sections** - Provides discussions required by CEQA regarding impacts that would result from the Proposed Project, including a summary of cumulative impacts, secondary impacts, including potential impacts

resulting from growth inducement, and significant irreversible changes to the environment.

- **Section 7, Report Preparation** - Lists report authors and agencies consulted for technical assistance in the preparation and review of the EIR.
- **Appendices** - Includes various documents and data directly related to the analysis presented in the Draft EIR.

REFERENCES

CEQA, 2011. *California Environmental Quality Act (CEQA) Guidelines.* Public Resources Code, Sections 21000-21178 (as amended January 1, 2011) and California Code of Regulations, Sections 15000-15387.

Napa County, 2008. *Napa County General Plan*. June 2008. Available online at: http://www.countyofnapa.org/GeneralPlan/.

Napa County, 2010. *Napa County's Local Procedures for Implementing the California Environmental Quality Act.* Napa County Conservation, Development and Planning Department. Revised September 2010. Available online at: http://www.countyofnapa.org/planning/CEQA.

SECTION 2.0

Executive Summary

SECTION 2.0

EXECUTIVE SUMMARY

2.1 INTRODUCTION

This Draft Environmental Impact Report (EIR) assesses the potential environmental impacts of the Lucia Abreu Vineyard Howell Mountain Conversion Project (Proposed Project). The California Department of Forestry and Fire Protection (CAL FIRE) is the Lead Agency. Napa County is the Responsible Agency for the CEQA review and approval of the Erosion Control Plan (ECP) required prior to conversion to vineyard. Inquiries about the project and the CEQA process should be directed to:

CAL FIRE, Resource Management
Attn: Dennis Hall, Chief for Forest Practice
P.O. Box 944246
Sacramento, CA 94244-2460
Email: SacramentoPublicComment@fire.ca.gov

2.2 PROJECT DESCRIPTION

2.2.1 PROJECT LOCATION

The Proposed Project is located on Las Posadas Road, approximately one mile southeast of the town of Angwin in northeast Napa County, California. The project site is situated within the unsectioned La Jota land grant (projected Section 5 of Township 8 North, Range 5 West): Mount Diablo Baseline and Meridian (MDBM) on the "Saint Helena, California," U.S. Geological Survey (USGS) 7.5-minute quadrangle (quad). The project site is located within the Napa County assessor's parcel number (APN) 024-080-028. The property is located within the upper Conn Creek watershed (Calwater 2206.500305). Onsite elevations range from approximately 1,700 to 1,860 feet above mean sea level with up to 14 percent slopes, although the project site sits on a hilltop and is relatively flat.

Moore Creek is located approximately 2,700 feet to the east of the project site and Conn Creek lies approximately 2,900 feet to the west. Both Moore Creek and Conn Creek flow south into Lake Hennessey, which is approximately five miles south of the project site. The project site contains no USGS blue line streams; Class I, II, or III watercourses; or jurisdictional wetlands.

Between the 1940s and 1990s, the property was periodically logged and managed for timber production that involved localized thinning of the tree canopy and understory vegetation, additional clearcutting, and the subsequent conversion of the area to orchard and non-native grassland. As a result of historic timber operations, the hilltop project site supports 12.8 acres of second-growth tree stands; there is little to no understory in the forested area. Evidence has been found of previous vineyard use on this site for approximately 20 years dating back to before Prohibition in the 1920s, before it was returned to timber management from the 1920s to present (**Appendix F**).

2.2.2 TIMBER HARVEST AND TIMBER CONVERSION

Approximately 12.8± acres of timberland would be harvested on the property under a Timber Harvest Plan (THP) consistent with Forest Practice Rules and will be processed under a separate CEQA-equivalent process by CAL FIRE (**Appendix H**). Subsequent to the timber harvest, the Timber Conversion Plan (TCP) must be approved for the 12.8-acre TCP area, which is the focus of this CEQA document. The County must also approve and authorize an ECP before planting of the vineyard to manage impacts from erosion and sedimentation. The TCP and ECP are the direct components through which discretionary actions by CAL FIRE and the County are subject to analysis in this Draft EIR.

2.2.3 EROSION CONTROL PLAN AND VINEYARD INSTALLATION

As described above, the timber harvest is the precursor action to the Proposed Project, which consists of two direct elements: the conversion of timberland to vineyard and implementation of the ECP. These actions effect the development of the Proposed Project on the property and would occur in the following order:

1) the separate harvest of 12.8± acres of timberland on the property and clearing of approximately 3.7± acres of grassland and 0.5± acres of ruderal, permitted separately under a THP approved by CAL FIRE;
2) the conversion of 15.3± acres within the 17± acre clearing limits to a vineyard block; and
3) the implementation of a County-approved ECP, which is required per County guidelines for the vineyard development since onsite slopes exceed a five percent grade.

2.3 ALTERNATIVES TO THE PROPOSED PROJECT

CEQA *Guidelines* require EIRs to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. Although

there are no significant unmitigable project impacts identified for the Proposed Project, **Section 5.0** evaluates the alternatives considered to the Proposed Project. These include the No Project Alternative / No Development Alternative, a Three Vineyard Block Alternative, and a No Timber Harvest Alternative, which are briefly described below. Refer to **Section 5.0** for a complete description of these alternatives.

2.3.1 NO PROJECT / NO DEVELOPMENT ALTERNATIVE

With the No Project / No Development Alternative, the property would continue to remain in its existing state as partially forested with areas of open, non-native grassland. The timber within the flight path of the Angwin-Parrett Field airport would continue to grow. No changes to the existing forested areas, access road, or open space areas would occur.

2.3.2 THREE VINEYARD BLOCK ALTERNATIVE

Under the Three Vineyard Block Alternative, 17± acres would be harvested for timber and cleared of grassland but in different locations on the site, and the subsequent conversion to vineyard would create three vineyard blocks covering the entire 17± acre cleared area. One vineyard block would be in the same general location as the Proposed Project, but the Three Vineyard Block Alternative would create two additional vineyard blocks at the southwest and northeast corners of the project area, where slopes range from six to eight percent. The timber in the immediate flight path of the airport would not be fully cleared. This alternative would require the ECP to be re-designed to account for vineyard conversion on steeper slopes at the edges of the conversion area, similar to the project previously proposed for this parcel, and may result in development on two parcels instead of one.

2.3.3 NO TIMBER HARVEST ALTERNATIVE

The No Timber Harvest Alternative would result in the planting of vineyard on approximately 4.2 acres of non-timberland on the property (3.66 acres of nonnative grassland and 0.54 acres of ruderal/developed land). No timber would be harvested as a result of this alternative, and therefore CAL FIRE would not need to approve a THP or TCP for this alternative. Additionally, the 4.2 acres proposed for vineyard planting under this alternative is less than five percent slopes, and would not require an ECP through Napa County. The No Timber Harvest Alternative would retain all trees onsite. It would not result in improved onsite drainages under an engineered ECP, would not clear trees within the flight path of Angwin-Parret Field airport for safety, and would not result in habitat enhancement techniques within the rest of the property.

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table 2-1 presents a summary of impacts and proposed mitigation measures for the Proposed Project by resource area that would avoid or minimize potential project-related impacts identified in **Section 4.0** of this EIR. In the table, the level of significance of each environmental impact is indicated both before and after the application of the recommended mitigation measure(s). Refer to the environmental analysis sections in **Section 4.0** for detailed discussions of all project impacts and mitigation measures.

Additional mitigation measures specific to the timber harvest element of the Proposed Project are included in the THP, which is provided as **Appendix H** to this EIR. These measures are specifically designed to reduce impacts related to timber removal and harvest activities on the property conducted pursuant to the terms of the THP under California Forest Practices Rules.
The mitigation measures in **Table 2-1**, organized by resource area below, will be implemented with the TCP and ECP. Collectively, the mitigation measures included in **Table 2-1** and in the THP (**Appendix H**) would reduce potentially significant impacts of the Proposed Project to a less-than-significant level.

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.1 Aesthetics **Impact 4.1-1**: The Proposed Project could have a substantial adverse effect on a scenic vista. However, the Proposed Project would be located on a relatively flat hilltop and would be surrounded by a forested buffer of land; therefore a less-than-significant impact would occur.	Less than Significant	**Mitigation Measure 4.1-1**: No mitigation is necessary.	Not Applicable
Impact 4.1-2: The Proposed Project could substantially damage scenic resources, such as scenic highway corridors and scenic landscape units. This would be a potentially significant impact. However, views from nearby roadways and nearby public access areas would not be significantly altered; therefore, the Proposed Project would not substantially damage scenic resources.	Less than Significant	**Mitigation Measure 4.1-2**: No mitigation is necessary.	Not Applicable
Impact 4.1-3: The Proposed Project could substantially degrade the existing visual character of the site and its surroundings. This would be a potentially significant impact. However, the Proposed Vineyard Block B is in an area surrounded by vineyards and will be compatible with the existing visual character of the area. Therefore, this is a less-than-significant impact.	Less than Significant	**Mitigation Measure 4.1-3**: No mitigation is necessary.	Not Applicable
Impact 4.1-4: The Proposed Project could create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. This would be a potentially significant impact. However, the Proposed Project does not involve any sources of lighting or glare, so this will be a less-than-significant impact.	Less than Significant	**Mitigation Measure 4.1-4**: No mitigation is necessary.	Not Applicable
4.2 Agriculture and Forestry **Impact 4.2-1:** The Proposed Project would result in the loss of forest land through conversion of forest land to non-forest use.	Potentially Significant	**Mitigation Measure 4.2-1**: With the implementation of **Mitigation Measure 4.4-4**, tree loss will be offset by the creation of a habitat retention area that will maintain and enhance the remainder of the forest land on the parcel. Therefore, the Proposed Project's effect on forest land is considered less than significant.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
This is a potentially significant impact; however, with implementation of mitigation measures described in **Section 4.4** the impact would be reduced to a less-than-significant level.			
4.3 Air Quality **Impact 4.3-1:** Construction activities such as timber harvest, land clearing, earthmoving, movement of vehicles, and wind erosion of exposed soil and operation associated with implementation of the Proposed Project would have the potential to conflict with or obstruct implementation of the applicable air quality plan and violate the ambient air quality standards or may contribute substantially to an existing or projected air quality violation.	Potentially Significant	**Mitigation Measure 4.3-1:** The Applicant shall implement a fugitive dust abatement program during the construction of #P05-0376-ECPA, which shall include the following elements: • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Cover all exposed stockpiles. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent paved streets. • Limit traffic speeds on unpaved roads to 15 miles per hour (mph). • Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. In addition to the above measures, the Applicant shall also implement the required basic construction mitigation measures as recommended by the BAAQMD during the construction of the Proposed Project, which shall include the following elements: • All exposed surfaces (e.g., parking areas, staging areas, and unpaved access roads) shall be watered as needed to ensure dust abatement. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		regulations. • All heavy duty construction equipment shall be fitted with diesel particulate matter filters and use only aqueous diesel fuel. The measures above are in addition to the permanent erosion control measures specified in #P05-0376-ECPA, which include establishing a permanent no till cover crop on all disturbed areas. As shown in **Table 4.3-3**, construction of the Proposed Project would not exceed the BAAQMD criteria pollutant threshold. The permanent erosion control measures would avoid the creation of nuisance dust and PM_{10} during operation of the Proposed Project, which would reduce these potentially significant impacts to a less than significant level. These measures are additive to those required during the timber harvest prior to conversion.	
Impact 4.3-2: Operation of the Proposed Project would attract additional vehicles to the property, resulting in new regional emissions; however, new emissions would not be substantial and would not conflict with or obstruct implementation of the applicable air quality plan and violate the ambient air quality standards or may contribute substantially to an existing or projected air quality violation.	Less than Significant	**Mitigation Measure 4.3-2:** No mitigation is required.	Not Applicable
Impact 4.3-3: Project-related criteria pollutant emissions in combination with other sources of criteria pollutants have the potential to cause a considerable net increase of criteria pollutant for which the project region is in non-attainment. However, project-related emissions would not be cumulatively considerable and a less-than-significant impact would result.	Less than Significant	**Mitigation Measure 4.3-3:** No mitigation is required.	Not Applicable
Impact 4.3-4: Construction and operation of the Proposed Project would slightly increase traffic volumes and congestion levels on local roadways, resulting in changes to CO concentrations; however, changes in CO concentrations would not be substantial.	Less than Significant	**Mitigation Measure 4.3-4:** No mitigation is required.	Not Applicable
Impact 4.3-5: Project construction and operation has the potential to result in odors. However, odors from operation would not be substantial and a less-than-significant impact	Less than Significant	**Mitigation Measure 4.3-5:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
would result.			
4.4 Biological Resources **Impact 4.4-1:** Development of the Proposed Project would have the potential to affect special status bird species. This is a potentially significant impact. After mitigation, impacts would be less than significant.	Potentially Significant	**Mitigation Measure 4.4-1:** The Applicant shall implement the following measures to avoid disturbing any special status bird species nesting on the project parcel in accordance with the following CDFW-recommended measures: If project activities are scheduled between February 1 and August 31, CDFW recommends surveys and avoidance measures for nesting birds. With respect to surveys for nesting bird and raptor species, CDFW recommends that the project specifies: 1) nest surveys be conducted no earlier than 14 days prior to tree removal and/or breaking ground (surveys should be conducted a minimum or 3 separate days during the 14 days prior to disturbance), 2) in the event that nesting birds are found, the project applicant should consult with CDFW and obtain approval for nest-protection buffers prior to tree removal and/or ground disturbing activities, and 3) nest protection buffers will remain in effect until the young have fledged. All nest protection measures should apply to off-site impacts and within 500 feet of project activities. If a lapse in project-related work of 15 days or longer occurs, another focused survey and, if required, consultation with CDFW, will be required before project work can be reinitiated. With implementation of **Mitigation Measure 4.4-1**, impacts would be less than significant.	Less than Significant
Impact 4.4-2: Changes in habitat as a result of the Proposed Project would have the potential to affect woodland foraging habitat for northern spotted owl. This is a potentially significant impact, but with implementation of **Mitigation Measure 4.4-2** below, the impact would be less than significant.	Potentially Significant	**Mitigation 4.4-2**: While there are two northern spotted owl activity centers (NP28 and NP29) within 1.5 miles, there are no activity centers located within 0.7 miles of the project parcel (Town, 2013). Northern spotted owl take avoidance will be achieved via compliance with California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention. These activity centers are located greater than 1,000 feet from the project parcel; additionally, as discussed above in **Section 4.4.4-8** NP28 has not been reported as active for more than 10 to 15 years (ERM, 2013). All information regarding northern spotted owl (NSO) shall be submitted to the CAL FIRE regional office in Santa Rosa, and annual operations will not commence until a letter is obtained from CAL FIRE confirming there have been no changes that would result in non-conformance with the plan. Protocol survey calling procedures shall follow the appropriate and most current NSO protocol from USFWS.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		The Applicant shall implement the following measures to avoid take of the northern spotted owl (USFWS, 2012): 1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan. 2. No harvesting of trees shall occur until NP29 is detected/located within their historic activity center during the year of planned timber harvest activities. The project parcel must be surveyed according to the current acceptable NSO protocol. 3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NP29. The activity centers for NP29 are further than 1/4 mile from the THP boundary; therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the project parcel boundary, the following seasonal restrictions may be applied by CAL FIRE. a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity centers of NP29, except on the use of existing roads. 4. In the event that a new activity center becomes established within the project site or within 1/4 mile of the project site, the following seasonal restrictions may be applied by CAL FIRE: a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity center, except on the use of existing roads. Implementation of **Mitigation Measure 4.4-2** would render impacts to a less than significant level.	
Impact 4.4-3: Development of the Proposed Project would have the potential to affect bat species of special concern by CDFW.	Potentially Significant	**Mitigation Measure 4.4-3:** Pre-construction surveys for bats shall be conducted two to three days prior to tree removal. If bats are discovered during the surveys then a buffer of 100 to 150 feet will be established. Optimal time to remove trees is September 15 to October 15, when young would be capable of flying and February 15 to April 1 to avoid hibernating bats prior to the formation of maternity sites. With implementation of **Mitigation Measure 4.4-3**, impacts would be less than significant.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact 4.4-4: Development of the Proposed Project has the potential to conflict with Napa County General Plan Goals CON-2 and CON-6 and Policies CON-17 and CON-24.	Potentially Significant	**Mitigation Measure 4.4-4:** Potential impacts to forested wildlife habitat would be reduced to a less-than-significant level through a combination of onsite avoidance, protection, and enhancement of retained forested areas outside of the 17± acre THP footprint on the project parcel. As a demonstration of good land stewardship, the Applicant has avoided sensitive habitats onsite and has volunteered to provide the following enhancement activities to these areas to encourage their use by wildlife. These practices are consistent with Napa County Goals CON-2 and CON-6, and Policies CON-17 and CON-24; thus, with implementation of the following mitigation measure, **Impact 4.4-4** would be reduced to less than significant. A habitat retention area will be designated onsite for the remainder of the parcel occurring outside of the 17± acre THP area that will be planted in vineyard (refer to **Figure 4.4-1**). The creation of a habitat retention area (totaling 16.5± acres) would allow for the protection of approximately 11.94 acres of Douglas Fir-Ponderosa Pine habitat and the entirety of the 4.58 acres of oak woodland habitat onsite (**Figure 4.4-1**; **Table 4.4-2**). Numerous enhancement techniques would be employed throughout the habitat retention area to improve the quality of forest habitat on the parcel for wildlife. Working closely with the Applicant, the RPF will design and recommend specific enhancement activities to be employed. These techniques include the careful placement of slash piles, snags, and large woody debris on the forest floor as well as the installation of nest boxes on trees for songbirds and roosting boxes for bats. Brush piles, tree branches and small downed trees will be used to create shelter habitat for small mammals and birds. Mulch may also be used to improve the groundcover within the forested areas onsite. These enhancement techniques will greatly improve the existing understory of the forest onsite and the habitat values of the parcel for use by wildlife. As discussed in the Hydrology Analysis (Balance Geo, 2013; **Appendix F**), to improve slope stability characteristics above pre-project conditions, the Applicant may consult with Pacific Union College to determine if they wish to install bioengineering features on their property. These features, which could include shrub and tree plantings within PUC McReynolds and Winning ravines, would improve wildlife habitat and biodiversity while simultaneously stabilizing the ravine channels. With implementation of **Mitigation Measure 4.4-4**, impacts would be less than significant.	Less than Significant
4.5 Cultural Resources	Potentially	**Mitigation Measure 4.5-1:** There is a possibility that unanticipated	Less than

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact 4.5-1: The project implementation has the potential to negatively impact previously unknown cultural resources within the property. This is a potentially significant impact.	Significant	subsurface archaeological deposits may exist within the proposed vineyard areas, as archaeological sites may be buried with no surface manifestation, or may be obscured by vegetation. In accordance with CEQA *Guidelines* Section 15064.5 (f), should any previously unknown prehistoric or historic resources, such as, but not limited to, obsidian and chert flaked-stone tools or toolmaking debris; shellfish remains, stone milling equipment, concrete, or adobe footings, walls, filled wells or privies, deposits of metal, glass, and/or ceramic refuse be encountered during onsite construction activities, earthwork within 100 feet of these materials shall be stopped and the Applicant shall consult with a professional archaeologist. Once the archaeologist has had the opportunity to evaluate the find he/she shall consult the local CAL FIRE Archaeologist regarding the results of the evaluation and appropriate site treatment options, as necessary. Said measures shall be carried out prior to any resumption of related ceased earthwork. All significant cultural resource materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards and a copy of the draft report provided to the local CAL FIRE Archaeologist for review and approval prior to finalization of it. Implementation of this mitigation measure would reduce this impact to less than significant.	Significant
Impact 4.5-2: The project implementation could result in the discovery and disturbance of unknown human remains.	Potentially Significant	**Mitigation Measure 4.5-2:** In the event that human remains are discovered, the provisions of the California Health and Safety Code Section 7050.5 (b) shall be followed, including contacting the Napa County Coroner within 24 hours of the find. Upon determining the remains as being Native American in origin, the Coroner would be responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours, pursuant to California Health and Safety Code 7050.5(c). The NAHC has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant (MLD), who is designated by the NAHC. Implementation of this mitigation measure would reduce this impact to less than significant.	Less than Significant
4.6 Geology and Soils **Impact 4.6-1:** Development of the Proposed Project would alter the rate of sediment erosion	Potentially Significant	**Mitigation Measure 4.6-1:** With full implementation of the ECP (**Appendix B**) and the implementation of the erosion control measures in the THP (**Appendix H**), no further mitigation is required.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
and yield onsite. This is a potentially significant impact. However upon implementation of the erosion control methods detailed in the ECP, the timber harvest and vineyard conversion would all be designed to create a decrease in sediment erosion and yield that would result in a less-than-significant impact to offsite receiving waters.			
Impact 4.6-2: Development of the Proposed Project would involve earthmoving and grading activities that would alter the existing topographic and geologic conditions at the property; however, conditions would not be altered such that significant damage to the property from excessive erosion, soil creep, catastrophic slope, or ground failure would occur nor would such hazards be likely to occur in the event of an earthquake. This is a less-than-significant impact.	Less than Significant	**Mitigation Measure 4.6-2:** No further mitigation is required.	Not Applicable
4.7 Greenhouse Gas Emissions **Impact 4.7-1:** Construction of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project sources of GHG emissions during construction would include the transport and delivery of construction equipment to the property; operation of construction equipment, including equipment used for the timber harvest, planting the vineyard, and installing the erosion control system; worker trips, fuel use, and material transport.	Potentially Significant	**Mitigation Measure 4.7-1:** The Applicant shall implement the following mitigation measures to reduce criteria pollutant emissions during construction of the Proposed Project: • The Applicant shall maintain all construction equipment in accordance with manufacturers' specifications. • The Applicant shall limit construction equipment idling time to less than five minutes.	Less than Significant
Impact 4.7-2: Operation of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project operational sources of GHG emissions would include vehicles (produce and material transports and workers) traveling to and from the Proposed Project, energy use, and limited water transport. Impacts would be considered less than significant.	Less than Significant	**Mitigation Measure 4.7-2:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.8 Hazards and Hazardous Materials **Impact 4.8-1:** There is potential for incidental leakage, rupture, or spillage when fueling timber harvest and agricultural equipment during construction and operation of the Proposed Project, which could result in hazards to the public or environment. If substantial quantities of diesel fuel or unleaded gasoline reach soil or on-site drainage areas, surface and/or groundwater quality may be degraded. This is a potentially significant impact.	Potentially Significant	**Mitigation Measure 4.8-1:** In addition to the erosion control measures described in **Section 3.0**, personnel shall follow written BMPs for filling and servicing construction equipment and vehicles. The BMPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include: • Refueling shall be conducted only with approved pumps, hoses, and nozzles. • Catch-pans shall be placed under equipment to catch potential spills during servicing. • All disconnected hoses shall be placed in containers to collect residual fuel from the hose. • Vehicle engines shall be shut down during refueling. • No smoking, open flames, or welding shall be allowed in refueling or service areas. • Refueling and all construction work shall be performed outside of any onsite stream buffer zones to prevent contamination of water in the event of a leak or spill. • Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents. • A spill containment kit that is recommended by the Napa County Department of Environmental Management or local CAL FIRE department will be onsite and available to staff if a spill occurs. In the event that contaminated soil and/or groundwater or other hazardous materials are generated or encountered during construction, all work shall be halted in the affected area and the type and extent of the contamination shall be determined. Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with federal, state, and local regulations. If containment and size of the spill is beyond the scope of the contractor, proper authorities shall be notified. The potential release of hazardous materials during construction of the Proposed Project is reduced to less than significant with the implementation of the mitigation measure above.	Less than Significant
Impact 4.7-2: In the event IPM techniques are found to be inadequate for vineyard maintenance, the Proposed Project would include the use of pesticides for vineyard maintenance. Non-compliance with hazardous	Potentially Significant	**Mitigation Measure 4.8-2:** In the event pesticides are used onsite, only a certified pest applicator shall apply the pesticides and personnel shall follow Standard Operating Procedures (SOPs) when applying chemicals to the vineyard. SOPs for pesticide use, shall include the following:	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
materials regulations including improper pesticide use, storage or disposal can be hazardous to human health and the environment.		• Purchase only enough pesticide that would be used per season. • All chemicals will be stored in their original containers. Labels on the containers will not be removed. • Chemicals will be kept in a well-ventilated locked area. • Chemical storage areas will be 100 feet from any drainage area, stream, or groundwater well. • If a chemical must be disposed of, contact the Napa County Agricultural Commissioner to locate a hazardous waste facility for proper disposal. • Chemicals will never be poured down the sink, toilet, or stream. • Proper personal protection equipment will be utilized when working with chemicals. Implementation of the mitigation measure above reduces potential impacts from improper chemical use and storage to a less than significant level.	
Impact 4.8-3: The potential release of hazardous materials into the environment may affect surface water or groundwater during operation and maintenance of the vineyard. This is a potentially significant impact. During operation of the vineyard under the Proposed Project, the use of hazardous materials would likely include substances such as gasoline, diesel fuel, motor oil, and potentially a limited amount of pesticides and fertilizers (see **Impact 4.8-2**). Hazardous materials releases from operation and maintenance of the vineyard may occur from dripping of fuels, oil, grease, pesticides, and fertilizers from mechanical equipment. The small quantities of hazardous materials that may drip from properly maintained equipment would occur in relatively low toxicity and concentration. Furthermore, the project site is hydrologically disconnected from downstream	Potentially Significant	**Mitigation Measure 4.8-3:** In addition to **Mitigation Measures 4.8-1** and **4.8-2**, fuel loading and chemical mixing areas should be established outside the proposed setbacks and away from any areas that could potentially drain off-site or potentially affect surface and groundwater quality. When farm equipment is cleaned at the existing facility, only rinse water that is free of gasoline residues, pesticides and other chemicals, and waste oils should be allowed to diffuse back into vineyard areas. In the event pesticides, herbicides or fungicides are used, all rinse water from farm equipment and rinse water from application equipment used to apply chemicals should be collected and stored in containers that are of sufficient size to contain the water until a hazardous materials transporter can remove the rinse water. No rinse water shall be drained to a septic system or discharged to ground or surface water to prevent the release of hazardous materials into the environment during operation and maintenance of the Proposed Project. Impacts after mitigation would be less than significant.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
surface waters (see **Section 4.9**). It is not likely that significant impacts to soil or groundwater would occur.			
4.9 Hydrology and Water Quality **Impact 4.9-1:** Development of the Proposed Project would alter the existing drainage pattern of the property. This is a potentially significant impact. However, with implementation of the ECP, a slight decrease in the volume and rate of runoff onsite would occur and therefore a less-than-significant impact on receiving waters would result.	Potentially Significant	**Mitigation Measure 4.9-1:** With implementation of the Erosion Control Plan, potential impacts are reduced to less than significant and no additional mitigation is required.	Less than Significant
Impact 4.9-2: Development of the Proposed Project has the potential to alter sedimentation levels in runoff flowing to off-site receiving waters. This is a potentially significant impact. However, as discussed in **Section 4.6**, there will be a decrease in sediment production from the parcel with implementation of the ECP and there will be a less-than-significant effect to receiving waters.	Less than Significant	**Mitigation Measure 4.9-2:** With implementation of the Erosion Control Plan, potential impacts are reduced to less than significant and no additional mitigation is required.	Not Applicable
Impact 4.9-3: The Proposed Project would not be located in a FEMA flood zone. Development of the Proposed Project would not exacerbate flooding or expose people or structures to a risk of loss.	Less than Significant	**Mitigation Measure 4.9-3:** No mitigation is required.	Not Applicable
Impact 4.9-4: Development of the Proposed Project would not substantially deplete groundwater supplies, or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. This is a less-than-significant impact.	Less than Significant	**Mitigation Measure 4.9-4:** No mitigation is required.	Not Applicable
4.10 Land Use **Impact 4.10-1**: The Proposed Project will not physically divide an existing community. This is a less-than-significant impact.	Less than Significant	**Mitigation Measure 4.10-1:** No mitigation is required.	Not Applicable
Impact 4.10-2: The Proposed Project will not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over	Less than Significant	**Mitigation Measure 4.10-2:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
the project.			
Impact 4.10-3: The Proposed Project could conflict with an applicable habitat conservation plan, or natural community conservation plan. However, the Proposed Project has been designed to avoid sensitive biological communities on site and the impact will be less than significant.	Less than Significant	**Mitigation Measure 4.10-3:** No mitigation is required.	Not Applicable
4.11 Noise **Impact 4.11-1:** Construction and operation of the Proposed Project would not expose persons to a temporary or substantial permanent increase in the ambient noise level or generate noise levels in excess of standards established in the General Plan or County noise ordinance, or applicable standards of other agencies. This impact is less than significant.	Less than Significant	**Mitigation Measure 4.11-1:** No mitigation required.	Not Applicable
Impact 4.11-2: The Proposed Project would not expose persons to or generate excessive groundborne vibration noise levels.	Less than Significant	**Mitigation Measure 4.11-2:** No mitigation is required.	Not Applicable
Impact 4.11-3: The Proposed Project is not located in the vicinity of a private airstrip; however, it is located within two miles of Virgil O Parrett Field, a public use airport. The Proposed Project would not place residences in the vicinity of the airport; therefore, the Proposed Project would not expose people residing in the project area to excessive noise levels. Workers have the potential to be temporarily exposed to airport and air craft noise during construction and operation of the Proposed Project. The Virgil O Parrett Field has approximately 32 aircraft operations per day or approximately three operations per hour. Approximately 92 percent of the aircraft operating at the airport are single engine aircraft. Vineyard workers would experience noise level in exceedance of 75 dBA, Leq for approximately five minutes during aircraft	Less than Significant	**Mitigation Measure 4.11-3:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
takeoff and landing, three times per hour or for 15 minutes per hour. The increase in the noise level would not exceed the County noise standard of 75 dBA, Leq for 30 minutes in any one hour.			
4.12 Traffic **Impact 4.12-1:** Construction and operation of the Proposed Project would temporarily increase traffic volumes on roadways in the area; however, an increase in approximately 100 trips during the construction period would be intermittent and not be substantial. A less-than-significant impact would result.	Less than Significant	**Mitigation Measure 4.12-1**: The following mitigation measures provided in the Timber Conversion Plan (**Appendix I**) shall be required for construction vehicles using off-site roadways during construction activities. • All oversized construction vehicles are advised to use extreme caution when transporting milled lumber along county roads, especially in areas of limited site visibility. • Oversized construction vehicles are to operate with headlights on for safety and are not to exceed 25 miles per hour while on rural county roads. • Oversized vehicles are not to use Jake brakes in the immediate vicinity of residential neighborhoods. • All construction activities are restricted to Monday through Saturday 7 am to 7 pm. No activities may take place on Sundays & holidays. • To further ensure no significant traffic impacts, delivery and removal of heavy equipment and trucks, including those hauling lumber from the project site, will be limited to non-peak hours. • Signs indicating slow trucks entering the roadway will be placed at a distance of 300 feet in both directions of the project site if warranted.	Less than Significant

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact 4.12-2: Construction and operational traffic generated by the Proposed Project will not result in inadequate emergency access.	Less than Significant	**Mitigation Measure 4.12-2:** No mitigation is required.	Not Applicable
Impact 4.12-3: Traffic generated by construction and operation of the Proposed Project has the potential to impact pedestrian, bicycle, and public transport in the vicinity of the project. However, there are no roadway pedestrian systems or public transportation facilities in the immediate vicinity of the Proposed Project. Also, the Proposed Project would not create a need for such a facility in the vicinity of the property. This is a less-than-significant impact.	Less than Significant	**Mitigation Measure 4.12-3:** No mitigation is required.	Not Applicable
Impact 4.12-4: The temporary increase in traffic from construction worker vehicles and the import and export of materials could adversely affect traffic and transportation conditions in the project area, resulting in a conflict with applicable County General Plan policies establishing measures of effectiveness for the performance of the circulation system. Because the increase in traffic volumes caused by construction would not exceed the capacity of affected roadways, the additional construction-related vehicle trips that would be generated from employee vehicles and construction equipment associated with project construction would not result in considerable changes in the performance of the circulation system. Therefore, these additional trips would not result in a conflict with an applicable plan, ordinance, or policy related to traffic circulation. This impact would be less than significant.	Less than Significant	**Mitigation Measure 4.12-4:** No mitigation is required.	Not Applicable
Impact 4.12-5: Traffic generated by the Proposed Project has the potential to result in changes to air traffic patterns resulting in substantial safety risks. However, the harvesting of on-site trees would remove the existing canopy which is located to the	Less than Significant	**Mitigation Measure 4.12-4:** No mitigation is required.	Not Applicable

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
immediate south of the Angwin-Parrett Airport. The harvesting of trees and planting of vineyards would beneficially impact the roadway clearance. This impact would be less than significant.			

SECTION 3.0

Project Description

SECTION 3.0

PROJECT DESCRIPTION

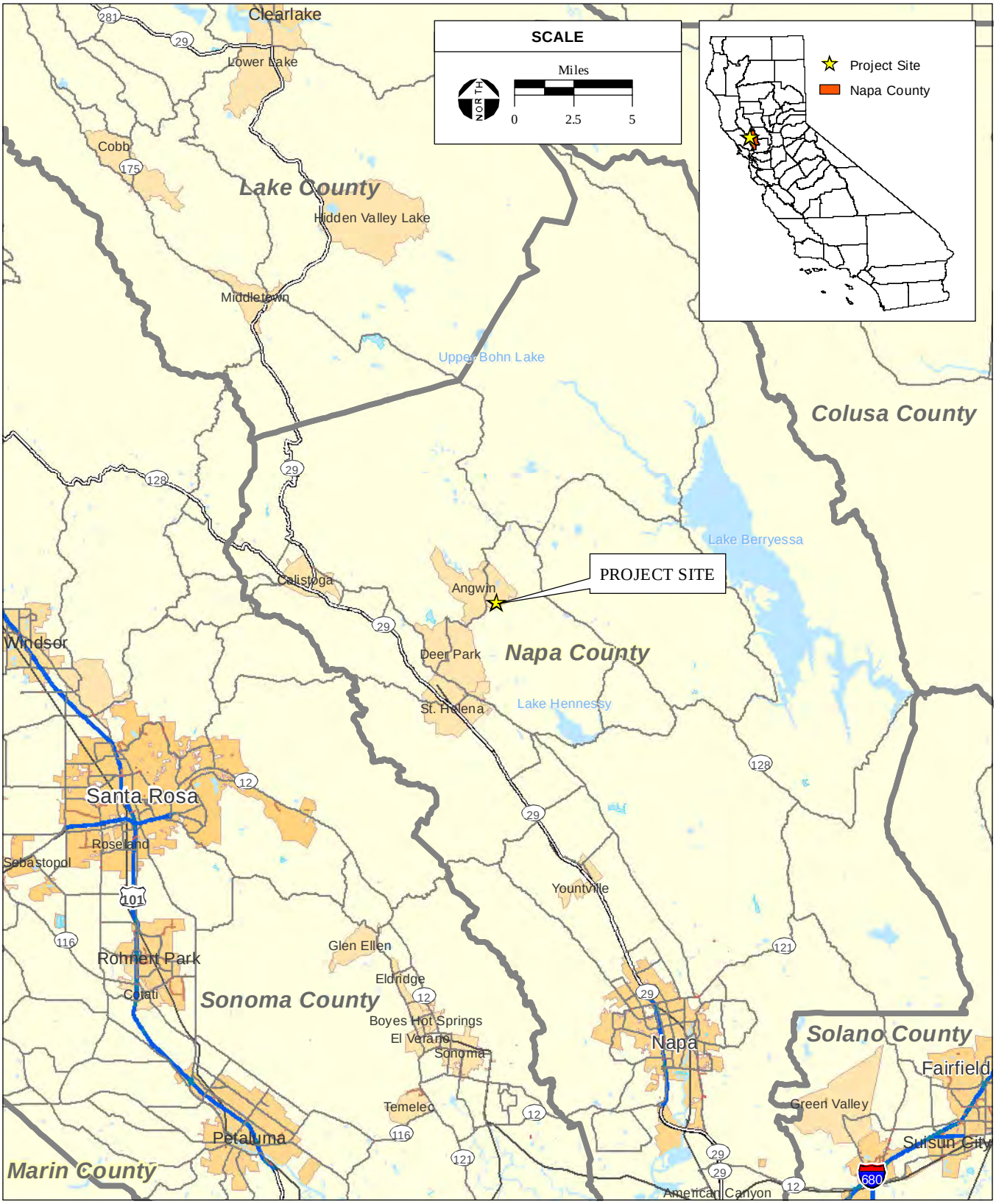
3.1 PROJECT LOCATION

The Lucia Abreu Vineyard Howell Mountain Conversion Project (Proposed Project) is located on Las Posadas Road, approximately one mile southeast of the town of Angwin in northeast Napa County, California. The Proposed Project would convert 12.8± acres of timberland, 3.7± acres of nonnative grassland, and 0.5± acres of ruderal land to a commercial vineyard within the Timber Harvest Plan (THP) area. A total of 17± acres (project site) will be the total disturbed acreage of the Proposed Project, and 15.3± net acre vineyard area is subject to the Erosion Control Plan (ECP) process under Napa County ordinance. The entire 17± acre cleared area is located within the Napa County assessor's parcel number (APN) 024-080-028.

The project site is situated within the unsectioned La Jota land grant (projected Section 5 of Township 8 North, Range 5 West): Mount Diablo Baseline and Meridian (MDBM) on the "Saint Helena, California," U.S. Geological Survey (USGS) 7.5-minute quadrangle (quad). The property is located within the upper Conn Creek watershed (Calwater 2206.500305), a subunit of the Napa River watershed. Onsite elevations range from approximately 1,700 to 1,860 feet above mean sea level with up to 14 percent slopes elsewhere on the property, although the project site sits on a hilltop and is relatively flat. **Figure 3-1** shows a map of the regional location of the property and **Figure 3-2** shows the site and vicinity. An aerial photograph of the property is included as **Figure 3-3**.

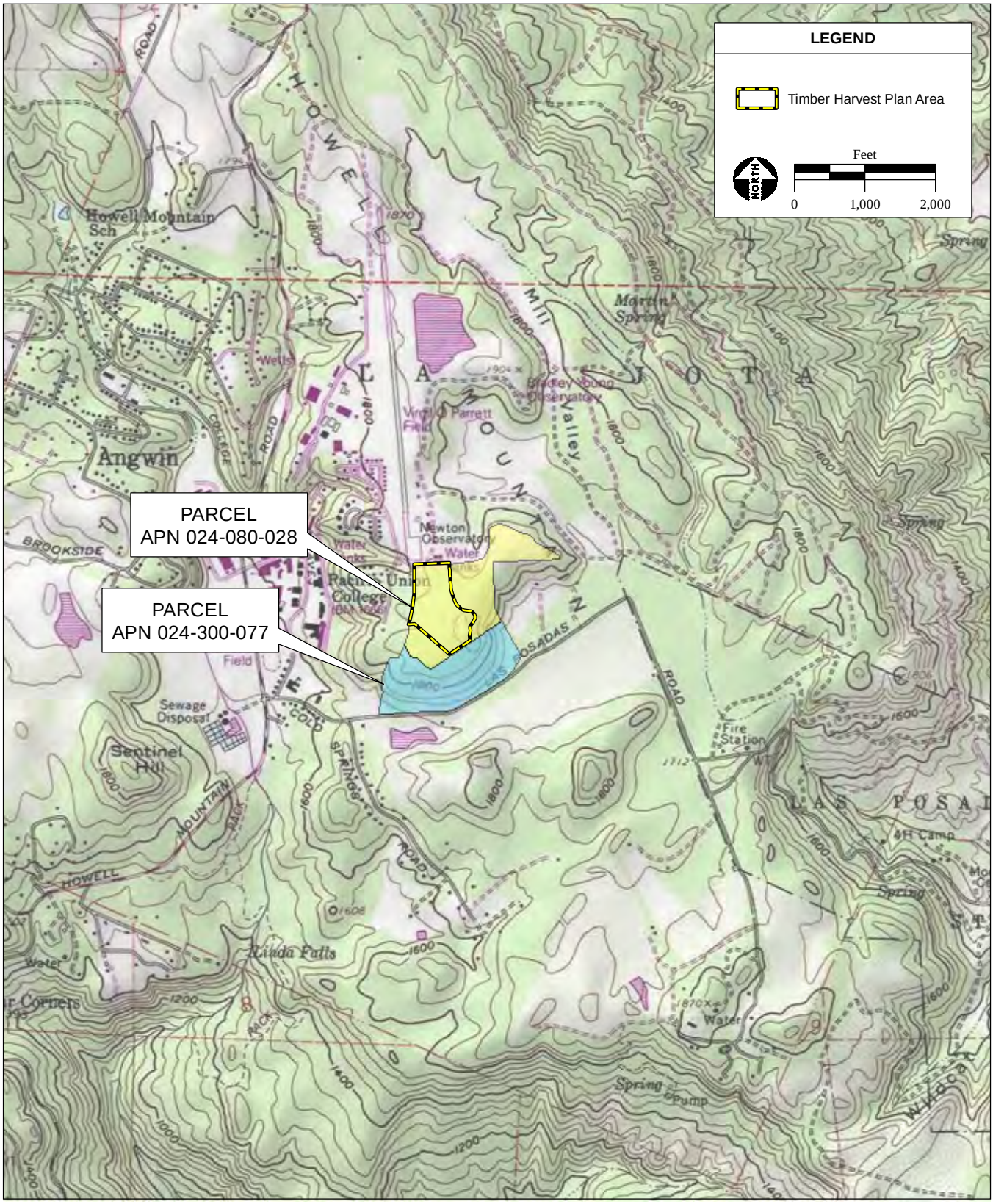
3.2 SITE AND VICINITY

The project site is situated on a southeast facing hilltop in Napa County near the town of Angwin. The project site is zoned Agricultural Watershed: Airport Compatibility Overlay (AW: AC). Pacific Union College and its airfield, Angwin-Parrett Field, lie to the north, while the unincorporated town of Angwin lies to the northwest. Land uses to the south and east are also designated as Agricultural Watershed and primarily support vineyards. The property is located within the Chiles Creek watershed and Lake Hennessey-Conn Creek watershed, sub-watersheds of the larger Conn Creek watershed. The 33,333 acre Conn Creek watershed is made up of approximately 23,380 acres (or 70 percent) forested land, portions of which may be subject to timbering activities consistent with current zoning, and approximately 2,845 acres (or 8.5 percent) existing agricultural land, which mostly consists



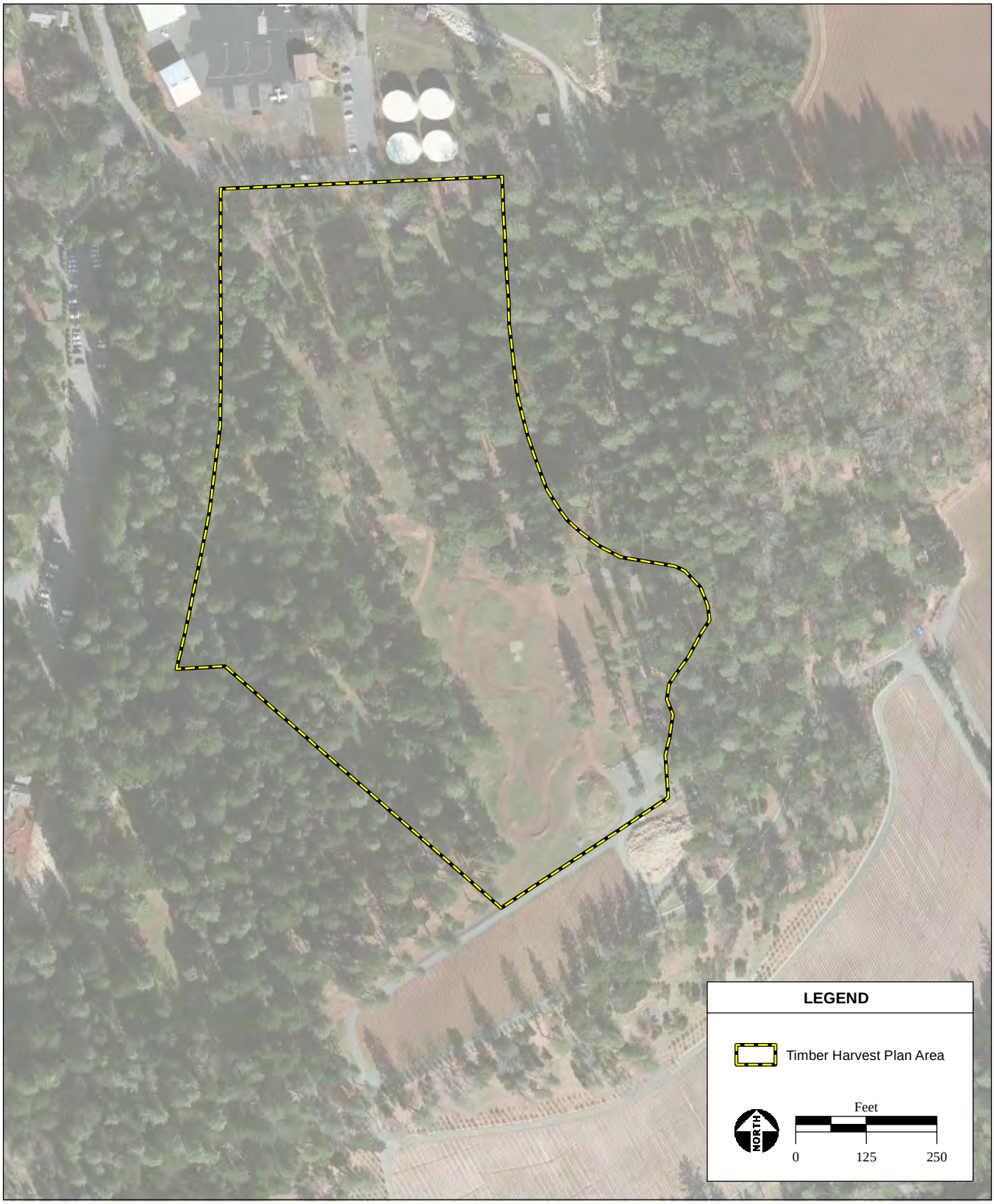
SOURCE: StreetMap North America, 2009; AES, 2012

Figure 3-1
Regional Location



SOURCE: "Saint Helena, CA" USGS 7.5 Minute Topographic Quadrangle
T8N, R5W, Unsectioned Area of Howell Mountain; AES, 2012

Figure 3-2
Proposed Site and Vicinity



SOURCE: Napa Valley Vineyards Engineering, 7/2005; AES, 2012

Figure 3-3
Aerial Photograph

of vineyards.

Moore Creek is located approximately 2,700 feet to the east of the project site and Conn Creek lies approximately 2,900 feet to the west. Both Moore Creek and Conn Creek flow south into Lake Hennessey, which is approximately five miles south of the project site. The project site contains no USGS blue line streams, Class I, II, or III watercourses, or jurisdictional wetlands.

3.2.1 HISTORICAL USES ON THE PROPERTY

Between the 1940s and 1990s, the property was periodically logged and managed for timber production that involved localized thinning of the tree canopy and understory vegetation, some clearcutting, and the subsequent creation of approximately 3.7 acres of non-native grassland on the project site today. As a result of historic timber operations, the hilltop project site supports only 12.8 acres of second-growth tree stands; there is little to no understory in the forested area. Evidence has been found of previous vineyard use on this site dating back to the 1920s and 1940s (**Appendix F**).

Additional information about the site and vicinity is provided in **Section 4.0** of this Draft EIR.

3.3 PROJECT OBJECTIVES

Approximately 12.8 acres of the 17± acre project site contains timberland that would be harvested under the THP. After the timber harvest occurs on the property, specific objectives associated with the Proposed Project are to:

- Convert the 17± acre cleared area of the THP to permanent uses other than timberland;
- Implement a 17± acre ECP for the overall project site;
- Develop 15.3± net acres of vineyard within the overall 17± acre project site on the parcel;
- Provide opportunities for vineyard employment and economic development in Napa County; and
- Increase safety of the nearby Angwin-Parrett Field airport by removing trees directly within and adjacent to the flight path.

Sustainable project practices include:

- Milling of all harvested material onsite at a temporary mill to avoid the use of logging trucks;
- Minimization of soil erosion from vineyard development and operation through vineyard design that avoids erosion-prone areas and controls erosion within the vineyard rather than capturing soil after it has been displaced;
- Use of integrated pest management practices and certified organic materials whenever possible (**Appendix J**); and
- Retention of the remainder of the acreage in the parcel (16.5± acres) as a habitat retention area (HRA) that would remain as forested habitat. This is discussed further in **Section 4.4**. Within this HRA, various habitat enhancement practices will occur to increase the wildlife habitat value of the Douglas fir-Ponderosa pine and California Black Oak woodland onsite. As such, this area would have significant wildlife habitat value and maintain significant carbon sequestration value (refer to the County Conservation Regulations 48 and 50 described in the THP, **Appendix H**).

3.4 DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Project consists of two direct elements: the conversion of a 17± acre area from mixed timber- and grassland to vineyard and implementation of the ECP. Each of these actions affect the development of the Proposed Project and would occur in the following order: 1) the separate harvest of 12.8± acres of timberland on the property and clearing of 4.3± acres on the property, permitted separately under a THP approved by CAL FIRE; 2) the conversion of 12.8± acres within the 17± acre harvested area to non-timber uses; 3) the development of a 15.3± net acre vineyard within the THP area with the balance of acreage to accommodate internal farm avenues, equipment turnaround, and vineyard maintenance operations; and 4) the implementation of a County-approved ECP, which is required per County guidelines for the vineyard development since some onsite slopes exceed a five percent grade. The precursor timber harvest phase, which is referenced and discussed in this document as a change from the baseline, the implementation of the ECP during the vineyard development, and conversion of the THP area to 15.3± acres of vineyard are analyzed in this Draft EIR and are discussed in detail below.

3.4.1 TIMBER HARVEST ELEMENT

As stated above, approximately 12.8 acres of the project site contains timberland that would be harvested on the property under a THP consistent with Forest Practice Rules. The timber harvest would occur before implementation of the timber conversion and the vineyard installation consistent with the ECP, which are the two direct components of the Proposed Project subject to this Draft EIR.

The project site is not located within a Timberland Production Zone (TPZ); however, since the Proposed Project would result in the conversion of "non-TPZ timberland to a non-timber growing use" through timberland operations in which "future timber harvests will be prevented or infeasible because of land occupancy and activities thereon," a TCP and approval is required from CAL FIRE consistent with the Z'berg-Nejedly Forest Practice Act (Division 4, Chapter 8, Public Resources Code) and California Forest Practice Rules (Title 14, California Code of Regulations).

CAL FIRE is the Lead Agency for the approval of both the TCP and THP for the harvest of timber resources on the project site. The THP and TCP are included with this Draft EIR as **Appendix H** and **Appendix I**, respectively, to provide full disclosure of impacts and activities within this document. Due to the interrelated nature of these two CAL FIRE approvals and the overlap of impact areas on the property, the outcome of the THP and TCP will be discussed in this Draft EIR to ensure that cumulative and indirect impacts to the property are fully analyzed (see **Section 6.0**).

All harvested timber would be processed on the property at a temporary mill under the THP. Virtually all of the timber processed onsite will be retained by the landowner for personal use. No new roads would be built, except internal farm avenues within the proposed vineyard. All non-merchantable trees and vegetation will be chipped and/or burned onsite, consistent with Napa County and Bay Area Air Quality Management District requirements. Erosion control measures and site stabilization approved by CAL FIRE would be incorporated into the precursor timber harvest phase to prevent erosion from the property until the ECP is implemented.

In summary, the permanent conversion from timberland to other non-timberland uses on the property within the overall 17± acre clearing limit and the proposed 15.3± acre vineyard with 2± acre farm avenues is the project analyzed in this document. This permanent conversion would result in the removal of this land from use as timberland and the conversion to use in agriculture. It should be noted that the County zoning designation for the property (Agricultural Watershed) is fully compatible with both the existing use as timberland (which includes timber harvesting practices), as well as the ultimate use of the parcel, which will include the 17± acre vineyard and protection of the 16.5± acre habitat retention area as open space consistent with the current Napa County canopy cover rules.

Figure 3-4 shows the proposed boundaries of the vineyard block and the proposed erosion control measures. As shown in **Figure 3-4**, the total disturbed acreage will be 17± acres, with the net vineyard acreage comprising 15.3± acres and the balance to accommodate internal farm avenues.

A detailed description of the existing biological resources currently onsite is found in **Section 4.4**. Avoidance and protective measures to mitigate for natural and biological resource impacts have been included for the Proposed Project in **Section 4.3** of this Draft EIR, are incorporated into the TCP, and are also proposed under the THP. The parcel containing the project site is currently fenced along its entire boundary. Therefore, no significant wildlife corridors exist through the property today or would be impacted by the Proposed Project (refer to **Section 3.4**; **Appendix D**).

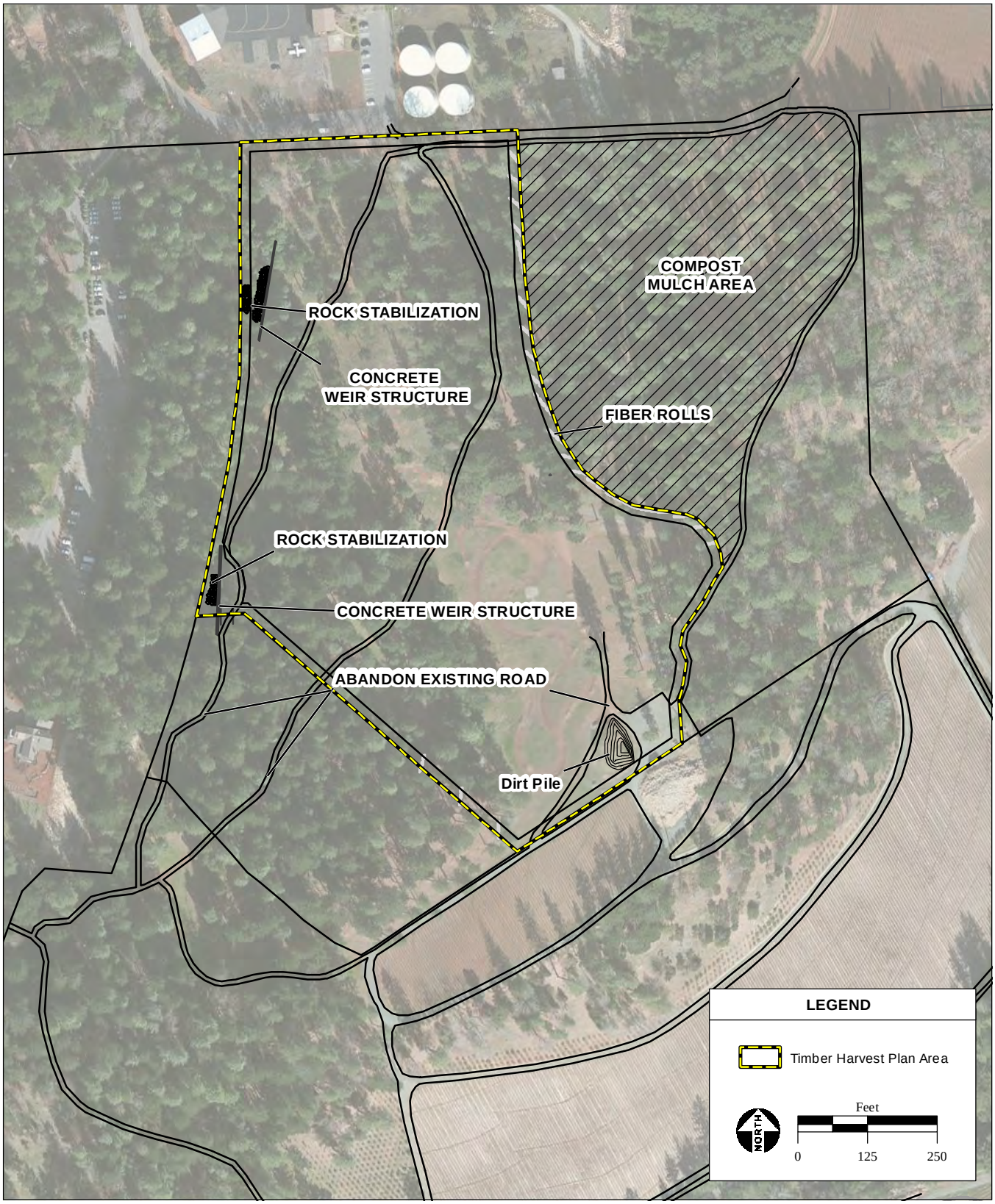
3.4.2 EROSION CONTROL PLAN ELEMENT

An ECP (File #P05-0376-ECPA) has been prepared by a Licensed Civil Engineer (Napa Valley Vineyard Engineering) pursuant to Chapter 18.108 of the Napa County Code (Conservation Regulations). An ECP is required for agricultural projects involving grading and earthmoving activities on slopes over five percent in Napa County. Since County approval of an ECP is required, the ECP is therefore a part of the Proposed Project analyzed in this EIR. In order to maximize the erosion control elements for the Proposed Project, the proposed ECP features cover the entire 17± acre conversion site. The Napa County action of approving the ECP element of the Proposed Project is subject to CEQA; therefore, Napa County is the Responsible Agency for this EIR. As of February 2, 2006, the Napa County Resource Conservation District determined that the ECP meets all technical adequacy requirements. Since then, it has undergone slight revisions, and the County is in the process of reviewing the newest version a final time. The complete ECP for the Proposed Project (#P05-0376-ECPA) is included as **Appendix B**. **Figure 3-4** shows the proposed vineyard block and highlights the erosion control features that would be installed on the property.

The basic philosophy for the design of the Proposed Project is to minimize environmental disturbance and control erosion on the property rather than to capture soil after it has been displaced. To help meet this goal, the ECP includes several different measures for prevention of erosion and control of sediment, as described below.

Temporary Erosion Control Measures

Temporary erosion control measures consist of the installation of fiber rolls and the application of straw mulch. The installation of all fiber rolls shall be completed in accordance with the appropriate details at all locations as shown on the plan sheet (refer to **Appendix B**).



SOURCE: Napa Valley Vineyards Engineering,12/2012; AES, 2013

Figure 3-4
Project Site Plan

Permanent Erosion Control Measures

Permanent erosion control measures include, but are not limited to, the following:

1) Construction and/or installation of rock stabilization, fiber rolls, concrete weirs, and detention ponds as described in the ECP (**Appendix B**).
2) Use of a winter cover crop (plowdown legumes) for the first two years following planting, and then installation of a permanent no-till cover crop to be planted within the entire vineyard area on alternating rows.
3) Spreading of compost mulch or other high-quality ground cover on the remaining forest floor of the hilltop outside of the proposed vineyard block and outside of the existing vineyard located in the northeastern corner of the larger property.

Runoff Collection System

Surface drainage will be filtered with fiber rolls along the edges of the vineyard block and other locations as detailed in **Appendix B**. The permanent erosion control measures described above will result in the creation of two retention basins along the west side of the vineyard block to ensure that the velocity of flow of runoff from the vineyard areas is reduced and that storm runoff can infiltrate into the forest soils.

Cover Crop

Vegetative erosion control measures would consist of a permanent cover crop planted in alternate rows of the vineyard and maintained to a level of 70 percent ground cover or greater. Disturbed areas would be seeded and mulched with a mix of seeds, and vineyard management personnel would apply fertilizer as necessary prior to September 15 before construction. A permanent cover crop would be managed in the fall of each year such that any areas that have less than the proposed vegetative cover would be re-seeded and mulched until adequate coverage is achieved. Maintenance of a vegetative cover crop would provide surface roughness to help prevent the concentration of runoff, collect moisture, and help prevent the loosening of soil that would be susceptible to erosion.

Road Construction and Maintenance

Approximately 1.5 acres of the project site are planned to be allocated to accommodate internal farm avenues for farm trucks, equipment turn around, and vineyard maintenance operations. The existing dirt roads that are currently internal to the project site are a source of sedimentation, and will be abandoned as part of the Proposed Project. A new farm avenue to provide access to the property will be located around the edge of the Proposed Vineyard Block B (**Appendix B**). New farm avenues will be built and maintained with crushed rock as needed.

Annual Winterization

The ECP calls for annual winterization to prevent erosion during the rainy season. Some of the winterization measures include, but are not limited to:

1) Seed and mulch all disked areas;
2) Evaluate the condition of the non-tilled cover crop;
3) Clean and reshape all diversion ditches and roadside ditches, as necessary;
4) Inspect, clean, and repair all concrete weirs and retention ponds;
5) Seed, fertilize, and mulch all roads that are not rocked or paved; and
6) Inspect and clean all existing erosion control features.

Implementation Schedule for the ECP

After the 17± acres of timber and grassland is cleared, and prior to installation of the vineyard, the ECP components would be installed on the property prior to the start of the rainy season (September 15) of the year following the timber harvest. The THP erosion control measures (Sec 18 of **Appendix H**) will be implemented in the first winter prior to the implementation of the ECP and planting of the vineyard. Some planting year operations for the vineyard may be conducted over one or two growing seasons.

The rainy season is defined as September 16 through March 31; all ground disturbing activities should be completed by September 1 and all erosion control measures should be in place by September 15. Erosion control measures should be maintained throughout the year.

3.4.3 VINEYARD CONVERSION ELEMENT

Layout and Installation

The Proposed Project would result in the development of one vineyard block of approximately 15.3 acres. Existing dirt trails throughout the project site will be abandoned and planted over. Vine rows would be planted approximately five feet apart. All disturbed areas would be planted with a vegetative cover crop, using the Plowdown Legumes Mix, Wrex Mix, or customized Abreu Perennial Mix from Napa Valley Ag Supply (**Appendix B**).

Vineyard Operation and Maintenance

The existing onsite well will be connected to the new drip irrigation system to meet the water supply requirements for the establishment of the vineyard. It is anticipated that a maximum of 11.2± acre-feet of water per year (afa) would be required for the first few years during the establishment of the vineyard. After establishment, the proposed vineyard would require 5.6± afa (**Appendix I**). The ongoing proposed water source for the vineyard is the existing

well number one on the property, which is capable of sustaining a water yield of at least 330 gallons per minute, equivalent to approximately 525± acre-feet (af) per acre (Balance Geo, 2013; **Appendix F**). Typical irrigation rates in Napa County are between 0.2 and 0.5 afa, which for the proposed 15.3± acres of vineyard equates to between 3.1 and 7.7 af of irrigation per growing season (Balance Geo, 2013; **Appendix F**).

Construction, Equipment, and Duration

Construction of the Proposed Project is anticipated to occur over two years, with ECP related construction and vineyard planting occurring only during the dry months. The typical construction hours would be 7 A.M. to 5 P.M. Monday through Friday. Sufficient equipment, labor, and materials would be committed and transported to the property prior to the commencement of construction to complete construction during each season. Once equipment is transported to the property it would remain there until implementation during that season is completed. The timber harvest and post-harvest site stabilization and erosion control under the ECP is anticipated to occur in the first year. Most of the actual vineyard installation and planting would occur in the second year. Construction will require about three workers during each phase of the project: the precursor THP phase, the installation of the ECP features, and the planting and operation of the vineyard. The total equipment proposed and materials/equipment deliveries anticipated for the timber harvest, ECP installation, and vineyard installation is provided in **Table 3-1** below.

TABLE 3-1
TYPICAL CONSTRUCTION ELEMENTS AND EQUIPMENT

Precursor Action: Timber Harvest	
I. Equipment*	**Quantity**
Excavator	1
Crawler Tractor	1
Grader	1
Skidder	1
Dump truck	1
Log loader	1
II. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	12 trips (maximum per year)
Material Deliveries	Up to 12 **
Proposed Project: Erosion Control Plan Installation	
I. Equipment*	**Quantity**
Excavator	1
Crawler Tractor	1
Grader	1
Dump truck	1
II. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	8 trips (maximum per year)
Material Deliveries	Up to 20 **
Proposed Project: Vineyard Installation	
I. Equipment*	**Quantity**
Excavator	1
Crawler Tractor	1
Grader	1
Dump truck	1
II. Vehicle Trips	**Duration/Amount**
Heavy Equipment Transport	8 trips (maximum per year)
Material Deliveries	Up to 40 **

Notes:
* Equipment per day is based on 8 hours, 20 days per month usage.
** Material Deliveries include materials necessary for the operation and installation of the THP, ECP and Vineyard such as culverts, straw, drip irrigation, vines etc.
Source: Environmental Resource Management, 2012

REFERENCES

Balance Geo, 2013. Erosion, Sedimentation, & Hydrologic Assessment of the Lucia Abreu Vineyard Howell Mountain Conversion Project. Prepared by Balance Geo (signed Martin Trso, P.G. License No. 7216), June 30, 2013.

Environmental Resource Management, 2012. Vineyard Development Information. July 7, 2011.

Napa Valley Vineyard Engineering (NVVE), 2005. Lucia Abreu Vineyard Erosion Control Plan. July 13, 2005.

SECTION 4.0

Environmental Setting, Impacts, and Mitigation

SECTION 4.0

ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

4.1 AESTHETICS

4.1.1 INTRODUCTION

This section addresses the potential for the Proposed Project to result in impacts associated with aesthetics and visual resources. Following an overview of the visual resource setting in **Section 4.1.2** and the relevant regulatory setting in **Section 4.1.3**, project-related impacts and recommended mitigation measures are presented in **Section 4.1.4**.

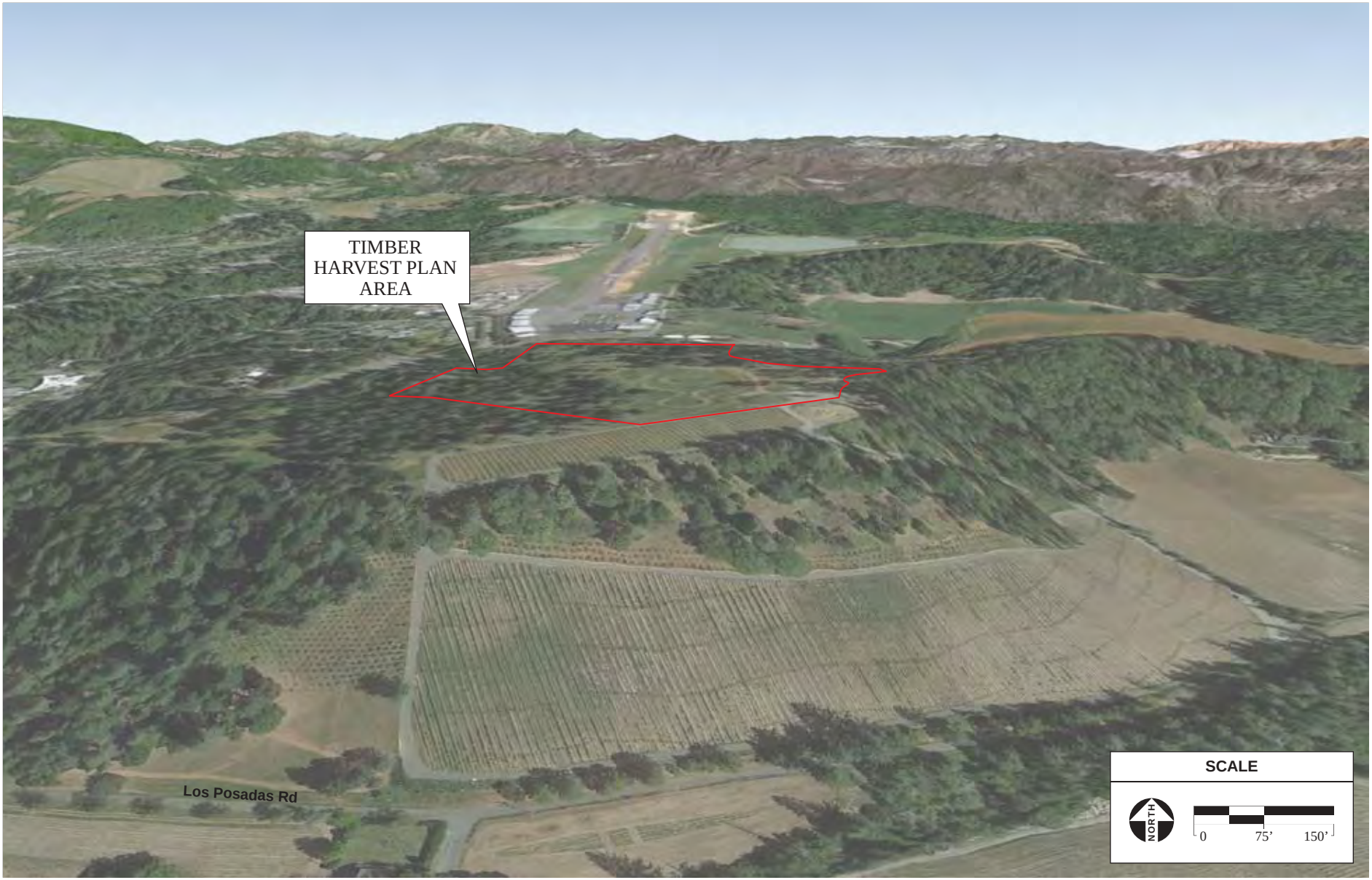
4.1.2 EXISTING SETTING

4.1.2-1 REGIONAL

Vineyards, rolling hills, lush forest, and mountains define the visual character of Napa County's landscape and are important to the quality of life of residents and the tourist and agricultural economies. The majority of the County is composed of agricultural and rural lands, with urban development primarily concentrated within the incorporated cities. Vineyards represent a prominent visual feature of the County, covering over 49,657 acres of hills and valleys (Napa County, 2008). Additionally, many of the associated wineries are valued for their unique contribution to the aesthetic setting of the County.

4.1.2-2 PROJECT SITE

As described in **Section 3.0**, the approximately 17-acre project site is situated on a plateau of Howell Mountain near the town of Angwin in northeastern Napa County. The project site is composed of flat to gently sloping areas with scattered stands of Black Oak, Ponderosa Pine, and Douglas fir trees. Views within the property boundary primarily consist of the existing vineyard, and access road and trails. Views of areas surrounding the property include the nearby Angwin-Parrett Airport, water storage tanks, and the buildings of Pacific Union College. Views of the project area are provided in **Figure 4.1-1.**



SOURCE: GeoEye, 2013; AES, 2013

Figure 4.1-1
Perspective View of the Project Area

4.1.3 REGULATORY FRAMEWORK

The 17± acre project site is located in rural, unincorporated Napa County. The property is under the jurisdiction of the County; therefore, only the County's General Plan and Zoning Ordinance are applicable to development on the site. The surrounding lands are also under the jurisdiction of the County.

4.1.3-1 STATE

Scenic Highways

The State Scenic Highways program is administered by the California Department of Transportation (Caltrans) to preserve and protect scenic highway corridors from projects that would diminish the aesthetic value of lands adjacent to highways (California Streets and Highways Code § 260). The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code.

There are currently no roadways within the County that are designated State Scenic Highways; however, State Route (SR) 29, SR-121, and SR-221 are considered eligible for scenic highway designation (Napa County, 2009). These "eligible" roadways would become officially "designated" if the local jurisdiction adopts a scenic corridor protection plan, applies for scenic highway approval through the California Department of Transportation (CalTrans), and receives official notification from CalTrans that the highway has been designated as a scenic highway (CalTrans, 2005).

4.1.3-2 LOCAL

Scenic Highways Element

The Scenic Highways Element of the Napa County General Plan designates a system of roadways within the County that are located in areas of "natural scenic beauty and recreational interest," including those that pass through vineyards, forested areas, and provide access to historic and recreation areas (Napa County, 2009). These designated roadways are valued for providing a scenic traveling experience for residents and tourists. Thirty-seven roadways have been included in the Scenic Highways Element of the Napa County General Plan; however, the project area would not be located in close proximity to any of these designated scenic roadways.

Napa County's 2001 Viewshed Protection Ordinance

The Napa County Viewshed Protection Ordinance is intended to " protect the public health, safety, and community welfare and to otherwise protect the scenic quality of the County both for visitors to the County, as well as for its residents by ensuring that future improvements are

compatible with existing land forms, particularly County ridgelines and that views of the County's many unique geologic features and the existing landscape fabric of the County's hillside areas are protected and preserved" (Napa County Code 18.106.010).

Napa County General Plan Goals and Policies on Aesthetics

The Community Character Element of the Napa County General Plan incorporates goals and policies pertaining to aesthetics, arts and culture, views, and scenic roadways that are applicable to the Proposed Project (Napa County, 2009):

Goal CC-1: Preserve, improve, and provide visual access to the beauty of Napa County.

Goal CC-2: Continue to promote the diverse beauty of the entire county since this beauty is intricately linked to the continued economic vitality of the region and benefits residents, businesses, and visitors.

Policy CC-1: The County will retain the character and natural beauty of Napa County through the preservation of open space.

Policy CC-5: Recognizing that vineyards are an accepted and attractive visual feature of Napa County, but that visual change can cause public concern, the County shall require the retention of trees in strategic locations when approving conversion of existing forested land to vineyards in order to retain landscape characteristics of the site when viewed from public roadways and shall require the retention of trees to screen non-agricultural activities and other proposed developments.

Policy CC-6: The grading of building sites, vineyards, and other uses shall incorporate techniques to retain as much as possible a natural landform appearance. Examples include:

- The overall shape, height, and grade of any cut or fill slope shall be designed to simulate the existing natural contours and scale of the natural terrain of the site.
- The angle of the graded slope shall be gradually adjusted to the angle of the natural terrain.
- Sharp, angular forms shall be rounded and smoothed to blend with the natural terrain.

Policy CC-10: Consistent with the County's Viewshed Protection Program, new developments in hillside areas should be designed to minimize their visibility from the County's scenic roadways and discourage new encroachments on natural ridgelines.

4.1.4 IMPACTS ANALYSIS

4.1.4-1 SIGNIFICANCE CRITERIA

This section addresses potential project impacts to aesthetic resources. The impact criteria are based on guidance provided by CEQA regarding what constitutes a significant environmental effect (*CEQA Guidelines* §15065, §15126, and Appendix G). For this Draft EIR, a project is considered to have a significant on aesthetic resources if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, such as scenic highway corridors and scenic landscape units;
- Substantially degrade the existing visual character of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Impairment of existing aesthetic resources may result from the degradation of a visual feature that has aesthetic significance, or from the introduction of objects or patterns that exhibit a relatively high degree of visual contrast with the existing objects and patterns on the site. Physical changes that may impair the quality of important views include changes in scale, form, color, and texture of natural features existing on the site. Such changes could result from new structures, grading and excavation, landscaping, or elimination of existing vegetation.

4.1.4-2 ANALYSIS METHODOLOGY

Impacts to existing aesthetic resources resulting from construction and operation of the Proposed Project are discussed below. The impacts are considered for all project components, including both short-term construction and long-term operational phases. If significant impacts are likely to occur, mitigation measures are included to increase the compatibility and safety of the Proposed Project and reduce impacts to less-than-significant levels.

4.1.4-3 IMPACTS AND MITIGATION MEASURES

Impact 4.1-1: The Proposed Project could have a substantial adverse effect on a scenic vista. However, the Proposed Project would be located on a relatively flat hilltop and would be surrounded by a forested buffer of land; therefore a less-than-significant impact would occur.

The project site would be screened from public access areas surrounding the property including nearby roadways and Pacific Union College facilities. The isolated location and retention of forested areas would ensure that the Proposed Project would not have a substantial adverse effect on a scenic vista.

Mitigation Measure 4.1-1: No mitigation is necessary.

Impact 4.1-2: The Proposed Project could substantially damage scenic resources, such as scenic highway corridors and scenic landscape units. This would be a potentially significant impact. However, views from nearby roadways and nearby public access areas would not be significantly altered; therefore, the Proposed Project would not substantially damage scenic resources.

There are no designated scenic corridors in the vicinity of the project site. Las Posadas Road is the nearest roadway to the project site and is not designated as a scenic roadway under Napa County's Viewshed Protection Ordinance. The Proposed Project would be located over 600 feet upslope from Las Posadas Road and would not be visible from this roadway. There is a forested buffer on the neighboring property between the Proposed Project and the western access road College Avenue used by Pacific Union College that will screen views of the project site from this area. A less-than-significant impact would occur.

Mitigation Measure 4.1-2: No mitigation is necessary.

Impact 4.1-3: The Proposed Project could substantially degrade the existing visual character of the site and its surroundings. This would be a potentially significant impact; however, the Proposed Vineyard Block B would be compatible with the existing visual character of the area that is surrounded by vineyards. Therefore, this is a less-than-significant impact.

Areas surrounding the project site are primarily characterized by low density rural development and agricultural production areas. Given that existing vineyards are located within the property boundary to the northeast and to the south of the project site and additional vineyards are located within the vicinity, the proposed conversion of 17 acres of second growth forest for the development of a vineyard would be compatible with the existing visual character of the site and surrounding areas. The timber clearing limit would only abut the property line along a portion of the northernmost boundary where timber would be cleared in the flight path of the airport to facilitate aviation safety; there would be no timber harvest and therefore no change in existing visual condition along the other property boundaries. This impact is less than significant.

Mitigation Measure 4.1-3: No mitigation is necessary.

Impact 4.1-4: The Proposed Project could create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. This would be a potentially significant impact. However, the Proposed Project does not involve any sources of lighting or glare, so this will be a less-than-significant impact.

Surrounding land uses such as residential areas, Pacific Union College, and the Angwin-Parrett Airport contribute to nighttime lighting in the area. The Proposed Project would not result in increases to daytime or nighttime lighting or glare; therefore, there would be no impact.

Mitigation Measure 4.1-4: No mitigation is necessary.

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4.2 AGRICULTURE AND FORESTRY RESOURCES

4.2.1 SETTING

As stated in **Section 3.0**, the project site occurs within Napa County assessor's parcel number (APN) 024-080-028. The property is zoned as Agricultural Watershed: Airport Compatibility Overlay (AW: AC) district (Napa County, 2012a). As stated in the Napa County Code of Ordinances:

> *"The AW district classification is intended to be applied in those areas of the county where the predominant use is agriculturally oriented, where watershed areas, reservoirs and floodplain tributaries are located, where development would adversely impact on all such uses, and where the protection of agriculture, watersheds and floodplain tributaries from fire, pollution and erosion is essential to the general health, safety and welfare" (Napa County, 2012b).*
>
> *"The [Airport Compatibility] combining district classification is intended to accommodate the orderly growth and development of public-use airports…; apply standards to development in the vicinity of airports…; and avoid the construction of structures and establishment of uses that would be incompatible with the continued existence and planned expansion of a public-use airport…" (Napa County, 2012c).*

Agricultural use, such as timber harvesting and vineyard production, is a permitted use under this designation. Generally, permitted uses under the AW: AC designation include, but are not limited to, the following (Napa County, 2012b):

- Agriculture, including but not limited to, is defined in Section 18.08.040 as: (a) growing and raising trees, vines, shrubs, berries, vegetables, nursery stock, hay, grain, and similar food crops and fiber crops; and (b) sale of agricultural products grown, raised, or produces on the premises;
- One single-family dwelling unit per legal lot;
- A second unit, either attached to or detached from an existing legal residential dwelling unit, providing that all of the conditions set forth in Section 18.104.280 are met (Napa County, 2012d); and
- Wineries and related accessory uses which have been authorized by use permit and used in a manner set forth in Section 18.124.080 or any predecessor section; provided, that no expansion of uses or structures beyond those which were authorized by a use permit or modification of a use permit issued prior to the effective date of the ordinance codified in this chapter shall be permitted, except as

may be authorized by a subsequent use permit issued pursuant to this title (Napa County, 2012e).

4.2.2 REGULATORY FRAMEWORK

4.2.2-1 FEDERAL

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that federal programs are administered in a matter that is compatible with state and local units of government, as well as private programs and policies to protect farmland (7 U.S.C. § 4201).

The Natural Resource Conservation Service (NRCS), responsible for the implementation of the FPPA, categorizes farmland in a number of ways. These categories include: prime farmland, farmland of statewide importance, and unique farmland. Prime farmland is considered to have the best possible features to sustain long-term productivity. Farmland of statewide importance includes farmland similar to prime farmland but with minor shortcomings, such as greater slopes or less ability to retain soil moisture. Unique farmland is characterized by inferior soils and it generally requires irrigation depending on the climate.

4.2.2-2 STATE

California Farmland Mapping and Monitoring Program (FMMP)

The FMMP, which monitors the conversion of the state's farmland to and from agricultural use, was established by the California Department of Conservation, under the Division of Land Resource Protection. The program maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years. The FMMP is an informational service only and does not constitute state regulation of local land use decisions.

The four categories of farmland defined under FMMP include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, which are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact. The Department of Conservation provides the following definitions for the categories of farmland:

> **Prime Farmland**: Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil

quality, growing season, and moisture supply needed to produce sustained high yields. The land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance: Farmland with a good combination of physical and chemical features but with minor shortcomings, such as greater slopes or a lesser ability to hold and store moisture.

Grazing land: Land on which the existing vegetation is suited to the grazing of livestock.

Figure 4.2-1 shows the FMMP designations in the Proposed Project vicinity. The project site is designated as "Other Land," which means it is not considered farmland or grazing land (Department of Conservation, 2008).

Williamson Act

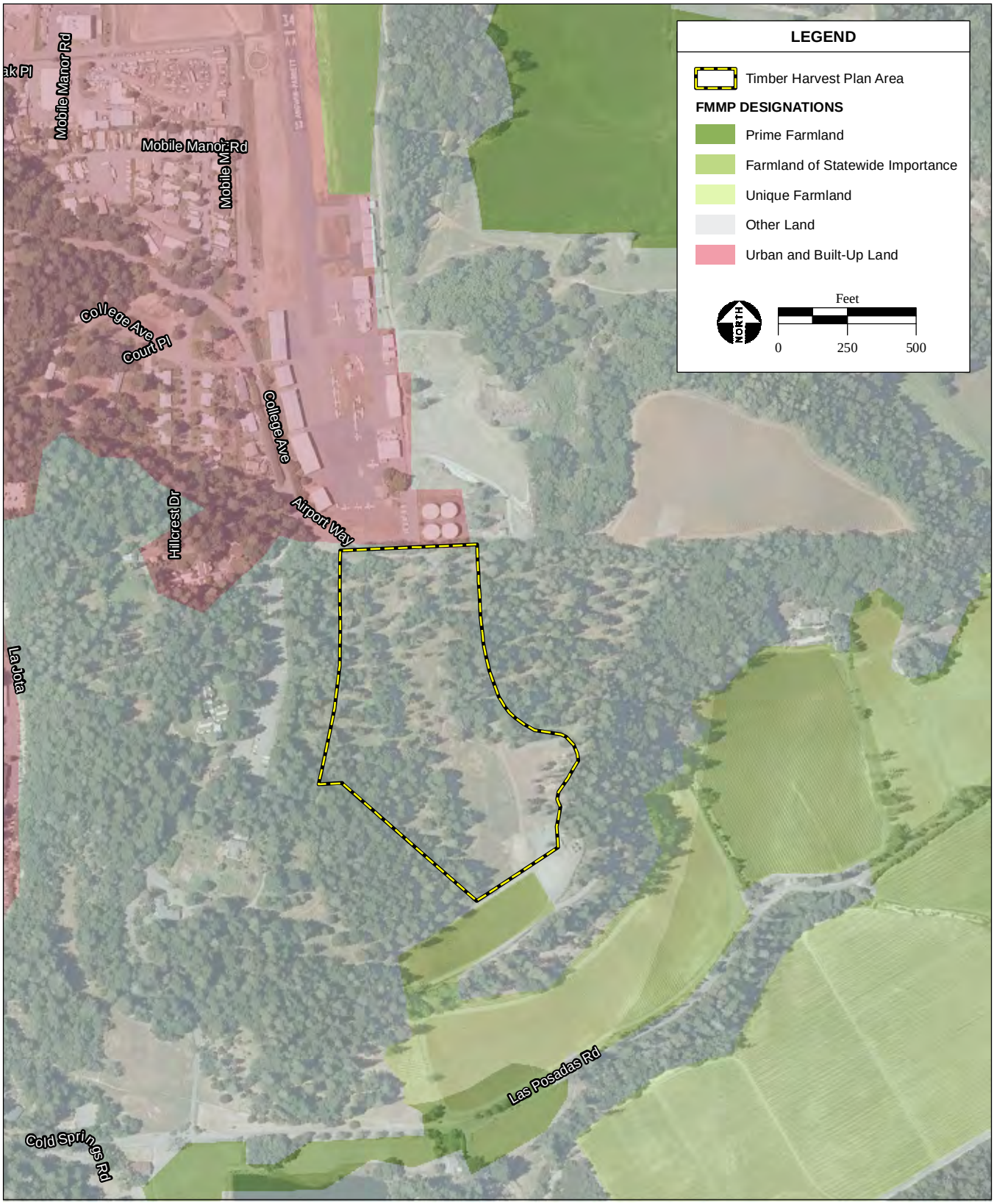
The Williamson Act is a state program that was implemented to preserve agricultural land. Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), landowners contract with the county to maintain agricultural or open space use of their lands in return for reduced property tax assessments. The Williamson Act contract is self-renewing; however, the landowner may notify the county at any time of intent to withdraw the land from its preserve status. Withdrawal from a Williamson Act contract involves a ten-year period of tax adjustment to full market value before protected agricultural/open space land can be converted to urban uses (Department of Conservation, 2008). In extraordinary situations, immediate termination is sometimes granted. No portion of the subject property for the Proposed Project is under Williamson Act contract.

California Land Evaluation and Site Assessment

The California Land Evaluation and Site Assessment (LESA) is a numeric rating system to evaluate the relative value of agricultural land resources. The LESA is composed of two separate sets of factors, the Land Evaluation and Site Assessment. Land Evaluation measures the natural quality of the soil in the area in relation to agricultural suitability, while Site Assessment measures social, economic, and geographic attributes in relation to agriculture. These specific factors include soil resource quality, project size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands (Department of Conservation, 1997).

Z'berg-Nejedly Forest Practice Act

The Z'berg-Nejedly Forest Practice Act (Forest Practice Act) was enacted in 1973 to ensure that logging is conducted in a manner that will preserve and protect fish, wildlife, forests, and



SOURCE: California Dept. of Conservation, Farmland Mapping and Monitoring Program, 2010; USDA NAIP Aeriial Photograph, 2010; AES, 2013

Figure 4.2-1
FMMP Designations

streams (CAL FIRE, 2011). The California Department of Forestry and Fire Protection (CAL FIRE) has enforcement responsibility for the Forest Practice Act. Additionally, CAL FIRE has enacted Forest Practice Rules. The purpose of the Forest Practice Rules is to implement the provisions of the Forest Practice Act in a manner consistent with other laws, including, but not limited to, the Timberland Productivity Act of 1982, CEQA, the Porter Cologne Water Quality Act, and the California Endangered Species Act (CAL FIRE, 2011).

4.2.2-3 LOCAL

Napa County

Agriculture and agricultural production are prevalent land uses in Napa County. Fertile valley and foothill areas have been identified by the County as areas where agriculture should continue to be the predominant land use. The Napa County General Plan provides the goal of planning for agriculture and related activities as the primary land uses in the County while concentrating urban uses within existing cities and urban areas (Goals 1 and 2) (Napa County, 2009). The County considers the development of urban uses outside of urbanized areas as detrimental to agriculture and the maintenance of open spaces, which are uses defined as economic and aesthetic attributes and assets of the County (Napa County, 2009).

The Agricultural Preservation and Land Use Element of the Napa County General Plan provides the following policies related to agricultural practices:

Policy AG/LU-1: Agriculture and related activities are the primary land uses in Napa County.

Policy AG/LU-3: The County's planning concepts and zoning standards shall be designed to minimize conflicts arising from encroachment of urban uses into agricultural areas.

Policy AG/LU-4: The County will reserve agricultural lands for agricultural use, including lands used for grazing, except for those lands which are shown on the Land Use Map as planned for urban development.

Additionally, as stated in the Napa County General Plan, the County has approximately 40,000 acres of land that contains commercial timber species (Napa County, 2009). Most of the County's timberland is located in five areas (in descending order): the Western Mountains, the Eastern Mountains, Livermore Ranch, Pope Valley, and Angwin. Most timber harvesting in the County is a one-time cutting of forests and the conversion of timberlands into other uses, such as vineyards. However, a limited amount of sustainable yield timber harvesting does take place in the County. As stated above, timber harvest is

considered a compatible agricultural use of the subject property for the Proposed Project under the current zoning designation of AW: AC.

The Agricultural Preservation and Land Use Element and the Conservation Element of the Napa County General Plan provide the following policies related to forestry practices:

Policy AG/LU-18: Timber production areas in the County shall be considered to be those defined in the most recent adopted mapping available from CAL FIRE, unless local areas are defined through a public planning process.

The Community Character Element of the Napa County General Plan incorporates goals and policies pertaining to aesthetics, arts and culture, views, and scenic roadways that are applicable to the Proposed Project (Napa County, 2009):

Policy CC-5: Recognizing that vineyards are an accepted and attractive visual feature of Napa County, but that visual change can cause public concern, the County shall require the retention of trees in strategic locations when approving conversion of existing forested land to vineyards in order to retain landscape characteristics of the site when viewed from public roadways and shall require the retention of trees to screen non-agricultural activities and other proposed developments.

Policy CON-1: The County will preserve land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty. The County will encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection.

Policy CON-35: The County shall encourage active forest management practices to preserve and maintain existing forests and timberland, allowing for their economic and beneficial use.

4.2.3 IMPACTS ANALYSIS

4.2.3-1 SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts to agricultural resources have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this analysis, the Proposed Project would have a significant impact if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220[g]), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104[g]);
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

4.2.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.2-1: The Proposed Project would result in the loss of forest land through conversion of forest land to non-forest use. This is a potentially significant impact; however, with implementation of mitigation measures described in **Section 4.4** the impact would be reduced to a less-than-significant level.

The property is currently zoned as AW: AC, which includes agricultural purposes such as timber harvest and vineyard. Implementation of the Proposed Project would allow better compliance with the site's zoning code of Agricultural Watershed: Airport Compatibility Overlay by removing tall trees directly in line with the Angwin-Parrett Field airport runway. Though the farmland directly adjacent to the property's eastern boundary is designated as Unique Farmland, the property itself is not currently designated under the FMMP. Upon implementation of the Proposed Project, the THP area would be converted for agricultural purposes (vineyards) and the rest of the property's existing agricultural uses would remain unchanged. Implementation of the Proposed Project would not result in converting Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. The Proposed Project would not conflict with existing zoning in the County's General Plan, or cause rezoning of forest land, nor would it conflict with an existing Williamson Act contract.

The property is not located within a Timberland Production Zone (TPZ); however, the Proposed Project would convert approximately 12.8 acres of non-TPZ timberland to a non-timber growing use. Therefore, a THP and TCP are required for the timber harvest action as stated in **Section 3.0**. The Proposed Project would result in the permanent conversion of forest land. However, the property is not located within the commercial forest land base of California. The THP for the Proposed Project (**Appendix H**), states that since the Proposed

Project would result in the removal of 12.8± acres (17 percent) of the property's timber, which is a relatively small amount of timber volume (0.5 percent) of the overall timberland acreage of the Conn Creek watershed, the impact would be less than significant.

Furthermore, the 12.8± acres of *Pseudotsuga menziesii-Pinus ponderosa* Forest Alliance (Douglas fir – Ponderosa pine Forest Alliance) that would be harvested from the property represents only 0.95 percent of the Douglas fir – Ponderosa pine forest within the Angwin area (NCCDPD, 2005). Please see **Section 4.4** for a complete discussion of habitat types within the property and within the County. Since the THP area is not located within the commercial forest land base of California and represents a small percentage of the forested land in the watershed and of the Ponderosa Pine habitat within the county, no significant impact can be expected to occur on timber resources of the state or the state's timber productivity and economy (**Appendix H**). Further, with implementation of mitigation to retain forest habitat as discussed in **Section 4.4**, impacts to loss of forest land would be considered less than significant. A cumulative impact analysis of the Proposed Project on Agriculture and Forestry Resources is provided in **Section 6.0**.

Mitigation Measure 4.2-1: No further mitigation is required.

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4.3 AIR QUALITY

4.3.1 ENVIRONMENTAL SETTING

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, are equally important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The Proposed Project is located approximately one mile southeast of the town of Angwin in Napa County, California. The property is situated within the northeastern end of the Napa Valley. Napa Valley is a long, narrow valley running north to south between two ridges formed within the coastal mountains that have an average ridgeline height of about 2,000 feet. Some peaks in the valley approach 3,000 to 4,000 feet in height. Up-valley winds (from the south during the day) and down-valley winds (from the north during the night) result because of the surrounding terrain. Topography in the County is defined by the Napa Valley and surrounding upland areas, which contain smaller valleys.

Napa Valley has a high potential for natural air pollution due to diminished ventilation caused by the terrain. Locally and regionally generated pollutants can be transported by the prevailing winds northward into the Napa Valley, often trapping and concentrating the pollutants under stable conditions. The local up-valley and down-valley flows shaped by the surrounding mountains may also re-circulate pollutants, contributing to a buildup of pollutants. Napa Valley generally has good air quality due to relatively little development across much of the valley despite its natural predisposition for air pollution. The property is located within the San Francisco Bay Area Air Basin (SFBAAB).

Air quality in the area is a function of the criteria air pollutants (CAPs) emitted locally, the existing regional ambient air quality, and the meteorological and topographic factors that influence the intrusion of pollutants into the area from sources outside the immediate vicinity. The project site is located on the coastal plain and not within the bayside area of the County, which is more subject to the inversion layers which tend to hold in air pollutants. The project site's air quality is based on the CAPs meeting the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS).

NAAQS have been established to protect public health and welfare for the six CAPs, ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 10 and 2.5 microns in size (PM_{10} and $PM_{2.5}$), and lead. California has adopted the NAAQS CAPs with more stringent standards than the NAAQS and has included four additional CAPs, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles, which are

designated as CAAQS. If a CAP exceeds the NAAQS or CAAQS than the air basin or region is designated by the Environmental Protection Agency or the California Air Resources Board (CARB) as nonattainment. The Bay Area Air Quality Management District (BAAQMD) provides California Environmental Quality Act (CEQA) thresholds for CAPs designated nonattainment in an air basin or region. These thresholds are based on the ability of the air basin or region to meet the NAAQS or CAAQS. **Table 4.3-1** shows the NAAQS attainment status for the SFBAAB.

TABLE 4.3-1
ATTAINMENT STATUS FOR THE SFBAAB

Pollutant	Average Time	CAAQS	NAAQS
Ozone (O_3)	8-hour	Nonattainment	Nonattainment
	1-hour	Nonattainment	N/A
$PM_{2.5}$	24-hour	Nonattainment	Nonattainment
	Annual	Nonattainment	Attainment
PM_{10}	24-hour	Nonattainment	Unclassified
	Annual	Nonattainment	Attainment
Carbon Monoxide (CO)	8-hour	Attainment	Attainment
	1-hour	Attainment	Attainment
Lead (Pb)	Quarterly	Attainment	Attainment
Nitrogen Dioxide (NO_2)	1-hour	Attainment	Unclassified
	Annual	Attainment	Attainment
Sulfur Dioxide (SO_2)	24-hour	Attainment	Attainment
	Annual	Attainment	Attainment
Sulfates (SO_4^{2-})	24-hour	Attainment	N/A
Hydrogen Sufide (H_2S)	1-hour	Unclassified	N/A
Vinyl Chloride	24-hour	NIA	N/A
Visibility Reducing Particles	8-hour	Unclassified	N/A

NIA = no information available; N/A = not applicable.
Source: BAAQMD, 2012.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. Some reasons for increased sensitivity include a person's pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as schools, hospitals, and convalescent homes are considered to be sensitive to poor air quality. This is because infants and children, the elderly, and people with health afflictions (especially respiratory ailments) are more susceptible to respiratory infections and other air quality related health problems than the general public. Residential areas are also considered to be sensitive to air pollution, because residents (including children and the elderly) tend to be

at home for extended periods of time, resulting in sustained exposure to any pollutants present.

There are no residences located on the property; however, there are several scattered residences in the vicinity. The nearest residence is located approximately 130 feet west of the western property boundary. The nearest school to the project site is Pacific Union College (PUC), located adjacent to the western boundary of the project site. The project site will remain buffered from the property line nearest the home and school by forested areas even after the 12.8± acres of forest are harvested and the 17± acres are converted to vineyard. The nearest hospital in the vicinity of the property is approximately 2.75 miles southwest of the project site.

4.3.2 REGULATORY FRAMEWORK

4.3.2-1 PLANS, POLICIES, AND STANDARDS

Regulation of air pollution is achieved through both national and state ambient air quality standards and emission limits for individual sources of air pollutants. As required by the Federal Clean Air Act (FCAA), the EPA has identified “criteria pollutants” and established NAAQS to protect public health and welfare.

California has adopted more stringent ambient air quality standards for most of the criteria air pollutants (referred to as California Ambient Air Quality Standards or CAAQS). Because of the unique meteorological conditions in California, there is considerable diversity between the CAAQS and NAAQS currently in effect in California. **Table 4.3-2** presents both state and national standards.

Under amendments to the FCAA, the EPA has classified air basins, or portions thereof, as either “attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the NAAQS have been achieved. In 1988, the State legislature passed the California Clean Air Act (CCAA), which is patterned after the FCAA to the extent that it also requires areas to be designated as “attainment” or “nonattainment”, but with respect to the CAAQS rather than the NAAQS.

The FCAA also requires nonattainment areas to prepare air quality plans that include strategies for achieving attainment. Air quality plans developed to meet the NAAQS are referred to as State Implementation Plans (SIPs). The CCAA also requires plans for nonattainment areas (except for PM_{10}) with respect to the State standards. Thus, just as areas in California have two sets of designations, many also have two sets of planning requirements; one to meet federal requirements relative to the NAAQS and one to meet requirements relative to the CAAQS.

TABLE 4.3-2
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	CAAQS	NAAQS[b]
Ozone (O_3)	1 hour 8 hour	0.09 ppm 0.070 ppm	N/A 0.075 ppm
Carbon Monoxide (CO)	1 hour 8 hour	20 ppm 9.0 ppm	35 ppm 9 ppm
Nitrogen Dioxide (NO_2)	1 hour Annual Mean	0.25 ppm N/A	N/A 0.053 ppm
Sulfur Dioxide (SO_2)	1 hour 3 hour 24 hour Annual Mean	0.25 ppm N/A 0.04 ppm N/A	N/A 0.5 ppm[1] 0.14 ppm 0.030 ppm
Respirable Particulate Matter (PM_{10})	24 hour Annual Mean	50 $\mu g/m^3$[c] 20 $\mu g/m^3$	150 $\mu g/m^3$ N/A
Fine Particulate Matter ($PM_{2.5}$)	24 hour Annual Mean	N/A 12 $\mu g/m^3$	35 $\mu g/m^3$ 15 $\mu g/m^3$
Sulfates	24 hour	25 $\mu g/m^3$	N/A
Lead (Pb)	30 day Calendar Quarter	1.5 $\mu g/m^3$ N/A	N/A 1.5 $\mu g/m^3$
Hydrogen Sulfide	1 hour	0.03 ppm	N/A
Visibility Reducing Particles	8 hour	0.23 per kilometer	N/A
Vinyl Chloride	24 hour	0.010 ppm	N/A

Notes: ppm = parts per million by volume; $\mu g/m^3$= micrograms per cubic meter.
N/A=Not Applicable
[1] Secondary Standard.
Source: CARB, 2012a

The EPA is responsible for implementing the programs established under the FCAA, such as establishing and reviewing the national ambient air quality standards and judging the adequacy of SIPs, but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

CARB, California's state air quality management agency, regulates mobile emissions sources and oversees the activities of regional/county air districts. CARB is responsible for establishing emissions standards for on-road motor vehicles sold in California. The BAAQMD is the regional agency empowered to regulate air pollutant emissions from stationary sources in the Bay Area. Both agencies regulate air quality though their permit authority and through their planning and review activities.

4.3.2-2 AIR QUALITY DATA

Pollutants of Concern

The pollutants of concern in the project area are ozone, particulate matter, and toxic air contaminates (TACs). A pollutant of concern is one that is designated nonattainment under the NAAQS or the CAAQS. TACs are discussed below, although no adopted air quality standards exist.

Ozone (O_3)

Photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X) resulting from the incomplete combustion of fossil fuels are the largest source of ground-level O_3. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. As a photochemical pollutant, O_3 is formed only during daylight hours under appropriate conditions, but is destroyed throughout the day and night. O_3 is considered a regional pollutant, as the forming reaction occurs over time downwind from the sources of the emissions.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particle pollution is a mixture of microscopic solids and liquid droplets suspended in air. This pollution, also known as particulate matter, is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores). The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers (µm) in diameter pose the greatest problems because they can travel deep into lungs (PM_{10}) and the bloodstream ($PM_{2.5}$). Exposure to such particles can affect the lungs and heart. Larger particles are of less concern, although they can irritate the eyes, nose, and throat.

CARB maintains several ambient air quality monitoring stations within the BAAQMD that provide information on the average concentrations of criteria air pollutants in the region. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources and the influence of topographical and meteorological factors. The closest monitoring station to the property is located in the City of Napa, at Jefferson Street near Central Avenue, about five miles southwest of the property. It should be noted that the monitoring station is located in an urban area while the property is located in a relatively rural area. **Table 4.3-3** presents a three-year summary of ambient air quality monitoring data from the Napa station and compares ambient air pollutant concentrations of ozone, $PM_{2.5}$, and PM_{10} to CAAQS and NAAQS.

TABLE 4.3-3
AIR QUALITY DATA SUMMARY FOR NAPA VALLEY 2008-2010

Pollutant/Standard	Standard	Days Standard Exceeded[1] in:		
		2009	2010	2011
Ozone	Federal 8-Hour	1	2	0
Ozone	State 8-Hour	3	2	0
Ozone	State 1-Hour	1	1	0
PM_{10}	State 24-Hour	1	0	0
$PM_{2.5}$	State 24-Hour	*	*	*

[1] An exceedance is not necessarily a violation.
* Insufficient Data.
Source: CARB, 2012b

The ambient air quality standards were not met at the monitoring location according to the NAAQS for 8-hour O_3 in 2009 and 2010, the CAAQS for 1- and 8-hour O_3 in 2009 and 2010, or the CAAQS for 24-hour PM_{10} in 2009, as shown in **Table 4.3-3**.

4.3.3 IMPACTS ANALYSIS

This air quality analysis includes a qualitative discussion of expected emissions generated from sources, such as timber harvesting, log hauling, and vineyard construction activities, including grading. This analysis also includes calculations of operational emissions from project initiation to buildout of the Proposed Project.

4.3.3-1 SIGNIFICANCE CRITERIA

For the purposes of this analysis, the Proposed Project would have a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

For construction and operational related emissions of CAPs, the 2010 BAAQMD CEQA *Guidelines* provide a 54 pounds per day (ppd) threshold for NO_x, ROG, and $PM_{2.5}$ and a 82 ppd threshold for PM_{10}. The BAAQMD CEQA Guidelines also require that basic construction mitigation measures, which are outlined in the guidance document, be implemented (BAAQMD, 2010).

4.3.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.3-1: Construction activities, such as timber harvest, land clearing, earthmoving, movement of vehicles, and wind erosion of exposed soil and operation associated with implementation of the Proposed Project, would have the potential to conflict with or obstruct implementation of the applicable air quality plan and violate the ambient air quality standards or may contribute substantially to an existing or projected air quality violation. This is a potentially significant impact. However, with implementation of **Mitigation Measure 4.3-1** below, the impact will be reduced to less than significant.

Conversion of the existing landscape to vineyard requires clearing of vegetation and earthmoving activities, which would expose bare soil to wind erosion, thereby generating fugitive dust. Earthmoving activities would be performed by heavy duty construction equipment, which would emit NO_x, ROG, $PM_{2.5}$, and PM_{10} emissions. These impacts would occur in two phases: the first is the timber harvest described in the attached THP (**Appendix H**), which will be conducted under a separate CEQA-equivalent process prior to the second phase, which will be the conversion from timberland to vineyard and the actual preparing of the land for planting. These two activities are likely to occur over two different calendar years with the timber harvest expected to be complete in 2013 and the planting of the vineyard in 2014. The property is located in a rural area; nevertheless, timber harvest and site preparation activities would have the potential to cause air quality impacts to the area.

The Urban Emissions (URBEMIS) 2007 model (Version 9.2.4), which estimates air pollution emissions from a wide variety of land use projects, was used to estimate the projected emissions from the Proposed Project during construction. For the purposes of the URBEMIS model, it was assumed that construction would only occur during the five-month dry season of each year, and that construction would be completed over the course of one dry season. Default values for typical construction equipment were used, and the total gross area of disturbed land was assumed to be 17± acres, reflecting the total timber harvest area on the property, even though only 12.8 acres contain forested land. Projected emissions from the total timber harvest (on 17 acres) and vineyard preparation and planting phases of activities which could cause impacts are presented jointly in **Table 4.3-4** below; URBEMIS output files are provided in **Appendix C.**

Onsite mulching would be the primary method used for the removal of vegetated material; however, in the event that burning is done onsite, it would occur during land preparation and during the wet season as permitted by the governing agencies and in accordance with the BAAQMD Regulation 5 (BAAQMD, 2006). As seen in **Table 4.3-4**, the Proposed Project would not exceed any BAAQMD threshold, even if all of the activities occur in a single year;

therefore, a less-than-significant impact to regional air quality would result from the project and the prior timber harvest.

TABLE 4.3-4
MITIGATED/UNMIGATED CONSTRUCTION EMISSIONS FROM VINEYARD INSTALLATION

Construction Year	ROG	NO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day			
2013 – Mitigated	6.57	45.19	4.24	2.74
2013 – Unmitigated	6.57	55.53	12.61	4.48
BAAQMD Significance Thresholds	*54*	*54*	*82*	*54*
Threshold Exceeded	***No (No)***	***No (Yes)***	***No (No)***	***No (No)***

Sources: URBEMIS, 2007; AES, 2012.

Mitigation Measure 4.3-1: The Applicant shall implement a fugitive dust abatement program during the construction of #P05-0376-ECPA, which shall include the following elements:

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Cover all exposed stockpiles.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent paved streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

In addition to the above measures, the Applicant shall also implement the required basic construction mitigation measures as recommended by the BAAQMD during the construction of the Proposed Project, which shall include the following elements:

- All exposed surfaces (e.g., parking areas, staging areas, and unpaved access roads) shall be watered as needed to ensure dust abatement.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- All heavy duty construction equipment shall be fitted with diesel particulate matter filters and use only aqueous diesel fuel.

The measures above are in addition to the permanent erosion control measures specified in #P05-0376-ECPA, which include establishing a permanent no till cover crop on all disturbed areas. As shown in **Table 4.3-3**, construction of the Proposed Project would not exceed the BAAQMD criteria pollutant threshold. The permanent erosion control measures would avoid the creation of nuisance dust and PM_{10} during operation of the Proposed Project, which would reduce these potentially significant impacts to a less than significant level. These measures are additive to those required during the timber harvest prior to conversion.

Impact 4.3-2: Operation of the Proposed Project would attract additional vehicles to the property, resulting in new regional emissions; however, new emissions would not be substantial and would not conflict with or obstruct implementation of the applicable air quality plan and violate the ambient air quality standards or may contribute substantially to an existing or projected air quality violation. This is a less-than-significant impact.

Maximum operational mobile and area source emissions would occur during the grape harvest season for the proposed vineyard. An estimated 43 one-way employees, grape haul trucks, and visitor trips would occur during this season, with a one-way trip length of between approximately 7 to 14 miles. Air quality modeling was performed for the Proposed Project using the URBEMIS 2007 (Version 9.2.4) air quality modeling program, with output files provided in **Appendix C**. **Table 4.3-5** shows the operational emissions from employee, visitor, and grape haul trips associated with the Proposed Project, and compare the total emissions for the Proposed Project to the BAAQMD thresholds.

TABLE 4.3-5
UNMITIGATED OPERATIONAL INCREASE IN EMISSIONS FROM VINEYARD CONVERSION

Source	ROG	NOx	PM_{10}	$PM_{2.5}$
	Pounds per Day			
Area Sources	0.12	0.02	0.01	0.01
Mobile Sources	0.97	1.26	2.55	0.48
Total Operational Emissions	1.09	1.28	2.56	0.49
BAAQMD Significance Thresholds	54	54	82	54
Threshold Exceeded	***No***	***No***	***No***	***No***

Sources: URBEMIS, 2007; AES, 2011.

The Proposed Project would not exceed the BAAQMD thresholds of significance; therefore, air quality impacts due to operation are less than significant.

Mitigation Measure 4.3-2: No mitigation is required.

Impact 4.3-3: Project-related criteria pollutant emissions in combination with other sources of criteria pollutants has the potential to cause a considerable net increase of criteria pollutants for which the project region is in nonattainment. However, project-related emissions would not be cumulatively considerable and a less-than-significant impact would result.

As shown in **Table 4.3-1**, the SFBAAB is in nonattainment for ozone, PM_{10}, and $PM_{2.5}$. Past, present, and future development projects contribute to a region's air quality conditions on a cumulative basis; therefore by its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of the NAAQS or CAAQS. If a project's individual emissions contribute toward exceedance of the NAAQS, then the project's cumulative impact on air quality would be significant.

The BAAQMD has determined suitable significance threshold, based on areas designated nonattainment status. These thresholds provide a tool by which the BAAQMD can achieve attainment for a particular criteria pollutant that is designated as nonattainment. Therefore, the BAAQMD's significance thresholds consider the regions cumulative emissions levels. Project compliance with the BAAQMD's threshold results in a less-than-significant cumulative impact. As shown in **Tables 4.3-4** and **4.3-5**, project emissions are below the BAAQMD's significance thresholds; therefore, the Proposed Project would have a less-than-significant impact on cumulative air quality.

Mitigation Measure 4.3-3: No mitigation is required.

Impact 4.3-4: Construction and operation of the Proposed Project would slightly increase traffic volumes and congestion levels on local roadways, resulting in changes to CO concentrations; however, changes in CO concentrations would not be substantial and a less-than-significant impact would result.

The Proposed Project is in a designated maintenance area for CO; the Napa Valley region has relatively low background levels of CO compared to other parts of the Bay Area. CO disperses rapidly into the atmosphere, which makes it a local pollutant. High concentrations of CO from vehicles generally occur when a large number of vehicles are idling for more than 35 seconds; this generally occurs at signaled intersections with large volumes of traffic (greater than 10,000 vehicles per hour). There are no intersections in the project vicinity

that would meet these criteria. Idling of construction equipment onsite has the potential to exacerbate CO concentrations near the property; however, there are no sensitive receptors near the property (nearest sensitive receptor is approximately 400 feet from construction activities) and with the implementation of **Mitigation Measure 4.2-1** above, CO concentrations from construction would be reduced. Therefore, the Proposed Project's effect on CO concentrations during construction is a less-than-significant impact.

Mitigation Measure 4.3-4: No mitigation is required.

Impact 4.3-5: Project construction and operation has the potential to result in odors. However, odors from operation would not be substantial and a less-than-significant impact would result.

During installation of #P05-0376-ECPA and subsequent vineyard operations, various diesel-powered vehicles and equipment used on the property would create odors. However, these sources are mobile and transient in nature, and the distance of approximately 200 feet to the nearest offsite residence would provide for dilution of odor-producing constituent emissions. These odors would dissipate rapidly and are temporary. Because of this, and the distance between the property and the nearest sensitive receptor, odors from vehicles and equipment would not be noticeable beyond the area of operation. The proposed vineyard would be managed as a biodynamic (without chemical treatments) operation. Other odors that may be generated during project operation include the potential application of soil amendments (natural soil enhancing elements). These odors would be temporary and would occur at a substantial distance from rural receptors (Approximately 400 feet from the nearest offsite receptors). This is a less-than-significant impact.

Mitigation Measure 4.3-5: No mitigation is required.

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4.4 BIOLOGICAL RESOURCES

4.4.1 METHODOLOGY

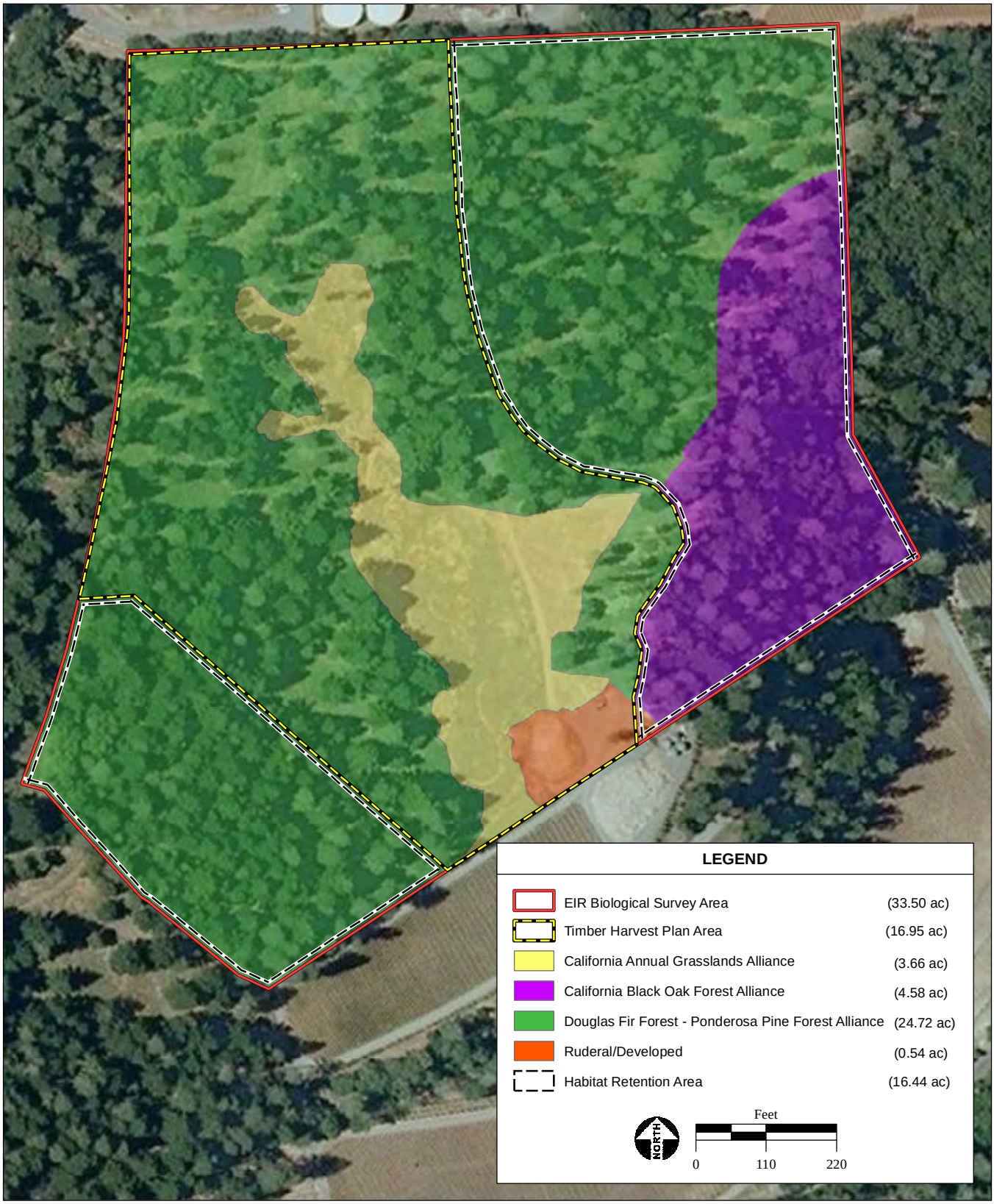
4.4.1-1 FIELD SURVEYS

Analytical Environmental Services (AES) biologists conducted a field survey of the parcel in May of 2012. Previous field surveys of the parcel were performed by biologist Theodore Wooster and botanist Debra Eakins in 2004, Wildlife Research Associates (WRA) biologists from January through June, 2007, and Environmental Resource Management (ERM) in 2007 and 2012 (**Table 4.4-1**).

TABLE 4.4-1
BIOLOGICAL SURVEYS PERFORMED ON THE PARCEL

Organization	Survey Type	Survey Date
Analytical Environmental Services	Habitat Assessment and Special-Status Plant Species Survey	May 25, 2012
Environmental Resource Management	Timber Removal Assessment	May 1, 2012
Wildlife Research Associates	Initial Site Assessment and Wetland Delineation	January 18, 2007
	Protocol-level Plant Surveys	March 28, June 4, 2007
Theodore Wooster, Biologist	Wildlife and Raptor Survey/ Northern Spotted Owl Survey	February 18, May 8, 14, 23, June 3, and October 26, 2004
Debra Eakins, Botanist	Botanical Surveys	May 25 and 27, 2004

Surveys of the parcel were conducted on foot and representative areas of all the vegetation communities and wildlife habitats were examined and refined via mapping. Vegetation communities in the field were mapped on an aerial photograph and shown in the biological field survey area boundary in **Figure 4.4-1** (for habitat descriptions, refer to **Section 4.4.3**). For the purpose of this analysis, vegetation communities within the area surveyed were characterized by the dominant species present and amount of cover of the uppermost canopy layer, according to the *Manual of California Vegetation, Second Edition* (MCV) (Sawyer et al., 2009) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986).



SOURCE: Napa County Vegitation Alliances Dataset, 2007; Napa Valley Vineyards Engineering, 7/2005; UC-G Aerial Photograph, 4/2012; AES, 2013

Figure 4.4-1
Habitat Map

The purpose of each of the field surveys was to determine potential impacts of the Proposed Project to onsite biological resources. Potential impacts to biological resources analyzed in this section include impacts from both the precursor timber harvest and development of the vineyard and installation of the ECP under the Proposed Project.

4.4.2 REGULATORY FRAMEWORK

4.4.2-1 SPECIAL STATUS SPECIES

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) implement the Federal Endangered Species Act (FESA) of 1973 (16 USC Section 1531 *et seq*.). Threatened and endangered species on the federal list (50 CFR Subsection 17.11, 17.12) are protected from "take" (direct or indirect harm), unless a Section 10 Permit is granted to an individual or a Section 7 consultation and a Biological Opinion with incidental take provisions are rendered to a lead federal agency. Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed species may be present in the project area and determine whether the proposed project would have a potentially significant impact upon such species.

Critical habitat is defined under the FESA as specific geographic areas within a listed species range that contain features considered essential for the conservation of the listed species. Designated critical habitat for a given species may not necessarily be currently occupied by that species if it is within the historic range of the species and supports habitat deemed by the USFWS to be important for the recovery of the species. Critical habitat designation applies only to federal actions or actions funded or permitted by federal agencies. If a federal action or an action allowed by federal funding or a federal permit has the potential to adversely affect critical habitat for a listed species, the responsible federal agency is required to consult with the USFWS or NMFS. Under FESA, habitat loss is considered to be an impact to the species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536 (3), (4)). Therefore, project-related impacts to these species, or their habitats, would be considered significant and would require mitigation. The USFWS also designates species of concern. Species of concern receive attention from federal agencies during environmental review, although they are not otherwise protected under FESA. Project-related impacts to such species would also be considered significant and would require mitigation.

The project parcel for the Proposed Project does not contain Critical Habitat for federally listed species.

California Endangered Species Act

The California Department of Fish and Wildlife (CDFW) implements state regulations pertaining to fish and wildlife and their habitat. The California Endangered Species Act (CESA) of 1970 (California Fish and Game (CFG) Code § 2050 *et seq*., and CCR Title 14, Subsection 670.2, 670.51) prohibits the take (interpreted to mean the direct killing of a species) of species listed under CESA (14 CCR Subsection 670.2, 670.5). A CESA permit must be obtained if a proposed project would result in the take of listed species, either during construction or over the life of the project.

California Environmental Quality Act (CEQA) Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA *Guidelines* § 15380(b) and (d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition of FESA and the section of the CFG Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a candidate species that has not yet been listed by the USFWS or a species recognized as being of special concern by the CDFW. Thus, CEQA provides the ability to protect a species from potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

California Fish and Game Codes

The California Fish and Game Code defines take (Section 86) and prohibits taking of a species listed as threatened or endangered under the CESA (California Fish and Game Code § 2080), or otherwise fully protected (California Fish and Game Code § 3511, 4700, and 5050). Section 2081(b) and (c) of the CESA allows the CDFW to issue an incidental take permit for a state listed threatened and endangered species if specific criteria outlined in Title 14 CCR, § 783.4(a), (b) and California Fish and Game Code § 2081(b) are met. The California Fish and Game Code § 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. If a project is planned in an area where a species or specified bird occurs, an applicant must design the project to avoid all take of nonlisted migratory birds; the CDFW cannot provide take authorization under the CESA. The CDFW protects plants designated as endangered or rare under Fish and Game Code § 1900.

Migratory Bird Treaty Act

Most bird species, especially those that are breeding, migrating, or of limited distribution, are protected under federal and state regulations. Under the Migratory Bird Treaty Act of 1918 (16 USC Subsection 703-712), migratory bird species and their nests and eggs are protected from injury or death. Project-related disturbances must be reduced or eliminated during the nesting cycle. CFG Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs. CFG Code § 3511 list birds that are "fully protected", which identifies those species that may not be taken or possessed except under specific permit. Bald and golden eagles are protected by the Migratory Bird Treaty Act and the federal Bald and Golden Eagle Protection Act. These Acts require some measures to continue to prevent eagle "take" resulting from human activities if they are present.

California Native Plant Protection Act

The California Native Plant Protection (CNPP) Act of 1977 (CFG Code § 1900 *et seq*.) requires CDFW to establish criteria for determining if a species or variety of native plant is endangered or rare. As a result, CDFW maintains a "special plants" list consisting of approximately 2,000 native plant species, subspecies, or varieties that are tracked by the California Natural Diversity Database (CNDDB). In addition, the CNPS maintains inventories of native flora of California and ranks species according to rarity (CNPS, 2010); List 1 plants are presumed extinct in California, List 1B includes plants rare or endangered in California and elsewhere, and List 2 plants are rare or endangered in California, but more common elsewhere. As stated on the CDFW website, "plants on Lists 1A, 1B, and 2 of the CNPS inventory consist of plants that may qualify for listing, and the CDFW recommends they be addressed in CEQA projects (CEQA Guidelines Section 15380)" (CDFW, 2012).

Oak Woodlands Conservation Act

The Oak Woodlands Conservation Act (California State Senate Bill 1334) became law on January 1, 2005 and was added to the CEQA statutes as 21083.4. This act requires that a county must determine whether or not a project would result in a significant impact on oak woodlands. If it is determined that a project may result in a significant impact on oak woodlands, then one or more of the following mitigation measures are required:

1) Conserve oak woodlands through the use of conservation easements;
2) Plant an appropriate number of trees, including maintenance of plantings and replacement of failed plantings;
3) Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and
4) Other mitigation measures developed by the county.

4.4.2-2 WETLANDS AND OTHER WATERS OF THE U.S.

Any project that involves working in navigable waters of the U.S., including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE), under Section 404 of the Clean Water Act. The CDFW requires notification prior to commencement, and possibly a Lake or Streambed Alteration Agreement pursuant to CFG Code Subsection 1601-1616, 5650, if a proposed project would result in the alteration or degradation of a stream, river, or lake in California. The Regional Water Quality Control Board (RWQCB) may require State Water Quality Certification (Clean Water Act Section 401 permit) before other permits are issued, which may involve implementation of a storm water pollution prevention plan.

4.4.2-3 LOCAL REGULATIONS, GOALS AND POLICIES

As stated in Article 1, Section 896(a) of the California Forest Practice Rules, the purpose of the Forest Practice Rules is to implement the provisions of the Z'berg-Nejedly Forest Practice Act of 1973, which includes the regulation of timber harvest activities, in a manner consistent with other laws, including but not limited to, CEQA (CAL FIRE, 2013). This Draft EIR contains a full analysis of environmental impacts of the Proposed Project and addresses the timber harvest and ECP elements of the project per CAL FIRE and Napa County regulations, respectively. For this reason, applicable local regulations, goals, and policies are described below for the ECP element of the Proposed Project for which Napa County has jurisdiction.

Napa County General Plan

Natural resource use in Napa County is regulated by the Napa County General Plan (Napa County, 2008). Relevant goals and policies from the General Plan pertaining to biological resources are provided below.

Open Space Conservation Policies

Policy CON-1: The County will preserve land for greenbelts, forest, recreation, flood control, adequate water supply, air quality improvement, habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty. The County will encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection.

Policy CON-2: The County shall identify, improve, and conserve Napa County's agricultural land by:

- Requiring existing significant vegetation be retained and incorporated into agricultural projects to reduce soil erosion and to retain wildlife habitat. When

retention is found to be infeasible, replanting of native or non-invasive vegetation shall be required; and

- Minimizing pesticide and herbicide use and encourage research and use of Integrated pest control methods such as cultural practices, biological control, host resistance, and other factors.

Natural Resource Goals and Policies

Goal CON 2: Maintain and enhance the existing level of biodiversity.

Goal CON-3: Protect the continued presence of special status species, including special status plants, special status wildlife, and their habitats, and comply with all applicable state, federal, or local laws or regulations.

Goal CON-4: Conserve, protect, and improve plant, wildlife, and fishery habitats for all native species in Napa County.

Goal CON-5: Protect connectivity and continuous habitat areas for wildlife movement.

Goal CON-6: Preserve, sustain, and restore forests, woodlands, and commercial timberland for their economic, environmental, recreation, and open space values.

Policy CON-10: The County shall conserve and improve fisheries and wildlife habitat in cooperation with governmental agencies, private associations and individuals in Napa County.

Policy CON-11: The County shall maintain and improve fisheries habitat through a variety of appropriate measures, including (the following lettered policies):

m) Control sediment production from mines, roads, development projects, agricultural activities, and other potential sediment sources.
n) Implement road construction and maintenance practices to minimize bank failure and sediment delivery to streams.

Policy CON-13: The County shall require that all discretionary residential, commercial, industrial, recreational, agricultural, and water development projects consider and address impacts to wildlife habitat and avoid impacts to fisheries and habitat supporting special status species to the extent feasible. Where impacts to wildlife and special status species cannot be avoided, projects shall include effective mitigation measures and management plans including provisions to (the following lettered policies):

a) Maintain the following essentials for fish and wildlife resources:
    3) Adequate amounts of feeding, escape, and nesting habitat.
    4) Proper temperature through maintenance and enhancement of streamside vegetation, volume of flows, and velocity of water.

c) Employ supplemental planting and maintenance of grasses, shrubs and trees of like quality and quantity to provide adequate vegetation cover to enhance water quality, minimize sedimentation and soil transport, and provide adequate shelter and food for wildlife and special status species and maintain the watersheds, especially stream side areas, in good condition.

d) Provide protection for habitat supporting special status species through buffering or other means.

e) Provide replacement habitat of like quantity and quality on- or off-site for special status species to mitigate impacts to special status species.

f) Enhance existing habitat values, particularly for special status species, through restoration and replanting of native plant species as part of discretionary permit review and approval.

g) Require temporary or permanent buffers of adequate size (based on the requirements of the subject special status species) to avoid nest abandonment by birds and raptors associated with construction and site development activities.

Policy CON-14: To offset possible losses of fishery and riparian habitat due to discretionary development projects, developers shall be responsible for mitigation when avoidance of impacts is determined to be infeasible. Such mitigation measures may include providing and permanently maintaining similar quality and quantity habitat within Napa County, enhancing existing riparian habitat, or paying in-kind funds to an approved fishery and riparian habitat improvement and acquisition fund. Replacement habitat may occur either on- site or at approved off-site locations, but preference shall be given to on-site replacement.

Policy CON-16: The County shall require a biological resources evaluation for discretionary projects in areas identified to contain or potentially contain special status species based upon data provided in the Napa County Baseline Data Report (NCBDR) (NCCDPD, 2005), CNDDB, or other technical materials. This evaluation shall be conducted prior to the approval of any earthmoving activities. The County shall also encourage the development of programs to protect special status species and disseminate updated information to state and federal resource agencies.

Policy CON-17: Preserve and protect native grasslands, serpentine grasslands, mixed serpentine chaparral, and other sensitive biotic communities and habitats of limited

distribution. The County, in its discretion, shall require mitigation that results in the following standards:

a) Prevent removal or disturbance of sensitive natural plant communities that contain special status plant species or provide critical habitat to special status animal species.
b) In other areas, avoid disturbances to or removal of sensitive natural plant communities and mitigate potentially significant impacts where avoidance is infeasible.
c) Promote protection from overgrazing and other destructive activities.
d) Encourage scientific study and require monitoring and active management where biotic communities and habitats of limited distribution or sensitive natural plant communities are threatened by the spread of invasive non-native species.
e) Require no net loss of sensitive biotic communities and habitats of limited distribution through avoidance, restoration, or replacement where feasible. Where avoidance, restoration, or replacement is not feasible, preserve like habitat at a 2:1 ratio or greater within Napa County to avoid significant cumulative loss of valuable habitats.

Policy CON-18: To reduce impacts on habitat conservation and connectivity (the following lettered polices apply):

a) In sensitive domestic water supply drainages where new development is required to retain between 40 and 60 percent of the existing (as of June 16, 1993) vegetation onsite, the vegetation selected for retention should be in areas designed to maximize habitat value and connectivity.
c) Preservation of habitat and connectivity of adequate size, quality, and configuration to support special status species should be required within the project area. The size of habitat and connectivity to be preserved shall be determined based on the specific needs of the species.
d) The County shall require discretionary projects to retain movement corridors of adequate size and habitat quality to allow for continued wildlife use based on the needs of the species occupying the habitat.
e) The County shall require new vineyard development to be designed to minimize the reduction of wildlife movement to the maximum extent feasible. In the event the County concludes that such development will have a significant impact on wildlife movement, the County may require the applicant to relocate or remove existing perimeter fencing installed on or after February 16, 2007 to offset the impact caused by the new vineyard development.

h) Support public acquisition, conservation easements, in-lieu fees where on-site mitigation is infeasible, and/or other measures to ensure long-term protection of wildlife movement areas.

Policy CON-19: The County shall encourage the preservation of critical habitat areas and habitat connectivity through the use of conservation easements or other methods as well as through continued implementation of the Napa County Conservation Regulations associated with vegetation retention and setbacks from waterways.

Policy CON-22: The County shall encourage the protection and enhancement of natural habitats which provide ecological and other scientific purposes. As areas are identified, they should be delineated on environmental constraints maps so that appropriate steps can be taken to appropriately manage and protect them.

Policy CON-26: Consistent with Napa County's Conservation Regulations, natural vegetation retention areas along perennial and intermittent streams shall vary in width with steepness of the terrain, the nature of the undercover, and type of soil. The design and management of natural vegetation areas shall consider habitat and water quality needs, including the needs of native fish and special status species and flood protection where appropriate. Site-specific setbacks shall be established in coordination with Regional Water Quality Control Boards, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration National Marine Fisheries Service, and other coordinating resource agencies that identify essential stream and stream reaches necessary for the health of populations of native fisheries and other sensitive aquatic organisms within the County's watersheds. Where avoidance of impacts to riparian habitat is infeasible along stream reaches, appropriate measures will be undertaken to ensure that protection, restoration, and enhancement activities will occur within these identified stream reaches that support or could support native fisheries and other sensitive aquatic organisms to ensure a no net loss of aquatic habitat functions and values within the county's watersheds.

Policy CON-27: The County shall enforce compliance and continued implementation of the intermittent and perennial stream setback requirements set forth in existing stream setback regulations, provide education and information regarding the importance of stream setbacks and the active management and enhancement/restoration of native vegetation within setbacks, and develop incentives to encourage greater stream setbacks where appropriate. Incentives shall include streamlined permitting for certain vineyard proposals on slopes between five and 30 percent and flexibility regarding yard and road setbacks for other proposals.

Oak Woodlands Goals and Policies

Goal CON-6: Preserve, sustain, and restore forests, woodlands, and commercial timberland for their economic, environmental, recreation, and open space values.

Policy CON-24: Maintain and improve oak woodland habitat to provide for slope stabilization, soil protection, species diversity, and wildlife habitat through appropriate measures including one or more of the following:

a) Preserve, to the extent feasible, oak trees and other significant vegetation that occur near the heads of drainages or depressions to maintain diversity of vegetation type and wildlife habitat as part of agricultural projects.
b) Comply with the Oak Woodlands Preservation Act (PRC Section 21083.4) regarding oak woodland preservation to conserve the integrity and diversity of oak woodlands, and retain, to the maximum extent feasible, existing oak woodland and chaparral communities and other significant vegetation as part of residential, commercial, and industrial approvals.
c) Provide replacement of lost oak woodlands or preservation of like habitat at a 2:1 ratio when retention of existing vegetation is found to be infeasible. Removal of oak species limited in distribution shall be avoided to the maximum extent feasible.
d) Support hardwood cutting criteria that require retention of adequate stands of oak trees sufficient for wildlife, slope stabilization, soil protection, and soil production be left standing.
e) Maintain, to the extent feasible, a mixture of oak species which is needed to ensure acorn production. Black, canyon, live, and brewer oaks as well as blue, white, scrub, and live oaks are common associations.
f) Encourage and support the County Agricultural Commission's enforcement of state and federal regulations concerning Sudden Oak Death and similar future threats to woodlands.

Policy CON-28: To offset possible additional losses of riparian woodland due to discretionary development projects and conversions, developers shall provide and maintain similar quality and quantity of replacement habitat or in-kind funds to an approved riparian woodland habitat improvement and acquisition fund in Napa County. While on-site replacement is preferred where feasible, replacement habitat may be either on-site or off-site as approved by the County.

Policy CON-29: The County shall coordinate its efforts with other agencies and districts such as the Resource Conservation District and share a leading role in developing and providing outreach and education related to stream setbacks and other best management practices that protect and enhance the County's natural resources.

Policy CON-30: All public and private projects shall avoid impacts to wetlands to the extent feasible. If avoidance is not feasible, projects shall mitigate impacts to wetlands consistent with state and federal policies providing for no net loss of wetland function.

Water Resources Policies
Policy CON-6: The County shall impose conditions on discretionary projects which limit development in environmentally sensitive areas such as those adjacent to rivers or streamside areas and physically hazardous areas such as floodplains, steep slopes, high fire risk areas and geologically hazardous areas.

Policy CON-41: The County will work to protect Napa County's watersheds and public and private water reservoirs to provide for the following purposes:

a) Clean drinking water for public health and safety;
b) Municipal uses, including commercial, industrial and domestic uses;
c) Support of the eco-systems;
d) Agricultural water supply;
e) Recreation and open space; and
f) Scenic beauty.

Policy CON-42: The County shall work to improve and maintain the vitality and health of its watersheds. Specifically, the County shall:

d) Support environmentally sustainable agricultural techniques and best management practices (BMPs) that protect surface water and groundwater quality and quantity (e.g., cover crop management, integrated pest management, informed surface water withdrawals and groundwater use).

Policy CON-45: Protect the County's domestic supply drainages through vegetation preservation and protective buffers to ensure clean and reliable drinking water consistent with state regulations and guidelines. Continue implementation of current Conservation Regulations relevant to these areas, such as vegetation retention requirements, consultation with water purveyors/system owners, implementation of erosion controls to minimize water pollution, and prohibition of detrimental recreational uses.

Policy CON-48: Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e., Basin Plan) requirements and are protective of

the County's sensitive domestic supply watersheds. Technical reports and/or erosion control plans that recommend site-specific erosion control measures shall meet the requirements of the County Code and provide detailed information regarding site specific geologic, soil, and hydrologic conditions and how the proposed measure will function.

Napa County Code

Stream Setbacks

Napa County Code defines streams and provides setbacks for land clearing for agricultural development. Under Section 18.108.030, a "stream" means any of the following:

1) A watercourse designated by a solid line or dash and three dots symbol on the largest scale of the United State Geological Survey maps most recently published, or any replacement to that symbol;
2) Any watercourse which has a well-defined channel with a depth greater than four feet and banks steeper than 3:1 (horizontal to vertical bank ratio) and contains hydrophilic (i.e., water-adapted) vegetation, riparian vegetation or woody vegetation including tree species greater than ten feet in height; or
3) Those watercourses listed in Resolution No. 94-19 and incorporated herein by reference.

Erosion gullies and ravines being repaired with the technical assistance and/or under the direction of the Napa County Resource Conservation District/National Resource Conservation Service, "scour-holes", and other non-linear features are not considered streams.

Napa County Code 18.108.025 applies setbacks for agricultural development adjacent to streams. Setbacks included in the Code range from 35 to 150 feet measured from the top of bank and increase with the slope of the terrain parallel to the top of bank.

Vegetation Preservation and Replacement

Napa County Code 18.108.100 requires the following conditions when granting a discretionary permit for activities within an erosion hazard area (slopes greater than five percent):

- Existing vegetation shall be preserved to the maximum extent consistent with the project. Vegetation shall not be removed if it is identified as being necessary for erosion control in the approved erosion control plan or if necessary for the preservation of threatened or endangered plant or animal habitats as designated by state or federal agencies with jurisdiction and identified on the county's environmental sensitivity maps.

- Existing trees six inches in diameter or larger, measured at diameter breast height, (DBH), or tree stands of trees six inches DBH or larger located on a site for which either an administrative or discretionary permit is required shall not be removed until the required permits have been approved by the decision-making body and tree removal has been specifically authorized.
- Trees to be retained or designated for retention shall be protected through the use of barricades or other appropriate methods to be placed and maintained at their outboard drip line during the construction phase. Where appropriate, the director may require an applicant to install and maintain construction fencing around the trees to ensure their protection during earthmoving activities.
- Wherever removal of vegetation is necessitated or authorized, the director or designee may require the planting of replacement vegetation of an equivalent kind, quality and quantity.

Napa County Baseline Data Report

Napa County prepared a Baseline Data Report (NCBDR) in 2005 in support of the Updated General Plan. The NCBDR provides data and information on a range of environmental resources within the County, including Biological Resources. The purposes of the Biological Resources Chapter of the NCBDR are to 1) provide a scientific basis for future regional and site-specific level assessments of project impacts and the evaluation of mitigation measures, conservation proposals, and enhancement opportunities for biological resources; 2) serve as the existing conditions section for biological resources chapters/sections in a planned EIR in support of the County's General Plan Update; 3) serve as a basis to evaluate current and future policies at the local and Countywide level as they relate to biological resource protection and enhancement; and 4) document the methods and definitions used to establish a Countywide searchable biological resources database.

Specifically, the NCBDR recommends that CNPS List 3 and 4 plant species be addressed for projects in Napa County to adequately address local species of concern. The Biological Resources Technical Memorandum (AES, 2012; **Appendix D**) prepared for the Proposed Project contains survey methodology and findings documentation consistent the standards and requirements of the Napa County General Plan (Napa County, 2008), including those outlined in the NCBDR (NCCDPD, 2005) in regards to special-status plant species (including local species of concern covered under CNPS List 3 and 4) and vegetation communities. See **Appendix D** for the Biological Resources Technical Memorandum.

4.4.3 ENVIRONMENTAL SETTING

4.4.3-1 REGIONAL SETTING

Napa County is located within the Inner North Coast Range Mountains, a geographic subdivision of the larger California Floristic Province (Hickman, 1993), which is strongly influenced by the Pacific Ocean. The region is in climate Zone 14 "Ocean Influenced Northern and Central California," characterized as an inland area with ocean or cold air influence. The climate of the region is characterized by hot, dry summers and cool, wet winters; average precipitation ranges from approximately 20 to 40 inches per year (World Climate, 2008). The average annual temperature for the region ranges from 45 to 90 degrees Fahrenheit. Napa County extends from an elevation of zero feet above sea level on the west side to approximately 4,200 feet above sea level on the east side. Because of its dramatic variation in climate and topographic diversity, Napa County has a high natural level of biodiversity compared to the rest of California.

The dominant natural land cover types in the vicinity of the project parcel, as mapped by Napa County Vegetation Alliances data (2007), include Agriculture, Douglas fir-Ponderosa Pine Alliance, Ponderosa Pine Alliance, Mixed Oak Alliance, and Urban. Oak woodlands are the dominant natural land cover type in Napa County, covering over 167,000 acres (33 percent of the land cover in Napa County) and are typically characterized by several oak species, including coast live oak (*Quercus agrifolia*), interior live oak (*Quercus wislizenii*), and black oak (*Quercus kelloggii*) (NCCDPD, 2005). The oak woodland in the vicinity of the Proposed Project consists mainly of mixed oak woodland and black oak woodland. Coniferous forests are also common in the County's higher elevation areas, occurring on almost 38,000 acres in the County. The Napa County Vegetation Alliances data (2007) designates the coniferous forest on and in the vicinity of the parcel as Douglas fir-Ponderosa pine Forest and Ponderosa pine forest. Biological field surveys conducted onsite identified the project parcel as containing Douglas fir-Ponderosa pine forest (see discussion in **Section 4.4.4**).

Grassland covers over 53,700 acres or nearly 11 percent of the County. The dominant grasses in the County and across California are non-native species including wild oats (*Avena* spp.), brome grasses (*Bromus* spp.), wild barley (*Hordeum* spp.), Italian ryegrass (*Lolium multiflorum*), medusa head (*Taeniantherum caput-medusae*), and annual fescue (*Vulpia*) species. Agricultural cropland consisting of vineyards is another predominant land use in the vicinity of the parcel. Agricultural land uses occupy over 40,000 acres in Napa County.

The project parcel is located on a largely forested upland bench between the Conn Creek and Moore Creek drainages within the "Saint Helena, California" USGS 7.5 minute quad. The parcel is within the Conn Creek watershed and is located north of Lake Hennessey.

Elevation onsite ranges from approximately 1,800 to 1,876 feet above sea level. The project parcel includes a relatively flat area on the hilltop and steeply-sloped hillsides. Slopes on the parcel range from approximately one to 14 percent, but the placement of the Proposed Vineyard Block B on the hilltop avoids the steeper slope on the parcel (**Figure 4.1-1**).

4.4.3-2 PROJECT PARCEL

As described in **Section 3.0**, the parcel is located in the 62.7 square-mile Conn Creek watershed and does not contain any streams, though runoff from the hillsides eventually travels to either the upper reaches of Conn Creek to the west or Moore Creek to the southeast.

Soils within the project parcel are classified by the U.S. Department of Agriculture (USDA) Soil Conservation Service's, Napa County Soil Survey as Soil Conservation Services (SCS) 100 & 102, Aiken Loam, with an erosion hazard rating of moderate (refer to **Section 4.6** for further discussion of soils).

In the local area of the project parcel, the average annual precipitation is 40.47 inches, and the average annual temperature is 46 to 69 degrees Fahrenheit (WRCC, 2012). On average, the area receives approximately two inches of snow in a year.

4.4.4 BIOTIC COMMUNITIES AND ALLIANCES

Biotic communities are the characteristic assemblages of plants and animals that are found in a given range of soil, climate, and topographic conditions across a region. Biotic communities across Napa County were mapped by Thorne et al. (1994). Site specific evaluations of the project parcel were conducted during the 2012 biological field surveys (AES, 2012; ERM, 2012) to better describe existing conditions on the project parcel, to capture finer-scale vegetation differences, as well as to use the updated classifications of biotic communities in the revised *Manual of California Vegetation, Second Edition* (Sawyer et al., 2009). The primary purpose of the MCV classification is to assist in the location and determination of significance and rarity of various vegetation types (biotic communities).

Jurisdiction over Sensitive Biotic Communities that are considered critical habitat for species listed as threatened or endangered by the Federal government lies with the USFWS and NMFS under the National Oceanic and Atmospheric Administration (NOAA). The CDFW considers Sensitive Biotic Communities to be those which are listed in the CNDDB (e.g., native grasslands; CDFW, 2003). Sensitive Biotic Communities are either designated by CDFW, considered by local experts to be communities of limited distribution, and/or considered to be waters of the U.S. or the state (Napa County, 2008).

Other natural communities in the County are considered sensitive simply due to their limited local distribution. These Biotic Communities of Limited Distribution encompass less than 500 acres of cover within the County and are considered by local biological experts to be worthy of conservation (e.g., Coast Redwood Alliance; Napa County, 2008). As shown in **Figure 4.4-1** and **Table 4.4-2** below, there are no sensitive biotic communities on the project parcel that meet the County's definition of a Biotic Community of Limited Distribution.

Vegetation communities identified onsite during the 2012 biological field surveys were based on Napa County Vegetation Alliance data (2007), which were refined according to field observations of species composition and density, and then classified according to MCV (Sawyer et al. 2009) and Holland (1986). **Figure 4.4-1** shows the vegetation alliances, or habitat types within the project parcel. A list of the habitat types and approximate impact acreages due to the Proposed Project are shown in **Table 4.4-2**.

Table 4.4-2 reports the gross acreage of each vegetation type in Napa County (when those estimates were available), on the project parcel, and summed across the proposed vineyard blocks. Detailed descriptions of each habitat type are provided in **Sections 4.4.4-1** through **4.4.4-3**. Representative photographs of each vegetation type are shown in **Figure 4.4-2.**

TABLE 4.4-2
BIOTIC COMMUNITIES AND IMPACT ACREAGES IN THE BIOLOGICAL SURVEY AREA

BIOTIC COMMUNITY[1]	NAPA COUNTY		ANGWIN AREA[5]	PROPOSED VINEYARD DEVELOPMENT		
	ESTIMATED ACREAGE IN NAPA COUNTY[2]	PERCENT OF TOTAL ACREAGE IN NAPA COUNTY[2]	ACREAGE OF VEGETATION TYPE IN THE ANGWIN AREA	ACREAGE OF VEGETATION TYPE PROPOSED FOR DEVELOPMENT[3]	PERCENT OF VEGETATION TYPE IMPACTED WITHIN SURVEY AREA[4]	PERCENT OF VEGETATION TYPE IN ANGWIN AREA IMPACTED
California Annual Grasslands Alliance	39,174.00	7.72%	52	3.66	100.00%	7.04%
California Black Oak Forest Alliance	2,572.00	0.51%	298	0.00	0.00%	0.00%
Douglas fir- Ponderosa pine Forest Alliance	9,196.00	1.81%	1,350	12.78	51.7%	0.95%

Notes: *All acreages are approximate
[1]Based on Sawyer et al. 2009.
[2]Based on NCCDPD, 2005.
[3]Includes proposed vineyard development and erosion control measures within the 17± acre THP footprint.
[4]Based on Figure 4.4-1
[5]Biotic communities classification of California Grasslands Alliance (*Avena* (*barbata, fatua*) Semi-Natural Herbaceous Stands (Wild oats grassland)) is based on Napa County Baseline Data Report (NCCDPD, 2005) and Biological Resources Technical Memorandum (AES, 2012)
Sources: NCCDPD, 2005, AES, 2012, Sawyer et al. 2009

PHOTO 1: View to the north of Douglas Fir-Ponderosa Pine Alliance with Madrone trees integrated.

PHOTO 2: View to the north of non-native grassland located in the center of the project parcel.

PHOTO 3: View to south of fence surrounding the project parcel taken from the western boundary.

PHOTO 4: View to the south of rockpile and disturbed/ ruderal gravel area.

PHOTO 5: View of California Black Oak Alliance habitat with Ponderosa Pine integrated on the eastern portion of the project parcel.

PHOTO 6: View to the north of the airport, Angwin-Parrett Field, located to the north of the project parcel.

SOURCE: AES, 2013

Figure 4.4-2
Site Photographs (May 2012)

4.4.4-1 GRASSLANDS

***Avena* (*barbata, fatua*) Semi-Natural Herbaceous Stands (Wild oats grassland) / California Annual Grasslands Alliance**

The south-central portion of the project parcel contains approximately 3.66 acres of open annual grassland dominated by wild oats and characterized by past human disturbance. Large stockpiles of boulders are found on the margins of this area near the southeastern portion of the project parcel. The vegetation is typically dominated by non-native annual grasses. Herbaceous species composition and density allows this area to be best classified as *Avena barbata* Semi-Natural Herbaceous Stands (Sawyer et al. 2009). This grassland alliance can be placed into the general California Annual Grasslands Alliance, which is currently used for classification in Napa County (NCCPCD, 2005).

The dominant plant species found in this community include non-native grasses such as slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), and soft chess (*Bromus hordeaceus*). Non-native forbs are often found in association with this grassland habitat type and may include filaree (*Erodium botrys*), sow thistle (*Sonchus asper*), chickweed (*Stellaria media*), rose clover (*Trifolium hirtum*), Italian thistle (*Carduus pycnocephalus*), yellow star thistle (*Centaurea solstitialis*), and milk thistle (Silybum marianum). Native forbs such as cudweed (*Gnaphalium canescens* ssp. *beneolens*) and others grow sparsely among non-native grasses in the area.

California Annual Grasslands Alliance on the project parcel is approximately 3.66 acres and represents approximately 0.009 percent of the total grasslands mapped in Napa County (NCCDPD, 2005; **Table 4.4-2**). Development of the Proposed Project would impact the total acreage of grassland on the project parcel (3.66 acres). This was part of the project design to reduce impacts to onsite woodlands.

4.4.4-2 WOODLANDS

***Quercus kelloggii* Forest Alliance (California Black Oak Forest Alliance)**

The eastern portion of the hilltop survey area contains woodland comprised of black oak (*Quercus kelloggii*) and coast live oak (*Quercus agrifolia*) integrated with Ponderosa pine (*Pinus ponderosa*). Black oaks comprise greater than 30 percent relative cover in the overstory and are co-dominant with coast live oak in this area, but lie outside of the clearing limits of the timber harvest. The tree species composition and density taken together with that of Ponderosa pine, allow this area to be best classified according to the membership requirements of California Black Oak Forest Alliance (Sawyer et al. 2009) and Black Oak Forest by Holland (1986). This alliance has a rarity ranking of G4-S4, which corresponds to greater than 100 viable occurrences worldwide/statewide and/or more than 12,950 hectares

(Sawyer et al. 2009). The habitat type will be fully avoided by construction and operation of the Proposed Project.

The shrub layer in the understory is largely absent due to a past regime of underbrush clearing and includes: snowberry (*Symphoricarpos alba*), poison oak (*Toxicodendron diversilobum*), and coffeeberry (*Rhamnus californica*). Other understory vegetation is sparse, limited to herbaceous species such as California poppy (*Eschscholzia californica*), smooth cat's ear (*Hypochaeris glabra*), pacific sanicle (*Sanicula crassicaulis*), soap plant (*Chlorogalum pomeridianum*), woodland pea (*Lathyrus vestitus*), and several species of brome (*Bromus* spp.) (AES, 2012; WRA, 2007). This vegetation community intergrades with Douglas Fir-Ponderosa Pine Forest Alliance (described below) along its margins.

California Black Oak Forest provides habitat for many wildlife species, especially those who are disseminators of acorns such as acorn woodpecker (*Melanerpes formicivorus*), western scrub jay (*Aphelocoma californica*), and western gray squirrel (*Sciurus griseus*), and those that use acorns as major sources of nutrition such as dusky-footed woodrat (*Neotoma fuscipes*), California ground squirrel (*Otospermophilus beecheyi*), and mule deer to name a few (CDFW, 1988).

California Black Oak Forest Alliance in Napa County covers approximately 2,572 acres, or roughly 0.51 percent of the total vegetative cover in the County. Approximately 4.58 acres of California Black Oak Forest Alliance is present within the property survey area (**Table 4.4-2**). As stated above, development and operation of the Proposed Project will not impact the California Black Oak Forest Alliance identified on the property since the proposed vineyard block has been designed outside of this area (**Table 4.4-2**). Site photos provided in **Figure 4.4-2** show views of the oak woodland on the property.

Pseudotsuga menziesii- Pinus ponderosa Forest Alliance (Douglas fir-Ponderosa pine Forest Alliance)

Douglas fir-Ponderosa pine Forest Alliance is the most prominent habitat type present in the survey area (**Figure 4.4-1**). Douglas fir is the dominant species in the overstory, comprising roughly 53 percent of the vegetative cover, and Ponderosa pine occurs as a co-dominant species in the overstory comprising a relative vegetative cover of approximately 30 percent. Historically, this habitat type on the project parcel has been harvested for timber and has been thinned over the years. Approximately 25 acres of Douglas fir-Ponderosa pine forest occur in the biological field survey area on the parcel (**Figure 4.4-1**). Madrone (*Arbutus menziesii*) also occurs within this habitat type. Tree species composition and density allow this area to be best classified according to the membership requirements of Douglas fir-Ponderosa pine Forest Alliance in the MCV (Sawyer et al. 2009) and Coast Range Mixed Coniferous Forest by Holland (1986).

While the Napa County Vegetation Alliances data (2007) designates this area as Ponderosa Pine Alliance, the results of field observations of species composition and density onsite found that this area is best classified as Douglas fir-Ponderosa pine forest alliance due to the dominance of Douglas fir in the overstory and presence of Ponderosa pine as a secondary co-dominant species with Madrone also present. Napa County Vegetation Alliances data (2007) mapping shows that the forested areas directly adjacent to the project parcel to the west and south also contain Douglas Fir-Ponderosa Pine Forest, so it appears that the project parcel best meets this classification owing to the membership requirements of this alliance per MCV and the County's similar Douglas Fir-Ponderosa pine forest designation shown for areas immediately adjacent to the project parcel.

According to the Napa County Baseline Data Report (2005) on a local scale for the area of Angwin, Douglas fir-Ponderosa pine forest occurs on 1,350 acres and is the dominant coniferous forest type in the region making up 86 percent of the total coniferous forest (1,552 acres). As explained above, the Douglas fir-Ponderosa pine forest on the project parcel best meets this classification as described in the Napa County Baseline Data Report (2005) for the Angwin area. Douglas fir-Ponderosa pine forest alliance is more widespread in the Angwin area as compared to the less prevalent Ponderosa Pine alliance, which is mapped by the County as representing 133 acres (or 8.6 percent), and the Douglas Fir forest alliance which is mapped as representing 26 acres (or 1.6 percent) of the local Angwin area (NCCDPD, 2005).

As stated above, the shrub layer in the understory of the Douglas fir-Ponderosa pine forest onsite is largely absent due to a past regime of underbrush clearing, however manzanita (*Arctostaphylos manzanita* spp. *manzanita*) and patches of herbaceous vegetation are found within the understory throughout this habitat type, including bull thistle (*Cirsium vulgare*), mustard (*Brassica* spp.), miner's lettuce (*Claytonia perfoliata*), bedstraw (*Gallium aparine*), hedgehog dog-tail grass (*Cynosurus echinatus*), and blue wildrye (*Elymus glaucus*).

Douglas fir-Ponderosa pine forest can support a wide diversity of wildlife species. Species of small mammals known to occur in this habitat type include dusky-footed woodrat, deer mouse, and ornate shrew. Bird species such as northern spotted owl (*Strix occidentalis*) and various thrushes, vireos, and warblers are commonly associated with this habitat type, as well.

The Douglas fir-Ponderosa pine forest alliance has a rarity ranking of G4-S4, which corresponds to greater than 100 viable occurrences worldwide/statewide and/or more than 12,950 hectares (Sawyer et al. 2009). According to the Napa County Baseline Data Report

(2005), this habitat type occurs on 9,196 acres or 1.81 percent of the County. Approximately 12.78 acres (51.7 percent) of the total 24.72 acres of Douglas fir-Ponderosa pine Forest Alliance on the project parcel would be developed into vineyard (**Table 4.4-2**). This represents 0.14 percent of this vegetation type impacted within the County (**Table 4.4-2**).

4.4.4-3 WETLANDS, DRAINAGES AND WATERS OF THE U.S.

No wetlands and/or watercourses have been identified on the project parcel during the biological survey by AES in 2012 or in previous surveys conducted by WRA (2007) that may be considered under the jurisdiction of the USACE, RWQCB, and CDFW.

Off-Site Streams

No streams occur within the project parcel. Although steelhead (*Oncorhynchus mykiss*) may occur within five miles of the project parcel, the drainages in the area are unlikely to support anadromous fisheries due to the dam at Lake Hennessey, which presents an impassible barrier to fish passage from the Napa River further downstream (WRA, 2007). Lake Hennessey also functions as a sediment trap, reducing sediment transport beyond Conn Dam and therefore downstream to anadromous streams. In addition, the ECP contains erosion control measures that would be implemented to prevent chemical and sediment transport from the project parcel to the two creeks and further downstream.

4.4.4-4 WILDLIFE MOVEMENT

In Napa County as a whole, wildlife movement is becoming increasingly restricted by urban and agricultural development. The project parcel has been harvested for timber in the past and shows signs of succession and re-growth of shrubs and trees. The project parcel is surrounded on three sides by adjacent woodlands; however, the entire project parcel has remained deer fenced since the purchase of the parcel by the current landowner several years ago. Therefore, the project parcel currently does not provide a corridor for large animal movement, such as deer or other wildlife that would otherwise be restricted from entering the property by the existing deer fence. Additionally, the project parcel has not been identified as part of a major regional movement corridor (NCCDPD, 2005).

4.4.4-5 WILDLIFE

Wildlife was identified onsite during the biological surveys by one or more of the following: calls, scat, remains, or direct sight (AES, 2012; WRA, 2007). Animals with potential to occur on the parcel and to which special regulatory status applies are discussed in the following section.

4.4.4-6 SPECIAL STATUS SPECIES

Special status species are those considered to be of management concern to state and/or federal resource agencies, including species:

- Listed as endangered, threatened or candidate for listing under the Federal Endangered Species Act.
- Listed as endangered, threatened, rare or proposed for listing under the California Endangered Species Act of 1970.
- Designated as endangered or rare, pursuant to California Fish and Game Code (§ 1901).
- Designated as fully protected, pursuant to California Fish and Game Code (§§ 3511, 4700 or 5050).
- Designated as species of special concern by the CDFW.
- Meeting the definitions of rare or endangered under CEQA.
- Listed as "locally rare" special status plant species in the Napa County Baseline Data Report (NCCDPD) (CNPS Lists 3 and 4), including plants ranked by the CNPS to be "rare, threatened or endangered in California" (Lists 1A, 1B and 2) (NCCDPD, 2005).

The list of potentially occurring special-status species shown in **Table 4.4-3** below is based on recent database queries of the project parcel quadrangle and the surrounding nine quadrangles (USFWS, 2013; CDFW, 2013; CNPS, 2013) and serves as an updated species list from the database queries performed in the Biological Resources Technical Memorandum (AES, 2012; **Appendix D**). Additional, focused queries were performed using Rarefind (CDFW, 2003) to identify species occurrence records within a 5-mile radius of the project parcel for those species with the potential to occur on the project parcel. A 5-mile radius focused CNDDB records search is commonly used in impact analysis under CEQA to narrow down and determine potential species impacts because it considers factors that affect the likelihood of occurrence for a species in the vicinity of a project, including habitat types, soil types, micro climate conditions, and local land uses. Species for which occurrence records were identified within a 5-mile radius of the parcel were given special consideration in the most recent biological field surveys in May 2012 (AES, 2012).

The list in **Table 4.4-3** has been adapted to show only those special-status species with the potential to occur onsite. As stated in **Section 4.2**, CDFW recommends that all CNPS List 1A, 1B, and 2 plant species be addressed for CEQA projects (CDFW, 2012). CNPS List 3 and 4 species were considered as well since such species are considered locally rare in Napa County and are recommended to be addressed per the NCBDR (see Biological Resources Technical Memorandum (AES, 2012) in **Appendix D**).

The project parcel contains suitable habitat for 13 special species, three bird species, and two mammal species as shown in **Table 4.4-3**. These species are discussed further below in **Sections 4.4.4-7** through **4.4.4-9**.

Species were dismissed from further consideration (refer to **Appendix E**) and analysis in **Section 4.4** of this EIR if:

1) Their distributions fall outside the project site;
2) The species has been recently delisted or has no state or federal status (but may be tracked by the CNDDB); and/or
3) The project site does not provide suitable habitat and/or soils for the species.

No critical habitats listed by the USFWS occur within the project parcel (**Appendix E**).

Descriptions of target species that have the potential to occur onsite are provided below (refer to **Table 4.4-3**).

TABLE 4.4-3
SPECIAL STATUS SPECIES WITH THE POTENTIAL TO OCCUR ON THE PROJECT PARCEL

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Amorpha californica* var. *napensis Napa false indigo	--/--/1B.2	Monterey, Marin, Napa, and Sonoma counties.	Broad-leaf upland forest (openings), chaparral, and cismontane woodland. Elevations from 120-2,000 meters.	April - July	No
Amsinckia lunaris Bent-flowered fiddleneck	--/--/1B.2	Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, and Yolo counties.	Coastal bluff scrub, Cismontane woodland, and Valley and foothill grassland. Elevations; 3-500 meters.	March - June	No
Arctostaphylos canescens* ssp. *sonomensis Sonoma canescent manzanita	--/--/1B.2	Known to occur in Colusa, Humboldt, Lake, Mendocino, Sonoma, Tehama, and Trinity counties (CNPS 2012).	Chaparral and Lower montane coniferous forest/sometimes serpentinite. Elevations; 180-1,675 meters (CNPS 2012).	January –June	No
Arctostaphylos manzanita* ssp. *elegans Konocti manzanita	--/--/1B.3	Known to occur in Colusa, Glenn, Lake, Napa, Sonoma and Tehama counties (CNPS 2012).	Chaparral, Cismontane woodland, Lower montane coniferous forest (volcanic). Elevations; 395-1,615 meters (CNPS 2012).	March - May	No
Astragalus clarianus Clara Hunt's milk-vetch	FE/CT/1B.1	Known to occur in Napa and Sonoma counties (CNPS 2012).	Chaparral (openings), Cismontane woodland, and Valley and foothill grassland/serpentinite or volcanic, rocky, and clay. Elevations; 75-275 meters (CNPS 2012).	March - May	No
Astragalus rattanii* var. *jepsonianus Jepson's milk-vetch	--/--/1B.2	Known to occur in Colusa, Glenn, Lake, Napa, Tehama, Yolo counties (CNPS 2012).	Chaparral, Cismontane woodland, Valley and foothill grassland (often serpentinite). Elevations; 320-700 meters (CNPS 2012).	March - June	No

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Brodiaea californica* var. *leptandra Narrow-anthered California brodiaea	--/--/1B.2	Lake, Napa and Sonoma counties.	Broadleaf upland forest, chaparral valley and foothill grassland, and lower montane coniferous forest; rocky volcanic soil. Elevations from 110-915 meters.	May - July	No
Ceanothus confusus Rincon Ridge ceanothus	--/--/1B.1	Lake, Mendocino, Napa, and Sonoma counties.	Closed-cone coniferous forest, Chaparral, and Cismontane woodland/volcanic or serpentinite. Elevations; 75-1065 meters.	February - June	No
Leptosiphon jepsonii Jepson's leptosiphon	--/--/1B.2	Lake, Napa and Sonoma counties.	Chaparral and cismontane woodland, usually volcanic. Elevations from 100-500 meters.	March - May	No
Lupinus sericatus Cobb Mountain lupine	--/--/1B.2	Colusa, Lake, Napa, and Sonoma counties.	Broad-leafed upland forest, Chaparral, Cismontane woodland, and Lower montane coniferous forest. Elevations range from 275-1,525 meters.	March - June	No
Micropus amphibolus Mount Diablo cottonweed	--/--/3.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties (CNPS 2012).	Broadleafed upland forest, Chaparral, Cismontane woodland, and Valley and foothill grassland/rocky. Elevations; 45-825 meters (CNPS 2012).	March - May	No
Trichostema ruygtii Napa bluecurls	--/--/1B.2	Napa County, possibly adjacent Solano County.	Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland; vernally mesic thin soils and vernal pools. Elevations from 30-680 meters.	June - October	No

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Viburnum ellipticum Oval-leaved viburnum	--/--/2.3	Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, and Sonoma counties. Also occurs in Oregon and Washington.	Chaparral, cismontane woodland and lower montane coniferous forest. Elevations from 215-1,400 meters.	May - June	No
Birds					
Elanus leucurus white-tailed kite	--/FP/--	Permanent resident of coastal and valley lowlands.	Nests in dense oak, willow, or other tree stands near open foraging areas. Hunts in herbaceous lowlands with variable tree growth.	Year-round peak nesting is from May - August	No
Progne subis purple martin	--/CSC/--	Local summer resident in wooded low-elevation habitats throughout California; rare migrant in spring and fall, absent in winter. In the south, now only a rare and local breeder on the coast and in interior mountain ranges.	Inhabits open forests, woodlands, and riparian areas in breeding season. Found in a variety of open habitats during migration, including grassland, wet meadow, and fresh emergent wetland, usually near water. Nests in conifer stands, often in woodpecker holes. Uses valley foothill and montane hardwood and conifer, and riparian habitats.	March - August	No

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Strix occidentalis caurina Northern spotted owl	FT/--/--	Geographic range of subspecies *caurina* extends from southwestern British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, and the North Coast Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2300 meters. Appear to prefer old-growth forests, but use of managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).	All Year	No
Mammals					
Antrozous pallidus pallid bat	--/CSC/--	Locally common species at low elevations. Throughout California except for the high Sierra Nevada from Shasta to Kern counties, and the northwestern corner of the state from Del Norte and western Siskiyou counties to northern Mendocino County.	Habitats occupied include grasslands, shrublands, woodlands and forests from sea level through mixed conifer forests below 2,000 meters. The species is most common in open, dry habitats with rocky areas for roosting. Roosts also include cliffs, abandoned buildings, bird boxes, and under bridges.	March - September	No

SCIENTIFIC NAME COMMON NAME	FEDERAL/STATE /OTHER STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Lasiurus cinereus hoary bat	--/CSC/--	May be found at any location in California, although distribution patchy in southeastern deserts.	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Preferred sites are hidden from above, with few branches below, and have ground cover of low reflectivity. Females and young tend to roost at higher sites in trees. Feeds primarily on moths. Requires water.	All Year	No

STATUS CODES
FEDERAL: U.S. Fish and Wildlife Service and National Marine Fisheries Service
FE Listed as Endangered by the Federal Government
FT Listed as Threatened by the Federal Government

STATE: California Department of Fish and Wildlife
CE Listed as Endangered by the State of California
CT Listed as Threatened by the State of California
CSC California Species of Special Concern
FP Fully Protected, Fish and Game Code § 3511

OTHER:
CNPS: California Native Plant Society
List 1B Plants rare or endangered in California and elsewhere
List 2 Plants rare or endangered in California, but more common elsewhere
List 3 Plants for which more information is needed
List 4 Plants of limited distribution
Threat Ranks
0.1-Seriously threatened in California (high degree/immediacy of threat)
0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)
Months in parenthesis are uncommon.

Sources: CNPS, 2012; CNPS, 2013; BCI, 2013

4.4.4-7 SPECIAL STATUS PLANTS

All of the special status plant species identified with the potential to occur on the project parcel, excluding those for which no suitable habitat or soils were present on the project parcel, are described briefly below. The CDFW suggests that all CNPS List 1B and 2 plant species be addressed for CEQA projects. Although not required for the CEQA review process, CNPS recommends that List 3 and List 4 plant species also be considered because their status may change and other local and/or regional regulations may require evaluation.

Napa false indigo (*Amorpha californica* var. *napensis*)
Pea Family (Fabaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Napa false indigo is a nearly glabrous deciduous shrub distinguished by prickle-like glands on the main axis of compound leaves and a sessile gland terminating leaflet midribs; the raceme of small purple flowers have showy exerted yellow stamens (Hickman, 2012). The period of identification is April through July. This plant is found in cismontane woodland, chaparral, and openings of broadleaved upland forest from 120 to 2,000 meters amsl. Napa false indigo is known from Monterey, Marin, Napa and Sonoma counties (CNPS, 2012).

There are 10 occurrences of this species within a five mile radius of the project parcel (CDFW, 2003). The nearest is located approximately 0.25 miles east of the project parcel (CNDDB Occurrence Number 16). The project parcel provides suitable habitat for Napa false indigo within oak woodland habitat and along the edge of the Ponderosa Pine alliance on site. Napa false indigo was not observed during of the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Bent-flowered fiddleneck *(Amsinckia lunaris)*
Borage Family (Boraginaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.2

Bent-flowered fiddleneck is an annual herb occurring in coastal bluff scrub, cismontane woodland, and valley and foothill grassland communities at elevations that range from three to 500 meters amsl. This species blooms from March through June. The known range of

bent-flowered fiddleneck includes Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, and Yolo counties (CNPS, 2012).

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). The project parcel provides suitable habitat for bent-flowered fiddleneck within annual grassland and oak woodland onsite. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Sonoma canescent manzanita (*Arctostaphylos canescens* ssp. *sonomensis*)
Heath Family (Ericaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Sonoma canescent manzanita is an evergreen shrub in the heath family (Ericaceae). It occurs in chaparral and lower montane coniferous forests, sometimes in serpentinite soils from elevations ranging from 180 to 1,675 meters amsl. The species blooms from January to April and sometimes into June and is known to occur in Colusa, Humboldt, Lake, Mendocino, Sonoma, Tehama, and Trinity counties (CNPS, 2012).

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). However, the project parcel provides suitable habitat for Sonoma canescent manzanita within the Ponderosa pine forest and oak woodland onsite. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Konocti manzanita (*Arctostaphylos manzanita* ssp. *elegans*)
Heath Family (Ericaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.3

Konocti manzanita is a shrub or small tree that occurs in chaparral, cismontane woodland, and lower montane coniferous forest communities at elevations ranging from 395 to 1,615 meters amsl. It frequently occurs on volcanic substrates. This species blooms from March

through May. The known range of Konocti manzanita includes Colusa, Glenn, Lake, Napa, Sonoma, and Tehama counties (CNPS, 2012).

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). However, the project parcel provides suitable habitat for Konocti manzanita within the Ponderosa pine forest and oak woodland onsite. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Clara Hunt's milk-vetch (*Astragalus claranus*)
Pea Family (Fabaceae)
Federal Status – Endangered
State Status – Threatened
Other – CNPS 1B.1

Clara Hunt's milk-vetch is a slender, sparse-leaved annual with up to nine leaflets per leaf and two to 14 white purple-tipped flowers (Hickman, 2012). This species is reported from Napa and Sonoma counties on rocky, clay, or serpentine soils in sparsely vegetated openings within blue oak woodland, chaparral, and grassland communities, at elevations of 320 to 700 meters amsl. The period of identification is March through May. Known from only five occurrences, Clara Hunt's milk-vetch was proposed for Federal listing in August of 1995 and was listed as Endangered in October 1997 (U.S. Federal Register, 1997). Currently, this species does not have a recovery plan or designated critical habitat (USFWS, 2009). CDFW (formerly, California Department of Fish and Wildlife, CDFW) listed this species as Threatened in 1990, and its status was determined to be "Stable to Declining" by a CDFW assessment in 1999 (CDFW, 2003). It is threatened by urbanization, recreational development, grazing, and non-native plants.

There are four recorded occurrences of this species within a five mile radius of the project parcel (CDFW, 2003). The closest occurrence of this species is documented approximately 4.5 miles south of the project parcel (CNDDB Occurrence Number 13). This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Jepson's milk-vetch (*Astragalus claranus*)
Pea Family (Fabaceae)
Federal Status – Endangered
State Status – Threatened
Other – CNPS 1B.1

Jepson's milk-vetch is an annual herb that occurs in chaparral, cismontane woodland, and valley and foothill grassland communities at elevations that range from 320 to 700 meters amsl. It frequently occurs on, but is not limited to, serpentine substrates. This species blooms from April through June. The known range of Jepson's milk-vetch includes Colusa, Glenn, Lake, Napa, Tehama, and Yolo counties (CNPS, 2012).

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). However, the project parcel provides suitable habitat for Jepson's milk-vetch within the annual grassland and oak woodland habitats onsite. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Narrow-anthered California brodiaea (*Brodiaea californica* var. *leptandra*)
Lily Family (Liliaceae)
Federal Status – None
State Status – None
Other – CNPS 1B.2

Narrow-anthered California brodiaea can be distinguished from the more common harvest brodiaea (*Brodiaea elegans* ssp. *elegans*) by checking the staminode character traits. Narrow-anthered California brodiaea has pale lilac to white flowers, and with a stem greater than 50 centimeters tall (Hickman, 2012). Narrow-anthered California brodiaea typically occurs from 110 to 915 meters in elevation in broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland on generally thin rocky soils, of volcanic serpentinite origin, often along drainages. The ideal period of identification is from May through July. It is found in Lake, Napa, and Sonoma counties (CNPS, 2012).

There are seven recorded occurrences of this species within a five mile radius of the project parcel (CDFW, 2003). The nearest record of this species is located approximately 0.5 miles southeast of the project parcel (CNDDB Occurrence Number 9). The project parcel provides suitable habitat for narrow-anthered California brodiaea within the annual grassland and oak

woodland. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Rincon Ridge ceanothus (*Ceanothus confusus*)
Buckthorn Family (Rhamnaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.1

Rincon Ridge ceanothus is a prostrate to decumbent shrub that occurs in closed-cone coniferous forest, chaparral, and cismontane woodland communities at elevations that range from 75 to 1,065 meters amsl. It frequently occurs on volcanic and/or serpentinite substrates. This species blooms from February through June. The known range of Rincon Ridge ceanothus includes Lake, Mendocino, Napa, and Sonoma counties(CNPS, 2012). This species is noted for having leaves that are less than two centimeters (cm) long with toothed margins and fruits that are typically five millimeters long. The fruits are bright red with slender upright horns that are not wrinkled, but have minute ridges (Hickman, 2012).

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). However, the project parcel provides suitable habitat for Rincon Ridge ceanothus within the oak woodland habitat onsite. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Jepson's leptosiphon (*Leptosiphon jepsonii*)
Phlox Family (Polemoniaceae)
Federal Status – none
State Status – none
Other – CNPS 1B.2

Described in 1996, Jepson's leptosiphon is an annual member of the phlox family that occurs in chaparral and woodland habitats, usually in volcanic soils, from 100 to 500 meters amsl. The species' known range is restricted to Lake, Napa and Sonoma counties. Its blooming period ranges from March to May (CNPS, 2012).

There are nine recorded occurrences of this species within a five mile radius of the project parcel (CDFW, 2003). The nearest record of this species is located approximately two miles southeast of the project parcel (CNDDB Occurrence Number 37). The project parcel provides suitable habitat for Jepson's leptosiphon within the oak woodland habitat onsite. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Cobb Mountain lupine (*Lupinus sericatus*)
Pea Family (Fabaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.2

Cobb Mountain lupine is a perennial herb occurring in broadleaf upland forest, chaparral, cismontane woodland, and lower montane coniferous forest communities at elevations that range from 275 to 1,525 meters amsl. This species blooms from March through June. The range of Cobb Mountain lupine includes Colusa, Lake, Napa, and Sonoma counties (CNPS, 2012). This species is noted for having peduncles that are eight to 15 centimeters long, leaves that are covered with short, appressed hairs, and purple petals (Hickman, 2012).

There are eight recorded occurrences of this species within five miles of the project parcel. The nearest record of this species is located approximately one mile southeast of the project parcel (CNDDB Occurrence Number 9). The oak woodlands and coniferous forests within the project parcel provide suitable habitat for this species. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Mount Diablo cottonweed (*Micropus amphibolus*)
Federal Status – None
State Status – None
Other – CNPS List 3.2

Mount Diablo cottonweed is an annual herb from the composite family (Asteraceae). It occurs in broadleaf upland forest, chaparral, cismontane woodland, and valley and foothill grassland (rocky) habitats at elevations that range from 45 to 825 meters above mean sea level. This species blooms from March through May. The range of Mount Diablo

cottonweed includes Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties (CNPS, 2012).

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). The oak woodlands and coniferous forests within the project parcel may provide suitable habitat for this species. However, this species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Napa bluecurls (*Trichostema ruygtii*)
Legume Family (Fabaceae)
Federal Status – None
State Status – None
Other – CNPS List 1B.2

Napa bluecurls is an annual herb found in chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland, and vernal pools. It is known to occur at elevations ranging from 30 to 680 meters amsl. The range of this species includes Lake, Napa, and Solano counties. This species blooms from June to October (CNPS, 2012).

There is one recorded occurrences of this species within five miles of the project parcel, located approximately one mile southeast of the project parcel (CNDDB Occurrence Number 3) (CDFW, 2003). The oak woodlands and annual grassland within the project parcel provide suitable habitat for this species. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

Oval-leaved viburnum (*Viburnum ellipticum*)
Caprifoliaceae family (Caprifoliaceae)
Federal Status – None
State Status – None
Other – CNPS List 2.3

The oval-leaved viburnum is a deciduous shrub with white flowers clustered in inflorescences two inches in diameter. Its leaves are elliptic, round, or cordate and have coarsely dentate margins (Hickman, 2012). Suitable habitat includes chaparral, cismontane

woodland, and lower montane coniferous forest, though it occurs most often in chaparral or yellow-pine forest habitats. It ranges in elevation from 215 to 1,400 meters amsl. It is known to occur in Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, Sonoma, and Tehama counties as well as Oregon and Washington. This species' blooming period is typically from May through June (CNPS, 2012).

There are no recorded occurrences of this species within five miles of the project parcel (CDFW, 2003). However, the Ponderosa pine forest within the project parcel provides suitable habitat for this -species. This species was not observed during the focused biological surveys of the project parcel, which were conducted within the appropriate period of identification for this species (AES, 2012). This species was not identified during previous biological surveys of the project parcel by Eakins (2004) and WRA (2007).

4.4.4-8 FORMERLY LISTED AND SPECIAL-STATUS BIRDS

While no special status bird species were observed on the project parcel during the biological surveys conducted by AES (2012) or in past surveys conducted by WRA (2007), suitable nesting and/or foraging habitat exists for several species. In addition, Ted Wooster, biologist, noted a pair of great horned owls nesting within the southwestern portion of the project parcel in 2004. These species, as well as the bird species from **Table 4.4-3**, are discussed briefly below.

Raptor Species

A few raptors formerly listed as California species of special concern have been downgraded in recent years to "species to watch," since their populations are thought to have stabilized (Shuford and Gardali, 2008). Some of these raptors have marginal potential to forage within the project parcel, including sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos*). Many of these species are known to nest in southern Napa County. The sharp-shinned hawk and ferruginous hawk are likely to occur primarily as migrants and/or winter visitors. Wooster (2004) noted that the project parcel supports few species of wildlife since the woodlands onsite are largely devoid of snags, dead branches, or woody debris. Groundcover has largely been removed due to clearing. As a result, the project parcel has a low potential to support nesting raptor species.

In 2004, a nesting pair of great horned owls was documented on the southwest corner of the project parcel (Wooster, 2004); however, this area is outside of the project footprint and will be fully avoided by the timber harvest and vineyard development activities. The location of this 2004 nest was in the far southwest corner of the project parcel, greater than 150 feet from the THP area. This area will be dedicated for conservation as part of the Habitat

Retention Area on the project parcel (refer to **Figure 4.4-1** and **Mitigation Measure 4.4-4**). No active great horned owl nests have been identified on the parcel to date. A brief species description is provided below.

Great Horned Owl (*Bubo virginianus*)
Family Strigidae – True owls
Federal Status – None
State Status – None

Great horned owls are common, permanent residents throughout the state from sea level to 2100 m (0 - 7000 ft). This species utilizes a variety of forests with meadows and other openings, extending from valley foothill hardwood to mixed conifer habitats. Great horned owls commonly feed and breed in riparian, conifer, chaparral, and desert habitats (CWHR, 2013).

Great horned owls require trees with dense foliage for roosting, and often use thickly wooded canyons. These owls frequently forage in meadows and woodland or forest openings, or along forest edges. Prey includes rabbits, rodents, and other small to medium-sized mammals, which typically constitute 90 percent of the diet. This species is also known to eat birds (occasionally smaller or younger raptors; Wiley 1975), amphibians, reptiles, fish, and arthropods (CWHR, 2013).

Special Status Species

White-tailed kite (*Elanus leucurus*)
Family Accipitridae – Diurnal Birds of Prey
Federal Status – None
State Status – Fully Protected

White-tailed kites are yearlong residents in the Central Valley, Coast Ranges, and coastal areas in California. Foraging occurs in open grasslands, meadows, farmland, and emergent wetlands. Prey includes small mammals, small birds, voles, amphibians, reptiles, and insects. Roosting habitat consists of trees with dense canopies. In southern California, this species is known to roost in saltgrass and Bermuda grass habitats as well. Intensively cultivated areas also used. Nesting habitat is located near suitable foraging habitat. Nest trees range from single isolated trees, to trees within relatively large stands (>100 hectares). Nest tree/shrub species extremely variable, from shrubs <three meters tall (e.g., *Atriplex* and *Baccharis*) to large trees >50 m tall (e.g., *Sequoia sempervirens* and *Picea sitchensis*) (Dunk, 1995). Nesting takes place from February through October with a peak season ranging May to August (CDFW, 2003). White-tailed kite is a yearlong resident throughout most of California. This species forages in open grasslands, meadows, agricultural fields,

and emergent wetlands. White-tailed kite nests in a variety of forested habitats and often selects oaks, cottonwood, or eucalyptus trees to build their nests in trees. This species nests from February through August and females incubate their eggs for an average of 30 days. White-tailed kites can have up to two broods per year and their young usually fledge within 40 days of hatching.

There are no documented occurrences of this species within five miles of the project parcel (CDFW, 2003). However, the Ponderosa pine forest and oak woodlands provide suitable nesting habitat for white-tailed kite and it may forage in the more open areas of the project parcel. This species was not observed during the biological surveys of the project parcel (AES, 2012) or in previous biological surveys of the project parcel by WRA (2007).

Purple martin (*Progne subis*)
Family Hirundinidae – Swallows and martins
Federal Status – None
State Status – California Species of Special Concern

One of the world's most studied birds, the purple martin breeds in North America and winters in South America. It is widely distributed throughout the eastern United States, and patchily distributed throughout the western U.S. In California, the species is locally distributed, with the highest concentration of populations occurring along the western Cascade and Sierra Nevada Ranges; North Coast and northern Central Coast Ranges; and in extreme southwest California. The purple martin is a cavity-nester. In the north coastal area of California, purple martin is generally concentrated in coast redwood forest stands, it also utilizes coniferous forests with large dead trees, or snags, containing woodpecker holes. Ideal breeding snags are located in forested areas with relatively open canopy and access to open airspace above (Williams, 1998). Breeding season extends from April to August (Brown, 1997; Sibley, 2003).

Two occurrences have been recorded in Napa County, one south of Angwin and the second near Calistoga at the north end of Napa Valley. Both of these occurrences are within five miles of the project parcel (CDFW, 2003). The project parcel does not provide suitable nesting habitat for this species in the form of large snags with woodpecker holes, largely due to current management practices that include the removal of dead or decaying trees for firewood and/or safety. However, purple martin may occur as transients during migration. This species was not observed during the biological surveys of the project parcel (AES, 2012) or in previous biological surveys of the project parcel by WRA (2007).

Northern spotted owl (*Strix occidentalis caurina*)
Family Strigidae – True owls
Federal Status – Threatened
State Status – Species of Special Concern

The distribution of the northern spotted owl (*Strix occidentalis caurina*) subspecies includes southwestern British Columbia, western Washington and Oregon, and northwestern California south to Marin County. The southeastern boundary of its range is the Pit River area of Shasta County (USFWS, 2011). In northern California it resides in dense, old-growth and second growth, multi-layered mixed conifer, redwood and Douglas-fir habitats from sea level up to 2,300 meters (CWHR, 2013). Northern spotted owls generally inhabit older forested habitats because they contain the structural characteristics required for nesting, roosting, and foraging such as a multi-layered canopy with moderate to high canopy closure. Dead or decaying trees with large cavities or other types of deformities as well as snags or an abundance of large, dead wood on the ground provide suitable habitat. However, some landscape-level analysis suggests that in parts of this subspecies' range a mosaic of older forest habitat interspersed with other vegetation types may be beneficial (USFWS, 2011).

Roost selection appears to be related closely to thermoregulatory needs; this species is intolerant of high temperatures and roosts in dense east overhead canopy on cooler slopes (north- or east-facing slopes) in summer. In winter, in Napa County, northern spotted owl roosts in similar habitats as in the summer. The northern spotted owl breeds from early March through June with peak in April and May and will usually nest in tree or snag cavities or in broken tops of large trees. Its nests are often stick nests and may include old raptor nests, red tree vole or squirrel nests.

This species primarily feeds on small mammals, including flying squirrels, woodrats, mice, voles, and rabbits. It may also eat small birds, bats, and large arthropods. The northern spotted owl usually searches from a perch and swoops or pounces on prey in vegetation or on the ground and is known to occasionally cache excess food. This species is sensitive to habitat destruction and fragmentation (CWHR, 2013).

The project parcel is located within the range of the northern spotted owl. There are two northern spotted owl activity centers (ACs) within a 1.5 mile radius of the project parcel, known as NP28 and NP29 (Town, 2013). NP28 is located to the southeast of the project parcel and has not been observed at this location annually for approximately 10 to 15 years since the nest tree was blown over by wind (ERM, 2013). NP29 is located to the northeast of the project parcel and a northern spotted owl pair has been observed at this location annually for many years (ERM, 2013).

The Douglas fir-Ponderosa pine Forest onsite may provide suitable foraging habitat for northern spotted owl. The canopy cover is greater than 40 percent with trees greater than 11 inches diameter at breast height (DBH). There is open annual grassland in the center of the project parcel that may provide suitable foraging areas for northern spotted owls to capture small birds and mammals such as mice or squirrels. Due to the Applicant's current management practices, the forest habitat onsite may be considered marginal for use by northern spotted owl for nesting and roosting. There are no trees onsite exhibiting snags, dead branches, or dead tops, nor is there an abundance of large, dead wood or branches on the ground. The project parcel does not contain old growth forest or a multi-layered canopy with moderate to high canopy closure. Therefore, the project parcel does not provide suitable nesting and roosting habitat that is generally known to be used by northern spotted owl. Although northern spotted owl was not observed during the biological surveys (AES, 2012; WRA, 2007), it has the potential to forage on the project parcel.

4.4.4-9 SPECIAL STATUS BATS

Two bat species of special conservation status have the potential to forage and/or roost on the project parcel: pallid bat and hoary bat. These species are briefly discussed below.

Pallid bat (*Antrozous pallidus*)
Federal Status – None
State Status – California Species of Special Concern
Other – Western Bat Working Group High Priority

Pallid bat occurs from British Columbia to Texas south to Baja California and central Mexico (Smithsonian, 2008). In California, pallid bat occurs throughout the state except in the high Sierra Nevada Range from Shasta County to Kern County. The pallid bat is most commonly found in dry, open habitats with rocky areas for roosting. Pallid bats roost alone or in small groups (two to 20 bats). This species has three different roosts: the day roost is usually in a warm horizontal opening such as in attics or rock cracks; the night roost is usually in the open, near foliage; and the hibernation roost, which is often in buildings, caves, or cracks in rocks (CDFW, 2011b). Roosts generally have unobstructed entrances/exits and are high above the ground. The species is an opportunistic feeder and forages primarily over open habitats. Winter habitats are not well understood but the species does not appear to migrate long distances between summer and winter sites.

There are five recorded occurrences of this species within a five mile radius of the project parcel (CDFW, 2003). The nearest record of pallid bat near the project parcel located approximately 1.5 miles northwest of the proposed project parcel (CNDDB Occurrence Number 218). While there is no roosting habitat onsite, the open grasslands and woodlands

on the project parcel provide suitable foraging habitat for the pallid bat. This species was not observed during the biological surveys of the project parcel (AES, 2012) or in previous biological surveys of the project parcel by WRA (2007).

Hoary bat (*Lasiurus cinereus*)
Federal Status – None
State Status – Species of Special Concern

The hoary bat is the most widespread North American bat and can be found at any location in California, although its distribution is patchy in southeastern deserts. This species roosts in dense foliage of medium to large trees and prefers open habitats or habitat mosaics with access to trees for cover and open areas or habitat edges for feeding. The species is migratory and during migration may be found at locations far from the normal range. Hoary bats have been recorded from sea level to 4125 meters above sea level. This is a solitary species that winters along the coast and in southern California. The young are born from mid-May through early July (CWHR 2011).

In California, it occurs throughout most of the state, with only patchy distribution in the southeastern regions; however, large densities have been shown to be located in California's Central Valley. This is a migratory species; patterns indicate that the species spends the winters along the coast and the summers in the northern regions. Fall migrations to the coast occur between September and November, in which copulation may begin, and spring migrations northward occur between February and May. Offspring are then born between mid-May through early July and are able to fledge after 33 days. The hoary bat tends to roost in dense foliage of large trees and have a strong association with riparian habitats, as well as fruit orchards (likely due to decreased availability of riparian habitat).

There are no recorded occurrences of this species within a five mile radius of the project parcel (CDFW, 2003). The Douglas fir-Ponderosa pine Forest onsite may provide suitable foraging habitat for the hoary bat. This species was not observed during the biological surveys of the project parcel (AES, 2012) or in previous biological surveys of the project parcel by WRA (2007).

4.4.5 IMPACTS ANALYSIS

4.4.5-1 SIGNIFICANCE CRITERIA

A project would have a significant adverse impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW, USFWS, or NMFS;
- Have a substantial adverse effect on federal protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal estuaries) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.4.5-2 IMPACTS AND MITIGATION MEASURES

Impact 4.4-1: Development of the Proposed Project would have the potential to affect special status bird species. This is a potentially significant impact. After mitigation, impacts would be less than significant.

Development of the Proposed Project would result in direct impacts to Douglas fir-Ponderosa pine Forest, whereby approximately 12.8 acres would be converted to vineyard (**Table 4.4-2**). Removal of woody and herbaceous vegetation would be performed in compliance with the THP (**Appendix H**). This vegetation represents potential nesting and foraging habitat for migratory birds and special-status birds.

Under the Migratory Bird Treaty Act of 1918 (16 USC Subsection 703-712), migratory bird species and their nests and eggs are protected from injury or death (**Section 4.4.2**). Therefore, project-related disturbances must be reduced or eliminated during the nesting

cycle. In addition, CFG Code Subsections 3503, 3503.5, and 3800 prohibit the possession, incidental take, or needless destruction of birds, their nests, and eggs.
Should project construction occur during the nesting season for most bird species, construction-related disturbances in these habitats during the nesting season could result in significant adverse impacts to bird species, including disruption of breeding, increased stress and mortality.

Mitigation Measure 4.4-1: The Applicant shall implement the following measures to avoid disturbing any special status bird species nesting on the project parcel in accordance with the following CDFW-recommended measures:

If project activities are scheduled between February 1 and August 31, CDFW recommends surveys and avoidance measures for nesting birds. With respect to surveys for nesting bird and raptor species, CDFW recommends that the project specifies: 1) nest surveys be conducted no earlier than 14 days prior to tree removal and/or breaking ground (surveys should be conducted a minimum or 3 separate days during the 14 days prior to disturbance), 2) in the event that nesting birds are found, the project applicant should consult with CDFW and obtain approval for nest-protection buffers prior to tree removal and/or ground disturbing activities, and 3) nest protection buffers will remain in effect until the young have fledged. All nest protection measures should apply to off-site impacts and within 500 feet of project activities. If a lapse in project-related work of 15 days or longer occurs, another focused survey and, if required, consultation with CDFW, will be required before project work can be reinitiated.

With implementation of **Mitigation Measure 4.4-1**, impacts would be less than significant.

Impact 4.4-2: Changes in habitat as a result of the Proposed Project would have the potential to affect woodland foraging habitat for northern spotted owl. This is a potentially significant impact, but with implementation of **Mitigation Measure 4.4-2** below, the impact would be less than significant.

Development of the Proposed Project would result in the removal of 12.8± acres of Douglas fir-Ponderosa pine Forest (**Table 4.4-2**), which may provide foraging habitat for northern spotted owl (**Section 4.4-8**).

Mitigation 4.4-2: While there are two northern spotted owl activity centers (NP28 and NP29) within 1.5 miles, there are no activity centers located within 0.7 miles of the project parcel (Town, 2013). Northern spotted owl take avoidance will be achieved via compliance with California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention, Attachment B. These activity centers are

located greater than 1,000 feet from the project parcel; additionally, as discussed above in **Section 4.4.4-8** NP28 has not been reported as active for more than 10 to 15 years (ERM, 2013).

All information regarding northern spotted owl (NSO) shall be submitted to the CAL FIRE regional office in Santa Rosa, and annual operations will not commence until a letter is obtained from CAL FIRE confirming there have been no changes that would result in non-conformance with the plan. Protocol survey calling procedures shall follow the appropriate and most current NSO protocol from USFWS.

The Applicant shall implement the following measures to avoid take of the northern spotted owl (USFWS, 2012):

1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan.

2. No harvesting of trees shall occur until NP29 is detected/located within their historic activity center during the year of planned timber harvest activities. The project parcel must be surveyed according to the current acceptable NSO protocol.

3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NP29. The activity centers for NP29 are further than 1/4 mile from the THP boundary; therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the project parcel boundary, the following seasonal restrictions may be applied by CAL FIRE.

    a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity centers of NP29, except on the use of existing roads.

4. In the event that a new activity center becomes established within the project site or within 1/4 mile of the project site, the following seasonal restrictions may be applied by CAL FIRE:

    a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity center, except on the use of existing roads.

Implementation of **Mitigation Measure 4.4-2** would reduce impacts to a less than significant level.

Impact 4.4-3: Development of the Proposed Project would have the potential to affect bat species of special concern by CDFW. This would be a potentially significant impact. After mitigation, impacts would be less than significant.

Development of the Proposed Project could result in direct impacts to bat nesting habitat through the removal of large trees with sufficient crevices to provide roosting habitat. Two species of bats have the potential to occur on the project parcel: pallid bat and hoary bat. Maternity colonies of pallid bats could roost in large deep cavities in oaks or other large trees and could be adversely affected during tree removal. Both species potentially forage over the project parcel and roost under bark or in the cavities of trees, rock crevices or nearby human-made structures. Many bat species are known to utilize vineyards for foraging habitat (Western Bat Working Group, 2005).

Construction related activities within the vicinity of roosting habitat also have the potential to impact nesting bats. Project construction would occur during the breeding season for these and other bat species (generally between early April and mid-September). Potentially significant impacts could occur to bats during the breeding season.

Mitigation Measure 4.4-3: Pre-construction surveys for bats shall be conducted two to three days prior to tree removal. If bats are discovered during the surveys within trees that are to be harvested, then a temporary buffer of 100 to 150 feet will be established during construction. Once the bats have left the trees, harvest may continue. Optimal time to remove trees is September 15 to October 15, when young would be capable of flying and February 15 to April 1 to avoid hibernating bats prior to the formation of maternity sites.

With implementation of **Mitigation Measure 4.4-3**, impacts would be less than significant.

Impact 4.4-4: Development of the Proposed Project has the potential to conflict with Napa County General Plan Goals CON-2 and CON-6 and Policies CON-17 and CON-24. This would be a potentially significant impact. However, with implementation of **Mitigation Measure 4.4-4** below, this impact would be reduced to less than significant.

Related Napa County General Plan Goals include: CON-2 and CON-6, and Policies CON-17 and CON-24. Goal CON-2 requires maintenance and enhancement of existing levels of biodiversity. Goal CON-6 requires the preservation, sustainment and restoration of forests, woodlands, and commercial timberland for their economic, environmental, recreation, and open space values. Policy CON-17 requires the protection of sensitive biotic communities and habitats of limited distribution, including by requiring no net loss of sensitive biotic communities and habitats of limited distribution through avoidance, restoration, or replacement where feasible. Policy CON-24 requires maintenance and

improvement of oak woodland habitat to provide for slope stabilization, soil protection, species diversity, and wildlife habitat (**Section 4.4.2-3**).

Douglas fir-Ponderosa pine forest occurs on 1,350 acres in the Angwin area and is the dominant coniferous forest type in the area making up 86 percent of total coniferous forest (1,552 acres) (**Table 4.4-2**; NCCDPD, 2005). The 12.8 acres of Douglas fir-Ponderosa pine forest proposed for removal within the THP area represents 0.95 percent of this habitat type in the local Angwin area. The conversion of approximately 12.8 acres of a total of 1,350 acres of Douglas fir-Ponderosa pine forest does not represent a significant loss of native woodland habitat when considered at a local scale for the Angwin area (NCCDPD, 2005).

Additionally, the Proposed Project is designed to avoid all oak woodland onsite, which is recognized by the County as a sensitive habitat type. Therefore, retention of all the California Black Oak Forest on the property will be achieved consistent with the County's General Plan policies.

Mitigation Measure 4.4-4: Impacts to forested wildlife habitat would be reduced to a less-than-significant level through a combination of onsite avoidance, protection, and enhancement of retained forested areas outside of the 17± acre THP footprint on the project parcel. As a demonstration of good land stewardship, the Applicant has avoided sensitive habitats onsite and has volunteered to provide the following enhancement activities to these areas to encourage their use by wildlife. These practices are consistent with Napa County Goals CON-2 and CON-6, and Policies CON-17 and CON-24; thus, with implementation of the following mitigation measure, **Impact 4.4-4** would be reduced to less than significant.

A permanent habitat retention area will be designated onsite for the remainder of the parcel occurring outside of the 17± acre THP area that will be planted in vineyard (refer to **Figure 4.4-1**). The creation of a habitat retention area (totaling 16.5± acres) would allow for the protection of approximately 11.94 acres of Douglas Fir-Ponderosa Pine habitat and the entirety of the 4.58 acres of oak woodland habitat onsite (**Figure 4.4-1**; **Table 4.4-2**). Numerous enhancement techniques would be employed throughout the habitat retention area to improve the quality of forest habitat on the parcel for wildlife. Working closely with the Applicant, the Registered Professional Forester (RPF) will design and recommend the specific enhancement activities to be employed. These techniques include the careful placement of slash piles, snags, and large woody debris on the forest floor as well as the installation of nest boxes on trees for songbirds and roosting boxes for bats. Brush piles, tree branches and small downed trees will be used to create shelter habitat for small mammals and birds. Mulch may also be used to improve the groundcover within the forested areas onsite. These enhancement techniques will greatly improve the existing understory of the forest onsite and the habitat values of the parcel for use by wildlife. As discussed in the Hydrology Analysis (Balance Geo, 2013; **Appendix F**), to improve slope

stability characteristics above pre-project conditions, the Applicant may consult with Pacific Union College to determine if they wish to install bioengineering features on their property. These features, which could include shrub and tree plantings within PUC McReynolds and Winning ravines, would improve wildlife habitat and biodiversity while simultaneously stabilizing the ravine channels.

With implementation of **Mitigation Measure 4.4-4**, impacts would be less than significant.

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4.5 CULTURAL RESOURCES

4.5.1 SETTING

4.5.1-1 REGIONAL SETTING

The property is part of the hilly to steep mountains located in the southern North Coast Ranges in central Napa County. A number of northwesterly parallel mountain ridges and intervening valleys of varying widths characterize the region. Characteristic vegetation communities occurring within the project region include annual grassland, black oak woodland, ponderosa pine-Douglas fir forest, mixed oak, bay, riparian, madrone woodland and chaparral.

Formal archaeological research in the project vicinity includes early syntheses of Napa County area prehistory by Heizer (1953), Meighan (1955), and Elsasser (1978). Other recent cultural resources studies in the southern North Coast Ranges have built on the work of Fredrickson (1974), who divides human history in California into three broad periods: Paleo-Indian, Archaic, and Emergent. This scheme differentiates between cultural units based on sociopolitical complexity, trade networks, population, and artifact variation. Additionally, Moratto (1984) provides an overview of the culture history of the San Francisco Bay Area. Milliken et al. (2007) devise a chronological framework for the San Francisco Bay Area based on material culture, particularly shell beads and ground stone. This chronology is an update of efforts by Fredrickson (1973, 1974) and Bennyhoff (1994) but incorporates new data, including Groza's (2002) work detailing the radiocarbon dating of shell beads throughout the Bay Area. This summary attempts to combine the basic terms that are used by these various schemes for differentiating the major time intervals (e.g. Early Holocene (Lower Archaic)).

Early Holocene (Lower Archaic) 10,000-5,500 B.P.

Evidence available from relatively few sites suggests regional occupation by semi-mobile foraging groups and subsistence based upon plants supplemented with marine resources (particularly shellfish) with less dietary emphasis on fish and birds. The archaeological record is characterized by ground stone artifacts, particularly milling stones and hand stones (e.g. manos). Projectile technology includes large, wide-stemmed and leaf-shaped points. Tightly flexed burials are also a characteristic of this time period.

Early Period (Middle Archaic) 5,500-2,500 B.P.

The Early Period witnesses a series of technological and social innovations in some areas that suggest a more sedentary lifestyle. Regional variation in material culture also becomes apparent, particularly within the San Francisco Bay Area. Increased abundance of net-sinkers also suggests increased concentration on harvesting marine resources, particularly

fish. Evidence of sedentism further inland includes recovery of a house floor with post holes dated to ca. 3,500 B.P.

Lower Middle Period (Initial Upper Archaic) 2,500 to 1,570 B.P.

The Lower Middle Period is often made archaeologically manifest by stylistic changes in shell beads. Rectangular forms that were once very common now disappear, and are replaced with split-beveled and tiny saucer *Olivella* beads, which are then outnumbered by large saucer beads. Awls, presumably for making basketry, signal the early development of the long-standing coiling technology in the Central and North Bay. Meanwhile, the milling stone/hand stone forager economy persists only on the Pacific Coast of the San Francisco Peninsula (Milliken et al., 2007: 115-116).

Upper Middle Period (Late Upper Archaic) 1,570 to 950 B.P.

The transition to the Upper Middle Period (Late Upper Archaic Period) is marked by another dramatic shift in material cultural. The trade network of saucer beads disappeared and was replaced by a series of temporally diagnostic beads known as M2, M3, and M4.

Initial Late Period (Lower Emergent) 950 to 450 B.P.

The cultures of the Bay Area underwent significant changes in the Initial Late Period. Of particular interest are the implications of the introduction of bow and arrow technology. Primarily, a host of new projectile point types appeared in the archaeological record. Procurement of high-quality sources of obsidian, such as Napa Valley Glass Mountain, was reduced dramatically, which is thought to be the result of the control of the sources by a few elite groups. Increases in social stratification were apparent through grave goods of significantly greater wealth than was seen in previous periods (Milliken et al., 2007: 116-117).

Terminal Late Period: 450 B.P. to Spanish Contact (1776)

Clamshell disk beads replace cup and sequin beads during this period, but were restricted to the North Bay for the first century. The rest of the region manufactured *Olivella* lipped and spire-lopped beads prior to the introduction of the new clamshell disk bead. The North Bay was the host of many innovations during this period. New artifact types seen in the North Bay during this period include hopper mortars, magnesite tube beads, corner-notched projectile points and toggle harpoons. The Terminal Late Period ends with Spanish Contact in 1776 (Milliken et al., 2007: 117-118).

Ethnography

Ethnographic literature indicates that at the time of historic contact, the project area was within the eastern portion of the territory occupied by Wappo-speaking people. There were

five dialects of Wappo, which is a member of the Yukian language family (also including Yuki, Coast Yuki, and Huchnom). Four of these dialects were centered in the Napa/Alexander Valley area and the fifth was an isolated enclave on the south bank of Clear Lake (Sawyer 1978:257). The territory of the Southern Wappo extended roughly from just north of the City of Napa northward to the City of St. Helena, encompassing the lower half of the Napa Valley and the fringing foothills and low mountains to the east and west including Pope Valley. The Wappo economy was based on fishing, hunting, and gathering, with village community, or tribelet, members moving to various places within their territory on a seasonal basis to take full advantage of different resources as they became available.

The Wappo culture was significantly disrupted through missionization and Euroamerican settlement during the 19th century, which they heartily resisted. "Wappo" is the Americanization of "Guapo," the Spanish word for brave. This was the Spanish name applied to the tribe during the time of missionizaton due to the people's resistance to the Franciscan establishment (Kroeber 1925).

4.5.1-2 HISTORICAL SETTING

Following the settlement of San Diego and Monterey, the Spanish made steady progress in the exploration and settlement of the coastal regions of Alta California. The interior regions, such as the Central Valley and the Sierra Nevada, remained largely uncharted. The first recorded expedition into what is now Napa County was made in 1823 led by Francisco Castro with Jose Sanchez and Father Jose Altamira, scouting for possible future mission locations. This began the earliest sustained settlement of the region by non-natives that same year with the establishment of the Mission San Francisco Solano, at Sonoma, with Napa County within its jurisdiction (Hoover et al., 1990: 242-243).

A community of Americans spread into the interior of Mexican California in the decades after American Jedediah Smith blazed an overland trail in 1826. As a result of Smith opening a route to the interior of California, additional trappers and pioneers emigrated to California. The Hudson's Bay Trading Company soon followed, utilizing the Siskiyou Trail from their outpost at Fort Vancouver. These early fur traders likely introduced malaria into the Sacramento Valley in 1833, resulting in an epidemic that killed tens of thousands of native people by 1846 (Hurtado, 1988), including the Wappo and their neighbors. Subsequent Euro-American settlement of the region was enabled, in large part, by the introduction of exotic diseases that decimated the native populations of California.

During the American period Napa County was established as part of the original 27 counties, with the City of Napa always being the county seat (Hoover et al., 1990: 242). Agriculture has always been the primary economic pursuit in Napa, which began with

ranching during the Mexican period. Prior to the mass influx of settlers precipitated by the Gold Rush, the hide and tallow were the primary products traded out of Alta California, with lesser amounts of wool. Following the mass emigration to California sparked by the Gold Rush, several boom towns sprung up in modern Napa County including Napa, St. Helena, Yountville, and Calistoga. Since that time viticulture has been an important product of Napa County, which has remained largely rural and agricultural in nature.

4.5.1-3 EXISTING PROPERTY SETTING

A cultural resources survey of the project site was conducted in May 2012 (Beard, 2012). The investigation covered approximately 17 acres of the proposed property, roughly within the proposed Timber Harvest Plan (THP) area (**Appendix K**). All cultural resources work was performed in compliance with the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Section 21083.2, CEQA *Guidelines* 15064.5, and PRC Section 5024.1.

On May 23, 2012, the State of California Native American Heritage Commission (NAHC) was asked to review the Sacred Lands file for information on Native American cultural resources on the property. Additional letters were sent to Native American organizations and individuals for further consultation in May and June of 2012.

A records search was conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) by Vicki Beard of Tom Origer and Associates (NWIC file no. 11-1236). The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historic records and reports for a 16-county area that includes Napa County, and is housed at Sonoma State University, Rohnert Park, California. The search was conducted to identify previous archaeological surveys and recorded sites within the property for the Proposed Project and included, but was not limited to, a review of the following:

- National Register of Historic Places;
- California Register of Historic Places;
- California Historical Landmarks;
- California Points of Historical Interest listing (as listed in the Historic Property Directory);
- Historical maps;
- Ethnographic literature; and
- Other pertinent historic data.

Other sources reviewed included the *California Inventory of Historical Resources* (California Office of Historic Preservation, 1976), the California Office of Historic Preservation's *Five Views: An Ethnic Historic Site Survey for California* (1988), *California Historical Landmarks* (1990), California Points of Historical Interest (1992), and the *Historic Properties Directory Listing for Napa County*. The *Historic Properties Directory* includes the *National Register of Historic Places* (2010), the *California Register of Historical Resources*, and the most recent listings (through July, 2012) of the *California Historical Landmarks and California Points of Historical Interest* prior to fieldwork.

Two previous surveys by James Harvey (1996) and Scott Butler (2005) were conducted within the study area. No cultural or historic resources were identified during these surveys.

No historic resources were identified during the cultural resources study prepared by Beard (2012).

4.5.2 REGULATORY FRAMEWORK

4.5.2-1 CULTURAL RESOURCES DEFINED

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Numerous laws, regulations, and statutes at the state and local level govern archaeological and historic resources deemed to have scientific, historic, or cultural value. The pertinent regulatory framework of these laws is summarized below.

4.5.2-2 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA requires that, for projects financed by, or requiring the discretionary approval of public agencies in California, the effects that a project has on historical and unique archaeological resources must be considered (Public Resources Code [PRC] Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 5020.1(i)). The CEQA Guidelines (Section 15064.5) define three cases in which a property may qualify as a historical resource for the purpose of CEQA review:

A. The resource is listed in or determined eligible for the listing in the California Register of Historical Resources (CRHR). PRC Section 5024.1 defines eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:
    1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

B. Properties must retain integrity to be eligible for listing on the CRHR. Properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP) are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (PRC Section 5024.1(d)(1)).
C. The resource is included in a local register of historic resources, as defined in Section 5020.1(k) of the PRC, or is identified as significant in a historical resources survey that meets the requirements of Section 5024.1(g) of the PRC (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
D. The lead agency determines that the resource may be a historical resource as defined in PRC Section 5020.1(j), 5024.1, or significant as supported by substantial evidence in light of the whole record.

PRC Section 21083.2 governs the treatment of unique archaeological resources, defined as "an archaeological artifact, object, or site about which it can be clearly demonstrated" as meeting any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

4.5.2-3 LOCAL REGULATIONS, GOALS, AND POLICIES

Napa County General Plan – Community Character Element

The General Plan identifies the following goal and policies to preserve and enhance cultural resources in Napa County (Napa County, 2008):

Goal CC-4: Identify and preserve Napa County's irreplaceable cultural and historic resources for present and future generations to appreciate and enjoy.

Policy CC-19: The County supports the identification and preservation of resources from the County's historic and prehistoric periods.

Policy CC-21: Rock walls constructed prior to 1920 are important reminders of the County's agricultural past. Those walls which follow property lines or designated scenic roadways shall be retained to the extent feasible and modified only to permit required repairs and allow for openings necessary to provide for access.

Policy CC-23: The County supports continued research into and documentation of the county's history and prehistory, and shall protect significant cultural resources from inadvertent damage during grading, excavation, and construction activities.

Policy CC-30: Because the County encourages preservation of historic buildings and structures in place and those buildings and structure must retain "integrity" to be considered historically significant, the County shall discourage scavenging of materials from pre-1920 walls and other structures unless they are beyond repair.

Napa County Code 18.04.010
Under Title 18, Zoning of the Napa County Code, the Board of Supervisors made several findings with respect to the zoning ordinance. One of those findings (F.15) relates to the objective of preserving sites and structures of a special historical, archaeological, or architectural character and to provide for the maintenance and development of appropriate settings for such resources.

4.5.3 IMPACTS ANALYSIS

4.5.3-1 SIGNIFICANCE CRITERIA

Based on CEQA *Guidelines* Section 15064.5 and Appendix G of the CEQA *Guidelines*, a project would have significant adverse impacts to cultural resources if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 (a);
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5 (c);
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Any one of the above-cited impacts to a historical resource, as defined by PRC Section 5020.1(i), constitutes a substantial adverse change pursuant to the California Environmental Quality Act (CEQA). A substantial adverse change to a historical resource is considered a significant impact on the environment.

4.5.3-2 IMPACTS AND MITIGATION MEASURES

This section identifies impacts to cultural resources, which could result from construction, operation, or maintenance of the project. Impacts were analyzed by reviewing various sources regarding cultural resources in the vicinity of the property and through a specific survey (Beard, 2012). State impact significance criteria were applied to each known resource relative to the project design. No prehistoric or historic-period cultural resources were identified on the project site as a result of the records review or field survey.

Impact 4.5-1: The project implementation has the potential to negatively impact previously unknown cultural resources within the property. This is a potentially significant impact.

Mitigation Measure 4.5-1: There is a possibility that unanticipated subsurface archaeological deposits may exist within the proposed vineyard areas, as archaeological sites may be buried with no surface manifestation, or may be obscured by vegetation. In accordance with CEQA *Guidelines* Section 15064.5 (f), should any previously unknown prehistoric or historic resources, such as, but not limited to, obsidian and chert flaked-stone tools or toolmaking debris; shellfish remains, stone milling equipment, concrete, or adobe footings, walls, filled wells or privies, deposits of metal, glass, and/or ceramic refuse be encountered during onsite construction activities, earthwork within 100 feet of these materials shall be stopped and the Applicant shall consult with a professional archaeologist. Once the archaeologist has had the opportunity to evaluate the find he/she shall consult the local CAL FIRE Archaeologist regarding the results of the evaluation and appropriate site treatment options, as necessary. Said measures shall be carried out prior to any resumption of related ceased earthwork. All significant cultural resource materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards and a copy of the draft report provided to the local CAL FIRE Archaeologist for review and approval prior to finalization of it.

Implementation of this mitigation measure would reduce this impact to less than significant.

Impact 4.5-2: The project implementation could result in the discovery and disturbance of unknown human remains.

While unlikely, there is always the possibility that ground disturbing activities such as earth removal, rock removal and trenching for irrigation lines could result in the discovery and disturbance of unknown human remains within the property by disturbing both surface and subsurface soils. This is a potentially significant impact.

Mitigation Measure 4.5-2: In the event that human remains are discovered, the provisions of the California Health and Safety Code Section 7050.5 (b) shall be followed, including contacting the Napa County Coroner within 24 hours of the find. Upon determining the remains as being Native American in origin, the Coroner would be responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours, pursuant to California Health and Safety Code Section 7050.5(c). The NAHC has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant (MLD), who is designated by the NAHC.

Implementation of this mitigation measure would reduce this impact to less than significant.

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4.6 GEOLOGY AND SOILS

4.6.1 SETTING

4.6.1-1 GEOLOGY AND TOPOGRAPHY

The property is located within the Moore Creek and Conn Creek watersheds within the California Coastal Ranges geomorphic province. These ranges occur in northwest trending ridges and valleys that extend along the Pacific Coast from Oregon to Southern California. The Coastal Ranges are comprised of the Franciscan Assemblage, an accreted tectonostratigraphic terrane of heterogeneous rocks comprised of marine sediments, volcanic rocks, and high-pressure metamorphic rocks, all faulted and folded due to the collision of the Farallon and North American Tectonic Plates and subsequent shearing along the San Andreas Transform Fault. These rocks are among the oldest in the Napa County region.

Stratigraphically above the Franciscan Assemblage is the Sonoma Volcanics which lie to the east in the Vaca Mountains and envelope the north and northeast crests and flank of Diamond Mountain (USGS, 1963). In most locations, the older Franciscan Assemblage is present at a depth below the Sonoma Volcanics. Formed from volcanic activity in the Sonoma/Napa region about three to 11 million years ago, the Sonoma Volcanics are comprised of layers of various Pliocene- and possible Miocene-age volcanic deposits of andesitic to basaltic lava flows (Fox et al., 1973). The various components are subdivided into volcanic rocks including: rhyolite (light colored, fine-grained, volcanic rock), tuff (cemented volcanic ash), and other pyroclastic (explosive or aerially ejected volcanic material) rocks. These chemically-variable and lithologically-diverse rocks underlie the entire property. The Sonoma Volcanic tuff is mapped underlying the lavas and crop out in the drainage channels located east and north of the site.

The property is located on a relatively flat plateau of Howell Mountain east of Sentinel Hill, with slopes aspects generally south to southeast facing. Elevation at the proposed project site ranges from approximately 1,700 feet above mean sea level (msl) to 1,860 feet above msl. Proposed vineyard Block B totals approximately of 15.3 acres of vines spanning from the northwest corner to the southeast side of the project site, ranging in elevation from 1,815 feet msl to 1,890 feet msl. No U.S. Geological Survey (USGS) blue line streams, Class I, II or III watercourses, or jurisdictional wetlands exist within the project site.

4.6.1-2 SOILS

Soil types and their characteristics in the Napa Valley subregion are controlled in part by their location in either valleys or hillsides. The surficial geologic deposits of the Napa Valley

subregion consist of widespread, locally-deep alluvium, and on the flanking ridge systems generally discontinuous deposits of colluviums, soil creep, and landslide deposits. The Napa Valley alluvium, or deposits of clay, silt, sand, and gravel left by flowing streams and runoff, consists primarily of alluvial fan, stream channel, flood plain deposits, and terrace deposits. The soils in Napa Valley are generally very deep, have high productivity, and are often used for vineyards, orchards, and pastures. The colluvial and landslide deposits are typically more heterogeneous in composition and consist of various combinations of mostly unconsolidated soil and rock fragments.

Soils on the property are shown in **Figure 4.6-1** and their characteristics pertaining to erosion and hydrologic factors are summarized in **Table 4.6-1**. The soil is mapped at the site as the Aiken loam series, on 2 to 15 percent, and 30 to 50 percent slopes. The Aiken series consists of well drained soils on uplands and is characterized as being formed in material weathered from basic igneous rock (USDA, 1978). These soils form on broad, gently sloping tabular ridges or benches with moderately steep to steep side slopes. Permeability is moderately low, with the effective rooting depth at 40 to 60 inches or more.

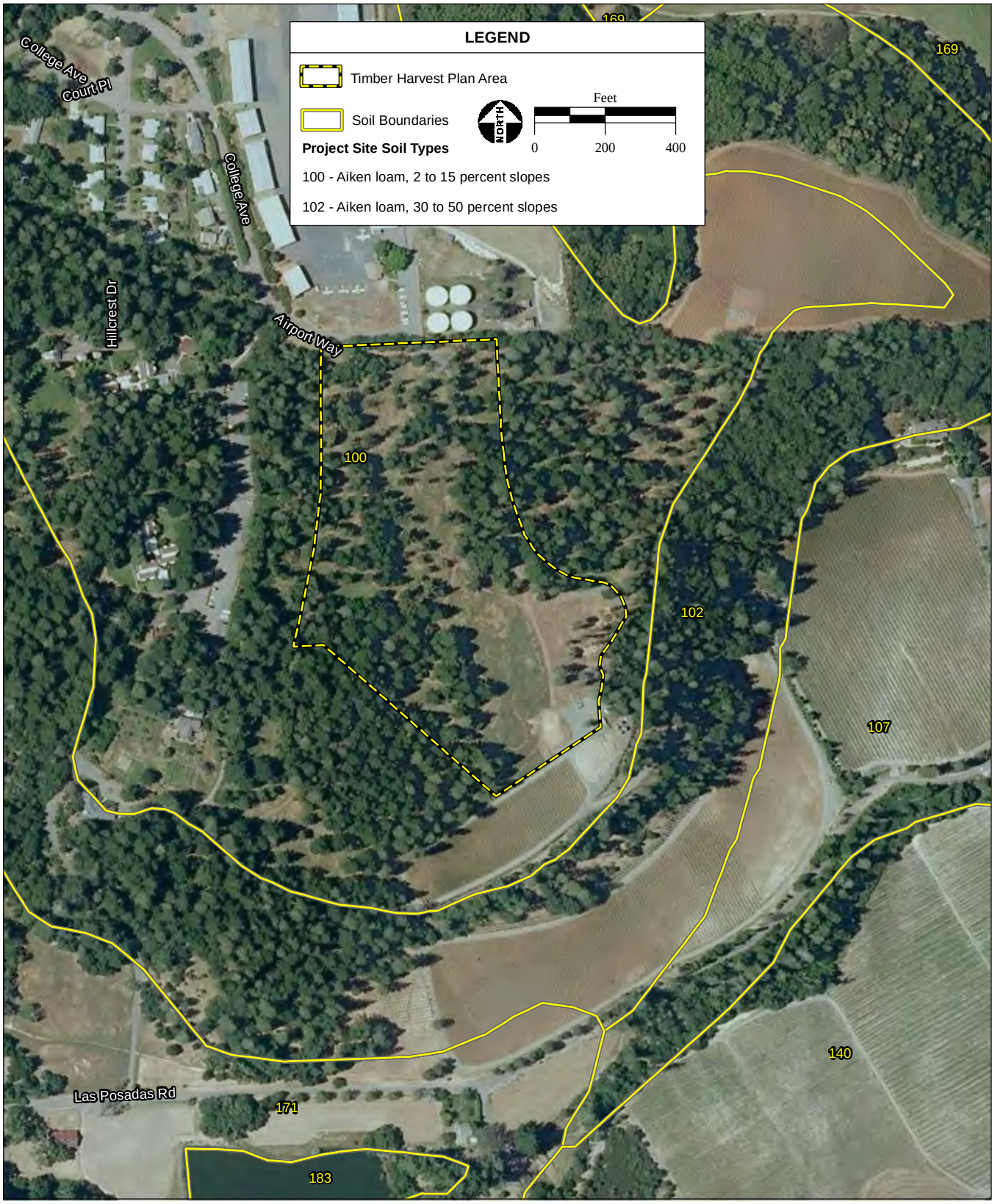
In a representative profile the surface layer is a reddish brown, medium acid, and a slightly acid loam eight inches thick. The subsoil is a medium acid, reddish brown clay loam and a medium acid, yellowish red clay 36 inches thick. Hard basic igneous rock can be found at a depth of over 40 inches.

The property contains only minor shallow soil creep and the hilltop area is unconditionally stable from landslides, which is discussed in more detail below (Balance Geo, 2013). Shallow soil creep is the slow downward movement of soil and loose rock on slopes. On the property, only small areas of minor soil creep exist around small ravines in the steep portion of the hillsides, outside the THP area. Furthermore, analyses of the property conducted in 2005 and 2013 by Gilpin Geosciences, Inc. found that the area of minor erosion and soil creep is associated with man-placed materials, occurs on steep slopes outside of the THP area, and will be unaffected by the Proposed Project (**Appendix G**).

TABLE 4.6-1
SOIL CHARACTERISTICS ON THE PROPERTY

Soil	Slope (%)	Landform	Drainage	Surface Runoff	Erosion[1]	Shrink-Swell
100 – Aiken Loam	2 to 15	Hillslopes	Well drained	Medium	Slight	Moderate
102 – Aiken Loam	30 to 50	Hillsides	Well drained	Medium	Severe	Moderate

[1] Erosion hazard represents the potential for erosion of soils after disturbance activities. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.
Source: USDA, 1978



SOURCE: USDA SSURGO Soils Surveys of Napa County,12/2007 ;
NAIP Aerial Photograph, 6/7/2009; AES, 2013

Figure 4.6-1
Soils Map

4.6.1-3 SEDIMENT EROSION AND TRAPPING

Sediment Erosion

Sediment erosion is the mechanical breakdown of rock material and the removal of the resultant materials, such as soil and rock particles, by water, wind, and ice. The potential for erosion of a particular area is dependent upon the geology, slope, vegetation cover, hydrology, precipitation, and the intensity of associated storm events. Shallow soil creep is the slow downward movement of soil and loose rock on slopes. On steep hillside areas the potential for erosion is greater and rilling, rutting, and damaging of channel systems can occur. Along many natural drainage courses on both hillsides and valley areas, stream and river flow can result in bank erosion. In overland flow areas (OFAs), or areas where the ground is impermeable or semi-impermeable, sediment is easily dislodged and transported to receiving waters. Large-scale erosion can occur during shallow and deep-seated landsliding or earthflows, particularly during high intensity storm events.

According to vineyard plot studies in the Napa River Basin, the annual surface erosion from hillside vineyards with limited straw or cover crops ranges from 2.3 to 23 tons per acre (tons/acre) (Napa County RCD, 1997). Notable amounts of sheetwash and rilling may also occur during large-magnitude storms due to the hydrologic effects of wildfires or vegetation removal. Large rainstorms that sweep across the Napa River watershed periodically induce both shallow and deep-seated landsliding. Landsliding is further discussed in **Section 4.6.1-5** below.

The THP area is naturally disconnected from downslope waterways due to the hydrogeology, soils, vegetation, and topography of the hilltop; all sediment and runoff generated on the hilltop flow to three natural swales on the property and infiltrate in the forest floor, and do not affect downstream waterways (Balance Geo, 2013). Pre-project hillside erosion outside of the footprint of the Proposed Project is the source of more than 90 percent of the existing erosion on the property, and will remain unchanged under the Proposed Project. Within the THP area, implementation of the erosion control measures detailed in the ECP will result in a 54 percent decrease in sediment production in post-project conditions (Balance Geo, 2013). Please see **Impact 4.6-1** below.

Sediment Trapping

Not all sediment produced by erosion is delivered to receiving waters. For this Proposed Project, all sediment is trapped in-route by sedimentation in onsite features. The ECP for the Proposed Project provides for maximum vineyard cover and runoff drainage to two retention basins created by the installation of rock stabilization and concrete weirs. After creation of the two retention basins as described in the ECP (**Appendix B**) that allow for infiltration within the forest floor, none of the sediment produced within the proposed

vineyard block will be transported off-site (Balance Geo, 2013). These runoff management practices, developed in part to prevent increases in peak runoff from the site, also promote on-site deposition of sediment eroded from vineyard fields. Please see **Section 4.9** for more detail on runoff from the Proposed Project.

4.6.1-4 GEOLOGIC STABILITY

Landslides

Napa County prepared Geographic Information System (GIS) maps of landslide deposits and areas of potential landslide hazards for the Napa County Environmental Baseline Data Report (NCCDPD, 2005). The data was collected from the interpretation of U.S. Geological Survey (USGS) aerial photographs from sources published over several decades. According to the results of the Napa County Environmental Baseline Data Report, there are no areas susceptible to landsides identified within the property.

In site visits conducted on July 7 and 11, 2005 and February 4, 2013, Gilpin Geosciences, Inc. geologists observed that the overall slope stability is favorable due to ground conditions and underlying geologic formations throughout the property. Furthermore, they observed that the cut slope in the western swale is between 50 to 100 years old and has shown no signs of erosion throughout precipitation conditions that have varied within 50 percent above and below average rainfall. This cut slope is on the steep hillside outside of the THP area. The overall performance of this cut slope indicates that minor potential changes in slope stability due to groundwater changes or root cohesion associated with the Proposed Project will not likely have an effect on the slopes of the other swales on the property (**Appendix G**).

A study conducted for the project site also analyzed slope stability using the model SHALSTAB, which used potential changes in groundwater and hydrologic factors to determine potential changes to hillslope conditions. According to this model, the entire plateau hilltop is unconditionally stable under any degree of soil saturation and tree cover conditions (Balance Geo, 2013). Please see **Appendix F** for a complete description of the model components, inputs, and results.

Seismicity

Seismic Potential

Numerous faults exist throughout the Bay Area of Northern California in the regional vicinity of the property. The majority of active faults within the Bay Area are components of the San Andreas Fault zone, a broad north-northwest trending system that extends along coastal California. An active fault is a fault that shows displacement within the last 11,000 years (the Holocene epoch), and therefore, is considered more likely to generate a future earthquake than a fault that has not shown signs of recent activity. A potentially active fault

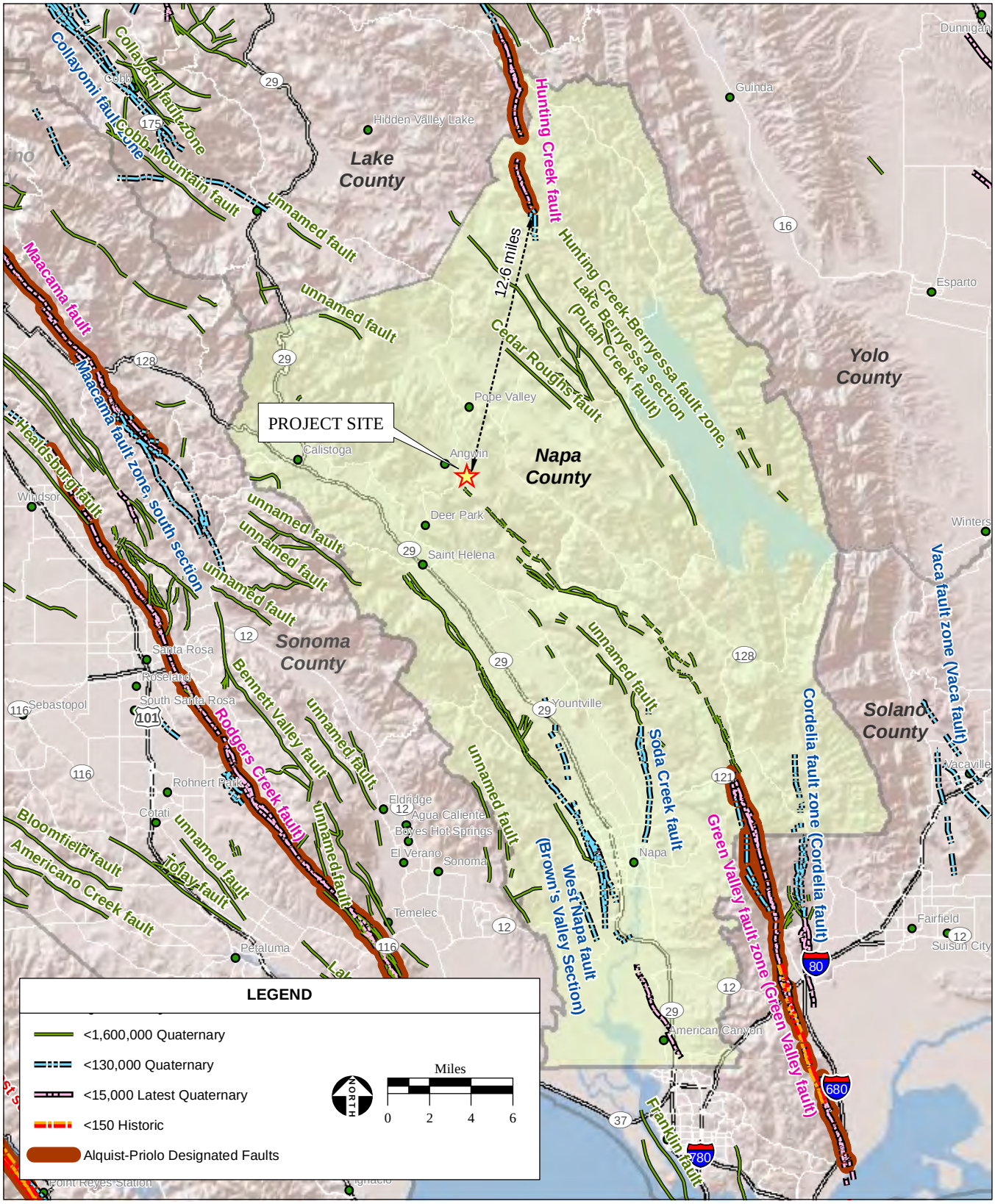
is one that has shown activity in the last 2.5 million years (the Quaternary Period). A fault that the California Geological Survey (CGS) determines to be sufficiently active and well-defined is zoned as an earthquake fault zone according to mandates of the Alquist-Priolo Earthquake Fault Zoning Act of 1972.

When an earthquake occurs, energy waves are radiated outward from the fault. The amplitude and frequency of earthquake ground motions partially depends on the material through which it is moving and distance from the source. The earthquake force is transmitted through hard rock in short, rapid vibrations, while this energy movement becomes a long, high-amplitude motion when moving through soft ground materials, such as valley alluvium. The force an earthquake applies to a structure is expressed in terms of a percentage of gravity (g). For example, an earthquake that produces 0.30 g horizontal ground acceleration will impose a lateral force on a structure equal to 30 percent of its total vertical weight. The intensity of an earthquake is expressed in terms of its effects, as measured by the Modified Mercalli Intensity Scale, and in terms of the quantity of energy released, or magnitude, as measured by the Richter scale. On the Richter scale every one-unit increase indicates an increment of roughly 30 times the energy.

There are numerous faults in the vicinity of the property that have not experienced geologic activity in 1,600,000 years. The closest fault to the property that has experienced activity in the past 130,000 years is the Hunting Creek fault, located approximately 12.6 miles north of the project site. This fault, part of the large Hunting Creek-Berryessa fault system, is also the nearest Alquist-Priolo fault. The Hunting Creek-Berryessa fault system is an active dextral strike-slip fault system associated with the San Andreas Fault system (Balance Geo, 2013). See **Figure 4.6-2** for a map of Napa County faults.

Numerous earthquakes have occurred in the Napa County region within historic times. Between 1735 and 2005, 97 earthquakes were recorded with a magnitude of 5.0 on the Richter scale or larger within 200 kilometers (or approximately 124 miles) of the center of Napa County (NCCDPD, 2005). Seven substantial earthquakes have been recorded since 1836 within 61 miles of the center of Napa County, and had median peak bedrock accelerations of 0.04 g to 0.10 g. This includes the 1906 earthquake of magnitude 8.3 with a median peak bedrock acceleration of 0.10 g located 55 miles from the center of Napa County. Other earthquakes have occurred in the vicinity of Napa County along the previously mentioned faults in the Bay Area, including the 1989 earthquake along the Loma Prieta Fault.

To estimate the probability of future earthquake events in the Bay Area, USGS considered potential sources of an event on seven different fault systems in the Bay Area. Based on a combined probability of all seven fault systems and background earthquakes, there is a 62



SOURCE: USGS Earthquake Hazards Program, 7/26/2010; California Geological Survey, 2005; AES, 2013

Figure 4.6-2

Napa County Faults

percent chance of a magnitude 6.7 or larger earthquake occurring in the Bay Area by the year 2032. Smaller earthquakes, between magnitudes 6.0 and 6.7, which are capable of causing considerable damage, have about an 80 percent chance of occurring in the Bay Area by 2030 (USGS, 2003).

Seismic Hazards

Seismic hazards describe the effects caused by surface fault rupture and seismic shaking from a seismic event. Surface fault rupture occurs when a fault breaks through to the ground surface during a seismic event. As discussed above, the property is susceptible to little hazard from surface rupture along an active fault trace.

Seismic shaking can result in structural damage. This risk is high because shaking damage can be caused by any of the active faults in the Bay Area discussed above. The severity of the shaking damage at a particular location depends on a number of factors, including the magnitude of the earthquake, the distance to its epicenter, and the nature and thickness of the deposits at the location. Areas that are subject to the greatest ground shaking damage are anticipated to be within Napa County's various valleys, because they consist of deep, unconsolidated alluvial deposits underlain by saturated estuarine deposits, which are subject to higher amplitude and longer duration shaking motions (NCCDPD, 2005).

Ground failures, or secondary effects, from ground shaking can extend many miles from the earthquake fault that generated the shaking. Ground failures include landsliding, differential settlement, lateral spreading, and liquefaction. Landsliding triggered by ground shaking occurs in the same types of hilly or mountainous terrains that are susceptible to non-seismically induced sliding events. Ground shaking can reactivate dormant landslides, cause new landslides, and accelerate or aggravate movement on active slides. Differential settlement is the non-uniform densification of loose soils that occurs during strong ground shaking and causes uneven settlement of ground surface. Differential settlement could occur in numerous locations, but most likely the valley areas of Napa County. Lateral spreading is a ground failure in which a subsurface layer of soil liquefies, resulting in the overlying soil mass deforming laterally toward a free face. Limited lateral spreading is extremely unlikely given the project area's low probability for liquefaction on the property. The potential for seismic ground shaking is mapped by the Association of Bay Area Governments (ABAG) as low in the project vicinity, and therefore, coupled with the shallow soils located on property, the potential of seismically-induced landslides is fairly low (ABAG, 2012).

Liquefaction is a process in which sandy, saturated soils become liquefied and lose their bearing capacity during seismic ground shaking. As a result, sufficiently liquefied soils can no longer support structures built on or beneath them. Liquefaction potential is dependent on such factors as soil type, depth to groundwater, degree of seismic shaking, and the

relative density of the soil. Soils most susceptible to liquefaction are saturated, clean, loose, uniformly graded, fine-grained, and unconsolidated materials that are most commonly associated with alluvial valleys with high groundwater levels. On a countywide basis, the potential for liquefaction-induced ground failures is relatively low, since only about 20 percent of the County is characterized as an alluvial valley. ABAG creates maps of Bay Area counties that show the susceptibility of mapped areas to liquefaction based on the presence of water-saturated sand and silty materials that may be more prone to liquefaction than other soils. The property's susceptibility to liquefaction is considered very low (ABAG, 2012).

4.6.2 REGULATORY FRAMEWORK

4.6.2-1 NAPA COUNTY

The Napa County General Plan (Napa County, 2008) serves as a broad framework for planning within Napa County. State law requires general plans to cover a variety of topics. The General Plan contains goals and policies related to open space conservation, natural resources, water resources and safety that provide guidance for issues related to geology and soils from the Proposed Project. The following goals and policies related to geology and soils in the General Plan are applicable to the Proposed Project:

Natural Resources Policies

Policy CON-38: The County shall identify, improve, and conserve Napa County's sand and gravel resources, preventing removal of streambed sand and gravel in any manner that would cause adverse effects on water quality, fisheries, riparian vegetation, or flooding.

Water Resources Policies

Policy CON-48: Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e., Basin Plan) requirements and are protective of the County's sensitive domestic supply watersheds. Technical reports and/or erosion control plans that recommend site-specific erosion control measures shall meet the requirements of the County Code and provide detailed information regarding site specific geologic, soil, and hydrologic conditions and how the proposed measure will function.

Policy CON-49: The County shall develop and implement a water quality monitoring program (or programs) to track the effectiveness of temporary and permanent Best Management Practices (BMPs) to control soil erosion and sedimentation within watershed areas and employ corrective actions for identified water quality issues (in violation of Basin

Plans and/or associated TMDLs) identified during monitoring.

Policy CON-50: The County will take appropriate steps to protect surface water quality and quantity, including the following:

g) Address potential soil erosion by maintaining sections of the County Code that require all construction-related activities to have protective measures in place or installed by the grading deadlines established in the Conservation Regulations. In addition, the County shall ensure enforceable fines are levied upon code violators and shall require violators to perform all necessary remediation activities.

Safety Goals and Policies

Goal SAF-1: Safety considerations will be part of the County's education, outreach, planning, and operations in order to reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire, flood, geologic, and other hazards.

Goal SAF-2: To the extent reasonable, protect residents and businesses in the unincorporated area from hazards created by earthquakes, landslides, and other geologic hazards.

Policy SAF-8: Consistent with County ordinances, require a geotechnical study for new projects and modifications of existing projects or structures located in or near known geologic hazard areas, and restrict new development atop or astride identified active seismic faults in order to prevent catastrophic damage caused by movement along the fault. Geologic studies shall identify site design (such as setbacks from active faults and avoidance of on-site soil-geologic conditions that could become unstable or fail during a seismic event) and structural measures to prevent injury, death and catastrophic damage to structures and infrastructure improvements (such as pipelines, roadways and water surface impoundments not subject to regulation by the Division of Safety of Dams of the California Department of Water Resources) from seismic events or failure from other natural circumstances.

Policy SAF-9: As part of the review and approval of development and public works projects, planting of vegetation on unstable slopes shall be incorporated into project designs when this technique will protect structures at lower elevations and minimize the potential for erosion or landslides. Native plants should be considered for this purpose, since they can reduce the need for supplemental watering which can promote earth movement.

Policy SAF-10: No extensive grading shall be permitted on slopes over 15 percent where landslides or other geologic hazards are present unless the hazard(s) are eliminated or

reduced to a safe level.

4.6.2-2 NAPA COUNTY RESOURCE CONSERVATION DISTRICT

The Napa County Resource Conservation District (RCD) published the Napa River Watershed Owner's Manual in 1996. The manual contains the following objective and recommendations that pertain to the Proposed Project:

Objective G: Reduce Soil Erosion

Recommendation G2: Reduce erosion resulting from agricultural activities. Agricultural activities in the Napa River watershed include grazing, viticulture, small farms and horticulture. Soil disturbance or vegetation removal as a result of agricultural activities can result in loss of topsoil and subsequent water quality degradation. Good agricultural management can also benefit water quality and wildlife habitat, and can contribute to the overall good health of the watershed.

Relevant sub-recommendations include:

- G2.1. Emphasize erosion prevention over sediment retention as a priority in agricultural planning and operations.
- G2.2. Promote the use of permanent vegetative ground cover in vineyards. Support research, demonstrations and technology exchange to refine cover crop technology for vineyards and orchards.
- G2.4. Maintain access roads and farm roads to control storm water runoff in agricultural areas. Utilize assistance from the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service, or other erosion control professionals, for design of storm water runoff control on rural roads.
- G.2.5. Minimize wet weather vehicle traffic through or across agricultural areas, especially on hillsides.
- G.2.6. Provide adequate energy dissipaters for culverts and other drainage pipe outlets.
- G.2.7. Establish vegetated buffer strips along waterways.

4.6.3 IMPACTS ANALYSIS

4.6.3-1 SIGNIFICANCE CRITERIA

The Proposed Project would involve clearing the existing grassland and timberland, earthmoving activities associated with the development of vineyard areas, erosion control measures, and other features included within the ECP. For the purposes of this EIR, the Proposed Project would have a significant impact if it would:

- Result in the accelerated, long-term erosion and loss of topsoil causing substantial depletion of the agricultural resource or an increase in the rate and quantity of sediment accumulated down slope to the extent that it damages roads, vineyard facilities, adjoining vineyards, or deposits excessive sediment in natural waterways, including the two unnamed tributaries that flow down into the Napa River.
- Alter the topographic or geologic site conditions such that an earthquake would cause substantial damage to the proposed vineyard, or a geologic unit or soil would become unstable, thereby resulting in excessive erosion, soil creep, catastrophic slope and ground failure, or loss of cultivatable land area.

4.6.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.6-1: Development of the Proposed Project would alter the rate of sediment erosion and yield onsite. This is a potentially significant impact. However upon implementation of the erosion control methods detailed in the ECP, the timber harvest and vineyard conversion would all be designed to create a decrease in sediment erosion and yield that would result in a less-than-significant impact to offsite receiving waters**.**

The conversion of existing habitats on the property to vineyard would result in the removal of 17± gross acres of existing vegetation from the THP area, and the subsequent conversion to 15.3± net acres of vineyard. Approximately two acres within the harvested area would be utilized for access of farm trucks, equipment turn around, and vineyard maintenance operations. The timber harvest and vineyard conversion would result in the removal of existing trees, as well as soil ripping, earthmoving and grading activities. Vegetation clearing would remove obstacles to sediment transport while exposing more soils to erosion. However, an impact from the conversion of existing vegetation to vineyard areas would only be considered significant if sediment erosion and yield are substantial to the extent that damage occurs to roads, vineyard facilities, or adjoining vineyards, or if sedimentation in receiving waters is significant.

The mainstem Napa River is listed as sediment-impaired according to the Clean Water Act, Section 303 (d), because it does not meet the beneficial uses for which is was designated, including steelhead habitat. Section 303 (d) requires the Regional Water Quality Control Board (RWQCB) to create a Total Maximum Daily Load (TMDL) for sediment in the Napa River watershed. In order to meet the TMDL standard, it is County Policy (Napa General Plan Policy Con-48) that there should be no change in erosion ("maintain pre-development sediment erosion conditions") or, alternatively, that the project complies with State Water Quality requirements (**Section 4.6.2**). With the proposed sediment control features detailed in the ECP, which includes the creation of two sediment retention basins, sediment erosion

from the project site will be reduced by roughly 54 percent from pre-project levels under the Proposed Project (Balance Geo, 2013). There will be no change in erosion from the property outside of the Proposed Vineyard Block B. Therefore, the project meets Napa County standards and will comply with the TMDL standard.

As stated in the Erosion, Sedimentation, and Hydrologic Assessment report for the property (**Appendix B**; Balance Geo, 2013), Universal Soil Loss Equation, Special Applications for Napa County, CA (USLE) was used to estimate sediment detachment and erosion potential for the Proposed Project. The sediment budget developed for the Abreu property estimates the sediment delivery conditions experienced during very wet winters or high-intensity, long-duration storms.

The total surface erosion of the proposed vineyard as predicted by USLE is about 20.9 tons per year [about 1.23 tons/acre/year (t/ac/yr)] (Balance Geo, 2013). Under current conditions, the 17-acre hilltop grassland and forestlands produce 45.3 tons of sediment per year. As a result of the Proposed Project and implementation of the ECP, erosion rates on the hilltop will decrease by approximately 53.8 percent (Balance Geo, 2013). Over the entire Abreu property, including the THP area, steep hillsides, and existing vineyard blocks, the current sediment production is estimated at 355.8 tons/year (or 4.69 t/ac/yr). The majority of this erosion occurs outside of the project site on the unmanaged forest land, and will therefore not be greatly affected by implementation of the Proposed Project and the ECP, although a 7.4 percent decrease in sediment production is expected to occur across the entire property (Balance Geo, 2013). **Table 4.6-2** provides the results of the Balance Geo analysis of pre- and post-project sediment production and delivery conditions.

TABLE 4.6-2
PRE-PROJECT AND POST-PROJECT ESTIMATED SEDIMENT PRODUCTION

Land Type[1]	Area (ac)	Current Sediment Production (t/yr)	Post-Project Sediment Production (t/yr) (includes ECP)	Percent Change
Proposed Vineyard	17.0	45.3	20.9	-53.8%
Existing Trails and Vineyard Avenues	2.0	8.6	6.6	-23.3%
Main Appurtenant Road	1.2	20.4	20.4	0%
Existing Vineyard	18.0	198.0	198.0	0%
Existing Forest/Grassland	37.3	83.5	83.5	0%
Total	**75.5**	**355.8**	**329.4**	**-7.4%**

1 Analysis was conducted over entire property, APN 024-080-028 (project site occurs here) and 024-300-077.
Adapted from Balance Geo, 2013; AES, 2013

The requirements of Napa County's Conservation Regulations (Chapter 18.108) are specifically listed as an effective measure at reducing sediment delivery. The Proposed Project complies with Policy Con-48 because it complies with the Basin Plan requirements with respect to estimated erosion rates. The project ECP and USLE calculations prepared by Balance Geo for the ECP demonstrate that the project would limit potential erosion below the USDA soil erosion tolerance (T) of 3.0 t/ac/yr. The use of erosion control measures including concrete weirs, rock stabilization, and fiber rolls would detain all surface runoff from the project site into two retention basins and prevent any of the sediment, including the sand size-fraction, from leaving the property. Changes in groundwater and surface hydrology that may occur as a result of the Proposed Project are discussed further in **Section 4.9.3-3**.

The use of the erosion control measures described above represents the best way of minimizing sediment delivery to streams from the Proposed Project and eliminating sand from leaving the property. As sand is identified in the Napa River Sediment TMDL as a primary concern due to potential impacts on beneficial uses, with implementation of the erosion control measures in the ECP, the Proposed Project would have a less-than-significant impact on the surrounding watershed.

With incorporation of erosion and runoff control measures proposed in the ECP and discussed above, the overall production of sediment from the project site and load of sediment transported to local waterways is anticipated to be a significant reduction from pre-project conditions with implementation of the Proposed Project.

Mitigation Measure 4.6-1: With full implementation of the ECP (**Appendix B**) and the implementation of the erosion control measures in the THP (**Appendix H**), no further mitigation is required.

Impact 4.6-2: Development of the Proposed Project would involve earthmoving and grading activities that would alter the existing topographic and geologic conditions at the property; however, conditions would not be altered such that significant damage to the property from excessive erosion, soil creep, slope instability, catastrophic slope or ground failure would occur, nor would such hazards be likely to occur in the event of an earthquake. This is a less-than-significant impact.

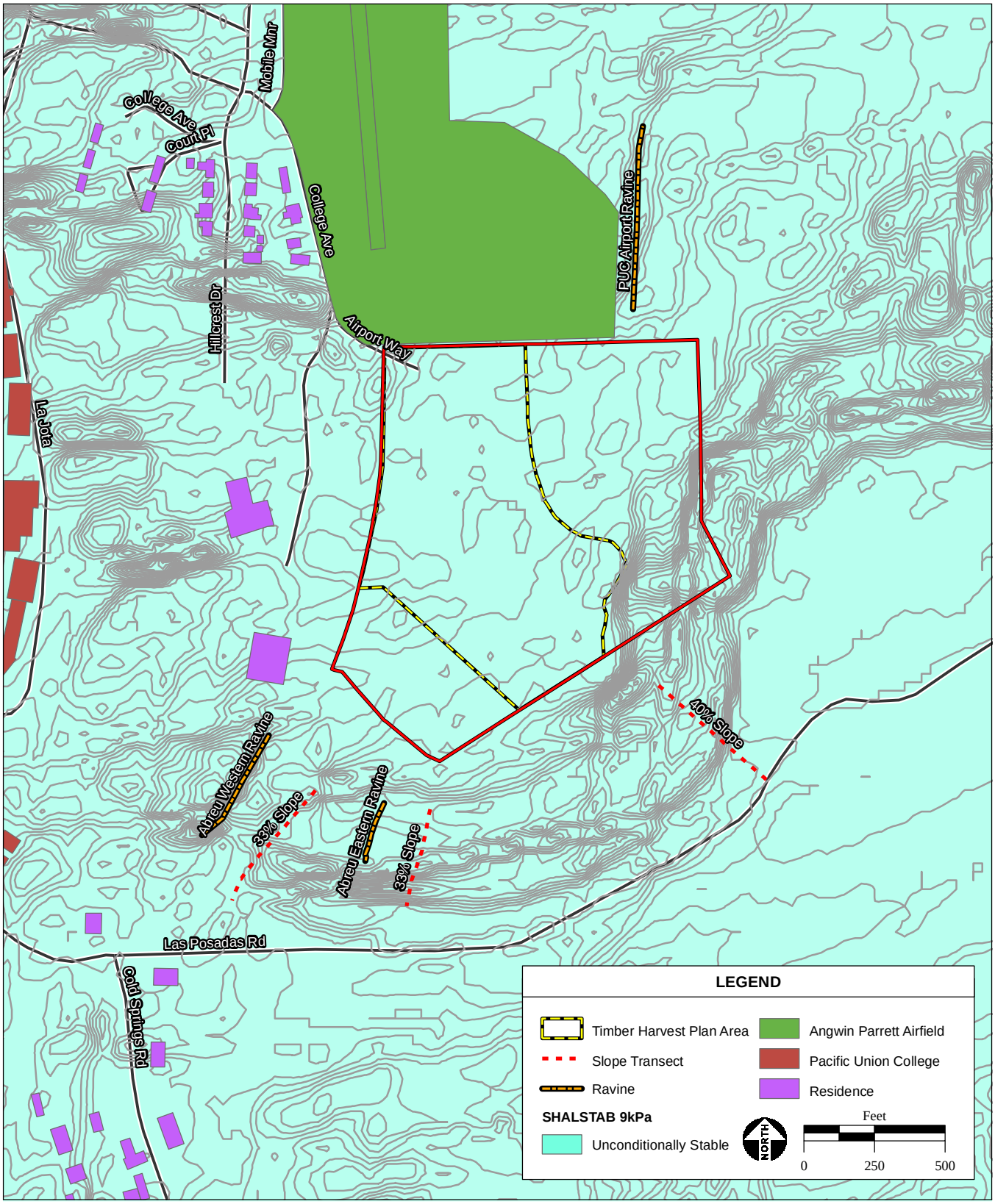
The Proposed Project could be subject to an earthquake event from one of the active faults within the San Andreas Fault zone. Numerous earthquakes with large magnitudes have occurred in the Bay Area over the last few centuries, and the USGS estimates that an earthquake of magnitude 6.0 or greater will likely occur in the Bay Area in the future. However, surface fault rupture would not be anticipated to occur at the property, since none

of the active faults in Napa County that the CGS determined capable of underground surface fault rupture are located at or near the property. The Proposed Project includes the conversion of natural hilltop, including forested areas and non-native grassland areas, into vineyard. Construction of the Proposed Project would involve earthmoving activities, soil cultivation, installation and maintenance of drainage and erosion control features, and vineyard plantings. Modifications that would alter the geologic setting of the property would be relatively minor changes associated with earthmoving activities for development of vineyards and associated avenues. Since the Proposed Project would not include construction of buildings or other facilities that would attract a large number of people, the potential risk of exposing people or structures to hazards from a seismic event is nonexistent.

Ground failures due to seismically-induced ground shaking can reactivate dormant landslides, cause new landslides, accelerate or aggravate movement on active slides, as well as result in differential settlement, lateral spreading, and liquefaction. Seismically-induced ground shaking potential is low on the property; therefore, the potential to reactivate or cause new slides is low (ABAG, 2011). As discussed in **Section 4.6.1-4** above, based on the observation of no landsides located within the property, soil types and depth to bedrock, the project area's susceptibility to liquefaction is considered low. Lateral spreading is unlikely to occur because there are no liquefiable slopes on the property. Additionally, there are no observed slides in the project site.

Figure 4.6-3 shows the results of the SHALSTAB model, the location of various downslope infrastructures, and slope transects along the property edge. As stated in **Section 4.6.1-4**, observations of the project site by a registered professional geologist do not indicate any risk to downslope infrastructure, such as Las Posadas Road and the houses downslope. In addition, the SHALSTAB model results (**Appendix F**) indicate that the project site is unconditionally stable for any combination of soil saturation and tree cover conditions; the rest of the property, including the steep ravines outside of the project site, are predicted to be unconditionally stable under project conditions. Under clearcut conditions, which are not proposed in this timber conversion project, there is some risk of minor soil movement within the steep ravines. However, any soil movement that might occur would settle "dozens of meters away from Las Posadas Road" and would not leave the property (Balance Geo, 2013). As noted in **Mitigation Measure 4.4-4**, some bioengineering planting may be requested by Pacific Union College to improve wildlife habitat and slope stability within offsite ravines, consistent with the Balance Geo supplemental recommendations (**Appendix F**). Therefore, there is no risk to downslope infrastructure and seismically induced ground failure as a result of the Proposed Project would be a less-than-significant impact.

Mitigation Measure 4.6-2: No further mitigation is required.



SOURCE: Martin Trso, P.G., 1/17/2013; Napa Valley Vineyards Engineering,12/2012; AES, 2013

Figure 4.6-3

Slope Stability Analysis

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4.7 GREENHOUSE GAS EMISSIONS

4.7.1 SETTING

It is anticipated that the average global temperature could rise 0.6 to 4.0 degrees (º) Celsius (C) (1.08 to 7.2 °Fahrenheit (F)) between the years 2000 and 2100 (IPCC, 2007). The extent to which human activities affect global climate change is a subject of considerable scientific debate. While many in the scientific community contend that global climate variation is a normal cyclical process that is not necessarily related to human activities, the Intergovernmental Panel on Climate Change (IPCC) report identifies anthropogenic greenhouse gases (GHGs) as a contributing factor to changes in the Earth's climate (IPCC, 2007).

The IPCC modeling estimates that anthropogenic carbon dioxide (CO_2) in the lower atmosphere has increased by approximately 31 percent since the year 1750. At the same time, average temperature in the lower atmosphere has increased approximately 0.6 to 0.8 °C (1.08 to 1.44 °F). Due to the challenges inherent in modeling the complexities of the Earth's climate, the proportional importance of anthropogenic activities as opposed to natural feedback systems is exceptionally difficult to establish. Nonetheless, the IPCC concludes that "Most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations." This EIR assumes that an increase in anthropogenic GHG concentration is in fact contributing to global warming, consistent with state policy.

IPCC theorizes that a continuation of this warming trend could have profound implications, including flooding, erratic weather patterns, and reduced arctic ice. The IPCC projects a number of future GHG emissions scenarios leading to a varying severity of impacts on the environment and the global economy. According to the 2007 IPCC report, if anthropogenic GHG continue to increase in the atmosphere there will be a point at which the above impacts would become irreversible, this point is commonly referred to as the "tipping point." Although the 2007 IPCC report states the tipping point may be as far off as 20 years, some experts contend the tipping point has already been reached.

Sources of GHG emission in the region include, but are not limited to, on and off road vehicles, agriculture (cattle and farming), water and wastewater transport, indirect electricity use, solid waste disposal, loss of carbon sequestration in flora, and changes in land use.

Climate change is a global phenomenon attributable to the sum of all human activities and natural processes. The California Governor's Office of Planning and Research (OPR) provides guidance on integrating analysis of climate change in CEQA documents (OPR, 2008).

The OPR Guidance recommends quantification of GHG emissions, assessment of the significance of any impact on climate change (provided in **Section 6.0 Other CEQA-Required Sections**), and identification of mitigation or alternatives that would reduce the GHG emissions. The analysis presented in **Section 6.0** is consistent with the OPR Guidance.

This analysis considers whether project emissions are individually or cumulatively significant. Based on the proposed project's GHG emissions (refer to **Section 6.0**), it was determined that specific climate change impacts could not be attributed to the proposed development. As such, project impacts are most appropriately addressed in terms of the incremental contribution to a global cumulative impact.

4.7.2 REGULATORY FRAMEWORK

Climate change is a global phenomenon attributable to the sum of all human activities and natural processes. The OPR recommends quantification of GHG emissions, assessment of the significance of any impact on climate change, and identification of mitigation or alternatives that would reduce GHG emissions. Climate change has the potential to reduce the snow packs in the Sierra Nevada Mountains, cause the sea level to rise, and increase the intensity of wildfires and storms.

The following regulatory background gives context to the issues of climate change and importance in reducing GHG emissions in California:

Assembly Bill 32
Signed by the California State Governor on September 27, 2006, Assembly Bill (AB) 32 codifies a key requirement of Executive Order (EO) S-3-05, specifically the requirement to reduce statewide GHG emissions to year 1990 levels by the year 2020. AB 32 tasks the California Air Resources Board (CARB) with monitoring state sources of GHGs and designing emission reduction measures to comply with the law's emission reduction requirements.

AB 32 required that CARB prepare a comprehensive "scoping plan" that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. In early December 2008, CARB released its scoping plan to the public and on December 12, 2008, the CARB Board approved the scoping plan.

The scoping plan calls for an achievable reduction in California's carbon footprint. Reduction of GHGs emissions to 1990 levels are proposed, which equates to cutting approximately 30 percent from estimated GHG emission levels projected in 2020, or about 15 percent from today's levels. The scoping plan relies on existing technologies and improving energy efficiency to achieve the 30 percent reduction in GHG emission levels by

2020. The scoping plan provides the following key recommendations to reduce GHG emissions:

- Expand and strengthen existing energy efficiency programs as well as building and appliance standards;
- Achieve a statewide renewable energy mix of 33 percent;
- Develop a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establish targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets; and
- Adopt and implement measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.

Senate Bill 97

Signed by the Governor on August 24, 2007, Senate Bill (SB) 97 required that the OPR prepare California Environmental Quality Act (CEQA) guidelines for evaluating the effects of GHG emissions and for mitigating such effects. The Natural Resources Agency adopted these guidelines on December 31, 2009.

In April 2009, OPR released the CEQA Guidelines Section Proposed to be Added or Amended, which included guidelines for evaluating the effects of GHG emissions and for mitigating such effects. On December 31, 2009, the Natural Resources Agency delivered its rulemaking package to the Office of Administrative Law for their review pursuant to the Administrative Procedure Act.

CEQA Guidelines

In accordance with SB 97, the Natural Resources Agency adopted Amendments to the CEQA *Guidelines* for GHGs on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010. The amendments to the CEQA *Guidelines* provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the lead agency;
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project;
- Significance may rely on qualitative analysis or performance based standards;
- The CEQA document shall discuss regional and/or local GHG reduction plans;
- A CEQA document shall analyze GHG emissions if they are cumulatively considerable;

- A description of the effects of climate change on the environment shall be included in CEQA documents;
- A CEQA document shall contain mitigation measures, which feasibly reduce GHG emissions;
- GHG analysis in a CEQA document may be Tiered or Streamlined; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

Senate Bill 375

SB 375 was approved by the Governor on September 30, 2008. SB 375 provides for the creation of a new regional planning document called a "sustainable communities strategy" (SCS). An SCS is a blueprint for regional transportation infrastructure and development that is designed to reduce GHG emission from cars and light trucks to target levels that will be set by CARB for 18 regions throughout California. Each of the various metropolitan planning organizations and the Association of Bay Area Governments (ABAG) must prepare an SCS and include it in that region's regional transportation plan. The SCS would influence transportation, housing, and land use planning. CARB will determine whether the SCS will achieve the region's GHG emissions reduction goals. Under SB 375 certain qualifying in-fill residential and mixed-use projects would be eligible for streamlined CEQA review.

Bay Area Air Quality Management District Climate Change Guidelines

In June 2010, the BAAQMD's Governing Board adopted new CEQA Guidelines (Guidelines), which provide guidance for analyzing project-level climate change impacts (BAAQMD, 2010). The Guidelines provide GHG emissions thresholds for project operation; however, the Guidelines do not provide project construction GHG emission thresholds. On March 5, 2012 the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds provided in its CEQA Guidelines. The court did not determine whether the thresholds were valid on the merits. The court set aside the thresholds and ceases dissemination of them until the BAAQMD complies with CEQA. The BAAQMD has appealed the Alameda County Superior Court's decision. The appeal is currently pending in the Court of Appeal of the State of California, First Appellate District.

Napa County

Since the certification of the Final General Plan EIR and adoption of the General Plan, Napa County has undertaken numerous efforts aimed at reducing GHG emissions. The County participated in a multi-jurisdictional effort lead by the Napa County Transportation and Planning Agency (NCTPA) to quantify community-wide emissions for all jurisdictions within the County and to develop a non-binding emission reduction framework (2009) that each jurisdiction can use to guide their decision making and planning.

The County has also prepared and adopted an emission reduction plan aimed at reducing emissions from County operations. The County is currently in the process of preparing a Climate Action Plan (CAP) specific to unincorporated areas of the County. The CAP is being developed to meet qualifications established by CARB. The CAP will include a refined inventory and forecast of GHG emissions for unincorporated Napa County, including emissions associated with agriculture and changes in carbon sequestration over time. The CAP will quantify emissions from vineyard development and operations (as well as other sectors), and will include emission reduction measures aimed at achieving goals of AB 32. A draft CAP was completed in January 2011 and was proposed to be adopted in late 2011. That draft CAP included a 52 percent reduction in GHG emissions from "business as usual" practices. In March 2012, the draft CAP was revised based on public input and it was determined that fewer vineyard conversion projects and the potential for even further reductions in GHG emissions from existing vineyards would occur. Therefore, the reduction from development and vineyard projects was revised to 38 percent. While the draft CAP represents a guiding framework for this analysis, since the draft CAP has not yet been adopted by the County, State goals are used in this analysis as the basis for determining less-than-significant impacts during project construction (see **Section 4.7.3-1** below).

4.7.3 IMPACTS ANALYSIS

4.7.3-1 SIGNIFICANCE CRITERIA

For the purposes of this analysis, the Proposed Project would have a significant impact if it would:

- Generate greenhouse gas emissions either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

In June 2010, the BAAQMD Board of Directors adopted the proposed BAAQMD CEQA Guidelines. In accordance with BAAQMD CEQA Guidelines (Guidelines), a project can be determined to have a less-than-significant impact by providing either project components or mitigation, which would reduce GHG emissions below a specific threshold defined by a public agency or recommended by experts provided that the decision of the lead agency to adopt such thresholds is supported by substantial evidence. The Guidelines included an operational threshold of 1,100 metric tons per year of CO_2 equivalent (CO_2e) and a methodology for calculating project-level GHG emissions.

CO_2e is a method by which GHGs other than CO_2 are converted to a CO_2-like emission value based on a heat-capturing ratio or global warming potential (GWP). CO_2 is used as the base and is given a value of one. Methane (CH_4) has the ability to capture 21 times

more heat than CO_2; therefore, CH_4 is given a CO_2e value of 21. GHG emissions are multiplied by the CO_2e value to achieve one GHG emission value. By providing a common measurement, CO_2e provides a means for presenting the relative overall effectiveness of emission reduction measures for various GHGs in reducing project contributions to global climate change.

Although the Guidelines provide clear guidance on how to analyze GHG emissions from biogenic sources, which result from natural biological processes such as the decomposition or combustion of vegetative matter (wood, paper, vegetable oils, animal fat, yard waste, etc.), the Guidelines do not require the quantification of biogenic emissions as part of the quantification of GHG emissions for projects and does not provide a GHG emission threshold for these sources for both operation and construction activities. However, the Guidelines do recommend that construction-related GHG emissions be quantified using the URBEMIS air quality program and disclosed in the appropriate environmental document. The Guidelines require that only exhaust from construction equipment be included in the climate change analysis, similar to the analysis for criteria pollutants.

For this analysis, a reduction of approximately 25 percent from “business as usual” levels of GHG emissions, which is consistent with recent court decisions and the language of AB 32, will be deemed to be an appropriate means for meeting the State’s GHG reduction goals (*Citizens for Responsible Equitable Environmental Development v. City of Chula Vista*, (July 8, 2011, D057779)). Therefore, for this analysis, such a reduction in GHG emissions will be considered as a less-than-significant impact to climate change. This significance threshold is consistent with the State of California and AB 32 GHG Reduction Goals. As stated above, since the County has not yet adopted any further reduction criteria, the State goals are used in this analysis as the basis for determining less-than-significant impacts during project construction. As described in **Section 4.7-2** above, the court did not set aside the BAAQMD operational GHG thresholds on its merits; therefore, the BAAQMD GHG operation threshold of 1,100 megatons (MT) per year or less shall be the basis for determining project operational significance.

4.7.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.7-1: Construction of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project sources of GHG emissions during construction would include the transport and delivery of construction equipment to the property; operation of construction equipment, including equipment used for the timber harvest, planting the vineyard, and installing the erosion control system; worker trips, fuel use, and material transport. This is a potentially significant impact; however, after mitigation, impacts would be considered less than significant.

Methodology

GHG emissions from construction equipment were estimated using the URBEMIS 9.2.4 air quality model. URBEMIS default construction equipment values were used. Typical equipment to be used during the timber harvest and installation of the vineyard and erosion control measures include excavators, crawler tractors, and graders. A complete description of the equipment to be used during construction of the Proposed Project is found in **Section 3.0 Project Description**. Where a precise equipment match with the URBEMIS model equipment categories was not found, a similarly rated piece of equipment from the standard URBEMIS default list was used. Direct GHG emissions from the removal of trees on the property were determined using EPA emissions factors (EPA, 2011). CO_2e emissions from the tilling and ground clearing process during construction were estimated using guidance from the 2006 Effects of Land Use on Soil Respiration: Conversion of Oak Woodlands to Vineyards (Carlisle, 2006).

Findings

Table 4.7-1 shows the estimated project construction emissions of GHG from construction activities including mobile and indirect sources as well as the GHG emissions from biogenic sources. Construction GHG emissions would be reduced with the milling and conversion of removed trees to lumber onsite.

TABLE 4.7-1
GREENHOUSE GAS CONSTRUCTION EMISSIONS

Proposed Project	GHGs	Emissions	Conversion Factor	GHG Emissions
		ST	ST/MT	MT of CO_2e
Construction GHG Emissions				
Mobile Construction Activities[1]	CO_2e	476	0.91	433
Timber Removal[2]	CO_2e			3,291
Soil Tilling/Ground Clearing[3]	CO_2e			615
Subtotal				**4,339**
Harvested Timber to Lumber	CO_2e			<2,370>[4]
Total Construction GHG Emissions				**1,969**

ST = short tons; MT = metric tons; CO_2e = carbon dioxide equivalent
[1] Estimated using BAAQMD recommended URBEMIS air quality model and includes land clearing, in vineyard avenues, irrigation system installation, planting, etc.
[2] Actual harvesting of standing carbon from the trees that will be cleared for vineyard construction. Timber Removal is based on 257.14 MT per acre, 12.8 acres cleared (EPA, 2011).
[3] Carbon loss from tilling and ground disturbing activities based on 15 acres tilled, 41 MT of carbon stored per acre.
[4] Based on 72 percent of timber converted to lumber.
Source: URBEMIS, 2007; AES, 2013.

As part of the Proposed Project's design, milling the harvested trees onsite and eliminating the use of logging trucks reduces the project's GHG emissions impacts in comparison to standard timber harvesting operations by roughly 50 percent. This is due to the high

number of trips associated with logging trucks under typical "business as usual" timber harvesting practices. Once the vineyard is established and the cover crop is applied, the vine plantings will occupy roughly 15.3± net acres within the 17±-acre THP area and will therefore function as an additional source of carbon sequestration on the property. However, it is hard to quantify these last two sources of carbon sequestration and therefore they were not included as a reduction in this analysis. Therefore, the URBEMIS model output reflects conservative estimates in terms of carbon sequestration. Construction GHG emissions would be further reduced with the implementation of the BAAQMD construction emission reduction measures outlined in **Mitigation Measure 4.7-1** (below); however, these reductions are difficult to accurately quantify due to limited scientific research available related to the measure. Therefore, reductions from **Mitigation Measure 4.7-1** are not included in this analysis, which results in a more conservative estimate of construction GHG emissions (**Table 4.7-1**).

As shown in **Table 4.7-1**, GHG emissions from construction activities, including removal of trees and carbon emitted due to tillage and ground clearing would result in 4,339 MT of CO_2e. Further, the Proposed Project's design would retain 2,370 MT of CO_2e or 55 percent of the project's GHG emissions in the form of lumber (**Table 4.7-1**). The total construction GHG emissions from the Proposed Project would be 1,969 MT of CO_2e. Therefore, the Proposed Project's design reduces GHG emissions from construction by 55 percent from "business as usual" practices, which results in a less-than-significant impact to climate change. Since the County's draft Climate Action Plan (CAP) provides for a reduction in GHG emissions by 38 percent, the Proposed Project meets the draft CAP standard. As stated in **Section 4.7.2**, while the draft CAP represents a guiding framework for this analysis and since the draft CAP has not yet been adopted by the County, State goals are used in this analysis as the basis for determining less-than-significant impacts during project construction. The Applicant would further reduce construction-related GHG emissions from the Proposed Project with implementation of **Mitigation Measure 4.7-1**.

Mitigation Measure 4.7-1: The Applicant shall implement the following mitigation measures to reduce criteria pollutant emissions during construction of the Proposed Project:

- The Applicant shall maintain all construction equipment in accordance with manufacturers' specifications.
- The Applicant shall limit construction equipment idling time to less than five minutes.

Impact 4.7-2: Operation of the Proposed Project would emit GHGs and would have the potential to exacerbate global climate change. Project operational sources of GHG emissions would include vehicles (produce and material transports and workers) traveling to and from the Proposed Project, energy use, and limited water transport. As shown below, impacts would be considered less than significant.

Methodology

Operational GHG emissions from mobile and area sources were estimated using URBEMIS 9.4.2 air quality model. Mobile sources include worker trips and transport of grapes and materials. Indirect GHG emissions from water conveyance and agriculture were estimated using the 2011, beta version of the BAAQMD GHG Model (BAAQMD, 2011). The average annual loss of carbon sequestration was estimated from EPA approved emissions factors (EPA, 2011). GHG emissions from mobile and area sources were converted to CO_2e and compared to appropriate climate change thresholds.

Findings

Under the BAAQMD CEQA Guidelines, a project's operational emissions must be quantified. **Table 4.7-2** shows the estimated project-related GHG emission from direct and indirect emission sources.

TABLE 4.7-2
GREENHOUSE GAS OPERATIONAL EMISSIONS

Proposed Project	GHGs	GHG Emissions (MT/yr of CO_2e)
Direct Operational GHG Emissions		
Loss of Sequestration[1]	CO_2e	39
Area	CO_2	1
Indirect Operational GHG Emissions		
Mobile	CO_2	158
Agricultural		16
Water and Wastewater[2]	CO_2e	5
Total Annual Operational GHG Emissions		**219**
BAAQMD Operational GHG Emissions Threshold		*1,100*
Significant		***No***

ST = short tons; MT = metric tons; CO_2e = carbon dioxide equivalent
[1] Actual loss of carbon sequestration due to the permanent removal of 12.8 acres of timber on-site.
[2] Based on 11.25 acre-feet of water use per year (refer to **Appendix B**).
Source: URBEMIS, 2007; BAAQMD, 2011; EPA, 2011.

Agricultural lands depend on water for irrigation and this water must be provided either from wells, lakes or streams. The movement of water can be energy intensive. In California, the movement of water constitutes 14 percent of the state's total energy usage due largely to factors such as distance moved, major state and federal water projects, and depth to ground water in some areas. The use of gas or diesel powered pumps to extract water from the ground or move water from lakes or streams for various land uses increases GHG emissions. However, the Proposed Project does not exhibit these factors since the

proposed water use would be from an existing onsite well, and the distance water would be moved to the proposed vineyard is relatively small. Thus, the Proposed Project would make efficient use of water from existing water sources to the degree needed. This would reduce the energy required to transport water and would therefore reduce GHG emissions. Thus, the GHG emissions impacts for water and wastewater shown in **Table 4.7-2** constitute a standard estimate that is largely conservative and does not take into account these project specific factors.

Benefits of the Proposed Project's Design

There are several other beneficial aspects of the Proposed Project's design that would reduce impacts to climate change. Construction equipment would be kept onsite during construction (which would minimize truck trips), engine idling would be minimized, equipment would be properly maintained, and a cover crop would be established on all disturbed areas. These project components, which would reduce GHG emissions, are not readily quantifiable due to the lack of verifiable scientific data; therefore, a conservative approach was taken in this analysis and the GHG emissions reductions due to these specific project components were not included in the analysis. Therefore, the GHG emissions impacts identified in **Table 4.7-2** are conservative estimates.

As shown in **Table 4.7-2**, operational GHG emissions would be less than the BAAQMD CEQA threshold of 1,100 MT of CO_2e for project-level operation; therefore, operation of the Proposed Project would result in a less-than-significant impact to climate change.

Mitigation Measure 4.7-2: No mitigation is required.

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4.8 HAZARDOUS MATERIALS

This section addresses hazardous materials, school and public safety, and emergency response plans.

4.8.1 SETTING

Definition of Hazardous Material

A material is considered hazardous if it appears on a list of hazardous materials prepared by a Federal, State, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations (CCR) as:

> "A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed" (CCR, Title 22, Section 66260.10).

4.8.1-1 CURRENT SITE CONDITIONS

Database Searches

Regulatory agency databases were searched in an effort to identify locations of current and historical hazardous materials storage, generation, and documented releases. It should be noted that a site could be listed on a hazardous materials database and be in compliance with local, state and federal laws. The State Water Resources Control Board (SWRCB) GeoTracker database search did not identify any hazardous sites on the project site or parcel (GeoTracker, 2012).

The nearest documented leaking underground storage tank (LUST) site is located on the campus of Pacific Union College (PUC) to the west the project site (GeoTracker, 2012). The Pacific Union College Heating Plant site (T0605591456), located on the PUC campus, is approximately 0.4 miles west of the project site. This site was closed on September 9, 1994 after remediation actions associated with an underground storage tank (GeoTracker, 2012). The property is not listed on the LUST database or the State CORTESE list and no hazardous releases have been reported within 1,500 feet of the project parcel (GeoTracker, 2012).

Air Strips and Airports

The Angwin-Parrett Field Airport, located to the immediate north of the project site is operated by PUC. Prior to purchase, the project site was routinely thinned to facilitate airport runway use. Underground fuel tanks are located within Angwin-Parrett Field approximately 350 feet north of the project boundary.

Wildland Fires

The Project Site is located on land designated as a state/federal responsibility area "Non-Very High Fire Hazard Severity Zone (VHFHSZ)" according to the Napa County Fire Hazard Zones Map produced by the California Department of Forestry and Fire Protection (CAL FIRE) (CAL FIRE, 2007).

4.8.1-2 PROPOSED VINEYARD OPERATIONS

Integrated Pest Management (IPM) techniques will be employed and materials which have the least environmental impact will be used for the operation of the Proposed Project (**Appendix J**). IPM employs an aggressive visual monitoring regime to identify the presence of invasive insects prior to infestation. This sustainable farming approach entails utilizing non chemical and minimalist chemical practices. In the event that a situation arises where a more intrusive material or technique is required, all other non chemical avenues will be exhausted first. Required chemicals will be chosen based on minimal environmental toxicity and will be used at the lowest rate possible in order to minimize non-targeted contamination and drift.

No permanent storage of fertilization or pesticide materials would occur at the project site. In the event fertilizer or pesticide is used, application equipment would be washed in an area free from runoff hazards and containment mechanisms and controls will be used where appropriate. Non-biodegradable residual materials and wastes will be handled and transported offsite in closed containers in accordance with local, State, and Federal regulations.

4.8.2 REGULATORY FRAMEWORK

4.8.2-1 FEDERAL

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the sale, distribution and use of pesticides in the United States (EPA, 2012a). Pesticides are regulated under FIFRA until they are disposed, at which time they become wastes and are regulated under the Resource Conservation and Recovery Act (RCRA), which ensures responsible management of hazardous and nonhazardous waste (EPA, 2012b). Some, but not all, pesticides are regulated as hazardous waste when disposed. FIFRA was enacted in

1947, and significantly amended in 1972 and 1996, to provide federal control of pesticide distribution, sale, and use. FIFRA requires that each manufacturer register each pesticide and its label with the U.S. Environmental Protection Agency (EPA) before it can be manufactured for commercial use.

The Occupational Safety and Health Administration (OSHA) was created to ensure worker safety and health in the United States by working with employers and employees to create better working environments. Section 1919, Subpart H-Hazardous Materials of the Occupational Safety and Health Act of 1970 provides information and guidelines for working with hazardous materials (OSHA, 1970). All employees at the property will be trained in proper methods of working with hazardous materials.

The U.S Department of Transportation has the authority to regulate all safety aspects of hazardous materials transportation in accordance with the Hazardous Materials Transportation Act of 1975. The Motor Carrier Act of 1980 requires carriers of hazardous materials to demonstrate their ability to pay for damages sustained from an accident involving such materials by means of adequate insurance. The California Highway Patrol regulates transportation of hazardous materials in California. Fertilizers and petroleum fuel that are used on the property would be delivered onsite by licensed contracted delivery companies.

4.8.2-2 STATE

The California Department of Pesticide Regulation (DPR) protects human health and the environment by regulating pesticide sales and use and fostering reduced-risk pest management. Oversight by DPR includes product evaluation and registration, environmental monitoring, residue testing of fresh produce, and local use enforcement through Napa County Agricultural Commissioner's Office. DPR's regulations of pesticide use on the property would be regulated through the policies of the Napa County Agricultural Commissioner. Pesticides are authorized to be applied by certified pest applicators under DPR and are permitted through the Napa County Agricultural Commissioner.

The RCRA and the California Health and Safety Code authorize the California Department of Toxic Substance Control (DTSC) to regulate the handling, storage, transportation, and disposal of hazardous substances. DTSC regulations of hazardous materials use on the property would be followed through the local Certified Unified Program Agencies (CUPAs) as described below.

Senate Bill 1082 required the establishment of a unified hazardous waste and hazardous materials management program. The result was the California Environmental Protection Agency (CalEPA) Unified Program. The Unified Program consolidates, coordinates, and

makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs. The state agencies responsible for these programs set the standards for their program, while local governments implement the standards. CalEPA oversees the implementation of the program as a whole (CalEPA, 2012). The Unified Program is implemented at the local level by 85 government agencies certified by the Secretary of CalEPA. These Certified Unified Public Agencies (CUPAs) have typically been established as a function of a local environmental health or fire department. The Proposed Project will comply with the Unified Program through the Napa County Department of Environmental Management.

To comply with Title 22 of the California Code of Regulations (CCR) (66262.34(f)), hazardous waste containers must be marked with specific information. This regulation applies to the Proposed Project because fuel and oil will be stored at the property during construction and operation activities.

All vehicles and drivers involved in the transportation of hazardous materials must comply with the requirements contained in federal and state regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol (CHP) (CHP, 2008). Fertilizers and petroleum fuel that are delivered onsite by the contracted delivery companies are responsible for complying with state and federal regulations.

4.8.2-3 LOCAL

Napa County Department of Environmental Management is the CUPA for Napa County, including all of its cities (Napa County, 2013). As the CUPA, the Napa County Department of Environmental Management administers the following Unified Programs:

- Hazardous Materials Release Response Plans and Inventory (Business Plan) Program;
- California Accidental Release Prevention Program (CalARP);
- Underground Storage Tank Program;
- Hazardous Waste Generator and Hazardous Waste Onsite Treatment Programs; and
- AST Program (Spill Prevention, Control and Countermeasure (SPCC) Plans).

Through the enactment of Assembly Bill 2185 in 1985, the Business Plan Program was developed, commonly known as the Hazardous Materials Business Plan (HMBP) or Community Right to Know Program. The purpose of the program is to make available to the public information on what hazardous materials are being handled at businesses in the community, provide information to emergency responders on what hazardous materials are

handled at a facility, and provide training to employees in how to handle a release or threatened release of hazardous materials at a facility. There are an estimated 1,250 facilities in Napa County subject to the HMBP program. The Napa County Department of Environmental Management began countywide implementation of this program in 1989. The Napa County Department of Environmental Management requires businesses that store hazardous materials above the minimum reportable quantities (a total weight of 500 pounds for solids, a total volume of 55 gallons for liquids, and 200 cubic feet for compressed gases) to have a HMBP. The HMBP consists of owner/operator information, chemical inventory, and an emergency response plan and maps. The Proposed Project would be subject to the HMBP, if oil, gasoline and diesel fuel are stored onsite in excess of 55 gallons (Napa County, 2013).

The CalARP Program regulates facilities that handle extremely hazardous materials in quantities that are greater than state or federal planning standards. The purpose of the program is to reduce the incidences of releases of extremely hazardous materials and decrease the impact of a release. A Restricted Materials Permit is required for hazardous materials listed on the Regulated Substances List, and if the quantity of hazardous materials stored or handled onsite are greater than the regulated limit. If a permit were required, a Risk Management Plan would need to be submitted.

The materials used on the property are not listed on the Federal Regulated Substances List; therefore, the Proposed Project is not subject to the CalARP Program.

The Napa County Agricultural Commissioner and staff are responsible for the implementation of federal, state and local hazardous materials regulatory programs within Napa County. The Agricultural Commissioner is authorized to enforce the laws administered by the DPR. The Agricultural Commissioner requires a private applicator certificate for restricted materials (pesticides) use.

Safety issues associated with transportation of hazardous substances are discussed in the Safety Element of the Napa County General Plan. The following safety and conservation policies are listed in the General Plan (Napa County, 2008):

- Policy SAF-5: The County shall cooperate with other local jurisdictions to develop intra-county evacuation routes to be used in the event of a disaster within Napa County.
- Policy SAF-30: Potential hazards resulting from the release of liquids (wine, water, petroleum products, etc.) from the possible rupture or collapse of aboveground tanks should be considered as part of the review and permitting of these projects.
- Policy SAF-31: All development projects proposed on sites that are suspected or known to be contaminated by hazardous materials and/or are identified in a

hazardous material/waste search shall be reviewed, tested, and remediated for potential hazards.

- Policy CON-2 (e): Encourage inter-agency and inter-disciplinary cooperation, recognizing the agricultural commissioner's role as a liaison and the need to monitor and evaluate pesticide and herbicide programs over time and to potentially develop air quality, wildlife habitat, or other programs if needed to prevent environmental degradation.
- Policy CON-2 (f): Minimize pesticide and herbicide use and encourage research and use on integrated pest control methods such as cultural practices, biological control, hose resistance and other factors.

4.8.3 IMPACTS ANALYSIS

The CEQA *Guidelines* list a series of threshold criteria to analyze hazardous materials impacts resulting from a project. This section considers only the criteria that involve use of hazardous materials, which are directly applicable to the project.

4.8.3-1 SIGNIFICANCE CRITERIA

For purposes of this analysis, an impact is considered significant if the Proposed Project would:

- Create a significant hazard to the public or the environment through routine transport, use or disposal of hazardous materials; or
- Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving release of hazardous materials into the environment.

4.8.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.8-1: There is potential for incidental leakage, rupture, or spillage when fueling timber harvest and agricultural equipment during construction and operation of the Proposed Project, which could result in hazards to the public or environment. If substantial quantities of diesel fuel or unleaded gasoline reach soil or on-site drainage areas, surface and/or groundwater quality may be degraded. This is a potentially significant impact.

During construction and operation of the Proposed Project, the use of hazardous materials would include substances such as gasoline, diesel fuel, motor oil, and hydraulic fluid through maintenance of vehicles and construction equipment. Fueling and oiling of construction equipment would be performed as needed. The most likely possible hazardous materials releases would involve the dripping of fuels, oil, and grease from equipment. The small

quantities of fuel, oil, and grease that may drip from properly maintained vehicles would occur in relatively low toxicity and concentration. Typical construction management practices limit and often eliminate the effect of such accidental releases. No long-term effects to the soil or groundwater would occur. An accident involving a service or refueling truck would present the worst-case scenario for the release of a hazardous substance. Depending on the relative hazard of the material, if a spill of significant quantity were to occur, the accidental release could pose a hazard to construction employees, as well as to the environment. Such a release could result in a potentially significant impact.

Potentially significant impacts during temporary construction activity can be mitigated to less than significant levels through the implementation of best management practices (BMPs) intended to eliminate construction related pollutants from leaving the construction site. Specific project objectives associated with the implementation of the Erosion Control Plan (ECP) under the Proposed Project are identified in **Section 3.0**. These measures as well as the BMPs described in **Mitigation Measure 4.8-1** would ensure that potential impacts are reduced to a less than significant level.

Mitigation Measure 4.8-1: In addition to the erosion control measures described in **Section 3.0**, personnel shall follow written BMPs for filling and servicing construction equipment and vehicles. The BMPs, which are designed to reduce the potential for incidents involving hazardous materials, shall include:

- Refueling shall be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans shall be placed under equipment to catch potential spills during servicing.
- All disconnected hoses shall be placed in containers to collect residual fuel from the hose.
- Vehicle engines shall be shut down during refueling.
- No smoking, open flames, or welding shall be allowed in refueling or service areas.
- Refueling and all construction work shall be performed outside of any onsite stream buffer zones to prevent contamination of water in the event of a leak or spill.
- Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents.
- A spill containment kit that is recommended by the Napa County Department of Environmental Management or local fire department will be onsite and available to staff if a spill occurs.

In the event that contaminated soil and/or groundwater or other hazardous materials are generated or encountered during construction, all work shall be halted in the affected area and the type and extent of the contamination shall be determined. Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with

federal, state, and local regulations. If containment and size of the spill is beyond the scope of the contractor, proper authorities shall be notified. The potential release of hazardous materials during construction of the Proposed Project is reduced to less than significant with the implementation of the mitigation measure above.

Impact 4.8-2: In the event IPM techniques are found to be inadequate for vineyard maintenance, the Proposed Project would include the use of pesticides for vineyard maintenance. Non-compliance with hazardous materials regulations including improper pesticide use, storage or disposal can be hazardous to human health and the environment. Non-compliance would be considered a potentially significant impact.

The Proposed Project may include the use of chemicals for vineyard maintenance in the event all other non-chemical methods were previously exhausted and found insufficient. If such a scenario were to occur, the owner would hire only a licensed pesticide applicator or would apply for a private applicator certificate and a restricted materials permit from the Napa County Agricultural Commissioner. The owner would also comply with the Napa County Agricultural Commissioner's regulations, such as renewing the private applicator certificate every three years and restricted materials permits annually, and reporting pesticides use to the Napa County Agricultural Commissioner by the 10th of every month following application. In addition, all vineyard employees would be trained annually in the proper use of pesticides. Implementation of **Mitigation Measure 4.8-2** would ensure that potential impacts are reduced to a less than significant level.

Mitigation Measure 4.8-2: In the event pesticides are used onsite, only a certified pest applicator shall apply the pesticides and personnel shall follow Standard Operating Procedures (SOPs) when applying chemicals to the vineyard. SOPs for pesticide use, shall include the following:

- Purchase only enough pesticide that would be used per season.
- All chemicals will be stored in their original containers. Labels on the containers will not be removed.
- Chemicals will be kept in a well-ventilated locked area.
- Chemical storage areas will be 100 feet from any drainage area, stream, or groundwater well.
- If a chemical must be disposed of, contact the Napa County Agricultural Commissioner to locate a hazardous waste facility for proper disposal.
- Chemicals will never be poured down the sink, toilet, or stream.
- Proper personal protection equipment will be utilized when working with chemicals.

Implementation of the mitigation measure above reduces potential impacts from improper chemical use and storage to a less than significant level.

Impact 4.8-3: The potential release of hazardous materials into the environment may affect surface water or groundwater during operation and maintenance of the vineyard. This is a potentially significant impact.

During operation of the vineyard under the Proposed Project, the use of hazardous materials would likely include substances such as gasoline, diesel fuel, motor oil, and potentially a limited amount of pesticides and fertilizers (see **Impact 4.8-2**). Hazardous materials releases from operation and maintenance of the vineyard may occur from dripping of fuels, oil, grease, pesticides, and fertilizers from mechanical equipment. The small quantities of hazardous materials that may drip from properly maintained equipment would occur in relatively low toxicity and concentration. Furthermore, the project site is hydrologically disconnected from downstream surface waters (see **Section 4.9**). It is not likely that significant impacts to soil or groundwater would occur.

Napa County Department of Environmental Management promotes BMPs to reduce hazardous material contamination of surface and groundwater. The Proposed Project would be operated in a manner that is consistent with Napa County Department of Environmental Management requirements

Implementation of **Mitigation Measure 4.8-3** would ensure that potential impacts are reduced to a less than significant level.

Mitigation Measure 4.8-3: In addition to **Mitigation Measures 4.8-1** and **4.8-2**, fuel loading and chemical mixing areas during operation should be established away from any areas that could potentially drain off-site or potentially affect surface and groundwater quality. When farm equipment is cleaned at the existing facility, only rinse water that is free of gasoline residues, waste oils, pesticides, and other chemicals should be allowed to diffuse back into vineyard areas. In the event pesticides, herbicides or fungicides are used, all rinse water from farm equipment and rinse water from application equipment used to apply chemicals should be collected and stored in containers that are of sufficient size to contain the water until a hazardous materials transporter can remove the rinse water. No rinse water shall be drained to a septic system or discharged to ground or surface water to prevent the release of hazardous materials into the environment during operation and maintenance of the Proposed Project. Impacts after mitigation would be less than significant.

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4.9 HYDROLOGY AND WATER QUALITY

4.9.1 SETTING

4.9.1-1 CLIMATE

The Napa Valley region has a Mediterranean climate characterized by warm, dry summers and cold, wet winters. The vast majority of the precipitation occurs in the form of rain, though snow is not uncommon at higher elevations. Approximately 90 percent of annual precipitation falls as rain during the winter and early spring months. Annual precipitation varies significantly from year to year, and deviations can be as high as 200 percent from the 85-year average. In general, precipitation varies significantly throughout Napa County ranging from 22.5 inches per year to 75 inches per year, decreasing from north to south and with lower elevations (NCCDPD, 2005). The greatest rainfall intensity occurs in the mountain regions along the northern and western edges of Napa County. For 100-year, 24-hour, and six-hour storm events, the maximum amount of precipitation ranges from five to 14 inches (NCCDPD, 2005). In the Conn Creek watershed, a subunit of the Napa River Watershed located along the eastern edge of the watershed, between 1961 and 1990, the average annual precipitation was 20 to 25 inches. In comparison, the precipitation in the western portion of the Napa River watershed during the same time period was 35 to 40 inches.

4.9.1-2 SURFACE WATERS

The topography of Napa County consists of a series of parallel northwest-trending mountain ridges and intervening valleys of varying sizes. These mountain ridges subdivide the County into three principal watersheds: Napa River watershed, Putah Creek/Lake Berryessa watershed, and Suisun Creek watershed. The Napa River watershed covers an area of approximately 426 square miles and extends in a northwesterly direction roughly 45 miles from San Pablo Bay to the hills north of Calistoga. The Napa River watershed includes primarily a central valley floor contained on three sides by mountains to the north, west, and east. The watershed further demarcated into the Upper Napa River Watershed and the Napa River watershed. The Upper Napa River watershed extends from the northern headwaters of the Napa River on Mount St. Helena to Howell Mountain to the east and Sulphur Creek to the west (NCRCD, 2005). The project site lies within the Conn Creek watershed, a subbasin that drains to Lake Hennesey, a reservoir formed by the Conn Dam, thence the Napa River.

The Napa River is the largest river in Napa County and drains numerous tributaries of the watershed along a 55-mile stretch from Mount St. Helena to the San Pablo Bay where it

empties to the south. The lowest reaches of the Napa River and its tributaries north into the City of Napa are influenced by tides due to the proximity to San Pablo Bay.

In general, tributaries to major drainages typically form canyons in their steeper upstream reaches, where they flow over the more resistant bedrock of the mountainous areas. In terms of geomorphic form, Napa County streams typically descend from steep headwater reaches onto alluvial fan surfaces and then onto valley floors. Some of the upstream reaches of tributaries are intermittent, while others are perennial. The downstream reaches, especially of the larger streams, are generally perennial. Stream flows generally peak in January or February and are lowest from August through November. Average and maximum stream flows are scaled with drainage areas.

There are 28 dams in the Napa River watershed with individual water storage capacities greater than 28 acre-feet (af) (Stillwater Sciences et al., 2002). Seventy-one percent of the total reservoir storage in the watershed is in Conn Creek Reservoir (Lake Hennessey). Other significant dams include Rector Creek, Bell Canyon, and Milliken Creek dams. All of these dams are located on the tributary streams along the eastern side of the watershed, and effectively block every major east side tributary between St. Helena and Napa, except Soda Creek.

Conn Creek Watershed

The property is situated on Howell Mountain, a peak that separates Napa Valley from Pope Valley to the east. The entire property consists of two parcels that total approximately 76 acres, with the project site located on the approximately 42.3 acre tabletop ridge of Howell Mountain. Onsite elevations range from 1,700 to 1,860 feet above mean sea level. The property is located in the upper Conn Creek watershed (Calwater 2206.500305), a subwatershed of the Napa River Watershed. Conn Creek drains a watershed of approximately 62.7 square miles, of which 12.6 square miles are below the Conn Dam. The project site is situated in the headwaters of Conn Creek, above the dam. The Proposed Vineyard Block B contains up to 14 percent slopes, but the project site is situated on the relatively flat hilltop. The project site contains no U.S. Geological Survey (USGS) blue line streams, Class I, II, or III watercourses, or jurisdictional wetlands based on surveys conducted in 2007 by WRA Environmental Consultants and in 2012 by Analytical Environmental Services (AES). Please see **Section 4.4 Biological Resources** for additional discussion of wetlands.

Drainage

Eighty percent of the property is naturally disconnected from stormwater and sediment supply to the adjacent downslope properties and waterbodies (Balance Geo, 2013). The Proposed Project is within the disconnected area of the property and is currently drained by three natural swale catchments that do not transmit runoff or sediment to downstream

waterways. Approval of the Proposed Project and implementation of the ECP (**Appendix B**) will result in the development of numerous erosion control measures designed to prevent soil erosion and sediment impairment of the Napa River Watershed.

Runoff Potential

The primary landscape feature affecting the volume and the rate of runoff are soil type, land use, vegetative cover, and slopes. The most predominate soil type located at the property is classified by the U.S. Department of Agriculture (USDA) Soil Conservation Service for the Napa County Soil Survey as the Aiken Loam series (SCS 100 and 102). Hydrologic soils are classified based on the minimum infiltration rate obtained for the bare soil after prolonged wetting (USDA, 2007). The Aiken Loam is in hydrologic soil Group B and is described as having "moderately low runoff potential when thoroughly wet," and water transmission through the soil is unimpeded (NRCS, 2012). In general, Group B soils typically have between 10 percent and 20 percent clay and 50 to 90 percent sands and have loamy sand or sandy loam textures. Please see **Section 4.6 Geology and Soils** for a detailed description of the soils on the property.

Different land uses require different types and amounts of coverage by vegetation, which influences runoff. Currently, the property consists of non-native grasslands, existing vineyard, and moderate- to high-density forest. Habitats with dense vegetation coverage disperse runoff by intercepting precipitation and providing obstacles to the concentration of runoff. The current hilltop portion of the parcel where the Proposed Project will be situated is drained by three unchanneled low-relief catchments, and experiences no surface runoff under current conditions (Balance Geo, 2013).

A detailed Erosion Control Plan (ECP) (**Appendix B**) has been created for the property by Napa Valley Vineyard Engineering, Inc. (NVVE) to comply with Napa County regulatory requirements. As of February 2, 2006, the Napa County Resource Conservation District determined that the ECP meets all technical adequacy requirements, and it is currently in a final review period. The complete ECP for the Proposed Project (#P05-0376-ECPA) is included as **Appendix B** (NVVE, 2012). The ECP provides for modifications of runoff patterns on the property to assist with mitigating impacts from erosion. To mitigate potential erosion and runoff, the ECP suggests construction of two weirs and retention basins along the western edge of the THP area to allow infiltration of runoff. These basins will trap runoff from the Proposed Vineyard Block B and allow infiltration to the forest floor. Additional erosion control measures are described in more detail in **Section 3.0** and **Figure 3-4**.

Flooding

The valley portion of Napa County is a flood-prone region as a result of the Mediterranean climate with wet winters and dry summers, and a landscape of steep hills and a wide valley

floor. Downstream flooding may cause hazards if flows are impeded by crossings, culverts, or roads, and if structures in urban areas are inundated with flood flows from upstream. The Federal Emergency Management Agency (FEMA) has mapped flood zones in Napa County for 100- and 500-year flood events. The Proposed Project is situated on a mountain overlooking the valley and is not located within any FEMA designated flood zones (FEMA map 06055C0270E).

Surface Water Quality

Sediment Loading

Runoff from the lower portions of the property, not including the project site, is eventually transported to the Napa River, which is currently listed as an impaired water body for nutrients, pathogens, and sediment under Section 303 (d) of the Clean Water Act (CWA). The construction of several large dams between 1924 and 1959 on major tributaries in the eastern Napa River watershed and northern headwater areas of Napa River has affected sediment transport processes into the mainstem Napa River by reducing the delivery of the coarse load sediments to the river. Thirty percent of the Napa River watershed drains into dams, such that ponds and reservoirs behind these dams capture a significant fraction of all sediment input to channels (Napolitano, et al. 2007). The entire property is above the Conn Creek Dam which creates Lake Hennessey behind it, which acts to trap sediment as described above.

The mainstem Napa River is listed as sediment-impaired according to the Clean Water Act, Section 303 (d), because it does not meet the beneficial uses for which is was designated, including steelhead habitat. Historically, the Napa River system has been described as a gravel-bed river; more recently, the Napa River has become increasingly dominated by finer sediments. Dams that trap sediment in the area have not significantly reduced the degree to which finer sediments are being delivered to the watershed. As a result of this fine sedimentation, habitats for steelhead, Chinook salmon, and Californian freshwater shrimp, which rely on more gravel substrate in the river, have been negatively affected from reduced gravel permeability (Stillwater Sciences et. al, 2002; Napolitano, 2007). Section 303 (d) requires the Regional Water Quality Control Board (RWQCB) to create a Total Maximum Daily Load (TMDL) for sediment in the Napa River watershed. Under California Water Code §13242, the RWQCB is also authorized to develop an implementation program to meet the TMDL. The RWQCB Staff Report for the development of the TMDL specifically cites vineyards as a source of human caused sediment discharge, and states that a total 50 percent reduction in sediment loading to the watershed is necessary in order to meet the TMDL (Napolitano et al., 2007). The TMDL load reductions are based on natural conditions prior to human activities. The Napa County ECP regulations are designed to address this ongoing issue with water quality.

Temperature

Parameters that influence stream temperature include ambient air temperature, humidity, riparian vegetation, topography, surrounding land uses, stream orientation, stream width, and flow conditions. Water temperature influences a number of chemical processes within water bodies. Streams in Mediterranean climates, such as in Napa County, experience naturally low summer flows which results in watersheds that are susceptible to the impacts of high water temperatures. Additionally, land development often alters channel geomorphology, which creates conditions that cause water temperatures to rise and habitat to degrade. These activities include the removal of riparian shading, reduced cold-water inputs (i.e., altered groundwater supplies), and increased surface runoff.

The Napa River watershed currently provides habitat for cold-water anadromous fish species, including steelhead trout and Chinook salmon. Water temperature is a key constituent for assessing the quality of water within the Napa River watershed. Steelhead and Chinook salmon are highly sensitive to temperature and require cold water throughout the majority of their life stages. Mainstem and tributary temperatures are elevated to a level that can cause stress to salmonids, but not high enough to be acutely lethal. Elevated temperature conditions contribute to reduced habitat conditions for salmonids, particularly when combined with low summer base flows and aggraded channels (raised from sediment). However, the Conn Creek Dam is a barrier to anadromy, preventing anadromous fish from traveling farther into the watershed.

Nutrients

Nutrients, specifically nitrogen and phosphorus, are essential for life and play a primary role in ecosystem functions. In addition to naturally present concentrations in the atmosphere and organic matter, nutrients are introduced to waterbodies through human or animal waste disposal or agricultural application of fertilizers. Nutrients are commonly the limiting factor for growth in aquatic systems. However, excessive levels of nutrients affect aquatic systems in a wide range of ways, including producing toxic or eutrophic conditions, both of which impair aquatic life. The Napa River is identified as impaired by nutrient loading according to Section 303 (d) of the CWA, as discussed in the Regulatory Framework section below (**Section 4.9.2**). Wang et al. (2004) identified numerous nutrient load contributors, including point sources such as wastewater treatment plants, and non-point sources such as septic system seepage, agricultural and urban runoff, and atmospheric deposition. No specific numeric nutrient targets for the Napa River watershed have been established by the SFBRWQCB.

Pathogens

High concentrations of fecal bacteria have been recorded in the Napa River since the 1960s. Consequentially, the SFBRWQCB identified the Napa River as impaired by

pathogens according to Section 303 (d) of the CWA. Sources that contribute to the significant pathogen loads in the watershed include faulty onsite sewage treatment systems, failing sanitary sewer lines, municipal runoff, and livestock grazing. Past monitoring efforts indicate that urban runoff and failing septic systems are the primary pathogen sources during wet weather months, while failing sanitary sewer lines and septic tanks may constitute the primary pathogen sources during the dry season. To address this issue, a TMDL has been developed for the Napa River and its tributaries, which implements density-based targets and zero discharge of untreated or inadequately treated human waste.

4.9.1-3 GROUNDWATER

Regional Groundwater Resources

In regional basins, municipal and irrigation wells have average depths ranging from about 200 to 500 feet. Well yields in these basins range from less than 50 gallons per minute (gpm) to approximately 3,000 gpm. The Napa-Sonoma Valley groundwater basin is one of the more heavily utilized basins in the region for groundwater supply; however, the property is not located within the boundaries of this basin. Groundwater data from the Napa Valley subbasin shows well yields at a maximum of 3,000 gpm and an average of 223 gpm (DWR, 2003). The North Napa Valley Basin (NNVB) is by far the most productive aquifer in the basin, which can locally provide water to wells at rates in excess of 3,000 gpm (NCCDPD, 2005).

Groundwater on the Property

The property is underlain by bedrock composed of hard andesitic lava-flow and ash-flow tuff rocks of the Sonoma Volcanics rock formation (Balance Geo, 2013). The Sonoma Volcanic Formation has moderate to high primary porosity, and as such plentiful groundwater resources are often found in these geologic units and it represents the principle water bearing geologic formation in the region. Sonoma Volcanics generally contain groundwater in fractures and joints, in zones of deep weathering, along remnant flow channels, and between individual flow units that developed amid successive volcanic events. Due to the nature of groundwater occurring in these rocks, the amount of groundwater available to wells in the volcanic materials is highly dependent on well depth, as well as the size, frequency, openness, lateral continuity and degree of interconnection of the fractures and joints encountered in the rocks at a specific site. Wells drilled in Sonoma Volcanics commonly yield from 10 to 50 gpm and drawdowns are on the order of from 10 to 120 feet (DWR, 2003), but well production varies greatly. Of the three existing wells on this property, one (Abreu Well No. 1) exceeds the average by a factor of ten. The depth to bedrock groundwater on the property was measured to be 192 feet below the surface of the property hilltop; given the elevation of the property, the water table elevation is 1,670 feet above sea

level (Balance Geo, 2013). Wells tapping the tuffaceous volcanic aquifer yield water at an average rate of 32 gpm (NCCDPD, 2005).

Groundwater Quality

In general, groundwater quality throughout most of the San Francisco hydrologic region is suitable for most urban and agricultural uses with only local impairments. The primary constituents of concern are high total dissolved solids (TDS), nitrate, boron, and organic compounds. Areas of high TDS (and chloride) concentrations have typically been found in groundwater basins situated close to the San Francisco Bay including the Napa Valley. Specifically, groundwater with high TDS, iron, and boron levels in other parts of Napa Valley make the water unfit for agricultural uses (DWR, 2003).

4.9.1-4 WATER SUPPLY

The Proposed Project would include a timber harvest of approximately 12.8± acres within the 17± acre THP area, with a subsequent conversion of the THP area into 15.3± net acres of commercial vineyard producing premium quality grapes. Water use on the new vineyard is expected to be 11.25± acre feet per annum (afa) during the establishment period (**Appendix I**). The water system for the Proposed Project consists of one existing well (Abreu Well No. 1), and the proposed installation of a drip irrigation system that will be used predominantly for the establishment of the vineyard.

Surface Water Supply

No USGS blue line streams, Class I, II or III watercourses, or jurisdictional wetlands exist within the project site. The entirety of the irrigation water for the vineyard would come from groundwater, as discussed below.

Groundwater Supply

A water balance analysis by Balance Geo (2013) for the Proposed Project determined that a 16 percent decrease in evapotranspiration (the discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants), and interception (the holding of raindrops by plants as water descends onto leaves, stems, and branches during storm events) is likely to occur with the conversion from forest to vineyard. These decreases will allow more water to be delivered to the soil surface for infiltration, percolation, and surface flow, and will result in a groundwater recharge increase of approximately three percent. This will help offset the irrigation requirements of the Proposed Project, which will be met by groundwater. Furthermore, as discussed in **Section 4.6**, the additional groundwater from removal of vegetation and irrigation will not cause any destabilizing impacts to the hillslope geology (**Appendix F**).

Abreu Well No. 1 is capable of sustaining a water yield of at least 330 gallons per minute, equivalent to a water yield of 525 afa (**Appendix F**)[1]. The long-term groundwater use of the Proposed Vineyard Block B is approximately 5.6± afa, or 26.6 percent of the parcel's allowable 21 afa by the County (Phase 1 Water Availability Analysis in **Appendix I**).

4.9.2 REGULATORY FRAMEWORK

4.9.2-1 FEDERAL

The Federal CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all pollutant discharges into the nation's waters are unlawful unless specifically authorized by a permit. The CWA authorizes the U.S. Environmental Protection Agency (USEPA) to protect and maintain the quality and integrity of the nation's waters. Part of the CWA provides for the National Permit for Discharge Elimination System (NPDES), in which discharges into navigational waters are prohibited except in compliance with specified requirements and authorizations (discussed in detail below).

4.9.2-2 STATE

The Regional Water Quality Control Plan for the San Francisco Bay Basin and the California Enclosed Bays and Estuaries Plan serve to protect the water quality of the state consistent with identified beneficial uses. These plans govern the waste discharge and non-point source control requirements in the state through the regional boards.

Section 303 (d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). Once a water body or segment is listed, the state is required to establish a TMDL for the pollutant causing the conditions of impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. The intent of the 303 (d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for continued water quality degradation. The SFBRWQCB has identified waters that are polluted and need further attention to support their beneficial uses. The 303 (d) list includes the Napa River for nutrients, pathogens, and sedimentation/siltation.

The SFBRWQCB identifies beneficial uses and water quality objectives for surface waters in the region, as well as effluent limitations and discharge prohibitions intended to protect those uses. The existing beneficial uses designated for the Napa River are agricultural,

[1] This was calculated in a 2-hour pump test conducted by HWD in 2003 and a 72-hour pump test conducted by Imboden Pumps in 2007.

municipal, and domestic supply, cold freshwater habitat, fish migration, navigation, preservation of rare and endangered species, water contact and non-water contact recreation, fish spawning, warm freshwater habitat, and wildlife habitat.

National Pollutant Discharge Elimination System

In California, the Environmental Protection Agency has delegated the implementation of this program to the State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards. The NPDES program regulates municipal and industrial storm water discharges under the requirements of the CWA. Initially, the NPDES program permits focused on regulating point source pollution. In the early 1970s, an amendment to the CWA directed the NPDES program to address non-point source pollution through a phased approach.

The NPDES is federally mandated, but enforced locally. Applicants with construction projects disturbing one or more acres of soil are required to file for coverage under the State Water Board, Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002 for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). Construction activities include clearing, excavation, stockpiling, and reconstruction of existing facilities involving removal and replacement. During installation, the Erosion Control Plan (ECP) would cover the stormwater management requirements under the General Permit.

4.9.2-3 LOCAL

The Napa County General Plan (General Plan) serves as a broad framework for planning within Napa County (Napa County, 2008). State law requires general plans to cover a variety of topics. The General Plan contains goals and policies related to: open space conservation, natural resources, water resources, safety, circulation, and provides guidance for issues related to hydrology and water quality. Applicable General Plan policies for the Proposed Project are provided below.

Open Space Conservation Policies

Policy CON-6: The County shall impose conditions on discretionary projects which limit development in environmentally sensitive areas such as those adjacent to rivers or streamside areas and physically hazardous areas such as floodplains, steep slopes, high fire risk areas and geologically hazardous areas.

Water Resources Goals and Policies

Goal CON-8: Reduce or eliminate groundwater and surface water contamination from known sources (e.g., underground tanks, chemical spills, landfills, livestock grazing, and

other dispersed sources such as septic systems).

Goal CON-9: Control urban and rural storm water runoff and related non-point source pollutants, reducing to acceptable levels pollutant discharges from land-based activities throughout the county.

Goal CON-10: Conserve, enhance and manage water resources on a sustainable basis to attempt to ensure that sufficient amounts of water will be available for the uses allowed by this General Plan, for the natural environment, and for future generations.

Goal CON-11: Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urbanized areas and ensure that land use decisions recognize the long term availability and value of water resources in Napa County.

Goal CON-12: Proactively collect information about the status of the county's surface and groundwater resources to provide for improved forecasting of future supplies and effective management of the resources in each of the County's watersheds.

Policy CON-42: The County shall work to improve and maintain the vitality and health of its watersheds. Specifically, the County shall:

d) Support environmentally sustainable agricultural techniques and best management practices (BMPs) that protect surface water and groundwater quality and quantity (e.g., cover crop management, integrated pest management, informed surface water withdrawals and groundwater use).

Policy CON-47: The County shall comply with applicable Water Quality Control/Basin Plans as amended through the Total Maximum Daily Load (TMDL) process to improve water quality. In its efforts to comply, the following may be undertaken:

e) Ensuring continued effectiveness of the National Pollution Discharge Elimination System (NPDES) program and storm water pollution prevention.
f) Ensuring continued effectiveness of the County's Conservation Regulations related to vineyard projects and other earth-disturbing activities.

Policy CON-48: Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control (i.e., Basin Plan) requirements and are protective of the County's sensitive domestic supply watersheds. Technical reports and/or erosion

control plans that recommend site-specific erosion control measures shall meet the requirements of the County Code and provide detailed information regarding site specific geologic, soil, and hydrologic conditions and how the proposed measure will function.

Policy CON-50: The County will take appropriate steps to protect surface water quality and quantity, including (the following specific policies):

a) Preserve riparian areas through adequate buffering and pursue retention, maintenance, and enhancement of existing native vegetation along all intermittent and perennial streams through existing stream setbacks in the County's Conservation Regulations.

c) The County shall require discretionary projects to meet performance standards designed to ensure peak runoff in 2-, 10-, 50-, and 100-year events following development is not greater than predevelopment conditions.

e) In conformance with National Pollution Discharge Elimination System (NPDES) requirements, prohibit grading and excavation unless it can be demonstrated that such activities will not result in significant soil erosion, silting of lower slopes or waterways, slide damage, flooding problems, or damage to wildlife and fishery habitats.

Policy CON-52: Groundwater is a valuable resource in Napa County. The County encourages responsible use and conservation of groundwater and regulates groundwater resources by way of its groundwater ordinances.

Policy CON-53: The County shall ensure that the intensity and timing of new development are consistent with the capacity of water supplies and protect groundwater and other water supplies by requiring all applicants for discretionary projects to demonstrate the availability of an adequate water supply prior to approval. Depending on the site location and the specific circumstances, adequate demonstration of availability may include evidence or calculation of groundwater availability via an appropriate hydrogeologic analysis or may be satisfied by compliance with County Code "fair-share" provisions or applicable State law. In some areas, evidence may be provided through coordination with applicable municipalities and public and private water purveyors to verify water supply sufficiency.

Safety Goals and Policies

Goal SAF-5: To protect residents and businesses from hazards caused by human activities.

Policy SAF-30: Potential hazards resulting from the release of liquids (wine, water, petroleum products, etc.) from the possible rupture or collapse of aboveground tanks should be considered as part of the review and permitting of these projects.

Circulation Goals and Policies

Policy CIR-8: Roadway, culvert, and bridge improvements and repairs shall be designed and constructed to minimize fine-sediment and other pollutant delivery to waterways, to minimize increases in peak flows and flooding on adjacent properties, and where applicable to allow for fish passage and migration, consistent with all applicable codes and regulations.

Napa County Code (Chapter 18.108 – Conservation Regulations)

Napa County Code 18.108 includes conservation regulations such as requirements for standard erosion control measures, provisions for intermittent or perennial streams, requirements for use of erosion hazard areas. This section of the code also defines streams and provides stream setbacks for grading and land clearing for agricultural development (see **Section 4.4** for the discussion of this code section).

Some portions of the property have slopes greater than five percent, therefore, under Napa County Code Section 18.108.070, the Proposed Project would require permit approval prior to any grading activities (see **Section 3.0**).

Napa County Resource Conservation District (RCD)

The RCD published the Napa River Watershed Owner's Manual in 1996. This manual lists the following objectives and recommendations that pertain to the Proposed Project:

> Objective G: Reduce Soil Erosion
> Recommendation G2: Reduce erosion resulting from agricultural activities. Agricultural activities in the Napa River watershed include grazing, viticulture, small farms and horticulture. Soil disturbance or vegetation removal as a result of agricultural activities can result in loss of topsoil and subsequent water quality degradation. Good agricultural management can also benefit water quality and wildlife habitat, and can contribute to the overall good health of the watershed. Sub-recommendations include:
>
> G2.1. Emphasize erosion prevention over sediment retention as a priority in agricultural planning and operations.
> G2.2. Promote the use of permanent vegetative ground cover in vineyards. Support research, demonstrations and technology exchange to refine cover crop technology for vineyards and orchards.
> G2.3. Establish tree cover in unused areas to decrease erosion of topsoil.
> G2.4. Maintain access roads and farm roads to control storm water runoff in agricultural areas. Utilize assistance from the USDA Natural Resource Conservation Service, or other erosion control professionals, for design of storm water runoff control on rural roads.

G2.5. Minimize wet weather vehicle traffic through or across agricultural areas, especially on hillsides.
G2.6. Provide adequate energy dissipaters for culverts and other drainage pipe outlets.
G2.7. Establish vegetated buffer strips along waterways.
G2.8. Develop grazing management plans to increase vegetation residue on rangeland.

4.9.3 IMPACTS ANALYSIS

The basic philosophy for the design of the Proposed Project is to minimize environmental disturbance and control erosion on the property rather than capturing soil after it has been displaced. To help meet this goal, the ECP includes several different measures for prevention of erosion and control of sediment, as described in **Section 3.4.2**. **Section 4.6.3-2** discusses how the project design will reduce the production of sediment by 54 percent. This section addresses how erosion control features will preserve the hilltop's existing disconnectivity from downstream waters to prevent sediment impacts to the Napa River. The Proposed Project would aim to preserve the existing courses of runoff and drainage onsite to the degree feasible, as well as implement ECP measures that improve the courses of runoff and drainage onsite once the vineyard block is in place.

4.9.3-1 SIGNIFICANCE CRITERIA

For the purpose of this EIR, an impact to hydrology and water quality would be significant if it would result in any one of the following:

- Alter the existing onsite drainage pattern in a manner that would substantially increase the volume and rate of surface runoff such that on- or offsite drainages become unstable (either by increased erosion or increased sediment deposition), the capacity of existing or planned stormwater drainage systems is overwhelmed, and/or significant flooding occurs;
- Alter the existing onsite drainage pattern in a manner that would substantially degrade water quality, onsite and within downstream receiving water bodies, by increasing the suspended sediment load and/or contributing other pollutants to the natural waterways;
- Expose people or structures to a significant risk of loss due to flooding; or
- Substantially deplete groundwater supplies, or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.

4.9.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.9-1: Development of the Proposed Project would alter the existing drainage pattern of the property. This is a potentially significant impact. However, with implementation of the ECP, a slight decrease in the volume and rate of runoff onsite would occur and there would be no change in runoff to receiving waters. Therefore, a less-than-significant impact would result.

The drainage pattern of an area will, in part, determine the rate and volume of runoff. Drainage patterns refer to the characteristics of a landscape that determine the course of runoff in an area, which is determined by the size and extent of vegetation, and topographic and geologic features. Development activities involved with the Proposed Project would alter the existing drainage pattern of the property. Lands that typically generate greater concentrations of runoff characteristically contain few obstacles, impervious surfaces, and poorly drained soils.

The timber harvest and subsequent conversion of the property into a vineyard would result in the removal of 12.8± acres of trees. Conversion of the land use would also involve soil ripping to a maximum depth of two feet, and earthmoving activities required for vineyard preparation. Installation of the proposed structural erosion control measures, as described in **Section 3.0**, would preserve water quality in downstream areas off the property. The erosion control measures provided for in the ECP and the vegetative erosion control measures to increase ground vegetation cover would provide new obstacles to runoff concentration that would reduce impacts to onsite water features (**Appendix B**).

Hydrology Analysis Methodology

To evaluate the effects of the Proposed Project on runoff, a quantitative watershed hydrology study was completed by Balance Geo (**Appendix F**). The analysis assessed the likely effects on runoff due to changes in land cover from forest to vineyard, and due to changed drainage patterns by the creation of two retention basins (**Appendix B**).

The WinTR-55 model, a U.S. Department of Agriculture hydrologic model that is often used for Napa County projects, was used to analyze the Proposed Project watershed (Balance Geo, 2013). WinTR-55 estimates runoff and peak discharge while developing hydrographs for small basins using rainfall, drainage basin topographic characterizations, and vegetative/soil cover to determine runoff potential as inputs (USDA, 2009).

WinTR-55 runoff estimates were not calibrated to measured stream flow for this analysis. The use of WinTR-55 for the Proposed Project was influenced by: 1) the common use of WinTR-55 in Napa County for these types of analyses, and 2) its ability to provide a runoff hydrograph that is necessary when designing retention basins. The shortcomings of

WinTR-55 with respect to quantify runoff from relatively undisturbed forested watersheds are acknowledged. This portion of the Upper Conn Creek watershed has been heavily disturbed in the past, and is not expected to respond similarly to an undisturbed watershed. The analysis was focused on an analytical comparison of pre- and post-project conditions associated with a timber to vineyard conversion project, so predictions of relative change are more important than the accuracy of the flow estimate provided. This method is better for Proposed Project conditions than for forested conditions; therefore, the design mitigation for project conditions is the most important part of the analysis.

Rainfall

The northwestern coastal U.S. is classified as type IA out of the four 24-hour rainfall distributions (USDA, 2007). Type IA rainfall represents a Mediterranean climate with dry summers and wet winters. For the property, rainfall events of a 24-hour duration were simulated in the model for the 2, 10, 50, and 100 year reoccurrence interval storms. A rainfall depth-duration-frequency analysis was performed using the precipitation record at the Angwin PUC Gage No. E30 0212 (from the period 1968 through 2008); results are shown in **Table 4.9-1** below.

TABLE 4.9-1
RAINFALL DEPTHS FOR TYPICAL RECURRENCE INTERVAL STORMS ON THE PROPERTY

Recurrence Interval Storm (24 hour Duration)	Precipitation Depth (in)
2 year	3.56
10 year	5.67
50 year	7.29
100 year	7.93

Adapted from Balance Geo, 2013

Vegetative/Soil Cover

The runoff potential of different land uses was determined by assigning land use curve numbers to different land uses. Land use composite curve numbers (curve numbers) indicate the runoff potential of a soil and are based on ground cover and the hydrologic soil group. A curve number is attributed to different land uses to measure the influence of land cover on infiltration and runoff rates. Curve numbers depend on the vegetative type, amount of cover, and the land use practice, and are weighted to take into account variances over the study area. Higher curve numbers indicate higher amounts of impervious surfaces, and therefore higher potential for runoff. The composite curve numbers for the current conditions ranged from 67 to 69, which is a conservative estimate for a woods-grass combination area that can typically range from 58 to 73 (Balance Geo, 2013; **Appendix F**; USDA, 2009). Post-project composite curve numbers varied from 62 to 72, which is typical of agricultural lands that can range from 58 to 81 (**Appendix F**; USDA, 2009).

Soils are classified into four groups (A, B, C, and D) according to the infiltration rate for rainfall, and are classified ranging from high infiltration rate and low runoff potential (Soil Group A) to very slow infiltration rate and a high runoff potential (Soil Group D). As mentioned in **Section 4.6**, the soils located at the property are classified by the USDA Soil Conservation Service Napa County Soil Survey as SCS 100 and 102, Aiken Loam. The Aiken Loam series is in the hydrologic soil group B and is described as having moderately low runoff potential when thoroughly wet (USDA, 2007).

Existing and Planned Drainage Catchments

To determine the drainage flow of the project, Balance Geo delineated the four existing zero-order swales on the hilltop, three of which drain the location of the Proposed Project (**Appendix F**). The drainage conditions of these swales will be altered subsequent to the timber harvest, grading activities, and ECP installation as called for in the Proposed Project; however, the addition of two retention basins will offset any impact to the three swales. For a complete description of the three existing drainages, please see the discussion below and in **Appendix F**.

Abreu North Swale Catchment is located in the northeastern portion of the parcel, and includes the eastern edge of the proposed vineyard Block B and extends to the east outside of the project boundaries. It is approximately 13.7 acres and hydrologically connected to the neighboring Angwin-Parrett Field airport property via a small ravine. About ten percent of the THP area currently drains to this catchment. High-quality compost mulch will be used on the forest floor within this catchment outside of the THP area to improve habitat and slow runoff to allow infiltration after the vineyard is in place.

Abreu West-North Swale Catchment is approximately 6.4 acres encompassing the northern portion of the Proposed Vineyard Block B. It drains 38 percent of the proposed project site in its existing configuration. Once Proposed Vineyard Block B is installed, runoff will be directed to a retention basin along the western edge of the vineyard block. Erosion control measures that will be located within this swale include the development of a retention basin using earth a concrete weir and rock stabilization.

Abreu West-South Swale Catchment is located in the center of the parcel and encompasses the southern portion of the THP area. It is approximately 9.7 acres and drains half of the project site. Erosion control measures that will be located within this swale include the development of a retention basin using earth a concrete weir and rock stabilization.

Results

Peak discharges for the post-project retention basins were calculated using the WinTR-55

model. The individual basins were analyzed for 2- and 100-year 24-hour storm events in current, post-project conditions with no erosion control, and post-project conditions with the proposed ECP. The current conditions provide a baseline for comparison with the post-project conditions with and without erosion mitigation (**Appendix B**). **Table 4.9-2**, below, compares the current and post-project peak discharges in cubic feet per second (cfs).

Overall, among the three drainage catchments, there would be a 3.9 percent average increase in the 100-year peak discharge as a result of the development of the vineyard block with no erosion control measures. Without the erosion control measures, which include development of two temporary retention basins, the timberland to vineyard conversion would result in an increase in peak runoff. However, with the development of the Proposed Project including the erosion control measures found in the ECP (**Appendix B**), an average 40.9 percent decrease in runoff from a 2-year rainfall event and 22.5 percent decrease in runoff from a 100-year rainfall event would occur across the three existing catchments on the hilltop. It is expected that required maintenance for all proposed diversion and retention structures will be performed on a routine basis (at least annually, as required in the ECP (**Appendix A**)) to ensure effective operation and retention function.

TABLE 4.9-2
PEAK FLOW COMPARISON FOR THE PROPERTY

	North Swale		**West-North Swale**		**West-South Swale**	
	Peak Discharge for 2-Year Event (cfs)	Peak Discharge for 100-Year Event (cfs)	Peak Discharge for 2-Year Event (cfs)	Peak Discharge for 100-Year Event (cfs)	Peak Discharge for 2-Year Event (cfs)	Peak Discharge for 100-Year Event (cfs)
Current Conditions	1.86	13.25	0.98	6.46	1.59	9.97
Post-Project (No ECP)	1.64	12.75	1.44	7.42	1.99	10.81
Post-Project (ECP)	0.81	10.77	0.51	3.79	1.30	8.60
Percent Change (with ECP)	-56.5%	-18.7%	-48.0%	-41.3%	-18.2%	-13.7%

Adapted from Balance Geo, 2013; AES 2013

Findings

According to analysis of pre- and post-project conditions using the WinTR-55 model, development of the Proposed Project would alter the drainage pattern of the property, but would not result in an increased rate or volume of runoff. In fact, the Proposed Project would result in a slight decrease in both the peak discharge and volume of surface runoff at the property. As stated above, the WinTR-55 model is limited in its ability to analyze forested watersheds; however, this watershed has been highly disturbed and the model is an appropriate choice to compare pre- and post-project conditions. The primary reason for the decrease in runoff is the construction of retention basins that would delay peak flow

timing. These basins would be created using concrete weir structures and rock stabilizations at two key locations that utilize existing topographic relief and would not require major excavation. The basins would promote the conveyance and infiltration of stormwater runoff, and would prevent runoff from exiting the property via existing ravines (**Appendix F**). Another factor contributing to the reduction in runoff is the use of a cover crop within all the vineyard blocks and application of compost mulch. Drainage system features onsite would not result in flooding because the rate and volume of runoff would not increase from the Proposed Project, and because these drainage features were determined to be appropriate for local hydrology conditions during development of the ECP. This is a less-than-significant impact.

Mitigation Measure 4.9-1: With implementation of the Erosion Control Plan, potential impacts are reduced to less than significant and no additional mitigation is required.

Impact 4.9-2: Development of the Proposed Project has the potential to alter sedimentation levels in runoff flowing to off-site receiving waters. This is a potentially significant impact. However, as discussed in **Section 4.6**, there will be a decrease in sediment production from the parcel with implementation of the ECP and there will be a less-than-significant effect to receiving waters.

As discussed in **Impact 4.9-1**, development of the Proposed Project would alter the existing drainage pattern of property through the removal of existing vegetative land cover, soil ripping and earthmoving activities, and the removal of trees. Alteration of the existing drainage pattern resulting in an increased volume and rate of runoff to these drainages could result in increased loading of sediment and pollutants to onsite drainages, and subsequently offsite streams and the Napa River. However, with implementation of the ECP and the creation of the two retention basins as discussed above, runoff from the project site would remain disconnected from downstream waters (Balance Geo, 2013). Therefore, the Proposed Project would not result in increased accumulation of sediments in receiving waters, increased nutrient loading, or adverse impacts to water temperature.

Sediment Loading

Since the mainstem Napa River has been listed as sediment-impaired according to the Clean Water Act, Section 303 (d), no net increase in sediment yield from the property should be allowed to occur from development of the Proposed Project. As discussed in **Impact 4.6-1**, with incorporation of erosion and runoff control measures proposed in the ECP and discussed above, the overall load of sediment transported to local waterways from the site of the Proposed Project is anticipated to remain the same or decrease from pre-project conditions. Total sediment erosion and sediment yield including gravel, sand, silt, and clay from the entire property may decrease from existing conditions under the Proposed Project

(**Appendix F**). Therefore, implementation of the ECP for the Proposed Project would be beneficial in reducing both offsite onsite erosion and sedimentation loads from contributing to sedimentation entering the Napa River. Thus, this is a less-than-significant impact. For a more detailed analysis of the project impacts to sediment loading from erosion, refer to **Section 4.6**.

Chemical Loading

The Proposed Project will be operated using integrated pest management (IPM) techniques that focus on environmentally sensitive methods of reducing agricultural pests and avoids the use of harsh chemicals. The use of chemical pesticides and herbicides will be applied only as a last resort method by a certified pesticide applicator (CPA), as discussed in **Section 4.8**. Fertilizers proposed for use at the property may include: nitrogen, phosphorus, potassium, micro-nutrients including zinc and boron, lime or gypsum, and compost. Use of fertilizers can result in runoff laden with excessive plant nutrients, which can lead to eutrophication and algal growth in receiving waters; pesticide use can result in runoff contributing to toxic conditions in receiving waters. However, the runoff from the property is disconnected from downstream surface waters and will not pose a risk to chemical loading of the Napa River. Therefore, this is a less-than-significant impact.

Temperature

Water temperature influences a number of chemical processes within water bodies. The elevation of the water temperature is influenced by ambient air temperature, humidity, riparian vegetation, topography, surrounding land use, and flow conditions. The Proposed Project would not alter the thermal characteristics of the downstream waterways. This impact is less than significant.

The Proposed Project would not alter the topography of local creeks located downstream of the property. Rock stabilization, weir structures, and fiber rolls will trap sediments to reduce the loosening of topsoil. As determined from the sediment budget discussed in **Impact 4.6-1**, sediment yield from the proposed vineyard and sediment accumulation in receiving waters would be expected to remain the same or decrease with the Proposed Project and implementation of the ECP (**Appendix F**). Potential impacts from sedimentation that can increase water temperature, such as excess sediment runoff due to the conversion of timberland to vineyard, would not occur. The modification of the vegetative cover on the site does not affect any watercourse shading, as no streams or watercourses occur on the parcel. This is a less-than-significant impact.

Mitigation Measure 4.9-2: With implementation of the Erosion Control Plan, potential impacts are reduced to less than significant and no additional mitigation is required.

Impact 4.9-3: The Proposed Project would not be located in a FEMA flood zone. Development of the Proposed Project would not exacerbate flooding or expose people or structures to a risk of loss. This is a less-than-significant impact.

Development of the Proposed Project would not be located within a FEMA mapped flood zone for a 100- or 500-year precipitation event. According to the hydrology analysis presented in **Impact 4.9-1**, no increase in the rate or volume of runoff is anticipated to occur along project watercourses under the Proposed Project conditions. The Proposed Project would not exacerbate flood flows downstream, impede or redirect flood flows or expose people or structures to flooding hazards.

Mitigation Measure 4.9-3: No mitigation is required.

Impact 4.9-4: Development of the Proposed Project would not substantially deplete groundwater supplies, or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. This is a less-than-significant impact.

The Proposed Project would withdraw groundwater to supplement its water resources. Three wells exist on the property, but only one (Abreu Well No. 1) would be used to irrigate Proposed Vineyard Block B. As stated in **Section 4.9.1-4**, approximately 11.25 afa will be used for the establishment of the vineyard; in the long-term, the Proposed Vineyard Block B will require approximately half of this amount of water. The long-term water use of the entire Abreu property is expected to be only 25 percent of the allowable groundwater allotment for the property. Furthermore, the timberland conversion portion of the project will result in decreased canopy interception and a 25± percent increase in infiltration to the soils of the THP area. Therefore, the development of the Proposed Project would not impact local or regional groundwater levels. This is a less-than-significant impact.

Mitigation Measure 4.9-4: No mitigation is required.

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4.10 LAND USE

4.10.1 SETTING

4.10.1-1 REGIONAL

The property is located within Napa County (County), which consists of approximately 788.3 square miles in northern California, northeast of San Pablo Bay. Approximately 51,000 acres of the County consists of active agriculture land and 54,000 acres consists of grazing land. The remaining area includes several towns and cities, including the City of Napa, Yountville, American Canyon, Calistoga, and St. Helena (WICC, 2010). St. Helena is the nearest incorporated city to the project site, located in the northwestern portion of the County, approximately five miles southwest of the project site. Angwin is the closest unincorporated town, located approximately one mile northwest of the project site. Land uses in this portion of Napa County primarily consist of Rural Residential, Urban Residential, Suburban, Public-Institutional, and Agriculture (Napa County, 2009).

4.10.1-2 LAND USES ON THE PROPERTY

As described in **Section 3.0**, the approximately 17-acre project site within the 76-acre property is situated on a hilltop with south and southeast facing slopes in northwestern Napa County. The property has been periodically logged and harvested for timber production in the past and shows signs of succession and re-growth of shrubs and trees. The property also has a history of supporting agricultural land uses, including vineyards, as early as the 1920s and 1940s. The property supports approximately 18 acres of recently cultivated hillside vineyard development and a network of unpaved trails and roads providing access to the existing vineyard. Primary access roads and the existing vineyard operation are located within the property boundary, but are not located within the proposed project site and will not be included within the Proposed Project or project alternatives.

4.10.1-3 SURROUNDING LAND USES

Land uses adjacent to the property primarily consist of farmland under active agricultural production, vineyards, undeveloped land, low density rural residential development, urban development, and low density commercial development. The Angwin-Parrett Field Airport and Pacific Union College are located north of the project site. The airport runway ends immediately north of the proposed vineyard location. Multiple buildings associated with Pacific Union College are located west of the project site. These buildings include college facilities and residential housing for employees and students. Las Posadas Road, a single-lane dead end road, lies south of the property and is primarily used by local residents and for access to nearby

agricultural production areas. Land uses south of Las Posadas Road consist of a vineyard, low density rural residential development, and an agricultural pond. An additional vineyard and low density rural residential development lie east of the project site.

4.10.2 REGULATORY FRAMEWORK

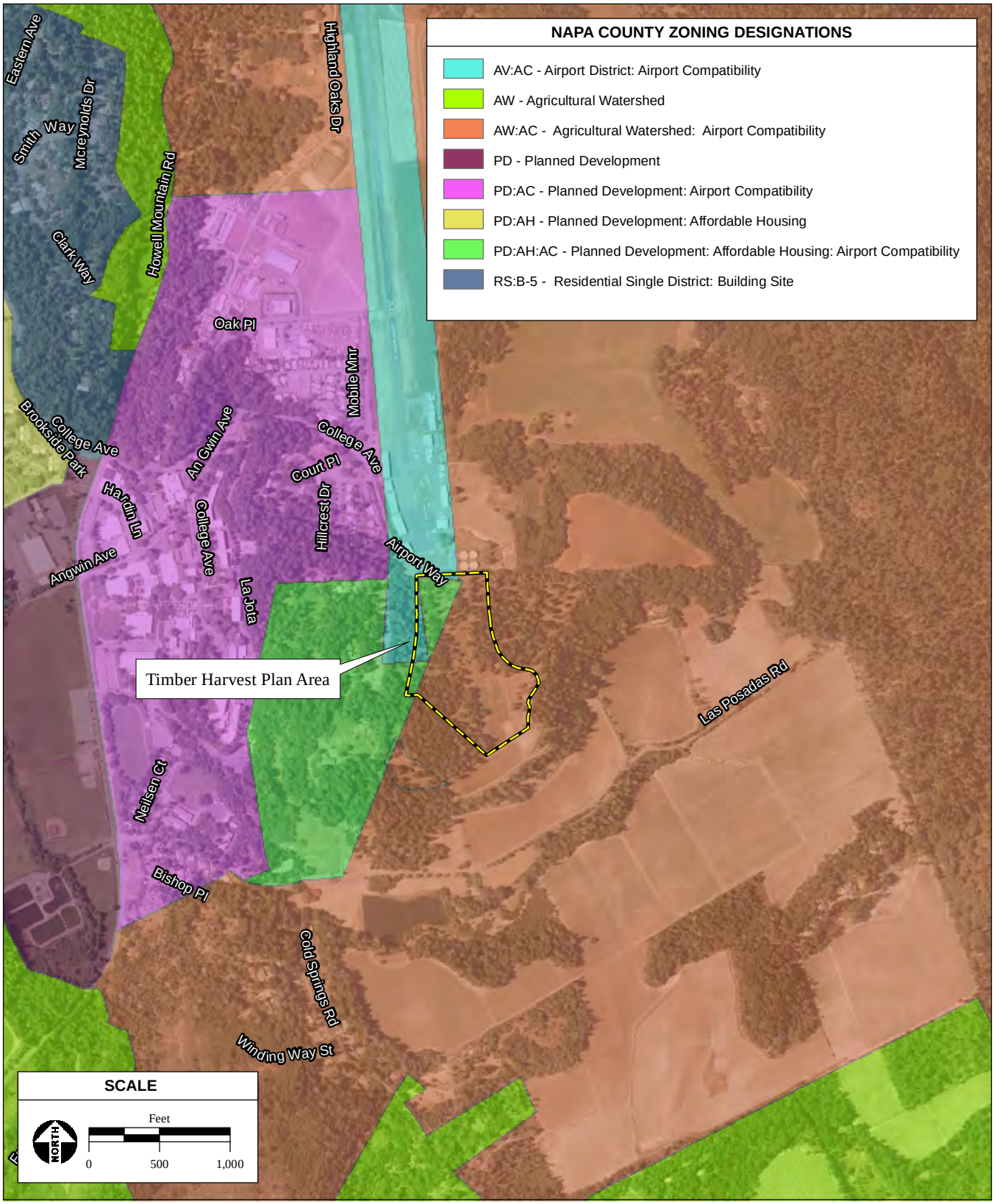
As shown in **Figures 4.10-1** and **4.10-2**, the 42.3± acre parcel is located in rural, unincorporated Napa County. The parcel is under the jurisdiction of the County; therefore, only the County's General Plan and Zoning Ordinance are applicable to land uses on the site. The surrounding lands are also under the jurisdiction of Napa County.

4.10.2-1 LAND USE DESIGNATIONS AND ZONING

Napa County Code of Ordinances - Zoning

As shown in **Figure 4.10-1**, the Napa County Zoning Ordinance has zoned the land within the project boundary as Agricultural Watershed: Airport Compatibility District (AW:AC), Planned Development: Affordable Housing Combination District: Airport Compatibility District (PD:AH:AC), and Airport District: Airport Compatibility District (AV:AC). The Napa County Zoning Ordinance describes the intent of these zoning designations as follows:

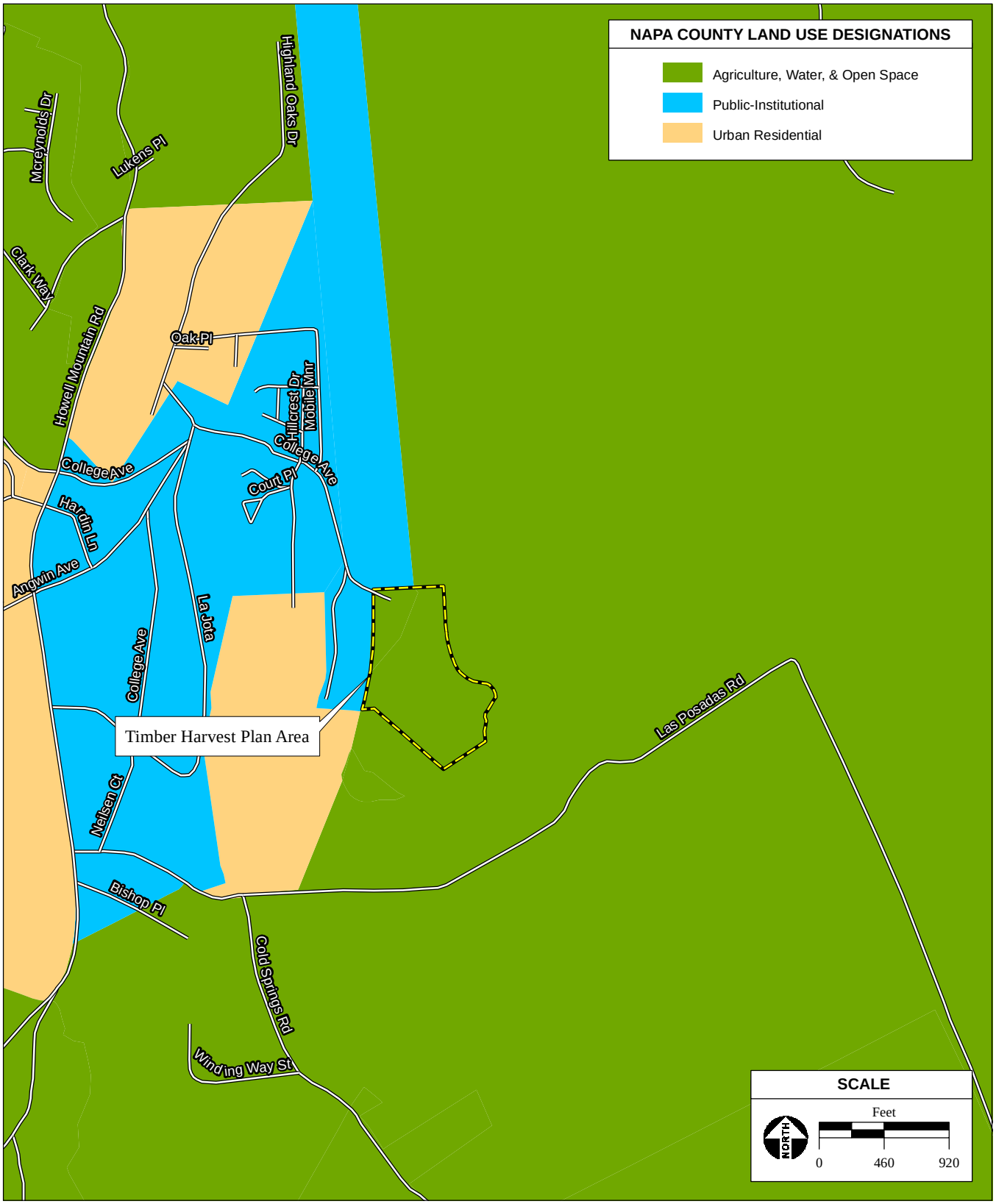
> *"The AW district classification is intended to be applied in those areas of the county where the predominant use is agriculturally oriented, where watershed areas, reservoirs and floodplain tributaries are located, where development would adversely impact on all such uses, and where the protection of agriculture, watersheds and floodplain tributaries from fire, pollution and erosion is essential to the general health, safety and welfare (Napa County, 2008)."*
>
> *"The PD district classification is intended to be applied in those areas of the county shown as "urban residential" or rural residential" in Figure 14 of the Napa County General Plan."*
>
> *"The AH combining district classification is intended to:*
>
> *A. Implement the goals of the housing element of the Napa County General Plan in regard to the construction of affordable housing by establishing development regulations for identified housing opportunity sites.*
> *B. Apply to specified Priority Housing Development Sites identified in Appendix H-1 of the 2009 Housing Element Update of the General Plan as may be amended from time to time.*



SOURCE: Napa County Planning Dept., 8/6/2002; AES, 2013

Figure 4.10-1

Napa County Zoning Designations



SOURCE: Napa County Planning Dept., 09/13/2009; AES, 2013

Figure 4.10-2

Napa County General Plan Land Use Designations

C. Allow the construction of a variety of affordable housing types on specified Priority Housing Development Sites in the 2009 Housing Element Update of the Napa County General Plan.
D. Establish maximum and minimum densities for the development of affordable housing and allow development by right up to specified densities, as set forth in Section 18.82.050.
E. Permit uses identified in this chapter as an alternative to the underlying zoning of the identified sites. Parcels may be developed in accordance with standards of the underlying zoning or in accordance with the standards set forth in this chapter by not both."

"The AV classification is intended to provide areas consistent with the General Plan that:
A. Provide sites in public and private ownership for the operation of airports and for the location of aircraft-servicing facilities;
B. Permit other uses not detrimental to or detrimentally affected by an environment devoted to air transportation an aircraft servicing;
C. Authorize reasonable conditions for the control and suppression of objectionable phenomena, environmental impacts including excessive sound and air pollution;
D. Apply development standards that contribute to air traffic safety

"The AC Combination District classification is intended to:
A. Accommodate the orderly growth and development of public-use airports, defined as "public airports" by Public Utilities Code Section 21675;
B. To apply standards to development in the vicinity of public-use airports which will:
C. Avoid the construction of structures and establishment of uses that would be incompatible with the continued existence and planned expansion of a public-use airport;"

Agricultural uses, such as timber harvesting and vineyard production, are considered permitted land uses under all of the applicable land use designations within the project site (Napa County Zoning Ordinance). Generally, permitted uses, as set forth in Section 18.20.020 include, but are not limited to, the following:

"Agriculture, including but not limited to, as defined in Section 18.08.040 as: (a) growing and raising trees, vines, shrubs, berries, vegetables, nursery stock, hay, grain, and similar food crops and fiber crops, and (d) sale of agricultural products grown, raised, or produced on the premises" (Napa County, 2012).

Napa County General Plan Land Use Designations

As shown in **Figure 4.10-2**, the Napa County General Plan's land use designation for the property is "Agriculture, Watershed & Open Space," with surrounding land use designations consisting of "Urban Residential," "Public-Institutional," and "Agriculture, Watershed & Open Space."

Napa County General Plan Goals and Policies for Land Use

The Agricultural Preservation and Land Use Element of the Napa County General Plan provides the following goals and policies pertaining to land use that are applicable to the Proposed Project (Napa County, 2009):

Goal AG/LU-1: Preserve existing agricultural land uses and plan for agriculture and related activities as the primary land uses in Napa County

Goal AG/LU-3: Support the economic viability of agriculture, including grape growing, winemaking, other types of agriculture, and supporting industries to ensure the preservation of agricultural lands.

Policy AG/LU-17: The County encourages active, sustainable forest management practices, including timely harvesting to preserve existing forests, retaining their health, product, and value.

Goal CON-11: Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urbanized areas.

Policy CON-2: The County shall identify, improve and conserve Napa County's agricultural land through the following measures:

c) Require that existing significant vegetation be retained and incorporated into agricultural projects to reduce soil erosion and to retain wildlife habitat.
f) Minimize pesticide and herbicide use and encourage research and use on integrated pest control methods such as cultural practices, biological control, host resistance, and other factors.

Napa County Erosion Control Plans

Erosion Control Plans are required for earthmoving activity, grading, improvement, or construction of a structure on sites of five percent slope or greater. The Napa County Conservation, Development and Planning Department administers this ordinance and grants approvals. The Napa County Resource Conservation District reviews all erosion control plans

for agricultural activities proposed on slopes greater than five percent, and passes on its recommendations to the Napa County Conservation, Development and Planning Department.

Napa County Stream Setbacks

Section 18.108.025 of the Napa County Conservation Regulations states that clearing of land for new agricultural uses is required to comply with designated stream setbacks which are based on slope, unless a use permit is obtained from Napa County, or unless an exemption in Section 18.108.050 applies. Setbacks are measured from the top of the bank on both sides of the stream as it exists at the time of replanting, redevelopment, or new agricultural activity.

Napa County Slope Regulations

Section 18.108.060 of the Napa County Conservation Regulations states that no construction, improvement, grading, earthmoving activity or vegetation removal associated with the development or use of land shall take place on those parcels or portions thereof having a slope of 30 percent or greater, unless an exemption under Sections 18.108.050 or 18.108.055 apply, or unless an exception through the use permit process is granted pursuant to Section 18.108.040 and resolution 94-19.

Napa County Erosion Hazard Areas

Sections 18.108.070 and 18.108.100 of the Napa County Conservation Regulations outline requirements in erosion hazard areas, including vegetation preservation and replacement.

4.10.3 IMPACTS ANALYSIS

4.10.3-1 SIGNIFICANCE CRITERIA

Section 15125(d) of the California Environmental Quality Act (CEQA) *Guidelines* states that "[t]he EIR shall discuss any inconsistencies between the Proposed Project and applicable general plans and regional plans." Criteria for determining the significance of land use impacts have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this EIR, land use impacts are considered significant if the Proposed Project would:

- Physically divide an existing community;
- Result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with any applicable habitat conservation plan, or natural community conservation plan.

4.10.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.10-1: The Proposed Project will not physically divide an existing community. This is a less-than-significant impact.

The Proposed Project would convert approximately 12.8 acres of existing timber land for the development of a 15.3± vineyard within a 17 acre THP area. This conversion would remain within the parcel and would not physically divide an existing community.

Mitigation Measure 4.10-1: No mitigation is necessary.

Impact 4.10-2: The Proposed Project will not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project. This will be a less-than-significant impact.

The Proposed Project is consistent with all applicable land use plans defined by the Napa County Code of Ordinances and the Napa County General Plan. Vineyards are considered an allowable agricultural land use under the zoning designations of the project site. Additionally, an erosion control plan has been prepared, thereby remaining consistent with the Erosion Control Plan regulation of the Napa County Code of Ordinances. The Proposed Project would not conflict with applicable land use plans, policies, or regulations.

The Proposed Project would be consistent with existing and surrounding land uses. Project design would involve removal of trees along the northern boundary of the project site to fully comply with the tree height restrictions of the Federal Avian Administration (FAA). In the past, Pacific Union College has performed tree and vegetation maintenance in this area. Removing the tree height and vegetation along the northern boundary of the project site would relieve the college of these duties and would ultimately benefit the operation of the Angwin-Parrett Field Airport by improving runway accessibility for air-traffic; therefore, the Proposed Project would result in a beneficial impact for surrounding land uses.

Mitigation Measure 4.10-2: No mitigation is necessary.

Impact 4.10-3: The Proposed Project could conflict with an applicable habitat conservation plan, or natural community conservation plan. However, the Proposed Project has been designed to avoid sensitive biological communities on site and the impact will be less than significant.

There are no habitat conservation plans or natural community conservation plans that are applicable to the Proposed Project. However, the Proposed Project has been designed to avoid

California Black Oak habitat on the parcel, in order to comply with the County conservation goal of avoiding removal of oak woodland within the County (Napa County, 2008). Furthermore, a habitat retention area will be designated on the property to permanently retain forested land onsite that could provide habitat or foraging areas for wildlife. See **Section 4.4** for additional information regarding the habitat retention area.

Mitigation Measure 4.10-3: No mitigation is necessary.

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4.11 NOISE

4.11.1 REGULATORY FRAMEWORK

4.11.1-1 FEDERAL

Federal regulations establish noise limits for medium and heavy trucks (defined as a vehicle weighing more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations, Part 205, Subpart B. The federal truck pass-by noise standard is 80 decibels (dB) at 15 meters (approximately 50 feet) from the vehicle pathway centerline. Federal regulations governing truck manufacturing implement these controls.

The Federal Highway Administration (FHWA) provides construction noise level thresholds in its Construction Noise Handbook, 2006, which are provided in **Table 4.11-1**.

TABLE 4.11-1
FEDERAL CONSTRUCTION NOISE THRESHOLDS

Noise Receptor Locations and Land-Uses	Daytime (7 AM - 6 PM)	Evening (6 PM - 10 PM)	Nighttime (10 PM - 7 AM)
	dBA, Leq[1]		
Noise-Sensitive Locations: (residences, Institutions, Hotels, etc.)	78 or Baseline + 5 (whichever is louder)	Baseline + 5	Baseline + 5> (if Baseline < 70) > Baseline + 3> (if Baseline 70)
Commercial Areas: (Businesses, Offices, Stores, etc.)	83 or Baseline + 5	None	None
Industrial Areas: (factories, Plants, etc.)	88 or Baseline + 5	None	None

[1] Leq threshold based on L10 thresholds, Leq threshold were empirically determined (FHWA, 2006).
dBA = hourly A-weighted sound level in decibels
Source: FHWA, 2006.

The FHWA establishes Noise Abatement Criteria (NAC) for various land uses categorized based upon activity. Land uses are categorized on the basis of their sensitivity to noise as indicated in **Table 4.11-2**. The FHWA NAC is based on peak traffic hour noise levels.

4.11.1-2 STATE AND LOCAL

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by noise standard is equal to the federal standard (80 dB). The state pass-by standard for light trucks and passenger cars (defined as a vehicle weighing less than 4.5 tons, gross vehicle weight rating) is also 80 dB at 15 meters (approximately 50 feet) from the centerline. These standards are implemented in two ways: (1) controls on vehicle manufacturers; and (2) legal sanctions from state and local law enforcement officials on vehicle operators in violation of these standards.

TABLE 4.11-2
FEDERAL NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL DECIBELS[1]

Activity Category	Activity Criteria[2] Leq (h) dBA[3]	Evaluation Location	Activity Category Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[4]	67	Exterior	Residential.
C[4]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[4]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, shipyards, utilities (water resources, water treatment, electricity), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

[1] Either Leq(h) may be used on a project.
[2] Hourly A-weighted sound level, decibels (dBA).
[3] The leq() and l10(h) Activity Criteria values are for impacts determination only, and are not design standards for noise abatement measures.
[4] Includes undeveloped lands permitted for this activity category.
Source: FHWA, 2010b.

U.S. Department of Transportation, Federal Transit Administration

The Federal Transit Administration set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These criteria include 65 VdB for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, and laboratory facilities), 80 VdB for residential uses and buildings where people sleep, and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, and offices) (FTA 2006).

Standards have been established by the Committee of Hearing, Bio Acoustics, and Bio Mechanics (CHABA) to address the potential for groundborne vibration, which may cause structural damage to buildings. For fragile structures, CHABA recommends a maximum limit of 0.25 in/sec PPV (FTA, 2006).

Napa County General Plan

The Napa County General Plan, adopted in 2008 (General Plan), is the guiding document for development in the unincorporated areas of Napa County (County), which include the subject property and surrounding properties. Policies in the General Plan that are relevant to noise and applicable to the Proposed Project include the following:

Goal –CC-7: Accept those sounds which are part of the County's agricultural character while protecting the people of Napa County from exposure to excessive noise.

Policy CC-35: The noises associated with agriculture, including agricultural processing, are considered an acceptable and necessary part of the community character of Napa County, and are not considered to be undesirable provided that normal and reasonable measures are taken to avoid significantly impacting adjacent uses.

Policy CC-38: Standards for maximum exterior noise levels for various types of land uses are established in the County's Noise Ordinance. Additional standards are provided in the Noise Ordinance for construction activities (i.e., intermittent or temporary noise). (Refer to **Table 4.11-3**)

Policy CC-49: Consistent with the County's Noise ordinance, ensure that reasonable measures are taken such that temporary and intermittent noise associated with construction and other activities does not become intolerable to those in the area. Construction hours shall be limited per the requirements of the Noise Ordinance. Maximum acceptable noise limits at the sensitive receptor are defined in Police CC-35.

TABLE 4.11-3
EXTERIOR NOISE LEVEL STANDARDS
(LEVELS NOT TO BE EXCEEDED MORE THAN 30 MINUTES IN ANY HOUR)

Land Use Type	Time Period	Noise Level (dBA) by Noise Zone Classification		
		Rural	Suburban	Urban
Single-Family homes and Duplexes	10 pm. to 7 am.	45	45	50
	7 am. to 10 pm.	50	55	60
Multiple residential 3 or More units Per Building (Triplex +)	10 pm. to 7 am.	45	50	55
	7 am. to 10 pm.	50	55	60
Office and Retail	10 pm. to 7 am.	60		
	7 am. to 10 pm.	65		
Industrial and Wineries	Anytime	75		

dBA = hourly A-weighted sound level in decibels
Source: Napa County, 2008.

Napa County Noise Ordinance

Section 8.16.080 Specific Types of Noise Prohibited under the County's Noise Ordinance, that are applicable to construction of the Proposed Project, includes:

2. Construction or Demolition:
   a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of seven p.m. and seven a.m., such that the sound there from creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the appropriate authority. This subsection shall not apply to the use of domestic power tools, as specified in subsection (B)(3) of this section.
   b. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule (refer to **Table 4.11-4**):

TABLE 4.11-4
NOISE LIMITS FOR CONSTRUCTION ACTIVITIES

	Residential	Commercial	Industrial
Daily: 7 am. to 7 pm.	75 dBA	80 dBA	85 dBA
Daily: 7 pm. to 7 am.	60 dBA	65 dBA	70 dBA

dBA = hourly A-weighted sound level in decibels
Source: Napa County, 2008.

4.11.2 ENVIRONMENTAL SETTING

4.11.2-1 CHARACTERISTICS OF ENVIRONMENTAL NOISE

Acoustical Background and Terminology

Noise is often defined as unwanted sound. Pressure variations occurring frequent enough (at least 20 times per second) for the human ear to detect are called sounds. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called hertz (Hz).

The perceived loudness of sounds depends upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable. The decibel scale measures sound levels using the hearing threshold (20 micropascals of pressure) as the point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum (20 hertz to 20,000 Hz). As a result, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz to better represent the human ear's sensitivity to mid-range frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard method of frequency de-emphasis and is typically applied to community noise measurements. In practice, the level of a sound source is measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. All of the noise levels reported herein are A-weighted unless otherwise stated. **Table 4.11-5** shows the most commonly used noise descriptors.

TABLE 4.11-5
DEFINITION OF ACOUSTICAL TERMS

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronnewtons per square meter)
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	Sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network, which de-emphasizes very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after adding 5 decibels to measurements taken in the evening (7 to 10 pm) and 10 decibels to measurements taken between 10 pm and 7am.
Day/Night Noise Level, Ldn	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Lmax, Lmin	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: FHWA, 2010a.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. **Table 4.11-6** shows examples of noise sources that correspond to various sound levels. The noise levels presented in **Table 4.11-6** are representative of measured noise at a given instant. These levels rarely persist consistently over a long period of time and community noise levels vary continuously due

to the contributing sound sources of the ambient noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources such as aircraft flyovers, moving vehicles, sirens, etc., which are typically readily identifiable to an individual. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to characterize a community noise environment and evaluate cumulative noise impacts.

TABLE 4.11-6
TYPICAL A-WEIGHTED SOUND LEVELS

Activities	Noise Level in Decibels
Limit of Hearing	0
Normal Breathing	10
Soft Whisper	30
Library	40
Refrigerator	50
Rainfall	50
Washing Machine	50-75
Normal Conversation	60
Hair Dryer	60-95
Alarm Clock	65-80
Power Mower	65-95
Dumpster Pickup (at 50 feet)	80
Garbage Disposal	80-95
Noisy Restaurant	85
Train Approaching (Engines)	85-90
Tractor	90
Shouting in Ear	110
Loud Rock Concert	120
Stock Car Race	130
Jet Engine at Takeoff	150

Source: Napa County, 2008.

Nighttime ambient noise levels are typically lower than daytime ambient noise levels. For this reason, and because of the potential for sleep disturbance, people tend to be more sensitive to increased noise levels at night than during the day, and increases in nighttime noise have a far greater impact on the community noise environment than increases in daytime noise.

Effects of Noise on People

The effects of noise on people can be divided into three categories:

1) Subjective effects of annoyance, nuisance, dissatisfaction;
2) Interference with activities such as speech, sleep, and learning; and

3) Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the third category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Generally, most noise is generated by transportation systems, primarily motor vehicles, aircraft, and railroads. Poor urban planning may also give rise to noise pollution, since juxtaposing industrial and residential land uses, for example, often adversely affects the residential acoustic environment. Prominent sources of indoor noise are office equipment, factory machinery, appliances, power tools, lighting hum, and audio entertainment systems. An important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment (or ambient noise) to which one has adapted. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 2009):

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA;
- Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10-dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. Noise levels are measured on a logarithmic scale, instead of a linear scale. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than the noise generated by only one of the noise sources (e.g., a noise source of 60 dBA plus another noise source of 60 dBA generate a composite noise level of 63 dBA). To apply this formula to a specific noise source, in areas where existing levels are dominated by traffic, a doubling in traffic volume will increase ambient noise levels by 3 dBA. Similarly, a doubling in heavy equipment use, such as the use of two pieces of equipment where one formerly was used, would also increase ambient noise levels by 3 dBA. A 3 dBA increase is the smallest change in noise level detectable to the average person. A change in ambient sound of 5 dBA can begin to create concern. A change in sound of 7 to 10 dBA typically elicits extreme concern and/or anger.

Noise Attenuation

Stationary "point" sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility spread over many acres or a street with moving vehicles (a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans, 2009). Noise from large construction sites (with heavy equipment moving dirt and trucks entering and exiting the site daily) would have characteristics of both "point" and "line" sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance.

Vibration

The effects of groundborne vibrations typically cause only a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although groundborne vibration can be felt outdoors, it is typically an annoyance only indoors, where the associated effects of a building shaking can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may consist of the rattling of windows or dishes on shelves.

Peak particle velocity (PPV) is often used to measure vibration. PPV is the maximum instantaneous peak (inches per second) of the vibration signal. Scientific studies have shown that human responses to vibration vary by the source of vibration, which is either continuous or transient. Continuous sources of vibration include construction, while transient sources include truck movements. Generally, the thresholds of perception and annoyance are higher for transient sources than for continuous sources. Structural damage can occur when PPV values are 0.5 inches per second or greater. Annoyance can occur at levels as low as 0.1 inches per second and become strongly perceptible at approximately 0.9 inches per second (Caltrans, 2004). **Table 4.11-7** shows PPV vibration levels caused by representative construction equipment, as published by the California Department of Transportation (Caltrans).

TABLE 4.11-7
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 feet (inches/second)
Large bulldozer	0.089
Excavator	0.089
Scraper	0.089
Loaded trucks	0.076
Small bulldozer	0.003

Source: Caltrans, 2004

4.11.2.-2 EXISTING NOISE LEVELS AND SOURCES

The area surrounding the property is rural and consists of agriculture uses (vineyards), open space with scattered residential land uses, an airport to the north, and educational uses to the west at the Pacific Union College (PUC) campus to the west. The nearest road to the property is Cold Springs/Las Posadas Road. Traffic on this roadway is a source of noise in the vicinity of the Proposed Project. The noise environment at and in the immediate vicinity of the property is also influenced by agricultural activities due to a neighboring vineyard to the west and airport operations to the north. Due to the rural nature of the property the ambient noise level is estimated to be 55 dBA, Leq. There are no known existing sources of groundborne vibrations in the vicinity of the Proposed Project.

4.11.2-3 SENSITIVE NOISE RECEPTORS

Some land uses are considered more sensitive to ambient noise levels than others, sensitivity being a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. Residential, hospital, and school land uses are generally more sensitive to noise than commercial and industrial land uses.

The project vicinity is characterized by very low-density residential and agricultural uses; most of these uses are located to the south and east of the property. The nearest sensitive noise receptor is a residence located approximately 130 feet west of the property line and approximately 400 feet west of the project site. There are no hospitals in the vicinity of the property. The PUC campus is located approximately 1,000 feet west of the project site.

4.11.3 IMPACT ANALYSIS

4.11.3-1 SIGNIFICANCE CRITERIA

The following criteria are established by California Environmental Quality Act (CEQA) *Guidelines* and have been used in this section to evaluate potential environmental impacts of the Proposed Project on sensitive noise receptors. Such an impact is considered significant if it would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive groundborne vibration noise levels;
- Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

- For a project located within an airport land use plan or, where such a plan has not been adopted within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4.11.3-2 METHODOLOGY

Noise

Construction noise levels from construction equipment were estimated using Caltrans Guidelines. Project-related construction noise level was compared to the FHWA construction significance levels provided in **Table 4.11-1** to determine noise impact due to construction of the Proposed Project.

Traffic volumes related to the Proposed Project were compared to existing traffic volumes. Caltrans noise guidelines were used to determine traffic noise level increase along Howell Mountain Road or Las Posadas Road attributable to the Proposed Project (Caltrans, 2009). The existing noise levels were added to the increased noise attributed to the Proposed Project and was compared to applicable significance thresholds. Increases in the ambient noise level due to stationary sources (agricultural equipment and idling truck noise) were estimated using known noise levels and comparing those noise levels to the applicable significance thresholds.

Vibration

Vibration noise levels for construction and operation of the Proposed Project were determined using Caltrans guidelines (Caltrans, 2004). Those vibration noise levels were then compared to significance thresholds.

4.11.3-3 SIGNIFICANCE THRESHOLDS

According to the County's Construction Noise Ordinance 8.16.080, if construction-related noise increases the ambient noise level above 75 dBA, Leq in the vicinity of a residence, a significant impact would occur (refer to **Table 4.11-4**). According to the County of Napa's General Plan, operational noise impacts are considered significant if a project-related noise source increases the ambient noise level above 75 dBA, Leq (refer to **Table 4.11-3**).

For this analysis, excessive groundborne vibrations are defined as those that are equal to or exceed 0.5 PPV at the nearest non-residential structure, and exceed 0.1 PPV experienced at the nearest residence (Caltrans, 2004). Therefore, an impact is considered potentially significant if construction or operation of the Proposed Project would result in an increase of 0.5 PPV at the nearest non-residential structure, or 0.1 PPV at the nearest residence.

4.11.3-4 IMPACTS AND MITIGATION MEASURES

Impact 4.11-1: Construction and operation of the Proposed Project would not expose persons to a temporary or substantial permanent increase in the ambient noise level or generate noise levels in excess of standards established in the General Plan or County noise ordinance, or applicable standards of other agencies. This impact is less than significant.

Typical construction noise levels are presented in **Table 4.11-8**. The nearest noise sensitive receptor to construction activities is a residence located approximately 130 feet west of the property. Based on the topography and natural noise barriers (trees) a noise attenuation value of 6.0 dBA, Leq per doubling of the distance was used in this noise analysis (Caltrans, 2009). Using noise levels listed in **Table 4.11-8** (reference distance of 25 feet) the maximum noise level at the nearest sensitive noise receptor during construction of the Proposed Project would be approximately 69 dBA, Leq.

TABLE 4.11-8
TYPICAL CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Noise Level (dB at 25 feet) (dBA, L_{max})
Bulldozers	87
Excavator	85
Heavy Trucks	88
Pneumatic Tools	85
Backhoe	85

Source: Caltrans, 2009

Noise associated with the construction activities of the Proposed Project would therefore be less than the County's noise threshold of 75 dBA, Leq for residential areas; however, in accordance with County ordinance 8.16.080 2, construction activities associated with the Proposed Project shall occur between the hours of 7 AM to 7 PM. Construction of the Proposed Project would not result in a temporary, significant increase in the ambient noise level or generate noise levels in excess of the County's noise standards; therefore, noise from construction of the Proposed Project is a less-than-significant impact.

The Proposed Project would slightly increase the ambient noise level in the immediate vicinity of the property. However, given the small size of the project, the location of the project (adjacent to an active airport, college, and other existing vineyards), the low-density residential uses in the area, and the County's General Plan Policy CC-35, which states that agriculture and agricultural processing is considered an acceptable and necessary part of the community character of Napa County and is not considered to be undesirable, vineyard operational noise impacts would be less than significant.

Mitigation Measure 4.11-1: No mitigation is required.

Impact 4.11-2: The Proposed Project would not expose persons to or generate excessive groundborne vibration noise levels. This impact is less than significant.

Construction. Construction activities for the Proposed Project would consist of using earthmoving equipment shown in **Table 4.11-9**. Generally, excessive vibration is only an issue when construction requiring the use of equipment with high vibration levels (i.e., compactors, large dozers, etc.) occurs within 25 to 100 feet of an existing structure. Several medium-sized dozers, compactors, scrapers and other equipment would be used during construction of the Proposed Project. No pile driving or high vibration level equipment would be used during construction. The nearest noise receptor is a residence, approximately 120 feet from the location of the nearest site of construction activities for the Proposed Project. **Table 4.11-9** provides estimated construction vibration levels at this distance. As shown in **Table 4.11-9**, the predicted PPV levels for all of the equipment to be used in construction of the Proposed Project would be below the significance thresholds of 0.5 PPV for non-residential structures and 0.1 PPV for residences (see **Section 4.11.3-3**). This would be a less-than-significant impact.

TABLE 4.11-9
PREDICTED PPV AT 50 AND 120 FEET FROM CONSTRUCTION[1]

Equipment	PPV (inches/second) at 50 feet	PPV (inches/second) at 120 feet
Large bulldozer	0.019	0.0020
Excavator	0.019	0.0020
Scraper	0.019	0.0020
Loaded trucks	0.016	0.0017
Small bulldozer	0.001	0.0001

[1]PPV was predicted using the equation PPV predicted = PPVref *(Dref/Dsource)^1.4.
PPV = peak particle velocity
Source: Caltrans, 2004; AES, 2012.

Operation. Loaded trucks traveling to and from the Proposed Property during operation would be the only source of vibrations from the operation of the Proposed Project. Truck usage on local roadways generated by the Proposed Project would increase during harvest season. Loaded trucks may occur as close as 50 feet to sensitive noise receptors. Based on the calculations presented in **Table 4.11-9**, at a 50-foot distance, vibrations from loaded trucks can be 0.029 PPV, which is below the significance threshold of 0.1 PPV for residences (see **Section 4.11.3-3**). Therefore, the additional loaded truck traffic during harvest would not expose sensitive noise receptors to excessive groundborne vibration or groundborne noise levels. This would be a less-than-significant impact.

Mitigation Measure 4.11-2: No mitigation is required.

Impact 4.11-3: The Proposed Project is not located in the vicinity of a private airstrip; however, it is located within two miles of Angwin-Parrett Field, a public use airport. The Proposed Project would not place residences in the vicinity of the airport; therefore, the Proposed Project would not expose people residing in the project area to excessive noise levels. Workers have the potential to be temporarily exposed to airport and air craft noise during construction and operation of the Proposed Project. The Angwin-Parrett Field has approximately 32 aircraft operations per day or approximately three operations per hour. Approximately 92 percent of the aircraft operating at the airport are single engine aircraft. Vineyard workers would experience noise level in exceedance of 75 dBA, Leq for approximately five minutes during aircraft takeoff and landing, three times per hour or for 15 minutes per hour. The increase in the noise level would not exceed the County noise standard of 75 dBA, Leq for 30 minutes in any one hour; therefore, this is a less-than-significant impact.

Mitigation Measure 4.11-3: No mitigation is required.

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4.12 TRANSPORTATION AND CIRCULATION

4.12.1 SETTING

4.12.1-1 EXISTING ROADWAY NETWORK

Access to the project site is provided via an existing roadway network surrounding the Community of Angwin. Direct access to the project site is provided via an internal gated driveway off of Los Posadas Road. Roadways that would be utilized by project related traffic are described below.

Las Posadas Road/Cold Springs Road is a one-lane east/west oriented roadway in the vicinity of the project site that extends from Howell Mountain Road to its terminus approximately 1.6-miles to the southeast. Las Posadas Road/Cold Springs Road is under the jurisdiction of the County of Napa (County). The Las Posadas/Cold Springs Road and Howell Mountain Road intersection to the west of the project site is one-way stop controlled.

Howell Mountain Road/Deer Valley Road is a two-lane north/south oriented major roadway that provides regional access to the project site. Howell Mountain Road connects Highway 29 in the Napa Valley with the Pope Valley to the north.

4.12.1-2 EXISTING TRAFFIC CONDITIONS

Existing PM peak hour traffic volume on Howell Mountain Road east of Silverado Trial is 85 trips per hour in the eastbound direction and 122 trips per hour in the westbound direction. Las Posadas Road volumes to the east of the intersection with Cold Springs Road has 11 trips eastbound and 13 trips westbound during the PM peak hour (Napa County, 2009).

Due to nature of the rural roadways in the vicinity of the project site and the existing vehicular traffic on these roadways, logging trucks will not be used under the Proposed Project; instead, the harvested timber will be milled onsite and lumber not retained onsite will be transported from the property on legally loaded, three-axle trucks. A majority of the timber processed onsite will be retained by the landowner for personal use (refer to **Section 3.0**).

As noted in the Timberland Conversion Plan (TCP) (**Appendix I**) for the Proposed Project, Howell Mountain Road, Las Posadas Road, and roads in the surrounding area have historically and are currently being used for the transport of agricultural crops by a wide variety of landowners in Napa County (County). Many of the roads in the surrounding area were originally built to transport agricultural products, including forest products and grapes, early in the last century.

4.12.1-2 BIKEWAYS, PEDESTRIAN FACILITIES, PUBLIC TRANSPORTATION SYSTEMS

There are no bicycle pathways/routes in the immediate vicinity of the project site, with the exception of a section of Howell Mountain Road in the immediate vicinity of the Pacific Union College (PUC) to the west. An internal unpaved trail system is located along the perimeter of the project boundary connecting to the adjacent PUC. No public transportation serves the property.

4.12.2 REGULATORY SETTING

4.12.2-1 STATE

California Department of Transportation

The California Department of Transportation (Caltrans) manages interregional transportation, including the management and construction of the state highway system. In addition, Caltrans is responsible for the permitting and regulation of state roadways. Caltrans establishes performance standards that apply to specific routes and publishes those standards in transportation concept reports. There is one roadway that falls under Caltrans' jurisdiction, SR-29, which is approximately 4.5 miles to the east of the Proposed Project.

4.12.2-2 LOCAL

Napa County General Plan (2008)

The Napa County General Plan Circulation Element (2008) seeks to provide safe and efficient movement on well-maintained roads throughout the County. The following are related goals and policy guidelines that pertain to transportation and circulation:

Goal CIR-2: The County's transportation system shall provide for safe and efficient movement on well-maintained roads throughout the County, meeting the needs of Napa County residents, businesses, employees, visitors, special needs populations, and the elderly.

Policy CIR-13: The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is both safe and efficient in terms of providing local access. The following list of improvements has been supported by policy makers within the County and all five incorporated cities/town, and will be implemented over time by the County and other agencies to the extent that improvements continue to enjoy political support and funding becomes available:

Countywide

- Install safety improvements on rural roads and highways throughout the county including but not limited to new signals, roundabouts, bike lanes, shoulder widening, softening sharp curves, etc.

Policy CIR-15: The County shall maintain and apply consistent highway access standards regarding new driveways to minimize interference with through traffic while providing adequate local access. The County shall also maintain and apply consistent standards (though not exceeding public road standards) regarding road widths, turn lanes, and other improvements required in association with new development. Application of these standards shall consider the level of improvements on contiguous roads.

Policy CIR-16: The County shall seek to maintain an adequate Level of Service (LOS) on roads and at intersections as follows. The desired level of service shall be measured at peak hours on weekdays.

- The County shall seek to maintain an arterial LOS D or better on all county roadways, except where maintaining this desired level of service would require the installation of more travel lanes than shown on the Circulation Map.
- The County shall seek to maintain a LOS D or better at all signalized intersections, except where the level of service already exceeds this standard (i.e., LOS E or F) and where increased intersection capacity is not feasible without substantial additional right-of-way.
- No single level of service standard is appropriate for un-signalized intersections, which shall be evaluated on a case-by-case basis to determine if signal warrants are met.

4.12.3 IMPACTS ANALYSIS

4.12.3-1 SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts to traffic and circulation have been developed based on Appendix G of the California Environmental Quality Act's (CEQA) *Guidelines* and relevant agency guidelines. Impacts to the existing transportation network would be considered significant if the Proposed Project would:

- Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways (LOS D in Napa County);
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or

- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

4.12.3-2 IMPACTS AND MITIGATION MEASURES

Impact 4.12-1: Construction and operation of the Proposed Project would temporarily increase traffic volumes on roadways in the area; however, an increase in approximately 100 trips during the construction period would be intermittent and not be substantial. A less-than-significant impact would result.

Construction. Construction of the Proposed Project would generate approximately 100 vehicle and truck trips traveling to and from the property (**Table 3-1**). Trips would result from daily construction workers and trucks delivering heavy equipment and materials to the project site. Equipment, including milling equipment, would stay onsite for the duration of timber harvest. Vehicles expected to be used during construction include (but are not limited to): legally loaded, three-axle trucks; dump trucks; delivery trucks; and construction worker vehicles. Las Posadas Road is the primary access roadway for all traffic entering and exiting the property.

Construction activities would be intermittent and short-term in nature. As stated in **Section 3.0**, construction of the Proposed Project is anticipated to occur over two years, with construction occurring only during the dry months. The typical construction hours would be 7 A.M. to 7 P.M. Monday through Saturday (**Appendix I**). Sufficient equipment, labor, and materials would be committed and transported to the property prior to the commencement of construction to complete construction during each season. Once equipment is transported to the property it would remain there until implementation during that season is complete.

Construction Operating Window
The timber harvest, vineyard development, and implementation of erosion control measures included within the ECP are anticipated to occur during the first year of construction. A majority of the actual vineyard installation and planting will occur in the second year of development. Construction workers will average about three workers during each phase of the project including the precursor THP phase, the installation of the ECP features, and the planting and operation of the vineyard.

As noted in **Table 3-1**, the greatest number of materials/heavy equipment deliveries and worker trips would occur during the first year of construction, during the timber harvest and post-harvest erosion control implementation per the ECP. It should be noted that the estimated number of trips associated with the ECP installation for the Proposed Project (approximately 52 trips as shown in **Table 3-1**) would be divided over the two year construction period, since post-harvest site stabilization measures would be constructed subsequent the timber harvest and specific erosion control devices for the vineyard would be installed according to vineyard development

during the second year of construction. As compared to the first year of construction of the Proposed Project, the second year of construction would generate fewer project-related trips as the timber harvest phase and initial site stabilization phase of the ECP for the project would be complete. Vineyard installation estimates approximately 48 total construction trips (**Table 3-1**).

Based on the estimate of approximately 100 total construction trips, the temporary increase in project-related trips during construction of the Proposed Project would not result in a substantial increase in traffic volumes on roadways accessing the property and in the vicinity.

As stated above, the existing peak hour traffic volume on Las Posadas/Cold Springs Road has 11 trips eastbound and 13 trips westbound during the PM peak hour (Napa County, 2009). Since this data represents the most current data available from the County, 12 hour trips will be used to estimate daily traffic flow on Las Posadas/Cold Springs Road during a typical eight hour work day. In general, 12 existing trips per hour is roughly equivalent to an average of 96 existing daily trips during an eight hour timeframe or 480 trips per week (Monday – Friday) during this same daily timeframe. The minimal and temporary increase in traffic during construction activities (estimated at 52 total trips) would not result in impacts to the LOS experienced by motorists on Las Posadas/Cold Springs Road as it would not be anticipated to change significantly.

Project-related trips on Las Posadas/Cold Springs Road would also apply to Howell Mountain Road, which provides regional access to the area. Therefore, the potential impact to local traffic conditions as a result of project-related trips during construction would additionally be less than significant on Howell Mountain Road. Mitigation has been provided to further reduce impacts to area circulation during construction activities.

Operation. Operation of the Proposed Project would generate trips on account of vineyard maintenance and grape harvest. Operational traffic associated with the Proposed Project would be greatest during harvest of the vineyard. During operation of the Proposed Project, grape harvest will be transported in farm trucks to wineries in the Napa Valley area. The grape harvest is expected to be transported via three 20± ton trucks over a 30-day harvest period when the vineyard reaches maturity (**Appendix I**). This type of agricultural traffic anticipated to be generated by the Proposed Project would be minimal and very similar to other agricultural transport activities (i.e. grapes, cattle, sheep, horses, apples, rock aggregates, fire wood, etc.) presently taking place on local roadways in the vicinity of the Proposed Project.

In summary, this long-term addition of operational trips to Las Posadas/Cold Springs Road would be minimal, seasonal, and would not exceed capacity on existing roadways serving the property and in the vicinity. Consistent with **Section 3.0**, no logging trucks would be used under the Proposed Project. Therefore, operation of the Proposed Project would result in a less-than-

significant impact to area circulation.

Mitigation Measure 4.12-1: The following mitigation measures provided in the Timber Conversion Plan (**Appendix I**) shall be required for construction vehicles using off-site roadways during construction activities.

- All oversized construction vehicles are advised to use extreme caution when transporting milled lumber along county roads, especially in areas of limited site visibility.
- Oversized construction vehicles are to operate with headlights on for safety and are not to exceed 25 miles per hour while on rural county roads.
- Oversized vehicles are not to use Jake brakes in the immediate vicinity of residential neighborhoods.
- All construction activities are restricted to Monday through Saturday 7 am to 7 pm. No activities may take place on Sundays & holidays.
- To further ensure no significant traffic impacts, delivery and removal of heavy equipment and trucks, including those hauling lumber from the project site, will be limited to non-peak hours.
- Signs indicating slow trucks entering the roadway will be placed at a distance of 300 feet in both directions of the project site if warranted.

Impact 4.12-2: Construction and operational traffic generated by the Proposed Project will not result in inadequate emergency access. This is a less-than-significant impact.

The property's main access point (including emergency access) is from an existing onsite road which connects to Las Posadas/Cold Springs Road approximately 0.32 mile east of the intersection with Howell Mountain Road. As discussed under **Impact 4.12-1**, since the level of temporary construction traffic is minimal and there is a very low increase in long-term traffic volumes associated with the addition of worker trips for operation of the vineyard, these factors would not change the LOS experienced by fire and emergency services in accessing the property.

The Proposed Project is located in a Moderate fire hazard zone (Cal Fire, 2007). However, due to the heavily forested area and the nature of the terrain, access for firefighting resources in the area is generally poor. Access for firefighting equipment to the property occurs from Las Posadas/Cold Springs Road, the airport to the north, and internal roadway systems. Fuel loading is moderate to high in the vicinity of the property. Some of the vegetation types present in the surrounding area are broken and discontinuous. However, installation of the proposed vineyard will further reduce fire susceptibility by breaking up some of the overstory fuels in the existing forest canopy, providing a less fire-sensitive irrigated agricultural crop than the existing use. Thus, the potential demands on fire services and emergency access would be reduced with the completion of the Proposed Project.

Therefore, because the Proposed Project would not result in inadequate emergency access, this impact is less than significant.

Mitigation Measure 4.12-2: No mitigation is required.

Impact 4.12-3: Traffic generated by construction and operation of the Proposed Project has the potential to impact pedestrian, bicycle, and public transport in the vicinity of the project.

There are no roadway pedestrian systems or public transportation facilities in the immediate vicinity of the Proposed Project. Also, the Proposed Project would not create a need for such a facility in the vicinity of the property. Although there are no designated bicycle facilities in the vicinity of the project, some bicycles operate along Howell Mountain Road and Las Posadas Road. Construction and operation of the Proposed Project would generate a small amount of project-related construction and operational traffic on Las Posadas Road (refer to **Impact 4.12-1**). However, the Proposed Project is not anticipated to affect bicycle transportation given the temporary and minimal project-related traffic that would be added to Las Posadas Road.

For the reasons discussed above, a less-than-significant impact would occur to bicycle, public transportation, and pedestrian facilities from implementation of the Proposed Project.

Mitigation Measure 4.12-3: No mitigation is required.

Impact 4.12-4: The temporary increase in traffic from construction worker vehicles and the import and export of materials could adversely affect traffic and transportation conditions in the project area, resulting in a conflict with applicable County General Plan policies establishing measures of effectiveness for the performance of the circulation system.

Because the increase in traffic volumes caused by construction would not exceed the capacity of affected roadways, the additional construction-related vehicle trips that would be generated from employee vehicles and construction equipment associated with project construction would not result in considerable changes in the performance of the circulation system. Therefore, these additional trips would not result in a conflict with an applicable plan, ordinance, or policy related to traffic circulation. This impact would be less than significant.

Mitigation Measure 4.12-4: No mitigation is required.

Impact 4.12-5: Traffic generated by the Proposed Project has the potential to result in changes to air traffic patterns resulting in substantial safety risks.

The harvesting of on-site trees would remove the existing canopy which is located to the immediate south of the Angwin-Parrett Airport. The harvesting of trees and planting of

vineyards would beneficially impact the roadway clearance. Federal flight line requirements have required past harvesting of many of the taller trees with the proposed project area in order to meet these height regulations. The installation of the vineyard would eliminate the requirement of future thinning activities and eliminate potential future height problems, thereby increasing the safety of the Angwin-Parrett Field. This impact would be less than significant.

Mitigation Measure 4.12-5: No mitigation is required.

REFERENCES

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SECTION 5.0

Alternatives

SECTION 5.0

ALTERNATIVES TO THE PROPOSED PROJECT

5.1 INTRODUCTION

This section reviews alternatives to the Proposed Project considered during the preparation of this EIR. The purpose of the alternative analysis, according to the California Environmental Quality Act (CEQA) *Guidelines* § 15126.6(a), is to describe a range of reasonable alternative projects that could feasibly attain most of the objectives of the Proposed Project and to evaluate the comparative merits of the alternatives. CEQA *Guidelines* § 15126.6(b) requires consideration of alternatives that could reduce to a less than significant level or eliminate any significant adverse environmental effects of the Proposed Project, including alternatives that may be more costly or could otherwise impede the Proposed Project's objectives. The range of alternatives evaluated in an EIR is governed by a "rule of reason," which requires the evaluation of alternatives "necessary to permit a reasoned choice." Alternatives considered must include those that offer substantial environmental advantages over the Proposed Project and may be feasibly accomplished in a successful manner considering economic, environmental, social, technological, and legal factors. An EIR does not need to consider every possible alternative, but must consider alternatives that will foster informed decision-making and public participation.

In accordance with the CEQA *Guidelines*, the alternatives considered in this EIR include those that 1) could accomplish most of the basic objectives of the project, and 2) could avoid or substantially lessen one or more of the significant effects of the project. To provide the appropriate context for this alternatives analysis, the Proposed Project objectives and key significant effects are summarized below in **Section 5.2**. Project alternatives determined to achieve the CEQA selection criteria are discussed in **Section 5.3**. This discussion evaluates the capacity of selected project alternatives to accomplish the basic objectives of the project and provides a comparison of the potential environmental impacts expected to occur for each resource area. These comparisons are used in **Section 5.4** to determine the Environmentally Superior Alternative.

5.2 PROJECT OBJECTIVES

Approximately 12.8 acres of the 17± acre project site contains timberland that would be harvested under a Timber Harvest Plan (THP) consistent with Forest Practice Rules, and evaluated under a CEQA-equivalent process led by the California Department of Forestry

and Fire Protection (CAL FIRE). The timber harvest would occur before the conversion of the timberland to non-timberland uses, and final vineyard development would be consistent with the erosion control plan (ECP) elements of the Proposed Project that require Napa County approval.

After the timber harvest occurs on the property, specific objectives associated with the Proposed Project are to:

- Convert the 17± acre cleared area of the THP to permanent uses other than timberland;
- Implement a 17± acre erosion control plan (ECP) for the overall project site;
- Develop a 15.3± net acre vineyard within the 17± gross acre project site on the property;
- Provide opportunities for vineyard employment and economic development in Napa County; and
- Increase safety of the nearby Angwin-Parrett Field airport by removing trees in the flight path.

5.2.1 KEY IMPACTS OF THE PROPOSED PROJECT

Key impacts of the Proposed Project are evaluated in **Section 4.0** of this EIR. Project design, regulatory requirements, and recommended mitigation measures would reduce all potential short- and long-term impacts during construction and operation of the Proposed Project to a less than significant level. There are no significant and unavoidable impacts associated with the Proposed Project.

5.3 ALTERNATIVES TO THE PROPOSED PROJECT

5.3.1 NO PROJECT / NO DEVELOPMENT ALTERNATIVE

Description

As required by CEQA *Guidelines* Section 15126.6(e), a No Project / No Development Alternative has been evaluated. The evaluation of the No Project / No Development Alternative allows decision makers to compare the impacts of the Proposed Project against no development of the project. According to the CEQA *Guidelines* Section 15126.6(e)(2), the No Project Alternative shall discuss what would reasonably be expected to occur in the foreseeable future if the project were not approved. Thus, the No Project / No Development Alternative consists of the environmental conditions that currently exist with no future development on the property. The property would remain as currently described in the existing setting under each issue area discussed in **Section 4.0**.

Ability to Meet Project Objectives

With the No Project /No Development Alternative, the property would continue to remain in its existing state as partially forested with small areas of open, non-native annual grassland. No changes to the existing forested areas, access road, or open space areas would occur. No conversion of the property to non-timber uses would occur. The trees and vegetation cover proposed for removal through the timber harvest would remain unaffected. No safety benefits to the Angwin-Parret Field airport would occur as the timber directly in the flight path would not be cleared under the THP. This alternative would not accomplish the basic objectives of the Proposed Project. The economic objectives of the timber harvest and vineyard conversion, including the sustainable operation of the proposed vineyard block, would not be achieved through this alternative.

Summary of Environmental Impacts

This alternative would eliminate short-term impacts related to construction activities. Temporary impacts associated with noise, pollutant, and greenhouse gas (GHG) emissions from construction activities would be avoided. Additionally, because ground-disturbing activities would not occur, potential impacts to biological resources associated with the Proposed Project would be avoided. However, no erosion control features would be installed on the property as a result of the No Project / No Development Alternative, which would eliminate the potential for a 54 percent decrease in sediment production.

The development of project features associated with the timber harvest, installation of the ECP, and vineyard conversion would not occur under this alternative. The impacts identified in **Section 4.0** would be avoided and the existing environmental setting would remain.

Overview of the No Project Alternative

The No Project / No Development Alternative would not meet the objectives of the Proposed Project. It would not result in any actions on the ground, including the improvement of flight safety for the Angwin-Parrett Field airport or the economic improvement to the local area that would occur with the Proposed Project.

5.3.2 THREE VINEYARD BLOCK ALTERNATIVE

Description

The Three Vineyard Block Alternative includes a 17± acre total conversion area, which is similar in size to the current Proposed Project. Vineyard Block A would be situated in the southwest corner of the property with slopes up to eight percent and vineyard Block C would be situated in the northeast corner of the parcel with slopes up to six percent. The location of vineyard Block B would be on the same flat hilltop position relative to the current Proposed Project, but would be set back from the property boundary. This alternative would

require the ECP (**Appendix B**) to be re-designed to accommodate the new development on steeper slopes and adjacent to the steep hillside.

Ability to Meet Project Objectives

The Three Vineyard Block Alternative would meet the objectives of the project and result in similar vineyard conversion acreage on the property; but, it would cause an increase in erosion and sedimentation in off-site watercourses due to the arrangement of the proposed vineyard blocks on the steeper slopes on the property. Furthermore, the location of Vineyard Block B under this alternative would be set back from the parcel boundary, resulting in no beneficial improvement to safety of the Angwin-Parrett Field airport.

Summary of Environmental Impacts

Compared to the Proposed Project, impacts to forested land would be similar under the Three Vineyard Block Alternative. Both alternatives propose the harvesting of 17± acres of non-native grassland, medium-density forest, and high-density forest. However, creating three vineyard blocks instead of one will increase habitat fragmentation greater than the impact of the Proposed Project. Impacts to biological resources would be similar to or greater than those of the Proposed Project (refer to **Section 4.4**).

Re-design of the ECP (**Appendix B**) would be necessary under the Three Vineyard Block Alternative. Since the ECP for the Proposed Project has been specifically designed to limit development on the steep slopes and to significantly reduce off-site erosion and sedimentation, these environmentally beneficial factors would not likely be possible under this alternative.

Re-arrangement of the proposed vineyard block on steep slopes in the southwestern and northeastern corners of the property would result in an increase in erosion and sedimentation levels; such impacts would require greater mitigation to reduce impacts to be equal to or less than pre-project conditions. Re-design of the ECP would be required to address the potential for increased levels of sediment to flow downstream and directly affect off-site watercourses, such as the Napa River, which is currently listed as an impaired water body for nutrients, pathogens, and sediment under Section 303 (d) of the Clean Water Act (CWA) (**Section 4.9**). This would be a potentially significant impact that would need to be addressed for this alternative.

With the Three Vineyard Block Alternative (like the Proposed Project), construction-related dust and particulate matter would be generated, additional vehicles would travel to the property during project construction and operation (as compared to current conditions), and noise would be generated. These impacts were analyzed for the Proposed Project to be less than significant (refer to **Sections 4.3**, **4.11**, and **4.12**).

Similar to the Proposed Project, the Three Vineyard Block Alternative would result in the potential to affect previously unknown cultural resources, and could result in the discovery and disturbance of unknown human remains. The mitigation measures included in the Proposed Project (**Mitigation Measures 4.5-1**, **4.5-2**, and **4.5-3**) would be required for the Three Vineyard Block Alternative to minimize potential impacts to cultural resources.

Like the Proposed Project, the Three Vineyard Block Alternative would not result in long term transportation and traffic impacts. In comparison, the impacts that would occur under this alternative would be similar to the less than significant impacts to transportation and circulation of the Proposed Project (see **Section 4.12**).

Overview of Impacts and Mitigation for the Three Vineyard Block Alternative

The Three Vineyard Block Alternative would result in the clearing of 17± acres and conversion of 15± acres to vineyard, similar to the Proposed Project. This alternative would place the two additional vineyard blocks on steep slopes near the southwestern and northeastern corners of the project area, which would cause greater impacts to erosion and hydrology. Impacts to hydrology and water quality as well as geology and soils would be greater under the Three Vineyard Block Alternative since re-arrangement of the proposed vineyard blocks would include steep slopes and therefore would require a complete re-design of the ECP. Since the Proposed Project was specifically designed to accommodate the onsite topography by avoiding steep slopes and to significantly reduce pre-project sedimentation conditions per the ECP, re-design of the ECP would likely increase impacts to these features as compared to the significantly reduced impacts to hydrology and water quality as well as geology and soils under the current ECP and Proposed Project.

5.3.3 NO TIMBER HARVEST ALTERNATIVE

Description

The No Timber Harvest Alternative would result in the planting of vineyard on approximately 4.2 acres of non-timberland on the property. This alternative would result in the conversion to vineyard of approximately 3.66 acres of California Annual Grassland and approximately 0.54 acres of ruderal/developed land. No timber would be harvested as a result of this alternative; therefore, no THP or Timber Conversion Plan (TCP) would be needed and CAL FIRE would not have discretionary approval authority over the project. The 4.2 acres proposed for planting is entirely situated on slopes less than five percent, so an ECP would not be needed and Napa County would not have approval authority over any portion of the No Timber Harvest Alternative. Because there is no discretionary approval needed for this alternative by a public agency, the property owner could move forward with development of this alternative at any time.

No trees would be removed as a result of this alternative and therefore no habitat mitigation would be needed. This means that no Douglas Fir Forest – Ponderosa Pine Forest or California Black Oak Forest would be permanently preserved on the property in the area designated the "Habitat Retention Area." While no habitat would be removed and this impact may be lesser than the Proposed Project, no habitat improvement techniques would be employed on the remainder of the parcel.

Ability to Meet Project Objectives

The No Timber Harvest Alternative would not meet the objectives of the project because it would result in significantly decreased vineyard acreage on the property. The development of the vineyard is the central objective of the project, one that will provide the greatest economic returns in the long term while also operating in a sustainable, environmentally sensitive manner. In addition, no trees would be removed as a result of this alternative, resulting in no beneficial improvement to safety at the Angwin-Parrett Field airport.

Summary of Environmental Impacts

Compared to the Proposed Project, impacts to forested land would be lesser under the No Timber Harvest Alternative. This alternative would not result in the harvesting of 17± acres of medium-density and high-density forest, and would result only in the conversion of grassland and ruderal/developed habitat to vineyard.

Lesser impacts would occur to special-status bat species and special-status bird species, including northern spotted owl, on the project site because no tree harvest would occur. Since the non-native annual grassland on the project site will still be removed under this alternative, impacts to northern spotted owl foraging habitat would be similar to the Proposed Project. However, this alternative would not result in the permanent protection of the Douglas fir–Ponderosa pine Forest or California Black Oak Forest on the property within the Habitat Retention Area. This alternative would not protect these sensitive habitats onsite and would not ensure the prevention of future development on the property. In addition, no habitat improvement techniques would occur on the forested land on the remainder of the property, as listed in **Mitigation Measure 4.4-4** for the Proposed Project. Therefore, in considering the above outcomes of this alternative, impacts to biological resources would be similar to those of the Proposed Project (refer to **Section 4.4**).

The grassland and ruderal/developed land proposed for conversion to vineyard under the No Timber Harvest Alternative is less than five percent slope. This means that no erosion control measures would be required. The ECP for the Proposed Project was specifically designed to reduce sedimentation to downstream, off-site watercourses, such as the Napa River, which is currently listed as an impaired water body for nutrients, pathogens, and

sediment under Section 303 (d) of the Clean Water Act (CWA) (**Section 4.9**). The No Timber Harvest Alternative would not be required to reduce post-project sediment production on the project site by preparing and complying with an ECP, and would therefore not have the environmental benefits associated with the erosion reduction in the Proposed Project.

With the No Timber Harvest Alternative (like the Proposed Project), construction-related dust and particulate matter would be generated, additional vehicles would travel to the property during project construction and operation (as compared to current conditions), and noise would be generated. This alternative does not include harvest of timber, so impacts due to construction of this alternative will be slightly lesser than the Proposed Project. However, these impacts were analyzed for the Proposed Project to be less than significant (refer to **Sections 4.3**, **4.11**, and **4.12**).

Similar to the Proposed Project, the No Timber Harvest Alternative would result in the potential to affect previously unknown cultural resources, and could result in the discovery and disturbance of unknown human remains. The mitigation measures included in the Proposed Project (**Mitigation Measures 4.5-1**, **4.5-2**, and **4.5-3**) would be required for the No Timber Harvest Alternative to minimize potential impacts to cultural resources.

Like the Proposed Project, the No Timber Harvest Alternative would not result in long term transportation and traffic impacts. In comparison, the impacts that would occur under this alternative would be similar to the less-than-significant impacts to transportation and circulation of the Proposed Project (see **Section 4.12**).

Overview of Impacts and Mitigation for the No Timber Harvest Alternative

The No Timber Harvest Alternative would result in the clearing and planting to vineyard of 4.2 acres of grassland and ruderal/developed land. This alternative would avoid harvesting all Douglas Fir Forest – Ponderosa Pine Forest and California Black Oak Forest on the project site. Because slopes within the 4.2 acres are less than five percent and no timber harvest or conversion would occur, no public agency has approval authority over this alternative and the property owner could go forward with the development of this alternative at any time. No ECP would be prepared for this alternative and the property owner would not be required to reduce sedimentation to downstream waters; therefore, the beneficial erosion reduction on the project site that would occur under the Proposed Project would not occur under the No Timber Harvest Alternative. Impacts to biological resources would be similar when compared to the Proposed Project. Although it would have a slightly lesser direct effect to habitat by not removing any trees, it would also not result in the habitat improvement techniques that are required in the Proposed Project.

5.4 ALTERNATIVES ELIMINATED FROM CONSIDERATION

5.4.1 SELECTIVE TIMBER HARVEST ALTERNATIVE

Description

For the Selective Timber Harvest Alternative, timber would be harvested for the entire allowable portions of the 42.3-acre parcel, and subsequently seedlings would be planted. No vineyard development would occur on the property; for this reason, this alternative has been removed from further consideration. Since the timber harvest area is designed to accommodate the vineyard conversion under the Proposed Project, under the Selective Timber Harvest Alternative, a larger timber harvest area would likely occur. Apart from the existing agriculture areas and roadways, nearly the entire 42.3-acre parcel would be selectively harvested for timber products and replanted for future timber harvest operations.

Ability to Meet Project Objectives

The Selective Timber Harvest Alternative would not fully meet the objectives of the project for the development of a vineyard. The harvest of timber over a larger portion of the property would provide short term economic benefits in the form of increased marketable timber products. However, it would take roughly 20 to 40 years before another timber harvest would be feasible given the size of the trees, or economically viable given the costs for harvesting operations and the sale of timber products. Likewise, the economic tax benefits to the County and the addition of jobs to the local workforce would be significantly reduced under this alternative as there would be no ongoing work force needed for the vineyard operations. The development of the vineyard is the central objective of the project, one that will provide the greatest economic returns in the long term while also operating in a sustainable, environmentally sensitive manner.

Summary of Environmental Impacts

Impacts to biological resources under the Selective Timber Harvest Alternative would include greater impacts than those of the Proposed Project, at least in the short term, to forest habitat onsite that provides habitat to birds, small mammals, and foraging habitat for northern spotted owl. Impacts to onsite habitat would be temporarily impacted during the operation of the timber harvest and replanting activities. Reduced vegetation cover over a greater acreage of the property under this alternative could impact foraging and cover habitat for many terrestrial and bird species during the forest re-growth period. However, similar to the Proposed Project, the recommended mitigation measures to reduce impacts to these resources would be applied in appropriate ratios to the actual acreage of woodland and northern spotted owl habitat impacted (refer to **Section 4.4**).

The selective timber harvest and corresponding Timber Harvest Plan (THP) would be implemented pursuant to California Department of Forestry and Fire Protection (CAL FIRE)

standards. The Napa County ECP regulations would not apply under this alternative. The Selective Timber Harvest Alternative could result in extensive impacts in terms of total acreage and could have the potential for greater impacts to hydrology and water quality as well as geology and soils.

The disturbance to the forest associated with the Selective Timber Harvest Alternative would cause ground disturbing activities over a greater total acreage than those anticipated and mitigated for in the Proposed Project. During timber harvest activities, potential impacts to resource areas such as hydrology and water quality, biological resources, noise, and air quality would likely be greater than those associated with and mitigated for in the Proposed Project. However, the THP process would also require mitigation measures to lessen or eliminate these potential impacts.

Overview of Selective Timber Harvest Alternative

The Selective Timber Harvest Alternative would impact a greater total acreage of the property. This alternative would cause greater, although mainly short-term, impacts. The economic returns of the timber harvest would be short term and limited to the initial harvest instead of the ongoing economic benefit of vineyard operations under the Proposed Project. Under the present regulatory environment and costs associated with timber harvest permits, it is highly probable that no net return would occur as a result of only a selective timber harvest on the property. Furthermore, this alternative fails to meet the objective of the project, to develop a vineyard, and is therefore eliminated from further consideration in this EIR.

5.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA *Guidelines* Section 15126.6(d) requires an evaluation of alternatives to the Proposed Project.

> *"The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."*

Consistent with this CEQA requirement, a summary matrix has been prepared which qualitatively compares the effectiveness of each of the alternatives in reducing environmental impacts. This matrix, presented in **Table 5-1**, identifies for each impact area whether the alternatives would have greater, lesser, or similar impacts compared with the

Proposed Project. As stated above in **Section 5.2.1**, there would be no significant and unavoidable impacts as a result of the Proposed Project. Each of the impacts identified under the Proposed Project would be considered less than significant after mitigation. Therefore "greater" and "lesser" impacts identified in **Table 5-1** are referring to varying degrees of impacts below established significance thresholds. In summary, the environmentally superior alternative is the alternative that would cause the least impact to the biological and physical environment.

TABLE 5-1
ENVIRONMENTAL IMPACT COMPARISON
BETWEEN THE PROPOSED PROJECT AND PROJECT ALTERNATIVES

Impact Area	Project Alternatives		
	No Project Alternative	**Three Vineyard Block Alternative**	**No Timber Harvest Alternative**
Aesthetics	Lesser	Similar	Lesser
Agriculture and Forestry Resources	Lesser	Similar	Lesser
Air Quality	Lesser	Similar	Similar
Biological Resources	Lesser	Greater	Similar
Cultural Resources	Lesser	Similar	Similar
Geology and Soils	Greater	Greater	Greater
Greenhouse Gas Emissions	Lesser	Similar	Similar
Hazards and Hazardous Materials	Lesser	Similar	Similar
Hydrology and Water Quality	Greater	Greater	Greater
Land Use/Planning	Similar	Similar	Similar
Noise	Lesser	Similar	Similar
Transportation and Traffic	Lesser	Similar	Similar

Source: AES, 2013

As discussed above, implementation of the No Project / No Development Alternative would result in no change in land use on the property; however, it fails to meet the objectives of the project. Under the No Project /No Development Alternative, impacts to hydrology and water quality as well as geology and soils would likely be greater than the Proposed Project since the drainages on the property would not be improved. Therefore, the current erosion and sedimentation occurring from this source would continue. Without implementation of the

ECP, the water quality of off-site watercourses would not be improved. This could lead to greater impacts to water quality in the long term for off-site watercourses such as the Napa River, which is currently listed as a Section 303 (d) impaired water body under the CWA.

The Three Vineyard Block Alternative would result in similar impacts as those of the Proposed Project, specifically for the timber harvest operations, installation of the ECP measures, installation of the vineyard, as well as operation of the vineyard. However, the Three Vineyard Block Alternative would require the re-design of the ECP and implementation of mitigation measures (in relative proportion to the re-assessment of actual impacts), which could result in significant impacts to hydrology and water quality as well as geology and soils as compared to the Proposed Project. Overall, the Three Vineyard Block Alternative would likely result in similar environmental impacts as those of the Proposed Project; however, since the Proposed Project was specifically designed to accommodate the onsite topography, re-design of the ECP would require greater erosion control measures to lessen potential impacts to hydrology and water quality as compared to the Proposed Project.

The No Timber Harvest Alternative would result in slightly lesser impacts as compared to those of the Proposed Project because it has a lesser footprint and does not involve timber harvest operations. The No Timber Harvest Alternative would not result in an action by a public agency (no timber harvest or timber conversion and development on slopes less than five percent removes all components that trigger analysis under CEQA), and therefore the property owner would not be required to implement a THP, TCP, or ECP. Therefore, the No Timber Harvest Alternative will not have some of the benefits of the Proposed Project, including improvement of onsite drainage via an engineered ECP or enhancement of onsite forested habitat within a habitat retention area. Overall, the No Timber Harvest Alterative would likely result in lesser direct impacts to the environment than the Proposed Project, but it would not result in any of the environmental benefits of the Proposed Project.

Generally, the environmentally superior alternative is the alternative that would cause the least damage to the biological and physical environment. Since implementation of the No Project / No Development Alternative would result in fewer adverse environmental effects than would occur under the Proposed Project, the Three Vineyard Block Alternative, and the No Timber Harvest Alternative, the No Project / No Development Alternative would be considered the environmentally superior alternative. However, the No Project / No Development Alternative would not achieve the central project objective of development of vineyard and improvement of safety to the Angwin-Parrett Field airport.

If the No Project / No Development Alternative is the environmentally superior alternative, CEQA *Guidelines* Section 1526.6(e)(2) requires identification of an environmentally superior

alternative among the other alternatives considered in the EIR. When comparing the remaining development alternatives, the Proposed Project is the most environmentally superior alternative. The Proposed Project is the only alternative which fully meets the project objectives and has been designed to lessen impacts to the environment to less-than-significant levels through implementation of the recommended mitigation measures provided in **Section 4.0**.

SECTION 6.0

Other CEQA-Required Sections

SECTION 6.0

OTHER CEQA-REQUIRED SECTIONS

California Environmental Quality Act (CEQA) required discussions are presented in this section, including:

- Indirect and Growth-inducing impacts of the Proposed Project;
- Cumulative Impacts of the Proposed Project;
- Unavoidable Significant Impacts of the Proposed Project (i.e., residually significant impacts); and
- Irreversible Changes.

6.1 INDIRECT AND GROWTH INDUCING IMPACTS

CEQA *Guidelines* § 15126.2 [d] requires that an Environmental Impact Report (EIR) evaluate the growth inducing impacts of a proposed project. A growth inducing impact is defined by the CEQA *Guidelines* as an impact that fosters economic or population growth, or the construction of additional housing, either directly or indirectly. Direct growth inducement would result, for example, if a project involved the construction of new housing. Indirect growth inducement would result if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises) or if it would remove obstacles to population growth (e.g., expansion of a wastewater treatment plant that could allow more construction in the service area).

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected. Local land use plans provide development patterns and growth policies that guide orderly development supported by adequate public services, such as water supply, roadway infrastructure, sewer services, and solid waste services. A project that would induce “disorderly” growth (i.e., conflict with the local land use plans) could directly or indirectly cause additional adverse environmental impacts and other public services impacts. An example of this would be the re-designation of property planned for agricultural uses to urban uses, possibly resulting in the development of services and facilities that encourage the transition of additional land in the vicinity to more intense urban uses. Another example would be the extension of urban services to a non-urban site, thereby encouraging conversion of non-urban lands to urban lands.

As described in **Section 3.0**, the Proposed Project would result in the timber harvest of 12.8± acres within the 17± acre Timber Harvest Plan (THP) area. As noted in **Section 4.10**, the Proposed Project is located within unincorporated Napa County (County) and is designated Agricultural Watershed: Airport Compatibility District (AW:AC), Planned Development: Affordable Housing Combination District: Airport Compatibility District (PD:AH:AC), and Airport District: Airport Compatibility District (AV:AC).

The harvest of timber and development of the vineyard under the Proposed Project would not conflict with existing County land use designations, surrounding land uses or local habitat conservation plans (**Sections 4.2** and **4.10**). The Proposed Project would not result in any of the following repercussions:

- remove (or create) obstacles to growth;
- cause a strain on existing community services provided in the region;
- impede economic growth; or
- cause a need for additional housing.

Therefore, no indirect or growth inducing impacts would occur as a result of the Proposed Project.

6.2 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts refer to the effects of two or more projects that, when combined, are considerable or compound other environmental effects. Cumulative impacts must consider the combined impact of past, present, and reasonably foreseeable future projects. When assessing a cumulative impact, an EIR must identify if the project makes a “cumulatively considerable” contribution to the cumulative environment. A project’s contribution may be cumulatively considerable even if the project’s individual impact is considered less than significant. CEQA *Guidelines* Section 15130(b) requires that discussion of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. The CEQA *Guidelines* state that the cumulative impacts discussion does not need to provide as much detail as is provided in the analysis of project-only impacts and should be guided by the standards of practicality and reasonableness. Pursuant to CEQA Guidelines Section 15130(b), this EIR uses projections contained in the Napa County General Plan EIR (2007), General Plan (2008), and related planning documents, which describe or evaluate regional or area-wide conditions contributing to cumulative impacts.

6.2.1 GEOGRAPHIC SCOPE

CEQA requires that the cumulative analysis define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for geographic limitations. As such, the analysis in this section will rely on projects that have the potential to contribute to cumulative impacts within the community of Angwin and an area generally within a three mile radius of the property, with the exception of air quality, greenhouse gas emissions, and agriculture and forestry, which were analyzed within a larger area of impact as discussed in **Section 6.2.2** below.

6.2.2 CUMULATIVELY CONSIDERABLE IMPACTS

CEQA *Guidelines* § 15130(a) provides the following direction with respect to the cumulative impact analysis and the determination of significant effects:

1. A cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts.
2. When the combined cumulative impact associated with the project's incremental effect is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed further.
3. An EIR may determine that a project's contribution to a significant cumulative effect will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

The following is an analysis of cumulative impacts related to the Proposed Project by environmental resource category as described in **Section 4.0**. Refer to **Section 4.0** for a detailed discussion of the nature and scope of impacts associated with the Proposed Project.

6.2.2-1 AESTHETICS

The visual character of Napa County is typified by vineyards, rolling hills, lush forest, and mountains. The conversion of the timberland on the project site to vineyard would be in keeping with the visual character of the surrounding agricultural and forest land. In combination with other reasonably foreseeable projects, the Proposed Project will not result in a cumulative adverse impact to aesthetic resources.

6.2.2-2 AGRICULTURE AND FORESTRY RESOURCES

The Z'berg-Nejedly Forest Practice Act [Division 4, Chapter 8, Public Resources Code (PRC)] defines timberland as "land… which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber." Although not within a Timberland Production Zone (TPZ), the project site meets the PRC definition of timberland. The trees proposed for harvest within the THP and TCP area fall within Douglas fir-Ponderosa pine forest habitat as mapped by Napa County. As stated in **Section 4.4 Biological Resources**, there are approximately 1,350 acres of Douglas fir-Ponderosa pine forest in the Angwin area. The harvest of 12.8± acres of timberland from the THP as a result of the Proposed Project will impact less than 0.95 percent of the Douglas fir-Ponderosa pine timberland within the Angwin area alone. As noted in the THP, since the Proposed Project would remove a small amount of timber volume that is not within the commercial forest land base of California, no significant impact can be expected to occur on timber resources of the state or its timber productivity and economy (**Appendix H**).

Conn Creek Watershed. An analysis of potential impacts to the Conn Creek watershed from implementation of the Proposed Project is presented in Section IV of the THP (**Appendix H**). The results of this analysis show that in the past ten years, timber harvesting has been limited to vineyard conversion on 37 acres within the assessment area. Furthermore, the number of timber conversion applications has most likely reach its peak and has dropped significantly within the last five years (**Appendix H**). The proposed timber harvest of 12.8 acres represents less than 0.04 percent of the total land in the watershed, and less than 0.05 percent of the timberland in the watershed. Combined with the other known projects from the last decade, the total amount of timber converted is approximately 49 acres and is 0.15 percent of the Conn Creek watershed. When added to the other known conversion projects in the watershed, this minor increase of less than 0.15 percent is less than significant to the watershed as a whole. Therefore, no significant impact can be expected to occur to the state timber harvest volumes or the economic values to Napa County or the state due to the loss of timberland, based on the following: the small amount of timber resources harvested annually in Napa County; the reduced number of timberland to vineyard conversions in the watershed; the small scale of the timberland conversion expected from the Proposed Project; and the small scale of the two other timberland conversion projects known in the assessment area. Therefore, cumulative impacts to agriculture and forestry resources would be considered less than significant

6.2.2-3 AIR QUALITY

The geographic scope for the cumulative air quality impact analysis is the San Francisco Bay Area Air Basin (SFBAAB), because cumulative air quality impacts could potentially affect the entire San Francisco Bay Area region. Cumulative air quality issues in the SFBAAB are addressed through regional air quality control plans developed by the Bay

Area Air Quality Management District (BAAQMD). These plans account for projected growth in the Bay Area, as embodied in the adopted General Plans of the various cities and counties that comprise the Bay Area. There is, therefore, no need to identify each and every specific "probable future project" that might contribute emissions within the air basin.

Project Construction. Construction elements of the Proposed Project, including the timber harvest, installation of erosion control measures, and development of the vineyard, concurrent with other projects in the air basin would generate emissions of criteria pollutants, including suspended and inhalable particulate matter (PM_{10}) and equipment exhaust emissions. As discussed in **Section 4.3,** for construction-related impacts, the BAAQMD has developed significance thresholds of 54 of nitrogen oxide (NO_X), reactive organic gases (ROG), and $PM_{2.5}$ and 82 pounds per day of PM_{10}, and recommends basic construction mitigation for all projects (BAAQMD, 2010). BAAQMD's significance thresholds consider the regions cumulative emissions levels. Construction emissions from the development of the Proposed Project would not exceed the BAAQMD threshold with implementation of a fugitive dust abatement program under **Mitigation Measure 4.3-1** (**Section 4.3**). The BAAQMD Guidelines take into account past, present, and future emissions of criteria pollutants; therefore, since the project would not exceed BAAQMD thresholds the cumulative impacts due to construction would be less than significant.

Project Operation. The BAAQMD also provides cumulative operational significance thresholds for NOx, ROG, $PM_{2.5}$ and PM_{10} (BAAQMD, 2010). The San Francisco Bay Area Air Basin (SFBAAB) non-attainment status for NOx, ROG, $PM_{2.5}$ and PM_{10} is attributed to the region's development history. Past, present, and future development contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact; no single project is sufficient in size to, by itself, result in non-attainment of the ambient air quality standards. However, if a project contribution is considerable, then the project's cumulative impact on regional air quality would be considered significant. Cumulative thresholds are the same as project thresholds, which are provided in **Section 4.3**. As shown in **Table 4.3-5** in **Section 4.2**, project-related operational NOx, ROG, $PM_{2.5}$ and PM_{10} emissions would not exceed the BAAQMD cumulative operational significance thresholds, and therefore the cumulative operational impacts would be less than significant.

6.2.2-4 BIOLOGICAL RESOURCES

Cumulative projects in the vicinity of the property, including growth resulting from build-out of the County's General Plan and any proposed future development in the vicinity of the property, are anticipated to permanently remove plant and wildlife resources, which could affect special status species and their habitat, nesting and foraging habitat for resident and migratory birds, and/or local policies or ordinances protecting biological resources.

Impacts to Biological Resources during Construction

As discussed in **Section 4.4**, potential impacts to biological resources analyzed in this EIR include impacts from the precursor timber harvest phase, the Erosion Control Plan (ECP), and vineyard installation under the Proposed Project. It should be noted that the project design follows County goals and policies including the incorporation of setbacks within the THP area that will prevent construction activities from disturbing adjacent forested areas to be retained onsite, outside of the 17± acre vineyard footprint. As a result, forested habitat onsite occurring outside of the THP area will not be impacted by construction and operation of the Proposed Project.

Section 4.4 includes mitigation measures to reduce potential impacts to special status species (**Mitigation Measures 4.4-1**, **4.4-2**, and **4.4-3**) and habitats (**Mitigation Measure 4.4-4**) during construction to less than significant levels. The County would similarly require cumulative projects with potentially significant impacts to wildlife and plant species in the vicinity of the Proposed Project to comply with federal, state and local regulations and ordinances and to mitigate for potential impacts to biological resources during construction. Cumulative projects with the incorporation of appropriate mitigation and approval of local, state, and federal agencies would reduce impacts to cumulative environmental conditions to less than significant levels.

Impacts to Biological Resources Due to Vineyard Conversion

Watershed. Although vineyards only provide limited habitat value for wildlife, local regulations ensure that installation of vineyards do not necessarily represent a total loss of habitat for wildlife. Napa County Conservation Regulations (Napa County Code, Chapter 18.108.100) require projects to maintain portions of open space on parcels proposed for development, which provides habitat for plants and foraging and nesting opportunities for wildlife. Napa County Conservation Regulations (Napa County Code, Chapter 18.108.025) generally preclude development on slopes greater than 30 percent and require setbacks of 35 to 150 feet from all County-definitional streams (depending on slopes). These County regulations would apply to any cumulative projects in the vicinity of the Proposed Project, which would lessen any potential impacts to the surrounding watershed.

Special Status Species. Habitats on the property where special status species may occur include: Douglas fir-Ponderosa pine Alliance, Ponderosa Pine Alliance, Agriculture, and California Black Oak Alliance. Although the project proposes to remove portions of these habitats, they are still relatively common in the cumulative environment surrounding the project site. As shown in **Table 4.4-2** of **Section 4.4**, the acreage of onsite habitat types removed by the Proposed Project total less than 0.95 percent of the Douglas fir- Ponderosa pine forest in the Angwin area. Specific mitigation and avoidance measures (**Mitigation**

Measures 4.4-1, 4.4-2, and **4.4-4**) reduce the cumulative impacts to habitat loss on potentially occurring special status species to less than significant levels.

Northern Spotted Owl. As stated in **Section 4.4**, the acreage of woodland that would be removed by the Proposed Project equals 12.8± acres of Douglas fir-Ponderosa pine Forest (**Impact 4.4-2**), which may provide foraging habitat for northern spotted owl. Due to the small size of the project and the fact that the habitat retention standards would be met for post-project conditions for both activity centers NP28 and NP29, which are the closest activity centers to the Proposed Project, with implementation of **Mitigation Measure 4.4-2**, impacts to the northern spotted owl would be considered less than significant (**Section 4.4**).

Mitigation 4.4-2: While there are two northern spotted owl activity centers (NP28 and NP29) within 1.5 miles, there are no activity centers located within 0.7 miles of the project parcel (Town, 2013). Northern spotted owl take avoidance will be achieved via compliance with California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention. These activity centers are located greater than 1,000 feet from the project parcel; additionally, as discussed above in **Section 4.4.4-8** NP28 has not been reported as active for more than 10 to 15 years (ERM, 2013).

All information regarding northern spotted owl (NSO) shall be submitted to CAL FIRE, and annual operations will not commence until a letter is obtained from CAL FIRE confirming there have been no changes that would result in non-conformance with the plan. Protocol survey calling procedures shall follow the appropriate and most current NSO protocol from USFWS.

The Applicant shall implement the following measures to avoid take of the northern spotted owl (USFWS, 2012):

1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan.
2. No harvesting of trees shall occur until NP29 is detected/located within their historic activity center during the year of planned timber harvest activities. The owl's activity center is located on private project parcel; therefore, daytime monitoring of the owl may not be possible due to access issues. If the owl is not detected within their historic activity centers, the project parcel must be surveyed according to the current acceptable NSO protocol.
3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NP29. The activity centers for NP29 are further

than 1/4 mile from the THP boundary; therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the project parcel boundary, the following seasonal restrictions may be applied by CAL FIRE.

   a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity centers of NP29, except on the use of existing roads.

4. In the event that a new activity center becomes established within the project site or within 1/4 mile of the project site, the following seasonal restrictions may be applied by CAL FIRE:
   a. Seasonal Restrictions: No operations from February 1 to July 30 within 1/4 mile of the activity center, except on the use of existing roads.

Implementation of the above mitigation would lessen cumulative impacts of any future project in the vicinity of any active northern spotted owl territories indentified in the local area to less than significant levels. As noted in **Section 4.4**, any future projects in the cumulative environment would be required to adhere to recommended USFWS northern spotted owl survey protocols.

6.2.2-5 CULTURAL RESOURCES

Potential projects in the vicinity of the property, including growth resulting from build-out of the County's General Plan and proposed development in the vicinity of the property, have the potential to cumulatively impact cultural resources. Archaeological and historic resources are afforded special legal protections designed to reduce the cumulative effects of development. Potential cumulative projects and the Proposed Project would be subject to the protection of cultural resources afforded by the CEQA *Guidelines* Section 15064.5 and related provisions of the Public Resources Code. In addition, projects with federal involvement would be subject to Section 106 of the National Historic Preservation Act. Given the non-renewable nature of cultural resources, any impact to protected sites could be considered cumulatively considerable. As discussed in **Section 4.5**, site specific cultural surveys have not identified cultural resources within the property.

Mitigation Measures 4.5-1 and **4.5-2** in **Section 4.5** provide for the protection of unanticipated discoveries during ground disturbing activities. With the implementation of these mitigation measures, the Proposed Project's incremental contribution to cumulative impacts to cultural resources is considered to be less than significant.

6.2.2-6 GEOLOGY AND SOILS

Implementation of the Proposed Project and other potential cumulative projects in the region, including growth resulting from build-out of the County's General Plan and other proposed development in the vicinity of the property, could result in increased erosion and soil hazards and could expose additional structures and people to seismic hazards.

Potential soil and seismic hazards from cumulative development could represent a significant cumulative impact if such projects do not incorporate grading/erosion plans and are not developed to the latest building standards by incorporating recommendations from site-specific geotechnical reports. As stated in **Section 4.6**, there were two technical reports prepared for the Proposed Project: the ECP (NVVE, 2013) and the Erosion, Sedimentation, and Hydrologic Assessment Analysis (Balance Geo, 2013). These technical studies include mitigation measures that are specifically designed for and included as part of the Proposed Project (refer to **Section 3.0**), which would reduce impacts during construction and operation of the Proposed Project to local geology and soils. The Applicant would implement the recommended mitigation measures and design specifications included in the ECP and supporting technical reports, which are designed to avoid, reduce, or mitigate potential impacts associated with geology and soils. Therefore, with incorporation of design standards, cumulative impacts of the Proposed Project would be considered less than significant.

6.2.2-7 GREENHOUSE GAS EMISSIONS

As discussed in **Section 6.2.2-2** above, cumulative air quality issues in the SFBAAB are addressed through regional air quality control plans developed by the BAAQMD. These plans account for projected growth in the Bay Area, as embodied in the adopted General Plans of the various cities and counties that comprise the Bay Area. There is, therefore, no need to identify each and every specific “probable future project” that might contribute emissions within the air basin.

Project Construction. The Proposed Project’s design reduces greenhouse gas (GHG) emissions from construction by 25 percent from “business as usual” practices, which results in a less than significant impact to climate change. Since the County’s draft Climate Action Plan (CAP) provides for a reduction in GHG emissions by 52 percent, the Proposed Project meets the draft CAP standard. While the draft CAP represents a guiding framework for this analysis and since the draft CAP has not yet been adopted by the County, State goals are used in this analysis as the basis for determining less than significant impacts during project construction. The BAAQMD standards of 1,100 metric tons (MT) per year or less are used as the basis for determining project operational significance.

As stated in **Section 4.7**, the total construction GHG emissions from the Proposed Project would be 1,941 MT of CO_2e. The Applicant would additionally reduce construction-related GHG emissions from the Proposed Project with implementation of **Mitigation Measure 4.7-1**. Since construction is to be completed over two years, the average annual construction emissions would be less than the BAAQMD operational levels of significance of 1,100 MT of

CO_2e per year. This impact would be less than significant with implementation of **Mitigation Measure 4.7-1**.

Project Operation. As shown in **Section 4.7**, **Table 4.7-2**, operational GHG emissions are estimated to be 2109 MT per year. These emissions would be less than the BAAQMD CEQA threshold of 1,100 MT of CO_2e for project-level operation. Therefore, operation of the Proposed Project would not result in cumulatively impacts to climate change.

6.2.2-8 HAZARDOUS MATERIALS

If unmitigated, construction and operation of the Proposed Project in combination with cumulative development in the project vicinity could lead to impacts related to hazardous materials. The Proposed Project and similar cumulative projects would involve the storage, use, disposal, and transport of hazardous materials to varying degrees during construction. Impacts related to these activities are extensively regulated by various federal, state, and local agencies and it is assumed that similar projects would also comply with these hazardous materials regulations.

Operation of the Proposed Project and cumulative projects in the vicinity could result in impacts if development were to result in potential exposure of hazardous materials to sensitive individuals or the general public-at-large. Operation of the Proposed Project using integrated pest management (IPM) practices and reduce the large scale use of chemicals such as pesticides and herbicides and would therefore result in a low risk for adverse effects. Because hazardous materials impacts are site-specific and the Proposed Project would not require substantial volumes of hazardous materials, the project would not contribute to cumulatively considerable hazardous impacts.

Furthermore, **Mitigation Measures 4.8-1** and **4.8-2** (**Section 4.8**) include measures to ensure that any hazardous materials that are stored or used onsite would be property maintained, reducing the risk of spills or adverse effects. With implementation of these mitigation measures, the Proposed Project would not cause cumulatively considerable impacts to the environment from hazardous materials use.

6.2.2-9 HYDROLOGY AND WATER QUALITY

The project site is located within the drainage area of the Conn Creek watershed, which constitutes roughly 62.7 square miles. As stated in **Section 4.9**, the analysis of impacts to hydrology and water quality from the Proposed Project included factors such as topography, drainage, and other physical features of the local area. For this cumulative impact analysis, potential impacts of the Proposed Project in addition to cumulative impacts of other projects within the watershed form the scope of this discussion.

Protection of Stream Corridors and Water Quality. The Proposed Project includes the restriction of earthmoving activities to the dry season consistent with County Code Section 18.108.070(L), and the installation of straw wattles, seeding and mulching of disturbed areas, and other erosion control measures and best management practices (BMPs) discussed in **Section 3.0 Project Description,** which would reduce the potential for sedimentation to move off-site. The Proposed Project would not increase runoff rates or volumes, or degrade water quality (as discussed in **Section 4.9 Hydrology and Water Quality**) and would not increase soil erosion or sedimentation (as discussed in **Section 4.6 Geology and Soils**).

As shown in **Section 4.9**, implementation of the ECP for the Proposed Project would result in improved conditions to on and off-site water quality. As stated in **Section 4.9.1-2**, the Napa River is currently listed as an impaired water body for nutrients, pathogens, and sediment under Section 303 (d) of the Clean Water Act (CWA). Runoff from the project site is eventually transported to the Napa River; therefore, from a cumulative standpoint, implementation of the ECP under the Proposed Project would be beneficial by improving onsite and off-site water quality by lessening cumulative sedimentation impacts to the Napa River.

6.2.2-10 LAND USE

Potential cumulative projects in the vicinity of the property, including growth resulting from build-out of the County's General Plan and proposed developments in the vicinity of the property, would be developed in accordance with local and regional planning documents; thus, cumulative impacts associated with land use compatibility are expected be less than significant. Additionally, as discussed in **Section 4.10**, the Proposed Project would not result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. Further, the Proposed Project is consistent with the County zoning ordinance, and General Plan (2008) land use designations, goals, and policies, and therefore would not cause cumulative impacts to land use.

6.2.2-11 NOISE

Construction. Construction activities associated with the Proposed Project are unlikely to occur in combination with additional development projects in the vicinity because the area is rural and surrounding County designated land uses include rural residences, vineyards, and agriculture. Existing noise from the adjacent PCU campus to the west and Angwin-Parrett Field to the north would be the only other source of noise in the immediate vicinity during construction of the Proposed Project.

As stated in **Section 4.11,** the nearest noise sensitive receptor to construction activities is a residence located approximately 200 feet west of the property. Analysis of potential noise impacts on this receptor included factors such as natural noise barriers (trees and vegetation), which attenuate noise impacts. The results concluded that the maximum noise level at the nearest sensitive noise receptor during construction of the Proposed Project would be approximately 69 dBA Leq, which is below the County's noise threshold of 75 dBA, Leq for construction near residential areas. Furthermore, construction activities associated with the Proposed Project shall occur between the hours of 7 AM to 7 PM, which is consistent with County Ordinance 8.16.080 2.

Construction of the Proposed Project in combination with cumulative sources of noise in the vicinity would not expose persons to temporary or substantial permanent increases in the ambient noise level or generate noise levels in excess of standards established in the General Plan, County noise ordinance, or applicable standards of other agencies.

Operation. As stated in **Section 4.11**, the Proposed Project would slightly increase the ambient noise level in the immediate vicinity of the property. However, given the small size of the project, the location of the project (adjacent to an active vineyard), the low-density residential uses in the area, and the County's General Plan Policy CC-35, which states that agriculture and agricultural processing is considered an acceptable and necessary part of the community character of Napa County and is not considered to be undesirable, the Proposed Project's contribution to potential cumulative impacts associated with ambient noise levels would be considered less than significant.

6.2.2-12 TRANSPORTATION AND CIRCULATION

As stated in **Section 4.12**, operation of the Proposed Project would generate trips on account of vineyard maintenance and grape harvest. Operational traffic associated with the Proposed Project would be greatest during harvest of the vineyard. During operation of the Proposed Project, grape harvest will be transported in farm trucks to wineries in the Napa Valley area. The grape harvest is expected to transport 20± tons annually over local roads using farm trucks (**Appendix H**). Grape harvest activities under the Proposed Project are anticipated to generate less than 20 trips per year. This type of agricultural traffic anticipated to be generated by the Proposed Project would be minimal and very similar to other agricultural transport activities (i.e. grapes, cattle, sheep, horses, apples, rock aggregates, fire wood, etc.) presently taking place on local roadways in the vicinity of the Proposed Project (**Appendix H**).

In summary, this long-term addition of operational trips to Las Posadas/Cold Springs Road and Howell Mountain Road would be minimal, seasonal, and would not exceed capacity on existing roadways serving the property and in the vicinity; therefore, operation of the

Proposed Project would not result in cumulative impacts to transportation and circulation in the area.

6.3 SIGNIFICANT AND UNAVOIDABLE IMPACTS

As stated in **Section 4.0**, there are no significant and unavoidable impacts that would result from implementation of the Proposed Project.

6.4 IRREVERSIBLE CHANGES

State CEQA Guidelines Section 15126.2(c) provides the following direction for the discussion of irreversible changes:

> *"Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."*

The Proposed Project would result in an irreversible use of energy resources, primarily fossil fuels for construction equipment (e.g., fuel, oil, natural gas, and gasoline), and the consumption or destruction of other nonrenewable or renewable resources (e.g., timber, gravel, metals, and water). However, operation of the Proposed Project would not require any long term or cumulative commitment of these resources other than the minimal equipment and materials needed to maintain the vineyard. As stated in **Section 3.0**, operation of the Proposed Project would involve the use of less chemicals, electricity, and fuel for equipment as compared to standard vineyard practices pursuant to the sustainable farming approaches.

The Proposed Project would also result in a temporary increase in car and truck trips during construction, which will be largely reduced during the operational phase. These additional trips would also require the use of fossil fuels and other nonrenewable resources.

REFERENCES

Balance Geo, 2013. Erosion, Sedimentation, & Hydrologic Assessment of the Lucia Abreu Vineyard Howell Mountain Conversion Project. Prepared by Balance Geo (signed Martin Trso, P.G. License No. 7216), June 30, 2013.

Bay Area Air Quality Management District (BAAQMD), 2010. *BAAQMD California Environmental Quality Act Air Quality Guidelines.* Prepared by the Bay Area Air Quality Management District. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx. Accessed January 2012.

Napa County, 2008. Napa County General Plan. June 3, 2008. Available online at: http://www.countyofnapa.org/PBES/Planning/. Accessed on December 27, 2012.

Napa Valley Vineyard Engineering, Inc. (NVVE), 2012. Erosion Control Plan for the Lucia Abreu Vineyard.

Shih, Tian-Ting, 1998. Land Base of California's Forests. Fire and Resource Assessment Program. California Department of Forestry and Fire Protection. December 1998.

Shih, Tian-Ting, 2002. Timberland Conversion in California from 1969 to 1998. Technical Working Paper 1-01-02. Fire and Resource Assessment Program. California Department of Forestry and Fire Protection.

SECTION 7.0

Report Preparation

SECTION 7.0

REPORT PREPARATION

7.1 LEAD AGENCY

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION
Attn: Dennis Hall
P. O. Box 944246
Sacramento, CA 94244-2460

7.2 RESPONSIBLE AGENCY

NAPA COUNTY PLANNING, BUILDING, AND ENVIRONMENTAL SERVICES DEPARTMENT
Attn: Brian Bordona
1195 Third Street, Suite 210
Napa, CA 94559

7.3 EIR CONSULTANTS

ANALYTICAL ENVIRONMENTAL SERVICES
1801 7th Street, Suite 100
Sacramento, CA 95811
(916) 447-3479

David Zweig, Project Director
Pete Bontadelli, Biological Resources Director
Annalee Sanborn, Deputy Project Manager

Jessica Alexander, Biologist
David Sawyer, Associate Environmental Specialist
Erin Quinn, Technical Specialist
Dana Hirschberg, Senior Graphic Designer
Glenn Mayfield, Graphic Designer

ENVIRONMENTAL RESOURCE MANAGEMENT
Scott Butler, Registered Professional Forester
889 Hwy 20-26
Ontario, OR 97914

BALANCE GEO
Martin Trso, Principal Geomorphologist
PMB 442,1442A Walnut Street
Berkeley, CA 94709

TOM ORIGER AND ASSOCIATES
Tom Origer, Archaeology/Historical Research
P.O. Box 1531
Rohnert Park, California, 94927

GILPIN GEOSCIENCES, INC.
Lou M. Gilpin, Geologist
3228 Silverado Trail
St. Helena, CA 94574

NAPA VALLEY VINEYARD ENGINEERING, INC.
Drew Aspegren, P.E., Civil Engineer
176 Main Street, Suite B
Saint Helena, CA

7.4 FEDERAL AGENCIES CONSULTED

United States Fish and Wildlife Service

7.5 STATE AGENCIES CONSULTED

Native American Heritage Commission
California Department of Fish and Wildlife
California Department of Mines and Geology
California Department of Toxic Substances Control
State Water Resources Control Board, Division of Water Rights

7.6 LOCAL GOVERNMENT AGENCIES CONSULTED

Napa County Planning, Building, and Environmental Services Department
Napa County Resource Conservation District

APPENDICES

APPENDIX A

Notice of Preparation (NOP)

Notice of Completion and Document Transmittal

NOP Comments

NOTICE OF PREPARATION

California Department of Forestry and Fire Protection

To: State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

From: Dennis Hall
CAL FIRE, Resource Management
P.O. Box 944246
Sacramento, CA 94244-2460

Subject: Notice of Preparation of a Draft Environmental Impact Report
Lucia Abreu Vineyard Howell Mountain Conversion Project
July 31, 2012

The California Department of Forestry and Fire Protection (CAL FIRE) is the Lead Agency and Napa County is a Responsible Agency for the preparation of an Environmental Impact Report (EIR) for the Lucia Abreu Vineyard Howell Mountain Conversion Project, in compliance with the California Environmental Quality Act (CEQA). Consistent with CEQA Guidelines Section 15082, CAL FIRE, as Lead Agency, has prepared this Notice of Preparation (NOP) to inform all responsible and trustee agencies that an EIR will be prepared. The purpose of the NOP is to describe the proposed project and potential environmental effects in order to allow agencies and interested parties to provide input on the scope and content of the EIR. A copy of this NOP and the figures referenced herein is provided on CAL FIRE's website: http://www.fire.ca.gov/resource_mgt/resource_mgt_EPRP_PublicNotice.php. Comments on this NOP are due to CAL FIRE by 5:00 PM on August, 30, 2012.

Project Location: The project site is located off Las Posadas Road, roughly one mile southeast of the town of Angwin in northern Napa County, California. The project site is located within the Upper Conn Creek watershed (Calwater #2206.500305). The project site contains no U.S. Geological Survey (USGS) blue line streams, Class I, II or III watercourses, or jurisdictional wetlands. Moore Creek occurs roughly 2,700 feet to the east of the project site and Conn Creek lies roughly 2,900 feet to the west. Both Moore Creek and Conn Creek flow south into Lake Hennessey. The elevation of the project site ranges from 1,700 to 1,860 feet above mean sea level. The slope of the project site is relatively flat because the project site is located on a hilltop, with the adjacent areas ranging from 4 to 14 percent slope. Slope aspects on the project site are generally south to southeast. The project site is predominately forested with a central open grass area. Land uses in the vicinity of the project site include vineyard, rural residences, open space, a small airport (Angwin-Parrett Field), and a small college (Pacific Union College). A map showing the regional location of the project site is attached as **Figure 1**.

Project Summary: The purpose of the Lucia Abreu Vineyard Howell Mountain Conversion Project (proposed project) is to convert 17± acres of timberland including an open grass area to a commercial vineyard 14± acres in size. The 17± acres will be the total disturbed acreage within the project site boundary. The project site boundary is 35.3± acres, which encompasses two Napa County assessor's parcel numbers (APNs) 024-080-028 and 024-300-077. A map showing the project site and vicinity is attached as **Figure 2**. A map of the proposed vineyard overlaid on an aerial photograph of the project site is attached as **Figure 3**.

General Plan/Zoning Designations: The project site is primarily zoned Agricultural Watershed: Airport Compatibility Overlay (AW: AC).

Project Description: The proposed project would result in the conversion of 17± acres of timberland and open grass area, and the development of 14± acres net of vineyard. The balance of the disturbed area within the 17± acre conversion area (2.4± acres) will be designed to accommodate internal farm avenues around the perimeter of the vineyard block for farm trucks, equipment turn around, and vineyard maintenance operations. This proposed project is

consistent with the current Napa County zoning designation. The project site is not located within a Timberland Production Zone (TPZ) (California Government Code § 51104 (g)). However, because the proposed project will convert "non-TPZ timberland to a non-timber growing use" through timber harvesting operations in which "future timber harvests will be prevented or infeasible because of land occupancy and activities thereon," a Timberland Conversion Permit (TCP) and approval is required from CAL FIRE consistent with the Z'berg-Nejedly Forest Practice Act (Division 4, Chapter 8, Public Resources Code) and California Forest Practice Rules (Title 14, California Code of Regulations).

A separate Timber Harvesting Plan (THP) is being processed by CAL FIRE under California Forest Practice Rules (Title 14 California Code of Regulations (CCR) Chapters 4, 4.5, and 10) for the harvest of the 17± acre project footprint, which will be the total disturbed acreage on the property. All harvested timber will be processed onsite at a temporary mill. Once processed, the material leaving the site will be limited to transport on 3-axle trucks and will not require the use of logging trucks. Virtually all of the timber processed on-site will be retained onsite by the landowner for personal use. No new roads, except internal farm avenues around the new vineyard, will be built. All non-merchantable trees and vegetation will be removed, chipped and/or (as a last option) burned onsite, consistent with CAL FIRE, Napa County, and Bay Area Air Quality Management District standards.

CAL FIRE is the CEQA Lead Agency because its approval of the TCP and THP for the proposed project is a prerequisite to other actions which require CEQA. Avoidance and protective measures for natural and biological resources included in the TCP and THP will be incorporated into the EIR, and the THP will be an appendix to the EIR. The interrelated nature of the two approvals will be discussed as a single proposed project in the EIR. In addition, the proposed project also includes an Erosion Control Plan (ECP) that will be prepared by a Licensed Civil Engineer pursuant to Chapter 18.108 of the Napa County Code (Conservation Regulations). An ECP is required for agricultural projects involving grading and earthmoving activities on slopes over 5 percent. The Napa County action of approving the ECP is subject to CEQA and therefore Napa County is a Responsible Agency for the proposed EIR.

Environmental Factors: Anticipated impacts of the proposed project for the following list of resource topics will be analyzed in the EIR, per CEQA Guidelines (Title 14 CCR Division 6, Chapter 3).

Aesthetics: The project is not located within the viewshed of vehicles traveling on nearby Howell Mountain Road to the west. The proposed vineyard block would not disrupt the viewshed of the other adjacent land uses, which include a small college and an airport located to the north and to the west of the project site. No significant impacts are anticipated; however, an analysis of potential impacts will be provided in the EIR.

Agriculture and Forestry Resources: This is a primary subject area of the EIR. As stated above, the proposed project will encompass 17± acres, which will be converted from timberland to 14± acres net of vineyard. A portion of the land identified within the timber harvest footprint is an open grass area with few trees present to harvest (see aerial photo in attached **Figure 3**). An analysis of potential impacts to agricultural and forestry resources in the vicinity of the project site and local region will be included in the EIR.

Air Quality: As stated above, the THP for the project site includes the milling of lumber on-site. No logging trucks will be used. Virtually all of the timber processed on-site will be retained onsite by the landowner for personal use. Non-merchantable trees and vegetation will be removed, chipped and/or (as a last option) burned onsite, consistent with Napa County and Bay Area Air Quality Management District standards. An analysis of potential impacts to air quality from the proposed project will be provided in the EIR.

Biological Resources: Based on spring and summer biological surveys conducted in 2010, there were no special-status species identified within the project site considered threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG) or any sensitive habitats or vegetation

communities present. Analysis of potential impacts to biological resources and the results of updated field surveys will be included in the EIR.

Cultural Resources: A preliminary cultural resources survey of the project site did not identify any significant historic or cultural resources on the project site. Analysis of potential impacts to cultural resources as a result of the proposed project will be provided in the EIR.

Geology/Soils: As stated above, an ECP will be prepared for the proposed project. The ECP will include erosion control measures to be implemented during construction and operation of the vineyard. Analysis of potential impacts to local geology/soils will be provided in the EIR.

Greenhouse Gas Emissions: An analysis of potential impacts due to the proposed project's greenhouse gas emissions attributed to construction, operation, and canopy removal will be provided in the EIR.

Hazards and Hazardous Materials: An analysis of hazards and hazardous materials that pertain to construction and operation of the proposed project will be provided in the EIR.

Hydrology/Water Quality: As stated above, the project site does not contain watercourses or water features. An analysis of potential impacts from construction and operation of the proposed project to local hydrology and water quality will be provided in the EIR.

Land Use/Planning: No significant impacts are anticipated to land use and planning. As stated above, the proposed project would result in the development of 17± acres of vineyard, which is consistent with the current Napa County zoning designation, Agricultural Watershed: Airport Compatibility Overlay (AW: AC). The harvest (removal) of trees on-site directly in the flight path of the runway located on the adjacent air field off-site would be an improvement over existing conditions and should be noted as a result of the project design. An analysis of potential impacts to land use/planning due to the proposed project will be provided in the EIR.

Mineral Resources: No significant impacts are anticipated because no Napa County-designated mineral resources are present on site.

Noise: No significant impacts are anticipated. However, an analysis of noise impacts to the site and vicinity as a result of milling lumber onsite, construction, and operation of the proposed project will be provided in the EIR.

Population/Housing: No significant impacts are anticipated because adjacent land uses presently include vineyard, including portions of the parcels where the project site is located. No additional workforce for operation of the project is anticipated that would impact population and housing.

Public Services: No significant impacts are anticipated to public services, including police and fire/emergency services. Potential fire hazards of the project will be discussed under the Hazards and Hazardous Materials section of the EIR.

Recreation: No significant impacts are anticipated because no recreational areas will be impacted. As stated above, no significant impacts to Land Use/Planning are anticipated, including recreational uses.

Transportation/Traffic: As stated above, no new roads, except internal farm avenues within the new vineyard will be built. An analysis of transportation/traffic issues as they pertain to construction/operation of the proposed project will be provided in the EIR.

Utilities/Service Systems: No significant impacts are anticipated because no new uses of utilities/service systems are anticipated. Existing operative wells on-site will provide the groundwater for the operation of the project.

Mandatory Findings of Significance: A complete analysis of mandatory findings of significance including cumulative impacts of the proposed project, will be provided in the EIR.

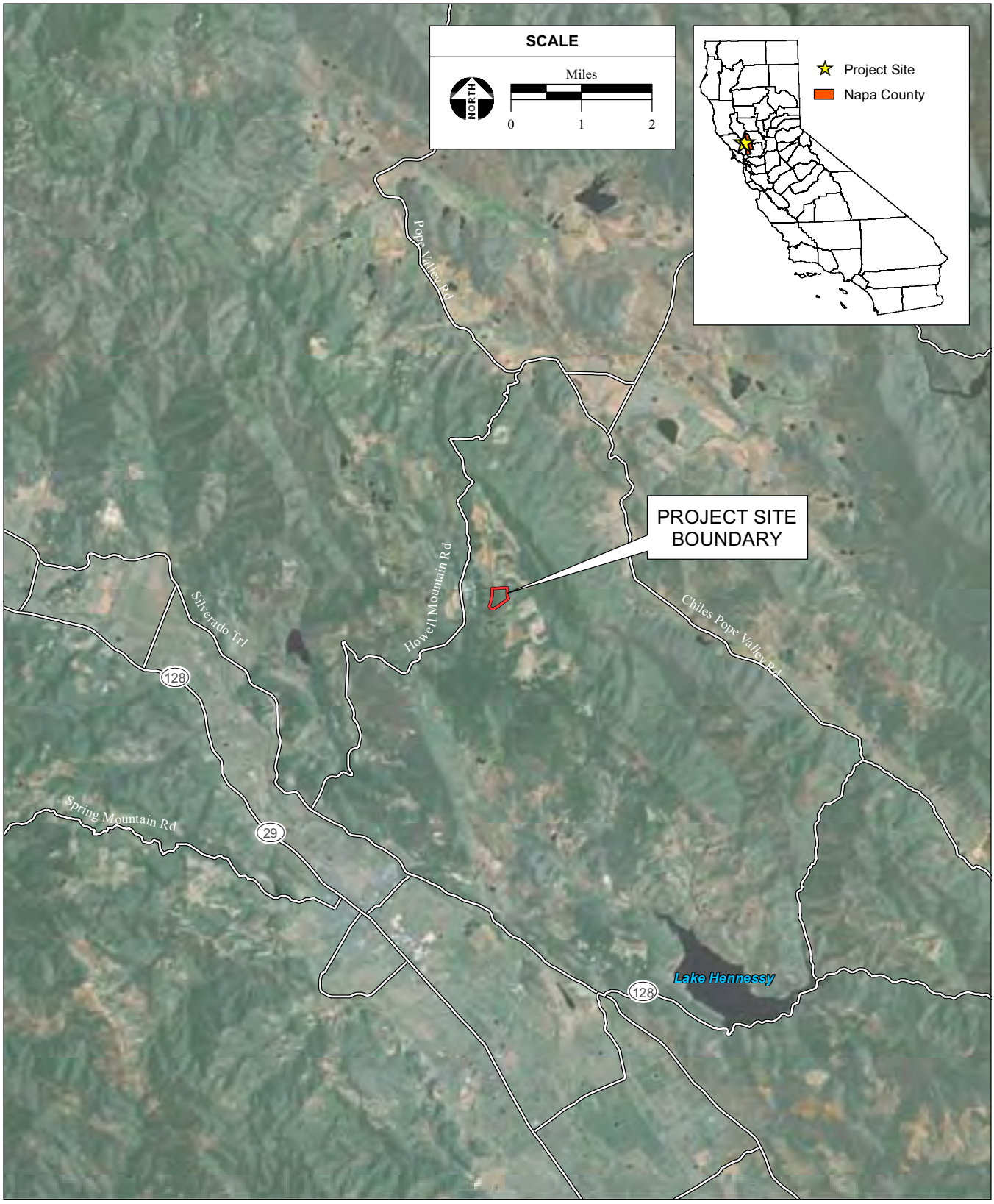
In order for your comments to be considered, written comments must be received no later than **5:00 PM** on August 30, 2012. Please submit written comments to:

Dennis Hall
CAL FIRE, Resource Management
P.O. Box 944246
Sacramento, CA 94244-2460

Or

Email comments to: **SacramentoPublicComment@fire.ca.gov** (please include "Lucia Abreu Vineyards" in the email subject line).

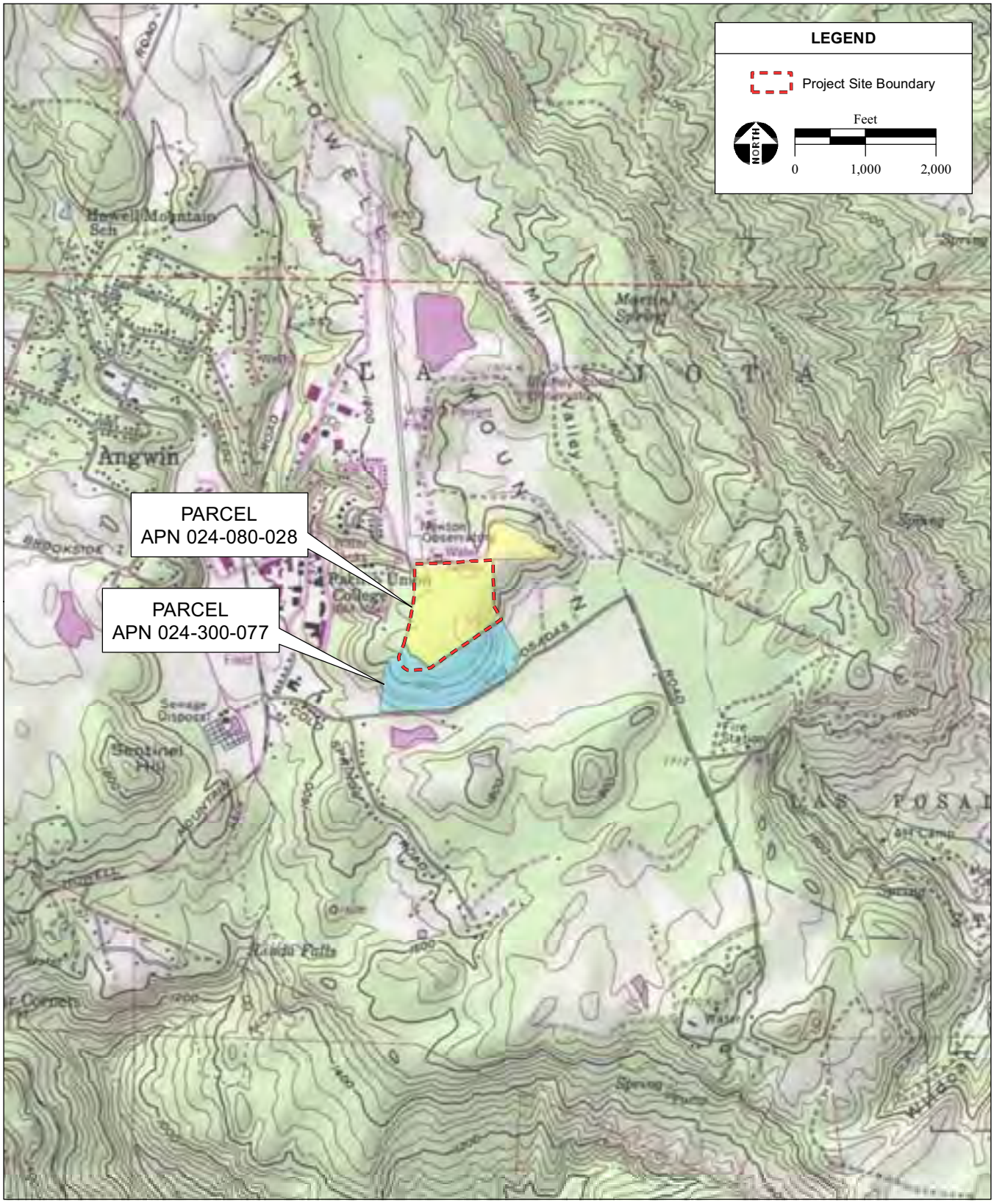
Comments by Fax will not be accepted.



SOURCE: USDA FSA NAIP Aerial Photograph, 6/2009; AES, 2012

Figure 1

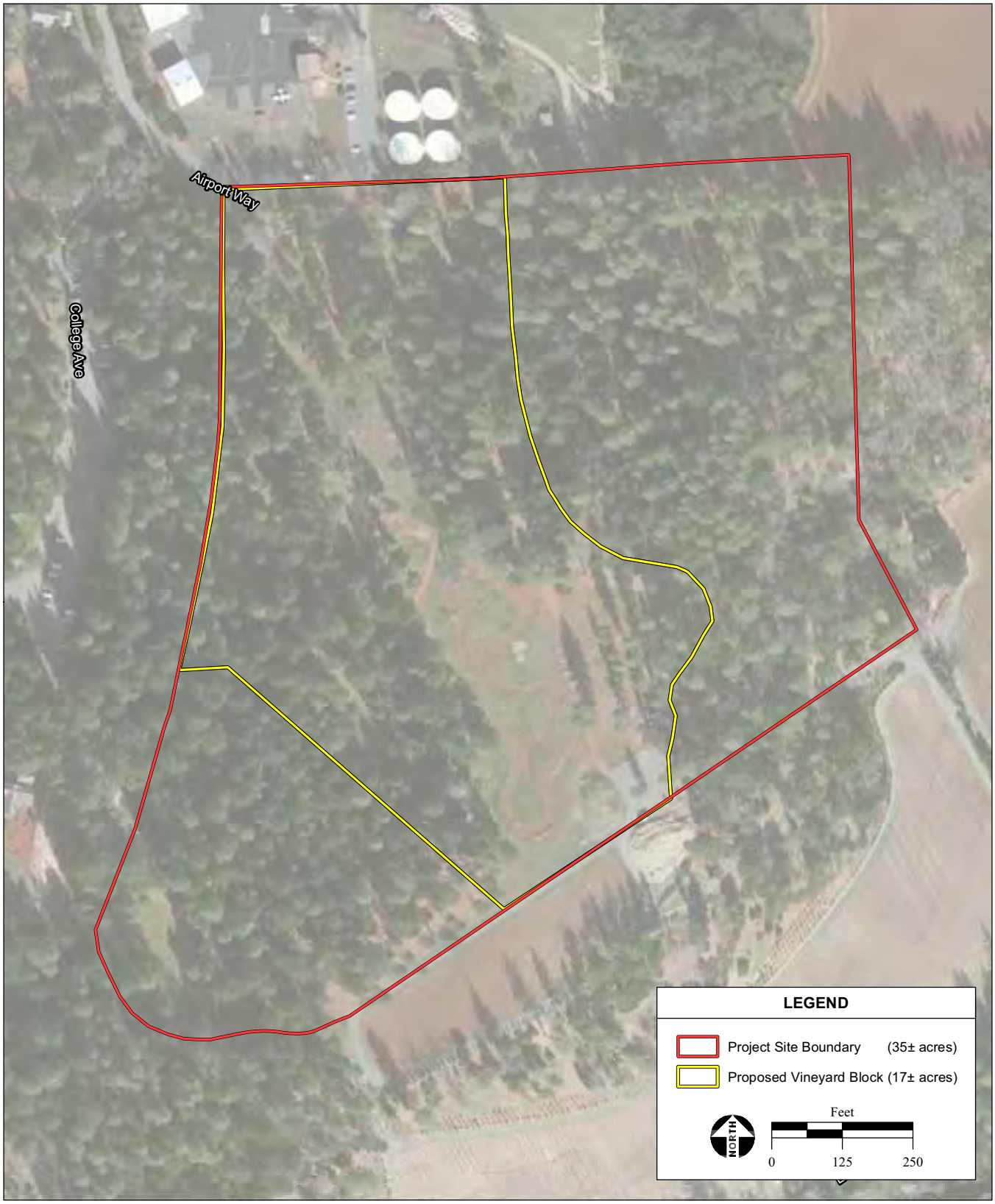
Proposed Project Location



SOURCE: "Saint Helena, CA" USGS 7.5 Minute Topographic Quadrangle
T8N, R5W, Unsectioned Area of Howell Mountain; AES, 2012

Figure 2

Proposed Site and Vicinity



SOURCE: Napa Valley Vineyards Engineering, 7/2005; AES, 2012

Figure 3

Project Site Boundary and Proposed Vineyard Block

NOTICE OF COMPLETION AND DOCUMENT TRANSMITTAL

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2012072063

Project Title: Lucia Abreu Vineyard Howell Mountain Conversion Project

Lead Agency: California Department of Forestry and Fire Protection — Contact Person: Dennis Hall
Mailing Address: P.O. Box 944246 — Phone: 916-653-9422
City: Sacramento — Zip: 94244-2460 — County: Sacramento

Project Location: County: Napa — City/Nearest Community: Angwin
Cross Streets: Las Posadas Road — Zip Code: 94508
Longitude/Latitude (degrees, minutes and seconds): 38 ° 34 ′ 4.0 ″ N / 122 ° 25 ′ 58.3 ″ W — Total Acres: 17
Assessor's Parcel No.: 024-080-028, 024-300-077 — Section: 5 — Twp.: 8N — Range: 5W — Base: Mt Diablo
Within 2 Miles: State Hwy #: 128 — Waterways:
Airports: Angwin Parrett Field — Railways: — Schools:

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec
☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ____ Other: ____

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other: ____

RECEIVED JUL 31 2012 STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other: ____

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☒ Other: timber harvest and conversion to vineyard

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☐ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☒ Geologic/Seismic
☐ Minerals
☒ Noise
☐ Population/Housing Balance
☐ Public Services/Facilities
☐ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☐ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☐ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☐ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☐ Wetland/Riparian
☐ Growth Inducement
☐ Land Use
☒ Cumulative Effects
☐ Other: ____

Present Land Use/Zoning/General Plan Designation:

Agricultural Watershed : Airport Compatibility Overlay (AW:AC)

Project Description: *(please use a separate page if necessary)*

Conversion of 17 +/- acres of timberland to a commercial vineyard. See NOP for more details.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "X".
If you have already sent your document to the agency please denote that with an "S".

X Air Resources Board
___ Boating & Waterways, Department of
___ California Emergency Management Agency
___ California Highway Patrol
x Caltrans District #4
___ Caltrans Division of Aeronautics
___ Caltrans Planning
___ Central Valley Flood Protection Board
___ Coachella Valley Mtns. Conservancy
___ Coastal Commission
___ Colorado River Board
___ Conservation, Department of
___ Corrections, Department of
___ Delta Protection Commission
___ Education, Department of
___ Energy Commission
X Fish & Game Region #3
___ Food & Agriculture, Department of
X Forestry and Fire Protection, Department of
___ General Services, Department of
___ Health Services, Department of
___ Housing & Community Development
X Native American Heritage Commission

X Office of Historic Preservation
___ Office of Public School Construction
___ Parks & Recreation, Department of
___ Pesticide Regulation, Department of
___ Public Utilities Commission
X Regional WQCB #2
X Resources Agency
___ Resources Recycling and Recovery, Department of
___ S.F. Bay Conservation & Development Comm.
___ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
___ San Joaquin River Conservancy
___ Santa Monica Mtns. Conservancy
___ State Lands Commission
___ SWRCB: Clean Water Grants
X SWRCB: Water Quality
___ SWRCB: Water Rights
___ Tahoe Regional Planning Agency
___ Toxic Substances Control, Department of
___ Water Resources, Department of

___ Other: ___
___ Other: ___

Local Public Review Period (to be filled in by lead agency)

Starting Date July 31, 2012 Ending Date August 30, 2012

Lead Agency (Complete if applicable):

Consulting Firm: Analytical Environmental Services
Address: 1801 7th Street, Suite 100
City/State/Zip: Sacramento, CA 95811
Contact: Pete Bontadelli
Phone: 916-447-3479

Applicant: Lucia Abreu Vineyards
Address:
City/State/Zip: Saint Helena, CA
Phone: 707-963-7487

Signature of Lead Agency Representative: ___ **Date:** 7-31-12

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

NOP COMMENTS

From: johnithin@aol.com
To: Sacramento Public Comment
Subject: Lucia Abreu Vineyards
Date: Wednesday, August 15, 2012 3:05:31 PM

Dear Sir,

Where is the Licia Abreu Vineyards file? We would like to review the project. The front desk at the Napa County Planning Department doesn't have it or can't locate it. Please advise.

John Stephens

E.D.E.N.
johnithin@aol.com
707-251-0106

From: johnithin@aol.com
To: Sacramento Public Comment
Subject: Lucia Abreu Vineyards
Date: Monday, August 27, 2012 8:24:27 PM

Earth Defense for the Environment Now
1370 Trancas PMB-614
Napa, Ca. 94559
707-255-7434 Fax. 259-1097
cmalan@myoneearth.org
www.edennapa.org
www.livingriverscouncil.org

Mission Statement: To conserve, protect and defend earth's deep ecology and biodiversity for a sustainable future and high quality of life for all. We will accomplish this through education, advocacy and science.

CAL FIRE
Resource Management
PO Box 944246
Sacramento. CA 94244-2460
SacramentoPublicComment@fire.ca.gov

Re: Lucia Abreu Vineyards
Published Notice of Preparation of a Draft EIR
AP # 024-080-028
AP # 024-300-077

August 19, 2012

1. The Public Notice published in the Napa Valley Register on July 31, 2012 refers to a "Figure 1," that shows a map showing the regional location of the project site that is attached. No Figure is attached to the published Notice.
The Public Notice refers also refers to "Figure 2," which shows the project vicinity and is attached. No figure is attached to the published Notice.
The Public Notice also refers to a "Figure 3," that shows the project overlaid on an aerial photograph. No figure is attached to the published Notice.
Since the published Public Notice has no attachments but still refers to them in the document the notice is deficient and needs to be re-published with the attachments or re-circulated appropriately. Earth Defense for the Environment Now has commented in the past on this project and is an interested party. We would like easy access to the information. Please put us on your mailing list for all communication on this project.

2. The notice did not inform the public where they may review the file. It should be included in the Public Notice.

3.Napa County Planning Department had not received the Public Notice by August 15, 2012 and was not aware of its publication or its responsibilities. All responsible agencies should be notified when there is a CAL FIRE Public Notice is released so the public can review the file.

Sincerely,

EDEN
John Stephens, Advisory Chair
Gary Margadant, Advisory Vice-chair
Chris Malan, Manager

From: johnithin@aol.com
To: Sacramento Public Comment
Subject: Lucia Abreu Vineyards
Date: Monday, August 27, 2012 8:21:00 PM

Earth Defense for the Environment Now
1370 Trancas PMB-614
Napa, Ca. 94559
707-255-7434 Fax. 259-1097
cmalan@myoneearth.org
www.edennapa.org
www.livingriverscouncil.org

CAL FIRE
Resource Management
PO Box 944246
Sacramento. CA 94244-2460
SacramentoPublicCommentWfire.ca.gov

Re: Lucia Abreu Vineyards
Comments for Notice of Preparation of a Draft EIR
AP # 024-080-028
AP # 024-300-077

August 28, 2012

Re: Erosion Control Plan, July 13,2005

--[if !supportLists]-->1. <!--[endif]-->A rock pile has been designated at the south side of Block B. As the erosion characteristics change when the rocks are removed to maintain the same erosion factor in the Universal Spoil Loss Equation. Therefore all rocks extracted from the site should be reintroduced back into the soil to maintain native transportation runoff characteristics.
--[if !supportLists]-->2. <!--[endif]-->No wildlife exclusion fencing is noted on the plan. Where will the fencing run? As wildlife often follow fencing lines the fencing line should allow for wildlife passage between the Pacific Union College property and Block A and Block B.
--[if !supportLists]-->3. <!--[endif]-->The Pacific Union College receives municipal water for domestic use. It's irrigation we assume comes from ground water, though. Will the projects wells have an impact on the PUC ability to continue to draw water? Are the two tanks at the northern property line on the adjacent parcel supplied by ground water and may be affected by the projects additional use of ground water?
--[if !supportLists]-->4. <!--[endif]-->An area is designated north of Block B outside of the vineyard layout as, "Approx. area to receive compost mulch…." Is the area wooded? Will any trees be cut down? Since the compost area is part of the project what normally is called "the corporation yard," a narration and or pad should be included and added to the project footprint in an EIR.

Sincerely,

John Stephens, Advisory Chair
Gary Margadant, Vice Advisory Chair
Chris Malan, Manager

State of California
Department of Fish and Game

Memorandum

RECEIVED
SEP - 5 2012

Date: August 30, 2012

To: Mr. Dennis Hall
California Department of
Forestry and Fire Protection
Post Office Box 944246
Sacramento, CA 94244

From: Scott Wilson, Acting Regional Manager
Department of Fish and Game – Bay Delta Region, 7329 Silverado Trail, Napa, California 94558

Subject: Lucia Abreu Vineyard Howell Mountain Conversion Project, Notice of Preparation, SCH #2012072063, Napa County

The Department of Fish and Game (DFG) has reviewed the documents provided for the subject project, and we have the following comments.

Please provide a complete assessment (including but not limited to type, quantity and locations) of the habitats, flora and fauna within and adjacent to the project area, including endangered, threatened, and locally unique species and sensitive habitats. The assessment should include the reasonably foreseeable direct and indirect changes (temporary and permanent) that may occur with implementation of the project. Rare, threatened and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380). DFG recommended survey and monitoring protocols and guidelines are available at http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf.

Please be advised that a California Endangered Species Act (CESA) Permit must be obtained if the project has the potential to result in take of species of plants or animals listed under CESA, either during construction or over the life of the project. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the project will impact CESA listed species, early consultation is encouraged, as significant modification to the project and mitigation measures may be required in order to obtain a CESA Permit.

For any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed, DFG may require a Lake and Streambed Alteration Agreement (LSAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant. Issuance of an LSAA is subject to CEQA. DFG, as a responsible agency

under CEQA, will consider the CEQA document for the project. The CEQA document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for completion of the agreement. To obtain information about the LSAA notification process, please access our website at http://www.dfg.ca.gov/habcon/1600/; or to request a notification package, contact the Lake and Streambed Alteration Program at (707) 944-5520.

If you have any questions, please contact Ms. Suzanne Gilmore, Environmental Scientist, at (707) 944-5536; or Ms. Karen Weiss, Senior Environmental Scientist, at (707) 944-5525.

cc: State Clearinghouse

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

AUG 0 9 2012

In Reply Refer
To:SB:266.0

Mr. Dennis Hall
Cal Fire
P.O. Box 944246
Sacramento, CA 94244-2460

Dear Mr. Hall:

NOTICE OF PREPARATION FOR THE LUCIA ABREU VINEYARD HOWELL MOUNTAIN CONVERSION PROJECT (SCH # 2012072063) IN NAPA COUNTY

State Water Resources Control Board (State Water Board), Division of Water Rights (Division) staff has reviewed the notice for the subject project. Based on the information provided in the notice, it appears the project may require a water right approval. The Applicant should contact the Division to determine whether a water right permit or other water right approval is needed. Information on water rights and the permitting process can be found on the Division's website at: http://www.waterboards.ca.gov/waterrights/

If a water right approval is needed, the State Water Board will act as a Responsible Agency for this project. Accordingly, the State Water Board may need to rely on the Lead Agency's California Environmental Quality Act (CEQA) document to support the Division's evaluation of the requested approval. The Lead Agency should therefore ensure that any CEQA document prepared for the project considers all potential direct and indirect environmental impacts associated with the diversion and use of water.

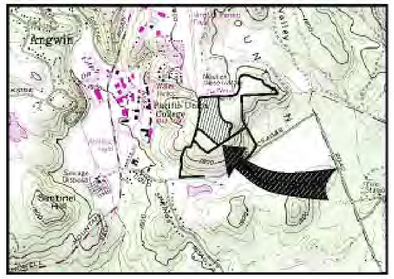
If you have any questions, please contact Sam Boland at (916) 322-9633 or by email at SBoland@waterboards.ca.gov. Written correspondences or inquiries should be addressed as follows: State Water Resources Control Board, Division of Water Rights, Attn: Sam Boland, P.O. Box 2000, Sacramento, CA, 95812-2000.

PHILLIP CRADER, Manager
Permitting and Licensing Section
Division of Water Rights

RECEIVED
AUG 1 4 2012
B. Confer

APPENDIX B

Erosion Control Plan



PORTION OF ST. HELENA 7.5 MIN. QUAD

Vicinity Map

1= ±2000'

LUCIA ABREU VINEYARD
EROSION CONTROL PLAN

SHEET INDEX

1. TITLE SHEET
2. PLAN & DETAILS

Narrative

This project is the development of approximately 17 gross acres (±15.3 net acres) of new vineyard, as part of a Timber Conversion Permit, within APNs 024-300-077 and 024-080-028, two parcels totaling ± 75.5 acres located along Las Posadas Road in Angwin. This plan treats the proposal as a single project within the two parcel boundary. Primary access is from Las Posadas Road and access to the proposed vineyard site is via existing roads. Within the new parcel boundaries, there are ± 12 acres of existing vineyard (93052-ECPA), ± 8 acres to be planted under separate agreement with Napa County, the proposed 17 acre development, an approved winery use permit and areas of conifer trees and open grassland.

Existing ground slopes within the project area range from 4% to 14%. Vineyard rows will be planted 5 feet apart and will run generally in a north/south direction. A new drip irrigation system will be installed to irrigate the vineyard, with existing wells as the water source. Water use on the proposed vineyard is expected to be ± 10.8 af per annum (afa), and the long term irrigation water use on both parcels is estimated to be ± 23 afa.

Certain measures contained in this plan are to be implemented to mitigate impacts of surface water hydrology. These measures are fully detailed in a report prepared by Martin Trso, Professional Geologist. That report, dated January 20, 2013 is titled:

Erosion, Sedimentation, & Hydrologic Assessment
Lucia Abreu Vineyard Howell Mountain Conversion Project, Napa County, California

This report is hereby incorporated into these plans, and any reference to the "Trso Report", shall mean the above-named document. Any conditions, specifications, or directions so referenced shall be construed to be a part of these plans.

There are no blueline, or county definition streams within, or adjacent to, the project area. The parcel drains to Conn Creek thence Lake Hennessey.

Vegetation Removal will be in accordance with the Timber Conversion Plan. All organic material to be burned shall be stacked at strategic locations within the cleared areas. Burning of the organic material only shall take place after obtaining approval from all the governing agencies.

Soils within the block boundaries have been classified in the USDA Soil Conservation Service's, Napa County Soil Survey, as SCS#100, Aiken loam, 2 to 15% slope, with an erosion hazard of slight.

No known special species or cultural sites occur in the project area, and there are no known landslides within 500 feet of the project.

Temporary Erosion Control Measures consist of the installation of fiber rolls, and the application of straw mulch. The installation of all fiber rolls shall be completed in accordance with the appropriate Details at all locations as shown on the Plan Sheet. A straw mulch cover shall be applied over all open and/or disturbed and seeded areas at the rate specified in the seeding requirements.

Permanent Erosion Control Measures consist of the following:

1) Construction of rock stabilization at the locations shown on the plan and in accordance with the appropriate detail.

2) a. An annual winter cover crop, using *Plowdown Legumes* (see Project Notes), will be established after harvest for the first two years following planting. This cover crop shall be disked each spring, and shall be reseeded and remulched each fall as part of the winterization.

b. At the end of the second growing season after planting, a permanent no-till cover crop, using the *Wrex Mix*, or *Abreu Perennial Mix* (see Project Notes), shall be planted within the entire vineyard area. This permanent cover crop shall be mowed and may be strip sprayed to a maximum width of 9" from vine row. Spraying will be done using springtime applications of "contact" sprays. NO PREEMERGENT SPRAYS WILL BE USED. To encourage water penetration and to stimulate root growth, alternate vineyard middles may be disked/tilled annually. After harvest each year, the disked/tilled middles shall be reseeded with a winter cover crop using either the *Wrex Mix*, or *Abreu Perennial Mix* or the *Plowdown Legumes* presented in the Project Notes. Every other year, the tilled/non-tilled middles shall be rotated, resulting in an "alternate middle-alternate year" cultivation scheme. No areas outside the vineyard proper shall be cultivated or sprayed. Optimally, a ground cover of 70% or greater will be obtained over the entire vineyard each winter.

3) Construction and/or installation of Fiber Rolls, Rock Stabilization, and Concrete Weirs and Detention Ponds as described in the Project Notes.

4) A compost mulch or other high quality ground cover shall be spread on the forest floor of the property hilltop outside of the existing and proposed vineyard. The mulch shall be spread mechanically or by hand at a rate of 2 tons/acre; see Project Notes - Straw Mulch and Trso Report.

Costs: The total cost of all erosion control measures is estimated to be $1500/ac including materials, labor and equipment.

The project site was last visited by the plan preparer in January, 2013 for a site inspection, and will be visited during and after redevelopment to check for proper erosion control features.

Project Notes

APNs: 024-300-077 — 024-080-028

Owner: Lucia Abreu Vineyard Howell Mt. LLC — David Abreu Vineyard Mgmt, Inc.

Contact: David Abreu @ 963-7487, David Abreu Vineyard Mgmt, Inc., PO Box 89, Rutherford, CA 94573 — Drew L. Aspegren, P.E. @ 963-4927, Napa Valley Vineyard Engineering, Inc., 176 Main St., Suite B, St. Helena, CA 94574

Mapping: Albion Surveys, Inc. April 27, 2004

Implementation Schedule: The work will be scheduled as follows:

Preplant Year April 1 thru September 15	PREPLANT SEASON OPERATIONS: Harvest timber and remove vegetation; burn vegetative materials; ripping and disking; staking; installation of irrigation system; installation of appropriate permanent and all temporary erosion control measures; winterize site.
Rainy Season September 16 thru March 31	Maintain erosion control measures.
Planting Year April 1 thru September 15	PLANTING SEASON OPERATIONS: Complete unfinished preplant operations, plant vineyard, begin cultural practices; install remaining permanent erosion control measures; winterize site. Maintain all erosion control measures.
Rainy Season After planting - forward	Maintain erosion control measures.

All ground disturbing activities shall be completed by September 1 of each year, and all erosion control measures shall be in place by September 15.

Seeding Requirements: All exposed or disturbed soils shall be seeded (using one of the mixes listed below). Seed and fertilizer shall be applied hydraulically or broadcast at the rates specified below:

Napa Valley Ag Supply "Plowdown Legumes" mix @ 100 lbs/ac	Bell Beans Forage Peas, VNS Forage Peas, VNS Common Vetch	40% 20% 20% 20%
Napa Valley Ag Supply "Wrex Mix" mix @ 100 lbs/ac	Barley Zorro Fescue (Deawned) Dwarf Perennial Rygrass Hykon Rose Clover, RK Creeping Red Fescue Chewings Fescue	70% 14% 7% 3% 3% 3%
Napa Valley Ag Supply "Abreu Perennial Mix" mix @ 50 lbs/ac	California Brome Hykon Rose Clover, RK White Yarrow	68% 23% 9%

Fertilizer Ammonium phosphate sulfate (16-20-0) 200-240 lbs/ac

An alternate seed mix and/or fertilizer may be used after review and approval by the Napa County RCD.

Straw Mulch shall be spread over all disturbed and seeded areas, within the proposed vineyard blocks. Outside the vineyard area, a high quality ground cover shall be established and maintained on the property hilltop. (Trso Report, p. 1, Mitigation #1). These areas are indicated on the plan. Initially this forest cover shall be established using compost mulch, with maintenance of grass cover and/or forest litter. Compost mulch shall be spread over the forest floor outside of the existing and proposed vineyard. All mulch shall be spread mechanically or by hand at the rate of 2 tons/acre.

Fiber Rolls shall be installed at the locations shown on the plan in accordance with the appropriate detail. Fiber Rolls shall be maintained through the winter after planting, after which it may be removed.

Rock Stabilization shall be constructed of Rock Slope Protection (see below) at low spots in the perimeter avenues as shown on the plan in accordance with the appropriate detail. Vegetated earthen berms shall be constructed below the rock stabilization as shown on the Plan.

Rock Slope Protection (RSP) shall be locally gathered fieldstone, or class light as defined in Caltrans Standard Specifications, Sec. 72-2.02. A non-woven filter fabric (Mirafi 140N, or equal) shall be placed between all RSP and earthen material.

Concrete Weirs and Detention Ponds shall be constructed at two locations where shown, in accordance with Detail 3. Prior to construction, detailed plans shall be prepared; minor grading may be required to achieve the desired water storage. (Trso Report, p. 29, Mitigation #2).

Maintenance: A cover crop shall be planted prior to September 15. An annual winter cover crop shall be planted during the preplant year, and for the first two years after planting. After the first two years, a permanent cover crop shall be planted on alternating rows. The cover crop shall be mowed each spring after the seed has fully matured (hard dough stage) to ensure annual grass species regeneration for the following year. Minimum mowing height of 4" shall be maintained for establishing annual and perennial grasses. Disking/tilling may take place only as described in the *Narrative* under *Permanent Erosion Control Measures*. The vineyard may be strip sprayed as described in the *Narrative* under *Permanent Erosion Control Measures*. Optimally, a ground cover of 70% or greater will be obtained with the owner being responsible for reseeding and maintenance in order to reach the desired degree of cover.

Annual Winterization: Each year, after harvest and prior to first rains each year, but no later than September 15, the following winterization shall be completed:

1) All disked areas shall be seeded and mulched as described in the *Narrative*.

2) The condition of the non-tilled cover crop, including those areas outside the vineyard, and the suitability and effectiveness of the seed mix and fertilizer shall be evaluated. Weak areas shall be reseeded as necessary; if addition of soil amendments is indicated, they shall be incorporated and those areas shall be seeded and mulched.

3) All diversion ditches and roadside ditches shall be cleaned and reshaped as necessary.

4) The concrete weirs and detention ponds shall be inspected, and cleaned and repaired as necessary.

5) All roads and turnspaces which are not rocked or paved shall be seeded, fertilized and mulched, and shall remain undisturbed throughout the rainy season.

6) All existing erosion control and drainage features shall be inspected and cleaned, or repaired as necessary.

All erosion control measures shall be inspected after each storm event, and repairs shall be promptly performed.

Legend

	APPROX. LIMIT OF VINEYARD
	AVENUE/TURNSPACE
	LIMIT OF NEW DISTURBANCE
AC	ACRES
AF	ACRE-FEET
2	DETAIL 2
ELEV	ELEVATION
	FIBER ROLL
	PROPERTY LINE
	ROCK STABILIZATION
SCS	SOIL CONSERVATION SERVICE
139	SCS SOIL MAPPING UNIT
	SCS SOIL TYPE BOUNDARY
WS	WATER SURFACE

ABREU VINEYARD MANAGEMENT
LUCIA ABREU VINEYARD
EROSION CONTROL PLAN

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

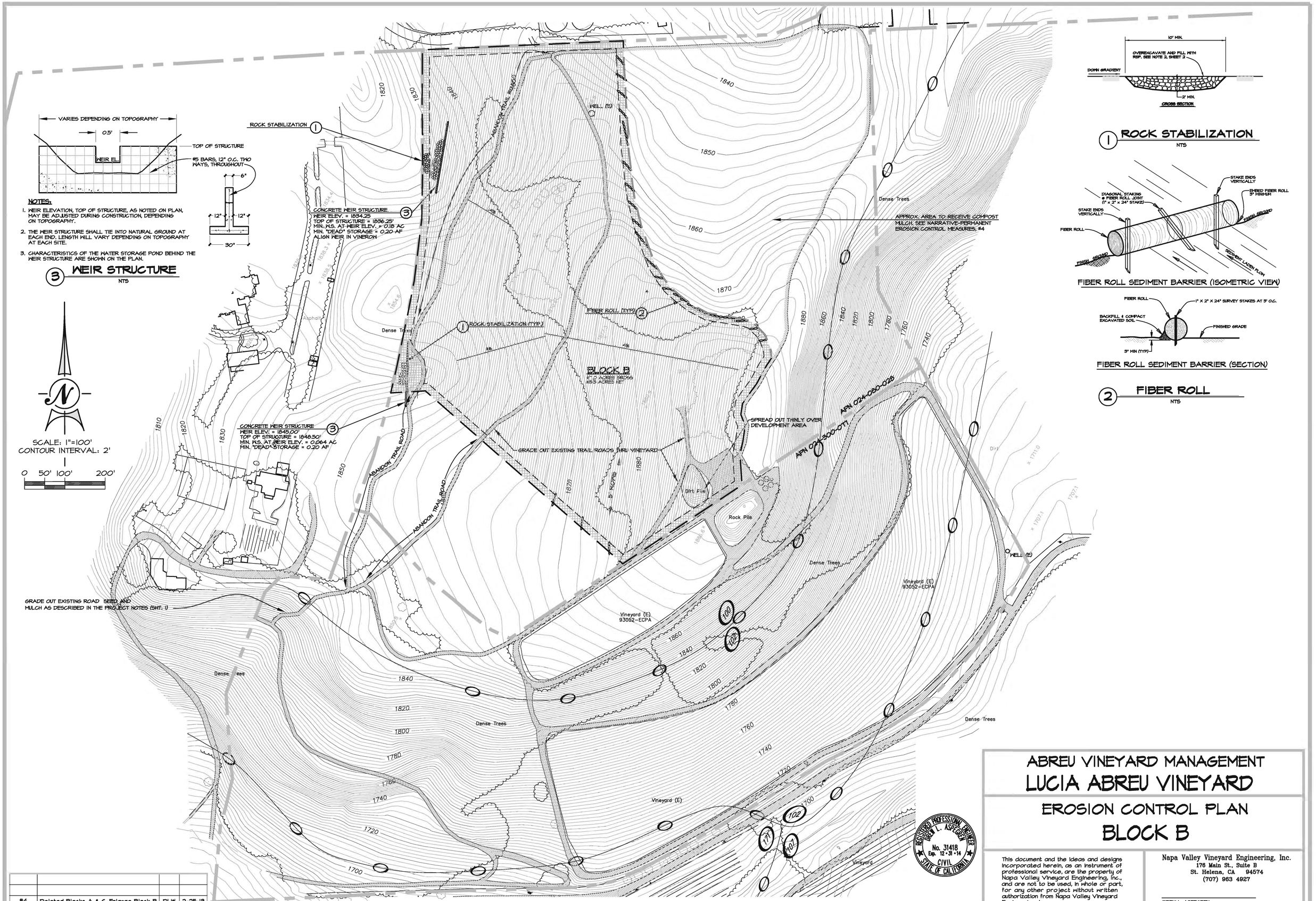
REGISTERED PROFESSIONAL ENGINEER DREW L. ASPEGREN No. 31418 Exp. 12-31-14 CIVIL STATE OF CALIFORNIA

DREW L. ASPEGREN, PE
R.C.E. 31418

July 19, 2005
DATE

Rev. #4 2-25-13; Deleted Blocks A & C, Enlarge Block B
Rev. #3 1-22-08; Rev. per Hydrologic Assessment, November 29, 2007
Rev. #2 1-23-06; Rev. per Jan. 17, 2006 RCD comments
Rev. #1 8-25-05; Add "Abreu Perennial Mix"

THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, ARE THE PROPERTY OF NAPA VALLEY VINEYARD ENGINEERING, INC., AND ARE NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT WRITTEN AUTHORIZATION FROM NAPA VALLEY VINEYARD ENGINEERING, INC.



NOTES:

1. WEIR ELEVATION, TOP OF STRUCTURE, AS NOTED ON PLAN, MAY BE ADJUSTED DURING CONSTRUCTION, DEPENDING ON TOPOGRAPHY.
2. THE WEIR STRUCTURE SHALL TIE INTO NATURAL GROUND AT EACH END. LENGTH WILL VARY DEPENDING ON TOPOGRAPHY AT EACH SITE.
3. CHARACTERISTICS OF THE WATER STORAGE POND BEHIND THE WEIR STRUCTURE ARE SHOWN ON THE PLAN.

3 WEIR STRUCTURE

NTS

1 ROCK STABILIZATION

NTS

FIBER ROLL SEDIMENT BARRIER (ISOMETRIC VIEW)

FIBER ROLL SEDIMENT BARRIER (SECTION)

2 FIBER ROLL

NTS

REV.	DESCRIPTION	BY	DATE
#4	Deleted Blocks A & C, Enlarge Block B	DLN	2-25-13
#3	Add weirs per Hydrologic Assessment dated November 29, 2007	DLN	1-22-08
#2	Rev. per 1-17-06 RCD comments	DLN	1-23-06

ABREU VINEYARD MANAGEMENT
LUCIA ABREU VINEYARD
EROSION CONTROL PLAN
BLOCK B

This document and the ideas and designs incorporated herein, as an instrument of professional service, are the property of Napa Valley Vineyard Engineering, Inc., and are not to be used, in whole or part, for any other project without written authorization from Napa Valley Vineyard Engineering, Inc.

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

DREW L. ASPESGREN
R.C.E. 31418

DATE:	SCALE:	DRAWN:	CHECKED:
7-19-05	AS SHOWN	TPO	DLA
		04LosPosadasECPR6.dwg	

Sheet 2 of 2

APPENDIX C

URBEMIS Output Files

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\equinn\Application Data\Urbemis\Version9a\Projects\Abreu Vineyard.urb924

Project Name: Abreu Vineyard - Proposed Project

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	6.57	55.53	28.42	0.00	10.02	2.60	12.61	2.09	2.39	4.48	7,312.65
2012 TOTALS (lbs/day mitigated)	6.57	45.19	28.42	0.00	1.65	2.60	4.24	0.35	2.39	2.74	7,312.65

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.12	0.02	1.55	0.00	0.01	0.01	2.81

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.97	1.26	12.71	0.01	2.55	0.48	1,412.57

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.09	1.28	14.26	0.01	2.56	0.49	1,415.38

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 4/2/2012-8/30/2012 Active Days: 130	**6.57**	**55.53**	**28.42**	**0.00**	**10.02**	**2.60**	**12.61**	**2.09**	**2.39**	**4.48**	**7,312.65**
Mass Grading 04/01/2012-08/30/2012	6.57	55.53	28.42	0.00	10.02	2.60	12.61	2.09	2.39	4.48	7,312.65
Mass Grading Dust	0.00	0.00	0.00	0.00	10.00	0.00	10.00	2.09	0.00	2.09	0.00
Mass Grading Off Road Diesel	6.48	55.36	25.52	0.00	0.00	2.59	2.59	0.00	2.38	2.38	6,997.13
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46
Mass Grading Worker Trips	0.08	0.16	2.90	0.00	0.02	0.01	0.02	0.01	0.01	0.01	315.06

Phase Assumptions

Phase: Mass Grading 4/1/2012 - 8/30/2012 - Default Fine Site Grading Description

Total Acres Disturbed: 17

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0.11

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 4/2/2012-8/30/2012 Active Days: 130	**6.57**	45.19	**28.42**	**0.00**	1.65	**2.60**	4.24	0.35	**2.39**	2.74	**7,312.65**
Mass Grading 04/01/2012-08/30/2012	6.57	45.19	28.42	0.00	1.65	2.60	4.24	0.35	2.39	2.74	7,312.65
Mass Grading Dust	0.00	0.00	0.00	0.00	1.63	0.00	1.63	0.34	0.00	0.34	0.00
Mass Grading Off Road Diesel	6.48	45.03	25.52	0.00	0.00	2.59	2.59	0.00	2.38	2.38	6,997.13
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46
Mass Grading Worker Trips	0.08	0.16	2.90	0.00	0.02	0.01	0.02	0.01	0.01	0.01	315.06

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2012 - 8/30/2012 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

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For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Excavators, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

For Scrapers, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

For Other Equipment, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

For Bore/Drill Rigs, the Diesel Oxidation Catalyst 20% mitigation reduces emissions by:

NOX: 20%

For Trenchers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Other General Industrial Equipment, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas							
Hearth							
Landscape	0.12	0.02	1.55	0.00	0.01	0.01	2.81
Consumer Products							
Architectural Coatings							
TOTALS (lbs/day, unmitigated)	0.12	0.02	1.55	0.00	0.01	0.01	2.81

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Vineyard	0.97	1.26	12.71	0.01	2.55	0.48	1,412.57
TOTALS (lbs/day, unmitigated)	0.97	1.26	12.71	0.01	2.55	0.48	1,412.57

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Vineyard		2.50	acres	17.00	42.50	1,487.50
					42.50	1,487.50

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.8	0.7	99.1	0.2
Light Truck < 3750 lbs	12.8	1.6	95.3	3.1
Light Truck 3751-5750 lbs	19.8	0.5	99.5	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	59.4	40.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	15.0	15.0	15.0	35.0	35.0	35.0
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Resicential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Vineyard				2.0	1.0	97.0

Operational Changes to Defaults

The urban/rural selection has been changed from Urban to Rural

Home-based work rural trip length changed from 16.8 miles to 15 miles

Home-based shop rural trip length changed from 7.1 miles to 15 miles

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Operational Changes to Defaults

Home-based other rural trip length changed from 7.9 miles to 15 miles

Commercial-based commute rural trip length changed from 14.7 miles to 35 miles

Commercial-based non-work rural trip length changed from 6.6 miles to 35 miles

Commercial-based customer rural trip length changed from 6.6 miles to 35 miles

APPENDIX D

Biological Resources Assessment

TECHNICAL MEMORANDUM

DATE: June 20, 2012

TO: Dennis Hall, Staff Chief, Forest Practice
California Department of Forestry and Fire Protection

FROM: Jessica Alexander

SUBJECT: **Biological Resources Technical Memorandum for the Lucia Abreu Vineyard Howell Mountain Conversion Project**

1.0 Introduction

The Lucia Abreu Vineyard Howell Mountain Conversion Project (proposed project) is located entirely within Napa County assessor's parcel number (APN) 024-080-028 (project parcel). The total project site is 17± acres that will be harvested under a Timber Harvest Plan (THP) consistent with Forest Practice Rules, of which 12.8± acres are forested and will be converted under a Timber Conversion Plan (TCP). The balance of the 17± acres (4.2± acres) is composed of grass, brush, and ruderal acreage. The net acres of the vineyard will be 15.3± acres within the harvested area. The timber harvest will occur before the vineyard conversion and installation of the onsite erosion control plan (ECP) under the proposed project, which are the components of the project that trigger the preparation of an Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA). This Biological Resources Technical Memorandum is provided as an attachment to the Draft EIR for the proposed project.

2.0 Purpose of the Biological Resources Survey

Analytical Environmental Services (AES) biologist Jessica Alexander conducted a biological field survey of the project parcel on May 25, 2012. The biological field survey was performed on the parcel in order to: 1) satisfy standards and requirements of the Napa County General Plan (General Plan; Napa County, 2008), including those outlined in the Napa County Baseline Report (Napa County, 2005) in relation to special-status plant species and vegetation communities (i.e. the Napa County Baseline Data Report recommends that CNPS list 3 and 4 species be addressed for projects in Napa County to adequately address local species of concern.); 2) ground-truth previous biological field work and findings documented in the Biological Resource Assessment prepared by WRA (2007) and the Botanical Survey Report prepared by Eakins (2004) for the parcel; and 3) refine the vegetation community boundaries from the Napa County Vegetation Alliances data (2007) for the project parcel to ensure accurate assessment of habitat impact acreages.

This memo presents a summary of the methodology and results of the field survey.

3.0 Survey Methodology

Database Queries

Information on biological resources in the vicinity of the project parcel was obtained from the following sources:

- USFWS list of federal listed special-status species with the potential to occur or be affected by projects on the "Saint Helena, CA" USGS quad and eight surrounding quads (USFWS, 2012; **Attachment A**).
- California Natural Diversity Database (CNDDB) query of special-status species known to occur within the "Saint Helena, CA" quad and eight surrounding quads (CDFG, 2012; **Attachment A**).
- California Native Plant Society (CNPS) query for special-status species known to occur within the "Saint Helena, CA" quad and eight surrounding quads (CNPS, 2012; **Attachment A**).
- Special-status species occurrences within five miles of the parcel (CDFG, 2012).
- Aerial photographs and topographic maps of the parcel.

For the purposes of this assessment, "special-status" has been defined to include those species that are:

- Listed as endangered or threatened under the federal Endangered Species Act (or formally proposed for, or candidates for, listing).
- Listed as endangered or threatened under the California Endangered Species Act (or proposed for listing).
- Designated as endangered or rare, pursuant to the California Fish and Game Code (§1901).
- Designated as fully protected, pursuant to the California Fish and Game Code (§3511, §4700, or §5050).
- Designated as species of concern to the CDFG.
- Defined as rare or endangered under CEQA.
- Designated as rare according to the California Native Plant Protection Act.

Field Survey

A survey of the southern area of the project parcel (hereafter, "biological field survey area") was conducted by Ms. Alexander on foot via meandering transects (**Attachment B**). The biological survey was floristic in nature and covered the entire THP area for the Proposed Project. Representative areas of each of the vegetation communities identified by Napa County (2007) were examined in detail. The boundaries of vegetation communities were reviewed with the aid of an aerial photograph of the parcel and through identification of dominant vegetation species cover within each vegetation community. The vegetation communities were also assessed for the potential to support state and/or federally listed special-status plant species (**Attachment A**).

4.0 Results

Habitat Types

The habitats identified onsite were based on Napa County Vegetation Alliance data (2007), which were refined according to field observations of species composition and density, and then classified according to *A Manual of California Vegetation, Second Edition* (MCV; Sawyer et al. 2009) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986). A map of the habitat

types observed on in the biological field survey area is presented as **Attachment B**. Descriptions of the habitats are provided below.

Quercus kelloggii Forest Alliance (California Black Oak Forest Alliance)

The eastern portion of the biological field survey area contains woodland comprised of black oak (*Quercus kelloggii*) and coast live oak (*Quercus agrifolia*) integrated with Ponderosa pine (*Pinus ponderosa*), which is seen in other areas of the parcel. Black oaks comprise greater than 30 percent relative cover in the overstory and are co-dominant with coast live oak in this area. The tree species composition and density taken together with the presence of Ponderosa pine, allow this area to be best classified according to the membership requirements of California Black Oak Forest Alliance in MCV (Sawyer et al. 2009) and Black Oak Forest by Holland (1986). This alliance has a rarity ranking of G4-S4, which corresponds to greater than 100 viable occurrences worldwide/statewide and/or more than 12,950 hectares (Sawyer et al. 2009). Approximately 4.6 acres of California Black Oak Forest Alliance is present in the survey area (**Attachment B**).

The shrub layer in the understory is largely absent due to a past regime of underbrush clearing and includes: snowberry (*Symphoricarpos alba*), poison oak (*Toxicodendron diversilobum*), and coffeeberry (*Rhamnus californica*). Other understory vegetation is sparse, limited to herbaceous species such as California poppy (*Eschscholzia californica*), smooth cat's ear (*Hypochaeris glabra*), pacific sanicle (*Sanicula crassicaulis*), soap plant (*Chlorogalum pomeridianum*), woodland pea (*Lathyrus vestitus*), and several species of brome (*Bromus* spp.) (AES, 2012; WRA, 2007). This vegetation community intergrades with Douglas Fir-Ponderosa pine Forest Alliance (described below) along its margins.

Pseudotsuga menziesii-Pinus ponderosa Forest Alliance (Douglas fir-Ponderosa pine Forest Alliance)

Douglas fir-Ponderosa pine Forest Alliance is the most prominent habitat type present in the survey area, with Douglas fir as the dominant species in the overstory comprising roughly 53 percent of the vegetative cover and Ponderosa pine occurring as a co-dominant species in the overstory comprising a relative vegetative cover of approximately 30 percent. Approximately 25 acres of Douglas fir-Ponderosa pine forest occur in the biological field survey area on the parcel (**Attachment B**). Madrone (*Arbutus menziesii*) also occurs within this habitat type. Tree species composition and density allow this area to be best classified according to the membership requirements of Ponderosa pine-Douglas fir Forest Alliance in the MCV (Sawyer et al. 2009) and Coast Range Mixed Coniferous Forest by Holland (1986). This alliance has a rarity ranking of G4-S4, which corresponds to greater than 100 viable occurrences worldwide/statewide and/or more than 12,950 hectares (Sawyer et al. 2009). In the past, this habitat type on the project parcel has been harvested for timber and has been thinned over the years.

While the Napa County Vegetation Alliances data (2007) designates this area as Ponderosa Pine Alliance, the results of field observations of species composition and density onsite found that this area is best classified as Douglas Fir-Ponderosa pine forest alliance due to the dominance of Douglas fir in the overstory and presence of Ponderosa pine as a secondary co-dominant species with Madrone also present. Napa County Vegetation Alliances data (2007) mapping shows that the forested areas directly adjacent to the project parcel to the west and south also contain Douglas Fir-Ponderosa Pine Forest, so it appears that the project parcel best meets this classification owing to the membership requirements of this alliance per

MCV and the County's similar Douglas Fir-Ponderosa pine forest designation shown for adjacent offsite areas.

The shrub layer in the understory of the Douglas fir-Ponderosa pine forest onsite is largely absent due to a past regime of underbrush clearing, however manzanita (*Arctostaphylos manzanita* spp. *manzanita*) and patches of herbaceous vegetation are found within the understory throughout this habitat type, including bull thistle (Cirsium vulgare), mustard (Brassica spp.), miner's lettuce (*Claytonia perfoliata*), bedstraw (*Gallium aparine*), hedgehog dog-tail grass (*Cynosurus echinatus*), and blue wildrye (*Elymus glaucus*).

Avena (*barbata, fatua*) Semi-Natural Herbaceous Stands (Wild oats grassland) / California Annual Grasslands Alliance

The south-central portion of the parcel contains approximately 3.66 acres of open annual grassland dominated by wild oats and characterized by past human disturbance. Large stockpiles of boulders are found on the margins of this area near the southeastern portion of the parcel. The vegetation is typically dominated by non-native annual grasses. Herbaceous species composition and density allows this area to be best classified as *Avena barbata* Semi-Natural Herbaceous Stands (Sawyer et al. 2009). This grassland alliance can be placed into the general California Annual Grasslands Alliance, which is currently used for classification in Napa County (NCBDR, 2005).

The dominant plant species found in this community include non-native grasses such as slender wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), and soft chess (*Bromus hordeaceus*). Non-native forbs are often found in association with this grassland habitat type and may include filaree (*Erodium botrys*), sow thistle (*Sonchus asper*), chickweed (*Stellaria media*), rose clover (*Trifolium hirtum*), Italian thistle (*Carduus pycnocephalus*), yellow star thistle (*Centaurea solstitialis*), and milk thistle (*Silybum marianum*). Native forbs such as cudweed (*Gnaphalium canescens* ssp. *beneolens*) and others grow sparsely among non-native grasses in the area.

Ruderal/Developed

A gravel area is located at the south of the parcel and is designated as ruderal/disturbed (**Attachment B**). This area contains a rockpile and is used for temporary equipment and material storage to support agricultural uses.

Special Status Species

According to the results of the database queries, previous field surveys on the parcel, and a review of the literature, the biological field survey area provides suitable habitat for the following special status species shown in **Table 1**. However, none of these special status species were observed on the parcel during the biological field survey by AES (2012) or in previous surveys conducted on the property by WRA (2007) and Eakins (2004).

TABLE 1
FEDERAL, STATE, AND CNPS LISTED POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Allium peninsulare var. *franciscanum* Franciscan onion	--/--/1B.2	Known to occur in Mendocino, Santa Clara, San Mateo, and Sonoma counties (CNPS 2012).	Cismontane woodland, Valley and foothill grassland/clay, volcanic, often serpentinite. Elevations; 52-300 meters (CNPS 2012).	May - June	No
Amorpha californica var. *napensis* Napa false indigo	--/--/1B.2	Know to occur in Monterey, Marin, Napa, and Sonoma counties (CNPS 2012).	Broad-leafed upland forest (openings), Chaparral, and Cismontane woodland. Elevations; 120-2000 meters (CNPS 2012).	April - July	No
Amsinckia lunaris Bent-flowered fiddleneck	--/--/1B.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, and Yolo counties (CNPS 2012).	Coastal bluff scrub, Cismontane woodland, and Valley and foothill grassland. Elevations; 3-500 meters (CNPS 2012).	March – June	No
Arctostaphylos canescens ssp. *sonomensis* Sonoma canescent manzanita	--/--/1B.2	Known to occur in Colusa, Humboldt, Lake, Mendocino, Sonoma, Tehama, and Trinity counties (CNPS 2012).	Chaparral and Lower montane coniferous forest/sometimes serpentinite. Elevations; 180-1,675 meters (CNPS 2012).	January –June	No
Arctostaphylos manzanita ssp. *elegans* Konocti manzanita	--/--/1B.3	Known to occur in Colusa, Glenn, Lake, Napa, Sonoma and Tehama counties (CNPS 2012).	Chaparral, Cismontane woodland, Lower montane coniferous forest (volcanic). Elevations; 395-1,615 meters (CNPS 2012).	March - May	No
Astragalus clarianus Clara Hunt's milk-vetch	FE/CT/1B.1	Known to occur in Napa and Sonoma counties (CNPS 2012).	Chaparral (openings), Cismontane woodland, and Valley and foothill grassland/serpentinite or volcanic, rocky, and clay. Elevations; 75-275 meters (CNPS 2012).	March - May	No

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Astragalus rattanii var. *jepsonianus* Jepson's milk-vetch	--/--/1B.2	Known to occur in Colusa, Glenn, Lake, Napa, Tehama, Yolo counties (CNPS 2012).	Chaparral, Cismontane woodland, Valley and foothill grassland (often serpentinite). Elevations; 320-700 meters (CNPS 2012).	March – June	No
Brodiaea californica var. *leptandra* Narrow-anthered California brodiaea	--/--/1B.2	Known range includes Lake, Napa, and Sonoma counties (CNPS 2012).	Broad-leafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (volcanic). Elevations; 110-915 meters (CNPS 2012).	May - July	No
Ceanothus confusus Rincon Ridge ceanothus	--/--/1B.1	Known to occur in Lake, Mendocino, Napa, and Sonoma counties (CNPS 2012).	Closed-cone coniferous forest, Chaparral, and Cismontane woodland/volcanic or serpentinite. Elevations; 75-1,065 meters (CNPS 2012).	February - June	No
Leptosiphon jepsonii Jepson's leptosiphon	--/--/1B.2	Known to occur in Lake, Napa, and Sonoma counties (CNPS 2012).	Chaparral and Cismontane woodland (usually volcanic). Elevations; 100-500 meters (CNPS 2012).	March - May	No
Lupinus sericatus Cobb Mountain lupine	--/--/1B.2	Known to occur in Colusa, Lake, Napa, and Sonoma counties (CNPS 2012).	Broad-leafed upland forest, Chaparral, Cismontane woodland, and Lower montane coniferous forest. Elevations; 275-1,525 meters (CNPS 2012).	March - June	No
Trichostema ruygtii Napa Bluecurls	--/--/1B.2	Known to occur in Lake, Napa, and Solano counties (CNPS 2012).	Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland and Vernal pools. Elevations; 30-680 meters (CNPS 2012).	June - October	No

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	SPECIES OBSERVED ONSITE
Viburnum ellipticum oval-leaved viburnum	--/--/2.3	Known to occur in Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, and Sonoma and Tehama counties in California and in Oregon and Washington states (CNPS 2012).	Chaparral, Cismontane woodland, and Lower montane coniferous forest. Elevations; 215-1,400 meters (CNPS 2012).	May - June	No

FEDERAL: United States Fish and Wildlife Service and National Marine Fisheries Service
FE Federally Endangered
FT Federally Threatened
FC Federal Candidate for Listing

STATE: California Department of Fish and Game
CE California Listed Endangered
CR California Listed Rare
CT California Listed Threatened
CSC California Species of Special Concern
CFP California Fully-Protected

CNPS: California Native Plant Society
List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3 Plants About Which We Need More Information - A Review List
List 4 Plants of limited distribution

Threat Ranks
0.1-Seriously threatened in California (high degree/immediacy of threat)
0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)

Sources: USFWS, 2012; CDFG, 2012; CNPS, 2012

5.0 Conclusion

The results of the biological field survey, which was conducted to ensure that all of the local plants of concern to Napa County were specifically surveyed for, found that while the parcel provides suitable or marginally suitable habitat for some special status plant species as discussed above, none of these plants were observed onsite by AES or during past biological surveys of the parcel by WRA (2007) and Eakins (2004).

This biological resources survey memorandum will be included in the Draft Environmental Impact Report prepared for the proposed project as the field survey methodology and findings documentation to satisfy the standards and requirements of the Napa County General Plan (General Plan; Napa County, 2008), including those outlined in the Napa County Baseline Report (Napa County, 2005), in relation to special-status plant species and vegetation communities.

6.0 References

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ATTACHMENT A

USFWS, CDFG, AND CNPS DATABASE QUERIES (2012)

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Landscape
Abreu Vineyards 9-Quad search

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1	Accipiter striatus	sharp-shinned hawk	ABNKC12020			G5	S3		
2	Agelaius tricolor	tricolored blackbird	ABPBXB0020			G2G3	S2		SC
3	Allium peninsulare var. franciscanum	Franciscan onion	PMLIL021R1			G5T2	S2.2	1B.2	
4	Alopecurus aequalis var. sonomensis	Sonoma alopecurus	PMPOA07012	Endangered		G5T1Q	S1.1	1B.1	
5	Amorpha californica var. napensis	Napa false indigo	PDFAB08012			G4T2	S2.2	1B.2	
6	Amsinckia lunaris	bent-flowered fiddleneck	PDBOR01070			G2?	S2	1B.2	
7	Antrozous pallidus	pallid bat	AMACC10010			G5	S3		SC
8	Aquila chrysaetos	golden eagle	ABNKC22010			G5	S3		
9	Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	PDERI04066			G3G4T2	S2.1	1B.2	
10	Arctostaphylos manzanita ssp. elegans	Konocti manzanita	PDERI04271			G5T2	S2.3	1B.3	
11	Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	PDERI041G4			G3T1	S1.1	1B.1	
12	Ardea alba	great egret	ABNGA04040			G5	S4		
13	Ardea herodias	great blue heron	ABNGA04010			G5	S4		
14	Astragalus claranus	Clara Hunt's milk-vetch	PDFAB0F240	Endangered	Threatened	G1	S1	1B.1	
15	Astragalus rattanii var. jepsonianus	Jepson's milk-vetch	PDFAB0F7E1			G4T3	S3	1B.2	
16	Athene cunicularia	burrowing owl	ABNSB10010			G4	S2		SC
17	Brodiaea californica var. leptandra	narrow-anthered California brodiaea	PMLIL0C022			G4?T2T3	S2S3.2	1B.2	
18	Calycadenia micrantha	small-flowered calycadenia	PDAST1P0C0			G2G3	S2S3.2	1B.2	
19	Calystegia collina ssp. oxyphylla	Mt. Saint Helena morning-glory	PDCON04032			G4T3	S3.2	4.2	
20	Ceanothus confusus	Rincon Ridge ceanothus	PDRHA04220			G2	S2.2	1B.1	
21	Ceanothus divergens	Calistoga ceanothus	PDRHA04240			G2	S2.2	1B.2	
22	Ceanothus purpureus	holly-leaved ceanothus	PDRHA04160			G2	S2	1B.2	
23	Ceanothus sonomensis	Sonoma ceanothus	PDRHA04420			G2	S2.2	1B.2	
24	Centromadia parryi ssp. parryi	pappose tarplant	PDAST4R0P2			G4T1	S1	1B.2	
25	Coastal and Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh	CTT52410CA			G3	S2.1		
26	Corynorhinus townsendii	Townsend's big-eared bat	AMACC08010			G4	S2S3		SC
27	Cryptantha dissita	serpentine cryptantha	PDBOR0A0H2			G2	S2	1B.1	
28	Cypseloides niger	black swift	ABNUA01010			G4	S2		SC
29	Downingia pusilla	dwarf downingia	PDCAM060C0			G2	S2	2.2	
30	Elanus leucurus	white-tailed kite	ABNKC06010			G5	S3		
31	Emys marmorata	western pond turtle	ARAAD02030			G3G4	S3		SC

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
32	Erigeron greenei	Greene's narrow-leaved daisy	PDAST3M5G0			G2	S2	1B.2	
33	Eryngium constancei	Loch Lomond button-celery	PDAPI0Z0W0	Endangered	Endangered	G1	S1	1B.1	
34	Falco mexicanus	prairie falcon	ABNKD06090			G5	S3		
35	Falco peregrinus anatum	American peregrine falcon	ABNKD06071	Delisted	unknown code...	G4T3	S2		
36	Fritillaria pluriflora	adobe-lily	PMLIL0V0F0			G3	S3	1B.2	
37	Haliaeetus leucocephalus	bald eagle	ABNKC10010	Delisted	Endangered	G5	S2		
38	Harmonia hallii	Hall's harmonia	PDAST650A0			G2	S2?	1B.2	
39	Hesperolinon bicarpellatum	two-carpellate western flax	PDLIN01020			G2	S2.2	1B.2	
40	Hesperolinon tehamense	Tehama County western flax	PDLIN010C0			G2	S2	1B.3	
41	Hydrochara ricksecker i	Ricksecker's water scavenger beetle	IICOL5V010			G1G2	S1S2		
42	Hydroporus leechi	Leech's skyline diving beetle	IICOL55040			G1?	S1?		
43	Juncus luciensis	Santa Lucia dwarf rush	PMJUN013J0			G2G3	S2S3	1B.2	
44	Lasionycteris noctivagans	silver-haired bat	AMACC02010			G5	S3S4		
45	Lasiurus cinereus	hoary bat	AMACC05030			G5	S4?		
46	Lasthenia burkei	Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1	
47	Layia septentrionalis	Colusa layia	PDAST5N0F0			G2	S2.2	1B.2	
48	Leptosiphon jepsonii	Jepson's leptosiphon	PDPLM09140			G2	S2	1B.2	
49	Limnanthes floccosa ssp. floccosa	woolly meadowfoam	PDLIM02043			G4T4	S3.2	4.2	
50	Limnanthes vinculans	Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1	
51	Lupinus sericatus	Cobb Mountain lupine	PDFAB2B3J0			G2	S2.2	1B.2	
52	Myotis evotis	long-eared myotis	AMACC01070			G5	S4?		
53	Myotis thysanodes	fringed myotis	AMACC01090			G4G5	S4		
54	Myotis yumanensis	Yuma myotis	AMACC01020			G5	S4?		
55	Navarretia leucocephala ssp. bakeri	Baker's navarretia	PDPLM0C0E1			G4T2	S2	1B.1	
56	Navarretia leucocephala ssp. pauciflora	few-flowered navarretia	PDPLM0C0E4	Endangered	Threatened	G4T1	S1	1B.1	
57	Navarretia myersii ssp. deminuta	small pincushion navarretia	PDPLM0C0X2			G1T1	S1.1	1B.1	
58	Navarretia rosulata	Marin County navarretia	PDPLM0C0Z0			G2?	S2?	1B.2	
59	Northern Vernal Pool	Northern Vernal Pool	CTT44100CA			G2	S2.1		
60	Oncorhynchus mykiss irideus	steelhead - central California coast DPS	AFCHA0209G	Threatened		G5T2Q	S2		
61	Penstemon newberryi var. sonomensis	Sonoma beardtongue	PDSCR1L483			G4T1	S1.3	1B.3	
62	Phalacrocorax auritus	double-crested cormorant	ABNFD01020			G5	S3		
63	Plagiobothrys strictus	Calistoga popcorn-flower	PDBOR0V120	Endangered	Threatened	G1	S1	1B.1	

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
64	Poa napensis	Napa blue grass	PMPOA4Z1R0	Endangered	Endangered	G1	S1.1	1B.1	
65	Progne subis	purple martin	ABPAU01010			G5	S3		SC
66	Rana boylii	foothill yellow-legged frog	AAABH01050			G3	S2S3		SC
67	Rana draytonii	California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3		SC
68	Serpentine Bunchgrass	Serpentine Bunchgrass	CTT42130CA			G2	S2.2		
69	Sidalcea hickmanii ssp. napensis	Napa checkerbloom	PDMAL110A6			G1	S1	1B.1	
70	Sidalcea oregana ssp. hydrophila	marsh checkerbloom	PDMAL110K2			G5T2?	S2?	1B.2	
71	Sidalcea oregana ssp. valida	Kenwood Marsh checkerbloom	PDMAL110K5	Endangered	Endangered	G5T1	S1	1B.1	
72	Streptanthus brachiatus ssp. brachiatus	Socrates Mine jewel-flower	PDBRA2G072			G2T1	S1.2	1B.2	
73	Streptanthus hesperidis	green jewel-flower	PDBRA2G510			G2	S2	1B.2	
74	Streptanthus morrisonii	Morrison's jewel-flower	PDBRA2G0S0			G2	S2		
75	Streptanthus vernalis	early jewel-flower	PDBRA2G120			G1	S1	1B.2	
76	Syncaris pacifica	California freshwater shrimp	ICMAL27010	Endangered	Endangered	G1	S1		
77	Trachykele hartmani	serpentine cypress wood-boring beetle	IICOLX6010			G1	S1		
78	Trichostema ruygtii	Napa bluecurls	PDLAM220H0			G2	S2	1B.2	
79	Trifolium amoenum	showy rancheria clover	PDFAB40040	Endangered		G1	S1	1B.1	
80	Trifolium hydrophilum	saline clover	PDFAB400R5			G2	S2	1B.2	
81	Valley Needlegrass Grassland	Valley Needlegrass Grassland	CTT42110CA			G3	S3.1		
82	Vandykea tuberculata	serpentine cypress long-horned beetle	IICOLX7010			G1	S1		
83	Viburnum ellipticum	oval-leaved viburnum	PDCPR07080			G5	S2.3	2.3	
84	Wildflower Field	Wildflower Field	CTT42300CA			G2	S2.2		

Inventory of Rare and Endangered Plants

v7-12jan 1-11-12

Status: search results - Thu, Feb. 2, 2012, 19:11 b

{QUADS_123} =~m/516C|500A|500B|517D|517A|501A|516D|516A|5 Search

Tip: Word fragments must be completed with a wildcard, e.g., `esch* hyp*` for Eschscholzia hypecoides.[all tips and help.]
[search history]

Your Quad Selection: St. Helena (516C) 3812254, Yountville (500A) 3812243, Rutherford (500B) 3812244, Calistoga (517D) 3812255, Detert Reservoir (517A) 3812265, Kenwood (501A) 3812245, Chiles Valley (516D) 3812253, Walter Springs (516A) 3812263, Aetna Springs (516B) 3812264

Hits 1 to 50 of 57

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
		1	**Allium peninsulare var. franciscanum**	Franciscan onion	Alliaceae	List 1B.2
		1	**Alopecurus aequalis var. sonomensis**	Sonoma alopecurus	Poaceae	List 1B.1
		1	**Amorpha californica var. napensis**	Napa false indigo	Fabaceae	List 1B.2
		1	**Amsinckia lunaris**	bent-flowered fiddleneck	Boraginaceae	List 1B.2
		1	**Arctostaphylos canescens ssp. sonomensis**	Sonoma canescent manzanita	Ericaceae	List 1B.2
		1	**Arctostaphylos manzanita ssp. elegans**	Konocti manzanita	Ericaceae	List 1B.3
		1	**Arctostaphylos stanfordiana ssp. decumbens**	Rincon Ridge manzanita	Ericaceae	List 1B.1
		1	**Astragalus claranus**	Clara Hunt's milk-vetch	Fabaceae	List 1B.1
		1	**Astragalus rattanii var. jepsonianus**	Jepson's milk-vetch	Fabaceae	List 1B.2
		1	**Brodiaea californica var. leptandra**	narrow-anthered California brodiaea	Themidaceae	List 1B.2
		1	**Calycadenia micrantha**	small-flowered calycadenia	Asteraceae	List 1B.2
		1	**Ceanothus confusus**	Rincon Ridge ceanothus	Rhamnaceae	List 1B.1
		1	**Ceanothus divergens**	Calistoga ceanothus	Rhamnaceae	List 1B.2
		1	**Ceanothus purpureus**	holly-leaved ceanothus	Rhamnaceae	List 1B.2
		1	**Ceanothus sonomensis**	Sonoma ceanothus	Rhamnaceae	List 1B.2
		1	**Centromadia parryi ssp. parryi**	pappose tarplant	Asteraceae	List 1B.2
		1	**Cryptantha dissita**	serpentine cryptantha	Boraginaceae	List 1B.2
		1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2
		1	**Erigeron biolettii**	streamside daisy	Asteraceae	List 3
		1	**Erigeron greenei**	Greene's narrow-leaved daisy	Asteraceae	List 1B.2
		1	**Eryngium constancei**	Loch Lomond button-celery	Apiaceae	List 1B.1
		1	**Eryngium pinnatisectum**	Tuolumne button-celery	Apiaceae	List 1B.2
		1	**Fritillaria liliacea**	fragrant fritillary	Liliaceae	List 1B.2
		1	**Fritillaria pluriflora**	adobe-lily	Liliaceae	List 1B.2

		1	**Harmonia hallii**	Hall's harmonia	Asteraceae	List 1B.2
		1	**Hesperolinon bicarpellatum**	two-carpellate western flax	Linaceae	List 1B.2
		1	**Hesperolinon serpentinum**	Napa western flax	Linaceae	List 1B.1
		1	**Hesperolinon tehamense**	Tehama County western flax	Linaceae	List 1B.3
		1	**Juncus luciensis**	Santa Lucia dwarf rush	Juncaceae	List 1B.2
		1	**Lasthenia burkei**	Burke's goldfields	Asteraceae	List 1B.1
		1	**Lasthenia conjugens**	Contra Costa goldfields	Asteraceae	List 1B.1
		1	**Layia septentrionalis**	Colusa layia	Asteraceae	List 1B.2
		1	**Leptosiphon jepsonii**	Jepson's leptosiphon	Polemoniaceae	List 1B.2
		1	**Lessingia hololeuca**	woolly-headed lessingia	Asteraceae	List 3
		1	**Limnanthes vinculans**	Sebastopol meadowfoam	Limnanthaceae	List 1B.1
		1	**Lupinus sericatus**	Cobb Mountain lupine	Fabaceae	List 1B.2
		1	**Micropus amphibolus**	Mt. Diablo cottonweed	Asteraceae	List 3.2
		1	**Navarretia leucocephala ssp. bakeri**	Baker's navarretia	Polemoniaceae	List 1B.1
		1	**Navarretia leucocephala ssp. pauciflora**	few-flowered navarretia	Polemoniaceae	List 1B.1
		1	**Navarretia leucocephala ssp. plieantha**	many-flowered navarretia	Polemoniaceae	List 1B.2
		1	**Navarretia myersii ssp. deminuta**	small pincushion navarretia	Polemoniaceae	List 1B.1
		1	**Navarretia rosulata**	Marin County navarretia	Polemoniaceae	List 1B.2
		1	**Penstemon newberryi var. sonomensis**	Sonoma beardtongue	Plantaginaceae	List 1B.3
		1	**Plagiobothrys strictus**	Calistoga popcorn-flower	Boraginaceae	List 1B.1
		1	**Poa napensis**	Napa blue grass	Poaceae	List 1B.1
		1	**Sidalcea hickmanii ssp. napensis**	Napa checkerbloom	Malvaceae	List 1B.1
		1	**Sidalcea oregana ssp. hydrophila**	marsh checkerbloom	Malvaceae	List 1B.2
		1	**Sidalcea oregana ssp. valida**	Kenwood Marsh checkerbloom	Malvaceae	List 1B.1
		1	**Streptanthus batrachopus**	Tamalpais jewel-flower	Brassicaceae	List 1B.3
		1	**Streptanthus brachiatus ssp. brachiatus**	Socrates Mine jewel-flower	Brassicaceae	List 1B.2

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

For more results click below:

These buttons will not appear on your list.

Revise Selection

Print this page

Print species list before going on to letter.

Make Official Letter

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 120202052037

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

- Branchinecta conservatio
  - Conservancy fairy shrimp (E)
- Desmocerus californicus dimorphus
  - valley elderberry longhorn beetle (T)
- Syncaris pacifica
  - California freshwater shrimp (E)

Fish

- Hypomesus transpacificus
  - delta smelt (T)
- Oncorhynchus kisutch
  - coho salmon - central CA coast (E) (NMFS)
- Oncorhynchus mykiss
  - Central California Coastal steelhead (T) (NMFS)
  - Central Valley steelhead (T) (NMFS)
  - Critical habitat, Central California coastal steelhead (X) (NMFS)
- Oncorhynchus tshawytscha
  - California coastal chinook salmon (T) (NMFS)
  - Central Valley spring-run chinook salmon (T) (NMFS)
  - winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

- Rana draytonii
  - California red-legged frog (T)

Birds

- Strix occidentalis caurina
  - northern spotted owl (T)

Plants

- Alopecurus aequalis var. sonomensis
  - Sonoma alopecurus (E)
- Astragalus clarianus
  - Clara Hunt's milk-vetch (E)
- Eryngium constancei
  - Loch Lomond coyote-thistle (=button-celery) (E)
- Lasthenia conjugens
  - Contra Costa goldfields (E)
  - Critical habitat, Contra Costa goldfields (X)
- Navarretia leucocephala ssp. pauciflora
  - few-flowered navarretia (E)
- Plagiobothrys strictus
  - Calistoga allocarya (popcorn-flower) (E)
- Poa napensis
  - Napa bluegrass (E)
- Sidalcea keckii
  - Keck's checker-mallow (=checkerbloom) (E)
- Sidalcea oregana ssp. valida
  - Kenwood Marsh checkermallow (=checkerbloom) (E)

Proposed Species

Amphibians

- Rana draytonii
  - Critical habitat, California red-legged frog (PX)

Quads Containing Listed, Proposed or Candidate Species:

YOUNTVILLE (500A)

RUTHERFORD (500B)

KENWOOD (501A)

WALTER SPRINGS (516A)

AETNA SPRINGS (516B)

ST. HELENA (516C)

CHILES VALLEY (516D)

DETERT RESERVOIR (517A)

CALISTOGA (517D)

County Lists

No county species lists requested.

Key:

- (E) Endangered - Listed as being in danger of extinction.
- (T) Threatened - Listed as likely to become endangered within the foreseeable future.
- (P) Proposed - Officially proposed in the Federal Register for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
- Critical Habitat - Area essential to the conservation of a species.
- (PX) Proposed Critical Habitat - The species is already listed. Critical habitat is being proposed for it.
- (C) Candidate - Candidate to become a proposed species.
- (V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
- (X) Critical Habitat designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.
See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding,

feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.
- During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.
- Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

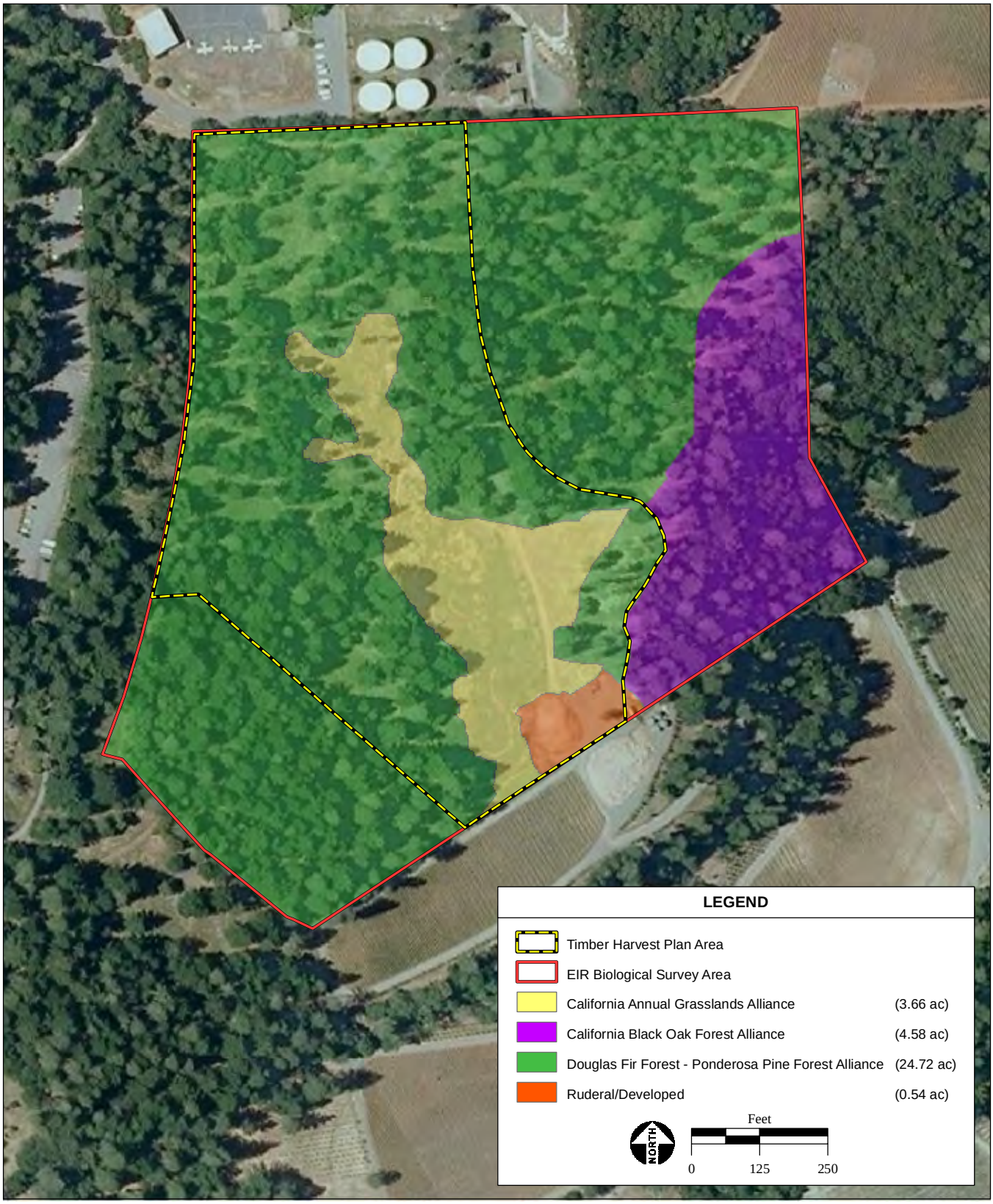
If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be May 02, 2012.

ATTACHMENT B

HABITAT MAP



SOURCE: Napa County Vegitation Alliances Dataset, 2007;
Napa Valley Vineyards Engineering, 7/2005;
UC-G Aerial Photograph, 4/2012; AES, 2013

Attachment B

Habitat Map

APPENDIX E

Special Status Species Searches Table

APPENDIX E
FEDERAL, STATE, AND CNPS POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Plants					
Allium peninsulare var. *franciscanum* Franciscan onion	--/--/1B.2	Known to occur in Mendocino, Santa Clara, San Mateo, and Sonoma counties (CNPS 2012).	Cismontane woodland, Valley and foothill grassland/clay, volcanic, often serpentinite. Elevations; 52-300 meters (CNPS 2012).	May - June	No. The project site does not contain suitable soils for this species.
Alopecurus aequalis var. *sonomensis* Sonoma alopecurus	FE/--/1B.1	Known to occur in Marin and Sonoma counties (CNPS 2012).	Marshes and swamps (freshwater) and Riparian scrub. Elevations; 5-365 meters (CNPS 2012).	May - July	No. The project site is outside the known geographic range and does not contain suitable habitat for this species.
Amorpha californica var. *napensis* Napa false indigo	--/--/1B.2	Know to occur in Monterey, Marin, Napa, and Sonoma counties (CNPS 2012).	Broad-leafed upland forest (openings), Chaparral, and Cismontane woodland. Elevations; 120-2000 meters (CNPS 2012).	April - July	Yes. See text.
Amsinckia lunaris Bent-flowered fiddleneck	--/--/1B.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, and Yolo counties (CNPS 2012).	Coastal bluff scrub, Cismontane woodland, and Valley and foothill grassland. Elevations; 3-500 meters (CNPS 2012).	March – June	Yes. See text.
Arctostaphylos canescens ssp. *sonomensis* Sonoma canescent manzanita	--/--/1B.2	Known to occur in Colusa, Humboldt, Lake, Mendocino, Sonoma, Tehama, and Trinity counties (CNPS 2012).	Chaparral and Lower montane coniferous forest/sometimes serpentinite. Elevations; 180-1,675 meters (CNPS 2012).	January –June	Yes. See text.
Arctostaphylos manzanita ssp. *elegans* Konocti manzanita	--/--/1B.3	Known to occur in Colusa, Glenn, Lake, Napa, Sonoma and Tehama counties (CNPS 2012).	Chaparral, Cismontane woodland, Lower montane coniferous forest (volcanic). Elevations; 395-1,615 meters (CNPS 2012).	March - May	Yes. See text.
Arctostaphylos stanfordiana ssp. *decumbens* Rincon manzanita	--/--/1B.1	Known to occur in Sonoma County (CNPS 2012).	Chaparral (rhyolitic) and cismontane woodland. Elevations; 75-370 meters (CNPS 2012).	February – April (sometimes May)	No. The project site is outside the known geographic range and does not contain suitable soils for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Astragalus clarianus Clara Hunt's milk-vetch	FE/CT/1B.1	Known to occur in Napa and Sonoma counties (CNPS 2012).	Chaparral (openings), Cismontane woodland, and Valley and foothill grassland/serpentinite or volcanic, rocky, and clay. Elevations; 75-275 meters (CNPS 2012).	March - May	Yes. See text.
Astragalus rattanii var. *jepsonianus* Jepson's milk-vetch	--/--/1B.2	Known to occur in Colusa, Glenn, Lake, Napa, Tehama, Yolo counties (CNPS 2012).	Chaparral, Cismontane woodland, Valley and foothill grassland (often serpentinite). Elevations; 320-700 meters (CNPS 2012).	March – June	Yes. See text.
Brodiaea californica var. *leptandra* Narrow-anthered California brodiaea	--/--/1B.2	Known range includes Lake, Napa, and Sonoma counties (CNPS 2012).	Broad-leafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland (volcanic). Elevations; 110-915 meters (CNPS 2012).	May - July	Yes. See text.
Calycadenia micrantha Small-flowered calycadenia	--/--/1B.2	Known to occur in Colusa, Lake, Monterey, Napa, and Trinity counties (CNPS 2012).	Chaparral, Meadows and seeps (volcanic soils), Valley and foothill grassland, roadsides, rocky, talus, scree, sometimes serpentinite, and sparsely vegetated areas. Elevations; five-1,500 meters (CNPS 2012).	June - September	No. The project site does not contain suitable habitat or soils for this species.
Calystegia collina ssp. *oxyphylla* Mt. Saint Helena morning glory	--/--/4.2	Known to occur in Lake, Mendocino, Marin, Napa, San Benito, and Sonoma counties (CNPS 2012).	Chaparral, Lower montane coniferous forest, and Valley and foothill grasslands on serpentinite soils. Elevations; 279-1,010 meters (CNPS 2012).	April - June	No. The project site does not contain suitable habitat or soils for this species.
Ceanothus confusus Rincon Ridge ceanothus	--/--/1B.1	Known to occur in Lake, Mendocino, Napa, and Sonoma counties (CNPS 2012).	Closed-cone coniferous forest, Chaparral, and Cismontane woodland/volcanic or serpentinite. Elevations; 75-1,065 meters (CNPS 2012).	February - June	Yes. See text.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Ceanothus divergens Calistoga ceanothus	--/--/1B.2	Known to occur in Lake, Napa, and Sonoma counties (CNPS 2012).	Chaparral (sepentinite, or volcanic, rocky). Elevations; 170-950 meters (CNPS 2012).	February - April	No. The project site does not contain suitable soils or habitat for this species.
Ceanothus purpureus Holly-leaved ceanothus	--/--/1B.2	Known to occur in Napa, Shasta, Solano, Sonoma, and Trinity counties (CNPS 2012).	Chaparral, Cismontane Woodland (volcanic, rocky slopes). Elevations; 120-640 meters (CNPS 2012).	February - June	No. The project site does not contain suitable soils or habitat for this species.
Ceanothus sonomensis Sonoma ceanothus	--/--/1B.2	Known to occur in Napa and Sonoma counties (CNPS 2012).	Chaparral (sandy, serpentinite, or volcanic). Elevations; 215-800 meters (CNPS 2012).	February - April	No. The project site does not contain suitable habitat for this species.
Centromadia parryi ssp. *parryi* pappose tarplant	--/--/1B.2	Known to occur in Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, and Sonoma counties (CNPS 2012).	Chaparral, Coastal prairie, Meadows and seeps, Marshes and swamps (coastal salt), and Valley and foothill grassland (vernally mesic)/often alkaline soils. Elevations; 2-420 meters (CNPS 2012).	May - November	No. The project site does not contain suitable soils or habitat for this species.
Cryptantha dissita (formerly *Cryptantha clevelandii* var. *dissita*) Serpentine cryptantha	--/--/1B.2	Known to occur in Lake, Mendocino, Napa and Sonoma Counties (CNPS 2012).	Chaparral (serpentinite). Elevations; 395-580 meters (CNPS 2012).	April - June	No. The project site does not contain suitable soils or habitat for this species.
Downingia pusilla dwarf downingia	--/--/2.2	Known to occur in Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba counties. Also occurs in South America (CNPS 2012).	Valley and foothill grassland (mesic) and Vernal pools. Elevations; one-445 meters (CNPS 2012).	March - May	No. The project site is outside the elevation range and does not provide suitable habitat for this species.
Erigeron bioletti streamside daisy	--/--/3	Known to occur in Humboldt, Mendocino, Marin, Napa, Solano, and Sonoma counties (CNPS 2012).	Broadleafed upland forest, Cismontane woodland, and North Coast coniferous forest/rocky, mesic. Elevations; 30-1,100 meters (CNPS 2012)	June - October	No. The project site does not contain suitable soils or habitat for this species.

SCIENTIFIC NAME COMMON NAME	FEDERAL/ STATE/ CNPS STATUS	DISTRIBUTION	HABITAT REQUIREMENTS	PERIOD OF IDENTIFICATION	POTENTIAL TO OCCUR ON-SITE
Erigeron greenei Greene's narrow-leaved daisy	--/--/1B.2	Known to occur in Napa, Sonoma, and Lake counties (CNPS 2012).	Chaparral (serpentinite or volcanic). Elevations; 80-1,005 meters (CNPS 2012).	May - September	No. The project site does not contain suitable habitat for this species.
Eryngium constancei Loch Lomond coyote-thistle	FE/CE/1B.1	Known to Lake, Napa, and Sonoma counties (CNPS 2012).	Vernal pools. Elevations; 460-855 meters (CNPS 2012).	April - June	No. The project site does not contain suitable habitat for this species.
Eryngium pinnatisectum Tuolumne button-celery	--/--/1B.2	Known to occur in Amador, Calaveras, Sacramento, Sonoma, and Tuolumne counties (CNPS 2012).	Cismontane woodland, Lower montane coniferous forest and Vernal pools (mesic). Elevations; 70-915 meters (CNPS 2012).	May - August	No. The project site does not contain suitable habitat and is outside the known geographic range for this species.
Fritillaria liliacea Fragrant fritillary	--/--/1B.2	Known to occur in Alameda, Contra Costa, Monterey, Marin, San Benito, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma counties (CNPS 2012).	Cismontane woodland, Coastal prairie, Coastal scrub, and Valley and foothill grasslands/often serpentinite. Elevations; three-410 meters (CNPS 2012).	February - April	No. The project site is outside the known geographic and elevation range for this species.
Fritilaria pluriflora Adobe lily	--/--/1B.2	Know to occur in Butte, Colusa, Glenn, Lake, Napa, Solano, Tehama and Yolo Counties (CNPS 2012).	Chaparral, Cismontane woodland, and Valley and foothill grassland (often adobe). Elevations; 60-705 meters (CNPS 2012).	February - April	No. The project site does not contain suitable soils for this species.
Harmonia hallii Hall's harmonia	--/--/1B.2	Known to occur in Colusa, Lake, Napa, and Yolo Counties (CNPS 2012).	Chaparral (serpentinite). Elevations; 500-900 meters (CNPS 2012).	April - June	No. The project site does not contain suitable soils or habitat for this species.
Hesperolinon bicarpellatum Two-carpellate western flax	--/--/1B.2	Known to occur in Lake, Napa and Sonoma counties (CNPS 2012).	Chaparral (serpentinite). Elevations; 60- 1,005 meters (CNPS 2012).	May - July	No. The project site does not contain suitable soils or habitat for this species.
Hesperolinon serpentinum Napa western flax	--/--/1B	Known to occur in Alameda, Lake, Napa, and Stanislaus counties (CNPS 2012).	Chaparral (serpentinite). Elevations; 50-800 meters (CNPS 2012).	May - July	No. The project site does not contain suitable soils or habitat for this species.

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Hesperolinon sharsmithiae Sharsmith's western flax	--/--/1B.2	Known to occur in Lake and Napa counties (CNPS, 2013).	Chaparral (serpentinite)	May-July	No. The project site does not contain suitable soils or habitat for this species.
Hesperolinon tehamense Tehama County western flax	--/--/1B.3	Known to occur in Alameda, Glenn, Lake, Napa, Stanislaus, Tehama, and Trinity counties (CNPS 2012).	Chaparral, Cismontane woodland (serpentinite). Elevations; 100-1,250 meters (CNPS 2012).	May - July	No. The project site does not contain suitable soils for this species.
Juncus luciensis Santa Lucia dwarf rush	--/--/1B.2	Known to occur in Lassen, Monterey, Modoc, Napa, Nevada, Placer, Plumas, Riverside, Santa Barbara, San Benito, San Diego, Shasta, and San Luis Obispo counties (CNPS 2012).	Chaparral, Great Basin scrub, Lower montane coniferous forest, Meadows and seeps, and Vernal pools. Elevations; 300–2,040 meters (CNPS 2012).	April - July	No. The project site does not contain suitable habitat for this species.
Lasthenia burkei Burke's goldfields	FE/CE/1B.1	Known to occur in Lake, Mendocino, Napa and Sonoma counties (CNPS 2012).	Meadows and seeps (mesic) and Vernal pools. Elevations; 15-600 meters (CNPS 2012).	April - June	No. The project site does not contain suitable habitat for this species.
Lasthenia conjugens *Contra Costa goldfields*	FE/--/1B.1	Known from Alameda, Contra Costa, Mendocino (though may be extirpated), Monterey, Marin, Napa, Santa Barbara (though may be extirpated), Santa Clara (though may be extirpated), and Sonoma counties (CNPS 2012).	Usually on mesic soils in cismontane woodland, Valley and foothill grassland, Vernal pools, and playas, occasionally alkaline. Elevations; zero-470 meters (CNPS 2012).	March - June	No. The project site is outside the known elevation range and does not contain suitable habitat for this species.
Layia septentrionalis Colusa layia	--/--/1B.2	Known to occur in Colusa, Glenn, Lake, Mendocino, Napa, Sonoma, Sutter, Tehama, and Yolo counties (CNPS 2012).	Chaparral, Cismontane woodland, Valley and foothill grassland (sandy, serpentine). Elevations; 100-1,095 meters (CNPS 2012).	April - May	No. The project site does not contain suitable soils or habitat for this species.
Leptosiphon jepsonii Jepson's leptosiphon	--/--/1B.2	Known to occur in Lake, Napa, and Sonoma counties (CNPS 2012).	Chaparral and Cismontane woodland (usually volcanic). Elevations; 100-500 meters (CNPS 2012).	March - May	Yes. See text.

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Lessingia hololeuca woolly-headed lessingia	--/--/3	Known to occur in Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo counties (CNPS 2012).	Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, and Valley and foothill grassland/clay, serpentinite. Elevations; 15-305 meters (CNPS 2012).	June - October	No. The project site does not contain suitable soils or habitat for this species.
Limnanthes floccosa ssp. *floccosa* Woolly meadowfoam	--/--/4.2	Known to occur in Butte, Lake, Lassen, Napa, Shasta, Siskiyou, Tehama, and Trinity counties in California, as well as Oregon (CNPS 2012).	Vernally mesic areas in Chaparral, Cismontane woodland, Valley and foothill grassland, and Vernal pools. Elevations; 60-1,335 meters (CNPS 2012).	March - June	No. The project site does not contain suitable habitat for this species.
Limnanthes vinculans Sebastopol meadowfoam	FE/CE/1B.1	Known to occur in Napa and Sonoma counties (CNPS 2012).	Meadows and seeps, Valley and foothill grassland, and Vernal pools (vernally mesic). Elevations; 15-305 meters (CNPS 2012).	April - May	No. The project site is outside the known elevation range and does not provide suitable habitat for this species.
Lupinus sericatus Cobb Mountain lupine	--/--/1B.2	Known to occur in Colusa, Lake, Napa, and Sonoma counties (CNPS 2012).	Broad-leafed upland forest, Chaparral, Cismontane woodland, and Lower montane coniferous forest. Elevations; 275-1,525 meters (CNPS 2012).	March - June	Yes. See text.
Micropus amphibolus Mount Diablo cottonweed	--/--/3.2	Known to occur in Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma counties (CNPS 2012).	Broadleafed upland forest, Chaparral, Cismontane woodland, and Valley and foothill grassland/rocky. Elevations; 45-825 meters (CNPS 2012).	March - May	Yes. See text.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	--/--/1B.1	Known to occur in Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Sutter, Tehama, and Yolo counties (CNPS 2012).	Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Valley and foothill grassland, Vernal pools (mesic). Elevations; five-1,740 meters (CNPS 2012).	April - July	No. The project site does not contain suitable habitat for this species.

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Navarretia leucocepahla ssp. *pauciflora* Few-flowered navarretia	--/--/1B.1	Known to occur in Lake and Napa counties (CNPS 2012).	Vernal pools on volcanic ash flow soils. Elevations; 400-855 meters (CNPS 2012).	May - June	No. The project site does not contain suitable soils or habitat for this species.
Navarretia leucocephala ssp. *plieantha* Many-flowered navarretia	FE/CE/1B.2	Known to occur in Lake and Sonoma counties (CNPS 2012).	Vernal pools (volcanic ash flow). Elevations; 30-950 meters (CNPS 2012).	May - June	No. The project site does not provide suitable soils or habitat for this species.
Navarretia myersii ssp. deminuta Small pincushion navarretia	--/--/1B.1	Known to occur in Lake County (CNPS 2012).	Vernal pools (clay loam). Elevations; 355-355 meters (CNPS 2012).	April - May	No. The project site is outside the known elevation and geographic range and does not provide suitable habitat for this species.
Navarretia rosulata Marin County navarretia	--/--/1B.2	Known to occur in Marin and Napa counties (CNPS 2012).	Closed-cone coniferous forest and Chaparral (serpentinite, rocky). Elevations range from 200-635 meters (CNPS 2012).	May - July	No. The project site does not provide suitable soils for this species.
Penstemon newberryi var. sonomensis Sonoma beardstongue	--/--/1B.3	Known from Lake, Napa, and Sonoma counties (CNPS 2012).	Chaparral (rocky). Elevations; 700-1,370 meters (CNPS 2012).	April - August	No. The project site does not provide suitable habitat for this species.
Plagiobothrys strictus Calistoga popcorn flower	FE/CT/1B	Known to occur in Napa County (CNPS 2012).	Meadows and seeps, Valley and foothill grassland, and Vernal pools (alkaline areas near thermal springs). Elevations; 90-160 meters (CNPS 2012).	March - June	No. The project site is outside the known elevation range and does not provide suitable habitat for this species.
Poa napensis Napa blue grass	FE/CE/1B.1	Known to occur in Napa County (CNPS 2012).	Meadows and seeps, Valley and foothill grassland (alkaline areas near thermal springs). Elevations; 100-200 meters (CNPS 2012).	May - August	No. The project site is outside the known elevation range and does not provide suitable soils for this species.
Sidalcea hickmanii ssp. *napensis* Napa checkerbloom	--/--/1B.1	Known to occur in Napa County (CNPS 2012).	Chaparral (rhyolitic soils). Elevations; 415-610 meters (CNPS, 2011).	April - June	No. The project site does not provide suitable soils or habitat for this species.
Sidalcea oregana ssp. hydrophia Marsh checkerbloom	--/--/1B.2	Known to occur in Glenn, Lake, Mendocino, and Napa counties (CNPS 2012).	Meadows and seeps and Riparian forests (mesic). Elevations; 1,100-2,300 meters (CNPS 2012).	July - August	No. The project site is outside the known elevation range and does not provide suitable habitat for this species.

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Sidalcea oregana ssp. valida Kenwood Marsh checkerbloom	FE/CE/1B.1	Known to occur in Sonoma County (CNPS 2012).	Marshes and swamps (freshwater). Elevations; 115-150 meters (CNPS 2012).	June - September	No. The project site does is outside the known geographic and elevation range and does not provide suitable habitat for this species.
Streptanthus batrachopus Tamalpais jewel-flower	--/--/1B.1	Known to occur in Lake and Marin counties (CNPS 2012).	Closed-cone coniferous forest and Chaparral (serpentinite). Elevations; 305-650 meters (CNPS 2012).	April - July	No. The project site does not provide suitable soils for this species.
Streptanthus brachiatus ssp. brachiatus Socrates Mine jewel-flower	--/--/1B.2	Known from Napa and Sonoma counties (CNPS 2012).	Closed-cone coniferous forest and Chaparral (usually serpentine). Elevations; 545-1,000 meters (CNPS 2012).	May - June	No. The project site does not contain suitable soils for this species.
Streptanthus hesperidis (Previously *Streptanthus breweri* var. *hesperidis*) Green jewel-flower	--/--/1B.2	Known from Glenn, Lake, Napa, and Sonoma counties (CNPS 2012).	Chaparral (openings) and Cismontane woodland (serpentinite, rocky). Elevations; 130-760 meters (CNPS 2012).	May - July	No. The project site does not provide suitable soils for this species.
Streptanthus morrisonii ssp. *elatus* Three Peaks jewel-flower	--/--/1B	Known to occur in Lake, Napa, and Sonoma counties (CNPS 2012).	Chaparral (serpentinite). Elevations; 90-815 meters (CNPS 2012).	June - September	No. The project site does not provide suitable soils for this species.
Streptanthus Vernalis Early jewel flower	--/--/1B.2	Know to occur in Lake county (CNPS 2012).	Closed-cone coniferous forest and Chaparral (serpentinite). Elevations; 610-610 meters (CNPS 2012).	March - May	No. The project site is outside the known geographic range and does not provide suitable soils for this species.
Trichostema ruygtii Napa Bluecurls	--/--/1B.2	Known to occur in Lake, Napa, and Solano counties (CNPS 2012).	Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland and Vernal pools. Elevations; 30-680 meters (CNPS 2012).	June - October	Yes. See text.

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Trifolium amoenum Showy rancheria clover (aka. showy Indian clover)	FE/--/1B.1	Known to occur in Marin, Napa (though may be extirpated), Santa Clara (though may be extirpated), Solano (though may be extirpated), and Sonoma (though may be extirpated/uncertain) counties (CNPS 2012).	Coastal bluff scrub and Valley and foothill grassland (sometimes serpentinite). Elevations; five-415 meters (CNPS 2012).	April - June	No. The project site does not contain suitable habitat for this species.
Trifolium hydrophilum (Previously *Trifolium depauperatum* var. *hydrophilum*) Saline clover	--/--/1B.2	Known to occur in Alameda, Colusa (?), Monterey, Napa, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, San Mateo, Solano, and Sonoma counties (CNPS 2012).	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), and Vernal pools. Elevations; zero-300 meters (CNPS 2012).	April - June	No. The project site is outside the known elevation range and does not provide suitable habitat for this species.
Viburnum ellipticum oval-leaved viburnum	--/--/2.3	Known to occur in Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, and Sonoma and Tehama counties in California and in Oregon and Washington states (CNPS 2012).	Chaparral, Cismontane woodland, and Lower montane coniferous forest. Elevations; 215-1,400 meters (CNPS 2012).	May - June	Yes. See text.

Animals					
Invertebrates					
Branchinecta conservatio Conservancy fairy shrimp	FE/--/--	Known from a few isolated populations distributed over a large portion of California's Central Valley and in southern California including Butte, Colusa, Glenn, Merced, Solano, Stanislaus, Tehama, Ventura, Yolo, and Yuba counties.	Ephemeral wetland habitats and vernal pools on clay, volcanic, and alluvial soils within annual grassland and pine forests. Elevations range from 5-1,700 meters.	Wet season: typically November-April (adults) Dry season: typically May-October (cysts)	No. The project site does not contain suitable habitat for this species.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT/--/--	Know throughout the riparian forests of the Central Valley from Redding to Bakersfield. Counties include Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Kern, Madera, Mariposa, Merced, Napa, Placer, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Yolo, and Yuba.	Riparian forest communities. Exclusive host plant is elderberry (*Sambucus species*), which must have stems ≥ 1-inch diameter for the beetle. Elevations range from 0-762 meters.	Year round	No. The project site does not contain suitable habitat for this species.
Syncaris pacifica California freshwater shrimp	FE/CE/--	Known only throughout Marin, Napa, and Sonoma counties.	Small, low-gradient, perennial coastal streams. Prefers relatively shallow streams with depths of 12-36 inches, exposed live roots of trees such as alder and willow, undercut banks greater than six inches, overhanging woody debris or stream vegetation and vines. Elevations range from 0-116 meters.	Consult Agency	No. The project site does not provide suitable habitat for this species.

Fish					
Hypomesus transpacificus Delta smelt	FT/CT/--	Occurs almost exclusively in the Sacramento-San Joaquin estuary, from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties. May also occur in the San Francisco Bay.	Estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	Consult Agency	No. The project site is outside the known geographic range and does not contain suitable habitat for this species.
Oncorhynchus kisutch Coho salmon Central California Coast ESU	FE/CE/--	This ESU is known to occur throughout the major rivers and tributaries from the Noyo River, south of Fort Bragg, to the San Lorenzo River, east of Santa Cruz. The distribution includes Marin, Mendocino, San Francisco, San Mateo, Santa Cruz, and Sonoma counties.	Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambeds.	November – February	No. The project site does not contain suitable habitat for this species.
Oncorhynchus mykiss irideus steelhead Central California Coast ESU	FT/--/--	Central California Coastal ESU, spawns in drainages from the Russian River basin, Sonoma and Mendocino Counties, to Soquel Creek, Santa Cruz County (including the San Francisco Bay basin, but not the Sacramento and San Joaquin Rivers or their tributaries).	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	No. The project site does not provide suitable habitat for this species.
Oncorhynchus mykiss Steelhead Central Valley ESU	FT/--/--	Spawn in the Sacramento and San Joaquin rivers and tributaries before migrating to the Delta and Bay Area.	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample cover from riparian vegetation or overhanging banks. Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	No. The project site does not contain suitable habitat for this species.

Oncorhynchus tshawytscha Chinook salmon California coastal ESU	FT/--/--	California Coastal ESU spawns in coastal drainages from Redwood Creek in Humboldt County to the Russian River in Sonoma and Mendocino Counties (includes only naturally spawned fall and spring Chinook salmon)	Spawning: streams with pool and riffle complexes. For successful breeding, require cold water and gravelly streambed.	Consult Agency	No. The project site does not contain suitable habitat for this species.
Oncorhynchus tshawytscha Chinook salmon Central Valley spring-run	FT/CT/--	Spawn in the Sacramento river and some of its tributaries. Juveniles migrate from spawning grounds to the Pacific Ocean.	Spawning occurs in large deep pools in tributaries with moderate velocities and a large bubble curtain at the head.	Consult Agency	No. The project site does not contain suitable habitat for this species.
Oncorhynchus tshawytscha Chinook salmon winter-run, Sacramento River	FE/CE/--	Spawn in the upper Sacramento River. Juveniles migrate from spawning grounds to the Pacific Ocean.	Returns to the Upper Sacramento River in the winter but delay spawning until spring and summer. Juveniles spend 5-9 months in the river and estuary before entering the ocean.	Consult Agency	No. The project site does not contain suitable habitat for this species.
Amphibians					
Rana aurora draytonii California red-legged frog	FT/CSC/--	Known populations from Alameda, San Francisco, Placer, Riverside, Santa Barbara, San Luis Obispo, San Mateo, Santa Cruz, Santa Clara, Marin, Sonoma, and Contra Costa counties.	Found in lowlands and foothills in or near permanent sources of deep water with dense shrubby or emergent riparian vegetation.	November – March (breeding) June - August (non-breeding)	No. The project site does not provide suitable habitat for this species.
Rana boylii Foothill yellow-legged frog	--/CSC/--	Ranges from northern Oregon west of the Cascades south along the coast to the San Gabriel mountains, and south along the western side of the Sierra Nevada mountains to Kern county; known populations from Lake County.	Found in woodland, chaparral, and forests associated with slow and gravelly streams and rivers.	March - June (breeding) July - September (non-breeding)	No. The project site does not provide suitable habitat for this species.

Reptiles					
Emys marmorata Western pond turtle	--/CSC/--	West coast of North America from southern Washington, USA to northern Baja California, Mexico. Many populations have been extirpated and others continue to decline throughout the range, especially in southern California.	Requires aquatic habitats with suitable basking sites. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	All year	No. The project site does not provide suitable habitat for this species.
Birds					
Accipiter striatus Sharp-shinned hawk	--/--/--	California-wide	Nests in dense, even-aged, single-layered, forest canopy including Ponderosa pine, black oak riparian deciduous, mixed conifer, and Jeffery pine forests. Prefers but does not require nearby riparian habitat. Usually nests within 275 feet of water.	All Year	No. The project site does not contain suitable habitat for this species.
Agelaius tricolor tricolored blackbird	--/CSC/--	Restricted to the Central Valley and surrounding foothills, throughout coastal and some inland localities in southern California, and scattered sites in Oregon, western Nevada, central Washington, and western coastal Baja California.	Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water.	All Year	No. The project site does not provide suitable habitat for this species.
Athene cinicularia Burrowing owl	--/CSC/--	Formerly common within the described habitats throughout the state except the northwest coastal forests and high mountains.	Yearlong resident of open, dry grassland and desert habitats. Occur in a variety of upland habitats including open grassland, prairie, plains, savannah, agricultural fields, and other ruderal areas such as vacant lots and wasteyards.	All Year	No. The project site does not provide suitable habitat for this species.

Cypseloides niger black swift	--/CSC/--	Breeds in the central and southern Sierra, the coastal cliffs and mountains of San Mateo, Santa Cruz, and Monterey counties, the San Gabriel, San Bernardino, and San Jacinto mountains of southern California, and within a small region of the Cascade Range.	Steep cliffs or ocean bluffs with ledges, cavities or cracks for nesting along ocean shore, inland deep canyons and often behind waterfalls. Forages in a wide variety of habitats including forests, canyons, valleys, and plains. Breeding elevations range from zero-2285 meters.	May-July	No. The project site does not provide suitable habitat for this species.
Elanus leucurus white-tailed kite	**--/--/--**	Permanent resident of coastal and valley lowlands.	Habitats include savanna, open woodland, marshes, partially cleared lands and cultivated fields, mostly in lowland situations. Nesting occurs in trees.	Year round	Yes. See text.
Falco mexicanus Prairie falcon	--/--/--	Not found along the coast.	Distributed from annual grasslands to alpine meadows, but associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub. Requires cliffs, bluffs, or rock outcrop to nest in.	All Year	No. While the project site may provide marginal foraging habitat, no breeding habitat for this species occurs on the project site.
Falco peregrinus anatum American peregrine falcon	FD/CE/--	Active nesting sites known along the coast north of Santa Barbara and other mountains in northern California.	Breeds mostly in woodland, forest, and coastal habitats near water on high cliffs or banks. Will nest on man-made structures and in the hollows of old trees or open tops of cypress, sycamore or cottonwood trees 50-90 feet above the ground.	Year Round (some migrate)	No. The project site does not provide suitable habitat for this species.

Haliaeetus leucocephalus bald eagle	FD/CE/--	Nests in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, Humboldt, and Trinity Counties. Winters throughout most of California.	Found near ocean shorelines, lakes, reservoirs, river systems, and coastal wetlands. Usually less than 2 km to water that offers foraging opportunities. Suitable foraging habitat consists of large bodies of water or rivers with abundant fish and adjacent perching sites such as snags or large trees.	All year	No. The project site does not provide suitable habitat for this species.
Progne subis Purple martin	--/CSC/--	Known from Mendocino, Napa, Sonoma, Lake, Riverside, Sacramento, San Luis Obispo, Placer, Shasta, San Diego and Monterey Counties.	Found in a variety of wooded, low-elevations habitats. Uses valley foothill and montane hardwood, valley foothill and montane hardwood-conifer, and riparian habitats. Also occurs in coniferous habitats, including closed-cone pine-cypress, ponderosa pine, Douglas-fir, and redwood. Inhabits more open areas in winter.	All Year	Yes. See text.

Strix occidentalis caurina northern spotted owl	FT/--/--	Geographic range extends from British Colombia to northwestern California south to San Francisco. The breeding range includes the Cascade Range, North Coast Ranges, and the Sierra Nevada. Some breeding populations also occur in the Transverse Ranges and Peninsular Ranges.	Resides in mixed conifer, redwood, and Douglas-fir habitats, from sea level up to approximately 2300 meters. Appear to prefer old-growth forests, but use of managed (previously logged) lands is not uncommon. Owls do not appear to use logged habitat until approximately 60 years after logging unless some larger trees or snags remain after logging. Nesting habitat is a tree or snag cavity, or the broken top of a large tree. Requires a nearby, permanent source of water. Foraging habitat consists of any forest habitat with sufficient prey (e.g. flying squirrels, mice, and voles).	All Year	Yes. See text.
Mammals					
Antrozous pallidus pallid bat	--/CSC/--	Locally common species at low elevations. It occurs throughout California except for the high Sierra Nevada from Shasta to Kern cos., and the northwestern corner of the state from Del Norte and western Siskiyou cos. to northern Mendocino Co.	Habitats occupied include grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests, generally below 2,000 meters. The species is most common in open, dry habitats with rocky areas for roosting. Roosts also include cliffs, abandoned buildings, bird boxes, and under bridges.	All Year	Yes. See text.
Corynorhinus townsendii Townsend's big-eared bat	--/CSC/--	Occurs throughout California, excluding subalpine and alpine habitats. Its range extends through Mexico to British Columbia and the Rocky Mountain states. Also occurs in several regions of the central Appalachians.	Requires caves, mines, tunnels, buildings, or other man-made structures for roosting. Hibernation sites must be cool and cold, but above freezing.	All year	No. The project site does not contain suitable roosting habitat for this species.

Lasionycteris noctivagans silver-haired bat	--/CSC/--	Known to occur from the Oregon border south along the coast to San Francisco Bay, and along the Sierra Nevada and Great Basin region to Inyo County. It also occurs in southern California from Ventura and San Bernardino counties south to Mexico and on some of the Channel Islands. This species also is recorded in Sacramento, Stanislaus, Monterey and Yolo counties.	Primarily a coastal and montane forest dweller feeding over streams, ponds and open brushy areas. Roosts in hollow trees, beneath exfoliating bark, abandoned woodpecker holes and rarely under rocks. Needs drinking water.	All Year	No. The project site does not contain suitable habitat for this species. No water source for this species occurs on the project site.
Lasiurus cinereus hoary bat	--/CSC/--	May be found at any location in California, although distribution patchy in southeastern deserts.	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Preferred sites are hidden from above, with few branches below, and have ground cover of low reflectivity. Females and young tend to roost at higher sites in trees. Feeds primarily on moths. Requires water.	All Year	Yes. See text.

Myotis evotis Long-eared myotis	--/--/--	Avoids the arid Central Valley and hot deserts, occurring along the entire coast.	The species occurs in nearly all brush, woodland, and forest habitats, from sea level to at least 2700 m (9000 ft), but coniferous woodlands and forests seem to be preferred. It is most common in ponderosa pine woodlands and is also found in piñon-juniper woodlands and subalpine forests (CDFG, 2012). This species utilizes dead snags and is typically found at elevations between 7,000 to 8,500 ft. (BCI, 2013).	Summer	No. The project site occurs outside of the elevation range of this species.
Myotis thysanodes Fringed myotis	--/--/--	The fringed myotis is widespread in California, occurring in all but the Central Valley and Colorado and Mojave deserts.	Habitats are pinyon-juniper, valley foothill hardwood and hardwood-conifer, generally at 1300-2200 meters (4000-7000 ft).	April-September	No. The project site occurs outside of the elevation range of this species.
Myotis yumanensis Yuma myotis bat	--/--/--	Found in a wide variety of habitats ranging from sea level to 11,000 feet.	Optimal habitats are open forests and woodlands with sources of water over which to feed; roosts in buildings, mines, caves, or crevices.	All year	No. The project site does not contain suitable habitat for this species. No water sources for this species occur on the project site.

Habitats					
Coastal and Valley Freshwater Marsh		Occasional along the coast and in coastal valleys near river mouths and around the margins of lakes and springs. Most extensive in the upper portion of the Sacramento-San Joaquin River Delta. Common in the Sacramento and San Joaquin Valleys in river oxbows and other areas on the flood plain. Occasional along the Colorado River on the California-Arizona border. Now much reduced in area through its entire range.	Quiet sites (lacking significant current) permanently flooded by fresh water (rather than brackish, alkaline, or variable). Prolonged saturation permits accumulation of deep, peaty soils.		No. There is no marsh habitat on the project site.
Northern Vernal Pools		Solano County, Sacramento County, Sacramento County, Riverside County, Tehama County, Butte County			No. There is no vernal pool habitat on the project site.
Serpentine Bunchgrass		Scattered widely through the Coast Ranges, less common in the Sierra Nevada and southern California mountains.	Open grassland dominated by perennial bunchgrasses. Total cover typically is low, but is markedly dominated by native species.		No. The project site does not have suitable soils to support this habitat type.
Valley Needlegrass Grassland					No. The grasslands onsite dominated by nonnative species and do not meet the criteria for this habitat type.

FEDERAL: United States Fish and Wildlife Service and National Marine Fisheries Service

FE Federally Endangered
FT Federally Threatened
FC Federal Candidate for Listing

STATE: California Department of Fish and Game

CE California Listed Endangered
CR California Listed Rare
CT California Listed Threatened
CSC California Species of Special Concern

CNPS: California Native Plant Society

List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3 Plants About Which We Need More Information - A Review List
List 4 Plants of limited distribution

Threat Ranks

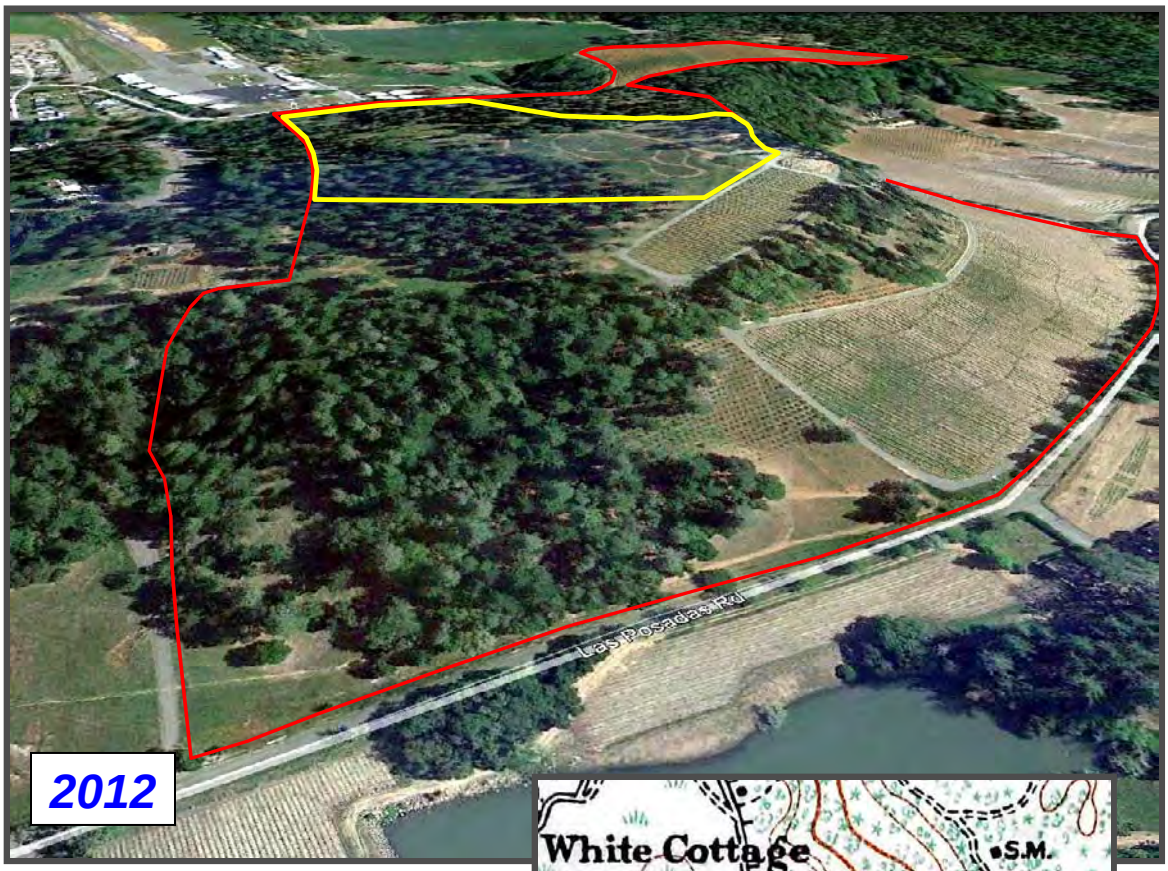
0.1-Seriously threatened in California (high degree/immediacy of threat)
0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)

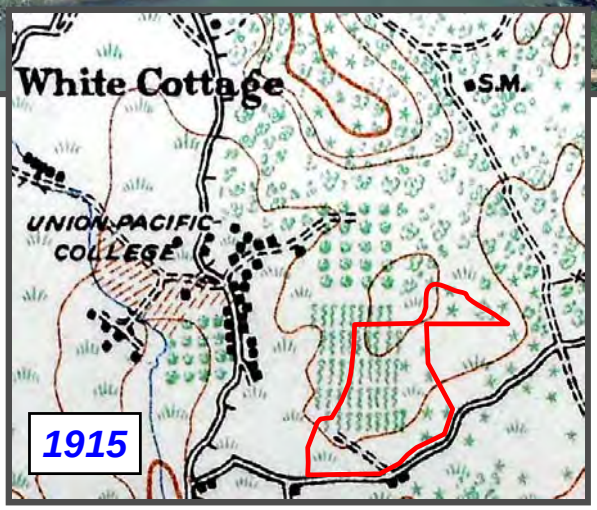
Sources: CNPS, 2012; CNPS, 2013; BCI, 2013

APPENDIX F

Erosion, Sedimentation and Hydrologic Assessment

Erosion, Sedimentation, & Hydrologic Assessment
Lucia Abreu Vineyard Howell Mountain Conversion Project, #P05-0376-ECPA, Napa County, California





Prepared For:

Abreu

David Abreu Vineyard Management
P.O. Box 89
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Prepared By:

BALANCE GEO
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June 2013

Erosion, Sedimentation, & Hydrologic Assessment
Lucia Abreu Vineyard Howell Mountain Conversion Project, #P05-0376-ECPA, Napa County, California

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June 2013

Note: Main front cover photograph courtesy of Google, Inc.

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Hillslope and Fluvial Geomorphology • Landform Analysis and Geomorphic Mapping • Erosion and Sedimentation • Water, Sediment, and Biogenic GHG Balance Assessment

June 30, 2013

David Abreu
David Abreu Vineyard Management, Inc.
P.O. Box 89
Rutherford, California 94573

Subject: Erosion, Sedimentation, & Hydrologic Assessment, Lucia Abreu Vineyard Howell Mountain Conversion Project, #P05-0376-ECPA, Napa County, California.

Dear Mr. Abreu,

At your request, I have reviewed in depth the concerns and technical comments made by the public reviewers in April 2010 on the updated Initial Study/Proposed Mitigated Negative Declaration (IS/MND) for the proposed timber conversion and vineyard development project (project) at Lucia Abreu Vineyard Howell Mountain (property). The updated IS/MND was released by CAL FIRE in March 2010, and reflected the 2008 revisions made to the original 2005 vineyard project Erosion Control Plan and IS/MND. The public water quality concerns from 2010 were addressed this year by providing relevant clarifications in this erosion, sedimentation, and hydrologic assessment report, and by carrying out more in-depth evaluations of the pre-project and post-project water balance and hillslope stability. Additionally, past natural disturbances and land-use activities on the property and their geomorphic response were documented in more detail, in order to strengthen the previously established rationale in support of the proposed vineyard development. As was done previously, these qualitative and quantitative evaluations focused on the primary and secondary on-site and off-site effects of the proposed project. To address the forthcoming San Francisco Bay Water Control Quality Control Board's pollutant discharge requirements for vineyard properties in the Napa River/Sonoma Creek watersheds, further minor modifications to the proposed project's Erosion Control Plan are recommended.

The conclusions and professional opinions presented in this report were developed in accordance with generally accepted engineering geologic principles and practices.

Feel free to contact me, by phone or email, if you have any questions. Thank you.

Sincerely,

Martin Trso
California Professional Geologist No. 7216 (Expiration 6/30/2015)
Certified Professional Geologist No. 11475 (Expiration 12/31/2013)
Certified Professional in Erosion and Sediment Control No. 5590 (Expiration 1/20/2014)
Qualified Napa County CEQA Consultant (Geology/Hydrology)

Cc: Peter Bontadelli, CEQA Project Manager, Analytical Environmental Services Corporation
Drew Aspegren, P.E., Project Engineer, Napa Valley Vineyard Engineering, Inc.
Scott Butler, RPF, Project Forester, Environmental Resources Management

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BACKGROUND AND OVERVIEW OF RESULTS

This report was completed by Balance Geo for David Abreu Vineyard Management, Inc. (DAVM). It presents the results of an erosion, sedimentation, sediment budget, hydrologic, and hillslope stability assessment. The assessment evaluated the erosion, sedimentation, and runoff impacts of the proposed Lucia Abreu Vineyard Howell Mountain vineyard development project (project), located in Angwin, Napa County, California. The ±75.8-acre (0.31 km^2) volcanic tableland property is owned by DAVM, also a project Applicant. The property is located on parcels APNs 024-300-077 and 024-080-028, which were purchased by DAVM from their previous owners, J. Abbott Family and Pacific Union College (PUC), in 2000 and 2002 respectively. The project involves the timber harvest and mixed timber and grassland conversion of a 17-acre hilltop (tabletop) portion of the property into a vineyard.

My first evaluation was carried out in a 1.5-year period from late 2006 to early 2008, and then more recently in the three-quarter-year period in 2012. The initial evaluation included a detailed review of the original Initial Study/Proposed Mitigated Negative Declaration (IS/MND)[1] documentation package, which was prepared for the California Department of Forestry and Fire (CAL FIRE)[2] by the project forester, Environmental Resources Management (ERM 2005). Also reviewed at the time were the documents prepared by the public reviewers, who in April 2006 objected to the approval of the proposed project based on their own technical evaluation.

Acknowledging the concerns put forth by the public reviewers, CAL FIRE recommended to the Applicant in April 2006 that the project be revised. As part of the project revision effort by the Applicant, I evaluated the effects of the original Erosion Control Plan (ECP) #P05-0376-ECPA prepared by the project engineer, Napa Valley Vineyard Engineering, Inc. (NVVE 2005). Furthermore, I identified a suite of project mitigation alternatives as they related to soil erosion, hydrologic connectivity, hillslope stability, storm runoff, and in-stream sedimentation. In June 2007, the most conservative of the proposed project erosion and runoff mitigation alternatives was adopted by DAVM, which led to the development of the modified project ECP (NVVE 2008), and, later, to the update and recirculation of the original Initial Study/Proposed Mitigated Negative Declaration (ERM 2010). In course of the project revisions and the preparation of the updated IS/MND, CAL FIRE performed a review of the underlying geologic, hydrologic, erosion/sedimentation, and land-use history and geomorphic-response evaluations (Martin Trso, P.G. 2007, 2008a), fully concurring with the methodologies applied, their conclusions, and their implications to the original project ECP (CAL FIRE 2006, 2009, 2010).

However, additional concerns were raised by the public reviewers in April 2010, which further questioned the details of the geologic and hydrologic evaluations (as well as the modified project ECP), the history of timber management during the DAVM ownership, and the updated IS/MND. Specifically, the reviewers were concerned with hillslope stability downslope from the southwestern end of the property hilltop, and with the related potential for secondary storm runoff generated erosion and in-stream sedimentation. These concerns were acknowledged by CAL FIRE, which in June 2010 recommended to the Applicant that an Environmental Impact Report (EIR) be prepared for the proposed project. The EIR process was initiated in February 2012 by Analytical Environmental Services Corporation (AES), which on behalf of DAVM requested that the key 2010 public concerns be thoroughly addressed, and, if necessary, the proposed project ECP be further adjusted accordingly. As a result, in March, April, November, and December 2012, I performed visual monitoring of erosion, hillslope soil-moisture, hydrologic connectivity, and stormwater turbidity at the property and its environs during eight storm events, and

[1] The original Initial Study and the Proposed Mitigated Negative Declaration was prepared pursuant to the California Environmental Quality Act (CEQA 1970), and State CEQA Guidelines (California Code of Regulations CCR, Title 14, Division 6, Chapter 3 (CCR 2010).

[2] CAL FIRE, as defined by CEQA, is the Lead Agency for the proposed project.

carried out more in-depth evaluations of the pre-project and post-project water balance and hillslope stability. Additionally, I have documented in more detail the past natural disturbances and land-use activities on the property and their geomorphic response, focusing on both the DAVM (post-2001) and pre-DAVM periods. Based on these supplemental technical evaluations, and input from the project forester and DAVM's viticulturalist, several iterations took place from March 2012 to July 2012 to further update the project proposal.

The Abreu property is located within the 34-km^2 (8,400 acres) upper watershed of Conn Creek, a tributary to Napa River, 0.5 kilometers (0.3 miles) west from the drainage divide with the Moore Creek watershed, and 0.8 kilometers (0.5 miles) east from upper Conn Creek (**Figure 1**). It is located immediately southeast from the Pacific Union College (PUC) in Angwin, and is comprised of 46.4 acres of a nearly flat hilltop (tabletop) of Howell Mountain, and 29.4 acres of steep-to-very steep, dominantly divergent hillsides below the hilltop's edge. The property hilltop is forested and mantled with shallow soils and variably thick organic litter. It is drained by four zero-order unchanneled low-relief catchments, and experiences no storm runoff under the current conditions. The proposed 17-acre vineyard project site is located in the middle of the flat hilltop. Due to its elevation and tableland topography, the flat hilltop receives no storm runoff or sediment supply from the neighboring properties. Conversely, due to the geologic structure of Howell Mountain, the flat hilltop is naturally isolated for the delivery of storm runoff and sediment supply to the adjacent downhill properties and waterbodies nearby.

Based on historical analysis (this study), the property has over a hundred-year history of timber-management and agricultural use. The historical land-use has involved the following: agricultural land expansion and the associated deforestation of old-growth forest over nearly the entire property in the 1900s through the 1930s (including 40 acres of the property hilltop);[3] about twenty years of grape growing prior to the enforcement of Prohibition; subsequent orchard operations and selective timber removal over 80 years prior to DAVM ownership; and limited mixed timber- and grassland-to-vineyard conversion during the period 1995-2005. Under the existing conditions, the property supports the following: 18.0 acres of recently developed hilltop and hillside vineyards;[4] 11.7 acres of hilltop, hillside, and footslope non-native grassland; 42.6 acres of hilltop and hillside second-growth conifer/hardwood forest; 3,840 meters (12,600 feet) or 2.3 acres of unpaved roads, trails, and vineyard avenues; and 1,800 meters (6,000 feet) or 1.2 acres of the rocked appurtenant road in the southern portion of the property.

Based on the aerial photographic analysis, the review of anecdotal evidence, and field surveys (this study in 2006-2008, and 2012), the property has not experienced any landslides or soil degradation, or caused water quality impacts to the off-site properties, in response to the past natural disturbances and the pervasive and extensive pre-DAVM ownership land-use activities.[5]

The previously proposed project involved three hilltop vineyard blocks: a 1.8-acre Block A, a 13.0-acre Block B, and a 2.2-acre Block C (NVVE 2005, 2008). The current proposal has eliminated Blocks A and C, and expanded Block B along its original perimeter, from 13.0 to 17.0 acres. Block B has an average gradient of 6.5% (NVVE 2013). The currently proposed mixed timber- and grassland-to-vineyard conversion will involve the following: the conversion of existing sparse non-native grassland over an area of 6.3 acres; the removal of moderate- and high-density second-growth forest over an area of 10.7 acres; soil ripping; the abandonment of 1,080 meters (3,540 feet, or 0.6 acres) of old hilltop trails; the installation of several permanent and temporary erosion and runoff control measures (i.e. hilltop runoff detention ponds and the associated concrete weirs and earth berm water spreaders, water bars, etc.); the

[3] The historic agricultural deforestation also involved the entire area of the proposed vineyard Block B.
[4] These include the North Abreu (7.1 acres), South Abbott-Abreu (1.8 acres), and Southeast Abbott-Abreu (9.1 acres) vineyards. The North Abreu and South Abbott-Abreu vineyards are located within the property hilltop.
[5] See Section 3.1 for additional details.

development and maintenance of 70%-and-higher cover crop within the proposed vineyard Block B in the winter periods; and the enhancement of ground cover outside the existing and the proposed vineyard within the hilltop portion of the property. The hilltop detention ponds and the ground cover enhancement constitute the mitigations adopted during the revision of the original ECP (NVVE 2008). As stated above, the proposed vineyard Block B is naturally isolated for the delivery of storm runoff and sediment supply to the remaining parts of the Abreu property, as well as all its neighboring properties.

Based on the updated erosion, sedimentation, and hydrologic assessment (this study), a 53.9% decrease in surface (soil) erosion will be achieved within the proposed vineyard Block B, and a 23.3% decrease within the property trails. In total, there will be a 7.4% decrease in erosion across the entire Abreu property. Additionally, as a result of the proposed vineyard development and mitigation, there will be a 22.5% decrease in the 100-year peak discharges combined across the property flat hilltop. Following the development of the proposed vineyard Block B, the estimated long-term water use of the property's four vineyards corresponds to 47.2% of the property's allowable groundwater allotment and 17.9% of the property's estimated annual groundwater recharge. The property's flat hilltop and steep hillslopes are predicted to remain unconditionally stable despite a reduction in root cohesion, or the estimated 3% increase in the groundwater recharge associated with the proposed timber clearing and the grassland- and timber-to vineyard conversion.

The recent (i.e. 1995-2005) and the currently proposed hilltop agricultural re-conversions amount to about 19 acres, or 53% less compared to the deforestation of the 40 acres of the property hilltop in the early 1900s. It is estimated that the early land clearing of old-growth forest would have brought about six times the increase in the groundwater recharge, and thus the potential for hillslope instability. However, as stated above, no landsliding, soil degradation, or water quality impacts off-site have been documented in response to the early 1900s land-use activities on the property hilltop. In summary, the currently proposed project at Lucia Abreu Vineyard Howell Mountain is expected to cause no adverse impacts to soils, hillslope stability, storm runoff, groundwater supply, primary and secondary (peak-flow generated) erosion and sediment delivery, in-stream sedimentation, and aquatic species.

This assessment supplements the geology, soils, and hydrology evaluations required by CAL FIRE, and the Napa County Planning, Building & Environmental Services (formerly Napa County Department of Conservation, Development and Planning). The assessment also addresses Napa County Code 18.108.027 (F), which requires a geotechnical report for projects in Sensitive Domestic Water Supply Drainages, as well as the forthcoming pollutant discharge requirements for vineyard properties in the Napa River/Sonoma Creek watersheds (Region 2 Water Board 2012).

The updated erosion, sedimentation, and hydrologic assessment report presents the results of (1) the review of geology and soils reports, topographic maps, aerial photographs, and other data applicable to the property and its environs; (2) geomorphic field surveys at the property and adjacent areas, as well as the monitoring of soil, vegetative cover, and runoff conditions over six years; (3) a supplemental hillslope stability analysis; (4) surface erosion, sediment delivery, and sediment yield calculations; and (5) a surface water hydrologic analysis, including water balance. See **Figures 1 through 8**, which illustrate the property setting, physiographic and vegetation conditions, existing and proposed vineyards, modeled and existing hydrologic pathways, sediment budget and hydrologic analyses catchments, the prediction of hillslope stability, and the past and recent conditions as captured by aerial photography and topographic maps during the period 1915-2012. See **Figures 9 through 74**, which document the property ground conditions. See **Appendix A** for details of the current and post-project conditions surface erosion calculations, **Appendix B** for details of the current and post-project peak discharge calculations, **Appendix C** for photographic monitoring during the March, April, November, and December 2012 storm runoff events, and **Appendix D** for details of the supplemental hillslope stability analysis.

1 PURPOSE AND SCOPE

According to the federal Clean Water Act Section 303(d) (Cal/EPA 1990), the mainstem Napa River has been listed as sediment-impaired. The listing was confirmed and refined on the Napa River Basin Sediment Total Maximum Daily Load (TMDL), concluding that the mainstem Napa River and its tributaries exhibit conditions of systemic sediment impairment, notably with regard to sand and silt grain-size fractions, causing a serious increase in mortality at steelhead spawning sites (Stillwater Sciences, Inc. and W.E. Dietrich 2002; Region 2 Water Board 2009). Gravel and turbidity were not found to be significantly limiting the feeding of steelhead. Similar concerns were raised in the Expert Witness Report on the cumulative impacts on fisheries resources in Napa County (Abbott and Coats 2001).

The property is located immediately southeast of the Pacific Union College in Angwin, on the edge of a nearly flat volcanic plateau of Howell Mountain. As is presented in detail in Section 3.6, over 80% of the property area remains naturally disconnected for the delivery of storm runoff and sediment supply to the adjacent downslope properties and waterbodies. This is due to the topographically elevated nature of the flat plateau, and the forest floor environment, which has a high rate of rainfall infiltration into its soils. Via an engineered agricultural drainage system, the small remaining portion of the property drains into upper Conn Creek and Lake Hennessey, which is a municipal drinking water supply reservoir for the City of Napa. The areas of potential downstream impacts include a 9.8-kilometer-long (6.1 miles) reach of upper Conn Creek, Lake Hennessey, and a small on-channel reservoir located between the Abreu property and upper Conn Creek (**Figures 1 and 3**). Habitat surveys (Leidy et al. 2006) indicate that upper Conn Creek supports suitable steelhead habitat for spawning and rearing. However, direct observations, electrofishing, and other fish-sampling methods provide evidence that the steelhead and other fish populations have declined in the upper Conn Creek (Leidy et al. 2006). The upper Conn Creek watershed is connected to mainstem Napa River through the spillage of Lake Hennessey and the supply of clay-size materials.

The objective of this assessment is to evaluate and quantify (1) the erosion, sedimentation, and runoff baseline conditions at the property and the project site, (2) the ability of the proposed project Erosion Control Plan #P05-0376-ECPA (NVVE 2013) to successfully control direct and indirect on-site and off-site vineyard-related storm runoff, erosion, and sediment delivery, and (3) the on-site and cumulative impacts of the proposed project. To address sediment-related concerns pertaining to fish habitat limiting factors and water quality in upper Conn Creek and Lake Hennessey, the sediment budget for the property and relevant off-site watersheds was partitioned by particle size classes as follows: (1) >2 milimeters (mm), represented by particles ranging from gravel to small boulders (gravel), (2) 0.064-2 mm (sand), (3) 0.004-0.064 mm (silt), and (4) <0.004 mm (clay).

The updated erosion, sedimentation, hydrologic, and geotechnical assessments presented in this report supplement the updated IS/MND (ERM 2010), by providing additional clarifications of the results of the 2006-2008 erosion, sedimentation, and hydrologic assessments (Martin Trso, P.G. 2008a), and further refine the proposed vineyard development project during its EIR phase.

2 METHODOLOGY

The erosion/sedimentation/hydrologic assessment fundamentally builds on: (1) the review of geologic literature and topographic maps for the property and its environs, the Napa County soil survey (USDA-NRCS and UC Cooperative Extension Service 1978), and the proposed project ECP (NVVE 2013); (2) the assessment of the geology, geomorphic landforms, and the depth and nature of soils at the property and its environs; (3) the assessment of natural disturbances and land-use history at the property since about 1900 (including the DAVM ownership post-2001), and the corresponding geomorphic response on-site and off-site; (4) the field-mapping of natural and management-related sediment sources, hydrologic

pathways, and the ground-cover conditions at the property; (5) the assessment of hydrologic connectivity across the property, and between the property, upper Conn Creek, and Lake Hennessey; (6) the quantification of sediment delivery, by grain size, from the mapped sediment sources (both within and outside the proposed vineyard Block B) at the property, using the application of the Napa County-specific Universal Soil Loss Equation USLE (USDA-NRCS 1994); (7) the quantification of storm peak discharge, using the small-watershed hydrologic model WinTR-55 (USDA-NRCS 2003); (8) an evaluation of hillslope stability at and around the property, using the SHALSTAB model (Montgomery and Dietrich 1994, Dietrich et al. 1995, Dietrich and Montgomery 1998, Dietrich et al. 1998a, Dietrich et al. 2001), which maps patterns of potential instability based on topographic and hydrologic conditions, as well as using earthquake ground motion analysis; and (9) the development of sediment and water budgets for the current and post-project conditions. The effects of the proposed ECP (NVVE 2013) have been factored into the USLE and WinTR-55 calculations of the post-project conditions.

The delineation of hydrologic pathways (i.e. the channel network) was accomplished by GIS-DTM modeling using the LiDAR (Light Detection and Ranging) 1-meter digital elevation model (DEM) data (National Center of Airborne Laser Mapping 2003, UC Berkeley 2004), and by documenting hillside and channel runoff conditions during rainstorms. The GIS-DTM model of the channel network (including topographic shaded relief) was used to guide field-mapping of the channel heads, ephemeral watercourses, hillside overland flow areas (OFAs), road-watercourse crossings, and hydrologic connectivity on-site and off-site. It assumed vegetation-free conditions, thus conservatively delineating the maximum theoretical extent of the channel network on-site and off-site. The OFAs correspond to areas where Hortonian and saturated sheet flow and concentrated flow pathways develop on hillsides and deliver surface-erosion materials (sheet wash) to watercourses during very wet winters or high-intensity and long-duration storms. The sediment source analysis involved identifying hillslope and trail- and road-related surface erosion, gullies, and soil slumps, and determining the extent to which the channel network is subject to chronic sediment delivery from shallow soil creep. 1:24,000 scale photographic series for the years 1940 (**Figure 7a**), 1952 (**Figure 7b**), 1968 (**Figure 7c**), 1984 (**Figure 7d**), 1987 (**Figure 7e**), 1993 (**Figure 7f**), 1999 (**Figure 7g**), and 2002 (**Figure 7h**) were inspected under the stereoscope to identify any past landslides at the property.

A total of five day-long site visits and twenty shorter site visits—all during and shortly following rainstorms—were made to the Abreu property. The surveys and analyses of the current and post-project conditions were carried out within two periods: the period from November 2006 to March 2008, in support of the updated IS/MND (ERM 2010), and the period March-December 2012, in support of the additional CEQA analysis and the Environmental Impact Report.

3 STUDY AREA CONDITIONS

3.1 Property, Land-Use History, and Disturbance Characterization

The Abreu property is located within the 34-km^2 (8,400 acres) upper Conn Creek watershed in Napa County, California, 0.5 kilometers (0.3 miles) west of the drainage divide with the Moore Creek watershed (this includes the 798-acre Las Posadas State Forest, located in the headwaters of Moore Creek), and 0.8 kilometers (0.5 miles) east of upper Conn Creek. It is situated within the southernmost extent of a broad and nearly horizontal volcanic plateau (tableland) of Howell Mountain, east of the town of Angwin. The property elevations range from 1,700 feet mean sea level (msl) at Las Posadas Road in Las Posadas Valley, at the base of Howell Mountain, to 1,860 fmsl at the top of Howell Mountain.

During the period 1968-2008, the average annual precipitation in the area of the project was 985 mm (38.7 inches). Based on the review of the precipitation record (hourly and daily rainfall depth data) from the Angwin PUC Gage No. E30 0212, and focusing on the period of DAVM ownership, the property

experienced very wet conditions in mid-December 2002 (including a 4.8”-depth storm on December 14), late December 2005 (including a 5.6”-depth storm on December 31), and late November 2012 (including a 5.9”-depth storm on November 30, the second largest daily precipitation quantity on the record since 1940). See Section 3.2 for details on the precipitation gauge record.

The property is bordered by the Pacific Union College (PUC) to the west and north (this area also includes Virgil O. Parrett Field Airport), the Rocky Ridge Vineyard (owned by Charles Krug Winery) to the east, and the W. S. Keyes Vineyard (owned by Cardinale Estate, a division of Kendall-Jackson Wine Estates, Ltd.) to the south. The property’s cliff-bench topography reflects the volcanic tableland characteristics associated with Howell Mountain. About 61% (46.4 acres) of the property is comprised of a nearly flat, bench-like hilltop or tabletop, and the remaining 39% (29.4 acres) of a steep-to-very steep, dominantly divergent hillside and footslope that flank the hilltop.[6] There are four subtle, unchanneled low-relief swales on the flat hilltop in the middle of the Abreu property,[7] which variably drain across the thick forest floor toward five ravines. The ravines deeply incise into the tableland of Howell Mountain, stretching between the base and the top of the table mountain.[8] Two of these ravines are located on the Abreu property, in the south of the hilltop by Las Posadas Road, and are referred to as Abreu Western Ravine and Abreu Eastern Ravine in this report. The remaining three ravines are located on the PUC property: two in the west of the Abreu property, on PUC campus, and one in the north, by Virgil O. Parrett Field Airport. These latter three ravines are referred to in this report as PUC Winning Ravine in the west-south, PUC McReynolds Ravine in the west-north, and PUC Airport Ravine in the north of the Abreu property. College Avenue on the PUC campus demarks the upslope-most extent of the western ravines, and the PUC bike trail demarks the upslope-most extent of the northern ravine (see **Figure 3** for an expanded view of the property and its environs, and **Figure 4** for a close-up).

In terms of vegetative cover, about 24% (18.0 acres) of the property area supports vineyards, which were developed and planted between 1995 and 2005.[9] The remainder of the property supports 11.7 acres of hilltop, hillside, and footslope non-native grassland; 26.8 acres of hilltop second-growth conifer/hardwood forest; and 15.8 acres of hillside second-growth conifer/hardwood forest. The tree species include Douglas Fir, Ponderosa Pine, and California Black Oak (after ERM 2005, WRA 2007b). The second-growth hilltop forest understory, as well as 12 pines, was cleared in 2004 and 2005 to manage localized tree mortality within the Ponderosa Pine (David Abreu, personal communication 2006). As a result, the hilltop forest floor experienced a decrease in the litter ground cover and gained a park-like quality eight years ago (**Figure 9**).

Based on the field observations in 2006-2008 and 2012, the second-growth forest on the hillsides, below the hilltop, remains unchanged by the current land-use practices. The area currently proposed for vineyard development is comprised of 6.3 acres of sparse hilltop grassland, 6.0 acres of moderate-density hilltop forest, and 4.7 acres of a high-density hilltop forest. (Note: the previous 17-acre project proposal involved the removal of 7.9 acres of sparse hilltop grassland, 6.2 acres of a moderate-density hilltop forest, and 2.9 acres of a high-density hilltop forest.) See **Table 1** for an overview of the property’s hillslope and vegetative cover characteristics.

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[6] The hillslope morphologies are characterized by the following average hillside gradients: 7% within the hilltop and the footslope, 18% within the steep hillsides, and 35% within the very steep hillsides.

[7] Proposed vineyard Block B is nearly entirely located within three of the four low-relief hilltop swales.

[8] The ravines are V-shaped and are characterized by soil-mantled and steep forested hillsides. A lithologic contact between the ash-flow tuff and the overlying lava-flow rock occurs at about the mid-point of the ravine’s longitudinal profile, which stretches between the base and top of Howell Mountain. The lithologic contact is characterized by locally moist soil conditions, due to groundwater exfiltration. See Sections 3.4 and 3.6 for details on seasonal runoff characteristics in the ravines, and Section 4 for details on hillside stability.

[9] The South and Southeast Abbott-Abreu vineyards were developed and planted by the previous property owner, the J. Abbott Family, between 1995 and 2000. North Abreu Vineyard was developed and planted by DAVM between 2003 and 2005.

Based on the interpretation of historic aerial photographs and historic USGS topographic maps (USGS 1915, 1942, 1960b, 1980) (this study), the property has over a hundred-year history of agricultural and timber-management activities. A wildfire most likely burned the property in 1931.[10] As part of the agricultural land expansion in Angwin and the construction of the PUC campus, the old-growth forest in nearly the entire property was clearcut in the 1900s through 1930s (**Figures 7a and 8a**). The deforestation and the associated development of vineyards involved 40 acres of the property hilltop, or 85% of the total hilltop area by PUC,[11] about 10 acres of the steep hillsides by Las Posadas Road, and about 2 acres of the footslope by Las Posadas Road. According to anecdotal accounts, the present-day Southeast Abbott-Abreu Vineyard supported a vineyard owned by an early pioneer of California wines, Paul Masson in the 1900s. The enforcement of the Volstead Act (Prohibition) in 1922 led to the abandonment of the hilltop and hillside vineyards on the property, as well as elsewhere in Angwin and Napa Valley. Based on aerial photography, PUC converted most of the vineyard into an orchard, and managed orchard operations until the 1940s (the area of the present-day North Abreu Vineyard, however, was maintained as a staging area for timbering and landfill operations until 2002, when DAVM purchased the parcel from PUC). After World War II (**Figures 7b and 7c**), the hilltop was managed by PUC mainly for timber production, which involved the localized thinning of the tree canopy, additional clearcutting, and the conversion of a small portion of the area to non-native grassland in the 1970s and 1980s (**Figures 7d, 7e, and 7f**). Following Prohibition, land-use activities on the steep hillside by Las Posadas Road were abandoned, and the hillside experienced a partial progressive re-growth of forest over the subsequent 70 years. From 1995 to 2000, however, a mixed grassland- and timber-to-vineyard conversion (i.e. re-conversion) took place over an area of 10.9 acres, including the steep hillside, under the J. Abbott Family ownership (i.e. South Abbott-Abreu and Southeast Abbott-Abreu vineyards) (**Figures 7g and 7h**).

Table 1. Hillslope Morphology and Vegetative Cover, Current and Post-Project Conditions.

Property Hillslope Morphology	Property Vegetative Cover Area (Ac) [1]				
	Existing Vineyards	Proposed Vineyard	Non-Native Grassland	Moderate-Density Forest	High-Density Forest
Hilltop (Tabletop)	8.9	17.0	0.8	--	17.7
Steep Hillside	9.1	--	2.0	3.9	0.6
Very Steep Hillside	--	--	1.0	--	11.3
Total Area (Ac)	*18.0*	*17.0*	*3.8*	*3.9*	*29.6*

[1] The acreages do not include the area of the property roads and trails (i.e. 3.5 acres).

As a result of the past pre-DAVM ownership timber operations, the 26.8-acre hilltop forest supports only 7.2 acres of second-growth mature tree stands. These stands are highly dense. Based on the tree diameters and aerial photography, it is estimated that the mature trees on the hilltop (DBH: 25”-30”) are 70-75 years old. The rest of the tree stands (DBH: 12”-18”) are about 40-45 years old, and have moderate-to-high density.

There are many fire-damaged trees within the southwestern portion of the property (including within Abreu Western and Abreu Eastern ravines) (**Figure 10**), indicating that a limited wildfire likely took place in this area about 25 years ago.

[10] The entire area of Howell Mountain was swept by a severe forest and brush fire in August 22-29, 1931, destroying thousands of acres of chaparral, California black oak, blue oak, yellow pine, and Douglas Fir in the mountainous area between Middletown, Lake County, and Chiles Valley, Napa County (Clark 1935).

[11] PUC purchased their present-day property of about 2,000 acres, including the hilltop portion of the Abreu property, in 1909.

During the DAVM ownership, since 2001, the vegetative cover across the 75.8-acre property, including within the proposed project area, has remained essentially unchanged (**Figures 7i through 7n**).[12]

There are no "USGS blue-line" streams, Class I and II watercourses, or jurisdictional wetlands at the property under the current conditions. Due to the property hydrogeology, soils, vegetation, and topography, a well-developed and continuous natural channel network is absent. Instead, the property flow pathways are fragmented, and limited to one short concentrated flow pathway on the property flat hilltop, which occurs within the litter-mantled floor of the thinned forest, one short concentrated flow pathway developed within the hilltop trail, and one discontinuous steep ephemeral channel in the ravine below the property hilltop (**Figure 5**). Based on a review of aerial photography and accounting for the land-use history in this area, this forest-floor pathway appears to be a former agricultural diversion or avenue, abandoned about 70 years ago.[13] No flowing water has been observed to form in this pathway during rainstorms since late 2006, on any of the twenty short visits. Instead, the presence of water on two occasions was limited to the saturated condition of the forest litter layer along the downslope-most segment of the pathway. A 0.1-acre seasonal groundwater seep is located within the grassed footslope immediately off Las Posadas Road, in the southwestern corner of the property (**Figure 11**). The seep does not support any plants, terrestrial, or aquatic habitat (this updated study; WRA 2007a). During long-duration storms and wet winter periods, the pavement of Las Posadas Road experiences persistent sheeting in response to the footslope seepage (i.e. groundwater exfiltration). See Section 3.6 for details.

There is a high-density network of trails, roads, and vineyard avenues, and one dry road-watercourse crossing. Recreational motorsport activities (involving all-terrain vehicles) appear to have taken place during DAVM ownership within the grassed areas of the property hilltop, including the proposed vineyard Block B area (**Figure 12**). In terms of road surfacing, this network includes: 2.0 acres (3,260 meters, or 10,700 feet) of unpaved trails and vineyard avenues; 0.3 acres (580 meters, or 1,900 feet) of an unpaved peripheral appurtenant road in the southwest portion of the property; and 1.2 acres (1,800 meters, or 6,000 feet) of a rocked main appurtenant road in the south portion of the property, downslope from and leading to the project site area. Both appurtenant roads cut across the steep hillsides by Las Posadas Road. The unpaved peripheral appurtenant road in the southwest portion of the property was built prior to 1915 (as shown on the USGS quadrangle map, **Figure 8a**), and currently experiences minimal traffic. The dry road-watercourse crossing is located on this road where it cuts across Abreu Western Ravine (**Figure D-7**). The rocked main appurtenant road in the south portion of the property supports all the traffic between the main property entrance off Las Posadas Road and the property hilltop, and likely was built by J. Abbott in 1995-96. There are several agricultural water wells at the property (see Section 5 for details).

A high-density engineered subsurface storm runoff drainage system exists within the existing South Abbott-Abreu and Southeast Abbott-Abreu vineyard blocks (**Figure 13**). This drainage, along with hillside cross-slope diversions, was installed by DAVM since 2001 to minimize surface erosion and soil loss within the vineyards developed by the previous property owner.[14] The vineyard drainage system is integrated with the drainage of the main appurtenant road (this road was upgraded by DAVM since 2001), and also includes two small underground storm runoff detention basins, which are located near the main

[12] The vegetative changes under the DAVM ownership involved the following: 1) planting olive trees over an area of 1.7 acres in 2004-05; 2) the conversion of 7.1 acres of a grass-covered timbering activities staging area to vineyard in 2003-05 (i.e. North Abreu Vineyard); and 3) the clearing of second-growth hilltop forest understory, and some pine trees, to manage tree mortality in 2004-05.

[13] In fact, a fragmented relic network of historic vineyard/orchard avenues is still discernible topographically (using the LiDAR 1-meter DEM) under the present-day forest conditions. These relic avenues follow the gridded pattern associated with the past orchard (see **Figure 7a** showing the 1940 conditions).

[14] Following land preparation (which involved the removal of second-growth forest) and vineyard development in 1995-96 by J. Abbott, notable soil degradation occurred within the steep hillside vineyard in 1997. The failure was attributed to the poor quality of land preparation, and to the large storms of December 1996 and January 1997 (D. Steiner of Napa County RCD, personal communication 2012; see Section 3.2 for details on precipitation record).

property entrance along Las Posadas Road (see Section 6 for details). There is also a highly efficient "T-spreader" flow energy dissipator located along the footslope of the middle portion of Southeast Abbott-Abreu Vineyard, stretching for about 70 meters (230 feet) along Las Posadas Road, 3 meters (10 feet) upslope from the property fence. Runoff and sediment supply from this subsurface storm runoff drainage system constitutes the only runoff and sediment yield that is produced from the Abreu property to off-site areas (see Section 3.6 for details).

To ensure that no hillslope instability is triggered downslope from the existing North Abreu Vineyard onto the adjacent PUC and Rocky Ridge Vineyard properties, DAVM maintains highly efficient seasonal erosion control measures, such as straw bales dikes to disperse any sheet flow that may form on vineyard avenues during high-intensity storms. These measures have been implemented along the edge of the nearly planar hilltop (**Figure 14**).

A small 3.3-acre reservoir, which was built in 1986, is located off-site on the W. S. Keyes Vineyard property to the south, across from Las Posadas Road (**Figure 15**). This reservoir is located on an intermittent 3rd-order tributary to upper Conn Creek,[15] and receives storm runoff and sediment supply from a 13.3-acre (18%) section of the Abreu property, which is drained by the agricultural drainage system. The remaining 62.5 acres (82%) of the Abreu property—including the entire property hilltop as well as the proposed vineyard Block B—are unconditionally disconnected from the downslope neighboring properties and upper Conn Creek for storm runoff and sediment delivery. Of the total property sediment yield off-site to the W. S. Keyes Vineyard reservoir, only 41% is transmitted across the reservoir to upper Conn Creek and, ultimately, to Lake Hennessey. This is due to the settling of non-colloidal particles within the reservoir.[16] See Sections 3.6 and 7 for details.

As reported earlier, the northern-most area of the property, including North Abreu Vineyard, used to be a timbering and landfill staging site for seven decades. Consequently, the north-facing steep hillsides on the property are mantled with a 1.5-meter thick (5 feet) scree of landfill debris. The scree consists mainly of glass, tin cans, rock, and soil (**Figure 16**).[17] It is also unconsolidated and exhibits loose conditions. Much larger landfill operations have been noted to occur on the PUC property, about 150 meters (500 feet) north of the Abreu property. These operations are still ongoing. The PUC property landfill has experienced a progressive increase in volume over the past 35 years, as shown on the aerial photographs. The landfill growth has increasingly impinged on PUC Airport Ravine and the north-trending

[15] The present-day 3rd-order tributary to upper Conn Creek existed naturally as an unchanneled forest-floor concentrated flow pathway in Las Posadas Valley. It was channelized in 1985-86 by ditching (by 2-3 feet), as part of the timber-to-vineyard conversion on the W. S. Keyes Vineyard property (Don Wesner of Don Wesner, Inc., personal communication 2012; see Section 3.6 for details).

[16] The W. S. Keyes Vineyard reservoir is cone-shaped, with a maximum length of 180 meters (600 feet), a maximum width of 92 meters (300 feet), and a mean width of 75 meters (250 feet). The original pond storage capacity is 48 acre-feet (Jeffrey Redding AICP, personal communication 2007). Based on the shape and size of the pond (after Verstraeten and Poesen 2000), it has an estimated trapping efficiency of 100% for gravel-, sand- and silt-sized materials, and a zero trapping efficiency for clay-sized materials. Repeated field observations revealed that the reservoir is kept at an estimated 50% storage capacity for most of the year and has very limited free storage capacity during the winter period.

[17] A 50-meter long (160 feet) crack has evolved recently (December 2005) within the landfill scree, along the hilltop edge. It is located within the PUC bike trail, which experiences daily recreational traffic, about 10 meters (33 feet) downslope from the North Abreu Vineyard. The crack was observed by Dennis Jackson-Hydrologist (2006), who attributed the formation of the crack to the hydrologic effects of the recent hilltop conversion to a vineyard. The crack was also observed on this study in 2007 (**Figure 17**). The hilltop grassland-to-vineyard conversion took place within an area which experienced repeated timber removal as well as timber and landfill operations over the past 90 years (see Section 3.1 for details). The conversion also involved the removal of about a dozen young trees in 2003. Based on our evaluation, the likely causes for the development of the crack are as follows: 1) the unconsolidated nature of the landfill and PUC bike trail fill; 2) the natural instability of the hilltop edge, which is due to hillside seepage associated with the lithologic contact between the porous/fractured basalts and the clay-rich and impervious ash-flow (the lithologic contact is about 4 meters or 13 feet downslope from the crack); 3) ground vibration due to the recent hilltop conversion to a vineyard; 4) by effects of very wet conditions in December 2005, including a 5.6" storm on December 31; or 5) all of the above.

discontinuous ephemeral watercourse which it supports and which originates near the Abreu property boundary (**Figure 18**). The present-day topography and extent of the PUC landfill are depicted on the LiDAR 1-meter DEM shaded-relief imagery (**Figure 3**). The north-trending discontinuous watercourse is depicted in **Figures 3 and 5** (also see Section 3.6 for details).

3.2 Climate and Storm History

The Mediterranean climate of northern California is characterized by cool, wet winters and warm, dry summers with frequent fog. The Abreu property is located within the eastern portion of the California Coast Range Province. Precipitation in this area occurs primarily as rain during the winter months. Annual precipitation ranges from 400 to 2,260 mm (16-89 in), based on the 1940-2011 precipitation record at the Angwin PUC Gage No. E30 0212, with a mean annual precipitation in the project area of 985 mm (38.7 in). The average annual snowfall is 50 mm (2 in). The average monthly minimum and maximum air temperatures in Angwin vary from 3 to 31 ºC (38 to 87 ºF), with extreme minimum and maximum air temperatures varying from -10 to 43 ºC (15 to 110 ºF).

During the period of historic records, a high incidence of large storms lasting several days occurred during three wet periods in the north coast region. The most recent periods occurred in the 1982-1983 and 1997-1998 water-year periods, when large storms triggered widespread flooding and geomorphic change in northern California watersheds. At the Abreu property, the large storms in these periods took place on the following dates: December 29-31, 1996 (290 mm, or 11.4 in); January 22-26, 1997 (220 mm, or 8.7 in); and February 2-7, 1998 (265 mm, 10.4 in). The annual precipitation in these wet years amounted to 1,700 mm (18 inches) in 1982, 2,260 mm (88.9 in) in 1983, and 1,430 mm (63.6 in) in 1998. In addition, the Abreu property also experienced very wet years in 1941 (1,630 mm, or 64 in), 1942 (1,500 mm, or 59 in), 1974 (1,500 mm, or 59 in), 1978 (1,450 mm, or 57 in), 1986 (1,670 mm, or 66 in), 1995 (1,700 mm, or 67 in), and 2006 (1,520 mm, or 60 in).

Table 2. Weather Station Angwin PUC: Rainfall Depth-Duration-Frequency Analysis.

Return Period (Year)	Maximum Rainfall For Indicated Time Period (in)							
	15 Min	30 Min	1 Hr	2 Hr	3 Hr	6 Hr	12 Hr	1 Day[1]
RP 2	0.26	0.39	0.57	0.88	1.16	1.79	2.62	3.56
RP 5	0.36	0.54	0.79	1.20	1.59	2.45	3.58	4.87
RP 10	0.42	0.62	0.92	1.40	1.85	2.86	4.17	5.67
RP 25	0.49	0.73	1.07	1.64	2.16	3.34	4.87	6.62
RP 50	0.54	0.80	1.18	1.80	2.38	3.67	5.36	7.29
RP 100	0.58	0.87	1.28	1.96	2.59	4.00	5.84	7.93
RP 200	0.63	0.94	1.38	2.11	2.79	4.31	6.29	8.55
RP 500	0.69	1.03	1.51	2.31	3.05	4.71	6.87	9.34
RP 1000	0.73	1.09	1.60	2.45	3.24	5.00	7.30	9.92
RP 10000	0.87	1.30	1.91	2.92	3.85	5.94	8.68	11.80

[1] The maximum rainfall values for 1-day storms in the green-shaded area were applied to run the WinTR-55 hydrologic model, to calculate the pre- and post-project peak discharge for the 2-, 5-, 10-, 25-, 50-, and 100-year return period 24-hour storm events.

Since the DAVM ownership, moderate and large storms lasting several days occurred on the following dates: December 13-16, 2002 (350 mm, or 13.7 in); December 28-31, 2005 (290 mm, or 11.5 in); February 8-10, 2007 (115 mm, or 4.5 in); January 18-21, 2010 (165 mm, or 6.4 in); March 13-16, 2012 (160 mm, or 6.3 in); and November 29-December 2, 2012 (285 mm, or 11.2 in). The maximum 24-hour rainfall intensity exceeded 115 mm (4.5 in) on the following days: December 14, 2002 (120 mm, or 4.8 in); December 31, 2005 (140 mm, or 5.6 in); and November 30, 2012 (150 mm, or 5.9 in). The most precipitation in 24 hours was 190 mm (7.4 in) on February 17, 1986.

Using the precipitation record at the Angwin PUC Gage No. E30 0212, a rainfall depth-duration-frequency analysis was performed to characterize the rainfall patterns at the property, estimating rainfall intensities of different durations and recurrence intervals (return periods). It was performed for durations ranging from 15 minutes to 1 day, and for recurrence frequencies ranging from 2 years to 10,000 years. The values are summarized in **Table 2** above.

3.3 Geologic Setting and Seismicity

The Abreu property is located 5 kilometers (3 miles) to the northwest of the inactive Atlas Peak-Foss Valley tectonic lineament zone (Baldwin et al. 2006), and 14.2 kilometers (8.8 miles) to the south of the active Hunting Creek-Berryessa fault system. Based on the recently updated Alquist-Priolo Earthquake Fault Zoning Maps (CGS 2007), California Geologic Survey maps (CGS 2005), U.S. Geologic Survey maps (USGS 1963, 1976, 1996, 1997, 1998, 2004, 2006), and field surveys (this investigation), there are no active or inactive faults mapped or observed on the property or in its vicinity.[18] According to USGS (2004, 2006) and CGS (2007, 2010), the Hunting Creek-Berryessa fault system showed activity during past 11,700 years without historic record. Based on a review of earthquake maps, no earthquakes of magnitude 1.5 and larger have occurred at or near the Abreu property over the last 42 years (USGS 2004, UCERF 2008, USGS 2012). See Section 4 for details.

3.4 Geology, Soils, Hydrogeology, and Geomorphology

The bedrock geology at the property is characterized by hard andesitic lava-flow and ash-flow tuff rocks of the Sonoma Volcanics rock formation (USGS 1960a, 1963; CGS 2005). Most of the individual flows and interflows are 4.5 to 7.5 meters (15-25 feet) thick (Ellen and Wentworth 1995). Based on this investigation, the Napa County soil survey data (USDA-NRCS and UC Cooperative Extension Service 1978), and the well log performed for DAVM (HWD 2003), the lava-flow rocks are hard and moderately permeable, and the siliceous tuffs are firm and impermeable. Stratigraphically, the flow rocks occupy ("cap") the upper portion of the property hilltop, with elevations generally ranging from approximately 545 meters (1,790 feet) to 565 meters (1,860 feet) above mean sea level (this investigation; HWD 2003). At Las Posadas Road, the tuffs generally range from 520 meters (1,700 feet) to 545 meters (1,790 feet). The bedrock hillsides are mantled with shallow regolith (pedolith and saprolite), and in topographic hollows, with colluvium; both are loosely referred to as soils. The depth to the bedrock groundwater was measured to be 58.5 meters (192 feet) below the surface of the property hilltop (after HWD 2003, Imboden Pump 2007). Given the elevation of the top of well of 568 meters (1,863 feet), the water table (groundwater) elevation is about 509 meters (1,670 feet).

There are subtle locally moist soil conditions during the rainy reason along portions of the lithologic contact between the ash-flow tuff and the overlying lava-flow rock outcropping on the steep hillside below the hilltop (**Figure 19**). These conditions occur seasonally in the south and the north of the Abreu property, on divergent and convergent hillsides.[19] The seeps are pronounced within the convergent Abreu Western and Abreu Eastern ravines, and coincide with limited areas of shallow soil creep, soil pipes, and small-scale soil slumping, which occur about 50 meters (165 feet) below the edge of the hilltop (**Figures 22 and D-8**) (see Section 4 for details on the locations of soil slumps and pipes on-site). The localized soil instability is most likely associated with groundwater exfiltration at the point of lithologic contact.

[18] California Geological Survey defines an "active fault" as one which has "had surface displacement within Holocene time" (about 11,700 years); this excludes "historic" faults, which exhibit movement over the past 200 years.

[19] To provide additional hillside stability, olive tree plantings have been recently installed by DAVM along a majority of the lithologic contact in the south of the property, over a total area of 1.7 acres (**Figure 20**). This includes olive tree plantings which stretch along the entire length of the main appurtenant road at the top of Southeast Abbott-Abreu Vineyard. Several hydrologic soil pipes have been observed within the landfill scree on a steep hillside on the PUC property, immediately to the north of the Abreu property, below the PUC bike trail failure crack (**Figure 21**).

Additional seasonal seepage along the lithologic contact naturally occurs along the roadcut bank of the north-south trending property access road in the west of the Abreu property (**Figure 23**). See below in this section for additional details on the inferred strike and dip of the lithologic contact.

There are two dominant soils types at the property. Using the USDA soil classification (USDA-NRCS and UC Cooperative Extension Service 1978), the soils are categorized as 100 Aiken loam, 2 to 15% slopes over 61% of the property area, and 102 Aiken loam, 30 to 50% slopes over 34% of the property area. The 100 Aiken loam, 2 to 15% slopes soils are located on the flat hilltop (**Figure 24**), and the 102 Aiken loam, 30 to 50% slopes soils are on the steep hillsides in the ash-flow tuff bedrock areas (**Figure 25**). There are two other sub-dominant soil types located within the property footslope by Las Posadas Road: 107 Boomer loam, 2 to 15% slopes (3%) and 171 Pleasanton loam, 2 to 9% slopes (2%). None of these soil types is rated as hydric. The Aiken series soils are 3.0-5.0 feet deep (this investigation; USDA-NRCS and UC Cooperative Extension Service 1978; USDA-NRCS 1994; CCA 2001; USDA-NRCS 2007), with depths of less than 1 meter (3 feet) on the hilltop. Texturally, Aiken series soils are clay loams with rock fragment components ranging from 10% (102 Aiken soils) to 50% (100 Aiken soils). Based on Ellen and Wentworth (1995), CCA (2001), and USDA-NRCS and UC Cooperative Extension Service (1978), the composite colluvium grain-size distribution is approximately 25% gravel, 10% sand, 35% silt, and 30% clay. A soil bulk density of 1.6 t/m^3 (1.2 t/yd^3) was assumed for all sediment sources.

Due to their medium permeability, the runoff of the 100 soil types is medium, and the erosion hazard is slight. Due to their low permeability, the runoff of the 102 soil types is rapid, and the surface erosion hazard is moderate (USDA-NRCS and UC Cooperative Extension Service 1978). The soil water holding capacity is estimated to range from 130 mm to 190 mm of meter of soil (0.13-0.19 in/in) (USDA-NRCS and UC Cooperative Extension Service 1978).

With the use of a spade, the hilltop color, texture, and odor of the topsoil and the subsoil within the proposed vineyard Block B were investigated at several locations by the author of this report. This involved the removal of the organic litter layer (about 6 centimeters, or 2.5 in), and the topsoil (about 10 centimeters, or 4 in). The absence of sulphidic odor, bleaching, red stains, and mottling indicated the absence of seasonal saturation.

Using the single ring infiltrometer, the Napa County office of USDA-NRCS measured soil infiltration rates within two hilltop forest floor sites, as well as within the two existing hilltop vineyards (USDA-NRCS 2007).[20] To account for spatial variability, three replications were made 3.5 meters (10 feet) apart at each site. The mean infiltration rates were determined to be: 162 mm/hr (6.4 in/hr) in the high-density forest soil, 132 mm/hr (5.2 in/hr) in the North Abreu Vineyard soil, 58 mm/hr (2.3 in/hr) in the moderate-density forest soils within the proposed vineyard Block B, and 38 mm/hr (1.5 in/hr) in the South Abbott-Abreu Vineyard. Because the proposed vineyard Block B is in the same location with similar land-use history and soil characteristics, it is expected that it will likely experience comparable infiltration rates as those measured in the South Abbott-Abreu Vineyard.

Under the existing conditions, the proposed vineyard Block B has tree canopy cover ranging from 0 to 75% (with an area-weighted average of 50%), and ground cover ranging from 20% to 70% (with an area-weighted average of 40%) (**Figure 26**). An average 60% cover crop condition was observed within the existing vineyards between November 2006 and March 2008 (**Figures 27, 28 and 29**), and in March/April 2012 (**Figures 30, 31, and 32**).[21] In 2006-2008, surface runoff within the vineyards appeared

[20] A 35% reduction in infiltration capacity has occurred within the South Abbott-Abreu Vineyard, and an 18% reduction in the North Abreu Vineyard.

[21] Due to the erosive effects of high-intensity storms in December 1996, January 1997, February 1998, December 2002, December 2004, and December 2005, the former southeastern Abbott vineyard (i.e. Southeast Abbott-Abreu Vineyard) underwent a redesign and a re-establishment of the seasonal cover crop by DAVM between 2001 and 2007.

relatively clear during storm events (**Figure 33**), with medium turbidity, as compared to runoff associated with the appurtenant road (**Figure 34**). Similar conditions on the Abreu property were observed in 2012. The runoff from both the vineyards and the appurtenant road were notably cleaner compared to the 2006-2008 conditions (**Figures 35 and 36**), delivering a relatively clear runoff off-site, toward the 3rd-order tributary to upper Conn Creek.[22] The storm runoff in this latter watercourse, however, exhibited conditions of very high turbidity at the time the observations were made on the Abreu property. See **Figures C-1 through C-17** in **Appendix C** for sequential ground photographs of storm runoff from the Abreu property at the storm drain outlet by Las Posadas Road in 2012, runoff-free conditions in the Abreu property hilltop forest-floor pathway, as well as sequential ground photographs of storm runoff in the 3rd-order tributary to upper Conn Creek.

In well-vegetated humid landscapes, like the Northern California Coast Range, precipitation intensity usually does not exceed the moderate-to-high soil infiltration capacities associated with the hillside shallow soil mantle and tree root systems. Thus, natural storm runoff (also referred to as surface runoff) typically occurs either as saturation overland flow or as shallow subsurface flow (i.e. throughflow) (Dunne 1978, Pierson 1980). Such runoff processes occur on the Abreu property (including in the roadcut bank along Las Posadas Road, immediately off-site), although Hortonian overland flow (i.e. infiltration-excess flow) is also present within the trails and the grass-covered hilltop areas (**Figure 37**). The presence and unrilled appearance of the thick litter cover on the forest floor (up to 6 centimeters, or 2.5 in) within some hilltop areas (**Figure 38**), including portions of the low-relief hilltop swales and the proposed vineyard Block B, suggest that overland flow is unimportant in these areas. Within the hilltop grass-covered areas and trails, however, wide-spread sheet flow and several short concentrated flow pathways have evolved (**Figure 39)**, likely in response to the effects of soil compaction associated with past pre-DAVM land-use activities (i.e. repeated deforestation, orchard operations, forest canopy thinning, etc.) as well as present-day recreational activities (see Section 3.6 for details). No overland flow has been observed to form within the existing hilltop vineyards during rainstorms since late 2006, on any of the twenty short visits.

As stated above, moist soil conditions were observed during the rainy season at several locations along the lithologic contact between the lava flow and the underlying ash-flow tuff rocks, at a depth of about 15 meters (50 feet) from the hilltop surface. Localized soil pipes, small-scale soil slumping, and the presence of bunch grass growing on the forest floor in the area of the soil slumps under dense canopy (**Figure 40**) may indicate the presence of a perched local aquifer, and thus exfiltration of groundwater flow. Such water movement would arise due to the permeability contrast between the flow rocks and the clay-rich ash-flow tuff beneath. This would limit the deep percolation of infiltrating water, and instead promote lateral groundwater flow during wet periods. An investigation was made to infer the strike and dip of the lithologic contact, and the elevations at which it outcrops in the ravines. The evaluation utilized the well lithologic log data from Abreu Well No. 1 and two PUC wells (nos. 6 and 7) in the PUC airport nearby, and involved ground surveys in the ravines on the PUC property to verify the inferred locations. It is estimated that the contact dips about 5 degrees north and strikes west. In PUC McReynolds Ravine, the contact outcrops along the PUC trail at 535 meters msl (1,755 feet). No contact exposure was found in PUC Winning Ravine due to heavy soil and vegetative cover. In PUC Airport Ravine, the contact outcrops along the PUC bike trail at 540 meters msl (1,770 feet).

Based on the estimated water balance for the property under the existing conditions (see Section 3.5), the average bedrock recharge is 390 mm/yr (15.4 in/yr, or 96.6 acre-feet/yr), or 40% of the average annual precipitation of 985 mm. The average surface runoff is 155 mm/yr (6.1 in/yr, or 38.7 acre-feet/yr), or 16% of the average annual precipitation. The groundwater recharge at the property is conservatively estimated to increase by as much as 3% (2.9 acre-feet/yr). This is a result of the decrease in evapotranspiration to

[22] See Section 3.6 for details on the connectivity between the Abreu property storm runoff and the upper Conn Creek tributary.

the proposed vineyards, following the conversion of existing ground cover. Considering the land-use history on the property (Section 3.1), such an increase corresponds to only about a sixth of the loss in interception and evapotranspiration, and, additionally, amounts to only about one sixth of the associated increase in the groundwater recharge/exfiltration that the property likely experienced following the 40-acre deforestation of the property hilltop in the 1900s-1930s.[23] As documented in Section 4, there have been no hillslope failures or soil degradation in response to these 1900s-1930s and other past land-use related disturbances under the pre-DAVM ownership. Thus, the 3% increase in the groundwater recharge/exfiltration estimated to occur under the post-project conditions will have negligible effects on hillslope or soil stability along the lithologic contact.[24]

Based on field reconnaissance conducted in this study, the hillslope sediment production within the non-vineyard portion of the property and the project site is characterized by the following: 1) variable surface erosion along the low-relief swales within the hilltop portion of the property; 2) variable surface erosion within the steep and very steep hillside portions of the property; 3) trail- and road-related surface erosion;[25] and 4) limited shallow soil creep along the property road and in the ravines within the steep hillside portion of the property. Over the past five years, conditions of high surface erosion characterize most of the bare-ground trails and some vineyard avenues on-site. Following a 4.5”-depth storm event on February 8-11, 2007, and a 6.3”-depth storm event on March 13-16, 2012, abundant sheet flow, long rills, and associated fan deposits evolved in the trail/road tread at three road segments on-site. Multiple rills caused by overland flow were also observed within the road tread of the rocked main appurtenant road. Due to their off-site location, sediment delivery from small soil slumps which annually evolve in the roadcut bank along Las Posadas Road (**Figure 41**), due to subsurface flow seepage, are not accounted for in the property sediment budget. See Section 7.2 for details related to sediment supply.

3.5 Water Balance

A simple water budget for the Abreu property was estimated by using the watershed-scale data from the surface water-groundwater modeling for the Napa River watershed (DHI 2007). Based on this data, the potential evapotranspiration is estimated to be 440 mm/yr (17.3 in/yr), or 45% of average annual precipitation of 985 mm. The infiltration of precipitation into bedrock groundwater as bedrock-recharge is estimated to be 390 mm/yr (15.4 in/yr, or 96.6 acre-feet/yr). The remaining 155 mm/yr (6.1 in/yr, or 38.7 acre-feet/yr) of average annual precipitation are estimated to be either stored within the shallow soil on the property, or flow across the property as overland flow, shallow subsurface storm flow, or open channel flow. All these processes are commonly referred to as ‘surface runoff.’ As a result of the mixed timber- and grassland-to-vineyard conversion and the related decrease in canopy interception and evapotranspiration,[26] the rainfall entering the soil on-site is expected to increase by up to 25% within the

[23] The agricultural expansion during the 1900s-1930s and the associated loss of canopy of the old-growth forest led to a decrease in interception and evapotranspiration. As a result, the rainfall entering the soil on-site likely increased by up to 35% within the hilltop. At the property scale, this was equivalent to an estimated increase of the groundwater recharge by 19%, or about 18 acre-feet/yr.

[24] This is based on a conservative assumption that all of the estimated increase in rainfall reaching the soil on-site (of about 3 acre-feet/yr) is transmitted to the perched groundwater field only, without being retained by the vineyard soils and the enhanced ground cover within and outside the vineyards (as dense cover crop and mulch, respectively), or without percolating further into the deeper groundwater field. Thus, the estimated elevated groundwater recharge could amount to a 3% increase in the seepage along the lithologic contact around Howell Mountain, south of the PUC airport. An estimated 0.6 acre-feet/yr would be likely be taken up by the olive trees growing along the lithologic contact, and the remainder of the excess seepage would be distributed between the divergent hillslopes along the lithologic contact as well as in the five ravines. Within the ravines with seasonal flow, the excess seepage would amount to a minute extension of baseflow, on the order of a few hours per year, and would have no effect on peak discharge.

[25] Trail- and road-related surface erosion involved unpaved, bare-ground (i.e. litter-free) trails across the hilltop and rock-surfaced main appurtenant road.

[26] In terms of the long-time-scale influence on the water balance, evapotranspiration typically removes 10% to 20% of precipitation where grasses and crops are the dominant vegetation, 10% to 25% where brush and oak trees predominate, and up to

proposed vineyard, and by about 3% at the property scale. This is equivalent to an increase of about 2.9 acre-feet/yr. This expected increase in rainfall entering the soil on-site would not develop into excess overland flow, nor would it cause the increase of the annual water yield. Rather, it would: 1) be retained via the swelling of clay-rich soils on-site; 2) be absorbed by the enhanced ground cover outside the existing and proposed vineyards; 3) infiltrate (percolate) into the shallow perched, or deep bedrock groundwater outside the existing and proposed vineyards; or 4) all of above. The proposed engineered ECP measures would provide additional storage of the conversion-related excess rainfall entering the soil on-site, especially during high-intensity storms. These measures include the temporary runoff detention ponds downslope from the proposed vineyard Block B, and the earth berm water spreaders downslope from the detention ponds (NVVE 2013). The runoff detention ponds are estimated to provide between 1.0 and 1.30 acre-feet of water ponding capacity during 100-year storm events. See Sections 5 and 6 for details.

3.6 Hydrologic Network and Connectivity

To investigate the channel network on-site and its connectivity to off-site areas, and to guide the field reconnaissance and the mapping of the channel network on-site, the channel network was computer-generated. This was done by utilizing the LiDAR-derived 1-meter DEM developed for the Napa River Basin by National Center of Airborne Laser Mapping (NCALM 2003) and UC Berkeley (2004) (**Figure 4**). The high-resolution DEM was used to calculate the hillside/channel slope and drainage area, and to identify the maximum hypothetical extent of the unchanneled overland flow and channeled hydrologic networks, including the channel heads (after Montgomery and Dietrich 1988). The channel morphology was described using classification system developed by Montgomery and Buffington (1997, 1998), and Montgomery and MacDonald (2002).

Based on field reconnaissance and mapping, however, only a very fragmented and ephemeral hydrologic network occurs on the property, both on the flat hilltop and the steep hillsides below (**Figure 5**). A well-developed and continuous natural channel network is absent. The property hydrologic network demarks abundant sheet flow and limited concentrated flow pathways, which form along trails and litter-mantled forest floor within the four zero-order unchanneled hilltop swales during high-intensity and long-duration storm events, and one discontinuous steep ephemeral channel in the ravine, downslope from one of the zero-order hilltop catchments. The four hilltop zero-order catchment names are Abreu North Swale catchment (13.7 acres), West-North Swale catchment (6.4 acres), West-South Swale catchment (9.7 acres), and South Swale catchment (4.1 acres). Sediment budgets and WinTR-55 watershed hydrologic model peak discharge evaluations were conducted for three (of the four) hilltop swale catchments, which drain the site of the proposed project. In terms of topographic connectivity to off-site landforms and waterbodies, the Abreu North Swale catchment “drains” to PUC Airport Ravine, the Abreu West-North Swale catchment to PUC McReynolds Ravine, the Abreu West-South Swale catchment to PUC Winning Ravine, and the Abreu South Swale catchment to Abreu Western and Eastern ravines.

A 25-meter-long (80 feet) concentrated flow pathway is located within the floor of the thinned forest in the Abreu West-South Swale catchment (**Figure 42**). As reported in Section 3.1, this forest-floor pathway may be a relic of an abandoned agricultural diversion or avenue. Another 25-meter-long (80 feet) concentrated flow pathway, a rill, has formed along the trail in the Abreu South Swale catchment (**Figure 43**). Morphologically, the concentrated flow pathways are characterized as grassed and litter-mantled swales. The hilltop trail is connected and its seasonal rill runoff discharges into a steep 20-meter (65 feet)

50% under a tree canopy (Burgy and Pomeroy 1958, Zinke 1967, Selby 1982, Pypker et al. 2005). About 3% of precipitation is intercepted by the forest litter under mature hardwoods in the eastern United States (Helvey and Patric 1965, as cited in Dunne and Leopold 1978). Following the timberland conversion to grassland in the California Coast Range, up to 60% increases in annual water yield have been observed (Burgy and Papazifirou 1971). This is due to the reduced vegetation interception and evapotranspiration associated with the removal of deeply rooted trees. The increase in annual water yield also corresponded to the extension of base flow through the dry season, and to related benefits for the anadromous fish species and aquatic ecosystems.

road segment, which connects the hilltop and the peripheral appurtenant road located in Abreu Western Ravine below.[27] The trail-related rill has been observed to generate overland flow frequently during storms since 2007.

No running water has been observed to form in the Abreu West-South Swale catchment forest-floor pathway during rainstorms since late 2006, on any of the twenty short visits (this includes the storm on November 30, 2012, which marked the second highest daily rainfall on record since 1940, as well as the March 13-16, 2013 storm). Instead, the presence of water on two occasions in 2006 and 2007 was limited to the saturated condition of the litter layer along the downslope-most segment of this short pathway (**Figure 46**). [28,29]

It was observed on this study, in both the 2006-2008 and the 2012 periods, that only sheet flow exits the Abreu property hilltop to the PUC property, from the Abreu North Swale and Abreu West-North Swale hilltop catchments (**Figures 51 and 52**). However, the sheet flow from the Abreu West-North Swale catchment seeps into the thick forest floor on the PUC property, at the Abreu-PUC property boundary (**Figure 53**). This forest stretches for 55 meters (180 feet) between the Abreu property and College Avenue, and is characterized being high density (**Figure 54**). As presented in Section 3.1, College Avenue demarks the upslope-most extent of the western ravines on the PUC property. No hydrologic pathway has formed, and no running water has been observed in the forest floor between the Abreu West-North Swale catchment and the culvert under College Avenue, draining to PUC McReynolds Ravine. The PUC forest demarks the point at which the northwestern portion of the Abreu property hilltop, including a 6.4-acre area of the northwestern portion of the proposed vineyard Block B, is disconnected for the delivery of surface runoff to the higher-order channel network of upper Conn Creek. However, due to the geologic structure of Howell Mountain, a connectivity likely exists between the Abreu West-North Swale catchment and PUC McReynolds Ravine for groundwater flow (see paragraph on the ravine below).

The sheet flow from the Abreu North Swale catchment during most rainstorms fans out on the PUC bike trail, despite the presence of seasonal erosion control measures which were installed by DAVM at the property fence between the Abreu and PUC properties (**Figure 55**). During storms exceeding about 5 inches, a 60-meter-long (200 feet) overland flow has been observed along the PUC bike trail on two occasions, extending as far as the natural channel head in PUC Airport Ravine. This channel and its seasonal runoff continue to the north for 50 meters (165 feet) before fanning out and seeping into the ground at the footslope of the PUC landfill (**Figure 56**). A variably discontinuous channel stretches over

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[27] In winter 2007, concentrated flow was observed to form on the trail within the hilltop low-relief Abreu South Swale catchment (**Figure 44**), and to exit to Abreu Western Ravine, below the hilltop's edge (**Figure 45**). As presented in sections 3.4 and 4, the colluvial deposits within the ravines on-site exhibit conditions of hydrologic piping and minor active slumping. To eliminate the potential for runoff impacts to hillslope stability on-site (including the triggering of secondary erosion due to elevated storm runoff), it was recommended that this flow path be eliminated by the abandonment of the 20-meter-long (65 feet) road segment.

[28] About 165 meters (540 feet) of the hilltop trail traverse the top of the Abreu West-North Swale catchment and the middle of the Abreu West-South Swale catchment. In 2012, abundant sheet flow was observed to form during a 6.3"-depth storm on this trail on March 13-16, along a 50-meter-long (165 feet) trail segment located close to the forest-floor pathway in the Abreu West-South Swale catchment (**Figure C-18**). The flow appeared to be several millimeters thick, and most likely delivered a measurable amount of water into the head of the litter-mantled forest-floor pathway (i.e. abandoned agricultural diversion or avenue). It is plausible that this 'infiltration-excess' trail sheet flow is the main runoff mechanism feeding the forest-floor pathway, causing its organic litter to become saturated at a downslope location by the property fence during high-intensity rainstorms. There was no surface erosion associated with the trail sheet flow, due to the presence of organic litter. See **Figure 5** for details.

[29] Extensive pine-needle dam formations have been observed along the property fence, both on the flat hilltop (**Figure 47**) and in Abreu Western Ravine (**Figure 48**). Public reviewers have attributed the formation of these dams to storm-related overland flow, and have implied that a high degree of fluvial connectivity exists between the Abreu property and the upper Conn Creek channel network. Based on observations made on this study (including those noting the absence of any running water during rain storms), it is much more likely that the needle dams form in response to eolian (i.e. wind) processes. These dams are located on the southeast-facing sides of the property fence and they showed no change in shape following several storm events during the period November 2006 to March 2008. Similar observations were made in 2012 (**Figures 49 and 50**).

150 meters (500 feet) between the northern boundary of the PUC landfill and Mill Valley in the north (**Figure 57**). The PUC landfill location demarks the point at which the northeastern portion of the Abreu property hilltop, including a 2.4-acre area of the northeastern portion of the proposed vineyard Block B, is naturally disconnected for the delivery of surface runoff to the higher-order channel network of upper Conn Creek.

From 2006-2008 and in 2012, no sheet flow, concentrated flow, or channel flow was observed to exit the Abreu West-South Swale catchment, which supports the short forest-floor pathway associated with the former agricultural diversion or avenue, and which also "drains" into the same forested hilltop area on the PUC property, west of the Abreu property (**Figures 58 and 59**). No hydrologic pathway has formed, and no running water has been observed in the forest floor between the Abreu West-South Swale catchment and the culvert under College Avenue draining to PUC Winning Ravine. The PUC forest demarks the point at which the southwestern portion of the Abreu property hilltop, including an 8.6-acre area of the southwestern portion of the proposed vineyard Block B, is disconnected for the delivery of surface runoff to the higher-order channel network of upper Conn Creek. However, due to the geologic structure of Howell Mountain, a connectivity likely exists between the Abreu West-South Swale catchment and PUC Winning Ravine for groundwater flow (see paragraph on the ravine below).

As stated earlier, the Abreu South Swale catchment drains into Abreu Western Ravine (as well as into the peripheral appurtenant road) via a 25-meter-long (80 feet) trail-related rill (**Figure 60**) and a 20-meter-long (65 feet) steep road segment below (**Figure 61**). The ravine also supports a 70-meter-long (230 feet) ephemeral channel (**Figure 62**).[30] The head of the ephemeral channel is located 15 meters (50 feet) downslope from the appurtenant road, at an elevation of about 545 meters (1,790 feet). As reported in Section 3.1, this ravine as well as the ephemeral channel it supports are located and remain on the Abreu property. No connectivity for surface runoff between the hilltop (i.e. the Abreu South Swale catchment) and Abreu Western Ravine are assumed to have occurred under the natural conditions. Instead, seasonal flow in the short ephemeral channel in the ravine is most likely dominantly spring-fed, due to groundwater exfiltration along the lithologic contact. Morphologically, the short channel is characterized as alternating colluvial cascade and step-pool. The channel gradient ranges from 8% at the bottom to 70% at the channel head. The bankfull width ranges from 0.3 to 0.6 meters (1.0 to 2.0 feet), and the bankfull depth ranges from 0.15 to 0.3 meters (4 to 12 inches). The channel bed is mixed angular cobble with medium gravel, with an estimated median streambed substrate (D50) of 80 mm. The flow and sediment load of this steep channel fan out in the grassed footslope area of the Abreu property, about 90 meters (300 feet) upslope from Las Posadas Road (**Figure 63**). This location demarks the point at which the southwestern portion of the Abreu property's steep hillside is disconnected for the delivery of surface runoff to the higher-order channel network of upper Conn Creek. See Section 4 for details on hillslope stability.

The same groundwater-flow connectivity mechanism between the Abreu South Swale catchment and Abreu Western Ravine appears to exist between the Abreu West-North Swale catchment and PUC McReynolds Ravine, and between the Abreu West-South Swale catchment and PUC Winning Ravine. Both ravines support ephemeral channels which originate at the lithologic contact, and stretch for about 150 meters (500 feet) as far as La Jota Drive, where their seasonal runoff enters the PUC campus and municipal drainage (**Figure 3**). Based on anecdotal evidence and field observations, the runoff that seasonally forms in PUC Winning Ravine is captured by the PUC trail, and subsequently diverted into the trail stairs and La Jota Drive, before reaching the campus storm drain. As noted in Section 3.4, the lithologic contact and the associated groundwater seepage appears to be located at an elevation of 535 meters (1,755 feet) in PUC McReynolds Ravine. The channel gradients range from 20% at the channel

[30] No overland flow pathways exist between the Abreu South Swale catchment and Abreu Eastern Ravine. The ravine supports no overland flow or channel flow pathways. See Section 4 for details on hillslope stability.

head to 5% at the bottom by La Jota Drive in PUC McReynolds Ravine, and 50% at the channel head to 5% at the bottom in PUC Winning Ravine. The channel bed consists of mixed small angular gravel with a cobble framework, but the fluvial channel bed is discontinuous.

Based on field reconnaissance, and reflecting the disconnectivity described above, only an estimated 18% (13.3 acres) of the Abreu property is connected for the delivery of storm runoff and sediment load to off-site properties and waterbodies. This occurs through the road- and vineyard-related storm runoff drainage and the underground storm runoff detention system within the southeastern portion of the property facing Las Posadas Road (**Figure 64**). The runoff and sediment supply originates from: 1) the very steep 2.8-acre hillside above the appurtenant road (this area is denoted as Abreu Las Posadas Road Drainage No. 1); 2) the steep 4.5-acre hillside above the existing Southeast Abbott-Abreu Vineyard (denoted as Abreu Las Posadas Road Drainage No. 2); 3) 55% of the existing Southeast Abbott-Abreu Vineyard (5.0-acres; denoted as Abreu Las Posadas Road Drainage No. 3); and 4) the road tread within the main appurtenant road (a 1-acre area) (**Figure 5**).

The vast majority of the storm runoff generated within the 13.3-acre connected section of the property exits the property close to the main entrance, via a 12”-diameter storm drain outlet (**Figure 65**) into a 33-meter long (110 feet) partially rock-lined ditch along Las Posadas Road (**Figure 66**), before entering a 18”-diameter culvert under the road (**Figure 67**). The runoff dissipates into the riparian forest floor at the culvert outfall, immediately by the road-side, 420 meters (1,400 feet) upstream from the W. S. Keyes Vineyard reservoir. The remainder of the property runoff off-site is carried by another 18”-diameter culvert under the road, which is located by the stone monument in the middle of Abbott-Abreu Southeast Vineyard, 320 meters (1,050 feet) upstream from the W. S. Keyes Vineyard reservoir. A rock level spreader is located under this culvert outfall (**Figure 68**), to promote the dissipation of the property runoff into the riparian forest floor (**Figure 69**). The runoff dissipation at the farther culvert takes place at a distance of 75 meters (250 feet) from the top of the bank of the 3rd-order tributary of upper Conn Creek. The runoff dissipation at the closer culvert is 39 meters (130 feet) from the top of the same bank. Both dissipations take place within a 25-year floodplain of this creek. As reported in Section 3.1, the present-day 3rd-order tributary to upper Conn Creek existed naturally as an unchanneled concentrated flow pathway which flowed seasonally on a swampy forest floor along Las Posadas Road in Las Posadas Valley. The pathway was ditched 2-3 feet deep along the 1,300-meter-long (4,500 feet) reach in 1985-86 as part of the timber-to-vineyard conversion on the W. S. Keyes Vineyard property, following the deforestation of the valley associated with the vineyard development (Don Wesner of Don Wesner, Inc., personal communication 2012). See Section 7 for **Figures 72, 74, and 76** featuring ground photographs of the above off-site runoff pathways.

The flat property hilltop, as well as the area of the proposed vineyard Block B, have been found to be naturally disconnected for the delivery of storm runoff and sediment load to the off-site properties and waterbodies, including the W. S. Keyes Vineyard reservoir and the upper Conn Creek watershed.

3.7 Upper Conn Creek Watershed Baseline Sediment Loading

Based on the sediment supply rates presented in the Napa River Sediment TMDL (Region 2 Water Board 2009), the average annual sediment supply from the upper Conn Creek watershed (34 km^2 or 13.1 mi^2) to Lake Hennessey was estimated to be about 22,000 tons, or 2.8 tons/acre-year, during the period 1993-2003 (Martin Trso, R.G. 2005). The estimated sediment supply is comprised of the following sediment source categories: hillside erosion (90.7%), road-related erosion (4.7%), and channel incision and bank widening (4.6%).

4 HILLSLOPE STABILITY EVALUATION

This section addresses Napa County Code 18.108.027 (F), which requires a geotechnical report for projects in Sensitive Domestic Water Supply Drainages. The geotechnical evaluation relied on (1) a review of the most updated geologic literature and landslide maps; (2) the analysis of eight series of stereoscopic aerial photographs (1940, 1952, 1968, 1984, 1987, 1993, 1999, and 2002) to identify any past and current landslides and soil degradation on the property; (3) geomorphic field surveys; (4) the development of the SHALSTAB.V model, which predicts a shallow landslide hazard under a suite of forest management practices; and (5) the assessment of the seismic hazards. The hillslope stability evaluation presented here follows the guidelines for engineering geologic reports for timber harvest plans (CGS 1999).

4.1 Current Hillslope Conditions

A review of the geologic and landslide maps (USGS 1963, 1976, 1996, 1997, 1998; Creasey 1988; Coe et al. 2000), multiple series of stereoscopic aerial photographs, and field surveys (this investigation) indicate no shallow-seated or deep-seated landslides occurred on the property, or within the existing hilltop and hillside vineyards, which were converted from old-growth forest in 1900s-1930s and later re-converted from 2nd-growth forest in mid-1990s.[31] Except for brief soil degradation in Southeast Abbott-Abreu Vineyard in 1997 (anecdotal record), which was due to the poor quality of land preparation and high-intensity storms in December 1996 and January 1997, no soil degradation occurred historically on the present-day Abreu property. A review of the 1940 aerial photography indicates stable soil conditions within both the hilltop orchard and the steep-hillside by Las Posadas Road, where a vineyard had been abandoned around 1922 due to Prohibition.

Minor shallow soil creep, fresh 3-7”-diameter soil pipes, and small-scale (~ 4 meters, or 14 feet) soil slumps/scarps occur under the current conditions within colluvial deposits where the lithologic contact between the tuffs and the overlying lava-flow bedrock meet the topographic surface. These areas are in the southwest of the property in the forested Abreu Western and Abreu Eastern ravines (**Figures D-1 and D-2**), both at the distance of about 220 meters (710 feet) from the proposed vineyard Block B. The colluvial-deposit soil pipes in both ravines were located at or close to the same elevation of 545 meters (1,790 feet). The slump scarps are at different elevations: at 545 meters (1,790 feet) in Abreu Western Ravine (**Figure D-3**), and at 555 meters (1,820 feet) in Abreu Eastern Ravine (**Figure D-4**). Compared to the 2007-08 conditions, the soil piping and slumping appeared more pronounced in 2012. A peripheral access road, built prior to 1915, cuts across the middle of the colluvial deposit in Abreu Western Ravine, and supports the toe of the colluvial deposit in Abreu Eastern Ravine.

In Abreu Western Ravine, the colluvial deposit has the following dimensions: 35 meters (115 feet) length, 13 meters (43 feet) width, and 1.5 meters (5 feet) maximum depth (**Figure D-5**). At most, the colluvial deposit contains an estimated 700 tons of long-term sediment storage. The downslope-most extent of the deposit in Abreu Western Ravine is located about 40 meters (130 feet) upslope from the property boundary (as well as from the north-south trending access road to the adjacent property in the west of the Abreu property), and about 230 meters (750 feet) upslope from Las Posadas Road. While the ravine’s steep hillsides are densely forested, the colluvial deposit supports only a few mature trees. In Abreu Eastern Ravine, the colluvial deposit has the following dimensions: 60 meters (200 feet) length, 30 meters (100 feet) width, and 1.0 meters (3.5 feet) maximum depth (**Figure D-6**). This ravine has the least V-

[31] The removal of deeply rooted vegetation (i.e. vegetation conversion from woody plants to grasses) is known to reduce slope stability. This is because the mechanical reinforcement of the soil profile on hillslopes provided by root systems is removed and the soil-moisture content is increased. As a result, soil strength tends to decrease, causing landslides under moderate-intensity storms.

shaped profile of all five ravines indenting Howell Mountain in the area of the Abreu property. At most, the colluvial deposit contains an estimated 1,300 tons of long-term sediment storage. The downslope-most extent of the deposit is located about 120 meters (390 feet) upslope from the property boundary, which is immediately at Las Posadas Road. The colluvial deposit within the eastern swale also shows more pronounced hummocky topography, as compared to 5 years ago. There are 60 mature trees growing within the colluvial deposit: 33 trees with a 20" DBH, 26 trees with a 36" DBH, and one tree with a 55" DBH. The 1.4-meter (DBH: 55") tree appears to exert a key role in stabilizing the deposit. **Figure D-7** depicts the colluvial deposits, the soil pipes, and the small-scale soil slumps located within the Abreu Western and Abreu Eastern ravines.

The small soil slumps are 20 to 30 years old, as indicated by the chainsaw marks on the stumps located within the slumps (**Figure 22**). Based on this estimated age, the slumps have likely evolved in response to natural climate- and/or land-use-driven accelerated fluctuations in the shallow groundwater flow regime over the past decades, possibly in relation to wildfire. This is corroborated by the observation of hillslope debris flow activity within the grass-covered areas along/below the lithologic contact on the 1984 aerial photography. The activity showed several rapid runouts outside the Abreu property, on the Rocky Ridge Vineyard property and downslope from the present-day North Abreu Vineyard. (At that time, PUC maintained timbering operations on the flat hilltop, and the area of the present-day Rocky Ridge Vineyard supported mixed grassland with forest.) The runouts did not exceed 60 meters (200 feet) in length, and appeared to transport only minor amounts of soil via overland sheeting. Most likely these runouts were triggered during the wet winters of the El Niño years of 1982 and 1983, as happened in many other areas in the San Francisco Bay area (after Creasey 1988).

Even if there are sudden increases in the soil pore-water pressure (due to shallow subsurface storm flow) or seepage pressures (due to groundwater recharge), it is anticipated that the response within the Abreu Western and Abreu Eastern ravines would be limited. This is irrespective of the causality (i.e. prolonged wet periods, large hydrologic events, and/or complete deforestation). Based on the past debris flow activity, the historic responses to land-use, the existing hydrologic pathways and forest cover, and the shallow landslide hazard potential (Section 4.2), the downslope transport would at most involve minor amounts of soil, over a short distance, and would settle on the grassed footslope on the property, dozens of meters away from Las Posadas Road and the 3rd-order tributary to upper Conn Creek. See Section 8 for vegetation planting recommendations.

4.2 Shallow Landslide Hazard Modeling

A shallow landslide hazard was delineated for the Abreu property, which includes the proposed project site, using the slope stability model SHALSTAB. SHALSTAB is a physically-based, deterministic model that combines an infinite slope stability model and a steady-state hydrologic model to predict the potential for shallow landsliding controlled by topography and pore-water pressure due to storm rainfall. Specifically, its theory is based on the observation that shallow landslides tend to occur in topographic hollows where shallow subsurface flow convergence leads to increased soil saturation, increased pore pressures, and reduced shear strength (Montgomery and Dietrich 1994, Dietrich et al. 1995, Dietrich and Montgomery 1998, Dietrich et al. 1998a, Dietrich et al. 2001). Therefore, the prediction is based on the slope angle, drainage area, and the degree of concentration of water from contributing area upslope. The model operates on digital elevation models (DEMs) of topography, requiring the GIS program ArcView 3.1 or higher. A high-resolution prediction of the shallow landslide hazard was developed using LiDAR 1-meter DEM data (NCALM 2003, UC Berkeley 2004).

There are several versions of the SHALSTAB model, which were developed to suit a range of analytical needs and capabilities with regard to PC computing power. The simplest, and the original version of the model (now referred to as SHALSTAB) assumes most simplifications about landslide-triggering

processes. It was designed predominantly to capture the topographic effects (i.e. the topographic convergence on concentrating runoff and elevating pore-water pressures), thereby avoiding costly and time-consuming field investigations and parametrization. The key simplifications are as follows: soils have a uniform depth across the catchments, soils are cohesionless (soil cohesion is set to zero), and lateral root strength—which plays a major role in slope stability—is neglected as well. Internal friction angle is spatially constant, and is set at 45 degrees, in part to compensate for the absence of root strength.[32] The soil bulk density and the soil transmissivity (i.e. its ability to convey the water downslope) are assigned average regional values of 1.7 ton/m^3 (1.3 tons/yd^3) and 50 m^2/day (540 ft^2/day), respectively (after Reneau 1988). As a result, this version of the model over-predicts the extent of possible instability, thus producing conservative predictions. In 2006-2008, only the most conservative prediction was developed (**Figure D-8**). According to this conservative model, a zone of high shallow landslide hazard is located within the Abreu Western and Abreu Eastern ravines, both located about 220 meters (710 feet) from the proposed vineyard Block B. The remainder of the Abreu property hilltop and hillsides, including the proposed vineyard Block B, are unconditionally stable.

To evaluate the relative change in the soil stability hazard due to a partial loss of timber cover associated with the proposed project, the shallow landslide hazard prediction was refined in 2012. As reported by Dietrich et al. (1995), soil thickness strongly affects relative slope stability by supporting vegetation that increases root strength, and by influencing soil moisture, and thus the role of subsurface to overland flow. Soils are typically thinnest on ridges and side slopes, where vegetation can root into the underlying bedrock, providing considerable strength, and thickest in unchanneled valleys (i.e. “swale” or “hollow”). In thick valley soils, slope instability is naturally favored because failure planes tend to form below the rooting depth and the topography generates flow convergence and elevated pore-water pressures. To account for spatial variation in colluvial soil thickness, and the influence of the associated root strength on the pattern of hillslope instability, a SHALSTAB.V model was developed by Dietrich et al. (1995, 2001), and Montgomery et al. (2000). The depth-dependent SHALSTAB.V couples a process-based prediction of spatially variable soil depth with spatially-constant root cohesion.

The colluvial soil depth model is based on the observation that on hilly landscapes, the loose surface soil is largely derived from the underlying bedrock by biogenic processes, such as tree throw and animal burrowing (Dietrich et al. 1995, Heimsath et al. 1997, Dietrich et al. 1998b, Roering et al. 1999, Heimsath et al. 2001). The model calculates the soil depth as a result of the dynamic balance between the downslope changes in the rate of transport and the production rate of soil. In brief, the model assumes that the soil production exponentially declines with depth, production being the largest on divergent slopes such as ridges, where the soils are the thinnest. In convergent areas (i.e. valleys), soil production is halted once the depth exceeds 1 meter (3 feet).[33] It also assumes that the transport processes are chronic and diffusive (soil-forming). In this region, the net accumulation of the colluvial valley fills—through such chronic diffusive processes—tends to be established within several thousand years, reaching an equilibrium in 5,000-10,000 years (5-10ka). At the Abreu property, the soil depths were initially modeled for the following time periods: 1ka, 2ka, 3ka, 4ka, 5ka, and 6ka. As shown in **Appendix D**, the observed property-specific values of soil depths in the ravines as well as on the hilltop were reached after a model run over a 5,000-year period. The 5ka soil depth model was used to model the shallow landslide hazard for the Abreu property using the SHALSTAB.V model.

As reported by Dietrich et al. (1995), Schmidt et al. (2001), Roering et al. (2003), and Hales et al. (2009), the subsurface character of root networks and root strength correlates with canopy type and age, reflecting

[32] Setting cohesion (i.e. soil shear strength, root strength) to zero maximizes the extent of possible instability across the land. This was somewhat compensated by setting the soil friction angle to a high value of 45 degrees (after Reneau et al. 1984).

[33] Shallow landsliding is a dominant erosional (soil-stripping) process in many soil-mantled landscapes in the Pacific Northwest. The shallow-seated slope failures are often initiated in unchanneled valleys or steep side-slopes, mobilizing the colluvial deposits (i.e. forming landslide scarps), and transporting the colluvial sediments over short as well as long distances.

the effects of natural disturbances (i.e. fires) as well as forest management on slope stability changes. Schmidt et al. (2001) found that median lateral root cohesion ranges from 6.8-23.2 kPa in industrial forests with significant understory and deciduous vegetation, to 25.6-94.3 kPa in natural forests dominated by coniferous vegetation. Lateral root cohesion in clearcuts is uniformly <10 kPa, around 2.5 kPa. Roering et al. (2003) and Hales et al. (2009) further refined the root cohesion values, and also separated total root cohesion from that exerted by roots smaller than 10 cm (4 in). Roering et al. also identified root strength in two unfailed, unchanneled valleys with 200+ year-old Douglas-fir trees, as being 49 and 179 kPa, respectively. Hales at al. (2009) recognized that the trees growing in the topographic hollows (i.e. unchanneled valleys) had consistently weaker roots, about twice as weak as compared to those of trees growing on ridges.

In evaluating the effects of variable tree cover scenarios on slope stability across the Abreu property, the SHALSTAB.V model utilized four root-cohesion values which were applied to the 5ka soil depth model: 23 kPa (mature industrial timberland scenario), 15 kPa (moderately mature industrial timberland scenario), 9 kPa (partly clear-cut scenario), and 2.5kPa (clear-cut scenario, at failure). The 23 kPa and 15 kPa scenarios approximate hillslope stability during the timber management periods, from about 1950-1995. The 9 kPa scenario is estimated to approximate the current, 1995-2012 tree-cover conditions, as well the post-project conditions. The 2.5 kPa scenario models hillslope stability under a complete clear-cut scenario, a condition which may have occurred around 1920.

Figure 6 shows the predicted relative shallow landslide hazard within the property, including the proposed project site, and the surrounding areas. The SHALSTAB.V model used to evaluate the current and post-project conditions was based on the 5ka model of variable soil depth, and used a spatially-constant root cohesion of 9 kPa. The regolithic mantle on the hilltop within the proposed vineyard is predicted to be unconditionally stable, under the current and post-project conditions.

In fact, the entire plateau hilltop is predicted to be unconditionally stable, under any degree of soil saturation and tree cover conditions (i.e. 23 kPa, 15 kPa, 9 kPa, and 2.5 kPa). The same unconditional stability is predicted for the property ravines under the 9-23 kPa conditions. A high shallow landslide hazard is predicted for the property ravines under the clear-cut scenario (2.5 kPa), although a complete deforestation scenario is not part of the proposed project. The prediction for the clear-cut conditions would delineate a ravine-scale zone with a high shallow landslide hazard within Abreu Western Ravine, and a small localized zone with a high shallow landslide hazard within Abreu Eastern Ravine, both at the distance of 220 meters (710 feet) from the proposed vineyard Block B (**Figure D18**).[34] The modeled predictions are corroborated by the geologic and geomorphic investigations carried out on this investigation.

See **Appendix D** for details on ground conditions (**Figures D-1 through D-7**), the depth-independent SHALSTAB prediction (**Figure D-8**), the soil depth modeling over six 1,000-year-long time intervals (**Figures D-9 through D-14**), and four depth-dependent, root-cohesion specific SHALSTAB.V model predictions (**Figures D-15 through D-18**).

[34] As presented in sections 3.6 and 4.1, the colluvial deposits within these ravines exhibit conditions of minor active slumping, due to either fire or land-use legacy effects, and Abreu Western Ravine receives seasonal trail- and road-related concentrated runoff. This runoff was observed to originate from a 20-meter-long (65 feet) steep road segment, which receives concentrated flow from a 25-meter-long (80 feet) hilltop trail in Abreu South Swale catchment. Despite the predicted unconditional hillslope stability associated with the proposed project, it is recommended that one measure be considered for implementation to assure that no acceleration in landslide potential occurs under the post-project conditions. This measure would be the abandonment of a 20-meter (65 feet) road segment. See Section 8 for details.

4.3 Seismicity and Seismic Hazard

According to the U.S. Geological Survey (2012), earthquakes with significant ground shaking will occur in the San Francisco Bay region within the next two decades, implying that the vineyard infrastructure will be subjected to strong ground shaking during its design life. Specifically, there is a 63% probability for one or more 6.7 magnitude or greater earthquakes by 2036 (UCERF 2008).

The property as well as the project site are not located within a current Alquist-Priolo Earthquake Zone (formerly Alquist-Priolo Special Studies Zones) (CGS 2007). As described in Section 3.3, the property is 5 kilometers (3 miles) to the northwest of the Atlas Peak-Foss Valley tectonic lineament zone (Baldwin et al. 2006), and 14.2 kilometers (8.8 miles) to the south of the Hunting Creek-Berryessa fault system. This Atlas Peak-Foss Valley tectonic lineament zone is a northward extension of the potentially active, dextral Concord-Green-Valley fault. While the Concord-Green-Valley fault exhibits Holocene displacement, there are no active geologic faults associated with the Atlas Peak-Foss Valley lineament zone. The Hunting Creek-Berryessa is an active (Holocene) dextral strike-slip fault system associated with the larger San Andreas fault system. This system showed activity during past 11,700 years without historic record.

According to USGS (2004, 2006) and CGS (2010), the Atlas Peak-Foss Valley tectonic lineament zone last showed activity more than 700,000 years ago. There are no active or inactive faults mapped or observed on the Abreu property or in its vicinity. Based on a review of earthquake maps, no earthquakes of magnitude 1.5 and larger have occurred at the Abreu property, or within a distance of 3.0 kilometers (2 miles) from the property, over the last 42 years (USGS 2004, UCERF 2008, USGS 2012). As a result, the likelihood of ground rupture, and thus seismic hazard to the proposed vineyard and its irrigation facility due to faulting along an active fault is considered to be very low.

Other potential risks related to seismic shaking include liquefaction, lateral spreading and lurching, and seismically induced slope failure. Based on the shallow depth (1 meter or 3 feet) to the bedrock, and the absence of loose and/or saturated soils in the area of the proposed project, the area's susceptibility to liquefaction is considered to be very low. Lateral spreading is normally induced by the vibration of alluvial strata in an exposed face, while lurching produces cracks during earthquakes. Since there are no exposed faces of the steep alluvial channel banks on the property which could be affected by lurching or lateral spreading, the potential for lateral spreading and lurching at the water tank site is considered to be very low. The risk of seismically-induced hillslope failure is nearly absent given the shallow soils, a modeled shallow landslide hazard, and a mapped peak ground acceleration (PGA) of 0.58 g at the site of the proposed vineyard (USGS 2012).

5 PROPOSED VINEYARD EROSION CONTROL PLAN

DAVM proposes to develop 17.0 gross acres (15.3 net acres) of hilltop vineyard within the non-native sparse grassland and second-growth moderate-to-high density forest area (**Figure 2**). The proposed vineyard Block 3 is located on parcel APN 024-080-028, which is located on a flat hilltop. Under the existing conditions, the proposed vineyard Block B has tree canopy cover ranging from 0 to 75% (with an area-weighted average of 50%), and ground cover ranging from 20% to 70% (with an area-weighted average of 40%). The average hillside gradient ranges from 0 to 16%, with an area-weighted average of 6.5% (about 40% of the area is under 5%). As in the past, the current proposal avoids the mature tree stands, which are located in the southwest portion of the property hilltop.

The water wells at the property have the following uses: Abreu Well No. 1 is the source of water for the proposed vineyard Block B, and Abreu Well No. 3 is the source of water for the existing South and Southeast Abbott-Abreu vineyards. A simple water budget, presented in Section 3.5, shows that up to a

3% increase in the groundwater recharge, from 96.6 acre-feet per year to 99.5 acre-feet per year, is likely to occur at the Abreu property as a result of the proposed project.

5.1 Land Grading

The development of the proposed vineyard Block B, as shown in the project Erosion Control Plan #P05-0376-ECPA (NVVE 2013), will involve: the conversion of the existing non-native sparse grassland over an area of 6.3 acres; the removal and conversion of the moderate-to-high density second-growth forest over an area of 10.7 acres; soil ripping to a depth of 5 feet; the elimination of the 25-meter-long (80 feet) forest-floor pathway (a relic of an abandoned agricultural diversion or avenue) located within the proposed vineyard; the abandonment of 755 meters (2,480 feet) of old litter-mantled hilltop trails located within the proposed vineyard;[35] the abandonment of 325 meters (1,065 feet) of old trails located within the Abreu South Swale catchment, south of the proposed vineyard;[36] and the installation of permanent and temporary erosion control and water quality protection measures (see Section 5.2 for details).[37] The abandonment of the hilltop trails includes the elimination of the 165-meter-long (540 feet) hilltop trail that traverses the Abreu West-North Swale and Abreu West-South Swale catchments. During high-intensity rainstorms, this trail delivers measurable sheet flow into the forest-floor pathway/abandoned agricultural ditch located within the Abreu West-South Swale catchment.

The project proposal above reflects the results of the hydrologic evaluation (Section 6), which quantified the hydrologic effects of the original ECP (NVVE 2005) and identified several mitigation measures and alternatives.

A new drip irrigation system will be installed to irrigate the proposed vineyard block during the dry season, using the existing Abreu Well No. 1 as the water source.

5.2 Soil Erosion Control and Water Quality Protection Measures

The permanent and temporary soil erosion control and water quality protection measures include the following: 1) about twenty fibre rolls along the Block B vineyard avenue, especially on the steep segment located within the Abreu North Swale catchment; 2) one rock stabilization structure, one earth berm water spreader, and one concrete weir structure located at the downslope end of the proposed vineyard Block B, at the western property boundary with the PUC forest, within the Abreu West-North Swale catchment; 3) two rock stabilization structures, one earth berm water spreader, and one concrete weir structure located at the downslope end of the proposed vineyard Block B, at the western property boundary with the PUC forest, within the Abreu West-South Swale catchment; and 4) two rock stabilization structures and four earth berm water spreaders within the Abreu North Swale catchment, including one rock stabilization structure and one earth berm water spreader at the northern property boundary with the PUC bike trail.

The vineyard design assumes that a permanent no-till 70% cover crop will be developed and maintained within the vineyard each winter.[38] This represents a significant improvement in ground cover within the existing non-native sparse grassland area (6.3 acres) as compared to the current conditions, unchanged conditions in the ground cover within the thinned forest (6.0 acres), and a significant decrease in the ground cover within the mature and high-density forest (4.7 acres).

[35] The abandonment will involve a change in the surface cover, from bare earth to vineyard cover crop, over an area of 0.46 acres.
[36] The abandonment will involve a change in the surface cover, from bare earth to grass, over an area of 0.20 acres.
[37] The Erosion Control Plan may be subject to minor revision pending Napa County approval.
[38] To encourage water penetration and to stimulate root growth, alternate vineyard rows will be disked/tilled annually. Every other year, the tilled/non-tilled rows will be rotated (NVVE 2013).

The project ECP also proposes to enhance the ground cover by applying compost mulch over an area of 10.0 acres within the forest and grassland outside the existing and proposed vineyards on the property hilltop. This enhancement will occur within the hilltop swale catchments, and it will amount to the following catchment-specific acreages: 8.90 acres within the Abreu North Swale catchment, and 1.06 acres within the Abreu West-South Swale catchment.

To maximize runoff infiltration on-site, concrete weir structures and earth berm water spreaders will be placed at the downstream ends of two hilltop low-relief swales to encourage temporary ponding within the Abreu West-North and Abreu West-South Swale catchments. Such structures are referred to as temporary runoff detention and dispersion ponds in this report. This erosion and runoff control measure will promote the conveyance and infiltration of the vineyard storm runoff, maintaining the winter period peak flows at or slightly under the pre-project conditions. The temporary detention ponds will not require the installation of plastic liners (low- or high-density polyethylene). Based on the WinTR-55 watershed runoff model analysis, the temporary ponding capacity during 100-year storm events will be about 0.56 acre-feet per year (see Section 6 for details). Additional water storage of about 0.2 acre-feet is estimated to occur within the proposed temporary pond structures, below the elevation of the bottom of the concrete weir notch, due to the topographic relief under the current conditions. This water storage is permanent (i.e. "dead" storage), and it will be increased to 0.2-0.5 acre-feet by additional earth contouring within the existing topographic lows during the soil ripping operations (NVVE 2013). With the addition of the temporary and the permanent water storages, the total water ponding capacity of the two hilltop temporary runoff detention ponds is estimated to be about 1.0-1.26 acre-feet. See Section 6 and **Appendix B** for details.

As proposed, the project Erosion Control Plan #P05-0376-ECPA (NVVE 2013) is in compliance with the forthcoming San Francisco Bay Water Control Quality Control Board's pollutant discharge requirements for vineyard properties in the Napa River/Sonoma Creek watersheds (Region 2 Water Board 2012). The geologic and hydrologic analyses, which were carried in support of the proposed project ECP (this study), examine the effects of the existing and proposed new vineyard structures and measures on runoff and sediment delivery to watercourses on-site and off-site. They also measure the effects of the related infrastructure (e.g., property roads and off-site reservoirs). As shown in Sections 3, 4, 6, and 7, the geologic and hydrologic analyses conclude that at points of discharge from the proposed and existing hilltop and hillside vineyards and roads, the proposed project is predicted to cause no on-site runoff concentration or changes in storm runoff such that they would contribute to significant local or off-site changes in sediment dynamics and/or channel habitat conditions. Additionally, these analyses identify all types of management-related sediment/pollutant sources, as well as the related sediment delivery, from the entire property area, allowing for the development of the farm plan and the planning of future sediment reductions (Region 2 Water Board 2012), in order to implement the Napa River watershed sediment TMDL (Region 2 Water Board 2009). See Section 8 for a detailed discussion.

5.3 Water Availability and Use

The proposed vineyard water use will be supported by Abreu Well No. 1, which is capable of sustaining a water yield of at least 330 gallons per minute (HWD 2003, Imboden Pump 2007).[39] This is equivalent to a water yield of 1.45 acre-feet per day, or 43.75 acre-feet per month.

[39] According to a 2-hour pump test (HWD 2003) and a 72-hour (Imboden Pump 2007) pump test carried for Abreu Well No.1, the well is capable of maintaining a water yield of at least 330 gallons per minute (gpm). The drawdown in the well amounted to 75 meters (248 feet) during the 72-hour well test, and the water level recovered in 30 minutes following the shut down of the well pump. For comparison, wells drilled in the Sonoma Volcanics commonly yield 10 to 50 gpm and drawdowns are on the order of from 10 to 120 feet (CDWR 1975). Abreu Well No. 1 exceeds the average water yield by a factor of ten.

The annual water use within the proposed vineyard is estimated to be about 5.63 acre-feet per year over the long-term, and 11.27 acre-feet per year over the short-term (this is in order to establish the vines over a period of two to three years).[40] This assumes an irrigation scenario of 40 and 80 gallons per vine per year in the long- and short-term, respectively, and 3,000 vines per acre (ERM 2013). The current water use of the existing vineyards on the Abreu property is estimated to be 6.0 acre-feet per year within the South and Southeast Abbott-Abreu Vineyards, and 5.6 acre-feet per year within the North Abbott-Abreu Vineyard (Environmental Resource Management 2005; David Abreu, personal communication 2007). DAVM does not anticipate having to provide water for frost protection (David Abreu, personal communication 2007).

In total, the proposed post-project water use at the Abreu property is estimated to be 17.83 acre-feet per year in the long-term, and about 23.47 acre-feet per year in the short-term.[41] Such water demand is by far exceeded by the water available from the Abreu agricultural wells, indicating no adverse effects of the proposed project on the property groundwater supply. The estimated long-term water use is equivalent to about 47.2% of the allowable groundwater allotment of 37.75 acre-feet per year,[42] and 17.9% of the property groundwater recharge of about 99.5 acre-feet per year. Analogously, the corresponding relative short-term water uses are about 62.2% and 23.6%, respectively.

As irrigation takes place in the dry season, which typically occurs from the beginning of June to the end of September in Napa County, the dry period water input into the on-site vineyard soils is expected to have no adverse effects on peak flows in the wet season, or during individual winter period storm events.

6 SURFACE WATER HYDROLOGY EVALUATION

6.1 Introduction

To evaluate the project's potential on-site storm runoff impacts to the existing and potential hydrologic pathways and hillslope stability within the Abreu property, a WinTR-55 watershed runoff model (USDA-NRCS 2003) was developed. The model examined the three low-relief hilltop swale catchments for the change in peak discharge runoff between the existing conditions and the proposed vineyard conditions, at the downstream end of each catchment within the hilltop portion of the property. About 10% of the proposed vineyard Block B is drained by the Abreu North Swale, 38% by the Abreu West-North Swale, and the remaining 51% by the Abreu West-South Swale catchment, respectively (see **Figure 4** for details). The project conditions reflected the original project ECP (NVVE 2005). Additionally, due to the predicted increase in the peak discharge under the post-project condition (see **Table 4**), a suite of project mitigation alternatives were identified and quantified.

The WinTR-55 runoff estimates were not calibrated to measured streamflow data collected near the project site. Rather, the analysis focused on an analytical comparison of the pre- and post-project changes in runoff.

As presented in Section 3, a well-developed and continuous natural channel network is absent within the Abreu property hilltop, under the current conditions. Instead, the hilltop flow pathways are fragmented, and limited to 1) one 25-meter-long (80 feet) concentrated flow pathway which occurs within the floor of

[40] The water use rates were calculated using the information presented in the Phase 1 Water Availability Analysis by ERM (2013), and amount to the following: 0.37 acre-feet/yr for the long-term, and 0.74 acre-feet/yr for the short-term water needs.

[41] This also includes water use by the olive trees, which is estimated to be 0.6 acre-feet/yr over an area of 1.7 acres. The estimate assumes an irrigation rate of 20 gallons per olive tree during the irrigation period.

[42] The groundwater allotment is calculated on the basis of Napa County's guidelines for allocating the usage of groundwater to property owners. Given the hillside characteristics of the Abreu property, this 'fair share' rule applies a threshold of 0.5 acre-feet of groundwater per acre of property area per year, yielding 37.75 acre-feet of allowable annual groundwater extraction.

the thinned forest in the Abreu West-South Swale catchment, and to 2) localized sheet flow within the grass-covered non-trail hilltop areas. This short forest-floor concentrated flow pathway appears be a relic of an abandoned agricultural diversion or avenue from the 1900s-1930s, and it has been observed to capture extensive sheet flow that develops on the compacted surface of the nearby trail during high-intensity rainstorms, under the current conditions. No running water, only occasional wetness of the organic litter, has been observed to form in this forest-floor pathway during rainstorms since late 2006 on any of the twenty visits.

The model was used to calculate the pre- and post-project peak discharge for the 2-, 5-, 10-, 25-, 50-, and 100-year return period 24-hour storm events. The rainfall depth data used to determine the runoff was based on the rainfall depth-duration-frequency analysis for the precipitation record at the Angwin PUC Gage No. E30 0212. This station is located at an elevation of 553 meters (1,815 feet) above mean sea level, close to the Abreu property. The rainfall depth-duration-frequency analysis characterized the rainfall patterns at the property, and estimated rainfall intensities of different durations and recurrence intervals (see Section 3.2). It was performed for durations ranging from 15 minutes to 1 day, and for recurrence frequencies ranging from 2 years to 10,000 years. The maximum rainfall values for 1-day (24-hour) storms were applied to run the WinTR-55 hydrologic model, to calculate the pre- and post-project peak discharge for the 2-, 5-, 10-, 25-, 50-, and 100-year return period 24-hour storm events. The rainfall depth estimates for the 2-, 5-, 10-, 25-, 50-, and 100-year 24-hour duration storm events at the Abreu property are 3.56, 4.87, 5.67, 6.62, 7.29, and 7.93 inches, respectively.

WinTR-55 is a single-event, rainfall-runoff, small watershed hydrologic model, which enables the calculations of storm runoff volume, the peak rate of discharge, hydrographs, and pond storage volumes required for floodwater reservoirs. The model is based on a NRCS runoff curve number procedure, which accounts for rainfall, initial abstraction, and potential maximum retention within land-use specific areas after the runoff begins. A land-use runoff curve number indicates the runoff potential of a soil and is based on vegetative ground cover conditions and the NRCS hydrologic soil group of each land-use specific area. The higher the curve number, the higher the potential for rainfall runoff. The land-use cover types established in the NRCS procedure for cultivated and other agricultural lands are as follows: fallow, row crop, small grain, close-seeded legumes or rotation meadow, pasture, grassland or range, meadow, brush, woods-grass, and woods. The hydraulic conditions, which reflect the vegetative ground cover, are classified in the NRCS procedure as poor (<50% cover), fair (50-75% cover), or good (>75% cover).

The model's limitations are that it only includes: NRCS rainfall distribution types, 24-hour rainfall duration, a maximum of 10 sub-watersheds and the associated reaches, a minimum watershed size of 1 acre, a maximum watershed size of 65 km^2 (25 mi^2 or 16,000 acres), a minimum 0.1 hour time of concentration, and a maximum 10-hour time of concentration. As described in the model documentation, the NRCS runoff procedure applies only to direct surface runoff, disregarding large sources of subsurface flow or groundwater level fluctuations. Within the shallow-soil landscapes, the hillside surface runoff processes are limited to the infiltration-excess (i.e. Hortonian) and saturation-excess overland flows. The program calculates the time of concentration for three flow types: sheet flow, shallow concentrated flow, and open channel flow. Sheet flow, which is flow over plane surfaces, is assumed to be less than 30 meters (100 feet) in length. The surface hydraulic roughness of the plane surfaces is expressed by the Manning number *n*, and is limited to ten vegetative-cover roughness types ranging from 'fallow-no residue' to 'dense woods.' Shallow concentrated flow occurs after sheet flow and before entering the open channel, and its characterization is limited to length and surface hydraulic roughness. The hydraulic roughness characterization of shallow concentrated pathways is restricted to the 'paved' and 'unpaved' designations. The open channel flow paths are characterized by their dimensions (length, width, cross-sectional area), slope, surface hydraulic roughness (Manning number, *n*), and flow velocity.

The model cannot be used in areas subject to runoff from snowmelt or rain on snow. In California, snow typically occurs at elevations higher than 4,000 feet. The lower altitude Coast Range Mountains in California, such as those in Napa Valley, rarely experience snow events.[43] Therefore, within the California coastal region, the WinTR-55 model is most suitable for watersheds underlain by bedrock hillsides mantled with shallow soils (i.e. less than 1 meter or 3 feet) of the NRCS hydrologic soil group types B, C, and D.

6.2 Current and Post-Project Conditions

6.2.1 Land-Use Curve Numbers and Time of Concentration

The proposed project will involve changes in the vegetative ground cover, by type and hydrologic soil condition, within various land-use areas across the property hilltop. No permanent engineered erosion control measures were assumed in the original project ECP (NVVE 2005). Within the proposed vineyard Block B, the vineyard design assumes that a permanent no-till 70% cover crop will be developed and maintained. This represents a significant improvement in ground cover within the existing non-native sparse grassland area (6.3 acres) as compared to the current conditions, unchanged conditions in the ground cover within the thinned forest (6.0 acres), and a significant decrease in the ground cover within the mature and high-density forest (4.7 acres). The proposed project ECP (NVVE 2013), under Mitigation Alternatives Nos. 1 and 3 (see Section 6.3 for details), also proposes to enhance the ground cover by applying compost mulch over an area of 10 acres within the forest and grassland outside the existing and proposed vineyards on the property hilltop. Additionally, the proposed project ECP (NVVE 2013) will involve the elimination of a 25-meter-long (80 feet) forest-floor pathway, a likely relic of an abandoned agricultural diversion or avenue from the 1900s-1930s, located within the Abreu West-South Swale catchment.

Based on the WinTR-55 evaluation of the proposed ECP (NVVE 2013), the proposed timber- and grassland-to-vineyard conversion, under Mitigation Alternatives Nos. 1 and 3, will result in slight-to-moderate changes in the surface roughness n-values, the curve numbers, and the times of concentration for each of the three low-relief hilltop swale catchments draining the proposed Vineyard Block B. The catchment-average curve number will decrease slightly from 67 to 62 in the Abreu North Swale catchment, under the project-conditions (**Table 3**). In both western catchments, it is predicted to increase slightly post-project despite the proposed ground cover enhancements outside the vineyard: from 68 to 72 in the Abreu West-North Swale catchment, and from 69 to 70 in the Abreu West-South Swale catchment.

Table 3. Land-Use Curve Numbers and Time of Concentration, Current and Post-Project Conditions.

Lucia Abreu Vineyard Howell Mountain: Ground Hydraulic Conditions	Hilltop Swale Catchment Runoff Characteristics					
	Abreu North Swale		Abreu West-North Swale		Abreu West-South Swale	
	CN	Tc (hr)	CN	Tc (hr)	CN	Tc (hr)
Current	67	0.112	68	0.107	69	0.168
Post-Project	66	0.112	72	0.071	71	0.078
Post-Project with Mitigation No. 1	62	0.112	72	0.071	70	0.078
Post-Project with Mitigation No. 2	66	0.112	72	0.071	71	0.078
Post-Project with Mitigation No. 3	62	0.112	72	0.071	70	0.078

[43] At the Abreu property, annual snowfall is insignificant, amounting to about 5% of the mean annual precipitation.

The times of concentration are predicted to increase by about 50% in both western hilltop catchments, and will remain unchanged in the Abreu North Swale catchment (**Table 3**). The large increase in the times of concentration in both western hilltop catchments is due to the change in the surface hydraulic roughness n-value, from that of 'light woods' under the current conditions (n=0.40), to 'dense grass' under the post-project conditions (n=0.24). The choice of n-value of 0.4 is conservative, given that nearly all understory has been removed over the past decades by land-use activities (the realistic value of surface roughness, under the current conditions, is probably closer to a 'rangeland' n-value of 0.13). The choice of the post-project n-value of 0.24, on the other hand, is likely an exaggeration, considering the 70% cover-crop ground cover value (most likely the surface roughness associated with the 70% cover is equivalent to a 'short grass' n-value of 0.15). No changes to the surface hydraulic roughness are assumed to take place in the Abreu North Swale catchment, due to the limited extent of the vineyard there. See **Appendix B** for details.

6.2.2 Peak Discharge

According to the WinTR-55 evaluation of the original project ECP (NVVE 2005), moderate increases in storm runoff are predicted in the 100-year peak discharge in both western catchments under the post-project conditions: 14.9% within the Abreu West-North Swale catchment, and 8.4% in the Abreu West-South Swale catchment (**Table 4**). As presented in Section 3.6, both western low-relief hilltop swales drain to the west across the PUC forest, which stretches along College Avenue, toward the PUC campus ravines. A slight decrease (3.8%) in storm runoff is predicted to occur within the Abreu North Swale catchment in the 100-year peak discharge, under the post-project conditions. There would be a 3.9% area-weighted average increase in the 100-year peak discharges combined, across the property hilltop, as a result of the proposed project. See **Appendix B2** for details.

Table 4. Hilltop Peak Discharge WinTR-55 Calculations, Current and Post-Project Conditions.

Lucia Abreu Vineyard Howell Mountain: Runoff Conditions	Hilltop Swale Catchment Peak Discharge (cfs)					
	Abreu North Swale Storm Event Return Period		Abreu West-North Swale Storm Event Return Period		Abreu West-South Swale Storm Event Return Period	
	2-Yr	100-Yr	2-Yr	100-Yr	2-Yr	100-Yr
Current	1.86	13.25	0.98	6.46	1.59	9.97
Post-Project	1.64	12.75	1.44	7.42	1.99	10.81
Post-Project with Mitigation No. 1	0.81	10.77	1.44	7.42	1.82	10.45
Post-Project with Mitigation No. 2	1.64	12.75	0.51	3.79	1.46	8.91
Post-Project with Mitigation No. 3	0.81	10.77	0.51	3.79	1.30	8.60

6.3 Project Mitigation Alternatives

To mitigate the predicted increase in peak discharge under the post-project conditions (see **Table 4** for details), several other runs of the WinTR-55 model were performed to explore and evaluate three project mitigation alternatives. The project mitigation scenarios are as follows: 1) Mitigation Alternative No. 1 addresses the hydrologic benefits of enhancing the ground cover conditions—via the application of compost mulch—within the undeveloped areas on the property hilltop;[44] 2) Mitigation Alternative No. 2

[44] To mitigate storm runoff impacts to soil erosion, it was recommended to DAVM in March 2007 that compost mulch (Cal/EPA 2002) be used within the forest floor, outside the existing and proposed vineyards. These areas experienced a loss in volume of the forest litter due to recent timber management related operations (**Figure 9**). The application of mulch would enhance the interception of precipitation within the forest floor litter, and promote water infiltration into soil.

involves the construction of small (0.1–0.3 acre) hilltop temporary runoff detention ponds; and 3) Mitigation Alternative No. 3 involves a combination of alternatives nos. 1 and 2.

As indicated in **Table 4**, the sole reliance on Mitigation Alternative No. 1 would bring about a 18.7% reduction in the 100-year peak discharge in the Abreu North Swale catchment, maintain a 14.9% increase in the Abreu West-North Swale catchment, and generate a 4.8% increase in the Abreu West-South Swale catchment. This mitigation scenario relies on ground cover enhancement across 8.90 acres of the forest floor within the Abreu North Swale catchment, and 1.06 acres within the Abreu West-South Swale catchment. The entire area of the Abreu West-North Swale catchment is occupied by the proposed vineyard, providing no space for forest floor enhancement. There would be a combined 4.4% area-weighted average decrease in the 100-year peak discharges across the property hilltop, as a result of the proposed vineyard development and Mitigation No. 1. However, this mitigation alternative would result in elevated 100-year storm runoff levels in both western low-relief hilltop swales that drain to the west across the PUC forest, toward the PUC campus ravines. See **Appendix B3** for details.

To reduce storm runoff from both western low-relief hilltop swales, Mitigation Alternative No. 2 relies on the construction of a temporary 0.3-acre hilltop runoff detention pond located within the Abreu West-North Swale catchment (Pond No. 1) and a temporary 0.1-acre hilltop runoff detention pond located within Abreu West-South Swale catchment (Pond No. 2). The two temporary ponds would be designed to store seasonal storm runoff, and would be constructed at the western property boundary, at the downslope end of the Abreu West-North and West-South Swale catchments, immediately west of proposed vineyard Block B and at the PUC-Abreu property boundary (**Figures 70 and 71**). The temporary ponds would occupy the existing topographic lows within each of the two low-relief hilltop swales, and would involve additional deepening and earth contouring to increase their temporary ponding capacity. As noted in Section 5, these temporary ponds would not require the installation of plastic liners (low- or high-density polyethylene). A concrete weir structure with a rectangular-shaped notch and an earth berm water spreader would be built at the downslope end of each deepened topographic low, causing them to act as temporary detention ponds during storms. No enhancement of ground cover conditions in any of these catchments outside the existing and proposed vineyards is assumed under this alternative.

The Win-TR55 runoff modeling explored multiple weir-length scenarios ("trials") for each temporary runoff detention pond: 0.5 feet, 3.0 feet, and 9.0 feet in the Abreu West-North Swale, and 0.5 feet, 1.0 feet, and 3.0 feet in the Abreu West-South Swale. To ensure a complete sinking, slowing, and dispersion (i.e. infiltration) of sheet flow from the proposed Block B, DAVM in 2007 adopted the most conservative concrete weir design for both temporary runoff detention ponds. This would be achieved through the construction of 0.5-foot long rectangular weir notches.

As indicated in **Table 4**, Mitigation Alternative No. 2 would result in a 3.8% reduction in the 100-year peak discharge in the Abreu North Swale catchment, a 41.3% decrease in the Abreu West-North catchment, and a 10.6% decrease in the Abreu West-South Swale catchment. There would be a combined 14.3% area-weighted average decrease in the 100-year peak discharges across the property hilltop, as a result of the proposed vineyard development and Mitigation No. 2. See **Appendix B4** for details. See **Figure 81** showing the locations of the proposed temporary runoff detention ponds nos. 1 and 2.

Mitigation Alternative No. 3 increases the hydrologic benefits of both alternatives nos. 1 and 2. It relies on the construction of the hilltop temporary runoff detention ponds nos. 1 and 2, and on ground cover enhancement across 8.90 acres of the forest floor within the Abreu North Swale catchment, and 1.06 acres within the Abreu West-South Swale catchment. As shown in **Table 4**, Mitigation Alternative No. 3 would bring about a 18.7% reduction in the 100-year peak discharge in the Abreu North Swale catchment, a 41.3% decrease in the Abreu West-North catchment, and a 13.7% decrease in the Abreu West-South Swale catchment. There would be a combined 22.5% area-weighted average decrease in the 100-year

peak discharges across the property hilltop, as a result of the proposed vineyard development and Mitigation No. 3. In 2007, DAVM adopted this mitigation alternative, which led to the revision of the original ECP (NVVE 2008). See **Appendix B5** for details.

Based on the WinTR-55 watershed hydrologic model analysis, the temporary ponding capacity under the Mitigation Alternative No. 3 would amount to about 0.56 acre-feet per year (see **Appendix B** for details). Additional water storage of about 0.2 acre-feet is estimated to occur within the proposed temporary pond structures, below the elevation of the bottom of the concrete weir notch, due to the topographic relief under the current conditions. This water storage is permanent (i.e. "dead" storage), and it will be increased to 0.2-0.5 acre-feet, to a total of 0.4-0.7 acre-feet, with additional earth contouring within the existing topographic lows during the soil ripping operations (NVVE 2013). Combining the temporary water storage with the permanent pond storage of 0.4-0.7 acre-feet, the total free temporary storage capacity of the two runoff detention ponds is estimated to range from about 1.0 to 1.26 acre-feet under this scenario.

See details of the model runs in **Appendix B**. These include the calculations of the time of concentration and the peak discharge by rainfall return period, a detailed summary of land use and curve numbers, the plots of modeled hydrographs, and pond storage volumes.

7 SEDIMENT BUDGET

7.1 Introduction

A sediment budget is simply defined by the sediment continuity equation: $\boldsymbol{P - \Delta S = O}$, where: $\boldsymbol{P}$ is the volume of sediment Production (from soil erosion and mass wasting processes), $\boldsymbol{\Delta S}$ is the change in sediment Storage, and $\boldsymbol{O}$ is the volume of sediment Output ("yield"). Recently, sediment budgets have been used to provide a reasonable estimate of erosion, sedimentation, and sediment transport within a basin in the absence of long-term and extensive measurements of suspended sediment and bedload. The spatial scale of a sediment budget can extend from a watershed (Dietrich and Dunne 1978, Dietrich et al. 1982, Lehre 1982) to a short reach of a stream channel. The temporal scale of a sediment budget is defined to reflect the temporal scales of the dominant hydrologic, sediment-producing, and sediment-delivering processes in the watershed, and typically ranges from years to decades.

Erosion or "sediment production" is defined as all particles which "break free" or detach from the soil through surface erosion and mass wasting. The transfer of loose sediment from hillslopes to watercourses is referred to as "sediment delivery." The process of sediment delivery reflects the saturated and Hortonian overland flow from "overland flow areas," as well as bank erosion due to shallow soil creep, under both current and post-project conditions. Not all delivered particles travel (i.e. are transported) long distances in the watercourses due to "sedimentation," i.e. the trapping of sediment. Those that do travel off-site are defined as "sediment yield."

As presented in Section 2, the Abreu property sediment budget was developed to estimate the sediment delivery conditions experienced during very wet winters or high-intensity and long-duration storms. During these sediment-producing events, a grain-size specific ratio of 0/100/100/100 was applied to calculate the hillside surface erosion sediment delivery. (This ratio assumes that all sand, silt, and clay sediment fractions are delivered from fluvially-connected hillsides to the stream channels.) The same delivery ratio is applied to estimate the grain-size specific sediment delivery along the hydrologically-connected portion of the appurtenant road on the property. A chronic sediment delivery from shallow soil creep (i.e. stream channel banks) is assumed to occur year round, when applying a grain-size specific ratio of 100/100/100/100. (This ratio assumes that all gravel, sand, silt, and clay sediment fractions are

delivered from the stream channel banks to the stream channels.) The sediment production from this process on the Abreu property is negligible.

7.2 Current and Post-Project Conditions

Based on field reconnaissance conducted in this study, the sediment production within the property is characterized by the following: 1) surface erosion within the existing and proposed vineyards (a total area of 35.0 acres); 2) surface erosion in the forest and grassland areas within the plateau portion of the property (a total area of 18.5 acres); 3) surface erosion in the forest and grassland areas within the steep hillside portion of the property (a total area of 6.5 acres); 4) surface erosion in the forest and grassland areas within the very steep hillside portion of the property (a total area of 12.3 acres); 5) trail- and road-related surface erosion (a total area of 3.5 acres); and 6) negligible shallow soil creep along the main appurtenant road and the ravines within the steep hillside portion of the property.

Due to subsurface flow seepage, small slumps annually evolve in the roadcut bank which parallels the southern property boundary along Las Posadas Road. Sediment delivery from these slumps is not accounted for in the property sediment budget as they are located outside the property. As presented in Section 3.4, no effects on peak discharge are anticipated to occur in the off-property ravines that support watercourses with seasonal flow (i.e. PUC McReynolds and Winning ravines), following the 3% project-related increase in the groundwater recharge and the related exfiltration along the lithologic contact. As a result, no secondary (peak-flow generated) erosion and sedimentation are expected to occur along the seasonal watercourses in the ravines outside the property, under the post-project conditions.

According to USLE calculations, which predicted soil erosion due to overland flow (USDA-NRCS and UC Cooperative Extension Service 1978, USDA-NRCS 1994), the rates of non-vineyard surface erosion range from 0.08 (forest) to 3.98 (grassland) tons/ac-yr for the flat hilltop, and from 0.54 (forest) to 45.00 (grassland) tons/ac-yr for the steep hillsides (**Appendix A1**). In total, an estimated 83.5 tons/yr of erosion are produced within the non-vineyard hilltop and hillside forest and grassland. The rates of surface erosion within the existing vineyards are 1.05 tons/ac-yr in South Abbott-Abreu Vineyard (SAAV); 11.18 tons/ac-yr in North Abreu Vineyard (NAV); 8.72 tons/ac-yr in the western section of Southeast Abbott-Abreu Vineyard ($SEAAV_w$); and 16.19 tons/ac-yr in the eastern section of Southeast Abbott-Abreu Vineyard ($SEAAV_e$) (**Appendix A1**), with an area-weighted average rate of 10.99 tons/ac-yr. The rate of surface erosion within the proposed vineyard Block B hilltop area is 2.67 tons/ac-yr.

Under the current conditions, an estimated 198.0 tons/yr are produced within the existing vineyards, and 45.3 tons/yr within the 17-acre area of the proposed vineyard (**Appendix A1**). Under the post-project conditions, the rate of surface erosion within the proposed vineyard is estimated to be 1.23 tons/ac-yr (**Appendix A2**), and amount to a total sediment production of 20.9 tons/yr. As a result of the proposed timber- and grassland-to-vineyard conversion, there would be a 24.4 tons/yr (53.9%) decrease in surface erosion (from 45.3 to 20.9 tons/yr) within the 17-acre area of the proposed vineyard. The vineyard-related surface erosion and sediment delivery are summarized in **Table 5**.

A total of 326.8 tons/yr [198.0+45.3+83.5=326.8] of non-road-related fine-grained sediment are produced within the existing vineyard blocks, forest, and grassland through surface erosion in the hilltop, hillside, and footslope areas within the Abreu property, under the current conditions. This amounts to a total non-road-related surface erosion rate of 1,116.9 tons/km^2-yr, or 4.52 tons/ac-yr, over the 72.3-acre non-road area. As a result of the proposed project, the sediment production due to non-road-related surface erosion on the property will decrease by 7.5%, from 326.8 tons/yr to 302.4 tons/yr [198.0+20.9+83.5=302.4]. Assuming a soil bulk density of 1.6 tons/m^3, these current and post-project erosion rates correspond to a total average non-road-related surface lowering rate of 0.70 mm/yr and 0.65 mm/yr, respectively.

Table 5. Summary of Vineyard Block USLE Calculations, Current and Post-Project Conditions.

Vineyard Block ID	USLE Erosion Rate, Current (T/Ac-Yr)	USLE Erosion Rate, Post-Project (T/Ac-Yr)	Vineyard Block Area		Current Vineyard Block Surface Erosion		Post-Project Vineyard Block Surface Erosion	
			Total (Ac)	Connected OFA[1] (Ac)	Sediment Production (T/Yr)	Sediment Delivery (T/Yr)	Sediment Production (T/Yr)	Sediment Delivery (T/Yr)
NAV	11.18	11.18	7.1	0	79.41	0	79.41	0
SAAV	1.05	1.05	1.8	0	1.89	0	1.89	0
$SEAAV_w$	8.72	8.72	4.1	0	35.75	0	35.75	0
$SEAAV_e$	16.19	16.19	5.0	5.0	80.97	80.97	80.97	80.97
Total Sediment Production/Delivery (Tons/Yr)					*198.02*	*80.97*	*198.02*	*80.97*
B	2.67	1.23	17.0	0	45.34	0	20.88	0
Total Sediment Production/Delivery (Tons/Yr)					*45.34*	*0*	*20.88*	*0*
Grand Total Sediment Production/Delivery (Tons/Yr)					**243.36**	**80.97**	**218.90**	**80.97**

[1] Overland Flow Area (OFA). See details on the calculation of sediment delivery on the following pages.

The proposed vineyard Block B, as well as the existing North Abreu Vineyard and South Abbott-Abreu Vineyard blocks, are naturally disconnected for runoff and sediment delivery to the areas outside the property. The sediment delivery from the existing Southeast Abbott-Abreu Vineyard block is discussed in the following paragraphs.

After the hilltop and hillside vineyard, forest, and grassland surface erosion, road-related erosion within the steep hillside appurtenant road and the property trails is the second most significant sediment source on the property. The main appurtenant road was rebuilt in 2003 by DAVM (see Section 3.1 for details), and it is paved with crushed rock and maintained annually (**Figure 72**). To increase the safety of traffic to the existing vineyard blocks in the south and southeast of the property, the road was built to be insloped and is effectively drained by a rocked inboard ditch coupled with a hillside subsurface storm runoff drainage system.[45] The road maintenance includes the seasonal construction of water bars.

Despite the effective drainage of the road prism, however, sheet flow and high erosion rates were observed within the road prism of the steepest section of the road during and following a storm in 2007. There were 2-to-4 mm rills within the crushed rock pavement in many places (**Figure 73**). Assuming an annual frequency of four sediment-producing storms in Napa Valley,[46] the single-event road surface erosion corresponded to an annual surface lowering rate of 0.0128 tons/meter, or 17.0 tons/acre-yr. As much as 20.4 tons [1.2 x 17=20.4] of crushed rock (i.e. sediment) could be produced annually within the road prism of the main appurtenant road on the property. This erosion is expected to remain unchanged under the post-project conditions, though DAVM plans to replace the crushed-rock surfacing with asphalt pavement within the next few years (David Abreu, personal communication 2012). No surface erosion has been observed along the peripheral appurtenant road.

[45] The subsurface storm runoff drainage system includes two underground storm runoff detention basins, which modulate runoff from the eastern half of Southweast Abbott-Abreu Vineyard block to the road ditch along Las Posadas Road. Specifically, the basins were designed to assure that no property-related flooding along Las Posadas Road occurs during storm and runoff events. (The storm runoff from the western half of the block is discharged into highly efficient "T-spreader" flow energy dissipators.) Both basins have a combined storage capacity of about 300 cubic feet (8.5 m^3, or 11.1 yd^3). Since 2003, an estimated 5 cubic yards (3.75 m^3) of coarse suspendable sediment (i.e. sand) have been removed as part of annual maintenance from these two basins and placed back into the soils within the vineyards (David Abreu, personal communication 2008). This is equivalent to an average annual sand sediment trapping of 1.5 tons/yr.

[46] This frequency is reported in Battany and Grismer (2000).

Additionally, during several storm events, it was observed that small rocks particles, which originate from the crushed rock road pavement, are fluvially transported into the inboard road ditch and, subsequently delivered to the subsurface storm runoff drainage system (**Figure 74**). Hillside sheeting and erosion within the road cut bank was also observed during the same storm events (**Figure 75**), as was variably turbid storm runoff at the property subsurface drainage outlet by Las Posadas Road (**Figure 76**). Repeated observations of sediment delivery to the inboard ditch, both during the 2007-2008 and 2012 periods, as well as the characteristics of the property runoff by Las Posadas Road, revealed that the main appurtenant road provides high hydrologic connectivity between the southern portion of the Abreu property and the areas off the property. As a result, the property main appurtenant road acts as the most significant sediment delivery mechanism on the property as well as to the properties downstream from the Abreu property.

Even though the unpaved hilltop trails and vineyard avenues are disconnected for the delivery of storm runoff and sediment supply (i.e. yield) to the areas outside the property, they exhibit sheet flow and high erosion rates within the road prism. This is based on the measurements of sediment storage within two trail-related alluvial fans, which formed during a single storm event within the North Abreu Swale catchment (**Figures 77 and 78**).[47] The trail surface lowering amounted to 0.7 mm (0.03 in) within a 50-meter-long (160 feet) segment, and 4.3 mm (0.17 in) within a 100-meter-long (330 feet) segment. Assuming an annual frequency of four sediment-producing storms in Napa Valley, the single-event surface erosion at the two sites corresponded to annual trail surface-lowering rates of 4.3 tons/ac and 28.0 tons/ac, respectively.[48] Assuming that the lower of the two trail surface erosion rates characterizes the average surface erosion conditions within the property hilltop trails and vineyard avenues (2.0 acres), at least 8.6 tons [4.3 x 2.0=8.6] of sediment could be produced annually within the property trails and vineyard avenues, under the current conditions. Because of the proposed abandonment of 1,080 meters (3,540 feet) of trails and the short road segment, or 33% of the total trail and vineyard-avenue length, sediment production from this sediment source is expected to decrease by 23.3%, from about 8.6 tons/yr to about 6.6 tons/yr [(4.3 x 1.34=5.76)+(0.66 x 1.23=0.81)=6.57].[49]

The very high hydrologic connectivity of the main appurtenant road is due to its location on a steep hillside below the hilltop, which causes the road to receive hillside sheet flow (as well as sediment delivery from hillside surface erosion) from three unique drainage areas. The connectivity is also due to the fact that the road-proximal hillslope and the road prism runoffs, as well as their respective sediment deliveries, are drained to the on-site subsurface storm runoff drainage system. The unique hillside drainages associated with the appurtenant road are defined as follows: 1) Abreu Las Posadas Road Drainage 1 (2.8 acres); 2) Abreu Las Posadas Road Drainage 2 (4.5 acres); and 3) Abreu Las Posadas Road Drainage 3 (5.0 acres) (**Figure 4**). In terms of vegetative cover, the Drainage 1 hillside is characterized as very steep hillside forest, Drainage 2 as steep hillside forest, and Drainage 3 as South Abbott-Abreu Vineyard. About 450 meters (1,475 feet) of the main appurtenant road are connected for the delivery of storm runoff and sediment supply to the areas outside the property.

Hillside runoff and sediment supply from drainages 1 and 2 are fully intercepted by the property main appurtenant road, and routed off-site via the underground storm runoff detention basins. In total, an

[47] The measurements were made following two storms in February 2007, and involved alluvial road deposit fans at two locations within the hilltop. The trail fan deposits had sand and silt textures. The first deposit of 0.1 m^3 (or 0.16 tons) is located at the east-west-trending segment of the Abreu trail, east of the proposed vineyard Block B. It originated from 150 m^2 (0.04 acres) of the steep trail surface (**Figure 79**). The second deposit of 1.3 m^3 (or 2.1 tons) is located at the north-south-trending segment of the trail within the North Abreu Swale catchment. It originated from 300 m^2 (0.07 acres) of the steep trail surface (**Figure 80**).

[48] The Abreu property rates of road surface lowering compare well to the road-related surface erosion of 6 mm/yr (0.24 inches/yr) observed on the Narsai David property, which is underlain by the same soil type, in the lower upper Conn Creek watershed (Martin Trso, R.G. 2005).

[49] The conversion from bare-earth conditions to grass cover involved applying a post-project vineyard surface erosion rate of 1.23 tons/acre-year to the areas of the abandoned hilltop trails, yielding a total surface erosion of 0.80 tons/yr in these areas.

estimated 3.1 tons [2.8 x 1.11=3.1] and 2.5 tons [4.5 x 0.54=2.5] of sediment, respectively, are delivered annually to the detention basins from these two sediment source areas. About 55% (5.0 acres) of Southeast Abbott-Abreu Vineyard is located within the Abreu Las Posadas Road Drainage 3. As a result, only 55% of the block's runoff and sediment supply is intercepted by the property main appurtenant road, and routed off-site via the underground storm runoff detention basins. In total, an estimated 81.0 tons [5.0 x 16.19=81.0] of sediment is delivered annually to the detention basins from this sediment source area, under the current conditions.

Additionally, about 5.8 tons [0.0128 x 450=5.8] of sediment is delivered annually to the underground storm runoff detention basins from the road tread of the main appurtenant road. These sediment deliveries are expected to remain unchanged under the post-project conditions, until the crushed-rock surfacing is replaced with the asphalt pavement.

According to the sediment budget developed for the Abreu property, about 355.8 tons/yr of sediment are produced on the hilltop and hillsides across the property, under the current conditions. This amounts to a unit-area sediment production rate of 1,160 t/km^2-yr, or 4.69 t/ac-yr, over the 75.8-acre property area. As a result of the proposed project, the total erosion within the property will decrease by 26.4 tons/yr, from 355.8 tons/yr to 329.4 tons/yr. This represents a 7.4% reduction in sediment production across the property, as compared to the current conditions. The results are presented in **Table 6**.

Table 6. Sediment Production and Delivery, Current and Post-Project Conditions.

Sediment Source Category		Current Conditions		Post-Project Conditions	
Type	**Area (Ac)**	**Sediment Production (T/Yr)**	**Sediment Delivery (T/Yr)**	**Sediment Production (T/Yr)**	**Sediment Delivery (T/Yr)**
Existing Vineyards	18.0	198.0	81.0	198.0	81.0
Proposed Vineyard	17.0	45.3	0	20.9	0
Existing Forest and Grassland	37.3	83.5	5.6	83.5	5.6
Main Appurtenant Road	1.2	20.4	5.8	20.4	5.8
Peripheral Appurtenant Road	0.3	0	0	0	0
Trails and Vineyard Avenues	2.0	8.6	0	6.6	0
Shallow Soil Creep	---	negligible	0	negligible	0
Total Sediment Production/Delivery (T/Yr)		**355.8**	**92.4**	**329.4**	**92.4**

With respect to type and significance, the sediment production at the property originates from the following sediment sources, under the current conditions: 198.0 tons/yr (56%) originate from the existing vineyards, 128.8 tons/yr (36%) from the existing forest and grassland, 20.4 tons/yr (6%) from the main appurtenant road, and 8.6 tons/yr (2%) from the trails and vineyard avenues (**Table 6**). As for land-use association, 227.0 tons/yr (64%) of the total property sediment production are management-related, and the remaining 128.8 tons/yr (36%) are natural or legacy-natural. Similar causalities have been reported from forested watersheds in the Northern California Coast Ranges (Kramer et al. 2001; Martin Trso, P.G. 2008c) and Napa County vineyard properties (Martin Trso, P.G. 2008b, 2009a, 2009b).

According to the sediment budget developed for the Abreu property, about 92.4 tons (26%) of the total property sediment production (i.e. 355.8 tons/yr) are delivered annually from an area of 13.3 acres, into the two underground storm runoff detention basins, under both the current and post-project conditions (**Table 6**). Applying the colluvium grain-size distribution and the grain-size specific hillside sediment delivery ratio of 0/100/100/100, this corresponds to a delivery of 12.3 tons/yr of sand, 43.1 tons/yr of silt, and 37.0 tons/yr of clay. None of this sediment originates from the property hilltop, nor from the

proposed vineyard Block B, due to the surface- and subsurface-flow hydrogeologic disconnectivity between the flat hilltop and the neighboring properties.

The remaining 263.4 tons/yr [355.8-92.4=264.3] of sediment production at the property is naturally stored within the soils at the property hilltop and footslope. An estimated 1.5 tons of coarse suspendable sediment (i.e. sand) are, on average, trapped annually within the two underground storm runoff detention basins.[50] The silt- and clay-sized sediment fractions are assumed to be fully transmitted though the detention basins during the storm runoff events. As a result, under both the current and post-project conditions, about 90.9 tons (98%) of the property sediment delivery (i.e. 92.4 tons/yr) is transported off-site, as the property sediment yield, to the W. S. Keyes Vineyard reservoir. Using the grain-size specific sediment delivery across the property, this corresponds to a sediment yield of 10.8 tons/yr of sand, 43.1 tons/yr of silt, and 37.0 tons/yr of clay. Because the W. S. Keyes Vineyard reservoir traps its sand and silt sediment supply, only about 37.0 tons/yr (amounting to 41% [37.0/90.9=0.407] of the property sediment yield of clay from the Abreu property is fully transmitted across the reservoir downstream to upper Conn Creek and, subsequently to Lake Hennessey, under the current conditions.

An estimated 22,000 tons of sediment is supplied annually from the upper Conn Creek watershed to Lake Hennessey (Martin Trso, R.G. 2005). Therefore, the Abreu property sediment yield amounts to 0.17% of the total estimated sediment supply in the upper Conn Creek watershed, under the current conditions. Because there is no project-related change expected in the off-site sediment yield, this contribution is expected to remain unchanged, under the post-project conditions.

8 CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

An erosion, sedimentation, hydrologic, and geotechnical stability assessment of the current and post-project conditions was performed for the Lucia Abreu Vineyard Howell Mountain property, and the neighboring downstream areas. The property owner, DAVM, proposes a mixed timber- and grassland-to-vineyard conversion, and the development of 17.0 gross acres (15.3 net acres) of hilltop vineyard within the non-native sparse grassland and the second-growth moderate-to-high density forest area.

The assessment took place over a period of six years, and involved the following: the assessment of land-use history; observations of the current conditions on hillslopes and in watercourses; an analysis of the empirical evidence of the property's geomorphic response to the effects of storms and land-use over the past 100 years; and numerical modeling of erosion, sediment delivery, sediment yield, water balance, peak discharge, and hillslope stability under the current and post-project conditions. This assessment focused on evaluating the feasibility and the on-site and off-site environmental effects of the proposed project Erosion Control Plan #P05-0376-ECPA (NVVE 2013).

The 75.8-acre Abreu property is located within the 34-km^2 (8,400 acres) upper watershed of Conn Creek, a tributary to Napa River. Since mainstem Napa River and its major tributaries, including Conn Creek, have been listed as sediment-impaired, notably with regard to sand and silt grain-size fractions, causing a serious increase in mortality at steelhead spawning sites (Cal/EPA 1990; Stillwater Sciences, Inc. and W.E. Dietrich 2002; Region 2 Water Board 2009), no net increase in soil transport off the project site should occur, due to the proposed vineyard development.

The Abreu property is uniquely situated within the southernmost extent of a broad and nearly horizontal volcanic plateau (tableland) of Howell Mountain, east of Angwin and the PUC campus, and south of the

[50] Comparing the estimated supply of sand (12.3 tons/yr) with the past sand trapping since 2003 (1.5 tons/yr) indicates a 12% [1.5/12.3=0.12] trap efficiency for sand-sized sediment. Typically, the storm runoff detention basins are designed to slow down velocities of runoff, rather than to trap sediment.

PUC airport. It is characterized as having cliff-bench topography, with the flat bench or tabletop occupying the property hilltop (which includes the project area). The hilltop is flanked by steep and dominantly divergent hillsides, and is deeply incised by two ravines on the Abreu property, two ravines on the neighboring PUC campus, and one ravine on the neighboring PUC airport. Its bedrock geology is comprised of hard andesitic lava-flow and ash-flow tuff rocks of the Sonoma Volcanics rock formation. Stratigraphically, the nearly-horizontal, permeable lava-flow rocks occupy ("cap") the property hilltop, and are underlain by impermeable ash-flow tuff. Due to the contrast in permeability, there are subtle locally-moist soil conditions during the rainy season along portions of the lithologic contact between the two geologic units outcropping on the steep hillsides below the hilltop, on both the Abreu and the PUC properties.

Prior to the arrival of the Euro-American settlers in mid-1800s, due to its elevation, tableland topography, geologic structure, and geomorphology, the area of the Abreu property (as well as the project site) was completely isolated for the delivery of storm runoff and sediment supply to the adjacent downhill properties and the upper Conn Creek watershed. This includes an area of the present-day 3rd-order tributary in Las Posadas Valley which parallels Las Posadas Road in the south of the Abreu property. The tableland's immediate vicinity, which includes Mill Valley to the northeast and Las Posadas Valley, was surrounded by unchanneled swampy meadows and alluvial forests. This natural disconnectivity has changed in response to land-use on and around the Abreu property over the past hundred and fifty years. While Mill Valley remains unchanneled to this day, a 3rd-order tributary was created in Las Posadas Valley by ditching the floor of an unchanneled alluvial forest in 1985-86, as part of vineyard development on the neighboring W. S. Keyes Vineyard property. This present-day ditch-watercourse did not naturally extend to the fish-bearing Conn Creek, and thus did not support fish populations. At the same time, in 1985-86, an on-channel ("on-ditch") reservoir on the W.S. Keyes Vineyard property was built. Under the current conditions, the reservoir traps all sand- and silt-sized sediment supply from its upstream watershed, which includes 13.3 acres of the Abreu property, and it transmits only clay-sized particles to upper Conn Creek.

The hydrologically connected 13.3-acre section of the Abreu property is due to the presence of a high-density engineered subsurface storm runoff drainage system, which is associated with the main appurtenant road and one existing vineyard block in the south of the property, by Las Posadas Road. The remaining 62.5 acres of the Abreu property, including the project site located on the property flat hilltop, remain naturally disconnected for the delivery of storm runoff and sediment supply to the adjacent areas, the present-day 3rd-order tributary, the W. S. Keyes Vineyard reservoir in Las Posadas Valley, upper Conn Creek and, ultimately, Lake Hennessey.

Based on the historical analysis carried out on this assessment, the Abreu property has over a hundred-year history of timber-management and agricultural use. As part of the agricultural land expansion in Angwin and the construction of the PUC campus, the old-growth forest over 70% (52 acres) of the property area was clearcut in the 1900s through 1930s. The deforestation and the associated development of vineyards also involved 40 acres of the property hilltop, including the entire area of the proposed vineyard Block B. Subsequent land-use included about twenty years of grape growing prior to the enforcement of Prohibition; subsequent orchard operations and selective timber removal over 70 years prior to DAVM ownership, which begun in 2001; and limited mixed timber- and grassland-to-vineyard re-conversion during the period 1995-2005. Since the DAVM ownership, the land-use activities were limited to the improvements of the main access road and two vineyard blocks (a total of 10.9 acres) developed under the previous ownership in 1995-2000; the clearing of second-growth hilltop forest understory and some pine trees, to manage tree mortality; the conversion of a 7.1-acre grass-covered area used for timbering staging activities into a vineyard; and the planting of olive trees over an area of 1.7 acres.

The hundred-year history of timber-management and agricultural use on the Abreu property has had a significant effect on the property's vegetative cover as well as its hydrologic processes. The vast historic reduction of the natural, old-growth vegetative cover, which took place over 52 acres of the property area in the 1900s-1930s, was followed by a progressive re-growth of the second-growth forest over the subsequent 70 years. Recently, in 1995-2000 under the previous ownership, a partial re-conversion to agricultural use took place over an area of about 11 acres. Since DAVM ownership in 2001, the vegetative cover across the property, including within the proposed project area, has remained essentially unchanged. Based on field reconnaissance and mapping, only a very fragmented and ephemeral hydrologic network occurs on the property, both on the flat hilltop and the steep hillsides below. A well-developed and continuous natural channel network is absent. Instead, the channel network demarks abundant and wide-spread sheet flow (which forms along trails and the grass-covered forest floor within the property hilltop during high-intensity and long-duration storm events), as well limited concentrated flow pathways, and one discontinuous steep ephemeral channel in the ravine. The wide-spread sheet flow has evolved most likely in response to the soil compaction associated with past pre-DAVM land-use activities (i.e. repeated deforestation, orchard operations, forest canopy thinning, etc.) as well as present-day recreational activities. No overland flow has been observed to form within the existing hilltop vineyards during rainstorms since late 2006. One of the concentrated flows is a 25-meter-long (80 feet) concentrated flow pathway that is located within the litter-mantled floor of the thinned forest, within the proposed vineyard block. Based on aerial photography, this pathway may be a relic of an abandoned agricultural diversion or avenue from the 1900-1930s. During high-intensity storms, the forest-floor pathway appears to receive appreciable amounts of sheet flow that forms within an old hilltop trail, causing it display localized wetted conditions in the forest litter. No running water, however, has been observed to form in this forest-floor pathway during rainstorms since late 2006.

Based on the review of the 1940-2011 precipitation record (hourly and daily rainfall depth data) at the Angwin PUC Gage, and field observations during rainstorms since late 2006, sheet flow appears to develop within the compacted trails during 4-5" storms and larger. Based on the rainfall depth-duration-frequency analysis that was performed to characterize the rainfall patterns at the property, and on the soil infiltration rates which were measured within the non-trail litter-mantled forest and vineyard soils (the rates were not measured within the grass-covered forest floor), it would require rainstorms with a multi-hundred year return interval to saturate the litter-mantled forest floor and generate overland flow.

Based on the simplified analysis of the water balance carried out on this assessment, the average groundwater recharge at the Abreu property is 96.6 acre-feet/yr. Up to a 3% increase (2.9 acre-feet/yr) in the groundwater recharge is likely to occur as a result of the expected increase in soil moisture within the proposed vineyard Block B, and the associated infiltration into the bedrock groundwater. The deforestation of the 40 acres of the property hilltop in the early 1900s would have brought about six times the increase in the groundwater recharge, about 18 acre-feet/yr (19%), and thus the likely exfiltration along the lithologic contact, estimated to occur to a lesser extent due to the proposed project. Based on aerial photographic analysis, the review of anecdotal evidence, and field surveys (this study in 2006-2008, and 2012), the property has not experienced any landslides or soil degradation, or caused water quality impacts to the neighboring downstream properties, in response to past natural disturbances and pervasive and extensive pre-DAVM ownership land-use activities. (The property has experienced no landsliding or soil degradation since DAVM ownership either.) Thus, the subtle estimated 3% increase in the groundwater recharge, under the post-project conditions, will have negligible effects on hillslope or soil stability along the lithologic contact. Within the two ravines on the PUC campus, which support short ephemeral watercourses, the excess groundwater seepage would amount to a minute extension of baseflow (on the order of a few hours a year), and would have no effects on peak discharge.

The field observations focusing on hillslope geotechnical stability and erosional conditions, as well as the lack of response to historical land use, are corroborated by the modeling of the shallow landslide hazard.

According to the SHALSTAB.V model, the entire property hilltop is predicted to be unconditionally stable, under any degree of soil saturation and tree cover (i.e. root cohesion) conditions, ranging from mature industrial forest to clearcut conditions. The same unconditional stability is predicted for the property's steep-sided ravines, with the exception of the clearcut scenario, which predicts a localized high shallow landslide hazard in the areas of the lithologic contact. Such a complete deforestation scenario, however, is not involved under the proposed project. Based on the geotechnical stability and landslide hazard evaluation performed in this study, it is concluded that no adverse effects on hillslope stability would occur as a result of the proposed timber clearing and the grassland- and timber-to vineyard conversion.

The long-term water use of the property's existing vineyards and the small olive orchard is estimated to be 12.2 acre-feet/yr under the current conditions. Following the development of the proposed project, the long-term water use at the property is estimated to increase to 17.8 acre-feet/yr, corresponding to 47% of the property's allowable groundwater allotment, and 18% of the property's estimated annual groundwater recharge. This indicates no adverse effects of the proposed project on the property groundwater supply.

The proposed project is expected to enhance the current hydrologic, erosional, and sediment-delivery conditions at the property hilltop. It proposes to: convert the existing non-native sparse grassland over an area of 6.3 acres, and the moderate-to-high density second-growth forest over an area of 10.7 acres to a high-density cover crop vineyard; eliminate a 25-meter-long (80 feet) forest-floor pathway, a likely relic of an abandoned agricultural diversion or avenue; abandon 755 meters (2,480 feet) of old litter-mantled hilltop trails located within the proposed vineyard (this includes the elimination of a 165-meter-long (540 feet) hilltop trail that delivers measurable sheet flow into the 25-meter-long forest-floor pathway/abandoned agricultural avenue); abandon 325 meters (1,065 feet) of old trails located south of the proposed vineyard; and install permanent and temporary erosion control and water quality protection measures. The measures will include the construction of two temporary runoff detention and dispersion ponds downslope from the proposed vineyard Block B. The ponds are designed to promote the conveyance and infiltration of vineyard storm runoff, and maintain the winter period peak discharges at or slightly under the pre-project conditions. The total water ponding capacity of the two hilltop temporary runoff detention and dispersion ponds is estimated to be about 1.0-1.3 acre-feet during 100-year storm events.

Based on the updated erosion, sedimentation, and hydrologic assessments (this study), a 53.9% decrease (from 45.3 tons/yr to 20.9 tons/yr) in surface erosion will be achieved within the proposed vineyard, and a 23.3% decrease (from 8.6 tons/yr to 6.6 tons/yr) within the property trails. In total, as a result of the proposed project, there will be a 7.4% decrease (from 355.8 to 329.4 tons/yr) in erosion across the entire Abreu property. According to the sediment budget developed for the Abreu property, about 263.4 tons of the property sediment production are naturally stored annually within the property soils, 1.5 tons are deposited in the two underground storm runoff detention basins, and 90.9 tons are transported off-site to the W. S. Keyes Vineyard reservoir. This property sediment yield amounts to 0.17% of the total estimated sediment supply from the upper Conn Creek watershed to Lake Hennessey, and is expected to remain unchanged under the post-project conditions. Additionally, as a result of the proposed vineyard development and mitigation measures, there will be a 22.5% decrease in the 100-year peak discharges, combined across the property flat hilltop.

In summary, the proposed vineyard development project at Lucia Abreu Vineyard Howell Mountain is expected to cause no adverse impacts to on-site soils or aquatic species, nor will it accelerate surface erosion, hillslope stability, storm runoff, groundwater, secondary (peak-flow generated) off-site channel incision, the related sediment delivery, or in-stream sedimentation.

In light of the above analyses, no additional project mitigations are required beyond those associated with the proposed project ECP (NVVE 2013). However, some beneficial measures have been explored for areas of the property outside of the project site, as well as off-site; these optional measures may be undertaken in conjunction with the habitat retention and reforestation effort on the property that is discussed further in the Environmental Impact Report. These recommendations include: 1) the abandonment or curtailment of use of a steep 20-meter-long (80 feet) road segment within the Abreu South Swale Catchment, which currently delivers concentrated flow from the hilltop trail to Abreu Western Ravine and its peripheral appurtenant road; 2) the planting of trees within the colluvial hollows and areas exhibiting soil slumping in the Abreu Western and Eastern ravines, as depicted on **Figure D-7**; 3) protecting the key hollow-stabilizing tree in Abreu Eastern Ravine: 1.4-meter DBH (DBH: 55”); and 4) consulting with Pacific Union College to determine if they wish to install bioengineering features on their property, such as the planting of shrubs within PUC McReynolds and Winning ravines, as depicted on **Figure 3**. Although the proposed project has no adverse effect on runoff, sedimentation, and hillslope stability, implementation of these additional, optional measures could improve these features beyond pre-project conditions.

9 LIMITATIONS

The erosion, sedimentation, hydrologic, and geotechnical assessment presented in this report has been prepared for the exclusive use of the owners of the Lucia Abreu Vineyard Howell Mountain property, and their project engineer, project forester, and the CEQA process team. This report should be used to describe the current and post-project geologic, soils, hydrologic, and geomorphic conditions on the property and at the project site, document the environmental effects of the proposed Erosion Control Plan #P05-0376-ECPA (NVVE 2013) on-site and off-site, and help assess the cumulative impacts of the proposed timber- and grassland-to-vineyard conversion project.

The proposed Erosion Control Plan also addresses the forthcoming San Francisco Bay Water Control Quality Control Board’s pollutant discharge requirements for vineyard properties in the Napa River/Sonoma Creek watersheds (Region 2 Water Board 2012). Specifically, it does not involve constructing engineered drainage that is known to concentrate flow and increase storm runoff off-site. Instead, it is designed to sink, slow, and spread runoff.

Any changes to the proposed Erosion Control Plan would have measurable effects on the predicted on-site and off-site erosion, sediment delivery, sediment yield, and storm runoff. The conclusions and professional opinions presented in this report were developed in accordance with generally accepted engineering geologic principles and practices.

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FIGURES

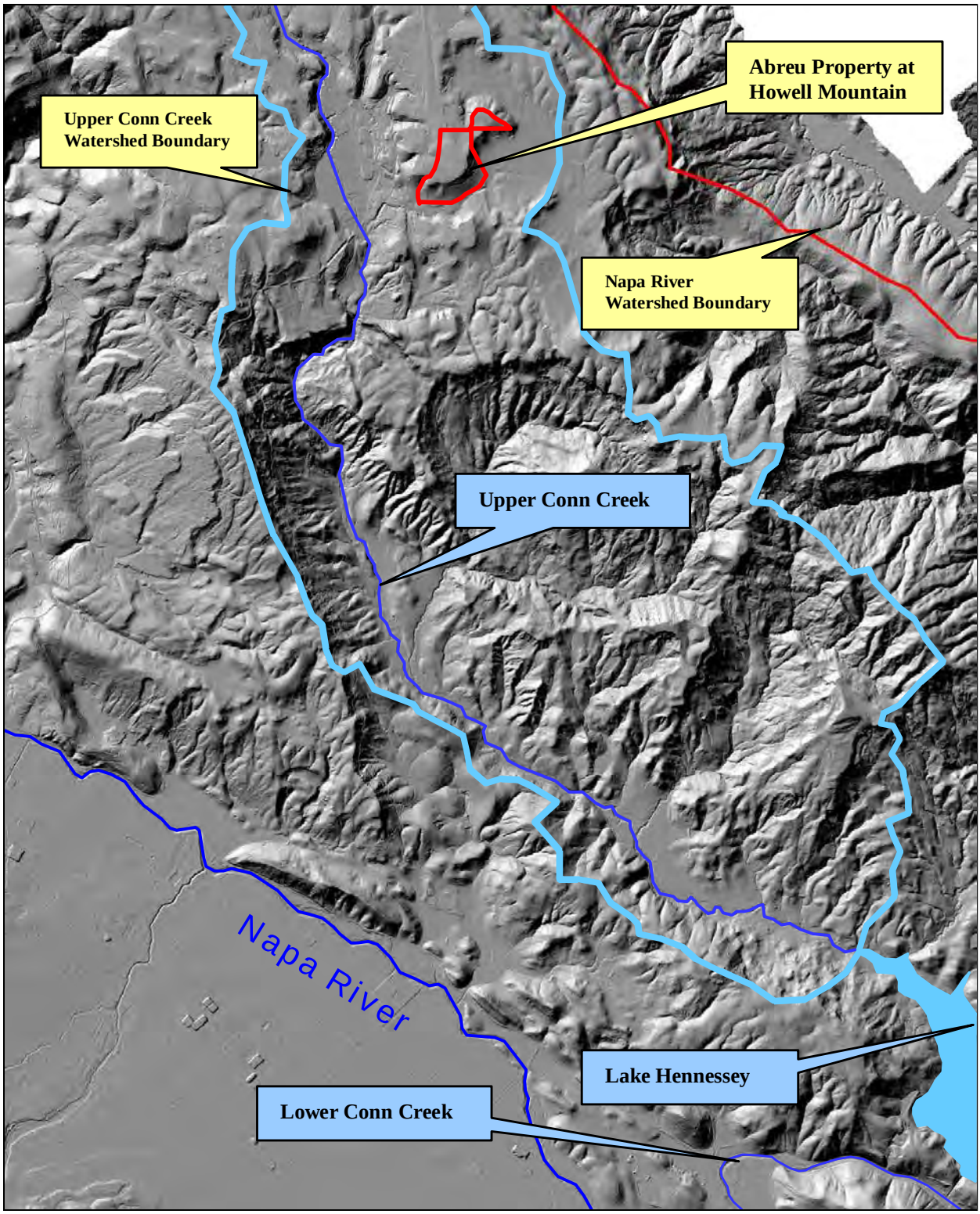


Figure 1. Upper Conn Creek watershed: Location of Abreu volcanic tableland property at Howell Mountain. LiDAR 3-meter DEM shaded relief (NCALM 2003, UC Berkeley 2004).

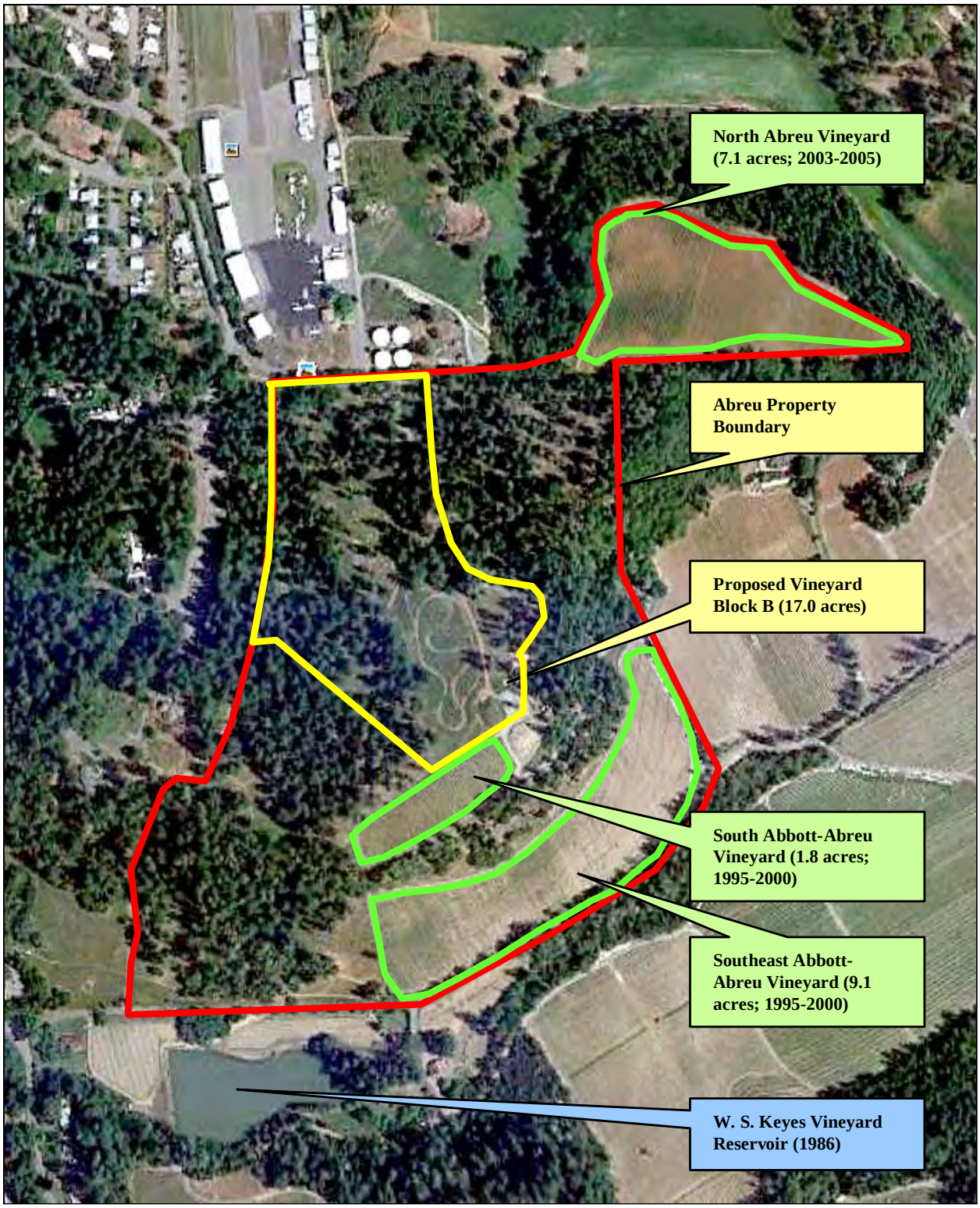


Figure 2. Detailed view of Abreu property boundary, and existing and proposed vineyards (NVVE 2013). 2012 aerial photograph.

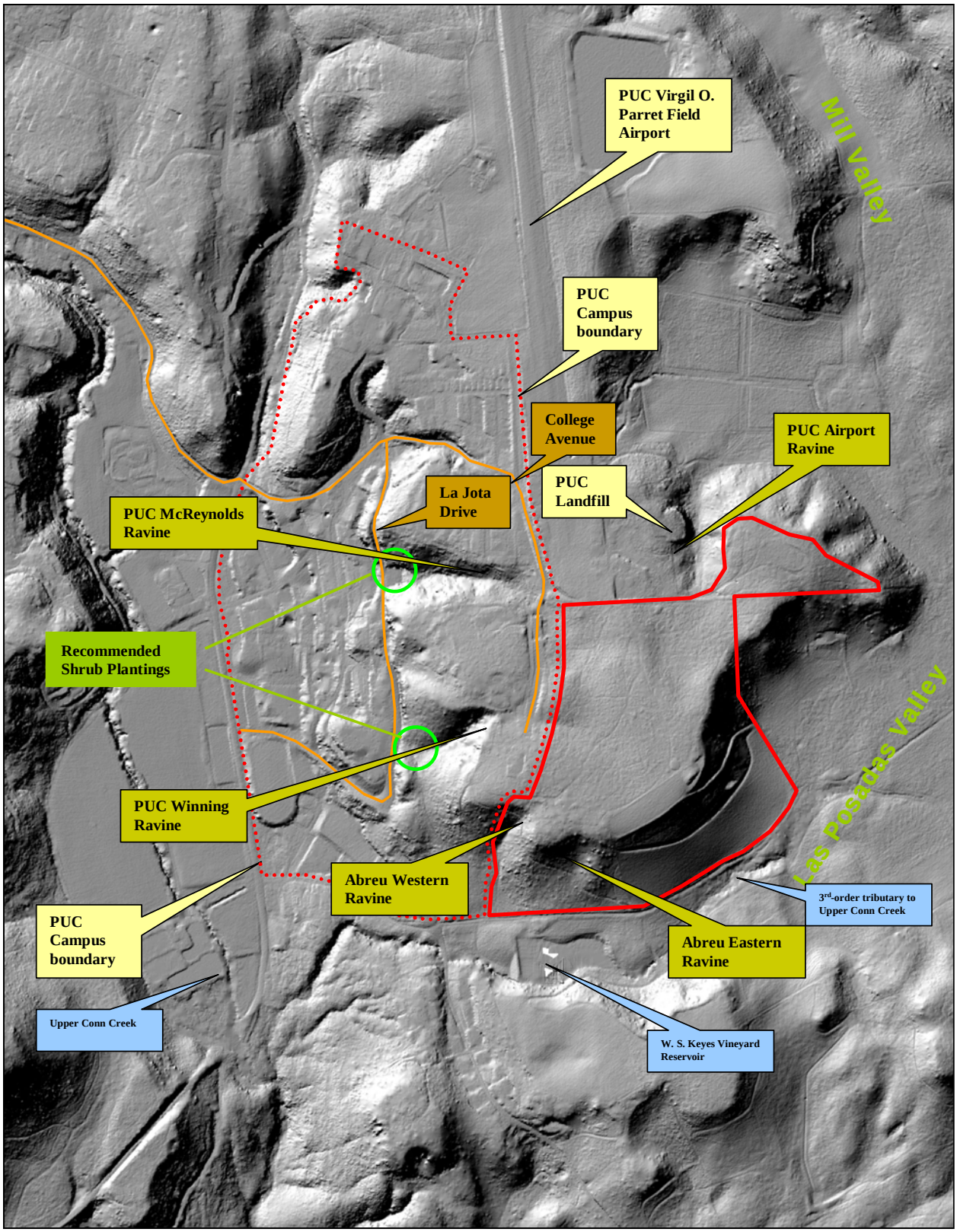


Figure 3. Outer view of Abreu volcanic tableland property at Howell Mountain, project hydrologic and sediment budget analyses catchments, on-site and off-site ravines, off-site watercourses, and proposed off-site shrub planting areas. LiDAR 1-meter DEM shaded relief (NCALM 2003, UC Berkeley 2004).

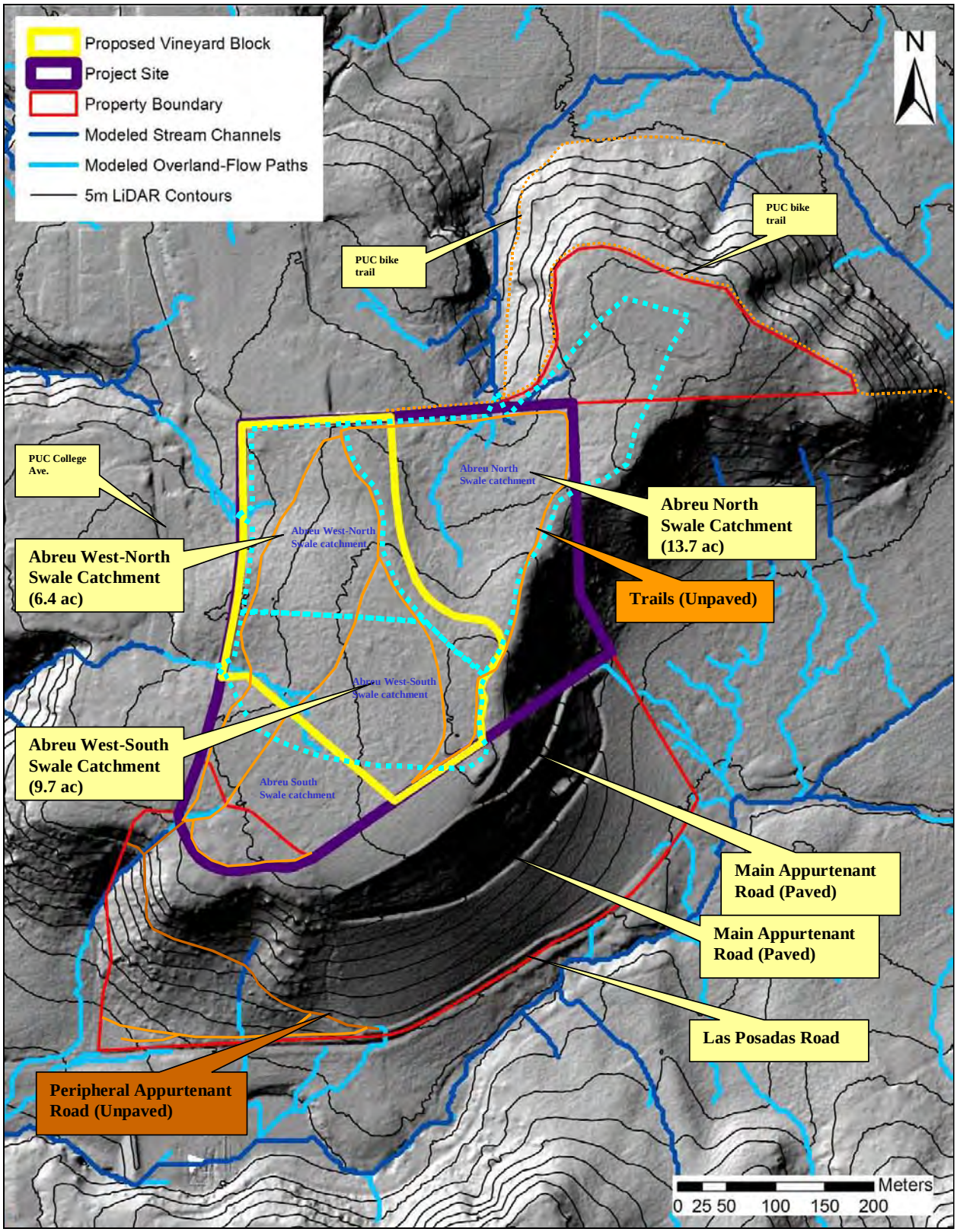


Figure 4. GIS-DTM model of maximum hypothetical extent of channel network on Abreu property, project hydrologic and sediment budget analyses catchments, and roads and trails. LiDAR 1-meter DEM shaded relief (NCALM 2003, UC Berkeley 2004).

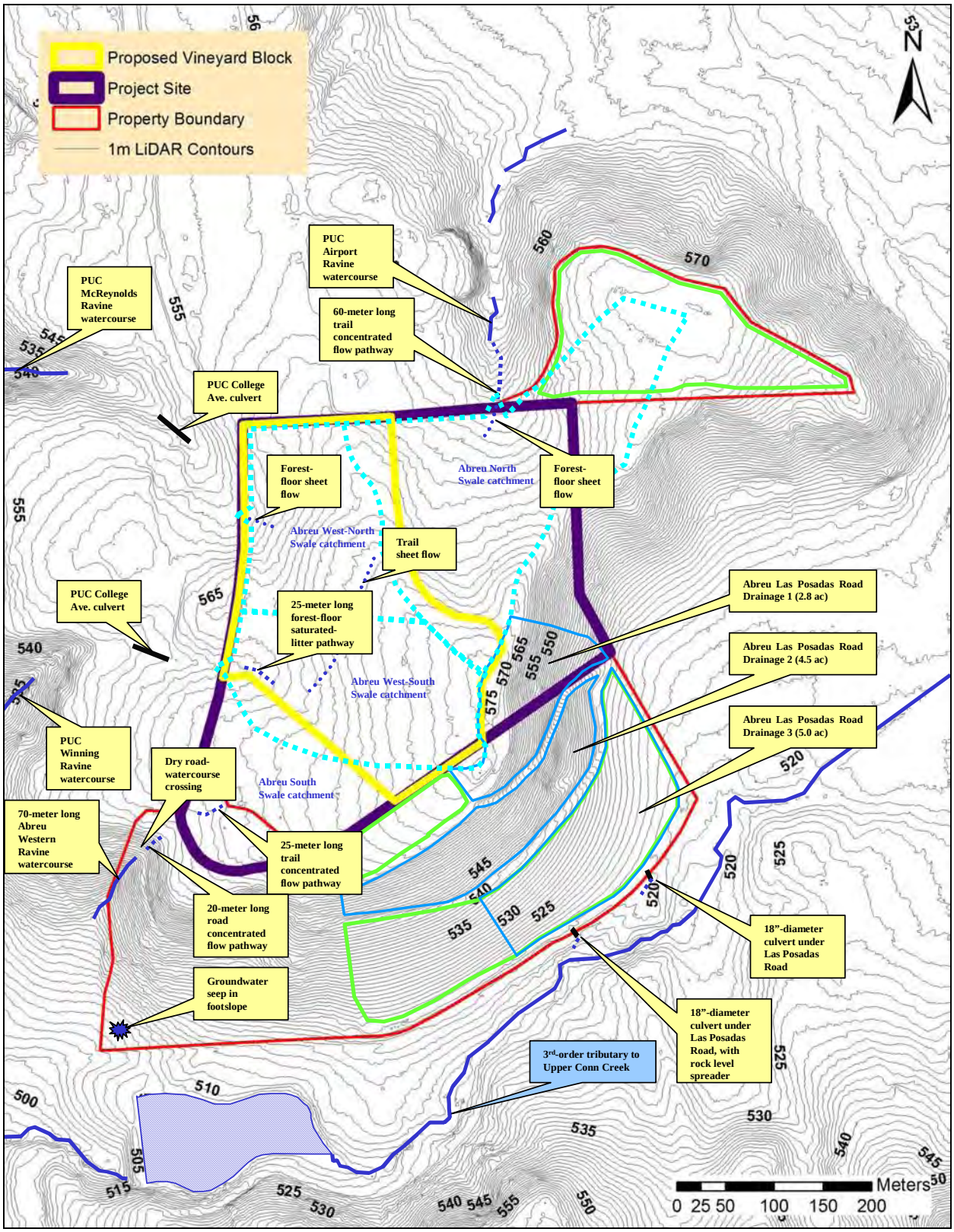


Figure 5. Abreu property on-site and off-site existing channel network (field reconnaissance), project hydrologic and sediment budget analyses catchments, existing and proposed vineyards, and off-site storm drain outlet. LiDAR-derived 1-meter contours (NCALM 2003, UC Berkeley 2004).

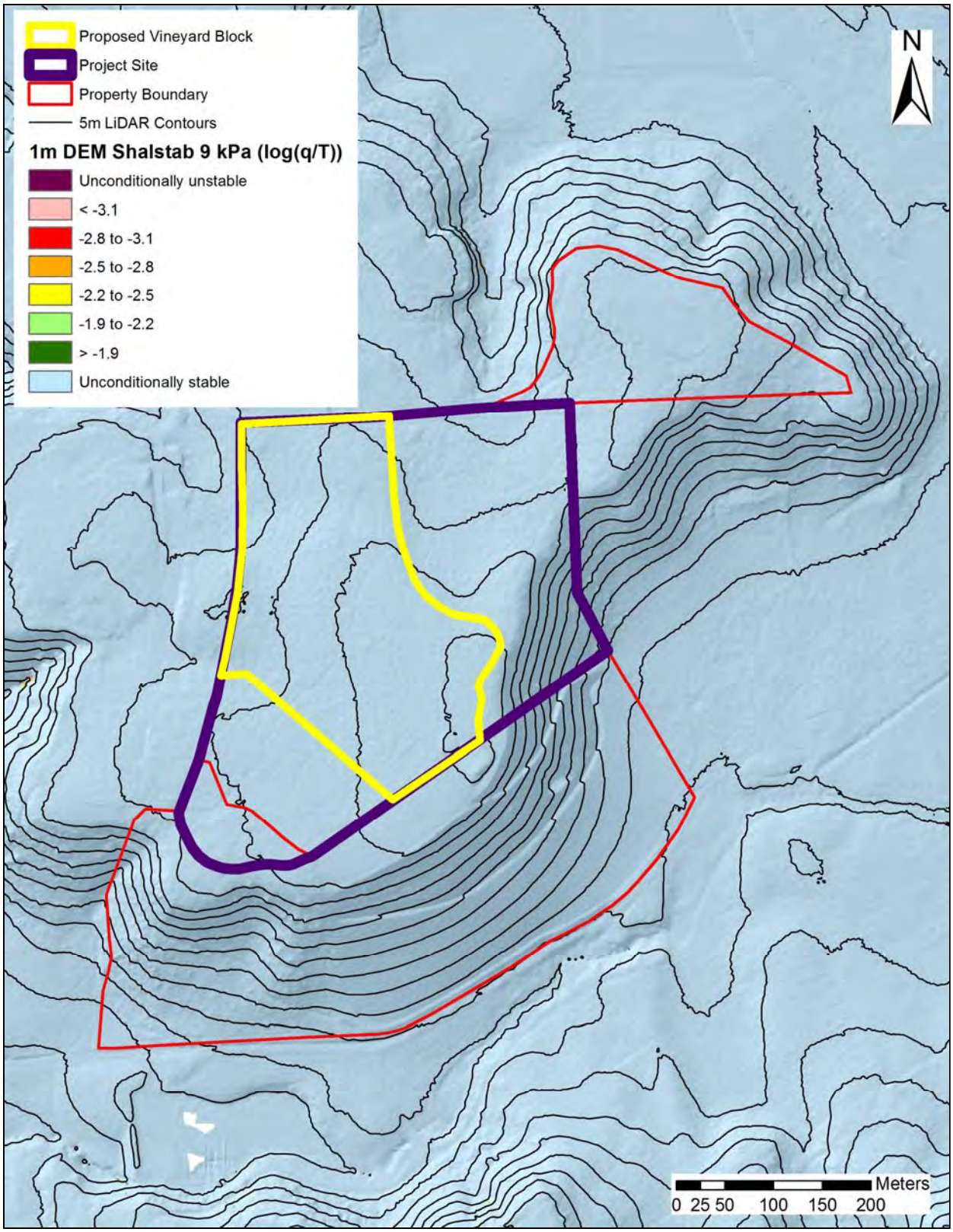


Figure 6. SHALSTAB.V prediction of shallow landslide hazard potential for the Abreu property, and existing and proposed vineyards.

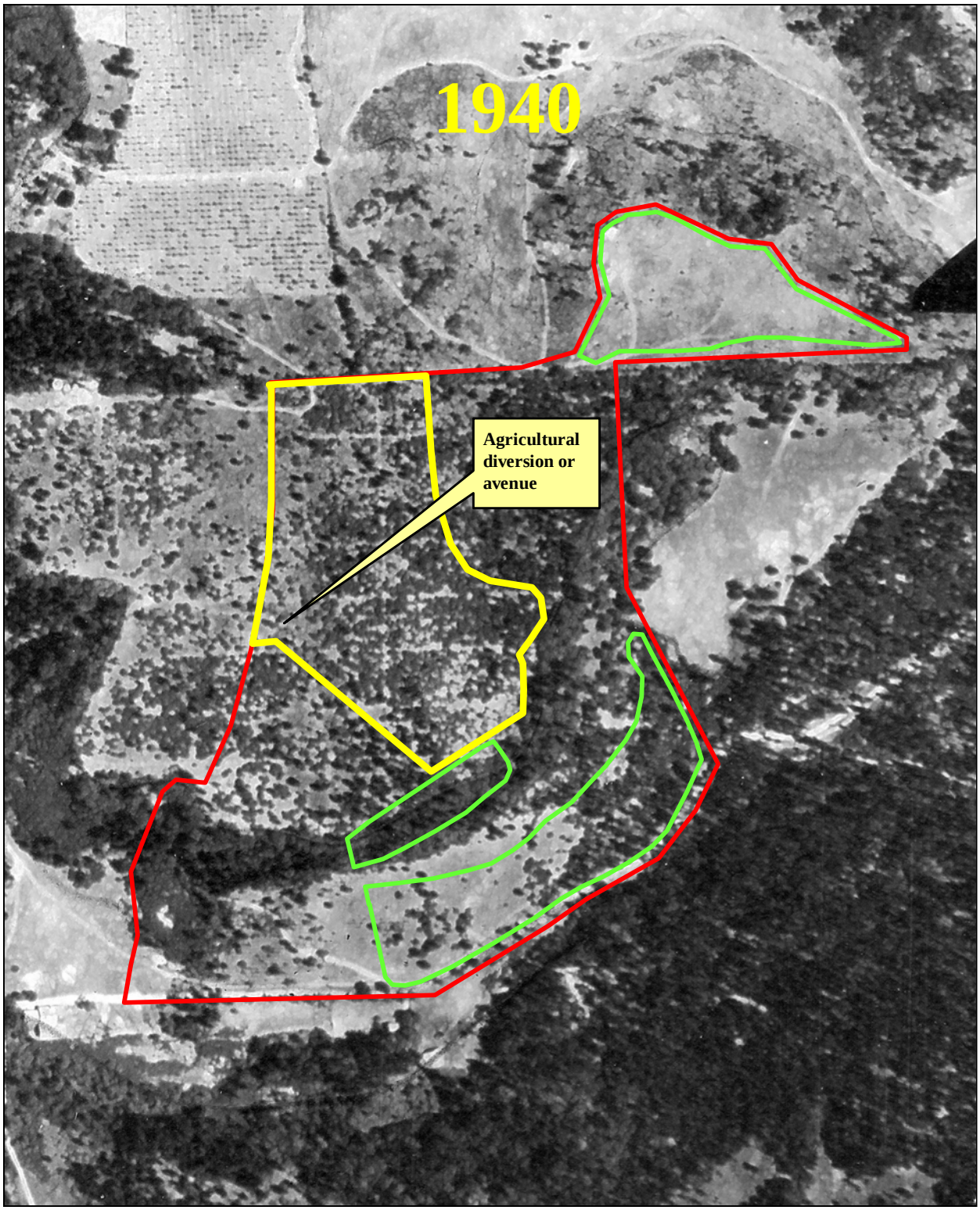


Figure 7a. 1940 aerial photograph of Abreu property, existing and proposed vineyards, and relic abandoned agricultural diversion or avenue.

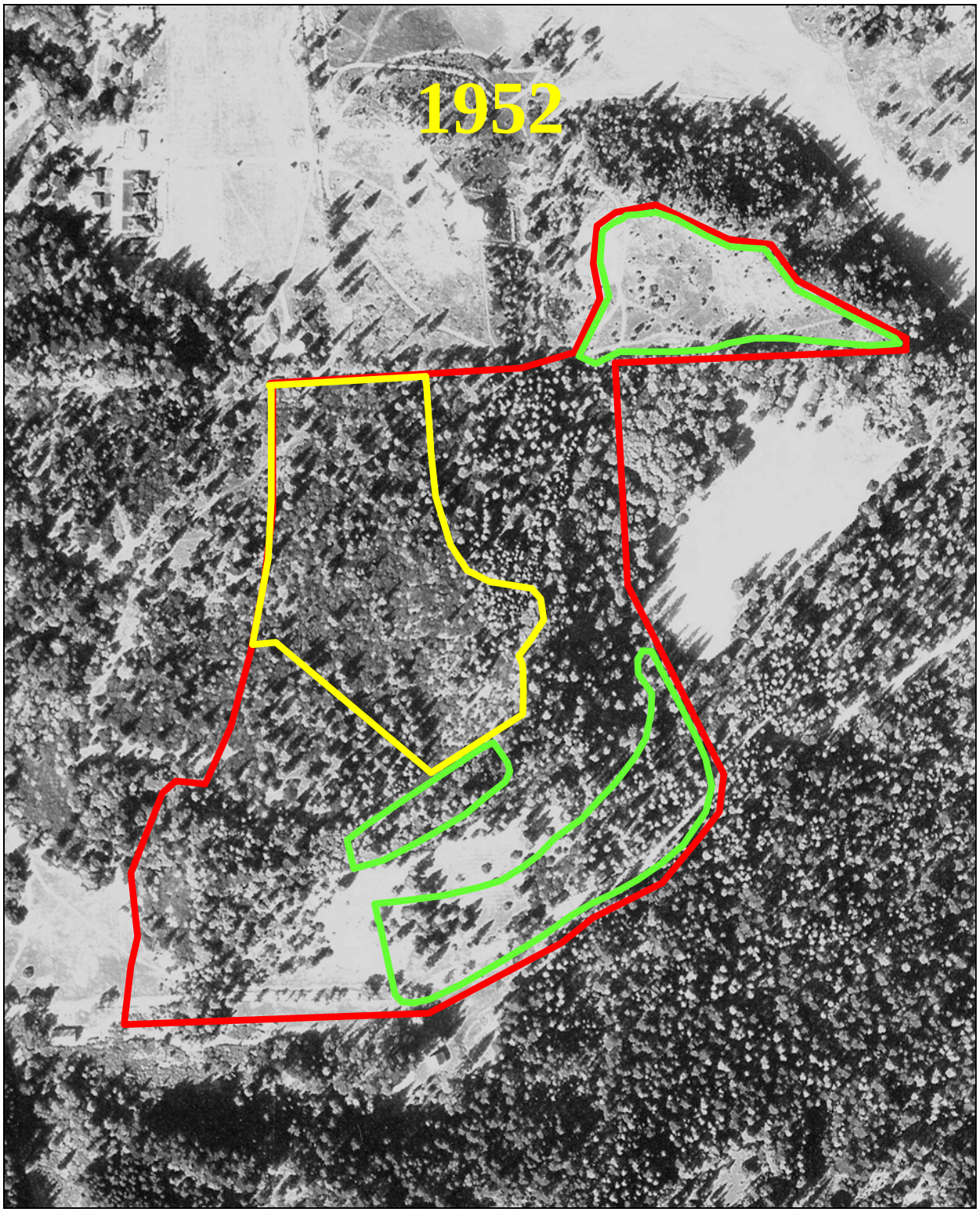


Figure 7b. 1952 aerial photograph of Abreu property, and existing and proposed vineyards.

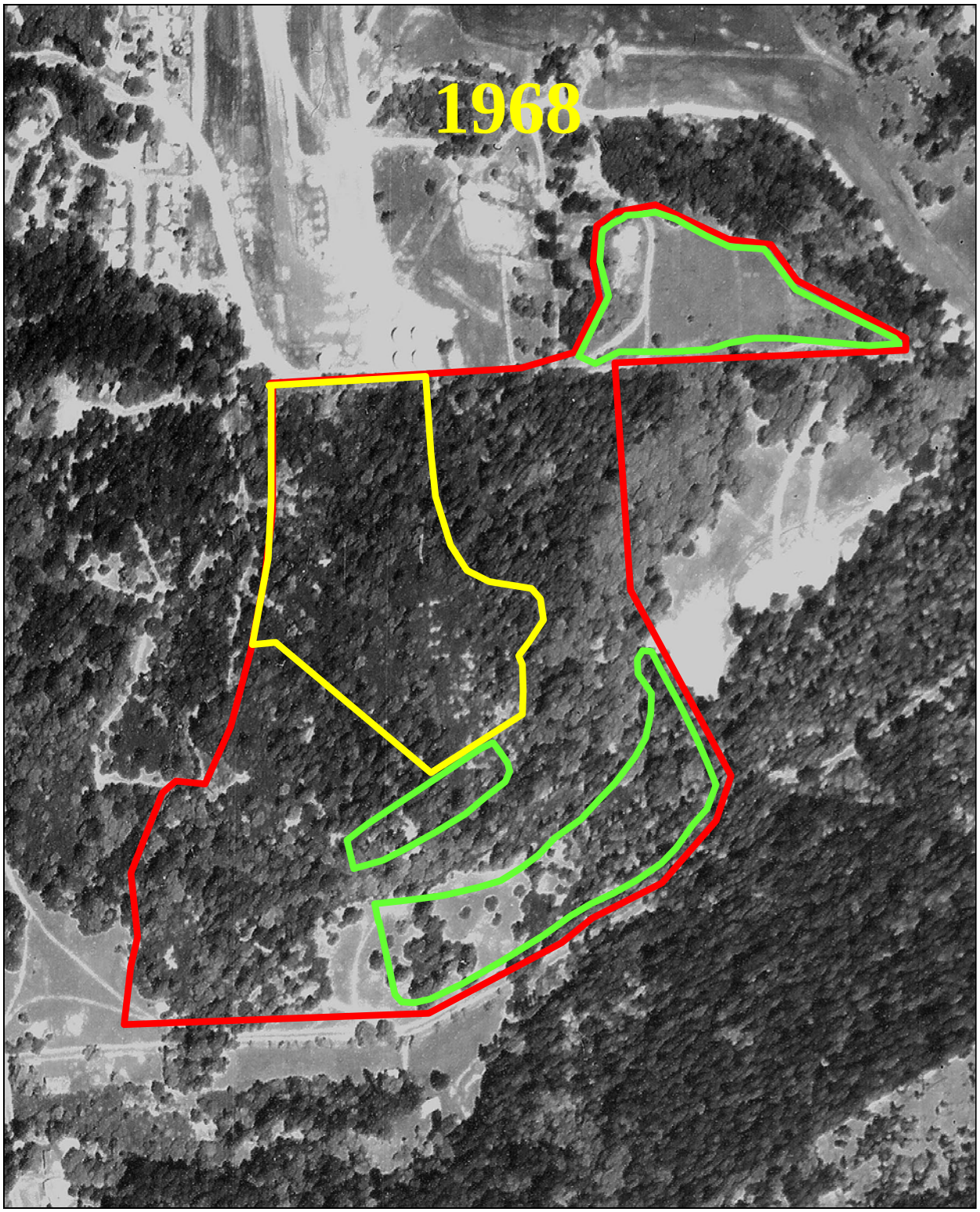


Figure 7c. 1968 aerial photograph of Abreu property, and existing and proposed vineyards.

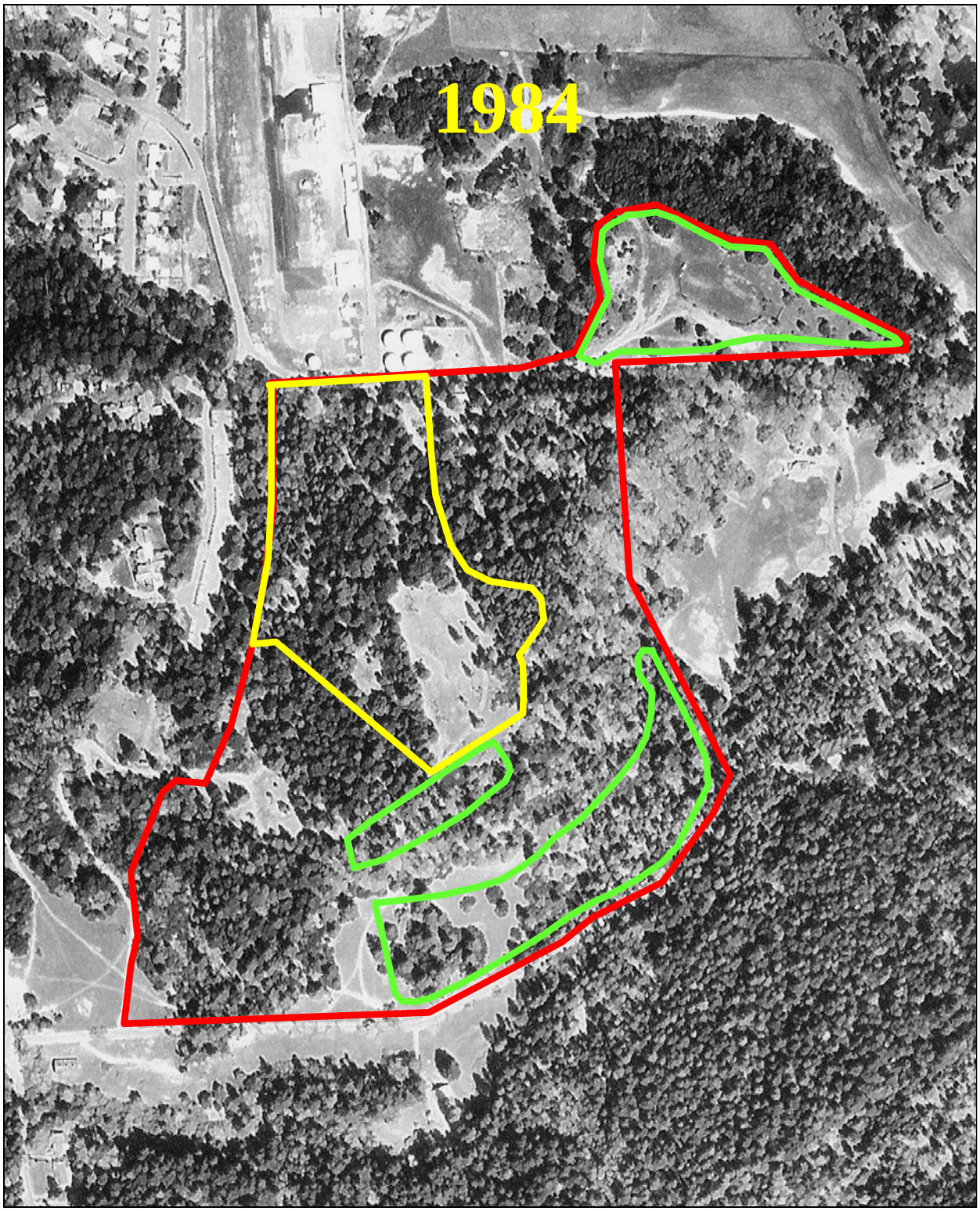


Figure 7d. 1984 aerial photograph of Abreu property, and existing and proposed vineyards.

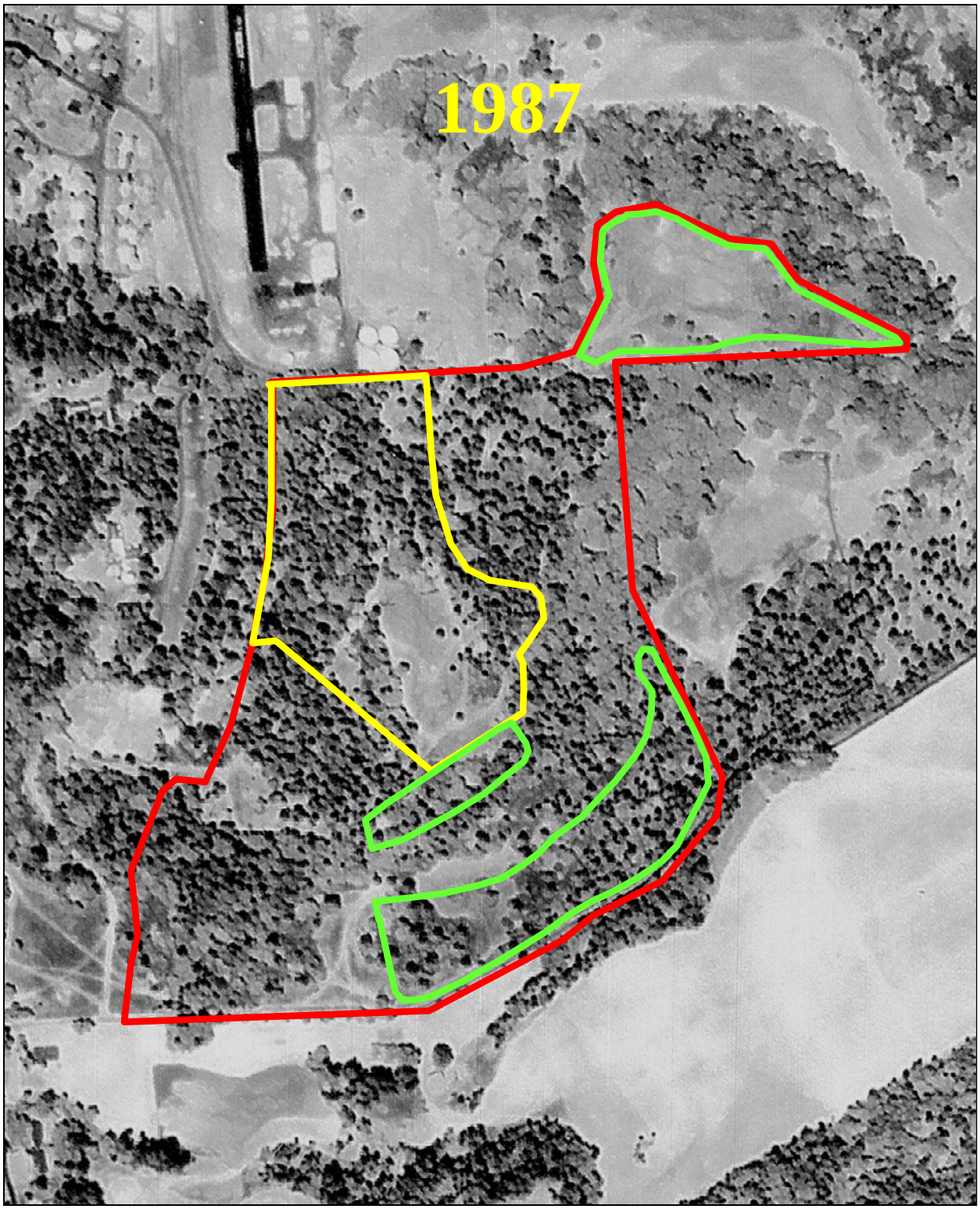


Figure 7e. 1987 aerial photograph of Abreu property, and existing and proposed vineyards.

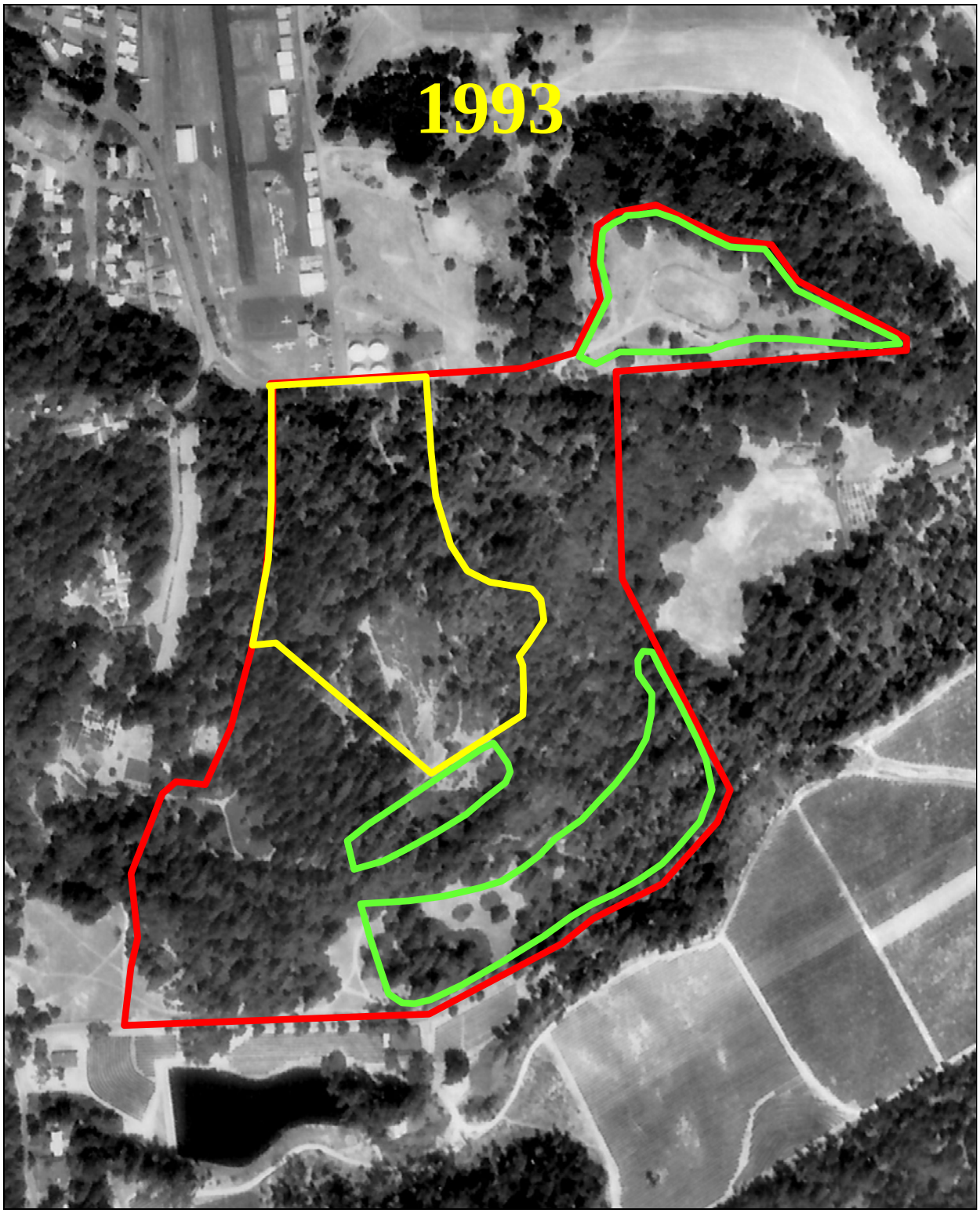


Figure 7f. 1993 aerial photograph of Abreu property, and existing and proposed vineyards.

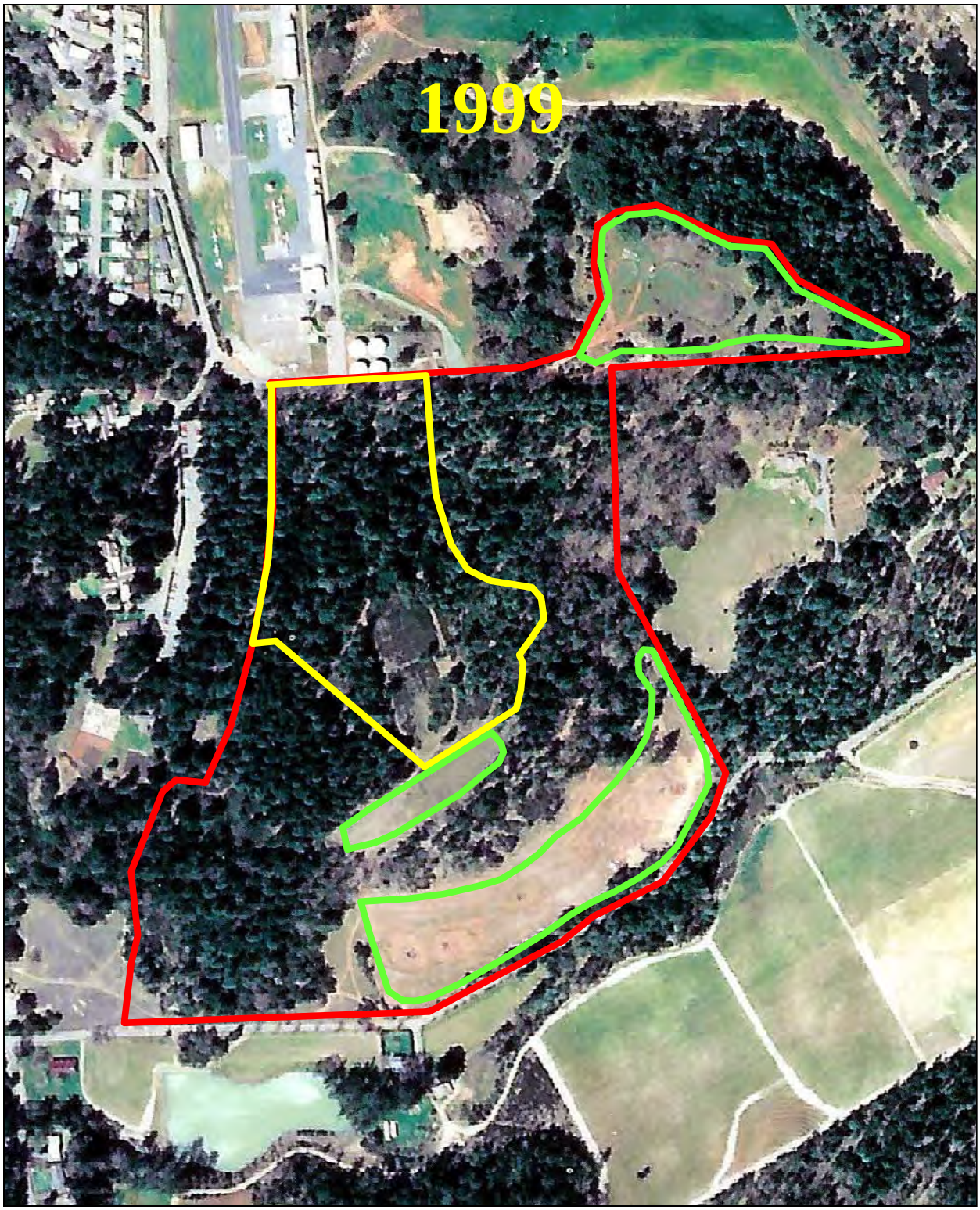


Figure 7g. 1999 aerial photograph of Abreu property, and existing and proposed vineyards.

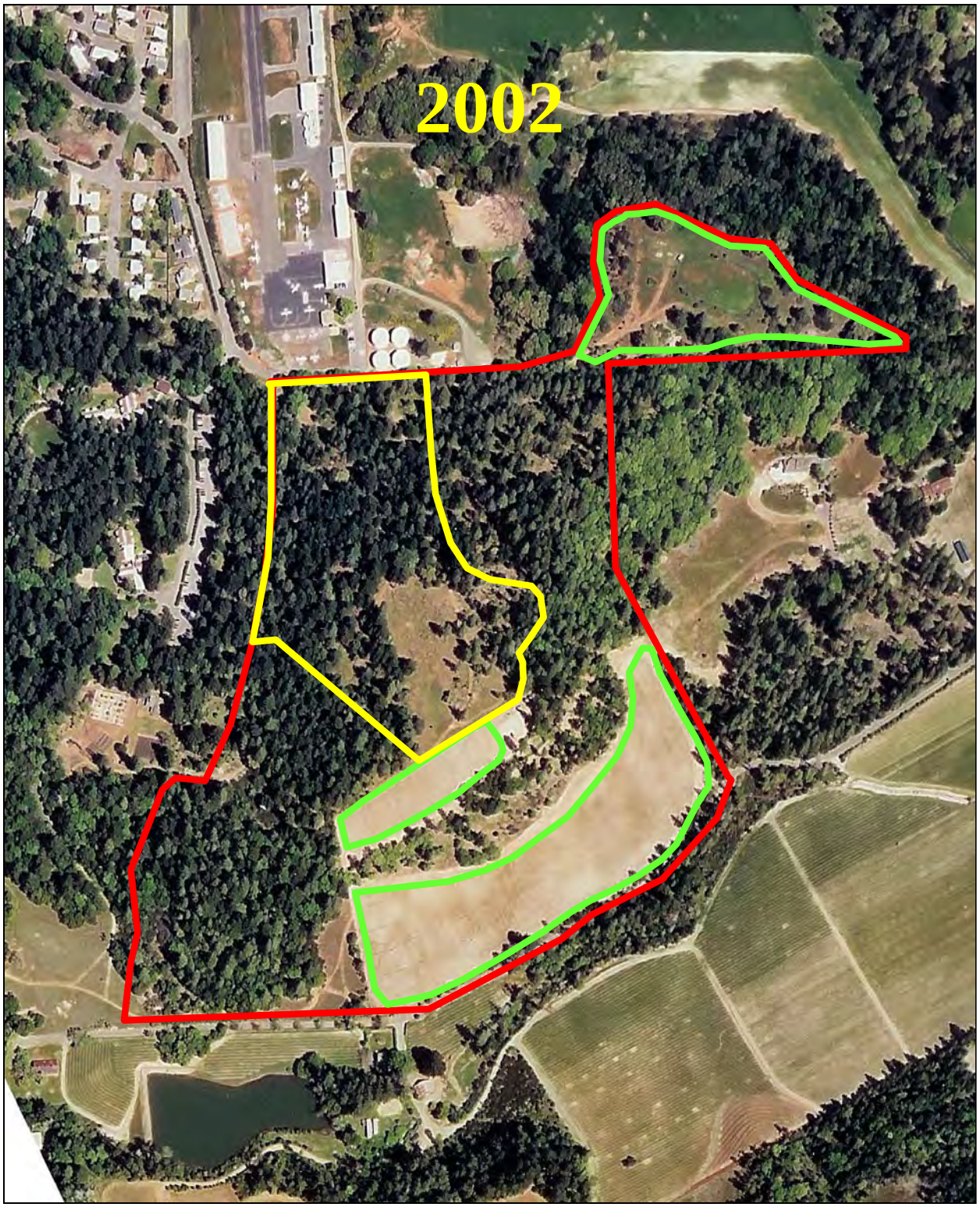


Figure 7h. 2002 aerial photograph of Abreu property, and existing and proposed vineyards.

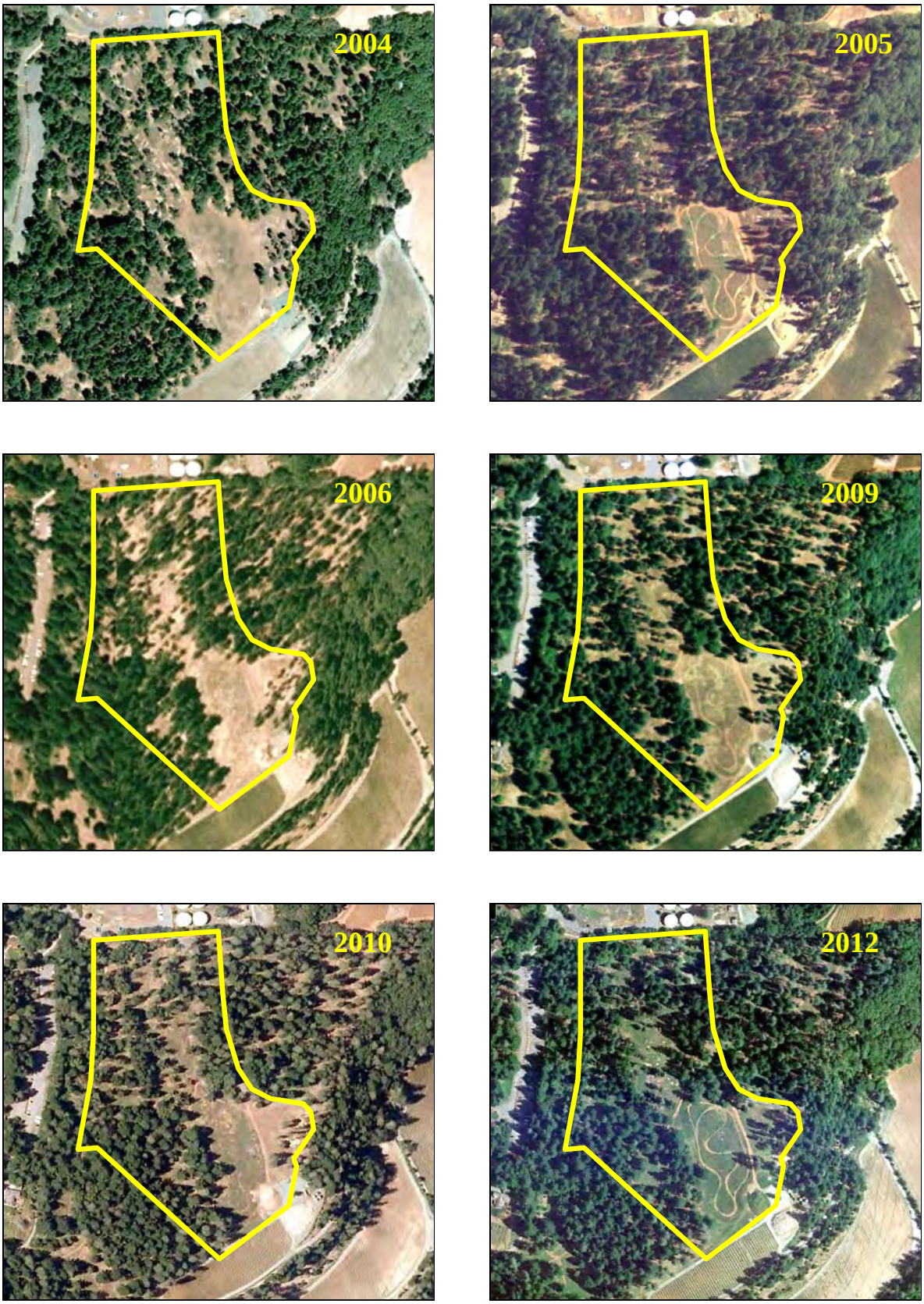


Figure 7 (cont'd). Aerial photographs of project area: 2004 (**Figure 7i**), 2005 (**Figure 7j**), 2006 (**Figure 7k**), 2009 (**Figure 7l**), 2010 (**Figure 7m**), and 2012 (**Figure 7n**).

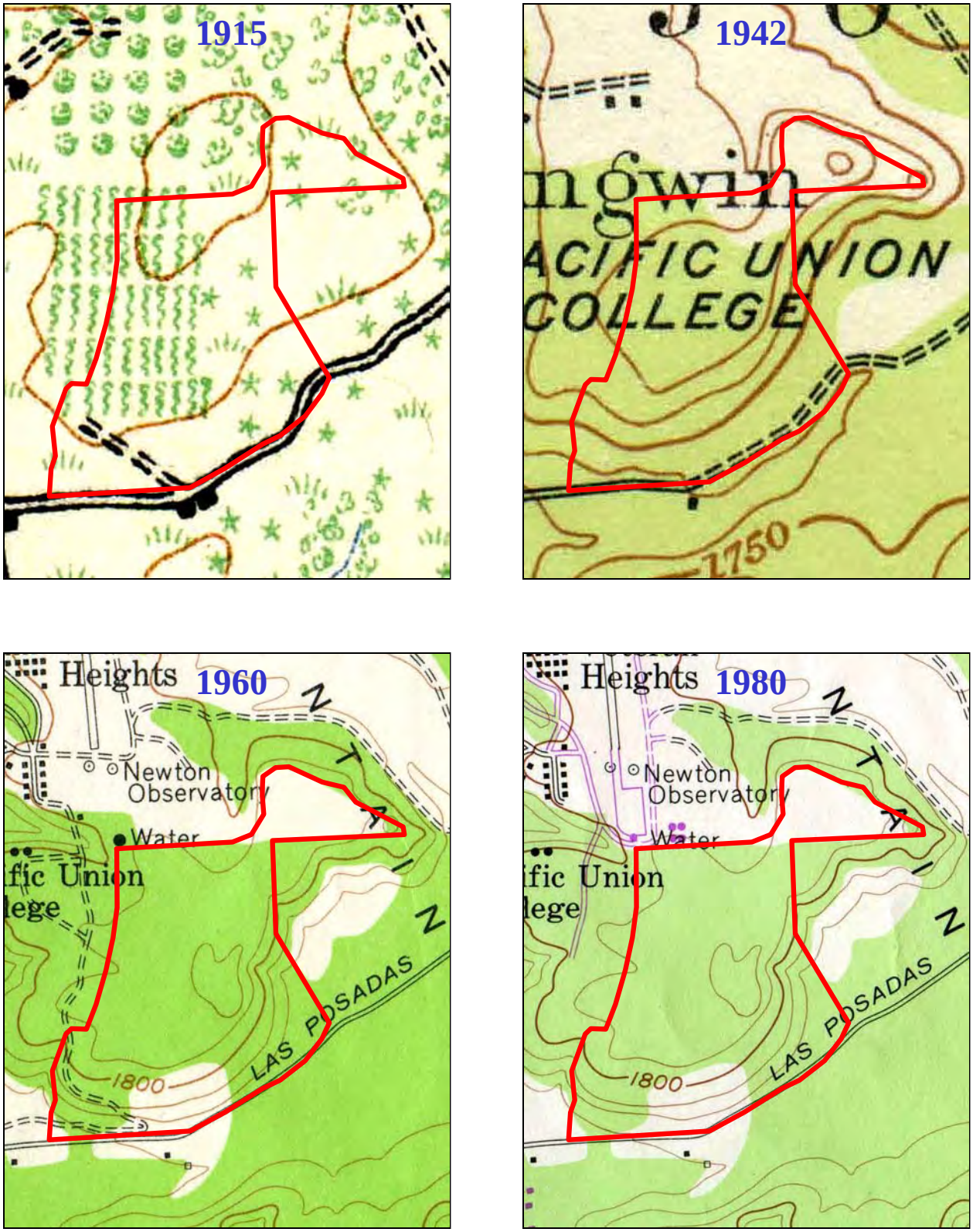


Figure 8a-d. Topographic map of Abreu property: 1915 (**Figure 8a**), 1942 (**Figure 8b**), 1960 (**Figure 8c**), and 1980 (**Figure 8d**).

Figure 9. Loss of forest litter due to recent timber management related operations.

Figure 10. Fire-damaged trees within southwestern portion of Abreu property.

Figure 11. Seasonal groundwater seep within property footslope, by Las Posadas Road.

Figure 12. Recreational motorsport activities during DAVM ownership.

Figure 13. Subsurface storm drain system within existing Southeast Abbott-Abreu Vineyard.

Figure 14. Highly efficient seasonal erosion control measures, North Abreu Vineyard.

Figure 15. Off-site reservoir, W. S. Keyes Vineyard across from Las Posadas Road.

Figure 16. View of PUC landfill scree, downslope from North Abreu Vineyard.

Figure 17. Landfill failure crack within PUC bike trail, immediately below North Abreu Vineyard.

Figure 18. PUC landfill impinging on off-site watercourse, downstream from Abreu North Swale.

Figure 19. Locally moist soil conditions along lithologic contact on Abreu property.

Figure 20. Olive tree plantings along lithologic contact within southern portion of Abreu property.

Figure 21. Hydrologic soil pipes within PUC landfill scree, below PUC bike trail failure crack.

Figure 22. Small-scale soil slumping in Abreu Eastern Ravine.

Figure 23. Seasonal seepage along lithologic contact in roadcut bank, west of Abreu property.

Figure 24. 100 Aiken loam soils located on flat hilltop, in lava-flow bedrock areas.

Figure 25. 102 Aiken loam soils on steep hillsides, in ash-flow tuff bedrock areas.

Figure 26. Average 50% canopy cover and 40% ground cover within proposed vineyard Block B.

Figure 27. Average 60% cover crop within existing North Abreu Vineyard (2008).

Figure 28. Average 60% cover crop within existing South Abbott-Abreu Vineyard (2008).

Figure 29. Average 60% cover crop within existing Southeast Abbott-Abreu Vineyard (2008).

Figure 30. Average 20% cover crop within existing North Abreu Vineyard (2012).

Figure 31. Average 70% cover crop within existing South Abbott-Abreu Vineyard (2012).

Figure 32. Average 60% cover crop within existing Southeast Abbott-Abreu Vineyard (2012).

Figure 33. Clear surface runoff within existing vineyard during storm event (2006).

Figure 34. Sediment-laden and turbid runoff off main appurtenant road on-site (2007).

Figure 35. Clear surface runoff within existing vineyard during storm event (2012).

Figure 36. Sediment-laden and moderately turbid runoff off main appurtenant road on-site (2012).

Figure 37. Sheet flow within property trails and grass-covered hilltop areas.

Figure 38. Unrilled conditions within thick litter cover on forest floor in property hilltop areas.

Figure 39. Past land-use associated wide-spread sheet flow pathways in property hilltop areas.

Figure 40. Exfiltration of groundwater flow and associated soil slumping in property ravines.

Figure 41. Small soil slumps annually evolve in roadcut bank along Las Posadas Road.

Figure 42. 25-meter-long forest-floor concentrated flow pathway, Abreu West-South Swale.

Figure 43. 25-meter-long hilltop trail concentrated flow pathway, Abreu South Swale.

Figure 44. Sheet flow on trail within low-gradient Abreu South Swale catchment.

Figure 45. Road concentrated flow from Abreu South Swale catchment to Abreu Western Ravine below.

Figure 46. Saturated condition of litter along forest-floor pathway in Abreu West-South Swale.

Figure 47. Eolian pine-needle dam along property fence, at Abreu Western Ravine (2007).

Figure 48. Eolian pine-needle dam along property fence, in Abreu South-West Swale (2007).

Figure 49. Eolian pine-needle dam along property fence, at Abreu Western Ravine (2012).

Figure 50. Eolian pine-needle dam along property fence, in Abreu South-West Swale (2012).

Figure 51. Sheet flow exits Abreu property into PUC property (bike trail), Abreu North Swale.

Figure 52. Sheet flow forms within Abreu West-North Swale.

Figure 53. Abreu West-North Swale sheet flow seeps into forest floor at Abreu-PUC property boundary.

Figure 54. High density forest stretches between Abreu property and College Avenue on PUC property.

Figure 55. Straw bale dikes manage surface runoff from Abreu North Swale to PUC bike trail.

Figure 56. Discontinuous off-site watercourse fans out at footslope of PUC landfill.

Figure 57. Discontinuous off-site watercourse stretches between PUC landfill and Mill Valley.

Figure 58. No surface runoff exits from Abreu West-South Swale into PUC property (2007).

Figure 59. No surface runoff exits from Abreu West-South Swale into PUC property (2012).

Figure 60. Abreu South Swale drains via road-related rill into Abreu Western Ravine, below hilltop.

Figure 61. View of Abreu Western Ravine, below hilltop Abreu South Swale catchment.

Figure 62. 70-meter-long ephemeral watercourse within Abreu Western Ravine.

Figure 63. Runoff and sediment load of Abreu ephemeral watercourse fan out at property footslope.

Figure 64. Abreu property underground storm runoff detention basin by Las Posadas Road.

Figure 65. 12”-diameter storm drain outlet.

Figure 66. Partially rock-lined ditch along Las Posadas Road.

Figure 67. 18”-diameter culvert under Las Posadas Road.

Figure 68. Rock level spreader under 18”-diameter culvert outfall.

Figure 69. Riparian forest floor along 3-rd order tributary to Upper Conn Creek.

Figure 72. Crushed rock pavement of property main appurtenant road, inboard ditch, and storm drain.

Figure 70. Ground view of location of proposed temporary runoff detention pond (Pond No. 1).

Figure 73. Road tread erosion within crushed rock pavement of main appurtenant road.

Figure 71. Ground view of location of proposed temporary runoff detention pond (Pond No. 2).

Figure 74. Fluvial transport of road-surfacing crushed rock into road ditch, delivery to subsurface storm drain system.

Figure 75. Hillside sheeting and erosion intercepted by main appurtenant road.

Figure 76. Moderately turbid storm runoff at property storm drain outlet, by Las Posadas Road.

Figure 77. 0.1 m^3 alluvial fan deposit at Abreu trail, February 2007 storm.

Figure 78. 1.3 m^3 alluvial fan deposit at Abreu trail, February 2007 storm.

Figure 79. 0.04-acre erosive area within steep trail surface of Abreu trail.

Figure 80. 0.07-acre erosive area within steep trail surface of Abreu trail.

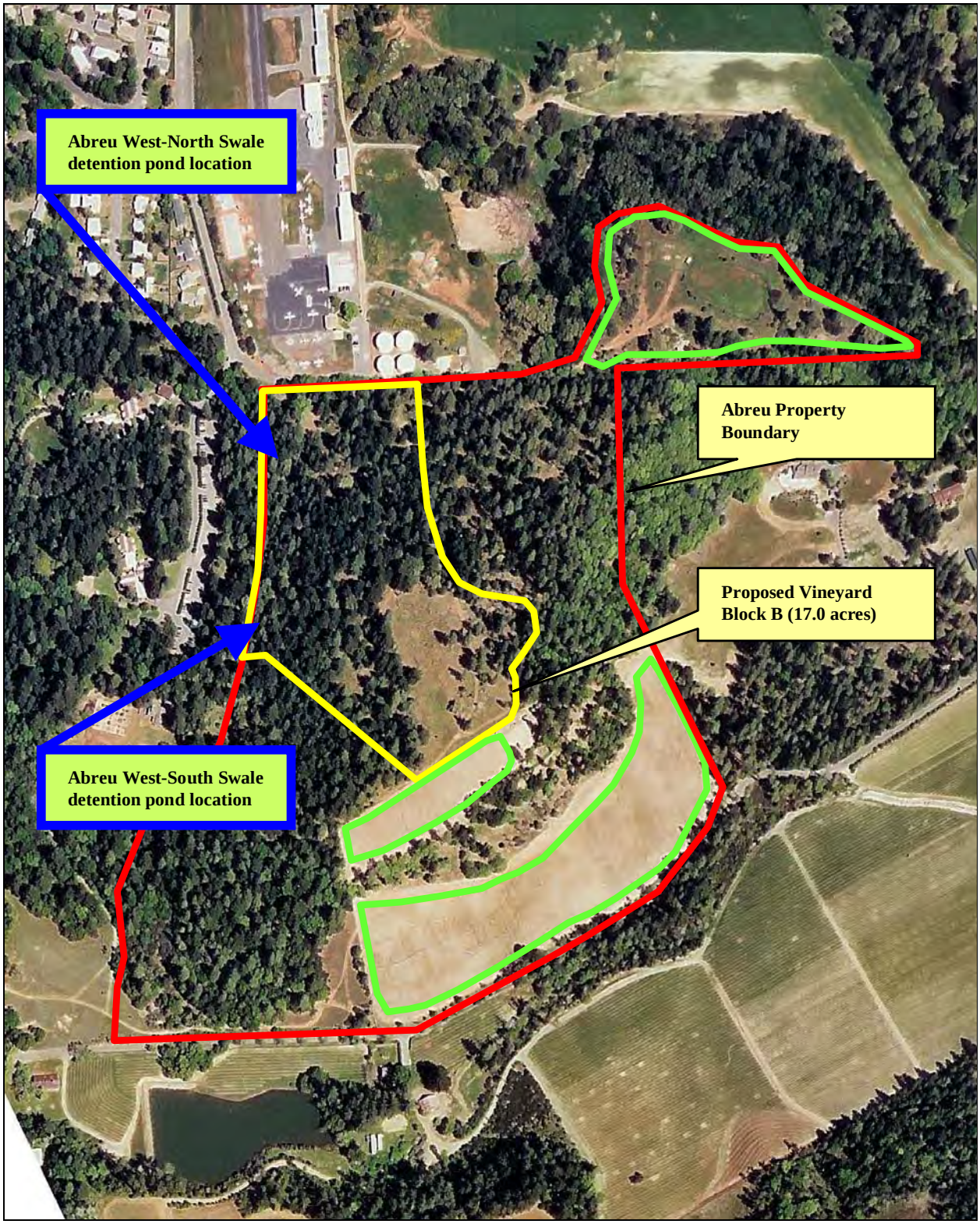


Figure 81. Locations of proposed temporary runoff detention ponds, Mitigation Alternative Nos. 2 and 3. 2002 aerial photograph.

APPENDIX A: USLE SURFACE EROSION CALCULATIONS

A1 Forested and Grassed Hilltop/Hillside, Existing and Proposed Vineyards: Current Conditions

		USLE VINEYARD LAYOUT AND PRACTICE ALTERNATIVES A=(R)(K)(LS)(C)(P)							
FOR:	Lucia Abreu Vineyard Howell Mountain								
SOIL TYPE:	100, 102	T=2							
USER:	MT								
DATE:	25-April-12								
USLE FACTOR		North Abreu Vineyard – 7.10 Ac		South Abbott-Abreu Vineyard – 1.80 Ac		Southeast Abbott-Abreu Vineyard (west) – 4.10 Ac		Southeast Abbott-Abreu Vineyard (east) – 5.00 Ac	
R	Rainfall	135		135		135		135	
K	Soil Erosiveness	0.28		0.28		0.28		0.28	
L	Slope Length (ft)	250		100		50		50	
S	Gradient	5.0		5.0		25.0		25.00	
LS	Calculated LS	0.85		0.53		3.30		3.30	
C	Cover	0.350	20%	0.052	70%	0.070	60%	0.130	50%
P	Practice	1	Vertical	1	Vertical	1	Vertical	1	Vertical
			No-Till		No-Till		No-Till	--	No-Till
A	Soil loss, T/Ac-Yr	11.18		1.05		8.72		16.19	
	Soil loss, T/Yr	79.41		1.89		35.75		80.97	

		USLE VINEYARD LAYOUT AND PRACTICE ALTERNATIVES A=(R)(K)(LS)(C)(P)							
FOR:	Lucia Abreu Vineyard Howell Mountain								
SOIL TYPE:	100, 102	T=2							
USER:	MT								
DATE:	25-April-12								
USLE FACTOR		Forest: Hilltop – 16.20 Ac		Forest: Very Steep Hillside – 11.90 Ac		Forest: Steep Hillside – 3.90 Ac		Grassland: Hilltop – 2.40 Ac	
R	Rainfall	135		135		135		135	
K	Soil Erosiveness	0.28		0.28		0.28		0.28	
L	Slope Length (ft)	75		190		250		150	
S	Gradient	7.0		35.0		18.0		7.0	
LS	Calculated LS	0.71		9.77		4.78		0.70	
C	Cover	0.003	60/95%	0.003	75/95%	0.003	75/95%	0.150	30%
P	Practice	--		--		--		--	
		--		--		--		--	
A	Soil loss, T/Ac-Yr	0.08		1.11		0.54		3.98	
	Soil loss, T/Yr	1.31		13.18		2.11		9.56	

		USLE VINEYARD LAYOUT AND PRACTICE ALTERNATIVES A=(R)(K)(LS)(C)(P)							
FOR:	Lucia Abreu Vineyard Howell Mountain								
SOIL TYPE:	100, 102	T=2							
USER:	MT								
DATE:	25-April-12								
USLE FACTOR		Grassland: Very Steep Hillside – 1.10 Ac		Grassland: Steep Hillside – 2.00 Ac		Proposed Vineyard BLOCK B – 17.00 Ac			
R	Rainfall	135		135		135			
K	Soil Erosiveness	0.28		0.28		0.28			
L	Slope Length (ft)	290		150		150			
S	Gradient	25.0		18.0		6.5			
LS	Calculated LS	7.94		3.70		0.73			
C	Cover	0.150	30%	0.028	70%	0.096	50/40%		
P	Practice	--		--		--			
		--		--		--			
A	Soil loss, T/Ac-Yr	45.00		3.92		2.67			
	Soil loss, T/Yr	49.50		7.84		45.34			

A2 Proposed Vineyard: Post-Project Conditions

		USLE VINEYARD LAYOUT AND PRACTICE ALTERNATIVES A=(R)(K)(LS)(C)(P)							
FOR:	Lucia Abreu Vineyard Howell Mountain								
SOIL TYPE:	100, 102	T=2							
USER:	MT								
DATE:	25-April-12								
USLE FACTOR		Proposed Vineyard BLOCK B – 17.00 Ac							
R	Rainfall	135							
K	Soil Erosiveness	0.28							
L	Slope Length (ft)	150							
S	Gradient	6.5							
LS	Calculated LS	0.73							
C	Cover	0.052	70%						
P	Practice	0.85	Cross-slope						
			Alt-Till						
A	Soil loss, T/Ac-Yr	1.23							
	Soil loss, T/Yr	20.88							

APPENDIX B: WinTR-55 MODEL PEAK DISCHARGE CALCULATIONS

B1 Current Conditions

WinTR-55 Data Description

User: Martin Trso
Date: 9/21/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu North Swale, Existing Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
North Swale		Outlet	13.72	67	0.112

Total area: 13.72 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

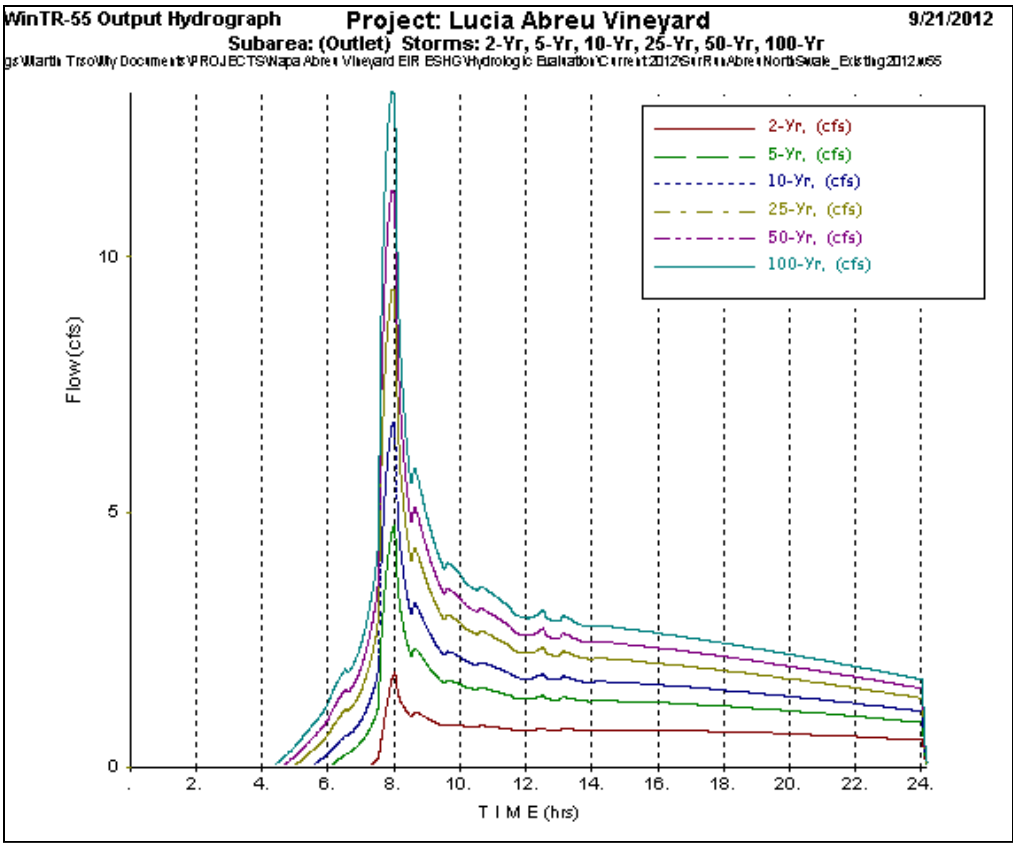
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
North Swale	Legume/Rot. Meadow Straight row (poor)	B	2.38	77
	Pasture, grassland or range (poor)	B	0.85	79
	Woods – grass combination (fair)	B	7.41	65
	Woods (fair)	B	3.08	60
	Total Area / Weighted Curve Number		13.72	67

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
North Swale							
SHEET	50	0.0800	0.400				0.112
SHALLOW	N/A						
SHALLOW	N/A						
CHANNEL	N/A						
				Total Velocity		0.1240	
				Time of Concentration			0.112

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
North Swale	1.86	4.73	6.75	9.35	11.31	13.25
REACHES						
OUTLET	1.86	4.73	6.75	9.35	11.31	13.25



WinTR-55 Data Description

User: Martin Trso
Date: 9/21/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-North Swale, Existing Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-North Swale		Outlet	6.44	68	0.107

Total area: 5.07 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

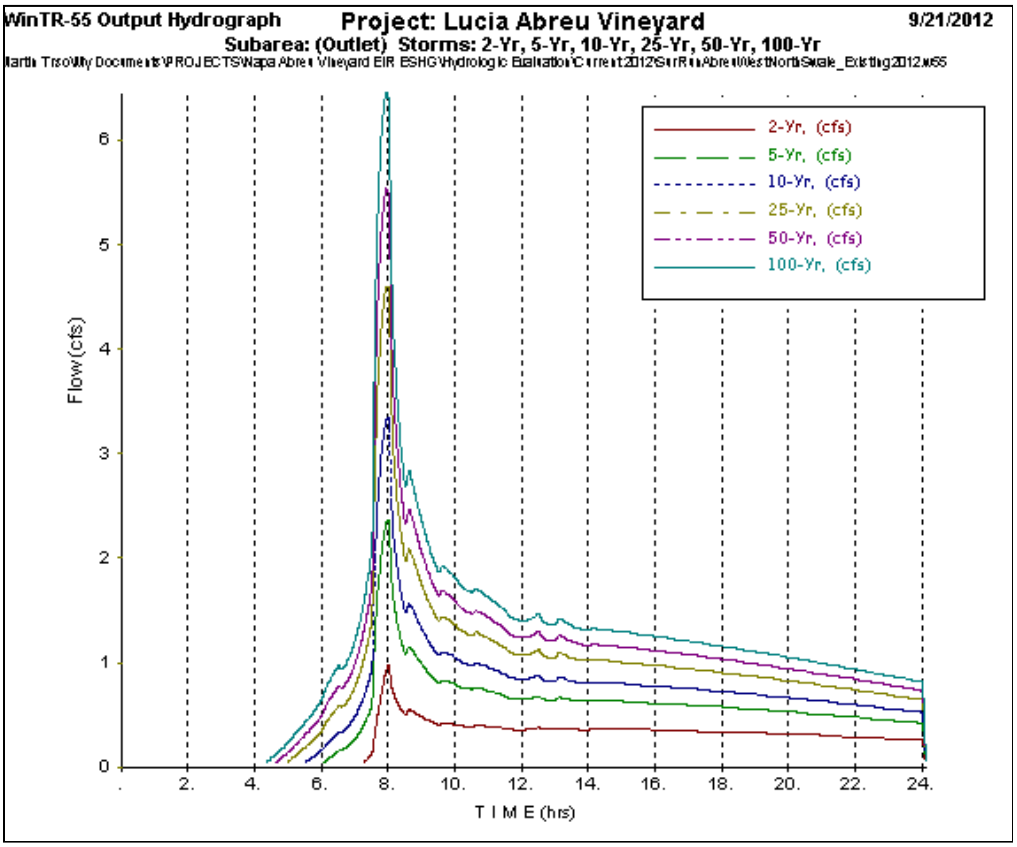
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-N Swale	Pasture, grassland or range (poor)	B	1.96	79
	Woods – grass combination (fair)	B	3.48	65
	Woods (fair)	B	1.00	60
	Total Area / Weighted Curve Number		6.44	68

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-North Swale							
SHEET	50	0.0900	0.400				0.107
SHALLOW	N/A						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1298	
					Time of Concentration		0.107

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-N Swale	0.98	2.37	3.35	4.60	5.54	6.46
REACHES						
OUTLET	0.98	2.37	3.35	4.60	5.54	6.46



WinTR-55 Data Description

User: Martin Trso
Date: 9/21/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-South Swale, Existing Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-South Swale		Outlet	9.68	69	0.168

Total area: 9.68 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

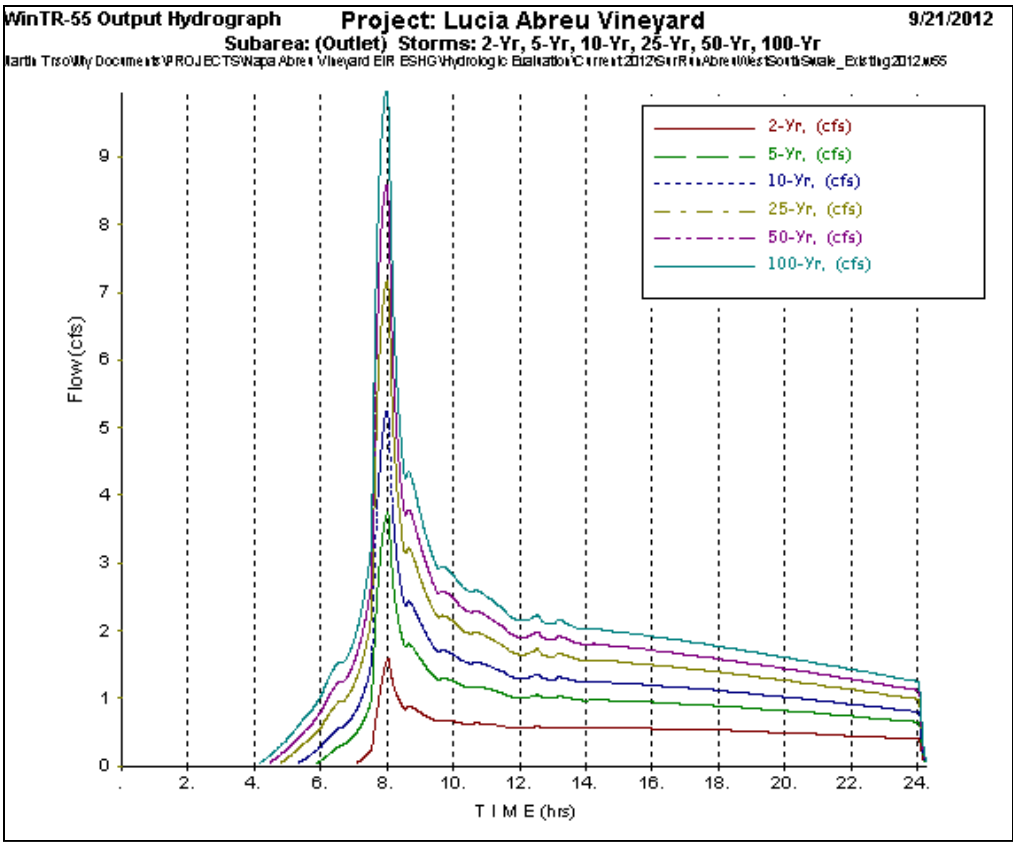
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-S Swale	Pasture, grassland or range (poor)	B	4.09	79
	Woods – grass combination (fair)	B	2.62	65
	Woods (fair)	B	2.98	60
	Total Area / Weighted Curve Number		9.68	69

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-South Swale							
SHEET	75	0.0700	0.400				0.163
SHALLOW	80	0.0700	Unpaved				0.005
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.2563	
					Time of Concentration		0.168

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-S Swale	1.59	3.74	5.25	7.16	8.58	9.97
REACHES						
OUTLET	1.59	3.74	5.25	7.16	8.58	9.97



B2 Post-Project Conditions (Proposed ECP)

WinTR-55 Data Description

User: Martin Trso
Date: 9/21/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu North Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
North Swale		Outlet	13.72	66	0.112

Total area: 13.72 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

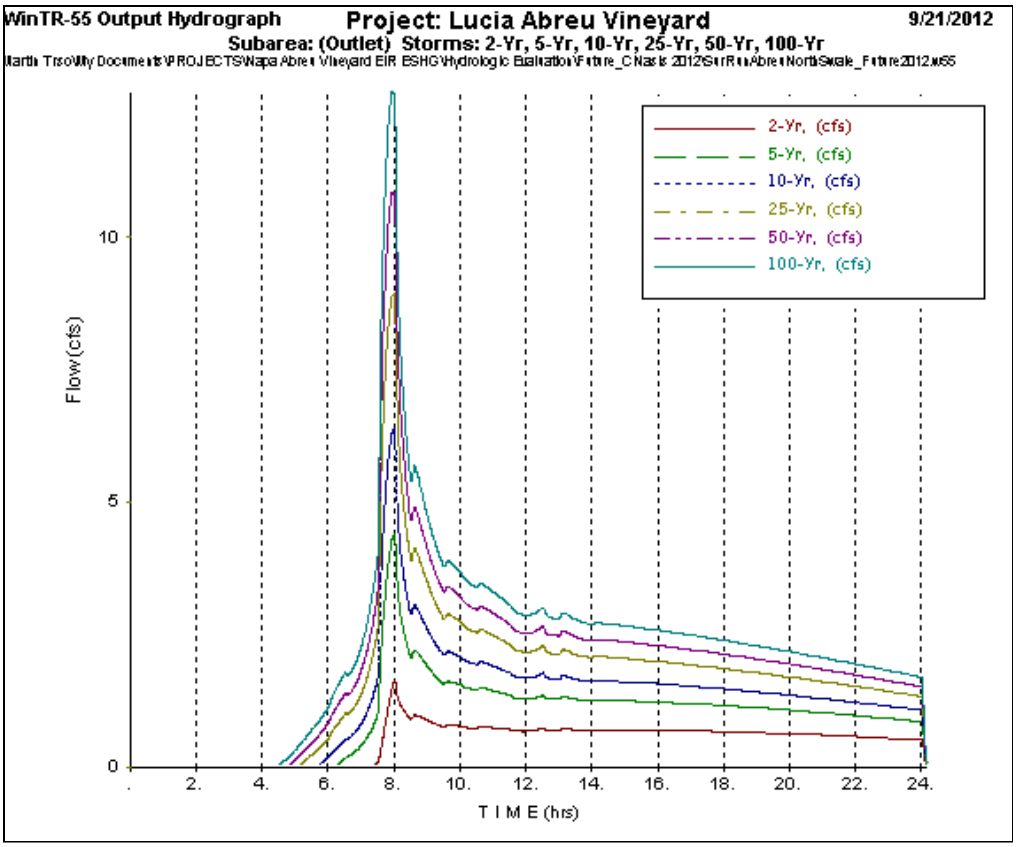
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
North Swale	Legume/Rot. Meadow Straight row (good)	B	4.82	72
	Woods – grass combination (fair)	B	6.19	65
	Woods (fair)	B	2.71	60
	Total Area / Weighted Curve Number		13.72	66

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
North Swale							
SHEET	50	0.0800	0.400				0.112
SHALLOW	N/A						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1240	
					Time of Concentration		0.112

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
North Swale	1.64	4.41	6.39	8.93	10.84	12.75
REACHES						
OUTLET	1.64	4.41	6.39	8.93	10.84	12.75



WinTR-55 Data Description

User: Martin Trso
Date: 9/21/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-North Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-North Swale		Outlet	6.44	72	0.071

Total area: 6.44 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

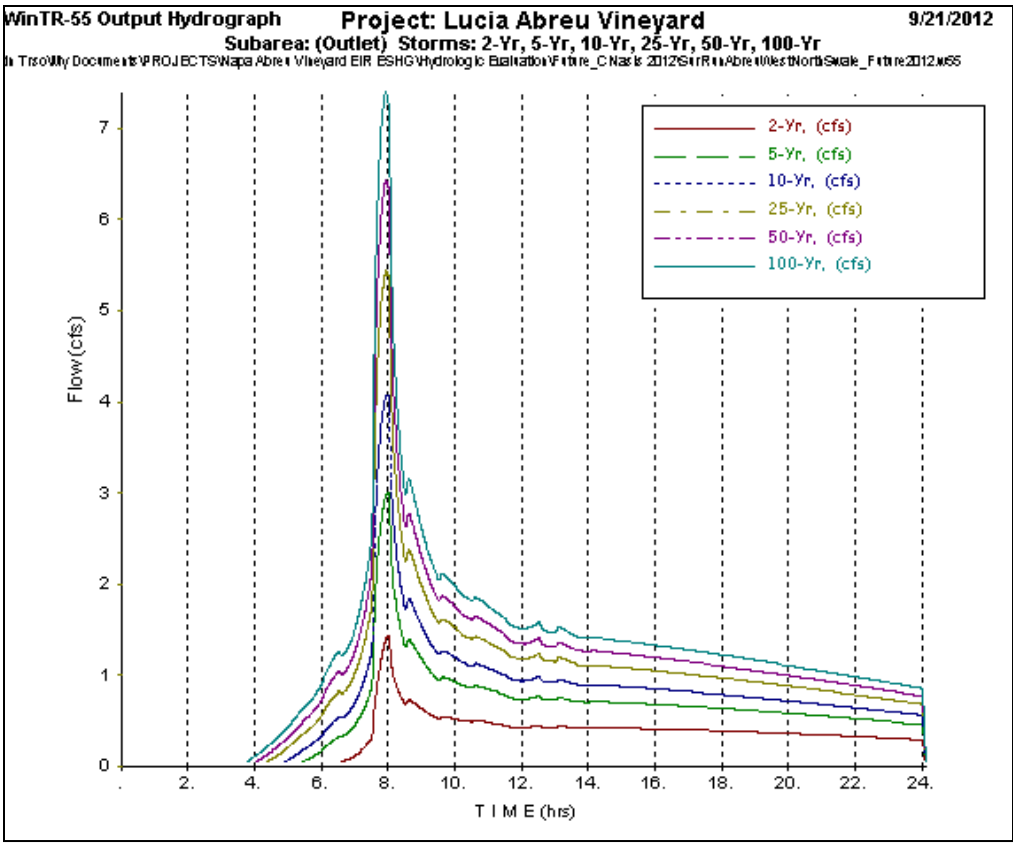
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-N Swale	Legume/Rot. Meadow Straight row (good)	B	6.44	72
	Total Area / Weighted Curve Number		6.44	72

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-North Swale							
SHEET	50	0.0900	0.240				0.071
SHALLOW	N/A						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1956	
					Time of Concentration		0.071

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-N Swale	1.44	3.00	4.08	5.45	6.45	7.42
REACHES						
OUTLET	1.44	3.00	4.08	5.45	6.45	7.42



WinTR-55 Data Description

User: Martin Trso
Date: 9/27/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-South Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-South Swale		Outlet	9.69	71	0.078

Total area: 9.69 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

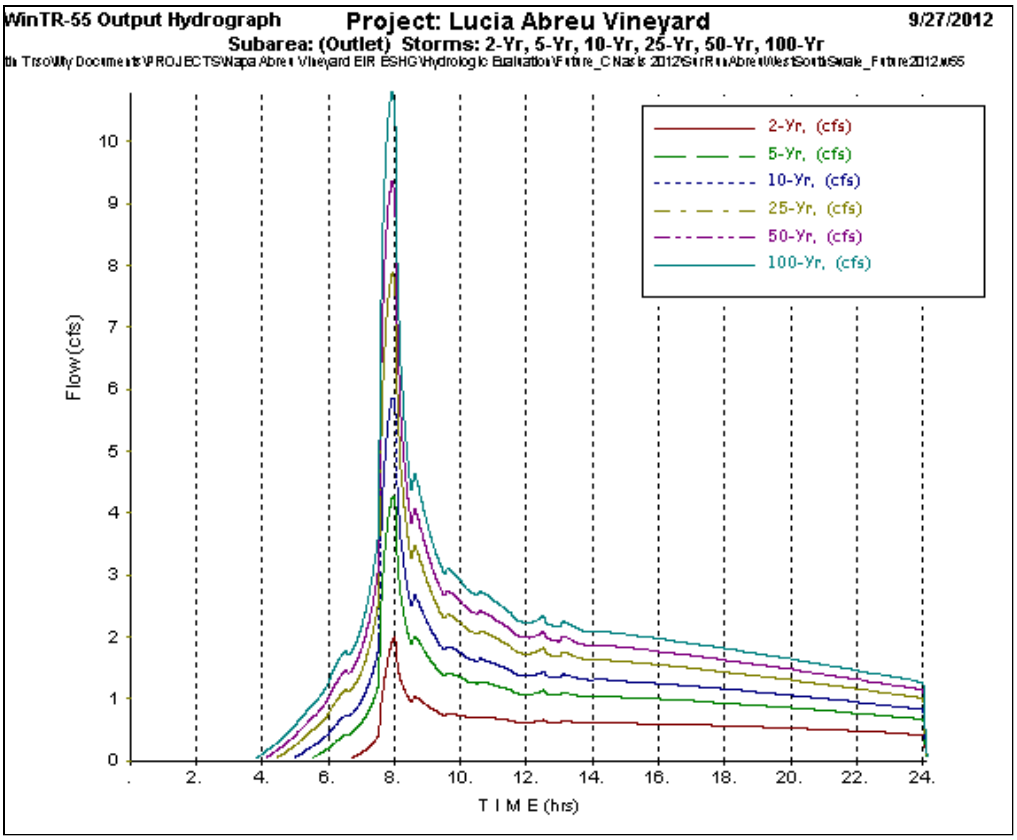
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-S Swale	Legume/Rot. Meadow Straight row (good)	B	8.62	72
	Pasture, grassland or range (poor)	B	0.20	79
	Woods (fair)	B	0.86	60
	Total Area / Weighted Curve Number		9.69	71

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-South Swale							
SHEET	50	0.0700	0.240				0.078
SHALLOW	Eliminated						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1781	
					Time of Concentration		0.078

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-S Swale	1.99	4.28	5.86	7.88	9.36	10.81
REACHES						
OUTLET	1.99	4.28	5.86	7.88	9.36	10.81



B3 Post-Project Conditions (Proposed ECP with Mitigation No. 1)

Mitigation Alternative No.1: Non-Vineyard Area Ground Cover Enhancement (Curve Number, CN, Improvement).

WinTR-55 Data Description

User: Martin Trso
Date: 9/21/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu North Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
North Swale		Outlet	13.72	62	0.112

Total area: 13.72 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

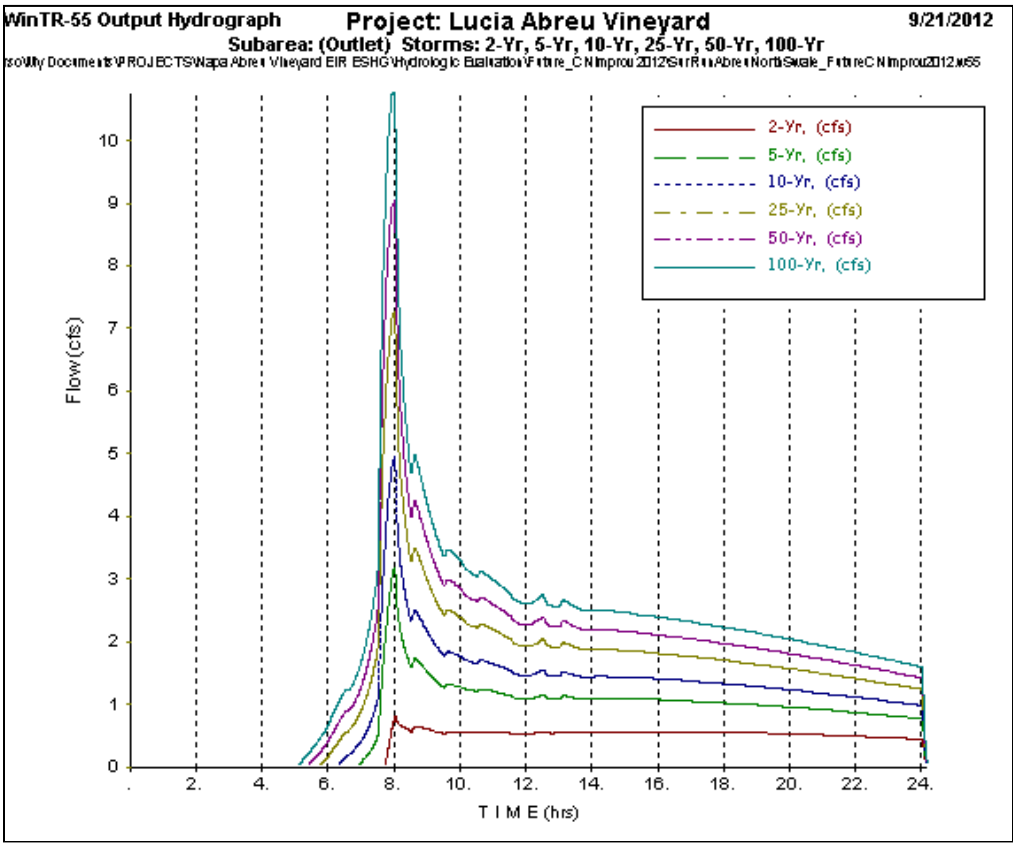
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
North Swale	Legume/Rot. Meadow Straight row (good)	B	4.82	72
	Woods – grass combination (good)	B	6.19	58
	Woods (good)	B	2.71	55
	Total Area / Weighted Curve Number		13.72	62

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
North Swale							
SHEET	50	0.0800	0.400				0.112
SHALLOW	N/A						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1240	
					Time of Concentration		0.112

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
North Swale	0.81	3.19	4.96	7.27	9.03	10.77
REACHES						
OUTLET	0.81	3.19	4.96	7.27	9.03	10.77



WinTR-55 Data Description

User: Martin Trso
Date: 9/27/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-South Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-South Swale		Outlet	9.69	70	0.078

Total area: 9.69 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

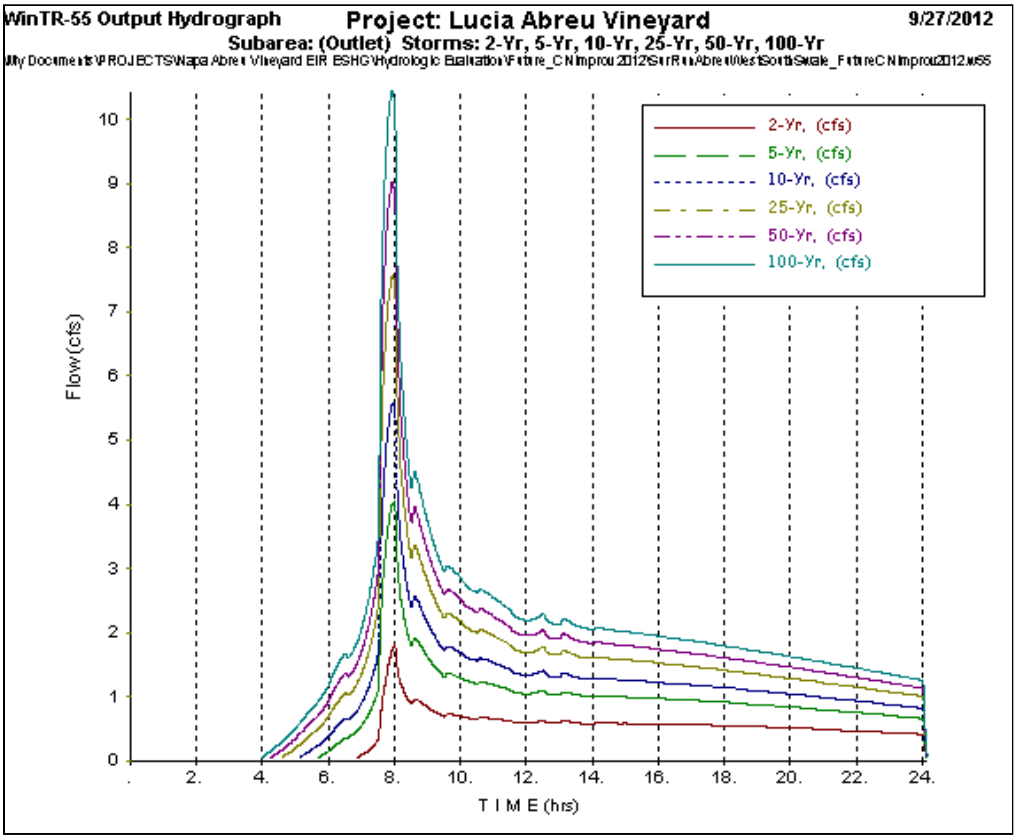
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-S Swale	Legume/Rot. Meadow Straight row (good)	B	8.62	72
	Pasture, grassland or range (good)	B	0.20	61
	Woods (good)	B	0.86	55
	Total Area / Weighted Curve Number		9.69	70

Sub-Area Time of Concentration Details

Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-South Swale							
SHEET	50	0.0700	0.240				0.078
SHALLOW	Eliminated						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1781	
					Time of Concentration		0.078

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-S Swale	1.82	4.04	5.57	7.56	9.02	10.45
REACHES						
OUTLET	1.82	4.04	5.57	7.56	9.02	10.45



B4 Post-Project Conditions (Proposed ECP with Mitigation No. 2)

Mitigation Alternative No. 2: Construction of Detention Ponds.

WinTR-55 Data Description

User: Martin Trso
Date: 9/27/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-North Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-North Swale		Pond 1	6.44	72	0.071

Total area: 6.44 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-N Swale	Legume/Rot. Meadow Straight row (good)	B	6.44	72
	Total Area / Weighted Curve Number		6.44	72

Sub-Area Time of Concentration Details

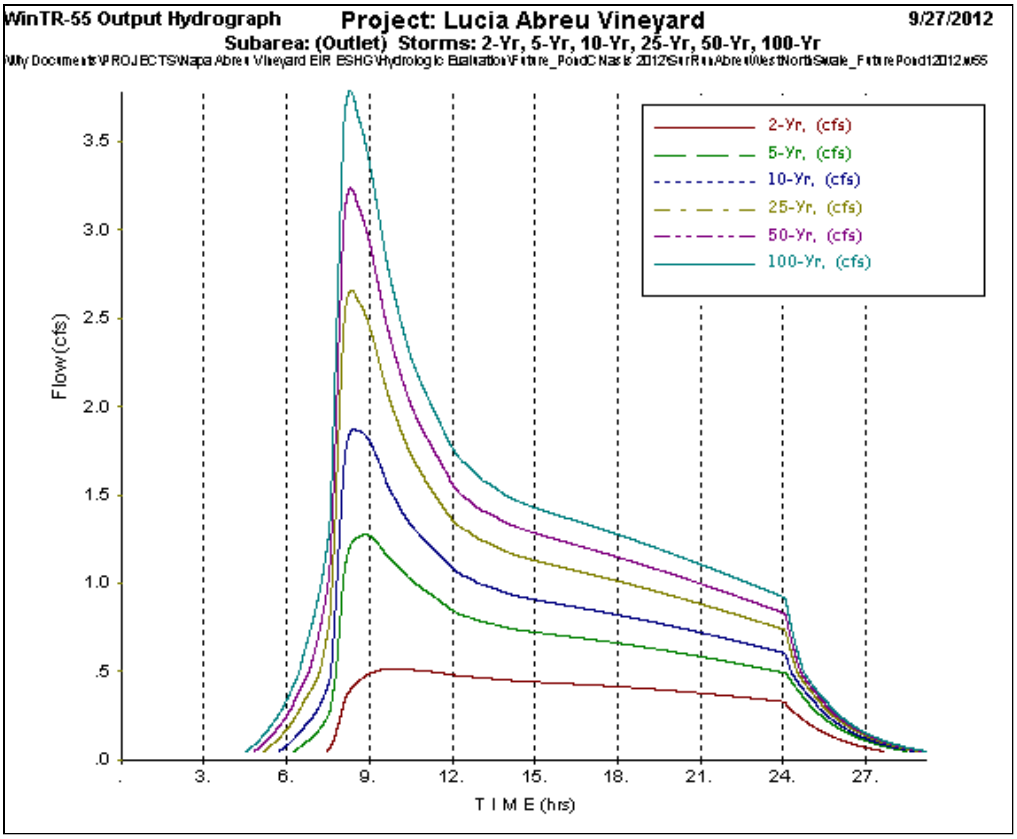
Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-North Swale							
SHEET	50	0.0900	0.240				0.071
SHALLOW	N/A						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1956	
					Time of Concentration		0.071

Watershed Peak Table

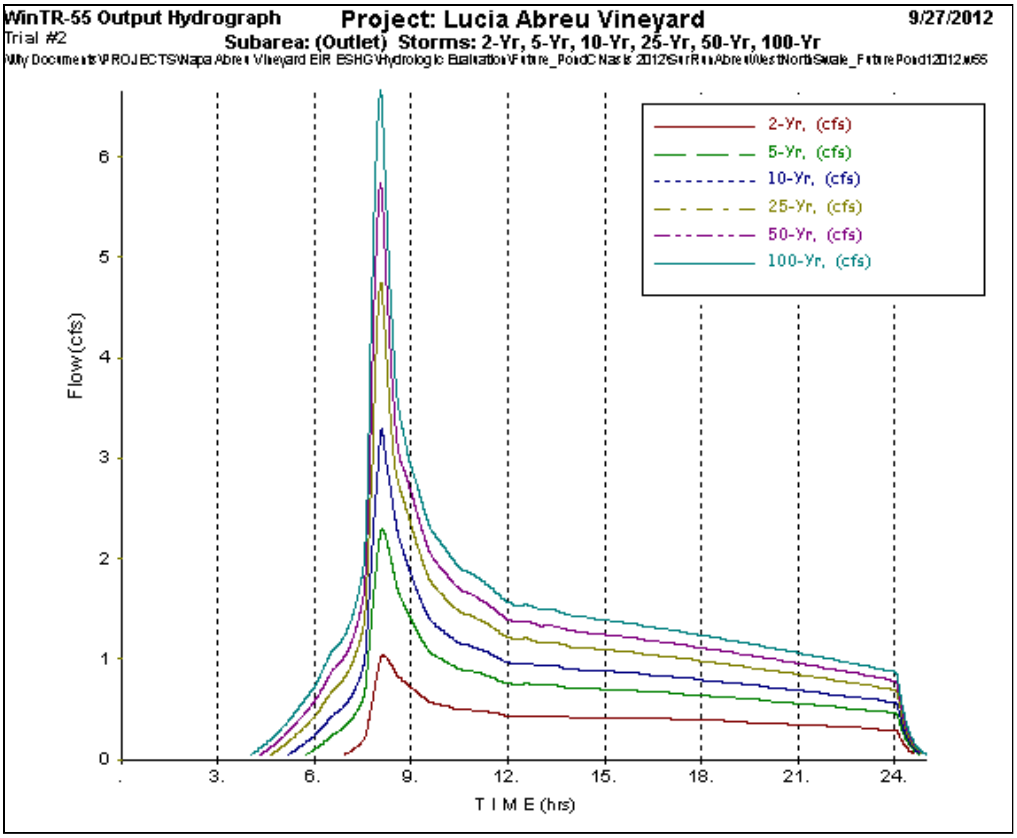
Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-N Swale	1.44	3.00	4.08	5.45	6.45	7.42
REACHES: West-North Swale Pond 1 (Trial 1 data only)						
Pond 1 In	1.44	3.00	4.08	5.45	6.45	7.42
Pond 1 Down	0.51	1.28	1.87	2.66	3.24	3.79
OUTLET	0.51	1.28	1.87	2.66	3.24	3.79

Structure Output Table

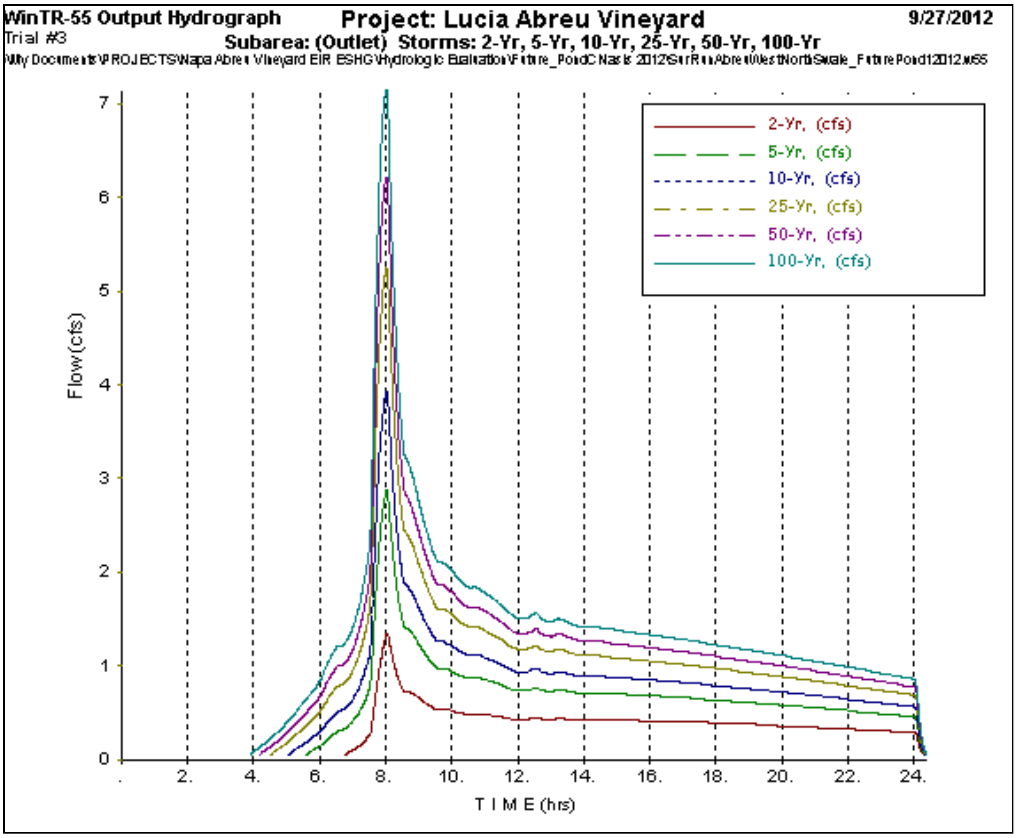
Reach/ Structure Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period 2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Reach: West-North Swale Pond 1						
Trial 1: Weir 0.5(ft)						
PF (cfs)	0.51	1.28	1.87	2.66	3.23	3.79
SV (ac ft)	0.08	0.15	0.20	0.26	0.30	**0.35**
STG (ft)	0.51	0.93	1.18	1.49	1.71	1.93
Trial 2: Weir 3(ft)						
PF (cfs)	1.04	2.30	3.29	4.75	5.74	6.67
SV (ac ft)	0.03	0.06	0.08	0.11	0.12	0.13
STG (ft)	0.18	0.39	0.53	0.66	0.76	0.84
Trial 3: Weir 9(ft)						
PF (cfs)	1.34	2.88	3.93	5.25	6.21	7.15
SV (ac ft)	0.01	0.03	0.04	0.05	0.06	0.06
STG (ft)	0.08	0.16	0.22	0.29	0.35	0.40



Trial 1: Weir length of 0.5 feet.



Trial 2: Weir length of 3.0 feet.



Trial 3: Weir length of 9.0 feet.

WinTR-55 Data Description

User: Martin Trso
Date: 9/27/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-South Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-South Swale		Pond 2	9.69	71	0.078

Total area: 9.69 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-S Swale	Legume/Rot. Meadow Straight row (good)	B	8.62	72
	Pasture, grassland or range (poor)	B	0.20	79
	Woods (fair)	B	0.86	60
	Total Area / Weighted Curve Number		9.69	71

Sub-Area Time of Concentration Details

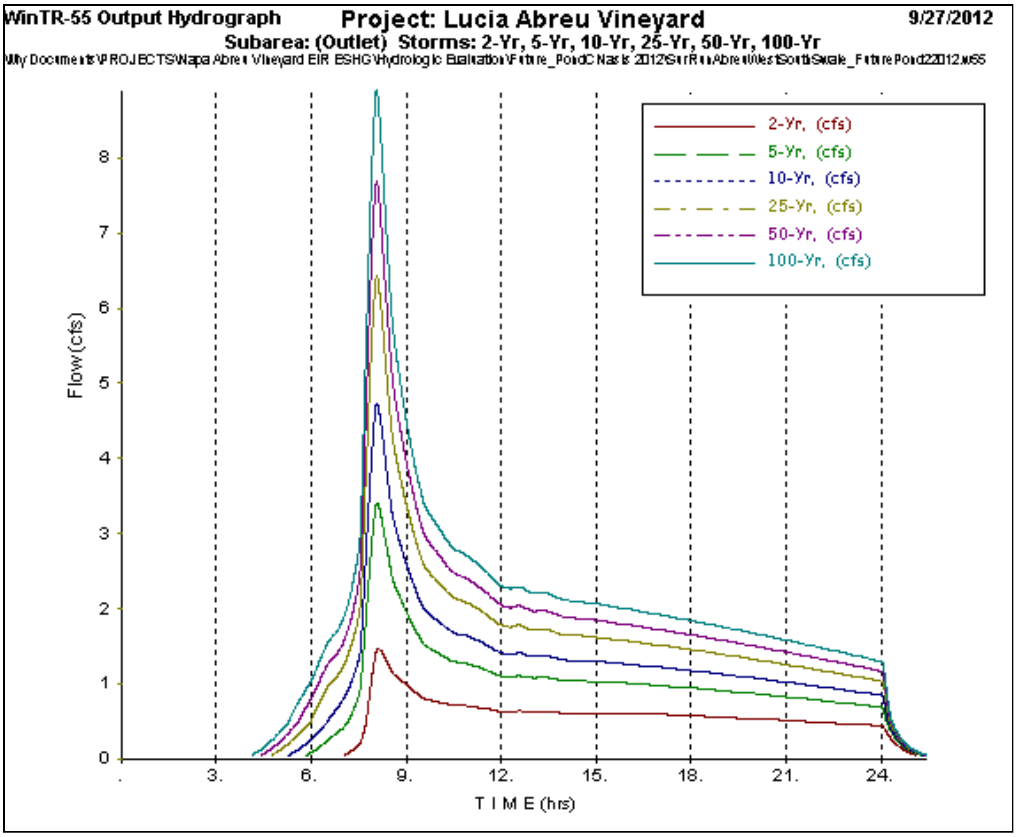
Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-South Swale							
SHEET	50	0.0700	0.240				0.078
SHALLOW	Eliminated						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1781	
					Time of Concentration		0.078

Watershed Peak Table

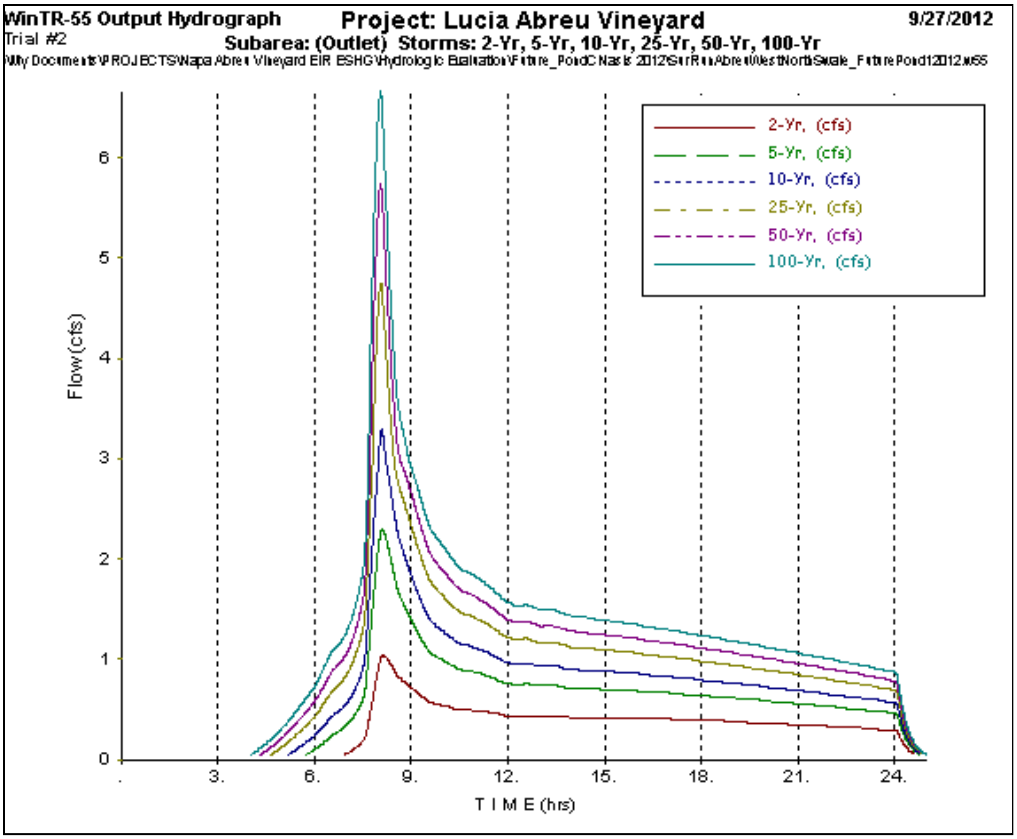
Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-S Swale	1.99	4.28	5.86	7.88	9.36	10.81
REACHES: West-South Swale Pond 2 (Trial 1 data only)						
Pond 2 In	1.99	4.28	5.86	7.88	9.36	10.81
Pond 2 Down	1.46	3.40	4.74	6.44	7.69	8.91
OUTLET	1.46	3.40	4.74	6.44	7.69	8.91

Structure Output Table

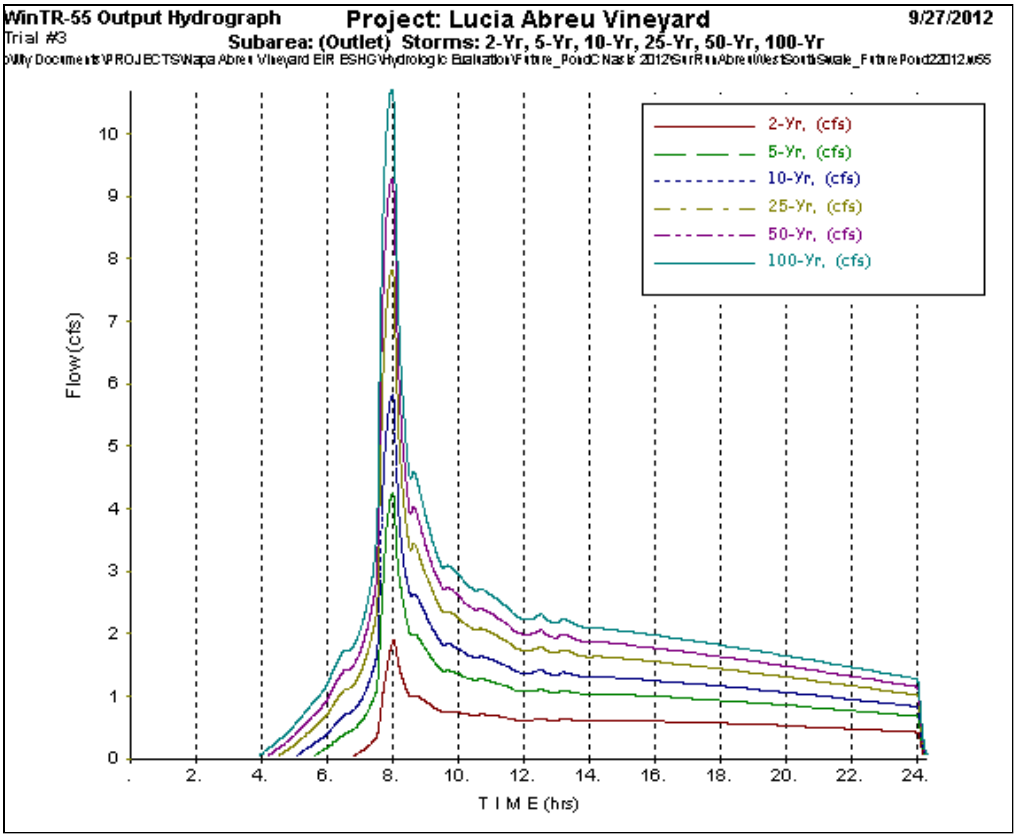
Reach/ Structure Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period 2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Reach: West-South Swale Pond 2						
Trial 1: Weir 0.5(ft)						
PF (cfs)	1.46	3.40	4.74	6.44	7.69	8.91
SV (ac ft)	0.04	0.09	0.12	0.16	0.19	**0.21**
STG (ft)	1.02	1.78	2.20	2.64	2.96	3.27
Trial 2: Weir 1(ft)						
PF (cfs)	1.74	3.97	5.48	7.39	8.80	10.17
SV (ac ft)	0.03	0.05	0.07	0.09	0.11	0.13
STG (ft)	0.71	1.23	1.52	1.90	2.11	2.29
Trial 3: Weir 3(ft)						
PF (cfs)	1.90	4.25	5.82	7.81	9.27	10.71
SV (ac ft)	0.01	0.02	0.03	0.04	0.04	0.05
STG (ft)	0.32	0.62	0.76	0.95	1.06	1.15



Trial 1: Weir length of 0.5 feet.



Trial 2: Weir length of 1.0 feet.



Trial 3: Weir length of 3.0 feet.

B5 Post-Project Conditions (Proposed ECP with Mitigation No. 3)

Mitigation Alternative No. 3: Non-Vineyard Area Ground Cover Enhancement (Curve Number, CN, Improvement) with Construction of Detention Pond.

WinTR-55 Data Description

User: Martin Trso
Date: 9/27/2012
Project: Lucia Abreu Vineyard Howell Mountain
SubTitle: Surface Runoff, Abreu West-South Swale, Post-Project Conditions
Units: English
Areal Units: Acres
State: California
County: Napa

Name	Description	Reach	Area(ac)	RCN	Tc
West-South Swale		Pond 2	9.69	70	0.078

Total area: 9.69 (ac)

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)
3.56	4.87	5.67	6.62	7.29	7.93

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type IA
Dimensionless Unit Hydrograph: <standard>

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
West-S Swale	Legume/Rot. Meadow Straight row (good)	B	8.62	72
	Pasture, grassland or range (good)	B	0.20	61
	Woods (good)	B	0.86	55
	Total Area / Weighted Curve Number		9.69	70

Sub-Area Time of Concentration Details

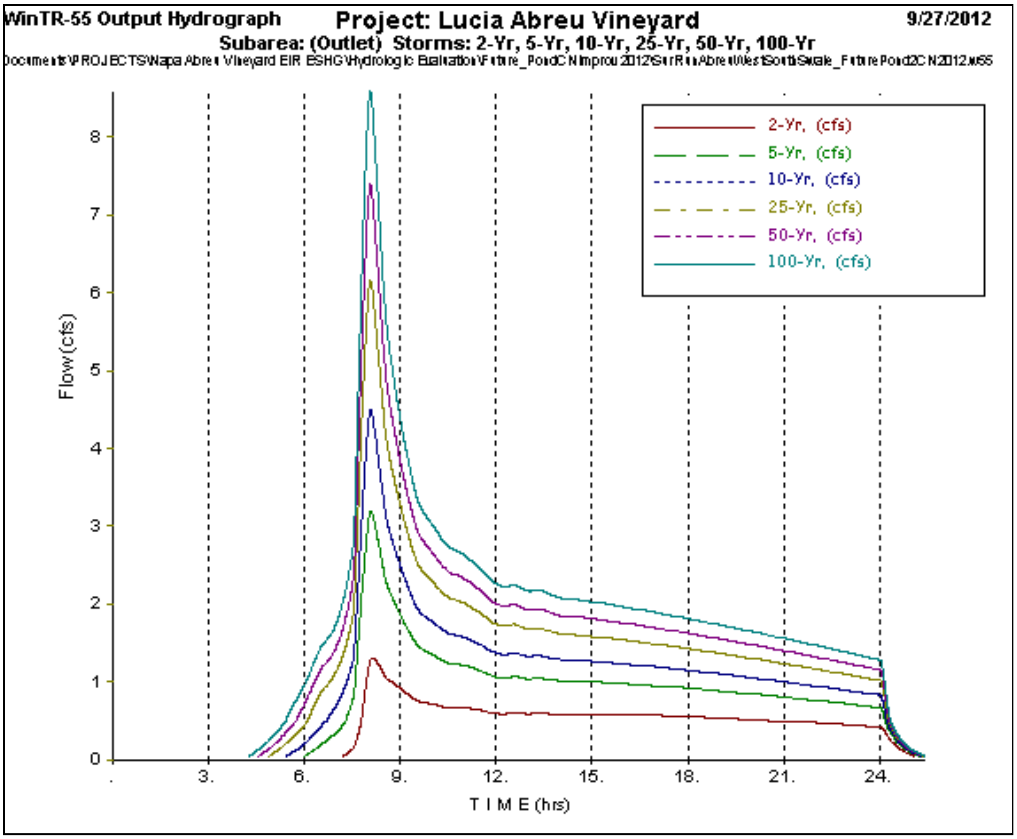
Sub-Area Identifier	Flow Length (ft)	Slope (ft/ft)	Manning's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
West-South Swale							
SHEET	50	0.0700	0.240				0.078
SHALLOW	Eliminated						
SHALLOW	N/A						
CHANNEL	N/A						
					Total Velocity	0.1781	
					Time of Concentration		0.078

Watershed Peak Table

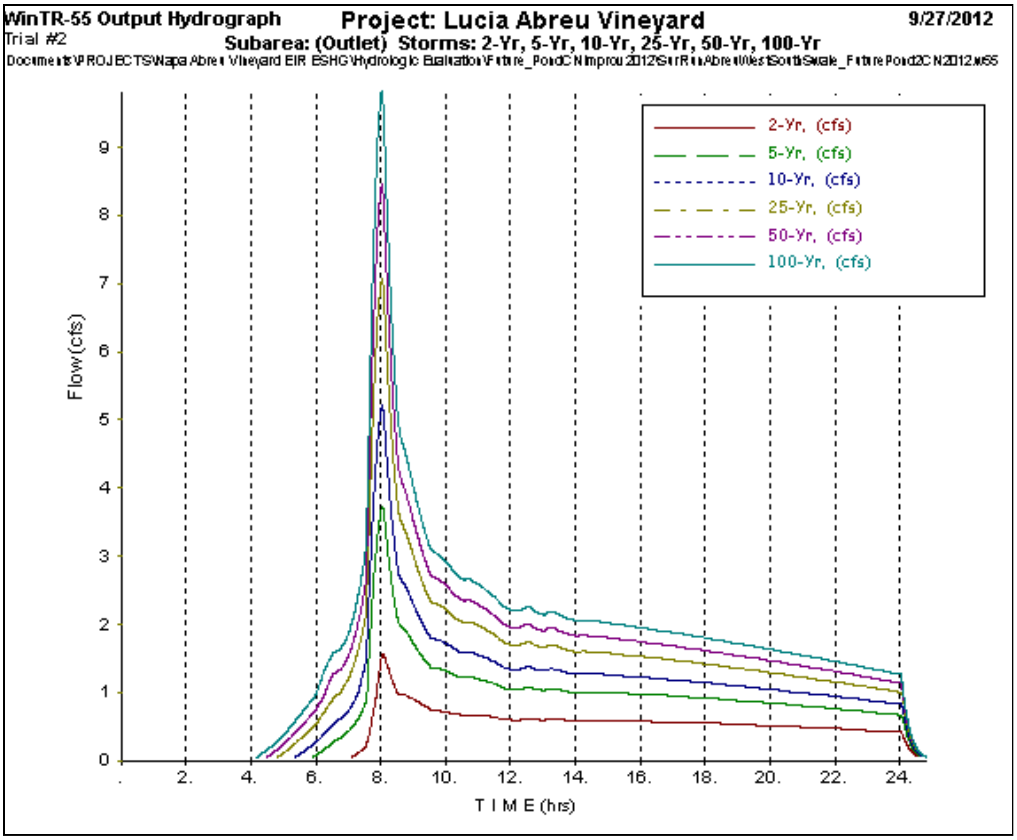
Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)
SUBAREAS						
West-S Swale	1.82	4.04	5.57	7.56	9.02	10.45
REACHES: West-South Swale Pond 2 (Trial 1 data only)						
Pond 2 In	1.82	4.04	5.57	7.56	9.02	10.45
Pond 2 Down	1.30	3.19	4.50	6.16	7.39	8.60
OUTLET	1.30	3.19	4.50	6.16	7.39	8.60

Structure Output Table

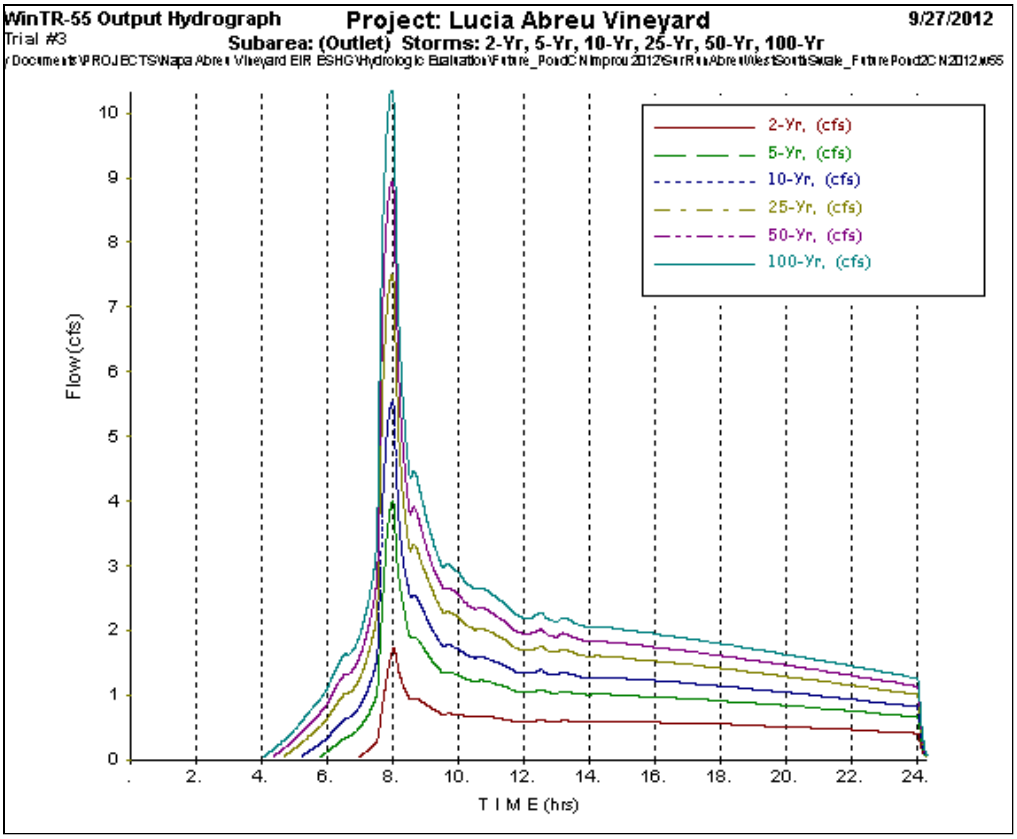
Reach/ Structure Identifier	Peak Flow (PF), Storage Volume (SV), Stage (STG) by Rainfall Return Period 2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr
Reach: West-South Swale Pond 2						
Trial 1: Weir 0.5(ft)						
PF (cfs)	1.30	3.19	4.50	6.16	7.39	8.60
SV (ac ft)	0.03	0.08	0.11	0.15	0.18	**0.21**
STG (ft)	0.94	1.70	2.14	2.56	2.88	3.19
Trial 2: Weir 1(ft)						
PF (cfs)	1.56	3.73	5.21	7.08	8.47	9.83
SV (ac ft)	0.03	0.05	0.07	0.09	0.11	0.12
STG (ft)	0.66	1.18	1.47	1.84	2.07	2.25
Trial 3: Weir 3(ft)						
PF (cfs)	1.72	4.00	5.55	7.50	8.93	10.35
SV (ac ft)	0.01	0.02	0.03	0.04	0.04	0.05
STG (ft)	0.29	0.59	0.74	0.92	1.03	1.13



Trial 1: Weir length of 0.5 feet.



Trial 2: Weir length of 1.0 feet.



Trial 3: Weir length of 3.0 feet.

APPENDIX C: MARCH/APRIL/DECEMBER 2012 STORM RUNOFF MONITORING

Figure C-1. Storm runoff from Abreu property at storm drain outlet, 14 March 2012.

Figure C-2. Storm runoff from Abreu property at storm drain outlet, 16 March 2012.

Figure C-3. Storm runoff from Abreu property at storm drain outlet, 25 March 2012.

Figure C-4. Storm runoff from Abreu property at storm drain outlet, 28 March 2012.

Figure C-5. Storm runoff from Abreu property at storm drain outlet, 13 April 2012.

Figure C-6. Storm runoff from Abreu property at storm drain outlet, 5 December 2012.

Figure C-7. Runoff-free conditions in Abreu West-South Swale forest-floor pathway, 3/16/12.

Figure C-8. Runoff-free conditions in Abreu West-South Swale forest-floor pathway, 3/22/12.

Figure C-9. Runoff-free conditions in Abreu West-South Swale forest-floor pathway, 3/25/12.

Figure C-10. Runoff-free conditions in Abreu West-South Swale forest-floor pathway, 3/26/12.

Figure C-11. Runoff-free conditions in Abreu West-South Swale forest-floor pathway, 12/5/12.

Figure C-12. Storm runoff in 3rd-order tributary to Upper Conn Creek, 3/14/12.

Figure C-13. Storm runoff in 3rd-order tributary to Upper Conn Creek, 3/1612.

Figure C-14. Storm runoff in 3rd-order tributary to Upper Conn Creek, 3/25/12.

Figure C-15. Storm runoff in 3rd-order tributary to Upper Conn Creek, 3/28/12.

Figure C-16. Storm runoff in 3rd-order tributary to Upper Conn Creek, 4/13/12.

Figure C-17. Storm runoff in 3rd-order tributary to Upper Conn Creek, 12/512.

Figure C-18. Abundant sheet flow on hilltop trail during high-intensity rainstorm, Abreu West-South Swale catchment, 3/16/12.

APPENDIX D: SUPPLEMENTAL HILLSLOPE STABILITY ANALYSIS (2012)

Figure D-1. Soil pipes within colluvial deposit in Abreu Western Ravine.

Figure D-2. Soil pipes within colluvial deposit in Abreu Eastern Ravine.

Figure D-3. Slump scarp at 545 meters in Abreu Western Ravine.

Figure D-4. Slump scarp at 555 meters in Abreu Eastern Ravine.

Figure D-5. Detailed view of colluvial deposit in Abreu Western Ravine.

Figure D-6. Detailed view of colluvial deposit in Abreu Eastern Ravine.

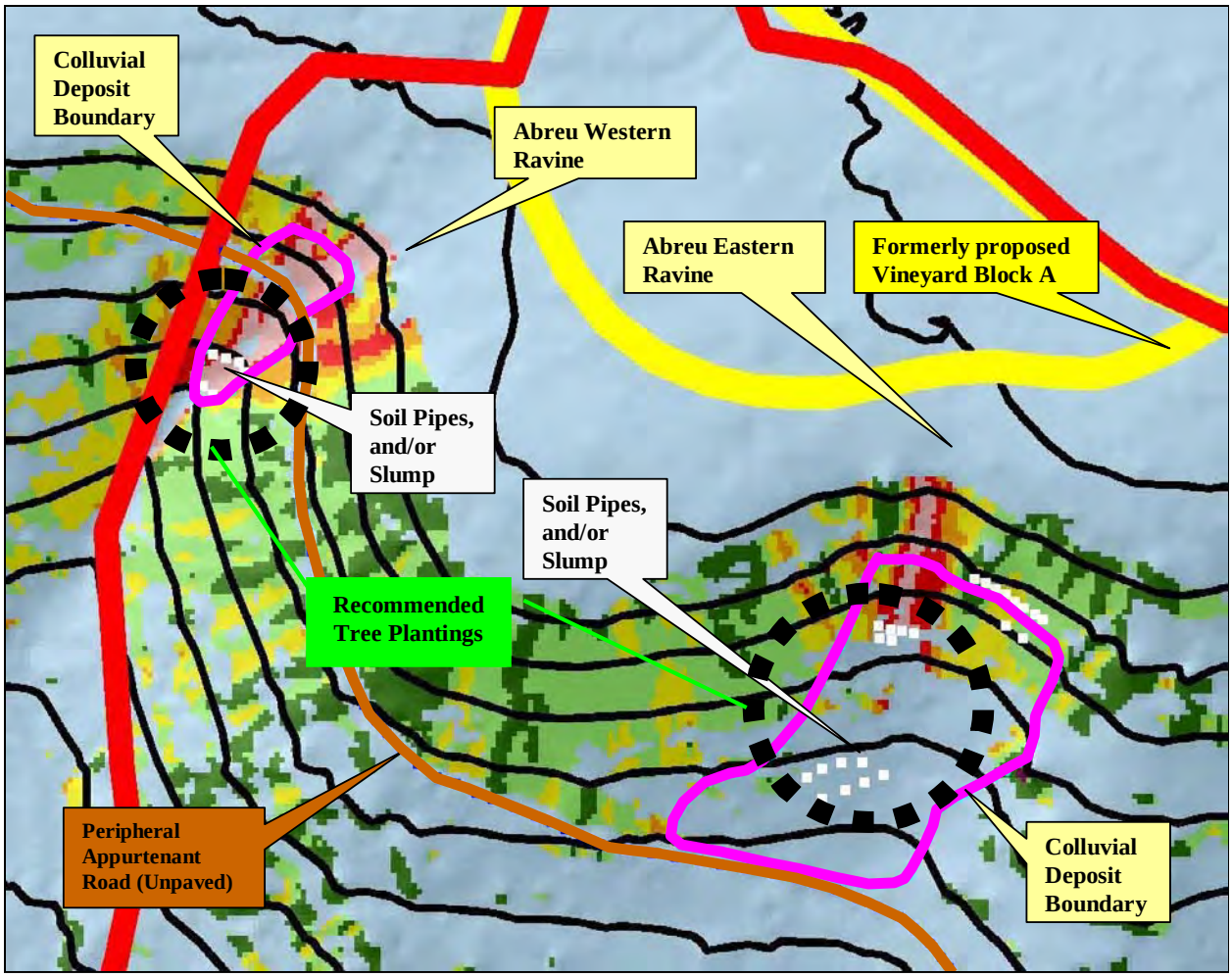


Figure D-7. Overview of colluvial deposits, soil pipe locations, small-scale soil slumps, and proposed tree planting areas within Abreu Western and Abreu Eastern ravines. SHALSTAB prediction in background.

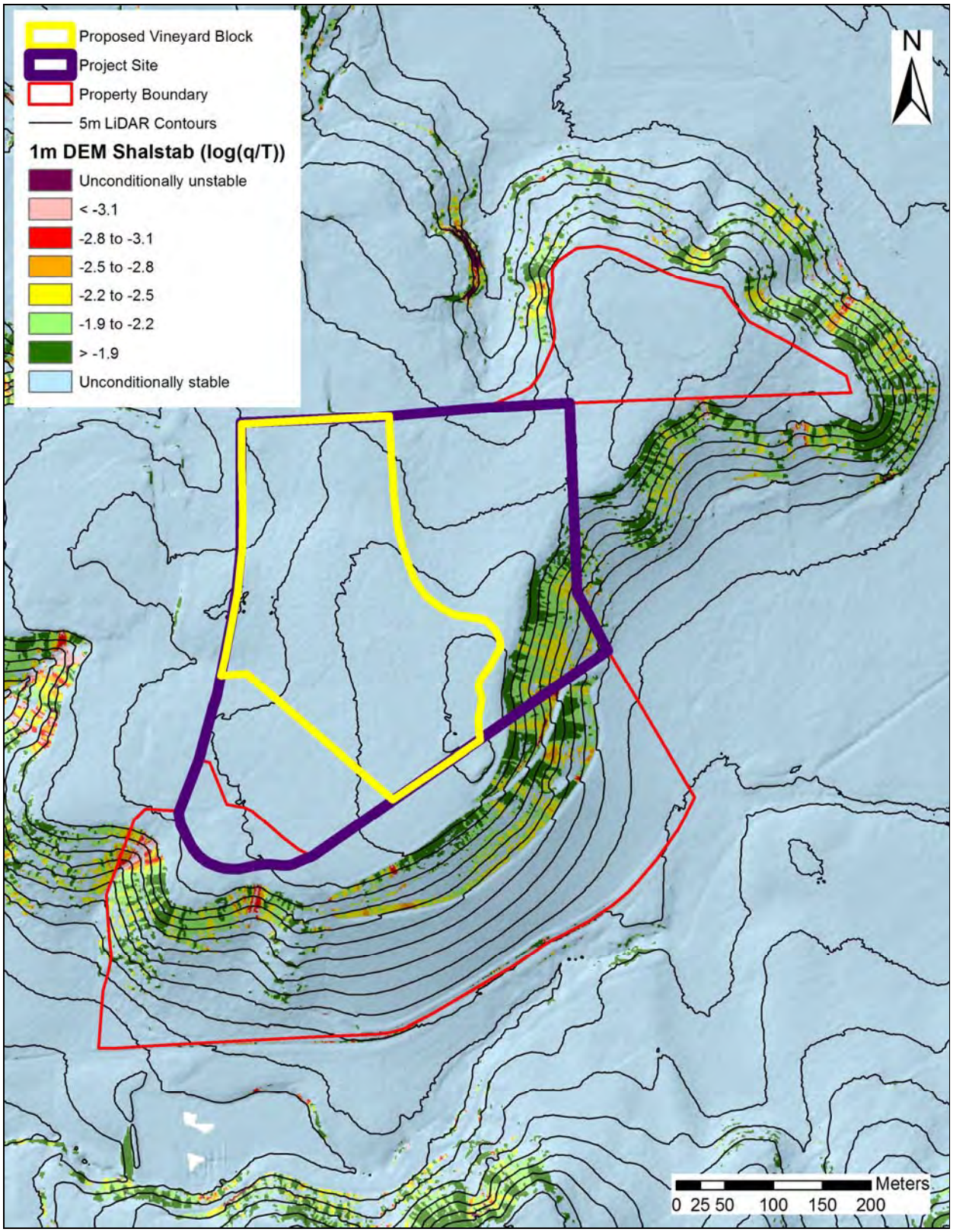


Figure D-8. SHALSTAB prediction: soil-depth independent, root cohesion-free scenario.

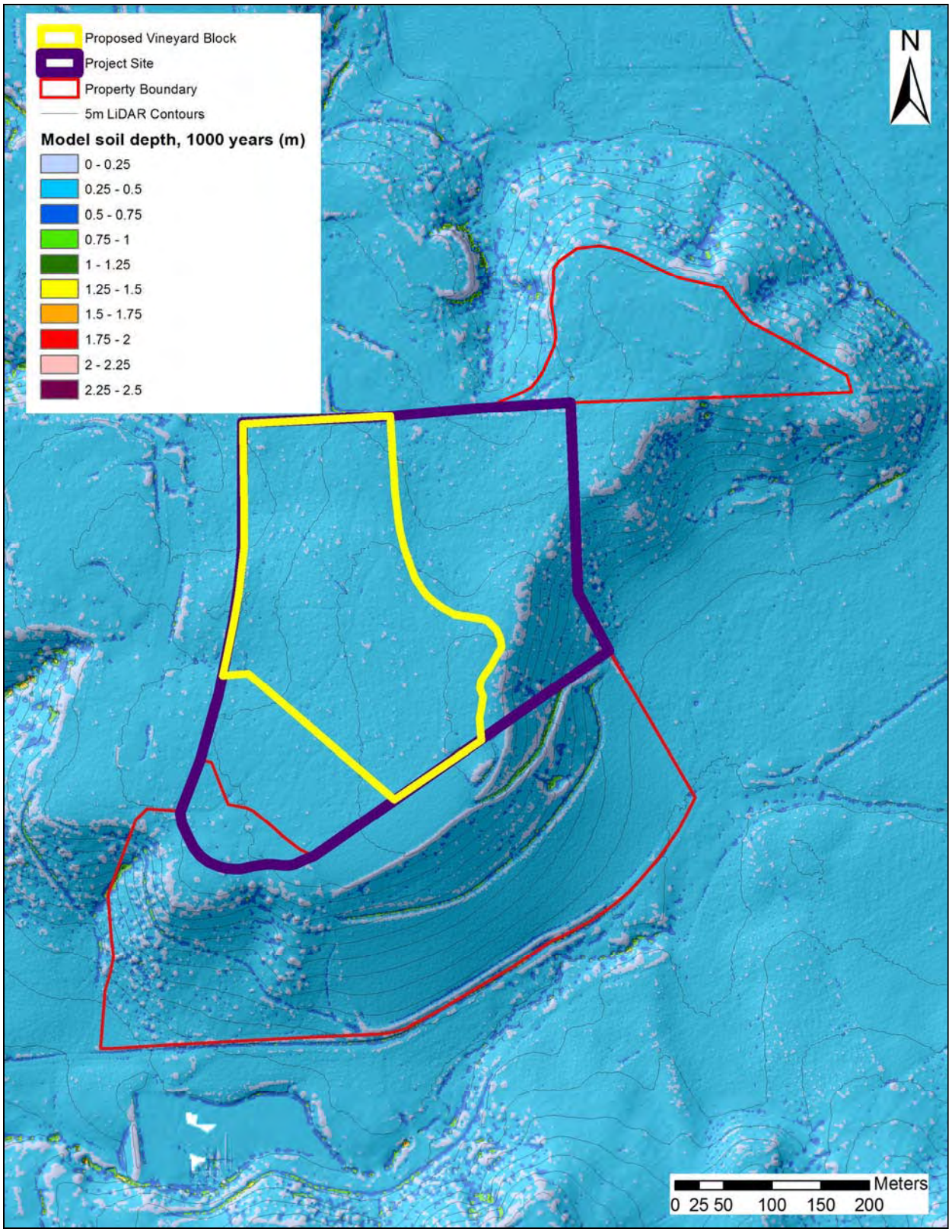


Figure D-9. Soil depth modeling: 1,000 years (1ka).

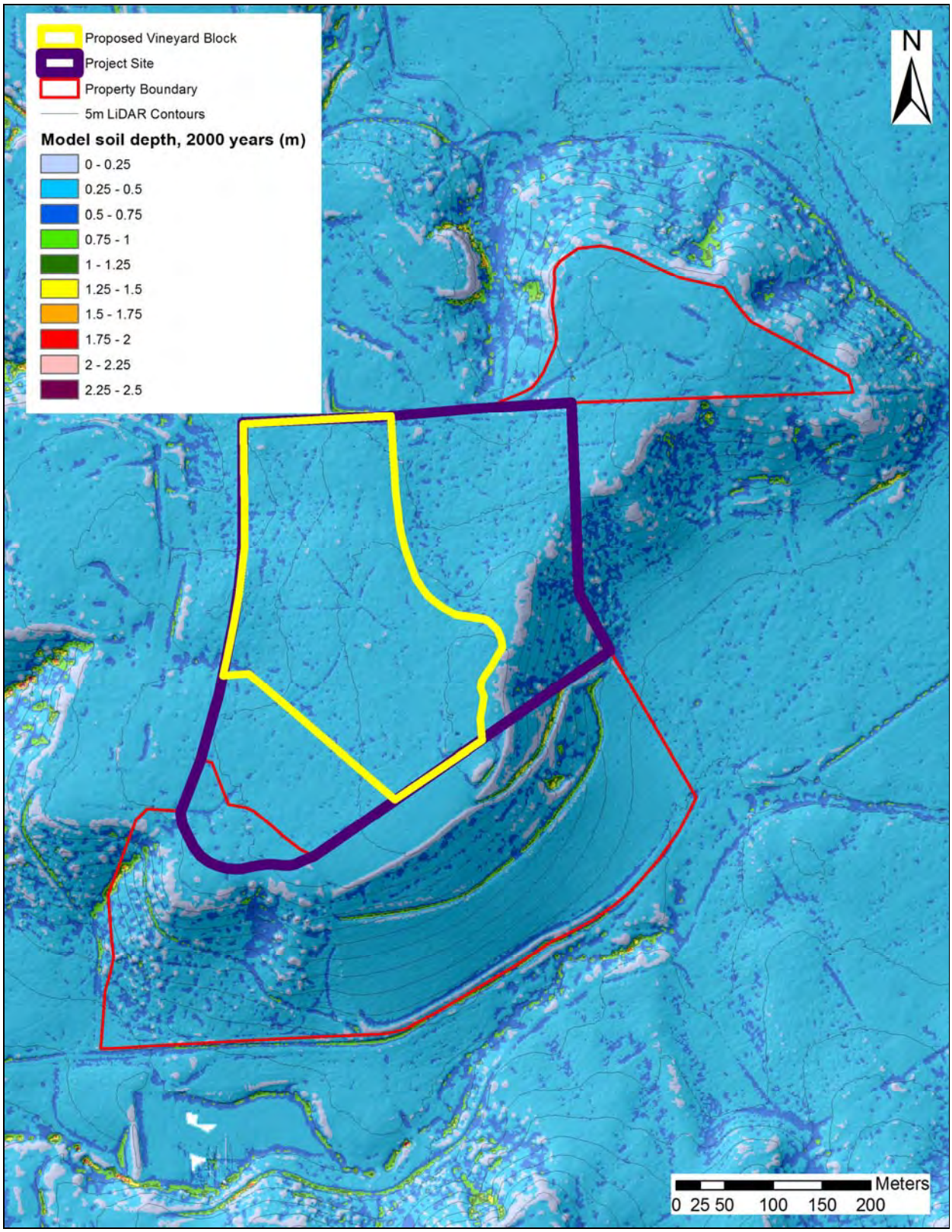


Figure D-10. Soil depth modeling: 2,000 years (2ka).

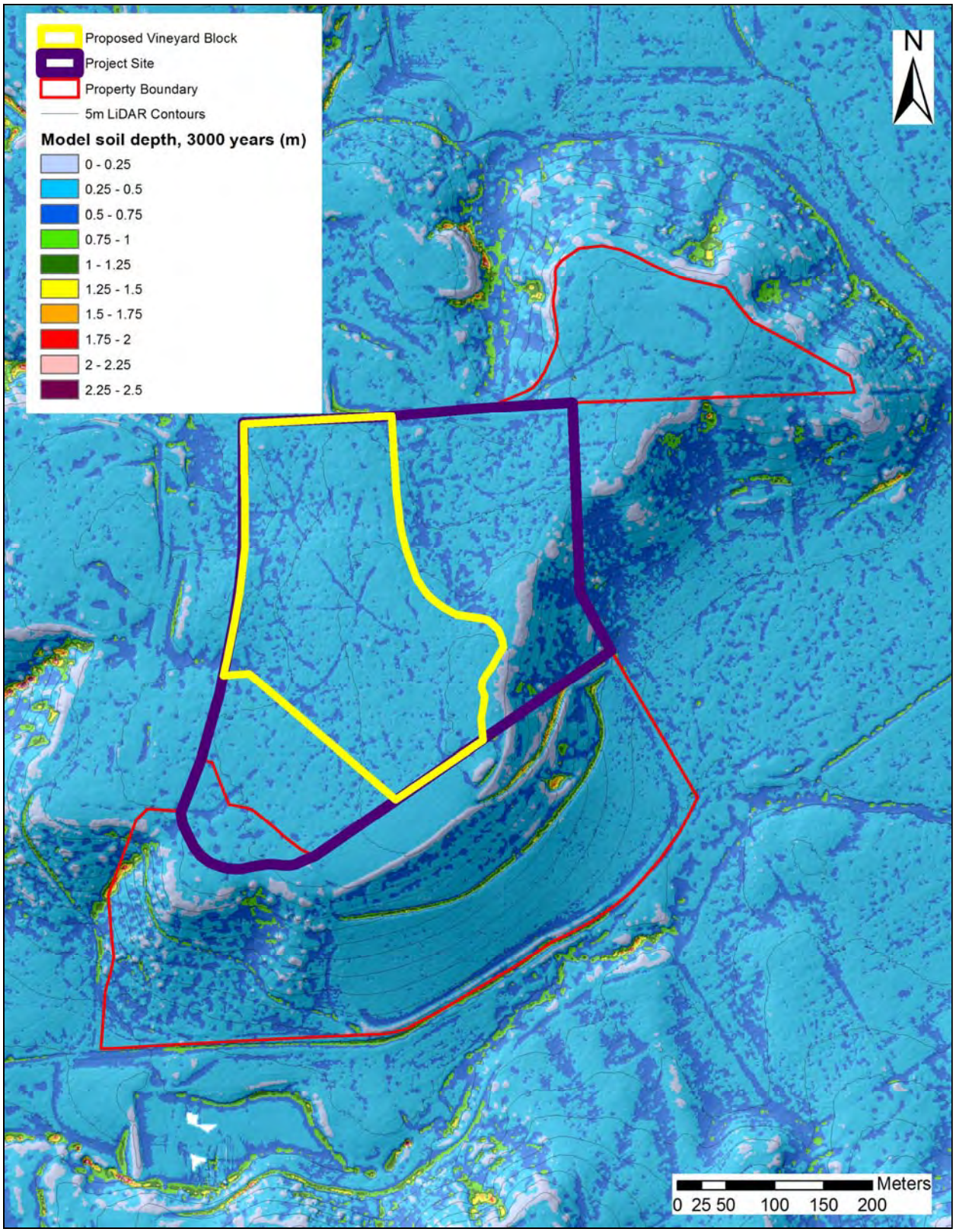


Figure D-11. Soil depth modeling: 3,000 years (3ka).

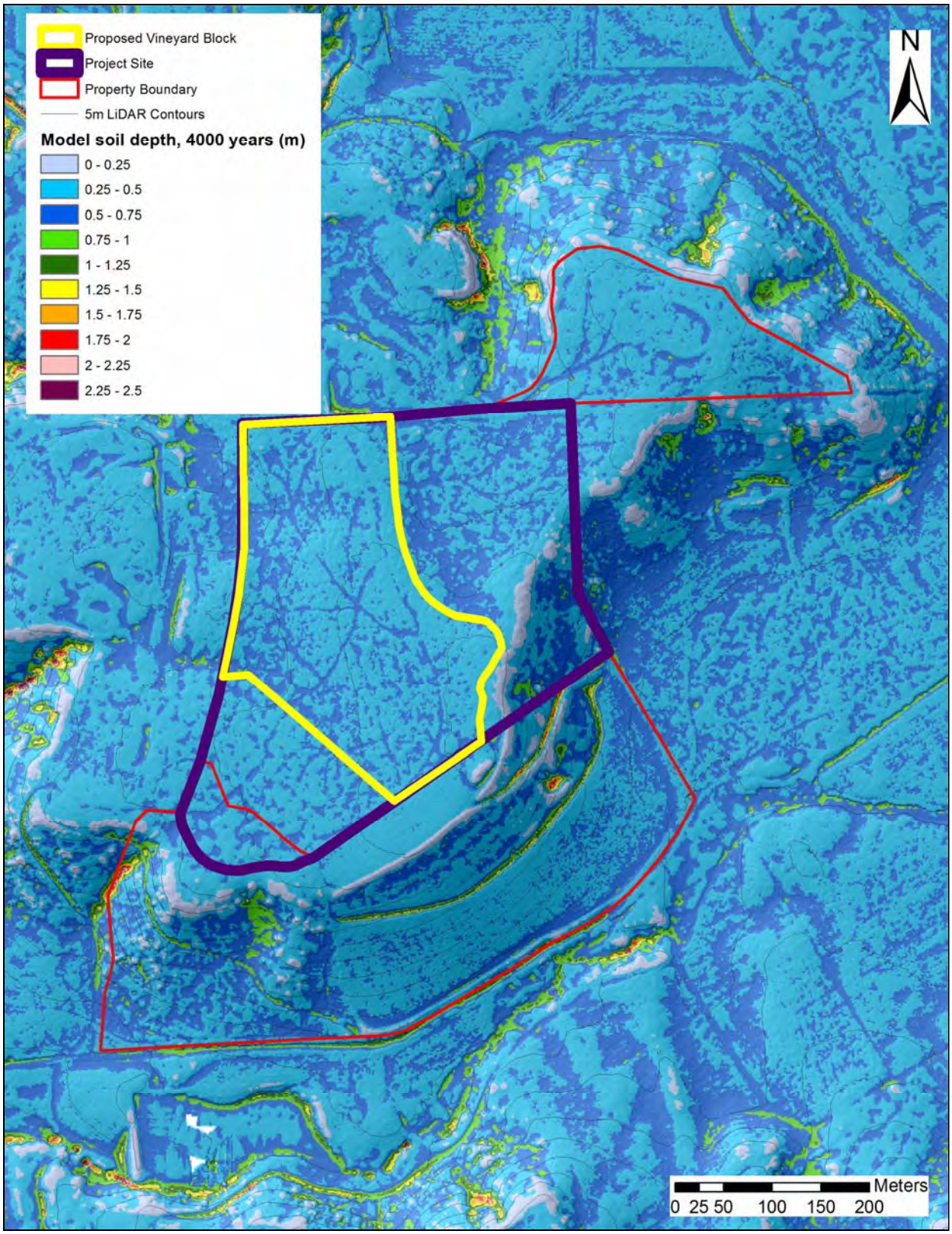


Figure D-12. Soil depth modeling: 4,000 years (4ka).

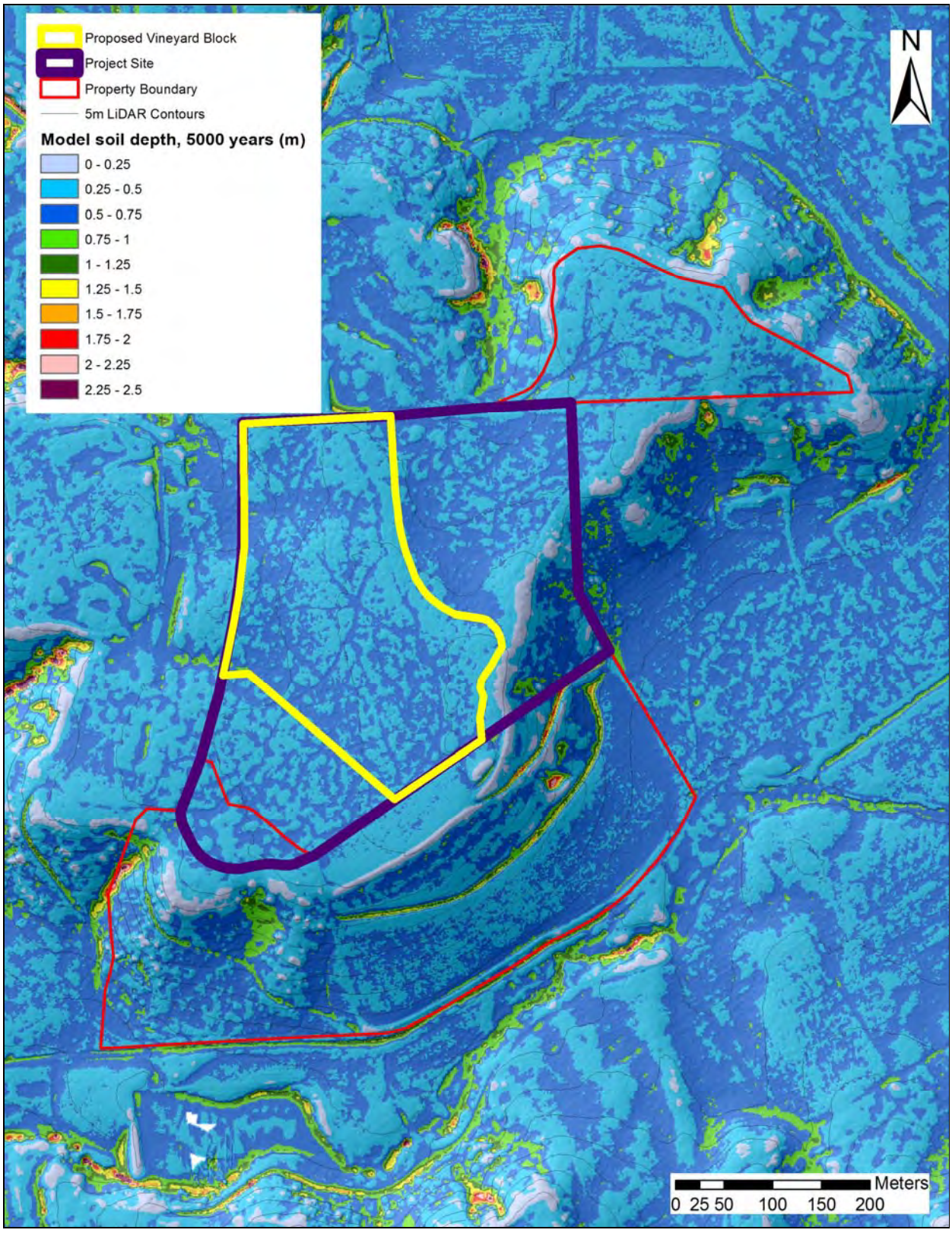


Figure D-13. Soil depth modeling: 5,000 years (5ka).

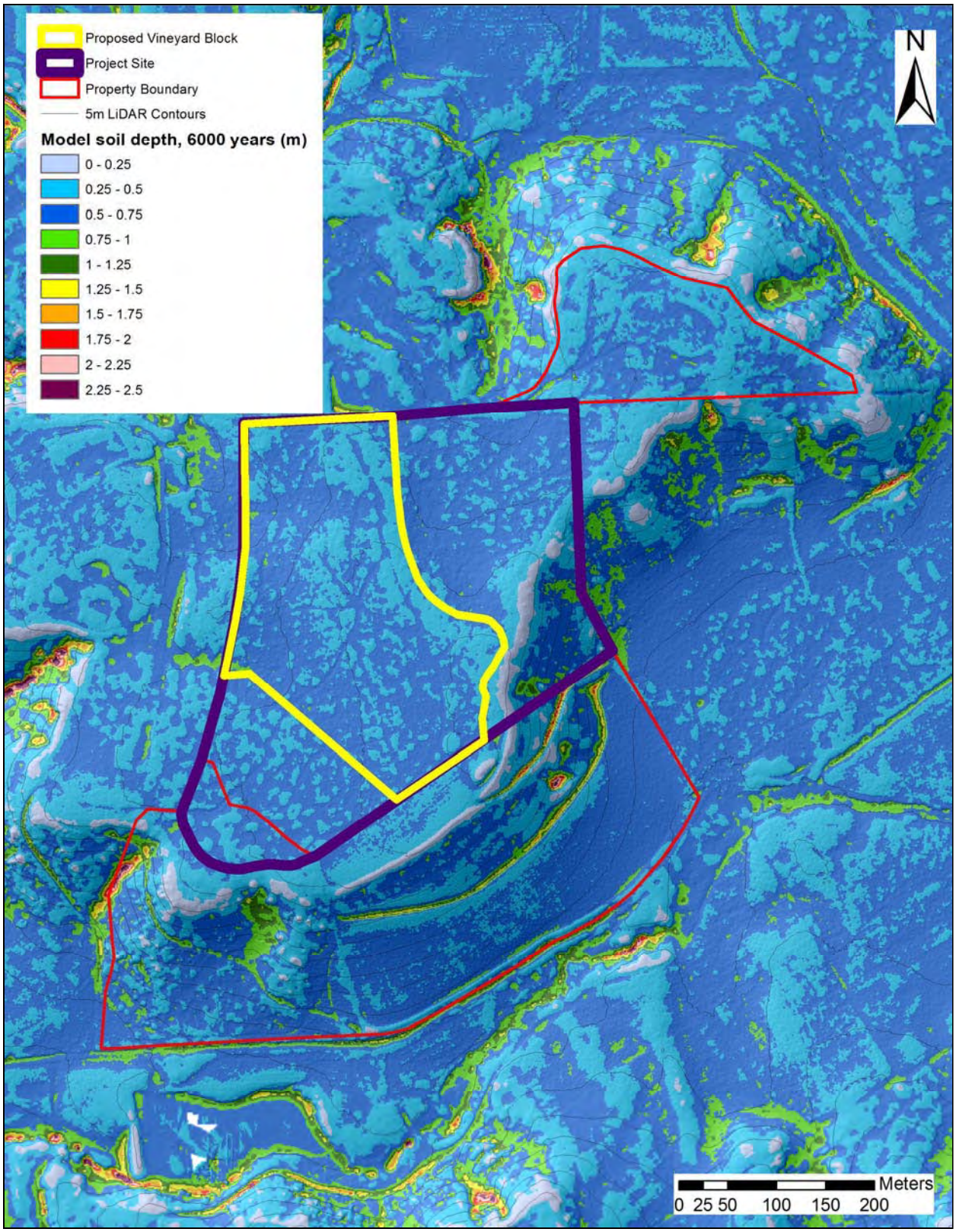


Figure D-14. Soil depth modeling: 6,000 years (6ka).

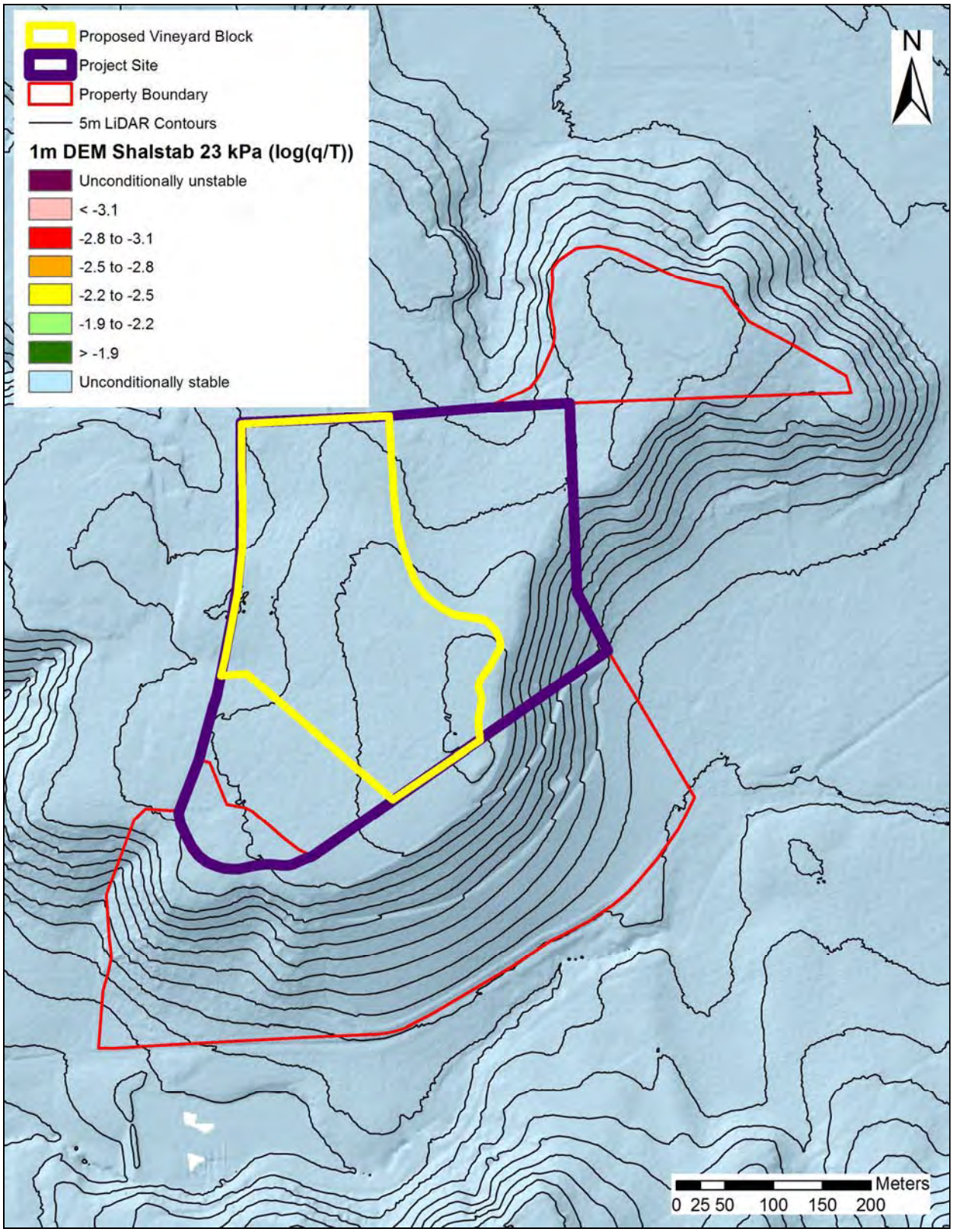


Figure D-15. SHALSTAB.V prediction: variable soil depth (5ka), 23 kPa root cohesion scenario.

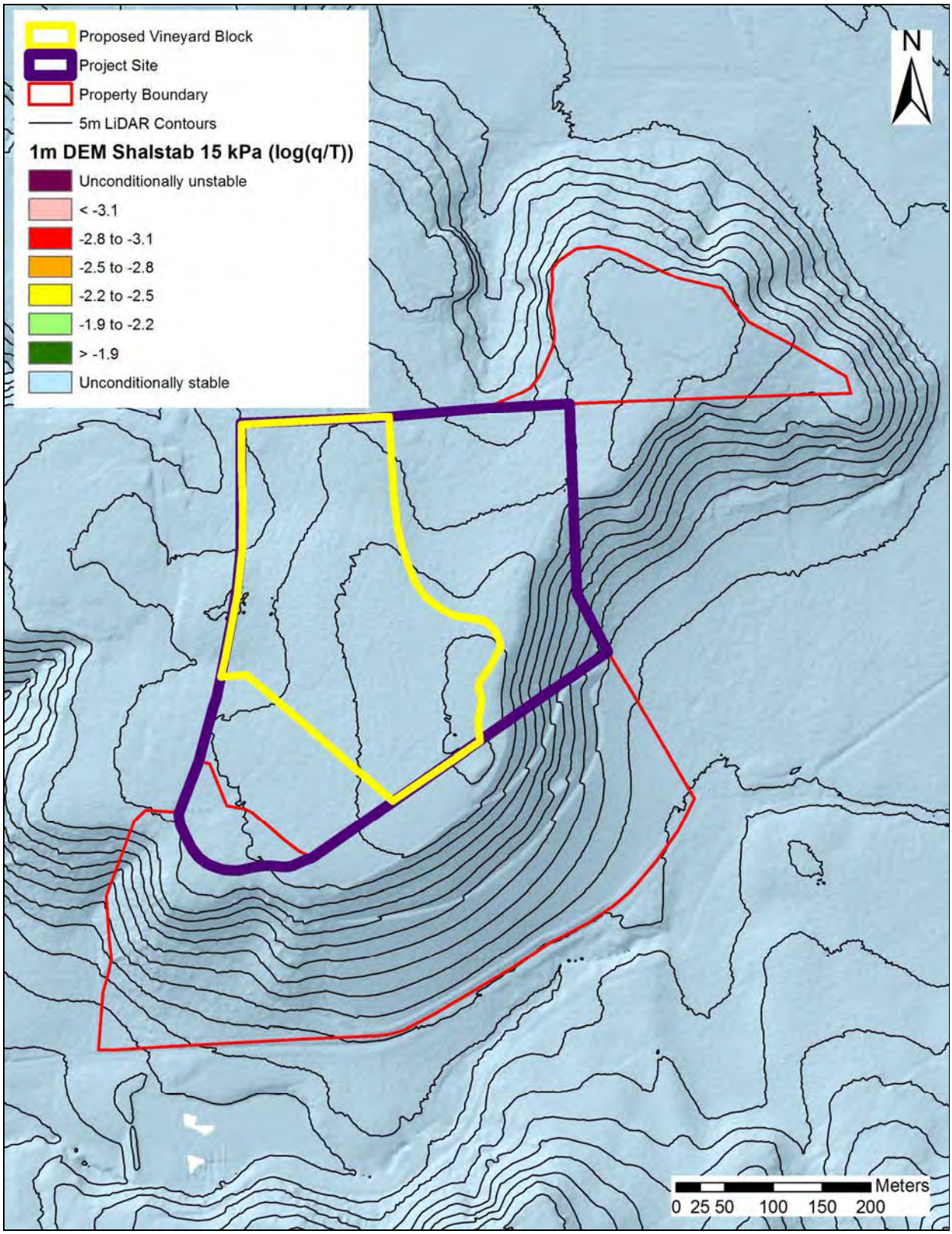


Figure D-16. SHALSTAB.V prediction: variable soil depth (5ka), 15 kPa root cohesion scenario.

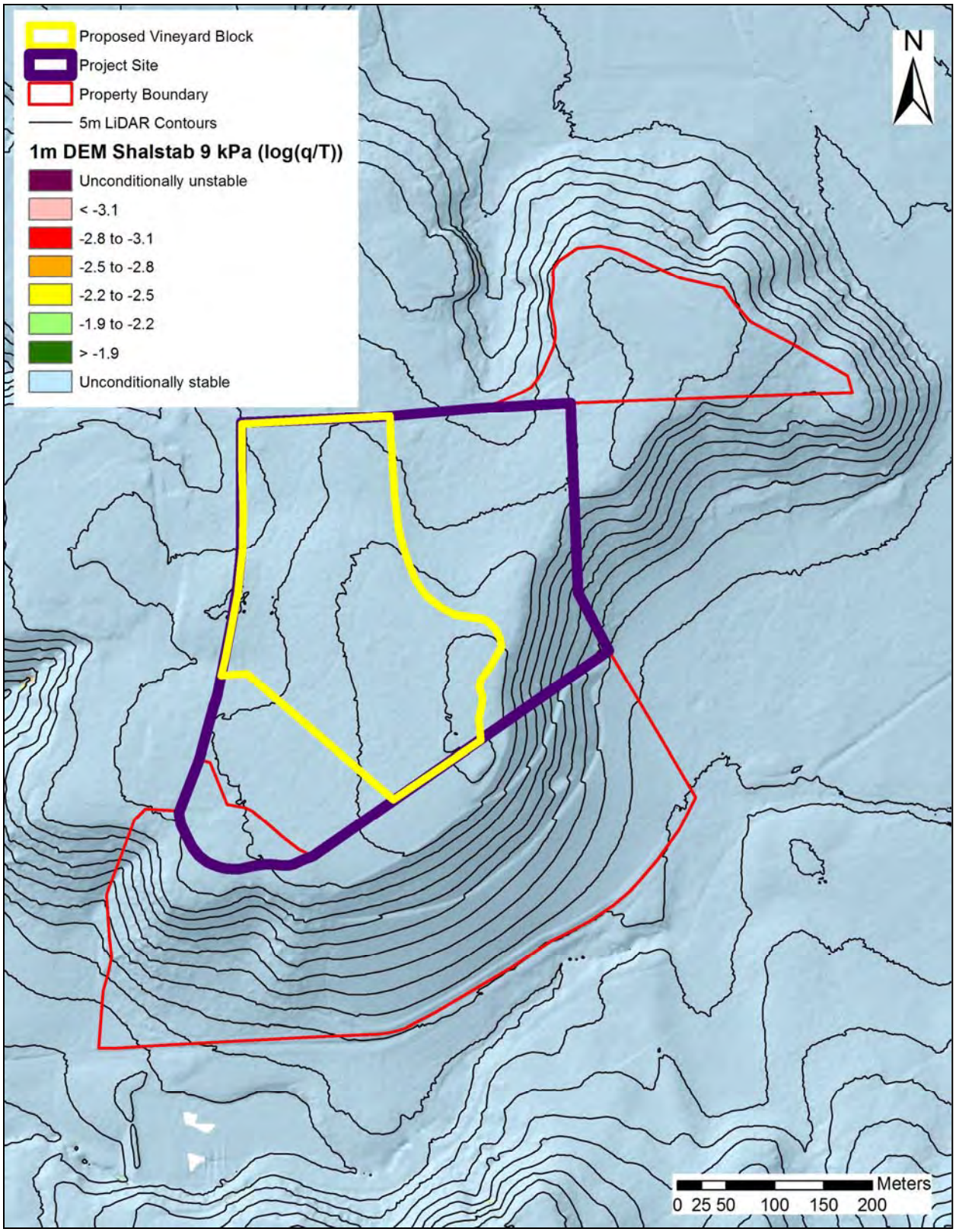


Figure D-17. SHALSTAB.V prediction: variable soil depth (5ka), 9 kPa root cohesion scenario.

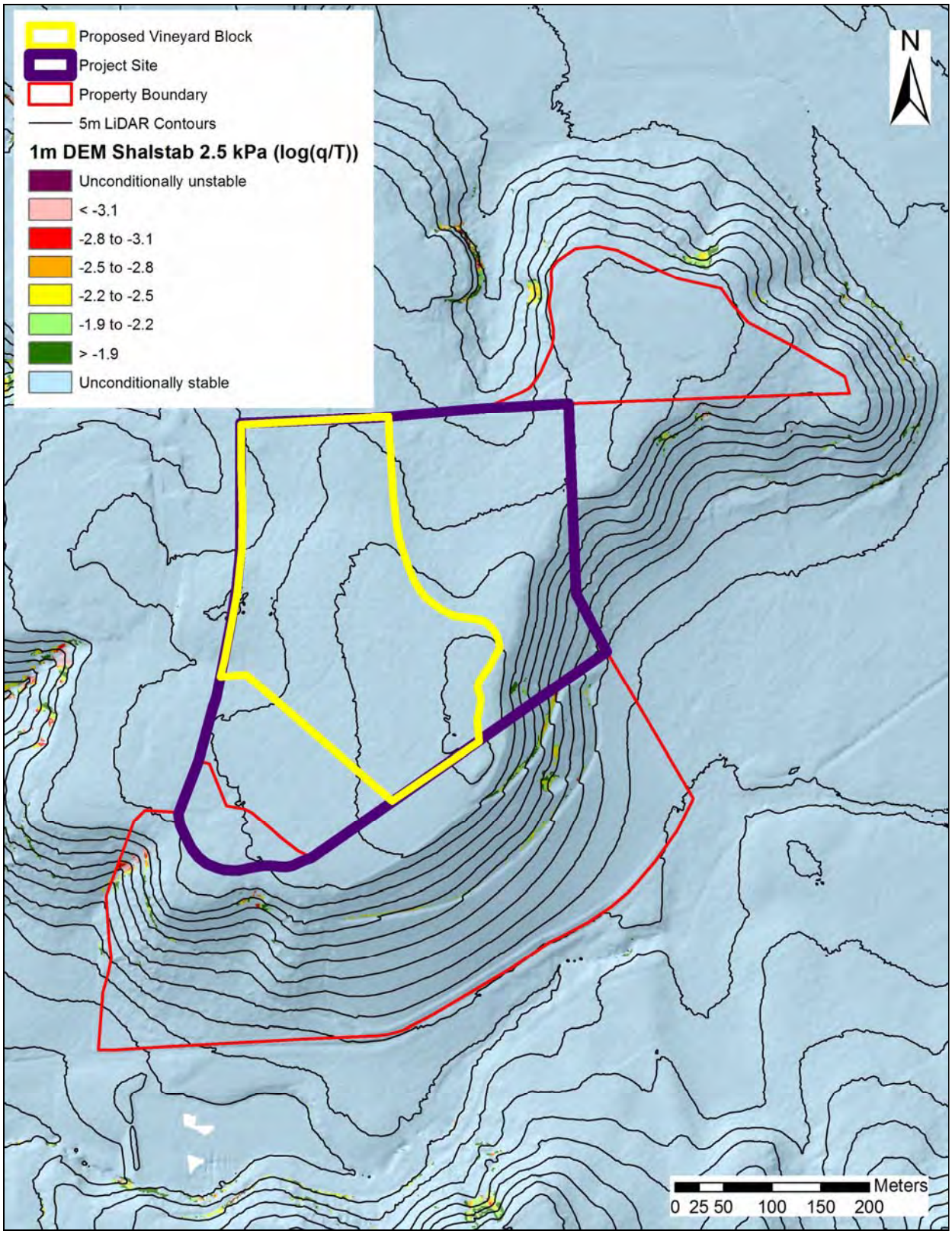


Figure D-18. SHALSTAB.V prediction: variable soil depth (5ka), 2.5 kPa root cohesion scenario.

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APPENDIX G

Geological and Geotechnical Evaluation

Gilpin Geosciences, Inc
Earthquake & Engineering Geology

February 4, 2013
91351.01

David Abreu
C/o Peter Bontadelli
Analytical Environmental Services
1801 7th St. Suite 100
Sacramento, CA 95811

Subject: UPDATE
Engineering Geological Evaluation
Lucia Abreu Vineyard
Abreu Vineyard Management
APN 024-300-066, 024-300-069
Las Posadas Road
Angwin, California

Dear Mr. Abreu:

We are pleased to present an update for our Engineering Geological Evaluation of the proposed Lucia Abreu Vineyard, presented in a letter dated 22 August 2005. We understand that this geological evaluation will supplement the Erosion Control Plan, prepared by Napa Valley Vineyard Engineering, Inc. (NVVE). The site is located on Las Posadas Road approximately 0.25 miles from Howell Mountain Road and the Town of Angwin. The project now consists of vineyard Block B, of approximately 17 acres of very gently north and west sloping meadow and sparsely forested upland area. Existing vineyards are located to the southeast on the upland, and along Las Posadas Road on the south flank of the same hillside.

SCOPE OF SERVICES

The purpose of this investigation was to review our findings and make any additional recommendations based on our recent site visit. The purpose of our evaluation is to identify any impacts of the proposed vineyard development to the local slope stability and conversely, any existing slope stability issues that would impact the vineyard design anc construction. In order to accomplish this, we performed the following tasks:

- reviewed our files and 2005 letter report;
- reviewed the Napa Valley Vineyard Engineering, Inc. Erosion Control Plan, and,
- performed a geologic reconnaissance on 4 February 2013.

2038 Redwood Road Napa, CA 94558 tel: (707) 251-8543 fax: (707) 257-8543

SITE CONDITIONS

We evaluated site conditions based on air photo interpretation and a geological reconnaissance. No subsurface exploration was conducted.

The Block B vineyard lies between approximate Elevations 1830 and 1888 feet, is centered on the upland surface and slopes gently towards the west at approximately 4 to 9% (NVVE, 2012). Blocks A and C, part of the original proposed development have been removed, increasing the distance from the two drainage swales south of the site.

We walked the site with the focus of observing any changes in erosion or slope stability since our last visit. We observed no significant changes. We attach a photograph of an old cut/fill road that crosses down from the upland surface crossing the western of the two, swale drainages. The cut slope is performing very well and shows no signs of erosion. The road probably pre-dates the present ownership and perhaps dates back to the 1900's. The outside edge of the fill appears to have been subject to minor rilling erosion.

CONCLUSIONS AND RECOMMENDATIONS

Based on our review of our files and the site conditions observed on 4 February 2013, the proposed vineyard development appears feasible from the standpoint of erosion control and slope stability. We observed favorable slope stability conditions with low inclinations, combined with very strong and little weathered andesite and volcanic tuff underlying the site.

The minor erosion and creep observed in the swales south of the site appears to be associated with man-placed materials. The cut slope in the western swale is inclined at between 1.5 to 1:1, horizontal to vertical and appears to be performing very well. This artificial cut provides a baseline on which to judge the slope stability within the two swales south of the site. In our opinion, the performance of this cut over the period of 50 to 100 years during which annual and multi-year cumulative precipitation have varied by at least +/-50% of the average annual, strongly suggests that the slopes within these swales should not be impacted by the small potential changes in infiltration modeled by the project design team.

LIMITATIONS

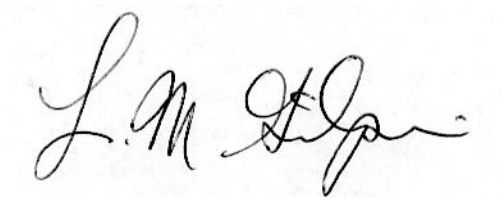
Our services have been performed in accordance with generally accepted principles and practices of the geological profession. This warranty is in lieu of all

other warranties, either expressed or implied. In addition, the preliminary conclusions and recommendations presented in this report are professional opinions based on the indicated project criteria and data described in this report. They are intended only for the purpose, site location and project indicated.

We trust that this provides you with the information you need. If you have any questions, please call.

Sincerely,

GILPIN GEOSCIENCES, INC.



Lou M. Gilpin, PhD
Engineering Geologist 1518

Attachments: References
Figure 1 Old Road Cut, Western Swale

REFERENCES

Napa Valley Vineyard Engineering, Inc., 2012, Abreu Vineyard Management Lucia Abreu Vineyard Erosion Control Plan, 3 Sheets, scale 1-inch=100-feet, dated??????.

OLD ROAD CUT
WESTERN SWALE

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

Las Posada Vineyard
Angwin, California

JOB NUMBER
91351.01

DATE
2/4/13

FIGURE
1

Gilpin Geosciences, Inc
Earthquake & Engineering Geology

August 22, 2005
91351.01

David Abreau
C/o Scott Butler
Environmental Resource Management
13333 Low Gap Road
Ukiah, California 95482

Subject: **Engineering Geological Evaluation**
Las Posadas Vineyard
Abreau Vineyard Management
APN 024-300-066, 024-300-069
Las Posadas Road
Angwin, California

Dear Mr. Abreau:

We are pleased to present the results of our engineering geological evaluation of the proposed Las Posadas Vineyards Blocks A, B, C. We understand that this geological evaluation will supplement the Erosion Control Plan, prepared by Napa Valley Vineyard Engineering, Inc. (NVVE). The site is located on Las Posadas Road approximately 0.25 miles from Howell Mountain Road and the Town of Angwin. The vineyard blocks A, B, and C, consists of approximately 1.8, 13, and 2.2 acres, respectively of very gently north and west sloping meadow and sparsely forested upland area. Existing vineyards are located to the southeast on the upland, and along Las Posadas Road on the south flank of the same hillside.

SCOPE OF SERVICES

The purpose of this investigation was to review the proposed vineyard development and evaluate the potential impact to local surface erosion and slope stability. In order to accomplish this, we performed the following tasks:

- reviewed published and unpublished reports and maps of the site;
- reviewed aerial photographs in order to develop a history of the site;
- reviewed the Napa Valley Vineyard Engineering, Inc. Erosion Control Plan, and,
- performed a geologic reconnaissance on 7 and 11 July 2005.

3228 Silverado Trail St. Helena, CA 94574 tel: (707) 968-9408 fax: (707) 257-8543

R

REGIONAL GEOLOGY

The site is located in the Coast Ranges geomorphic province, which is characterized by northwest-southeast trending valleys and ridges. These are controlled by folds and faults that resulted from the collision of the Farallon and North American plates and subsequent shearing along the San Andreas fault. The bedrock in the site vicinity is mapped as Sonoma Volcanics (Fox and others, 1973). No landslides have been mapped in the site vicinity (Dwyer and others, 1976).

Active faults have been mapped in the vicinity. The closest active fault to the site is the Hunting Creek-Berryessa Fault approximately 6.5 miles northeast of the site. The Hunting Creek-Berryessa fault is classified as a type B fault by the UBC, (ICBO, 1988) and is capable of generating a Moment Magnitude 6.9 earthquake.

SITE CONDITIONS

We evaluated site conditions based on air photo interpretation and a geological reconnaissance. No subsurface exploration was conducted.

The proposed vineyard improvements are located at the southern extent of a broad upland surface that incorporates the Angwin airstrip to the north of the site and rises from 40 to 120 feet above the surrounding upland areas of Howell Mountain. The vineyards lie between approximate Elevations 1832 to 1890 feet (NVVE, 2005). Blocks A and C lie on the southwestern and northeastern edges of the upland, whereas Block B is the largest of the blocks, and is centered on the southern end of the upland surface.

Proposed vineyard Block A lies at the southwest end of the upland surface and consists of approximately 1.6 acres bounded by a residence belonging to Pacific Union College along the west property line. The block lies at Elevation 1840 to 1860 feet (NVVE., 2005). The Block slopes gently at approximately 4 degrees or 7% to the southwest. Block B extends from Elevation 1840 to 1890 feet and slopes gently towards the west at approximately 3.5 degrees or 6%. Vineyard Block C lies at Elevations 1832 to 1876 feet and has gentle slopes to the north at approximately 4.7 degrees or 8%.

Slopes adjacent to the A and B vineyard blocks slope off at inclinations of between 17 degrees (30%), to 30 degrees (60%) to the south and east, respectively. Two well defined swales drain the uplands to the south below proposed

vineyard Block A, a swale drains Vineyard Block B in a narrow drainage to the west and Block C lies in the upper southeastern portion of a north draining swale.

Aiken Loam soils on 5 to 15 % slopes are mapped at the site. This soil is well drained and characteristic of weathered basic igneous bedrock on upland surfaces, and has a slight erosion hazard (USDA, 1978)•

The site is mapped underlain by Sonoma Volcanics (Fox and others, 1973). The upland on which the vineyards are located forms a large out crop of andesitic to basaltic lava. The upland lava outcrop is flanked by a more heterogeneous volcanic ash-flow tuff deposit that generally crops out at lower elevations on the uplands of Howell Mountain. We observed abundant float and field stones stacked on the site that were composed of weathered blocks of andesite. The andesite blocks were little fractured, hard, very strong and little weathered. It is characterized by fresh phenocrysts and frequent vesicles. Although a recently placed rock pile is located at the eastern edge of the proposed Block B, we observed field stones stockpiled along the periphery of the upland surface on the eastern part of the site, which indicates that the area has been cleared in the past, presumably for agricultural purposes. We observed an accumulation of fieldstones combined with soil and overgrown with brush at the southern edge of the Block A vineyard area. This old stockpile sits on the moderately steep slope adjacent to the vineyard Block A, and has been subject to some soil creep since it was placed.

CONCLUSIONS AND RECOMMENDATIONS

Based on our research and review of the site conditions the proposed vineyard development appears feasible from the standpoint of erosion control and slope stability. We observed favorable slope stability conditions with low inclinations, combined with very strong and little weathered andesite underlying the site.

The NVVE Erosion Control Plan has proposed several drainage improvements for the new vineyard blocks that include fiber rolls, water bars, a roadside diversion ditch, earth diversion berms, and rock stabilization to control the surface runoff and prevent erosion. These improvements are located either at the edges of the proposed vineyard blocks where surface runoff appears to flow into the downslope natural swales, or in the case of the water bars, across the vineyard roads where they traverse directly down some of the steeper slopes on the site.

We have observed slope creep along the top of the slope below vineyard Block A, at the south end of the upland surface. An old stockpile of field stones appears to have moved slightly downslope. Surface runoff from the vineyard and block perimeter road, if not mitigated, could accelerate this movement, and cause a localized debris landslide. The drainage improvements shown on the NVVE Erosion Control Plan show a series of in-road fiber rolls, a roadside diversion ditch along the downslope edge of the road, and a 18-inch high earth diversion berm at the end of the ditch to control the runoff. We concur with the proposed surface drainage improvements, and recommend that the ditch and diversion berm be periodically inspected to insure that they are free of debris and working as intended.

LIMITATIONS

Our services have been performed in accordance with generally accepted principles and practices of the geological profession. This warranty is in lieu of all other warranties, either expressed or implied. In addition, the preliminary conclusions and recommendations presented in this report are professional opinions based on the indicated project criteria and data described in this report. They are intended only for the purpose, site location and project indicated.

We trust that this provides you with the information you need. If you have any questions, please call.

Sincerely,

GILPIN GEOSCIENCES, INC.

REGISTERED GEOLOGIST
L. M. GILPIN
No. 1518
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Lou M. Gilpin, PhD
Engineering Geologist 1518

Attachments: References
Figure 1 Location Map

REFERENCES

Dwyer, M. J., Noguchi, N., and Orourke, J., 1976, Reconnaissance photointerpetation map of landslides in 24 selected 7.5 minute quadrangles in Lake, Napa, Solano, and Sonoma Counties, Callifornia: U.S. Geological Survey Open File Report 76-74, St. Helena Quadrangle, scale 1:24,000.

Fox, K.T., Sims, J.D., Bartow, J.A., and Helley, E.J., 1973, Preliminary Geologic map of Eastern Sonoma County and western Napa County, California: U.S. Geological Survey Miscellaneous Field Studies MF-483, scale 1:62500.

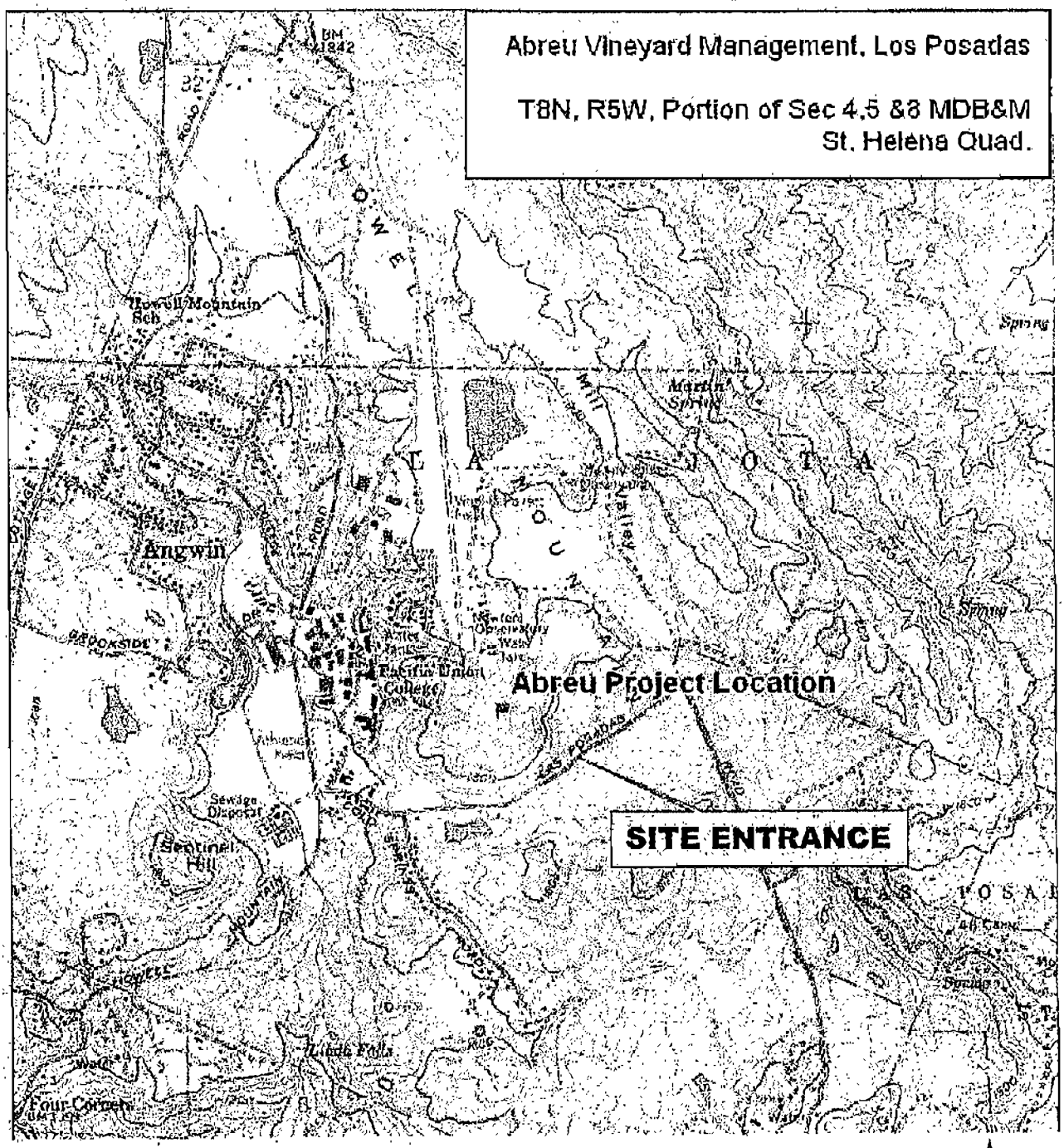
International Conference of Building Officials, 1988, Maps of known active fault near-source zones in California and adjacent portions of Nevada: prepared by California Division of Conservation Division of Mines and Geology, p. 19, with maps.

Napa Valley Vineyard Engineering, Inc., 2005, Abreu Vineyard Management Las Posadas Vineyard Erosion Control Plan, 3 Sheets, scale 1-inch=100-feet, dated, July 13, 2005.

U.S. Department of Agriculture, 1978, Soil Survey of Napa County, California: U.S. Department of Agriculture Soil Conservation Service, Washington, D.C.

Aerial Photographs

Date	Photo Number	Scale	Source
10/8/99	CIR 6323-11-12, 13	1:12,000	Pacific Aerial Survey
10/8/99	CIR 6323-10-8, 10	1:12,000	Pacific Aerial Survey
3/20/86 Survey	AV 2825-1-1, 2	1:9,600	Pacific Aerial
9/8/70 Surveys	AV 965-05-01, 02	1:48,000	Pacific Aerial



Base Map: U.S.G.S. St Helena Quad.

SITE LOCATION MAP

Gilpin Geosciences, Inc.
Earthquake & Engineering Geology Consultants

Las Posada Vineyard
Angwin, California

JOB NUMBER 91351.01

DATE 6/22/05

FIGURE 1

199.6

R

APPENDIX H

Timber Harvest Plan

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	Adjacent Landowner & Down stream water user letter		**90**
	Legal notice posting		**93**
	Timber Conversion Plan	**Appendix I**	
	Erosion Hazard Rating		**22**
	Custom NRCS Soil Report		**99-113**
	APN information		**120-129**
	Napa County RCD technical approval		**130-131**
	Pictures		**132-133**
	Erosion Control Plan (ECP)	**Appendix B**	**134-135**

Explanation of additional documentation.

The project is located in Napa County California, as such an Erosion Control Plan (ECP) has been designed to meet Napa County regulations and is attached to this THP. An Environmental Impact Report has been prepared by Analytical Environmental Services to satisfy CEQA requirements for the Timberland Conversion. Frequent reference to the Draft EIR will be made throughout this document.

Additional Reports Attached to the DRAFT EIR.

Erosion Control Plan	Appendix B of the EIR	Napa Valley Vineyard Engineering
Biological Resources Technical memorandum	Appendix D of the EIR	Analytical Environmental Services
Erosion Sedimentation & Hydrologic Assessment	Appendix F of the EIR	Balance GEO
Engineering Geological Evaluation	Appendix G of the EIR	Gilpin Geosciences Inc.
Integrated Pest Management Plan	Appendix J of the EIR	Daniel Fischl & David Abreu
Cultural Resources Survey & CAA	Appendix K of the EIR	Tom Origer and Associates
Napa County RCD, Technical Adequacy	Appendix L of the EIR	Dave Steiner

FOR ADMIN. USE ONLY
Amendments-date & S or M

1. _____ 7. _____
2. _____ 8. _____
3. _____ 9. _____
4. _____ 10. _____
5. _____ 11. _____
6. _____ 12. _____

TIMBER HARVESTING PLAN

STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY
AND FIRE PROTECTION
RM-63 (02-03)

THP Name: **Lucia Abreu Vineyard**

(In the CDF FPS, this is "THP Description")

If this is a Modified THP, check box: [ ]

FOR ADMIN. USE ONLY

THP No. _____

Dates Rec'd _____

_____

Date Filed _____

Date Approved _____

Date Expires _____

Extensions 1) [ ] 2) [ ]

This Timber Harvesting Plan (THP) form, when properly completed, is designed to comply with the Forest Practice Act (FPA) and Board of Forestry and Fire Protection rules. See separate instructions for information on completing this form. NOTE: The form must be printed legibly in ink or typewritten. The THP is divided into six sections. If more space is necessary to answer a question, continue the answer at the end of the appropriate section of your THP. If writing an electronic version, insert additional space for your answer. Please distinguish answers from questions by *font change*, **bold** or underline.

SECTION I - GENERAL INFORMATION

This THP conforms to my/our plan and upon approval, I/we agree to conduct harvesting in accordance therewith. Consent is hereby given to the Director of Forestry and Fire Protection, and his or her agents and employees, to enter the premises to inspect timber operations for compliance with the Forest Practice Act and Forest Practice Rules.

1. TIMBER OWNER(S) OF RECORD: Name **David Abreu Vineyard Management Inc.**

   Address **P. O. Box 89**

   City **Rutherford** State **CA** Zip **94573** Phone **(707) 963-7487**

   Signature **See page 3 for signatures** Date _____

   NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060; phone 1-800-400-7115; BOE Web Page at http:// www.boe.ca.gov.

2. TIMBERLAND OWNER(S) OF RECORD: Name **David Abreu Vineyard Management Inc.**

   Address **P. O. Box 89**

   City **Rutherford** State **CA** Zip **94573** Phone **(707) 963-7487**

   Signature **See page 3 for signatures** Date _____

3. LICENSED TIMBER OPERATOR(S): Name **To be determined at a later date** Lic. No. **LTO #**

   (If unknown, so state. You must notify CDF of LTO prior to start of operations)

   Address _____

   City _____ State **CA** Zip _____ Phone _____

   Signature **See Page 3 for signature** Date _____

4. PLAN SUBMITTER(S): Name **David Abreu**

   Address **P. O. Box 89**

   City **Rutherford** State **CA** Zip **94573** Phone **(707) 963-7487**

   Signature **See page 3 for signatures** Date _____

THP Signature page

For Office Use Only
THP #:
Date Rec'd:

1. TIMBER OWNER(S) OF RECORD: Name David Abreu Vineyard Management Inc.

   Signature X. Abreu Date July 10 13

   NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060; phone 1-800-400-7115; BOE Web Page at http:// www.boe.ca.gov.

2. TIMBERLAND OWNER(S) OF RECORD: Name David Abreu Vineyard Management Inc.

   Signature X. Abreu Date July 10 13

3. LICENSED TIMBER OPERATOR(S): Name Unknown at this time Lic. No. LTO #

   Signature _____ Date _____

4. PLAN SUBMITTER(S): Name David Abreu Vineyard Management Inc.

   (Submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR 1032.7 (a))

   Signature X. Abreu Date July 10 13

5. RESPONSIBLE FOR CONDUCT OF OPERATION: Name David Abreu

   Signature X. Abreu Date July 10 13

13. REGISTERED PROFESSIONAL FORESTER: Name Scott R. Butler Lic. No. 1851

   Signature _____ Date _____

DIRECTOR OF FORESTRY AND FIRE PROTECTION

This Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry and Fire Protection and the Forest Practice Act:

By: _____
(Signature)

_____
(Date)

THP Signature page

For Office Use Only
THP #:
Date Rec'd:

1. TIMBER OWNER(S) OF RECORD: **Name** **David Abreu Vineyard Management Inc.**

   Signature _____ **Date** _____

   NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060; phone 1-800-400-7115; BOE Web Page at http:// www.boe.ca.gov.

2. TIMBERLAND OWNER(S) OF RECORD: **Name** **David Abreu Vineyard Management Inc.**
   Signature _____ **Date** _____

3. LICENSED TIMBER OPERATOR(S): **Name** **Unknown at this time** **Lic. No.** **LTO #**

   Signature _____ **Date** _____

4. PLAN SUBMITTER(S): **Name** **David Abreu Vineyard Management Inc.**

   (Submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR 1032.7 (a))

   Signature _____ **Date** _____

5. RESPONSIBLE FOR CONDUCT OF OPERATION: **Name** **David Abreu**

   Signature _____ **Date** _____

13. REGISTERED PROFESSIONAL FORESTER: **Name** **Scott R. Butler** **Lic. No.** **1851**

   Signature _____ **Date** 7-1-2013

DIRECTOR OF FORESTRY AND FIRE PROTECTION

This Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry and Fire Protection and the Forest Practice Act:

By: _____
(Signature)

_____
(Date)

THP Signature page

For Office Use Only
THP #:
Date Rec'd:

1. TIMBER OWNER(S) OF RECORD: **Name** **David Abreu Vineyard Management Inc.**

   Signature _____ **Date** _____

   NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060; phone 1-800-400-7115; BOE Web Page at http:// www.boe.ca.gov.

2. TIMBERLAND OWNER(S) OF RECORD: **Name** **David Abreu Vineyard Management Inc.**
   Signature _____ **Date** _____

3. LICENSED TIMBER OPERATOR(S): **Name** **Unknown at this time** **Lic. No.** **LTO #**

   Signature _____ **Date** _____

4. PLAN SUBMITTER(S): **Name** **David Abreu Vineyard Management Inc.**

   (Submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR 1032.7 (a))

   Signature _____ **Date** _____

5. RESPONSIBLE FOR CONDUCT OF OPERATION: **Name** **David Abreu**

   Signature _____ **Date** _____

13. REGISTERED PROFESSIONAL FORESTER: **Name** **Scott R. Butler** **Lic. No.** **1851**

   Signature _____ **Date** _____

DIRECTOR OF FORESTRY AND FIRE PROTECTION

This Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry and Fire Protection and the Forest Practice Act:

By: _____
(**Signature**)

_____
(**Date**)

5. a. List person to contact on-site who is responsible for the conduct of the operation. If unknown, so state and name must be provided for inclusion in the THP prior to start of timber operations.

Name **David Abreu**

Address **P. O. Box 89**

City **Rutherford** State **CA** Zip **94573** Phone **(707) 963-7487**

Signature **See page 3 for signatures** Date _____

LTO listed under item #3 will be present on site during timber harvesting operations. The landings and skid trails, if any, will be maintained by the listed LTO until a Notice of Completion is filed. The landowner listed in item #1 will be responsible for vineyard development after the Notice of Completion is filed.

b. [**X**] Yes [ ] No Will the timber operator be employed for the construction and maintenance of roads and landings during conduct of timber operations? If no, who is responsible?

The timber operator will be responsible for the maintenance of erosion control facilities on the timber harvest plan and timberland conversion. This includes all landings, skid trails and roads, up to the time of completion. After the completion has been filed and approved, the responsible person will be the landowner and implementation of the erosion control plan (**See attached ECP**). It should be pointed out that a 3-year maintenance period exists on this THP.

c. Who is responsible for erosion control maintenance after timber operations have ceased and until certification of the Work Completion Report? If not the LTO, then a written agreement must be provided per 14 CCR 1050 (c).

Same as number three above

The Licensed Timber Operator shall also:

a. Inform the RPF of any site conditions, which in the LTO's opinion, prevent implementation of the approved plan, including amendments.
b. Keep a copy of the approved plan and amendments available, at all times, at the site of active timber operations.
c. Maintain the location of all flagging during the conduct of operations (skid trails, watercourse protection, stream crossings, harvest boundary etc.).

After the completion has been filed and approved, the responsible person will be the landowner for the balance of the 3-year maintenance period.

Completion meeting:

There shall be a meeting at the end of timber harvesting operations between the RPF, LTO and the vineyard manager to discuss each person's responsibilities when logging is complete. CDF and any other reviewing agency may be invited to this meeting. **THP mitigation #1, Completion meeting.**

14 CCR 916.9(p) (936.9(p), 956.9(p)) states, The erosion control maintenance period on permanent and seasonal roads and associated landings that are not abandoned in accordance with 14 CCR 923.8 (943.8, 963.8) shall be three years.

6. a. Expected date of commencement of timber operations:
[**X**] date of THP conformance, or [ ] _____(date)

b. Expected date of completion of timber operations:
[**X**] 3 years from date of THP conformance, or [ ] _____(date)

7. The timber operation will occur within the:

[ ] COAST FOREST DISTRICT
[ ] Southern Subdistrict of the Coast F. D.
[ ] SOUTHERN FOREST DISTRICT
[ ] High use subdistrict of the Southern F. D.
[**X**] NORTHERN FOREST DISTRICT
[ ] The Tahoe Regional Planning Authority Jurisdiction
[ ] A County with Special Regulations, identify:
[ ] Coastal Zone, no Special Treatment Area
[ ] Special Treatment Area(s), type and identify:
[ ] Other

8. Location of the timber operation by legal description:
Base and Meridian: [**X**] Mount Diablo [ ] Humboldt [ ] San Bernardino

Section	Township	Range	Acreage	County	Assessor's Parcel Number (Optional)
Por, 5 & 8	**T8N**	**R5W**	**17**	**Napa**	**APN# 024-080-028**

TOTAL ACREAGE **12.8** (Logging Area Only) **Portion of the St. Helena quadrangle**

Acreage explanation

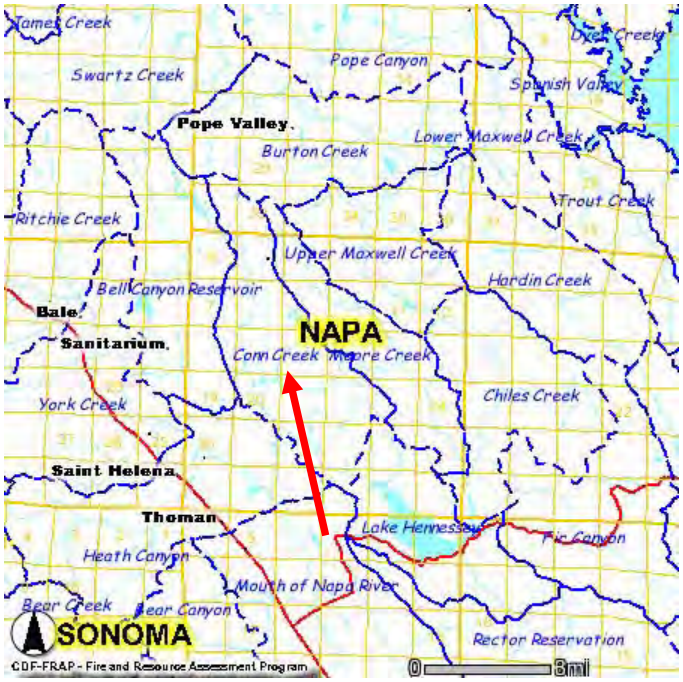
The total project area is 17 acres, of which 12.8 acres are forested and will be converted. The balance of the 17 acres (4.2) is composted of grass, brush and ruderal acreage. The net acres of the vineyard will be 15.3 acres.

See General location map, THP page 91

See THP map, page 92

Calwater ID v2.2: Conn Creek Watershed, #2206.500305, 7297 acres

Watershed Name:	Conn Creek			
Calwater ID v2.2:	2206.500305			
Calwater ID v1.2:	206.500300			
Average Annual Rainfall:	38	*Coho*	*Steelhead*	*Chinook*
Evolutionarily Significant Units:		No	Yes	No



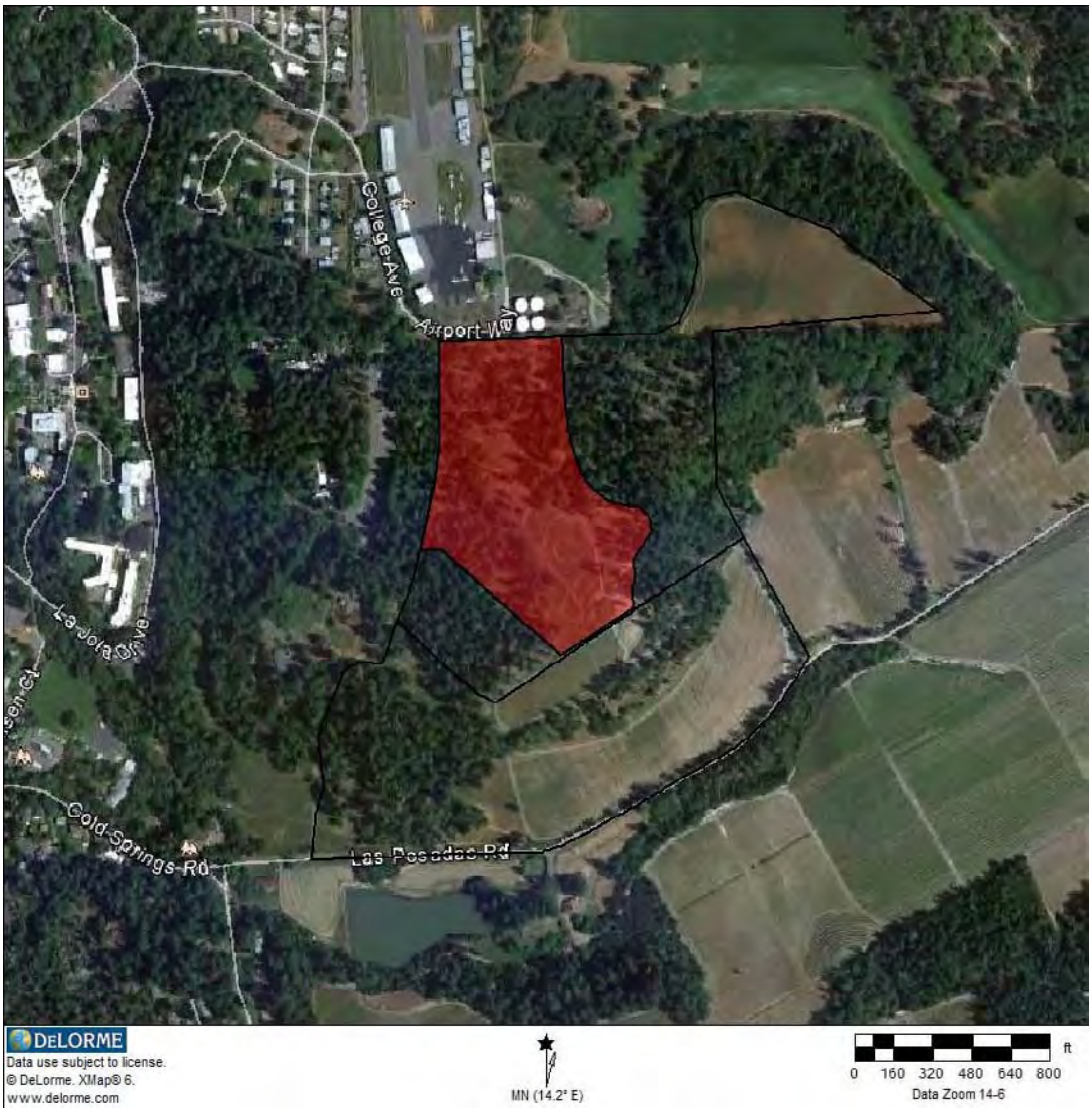
Zoning

See aerial photo of adjacent landowners existing uses, **below**. The property is zoned AW-AC, Agriculture-Watershed and Airport Compatibility overlay by Napa County.

AW Agricultural Watershed

> "The AW district classification is intended to be applied in those areas of the county where the predominant use is agriculturally oriented, where watershed areas, reservoirs and floodplain tributaries are located, where development would adversely impact on all such uses, and where the protection of agriculture, watersheds and floodplain tributaries from fire, pollution and erosion is essential to the general health, safety and welfare."

Agricultural use, such as timber harvesting and vineyard production, is a permitted use. The Napa County Code of Regulations requires preparation of an Erosion Control Plan for any development or changed land use unless exempted. An Erosion Control Plan has been prepared to Napa County Technical Standards by a professional vineyard engineering firm for this project. See **attached ECP**, the ECP meets county technical standards, see **Draft EIR Appendix L**. The major land uses in the area are agricultural, college, airport and rural residential. Most of the agricultural use is vineyard production of ultra premium grapes. The residential use is primarily rural residences. Substantial areas of undeveloped wildland are present. The ECP has been made a part of this plan. An approved copy of the ECP will be submitted to CDF upon approval by Napa County Planning Department.



9. [**X**] Yes [ ] No Has a Timberland Conversion been submitted? If yes, list expected approval date or permit number and expiration date if already approved.

The conversion application was submitted to CDF Sacramento; approval expected prior to THP approval.

10. [ ] Yes [**X**] No Is there an approved Sustained Yield Plan for this property? Number _____Date app.

[ ] Yes [**X**] No Has a Sustained Yield Plan been submitted but not approved? Number _____Date sub.

11. [ ] Yes [**X**] No Is there a THP or NTMP on file with CDF for any portion of the plan area for which a Report of Satisfactory Stocking has not been issued by CDF?
If yes, identify the THP or NTMP number(s):

[ ] Yes [**X**] No Is there a contiguous even aged unit with regeneration less than five years old or less than five feet tall? If yes, explain. Ref. Title 14 CCR 913.1 (933.1, 953.1) (a)(4).

12. [**X**] Yes [ ] No Is a Notice of Intent necessary for this THP?

[**X**] Yes [ ] No If yes, was the Notice of Intent posted as required by 14 CCR 1032.7 (g)?

A list of all landowners located within 300 feet of the THP boundary, see **page 89 of the THP.** Notice was sent to all landowners located within 300 feet of the THP boundary, see **page 90 of the THP** for an example of this letter. Responses, if any, can be found on **page 90.1**. The letter was mailed to landowners located within 300 feet of the THP boundary on **2-13-2013**.

The notice of intent was posted (**2-14-2013**) at the entrance to the Abreu Property on Las Posadas Rd. See **page 92 and 95 .**

One landowner exists within 1,000 feet downstream of the THP boundary. As such a notice by letter was sent to this downstream water user. See the a copy of the letter **page 99**. The notice was published in a newspaper of general circulation. Forest practice rules, 14 CCR section 1032.10. A copy of this legal notice can be found on **page 94.**

13. RPF preparing the THP: Name **Scott R. Butler** RPF Number **RPF #1851**
Address **889 Hwy 20-26**
City **Ontario** State **OR** Zip **97914** Phone **(707) 468-8466**

a. [**X**] Yes [ ] No I have notified the plan submitter(s), in writing, of their responsibilities pursuant to 14 CCR 1035 of the Forest Practice Rules **See attached letter on page 106 of the THP**. Emailed 8-19-11.

[**X**] Yes [ ] No I have notified the timber owner and the timberland owner of their responsibilities for compliance with the Forest Practice Act and rules, specifically the stocking requirements of the rules and the maintenance of erosion control structures of the rules. **See attached letter on page 82 of the THP. Emailed 2-13-2013.**

b. [**X**] Yes [ ] No I will provide the timber operator with a copy of the portions of the approved THP as listed in 14 CCR 1035 (e). If "no", who will provide the LTO a copy of the approved THP?

I, or my supervised designee, will meet with the LTO prior to commencement of operations to advise of sensitive conditions and provisions of the plan pursuant to 14 CCR 1035.2.

c. I have the following authority and responsibilities for preparation and administration of the THP and timber operation. (Include both work completed and work remaining to be done):

I am responsible for the preparation of this THP and coordination with the regulatory agencies to gain its approval. I will provide any additional information needed for plan approval or amendment. I will provide field assistance to the timber owner, CDF and the Timber Operator in carrying out the provisions of the plan as requested or as required by 14 CCR 1035.1 and 2. I will be available, on request, to provide professional assistance during timber operations as required by CCR 1035 (d)(1). I will have no responsibility for execution of the plan. I have done no survey work and have accepted the existing boundaries as represented by the landowner.

d. Additional required work requiring an RPF, which I do not have the authority or responsibility to perform:

None at this time

e. After considering the rules of the Board of Forestry and Fire Protection and the mitigation measures incorporated in this THP, I have determined that the timber operation:

[ ] will have a significant adverse impact on the environment. (Statement of reasons for overriding considerations contained in Section III).

[**X**] will not have a significant adverse impact on the environment.

Registered Professional Forester: I certify that I, or my supervised designee, personally inspected the THP area, and this plan complies with the Forest Practice Act, the Forest Practice Rules and the Professional Foresters Law. If this is a Modified THP, I also, certify that: 1) the conditions or facts stated in 14 CCR 1051 (a) (1) - (16) exist on the THP area at the time of submission, preparation, mitigation, and analysis of the THP and no identified potential significant effects remain undisclosed; and 2) I, or my supervised designee, will meet with the LTO at the THP site, before timber operations commence, to review and discuss the contents and implementation of the Modified THP.

Signature **See page 3 for signature** Date

LICENSED TIMBER OPERATOR RESPONSIBILITY ACKNOWLEDGEMENT

(As per 14 CCR §§ 1035.3(a)(1)-(2), 1092.14(a)(1)-(2).)

Harvesting Plan Number: **Unknown at this time**

Licensed Timber Operator Information

Name: **Unknown at this time**

Street Address/PO Box: _____ City: _____ Zip Code: _____

Telephone Number: _____ LTO Number: _____

I hereby agree to abide by the terms and specifications of the plan. I have read and understand my responsibility as LTO, as described under 14 CCR §§ 1022.4, 1090.12 and 1092.14. I agree to fulfill my responsibilities as an LTO as they pertain to this plan.

LTO Signature: **See Signature page 3 of the THP** Title: _____

Responsible On-Site Contact (if different)

Name: _____

Printed Name: _____ Date: _____

Street Address/PO Box: _____ City: _____ Zip:_____

Telephone Number: _____

REGISTERED PROFESSIONAL FORESTER (RPF) RESPONSIBILITY ACKNOWLEDGEMENT

(As per 14 CCR § 1035.1)

RPF Certified to Provide Professional Advice:

Name: **Scott R. Butler**

Street Address/PO Box: **889 Hwy 20-26** City: **Ontario** Zip Code: **97914**

Telephone Number: **707 468-8466** RPF Number: **1851**

I have read and understand my responsibility as RPF, as described under 14 CCR § 1035.1(a)-(g). I agree to fulfill my responsibilities as an RPF as they pertain to this plan.

[**X**] Yes [ ] No I have been retained as the RPF available to provide professional advice to the licensed timber operator and timberland owner upon request throughout the active timber operations regarding: (1) the plan, (2) the forest practice rules, (3) and other associated regulations pertaining to timber operations.

RPF Signature**:** **See Signature page 3 of the THP**

PLAN SUBMITTER RESPONSIBILITY ACKNOWLEDGEMENT

(As per 14 CCR § 1035)

Plan Submitter

Name: **David Abreu**

Street Address/PO Box: **P. O. Box 89** City: **Rutherford** Zip Code: **94573**

Telephone Number: **707 963-7487**

I have read and understand my responsibilities as Plan Submitter as described under 14 CCR § 1035. I certify that I have fulfilled my legal obligation as stated in the forest practice rules and agree to fulfill my responsibility as the plan submitter as it pertains to this plan.

[**X**] Yes [ ] No I have retained the services of an RPF to provide professional advice to the LTO and timberland owner upon request throughout active timber operations regarding: (1) the plan, (2) the forest practice rules, (3) and other associated regulations pertaining to timber operations.

[ ] Yes [**X**] No I have authorized the timberland owner to perform the services of a professional forester, understanding that the services will be provided personally on lands owned by the timberland owner.

Plan Submitter Signature: **See page 3 for signature**

TIMBERLAND OWNER RESPONSIBILITY ACKNOWLEDGEMENT

(As 14 CCR § 1035(d)(2)(B))

Timberland Owner

Name: _____

Street Address/PO Box: _____ City: _____ Zip Code: _____

Telephone Number:_____

I have read and understand my responsibilities as timberland owner as described under 14 CCR § 1035(d)(2)(A)–(C). I certify that I have fulfilled my legal obligation as stated in the forest practice rules, and agree to fulfill my responsibilities as the timberland owner as it pertains to this plan.

I understand that I have been authorized by the plan submitter to perform the services of a professional forester pursuant to the Landowner exception in PRC § 757, and such services will be personally performed only on those lands that I own.

Timberland Owner's Signature: **Not Applicable**

SECTION II - PLAN OF TIMBER OPERATIONS

NOTE: If a provision of this THP is proposed that is different than the standard rule, the explanation and justification should normally be included in Section III unless it is clearer and better understood as part of Section II.

14. a. Check the Silvicultural methods or treatments allowed by the rules that are to be applied under this THP. Specify the option chosen to demonstrate Maximum Sustained Production (MSP) according to 14 CCR 913 (933, 953) .11. If more than one method or treatment will be used show boundaries on map and list approximate acreage for each.

[ ] Clearcutting _____ac. [ ] Shelterwood Prep. Step _____ ac. [ ] Seed Tree Seed Step _____ ac.
[ ] Shelterwood Seed Step _____ ac. [ ] Seed Tree Removal Step _____ ac.
[ ] Shelterwood Removal Step_____ ac.
[ ] Selection _____ ac. [ ] Group Selection _____ ac. [ ] Transition _____ ac.
[ ] Commercial Thinning _____ac. [ ] Road Right of Way_____ ac. [ ] Sanitation Salvage _____ ac,
[ ] Special Treatment Area_____ac. [ ] Rehab. of Understocked Area _____ ac. [ ] Fuelbreak _____ ac.
[ ] Alternative _____ac. [**X**] Conversion **12.8** ac. [**X**] Non-Timberland Area **4.2** ac.

Total acreage **17** ac.: Explain if total is different from that in 8. MSP option chosen: (a) [ ] (b) [ ] (c) [**X**]

Acreage explanation

The total project area is 17 acres, of which 12.8 acres are forested and will be converted. The balance of the 17 acres (4.2) is composed of grass, brush and ruderal acreage. The net acres of the vineyard will be 15.3 acres.

b. If Selection, Group Selection, Commercial Thinning, Sanitation Salvage or Alternative methods are selected the post harvest stocking levels (differentiated by site if applicable) must be stated. Note mapping requirements of 1034 (x) (12).

c. [ ] Yes [**X**] No Will evenage regeneration step units be larger than those specified in the rules (20 acres tractor, 30 acres cable)? If yes, provide substantial evidence that the THP contains measures to accomplish any of subsections (A) - (E) of 14 CCR 913 (933, 953) .1 (a) (2) in Section III of the THP. List below any instructions to the LTO necessary to meet (A) - (E) not found elsewhere in the THP. These units must be designated on map and listed by size.

d. Trees to be harvested or retained must be marked by or marked under the supervision of the RPF. Specify how the trees will be marked and whether harvested or retained.

Marking

All trees within the flagged boundaries of the vineyard conversion blocks will be harvested.

WLPZ Marking

The project area has no watercourses on or adjacent to the plan area or the property.

Hardwood Marking

All hardwoods within the vineyard conversion blocks will be harvested.

[ ] Yes [**X**] No Is a waiver of marking by the RPF requirement requested? If yes, how will LTO determine which trees will be harvested or retained? If yes and more than one silvicultural method, or Group Selection is to be used, how will LTO determine boundaries of different methods or groups?

d. Forest products to be harvested: **Sawlogs, Fuelwood, Pulpwood, Poles, and Chips**

The landowner proposed to mill all logs onsite. No logs will be transported from the proposed project.

f. [ ] Yes [**X**] No Are group B species proposed for management?
[ ] Yes [**X**] No Are group B or non-indigenous A species to be used to meet stocking standards?
[ ] Yes [**X**] No Will group B species need to be reduced to maintain relative site occupancy of A species?

If any answer is yes, list the species, describe treatment, and provide the LTO with necessary felling and slash treatment guidance. Explain who is responsible and what additional follow-up measures of manual treatment or herbicide treatment are to be expected to maintain relative site occupancy of A species. Explain when a licensed Pest Control Advisor shall be involved in this process.

g. Other instructions to LTO concerning felling operations. **None**

h. [ ] Yes [**X**] No Will artificial regeneration be required to meet stocking standards?

i. [ ] Yes [**X**] No Will site preparation be used to meet stocking standards? If yes, provide the information required for a site preparation addendum, as per 14 CCR 915.4 (935.4, 955.4).

j. If the rehabilitation method is chosen provide a regeneration plan as required by 14 CCR 913 (933, 953) .4 (b).

PESTS

15. a. [**X**] Yes [ ] No Is this THP within an area that the Board of Forestry and Fire Protection has declared a Zone of Infestation or Infection, pursuant to PRC 4712 - 4718? If yes, identify feasible measures being taken to mitigate adverse infestation or infection impacts from the timber operation. See 14 CCR 917 (937, 957) .9 (a).

Sudden Oak Death

The proposed project is in Napa County and in a declared zone of infestation for Sudden Oak Death (SOD). See **map figure this page**. This map shows the project location has no known locations of SOD within 5 miles of the project area. However since the plan is within the declared zone of infestation it has limitations placed on the shipment of vegetation from the plan area. These limitations have been placed in the THP document, see below. For a current list of **Regulated Hosts and Plants** proven to be associated with Phytophthora ramorum (SOD), see below. Neither the RPF nor the botanist found SOD on, or adjacent to, the project area.

Regulations

The following California counties have confirmed *Phytophthora ramorum* findings and are under State and federal quarantine: Alameda, Contra Costa, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma. The organism has also been found in Curry County, southwestern Oregon. These quarantined areas are subject to regulations regarding the movement and use of susceptible plants. County Agricultural Commissioners enforce both California and federal regulations.

Best Management Practices, BMP's for SOD

Infested forests

If possible, avoid working in areas that are known or appear to be diseased. If you cannot avoid infested areas, follow the sanitation practices below when working in the known infested areas. If you don't know if the site is infested, play it safe and assume that it is. Maps of infested areas are available online (see Resources). These maps do not note every diseased area, but can give you a general idea of the infested areas in California.

Pathogen biology and risk of spread

Phytophthora ramorum prefers moist environments and cool temperatures, and can be found in living, dying, or recently dead plants. During wet periods, the organism seems to be most active and therefore most likely to start new infections. Its spores can be found in soil, water, and plant material. The risk of movement and spread of the organism is greatest in muddy areas and during rainy weather. If possible, do not work in infested forests during the wet, rainy and cool times of the year. Generally, avoid working in muddy conditions.

SOD Mitigation (Sudden Oak Death),

Timber operations which minimize or avoid the introduction, build-up, or spread of SOD are considered Best Management Practices (BMP's). Specific state and federal regulations must be followed, but BMP's should be incorporated, and could act as timber harvest plan mitigations. Infected host material (especially foliage) can be carried on logging equipment and vehicles, and transferred to other sites. Mitigation measures to minimize the unintended movement of host material are recommended. The following (or similar) mitigation measures should be implemented to the extent practical and may be required for timber operations regulated by the State. Even if regulated articles do not move from the ZOI and are therefore not subject to state or federal regulations, CCR 917.9(a) still requires mitigation in timber harvest plans on state or private property for a pest covered by a ZOI.

THP mitigation #2, Sudden Oak Death Syndrome

1. RPF (or LTO for most Exemptions) should inform personnel that they are working in an area with Sudden Oak Death disease, unauthorized movement of plant material is prohibited, and the intent of mitigation measures is to prevent disease spread (14 CCR 1035.2). If some sites in the general operating area are found to be disease-free or have a low incidence of disease, consider initiating operations on these sites before moving to more heavily infested sites.
2. To the extent practical and feasible, route equipment away from host plants and trees, especially in areas with disease symptoms. Locate landings, log decks, logging roads, tractor roads, and other sites of equipment activity away from host plants, especially in areas with disease symptoms.
3. Each time equipment or vehicles leave the site, the equipment or vehicles should be inspected by operations personnel for host plant debris (leaves, twigs, and branches). Host plant debris should be removed from equipment and vehicles prior to their departure. This applies to all equipment and vehicles associated with the operation, including

logging equipment, log-hauling trucks, pick-up trucks, employee's personal vehicles, etc. An exception will be granted for equipment or vehicles that leave the site temporarily and will be not be traveling to uninfested areas prior to their return.

4. Conduct operations during the dry season. Utilize paved and rocked roads and landings to the extent possible.
5. After working in an infested area, remove or wash off accumulations of soil, mud, and organic debris from shoes, boots, vehicles and heavy equipment, etc. before traveling to an area that is not infested with Sudden Oak Death. Lysol® or a bleach solution can be used to disinfect shoes and boots after cleaning.
6. Inspect loads of logs and equipment leaving the site to ensure that no host material is being transported without a permit. This may require cleaning mud from vehicle to remove host plant material imbedded in mud, depending on conditions when the timber harvest is conducted. Consider establishing an equipment power wash station. The station should be: located within the generally infested area, paved or rocked, well drained so that vehicles exiting the station do not become contaminated by the wash water, located where wash water and displaced soil does not have the potential to carry fines to a watercourse (see "Saturated Soil Conditions" in 14 CCR 895.1), pay particular attention to sites where soil and organic debris may accumulate.

Firewood

If firewood from host material is being removed from the site for commercial or private use, a compliance agreement must be in place. The information as to where and what is being removed, how it will be transported, specifically where it will be moved to, and during what time period should be included in the harvest document if the document will act as the compliance agreement. If this information is not included in the plan, a separate compliance agreement will be necessary prior to movement of host material. Compliance agreements not associated with a CDF harvest document are issued by the local County Agricultural Commissioner. Secure loads completely when transporting firewood or other materials. No unprocessed less than 4" diameter material shall be removed from the project site. All processed firewood must be free of leaves and small branches.

Firewood in the form of Pine, D-fir and Oak may be removed from the project area. Destinations of firewood is limited to SOD quarantined counties. Transportation will be in ten wheelers, pickup trucks and trailers, and transportation is limited to locations within the SOD guaranteed counties. Transportation of firewood is limited to the non winter period. See **see THP page 14** for a list of guaranteed counties.

Treatments

There are treatments or processing protocols that can be used to minimize the risk of spread. Removing the bark allows the wood to dry and permits movement within the state and out of state with a certificate. If bark is removed or other parts are not used, burn the excess materials if possible. If burning is done, make sure it is done in a safe and approved manner. Burning poses no risk of spread since the organism is killed in the fire. When storing material, keep it dry and out of any standing water. Kiln drying will also kill the organism.

Drafted water

Infested water has not been proven to be a pathway for *P. ramorum* to cause new infections in forested areas, but has been shown to cause new infections in nurseries. Hence, drafted water has the potential to spread spores of the pathogen onto roadside hosts during dust abatement operations. Spores of the pathogen have been recovered from water collected beneath infected hosts, as well as from creeks and streams in infested areas. Water is not regulated under either state or federal quarantine regulations. However, the following practices may minimize the unintentional introduction of the pathogen:

- If water is drafted and used for dust control, draft water from areas upstream of known infestations or from uninfested drainages.
- If drafting from known infested watercourses, do not water roads with that source in areas that are not known to be infested.
- If water is being drafted under a 1600 Series agreement with the California Department of Fish and Game and/or used in both infested and non-infested areas, it may require treatment with Ultra Clorox, similar to the recommended water treatment for *P. lateralis*, which causes Port-Orford Cedar Root Disease. The registration rate is 1 gallon of Ultra Clorox Bleach per 1,000 gallons of drafted water.
- Do not use untreated water from infested areas for irrigation of host species nursery stock. Off –road approaches to drafting sites should be sufficiently rocked to minimize accumulating infested soil on drafting vehicles.

Snag retention

As stem-infected oaks and tanoaks decline and die, they are invaded by other wood decaying organisms and bark beetles. Such trees are prone to early structural failure, often breaking off several feet above ground. When selecting snags or recruitment trees for snags as a benefit for wildlife use, do not select SOD-infected trees.

Operations personnel, as used in this section of the THP, will be under the direction of the LTO.

SOD mitigations as proposed are valid for one year , if SOD mitigations change after one year the THP will be amended to include the most current SOD information and mitigations.

11 July 2006

Regulated *Phytophthora ramorum* Hosts of Concern when Filing Timber Harvest Documents

Plants on the federal *P. ramorum*-Regulated Host list should be addressed by Registered Professional Foresters (RFPs) in harvest documents. These plants are: naturally infected by *P. ramorum;* found in California's forests; and have had Koch's postulates completed, documented, reviewed, and accepted. Further details on regulated plants and plant parts can be found at http://www.aphis.usda.gov/ppq/ispm/pramorum/.

Plants on the federal *P. ramorum* Associated Host list are regulated in nurseries only and not in wildland settings; therefore, they do not have to be addressed by RPFs.

Note: As new hosts are found, they will be added to the host or associated host list. As Koch's postulates are successfully completed on associated hosts, they will be reclassified as hosts. As neither list is static, it is important to check for updates frequently.

Scientific Name	**Common Name**
Acer macrophyllum	Bigleaf maple
Adiantum aleuticum	Western maidenhair fern
Adiantum jordanii	California maidenhair fern
Aesculus californica	California buckeye
Arbutus menziesii	Madrone
Arctostaphylos manzanita	Manzanita
Frangula californica (=*Rhamnus californica*)	California coffeeberry
Frangula purshiana (=*Rhamnus purshiana*)	Cascara
Heteromeles arbutifolia	Toyon
Lithocarpus densiflorus	Tanoak
Lonicera hispidula	California honeysuckle
Maianthemum racemosum (=Smilacina racemosa)	False Solomon's seal
Pseudotsuga menziesii var.*menziesii*	Douglas-fir
Quercus agrifolia	Coast live oak
Quercus chrysolepis	Canyon live oak
Quercus kelloggii	California black oak
Quercus parvula var. *shrevei*	Shreve's oak
Rhododendron spp.	Rhododendron (including azalea)
Rosa gymnocarpa	Wood rose
Sequoia sempervirens	Coast redwood
Trientalis latifolia	Western starflower
Umbellularia californica	California bay laurel/pepperwood
Vaccinium ovatum	Evergreen huckleberry

Pine Slash Treatment

The project area proposes the removal of Ponderosa Pine trees. The project area lies within a Board declared Zone of Infestation. Pine slash will be treated as listed below.

917.9, 937.9, 957.9 Prevention Practices. [All Districts]

(c) The Board of Forestry has determined that insects breeding in pine logging slash can be a significant problem if they are not managed. Board of Forestry Technical Rule Addendum Number 3 describes the considerations that the RPF preparing a THP shall use in developing alternatives for treating pine brood material. The addendum also describes methods of treating pine brood material that may be used to meet the objectives of this rule. The RPF may propose or the Director may require hazard reduction treatments to mitigate significant adverse impacts of insects breeding in pine brood material at any time during the life of a THP.

BOARD OF FORESTRY TECHNICAL RULE ADDENDUM NO. 3 BROOD MATERIAL

A. Hazard Determination

- Tree mortality and top killing result when Ips beetle populations reproduce and increase in pine brood material and then leave this material and attack pines in the residual stand. Hazard increases with the amount of pine brood material present.
- Any suitable breeding material, including pine logs from recently felled trees, represents a hazard as long as it remains on site long enough for the beetles to complete a life cycle in it. During suitable weather, the life cycle may be as short as five weeks. Piling of brood material is more hazardous than leaving it spread-out on the ground.
- Timing of brood material production may influence hazard. Hazard is presumed to be highest when pine brood material is produced from February through June and moderate when produced at other times of the year. At no time is hazard presumed to be low. In some parts of the Southern Forest District, hazard is presumed to be high year round, regardless of when the brood material was produced.
- Age, size, and species of residual trees influence hazard. Young pole size stands of pine are most susceptible to damage. Tree species other than pine are not damaged by insects that breed in pine brood material. Brood material from tree species other than pine generally does not contribute to the build-up of damaging beetle populations.
- Low vigor residual trees are at greatest risk. Historically, drought stressed, suppressed, and overstocked stands have been identified as high risk. Off-site, diseased, damaged, and overmature trees are also at risk.
- If damaging insect populations are high, hazard will be greater. High beetle populations have the potential to damage more than just low vigor trees. Chronic pine mortality in the area should be evaluated to determine if high beetle populations are present. An established Zone of Infestation for pine bark beetles implies that conditions are appropriate for the build-up of beetle populations.
- Potential for the spread of damaging insects to adjacent ownerships should be considered. The closer the ownership, the greater the risk. Generally, ownerships beyond one quarter of a mile will have little or no risk.
- Value of residual trees should be considered. How much loss to residuals is acceptable?

B. Pest Hazard Reduction Treatment Alternatives applied to Pine Slash

Any treatment to reduce hazard should apply to the entire area where a hazard has been determined to exist, including the area where lopping for fire hazard reduction has been used. Treatment alternatives include modification of the brood material so that it is less suitable as a breeding site for beetles or methods to reduce beetle populations that have developed. Specific Treatment Alternatives applied to pine brood material are as follows:

(1) The following treatments are acceptable provided they are completed before insect broods emerge from infested material. During weather that is suitable for brood development, a five week window is the maximum time that should elapse between creation of brood material and its treatment by one of the following methods: brood material can be removed from the site for processing or disposal; if left on-site, it can be piled and burned, chipped, debarked, treated with an appropriate pesticide, or piled and covered with clear plastic. If brood material is piled and covered, the plastic used must be a minimum of 6 mil thick; piles must be completely sealed by the plastic so that there are no openings to the outside and remain covered for 6 months (or 4 months if at least 2 summer months are included).

(2) The following treatment is acceptable, provided it is completed as soon after brood material creation as is practical, but not later than one week. Lop all branches from the sides and tops of those portions of main stems which are 3" or more in diameter. Branches shall be scattered so that stems have maximum exposure to solar radiation. Do not pile brood material. Lopped stems could also be cut into short segments to decrease drying time and further reduce hazard.

(3) Burying brood material will prevent it from being colonized by beetles, but may not prevent emergence of the beetles. Therefore, it must be buried before becoming infested. During suitable weather, brood material must be buried concurrent with its creation. "Suitable" weather depends upon location. In areas that receive snowfall, suitable weather generally exists from April 15-October 15. In other areas, suitable weather exists from March 1-November 30.

THP Mitigation #3, Pine slash reduction

Pine Slash Hazard Reduction Mitigations implemented under this THP/Conversion

Treatment of Pine slash as directed by Board Of Forestry Technical Rule Addendum No. 3 See **THP page 18** for details.

Sustainable Integrated Pest Management (IPM) Plan

The project proposes the use of a **Sustainable Integrated Pest Management Plan**. See the IPM developed by Daniel Fischl and David Abreu, **Attached IPM, DRAFT EIR Appendix J**. Best management practices have been incorporated into the plan and will be part of the vineyard management activities. These best management practices are also part of the Erosion Control Plan application with Napa County, see **Attached ECP, DRAFT EIR Appendix B.**

Excerpt form IPM

Outline and Farming Philosophy

Our intention on this site is to use an integrated approach to farming and management, derived from the best possible combination of sustainable practices, integrated pest management (IPM), and the use of certified organic materials wherever possible. The recent trend in Napa County has been of gentle progress toward sustainable practices, whilst recent statistics show that County-wide incorporation of organic fanning principles has been on the increase. We feel that this approach is the best solution for the long-term vitality of both the viticultural industry and the County ecosystem as a whole, and is in the best interests of all communalities as the separations between agriculture and habitat ever shrink.

The recent in-house addition of a highly-trained agricultural scientist with a strong background in agroecology and sustainable land use management is pivotal to David Abreu Vineyard Management to devise a highly integrated, strongly sustainable management program on the proposed site. The program we will be devising will incorporate the latest understanding of whole-systems biology, agroforestry and agroecology to provide key habitat, promote positive environmental interaction, and mitigate negative impacts from the vineyard itself.

THP Mitigation #4, Integrated Pest Management Plan

Implementation of the Integrated Pest Management Plan, see the **DRAFT EIR section 4.8.1-2 and the IPM Appendix J**.

b. [ ] Yes [**X**] No If outside a declared zone, are there any insect, disease or pest problems of significance in the THP area? If yes, describe the proposed measures to improve the health, vigor, and productivity of the stand(s).

HARVESTING PRACTICES

16. Indicate type of yarding system and equipment to be used:

GROUND BASED*	CABLE	SPECIAL
a. [**X**] Tractor, including end/long lining	d. [ ] Cable, ground lead	g. [ ] Animal
b. [**X**] Rubber tired skidder, Forwarder	e. [ ] Cable, high lead	h. [ ] Helicopter
c. [**X**] Feller buncher	f. [ ] Cable, Skyline	i. [ ] Other

* All tractor operations restrictions apply to ground based equipment.

17. Erosion Hazard Rating: Indicate Erosion Hazard Ratings present on THP. (Must match EHR worksheets)

[ ] Low [**X**] Moderate [ ] High [ ] Extreme

If more than one rating is checked, areas must be delineated on map down to 20 acres in size (10 acres for high and Extreme EHRs in the Coast District).

See EHR worksheet Below.

The soil is mapped at the property as the Aiken loam series, on 2 to 15 percent, and 30 to 50 percent slopes. Aiken loam soils are characterized as developing on basic igneous rock (USDA, 1978)." **See Lucia Abreu Soil Report attached.** All soils within the project area are Aiken loam series 100, 2-15% slopes.

ABREU VINEYARDS THP/CONVERSION								
ESTIMATED SURFACE SOIL EROSION HAZARD STATE OF CALIFORNIA								
RM-87 (4/84)				**BOARD OF FORESTRY**				
Napa County Soils			**MAP UNIT**		**SOIL SERIES NAME**			
	A		**100**		**Aiken Loam 2 – 25%**			
	B		**102**		**Aiken Loam 30 – 50 %**			
					FACTOR RATING BY AREA			
I. SOIL FACTORS								
A. SOIL TEXTURE	FINE		MEDIUM		COURSE		**A**	**B**
1. Detachability	Low		Moderate		High			
Rating	1-9		10-18		19-30		10	10
2. Permeability	Slow		Moderate		Rapid			
Rating	5-4		3-2		1		3	3
B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK								
	Shallow		Moderate		Deep			
	1”- 19”		20” -39”		40”- 60” (+)			
Rating	15-9		8-4		3-1		3	3
C. PERCENT SURFACE COURSE FRAGMENTS GREATER THAN 2MM IN SIZE INCLUDING ROCKS OR STONES								
	Low		Moderate		High			
	(-) 10-39%		40-70%		71-100%			
Rating	10-6		5-3		2-1		8	8
II. SLOPE FACTOR								
Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80% +		
Rating	1-3	4-6	7-10	11-15	16-25	26-35	4	4
III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE								
	Low		Moderate		High			
Percent	0-40%		41-80%		81-100%			
Rating	15-8		7-4		3-1		15	15
IV. TWO-YEAR, ONE – HOUR RAINFALL INTENSITY (Hundredths Inch)								
	Low	Moderate		High		Extreme		
Inches	(-) 30-39	40-59		60-69		70-80 (+)		
Rating	1-3	4-7		8-11		12-15	11	11
					TOTAL SUM OF FACTORS		54	54
	EROSION HAZARD RATING							
	<50	50-65		66-75		>75		
	LOW **(L)**	MODERATE **(M)**		HIGH **(H)**		EXTREME **(E)**		
					THE DETERMINATION IS		**M**	**M**

18. Soil Stabilization: In addition to the standard waterbreak requirements describe soil stabilization measures or additional erosion control measures to be implemented and the location of their application. See requirements of 14 CCR 916.7 (936.7, 956.7), and 923.2 (943.2, 963.2) (m), and 923.5 (943.5, 963.5) (f).

Soil Stabilization:

Soils within the property and the project area are classified by the USDA Soil Conservation Service's, Napa County Soil Survey, as SCS 100 Aiken Loam, with an erosion hazard rating of moderate. The mean annual precipitation is 30 to 50 inches, and the mean annual temperature is 54° to 55° F. Summers are warm and dry while winters are cool and moist. The frost-free season is 200 to 250 days. **See the Lucia Abreu soil report attached**.

See erosion control measures proposed in the **Erosion Control Plan (ECP), DRAFT EIR Appendix B attached.** The ECP is attached and made a part of the plan. (**ECP #P05-0376-ECPA**) The ECP has been reviewed by the Napa County Resource Conservation District (RCD) and found "RCD finds the referenced Plan technically adequate for erosion and sediment control", Dave Steiner, 2-2-2006. Phone conversation with Napa County Brian Bordona (2-14-2013), the original ECP application is still active and awaiting CEQA documentation. Project revisions have been submitted to Napa County.

Soil stabilization will take place as required by the Forest Practice Rules up to the completion of the timber harvest plan. All exposed soil surfaces greater than 100 sq. ft shall be straw mulched and grass seeded, this applies to landing surfaces and road surfaces unless rocked. All permanent road surfaces shall be rocked upon completion. A three-year erosion control maintenance period applies to all roads and skid trails within this project area until implementation of the ECP, at which time all ECP measures shall apply. Sidecast or fill material extending more than 20 feet in slope distance from the outside edge of the landing and which has access to a watercourse or lake shall be seeded, planted, mulched, removed or treated to adequately reduce soil erosion.

Grass seed and straw:

Seedling Requirements: All exposed or disturbed soils shall be seeded (using one of the mixes listed below). Seed and fertilizer shall be applied hydraulically or broadcast at the rates specified below. (**See the ECP DRAFT EIR Appendix B attached**)

Napa Valley Ag supply	Ball Beans	40%
"Plowdown legumes"	Forage Peas, VNS	20%
@ 100 lbs/ac	Forage Peas, VNS	20%
	Common Vetch	20%

Napa Valley Ag supply	Barley	70%
"Wrex Mix":	Zorro Fescue (Deawned)	14%
@ 100 lbs/ac	Dwarf Perennial Ryegrass	7%
	Hykon rose Clover RK	3%
	Creeping Red Fescue	3%
	Chewings Fescue	3%

Napa Valley Ag Supply	California Brome	68%
"Abreu Perennial Mix"	Hykon Rose Clover, RK	23%
@ 100 lbs/ac	White Yarrow	9%

An alternative seed mix and/or fertilizer may be used after review and approval by Napa County Resource Conservation Department.

Straw Mulch: During the life of plan, straw mulch shall be spread annually over all disturbed and seeded areas. The mulch shall be spread mechanically or by hand at the rate of 2 tons/acre. Straw mulch may be crimped in place after spreading. Straw spread after reseeding or repair may also be crimped.

After logging and slash control has been completed and the completion report filed, the **Erosion Control Plan (ECP) DRAFT EIR Appendix B attached,** will direct soil stabilization procedures. It should be pointed out that no operations will take place within a WLPZ. There are no stream crossings proposed for the plan.

Note: Excavation of soil, or stump removal, constitutes grading operations under Napa Counties Grading permit and as such implementation of the ECP applies. Once the ECP has begun, all aspects of the ECP must be completed within the time frame allowed under the ECP, see the ECP for details. To eliminate any confusion as to responsibility and implementation of the THP and ECP, there shall be a meeting at the end of timber harvesting operations between the RPF, LTO and the vineyard manager to discuss each person's responsibilities when logging is complete. CDF and any other reviewing agency may be invited to this meeting. **THP Mitigation #1**. See THP completion meeting requirements**, Item #38 of the THP.**

Dust Abatement

As a result of review made in the DRAFT EIR and input from Napa County Planning the following mitigations have been proposed for dust abatement.

THP Mitigation #12 (DRAFT EIR Mitigation Measure 4.3-1, see page 4.3-8)

The Applicant shall implement a fugitive dust abatement program during the construction of the county ECP #P05-0376-ECPA, which shall include the following elements:

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Cover all exposed stockpiles.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent paved streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

In addition to the above measures, the Applicant shall also implement the required basic construction mitigation measures as recommended by the BAAQMD during the construction of the Proposed Project, which shall include the following elements:

- All exposed surfaces (e.g., parking areas, staging areas, and unpaved access roads) shall be watered as needed to ensure dust abatement.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- All heavy duty construction equipment shall be fitted with diesel particulate matter filters and use only aqueous diesel fuel.

The measures above are in addition to the permanent erosion control measures specified in #P05-0376-ECPA, which include establishing a permanent no till cover crop on all disturbed areas. As shown in **Table 4.3-3, DRAFT EIR attached**, construction of the Proposed Project would not exceed the BAAQMD criteria pollutant threshold. The permanent erosion control measures would avoid the creation of nuisance dust and PM_{10} during operation of the Proposed Project, which would reduce these potentially significant impacts to a less than significant level. These measures are additive to those required during the timber harvest prior to conversion.

19. [ ] Yes [**X**] No Are tractor or skidder constructed layouts to be used? If yes, specify the location and extent of use:

20. [ ] Yes [**X**] No Will ground based equipment be used within the area(s) designated for cable yarding? If yes, specify the location and for what purpose the equipment will be used. See 14 CCR 914.3 (934.3, 954.3) (e).

21. Within the THP area will ground based equipment be used on:

a. [ ] Yes [**X**] No Unstable soils or slide areas? Only allowed if unavoidable.
b. [ ] Yes [**X**] No Slopes over 65%?
c. [ ] Yes [**X**] No Slopes over 50% with high or extreme EHR?
d. [ ] Yes [**X**] No Slopes between 50% and 65% with moderate EHR where heavy equipment use will <u>not</u> be restricted to the limits described in 14 CCR 914 (934, 954) .2 (f) (2) (i) or (ii)?
e. [ ] Yes [**X**] No Slopes over 50% which lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a watercourse or lake?

If a. is yes, provide site specific measures to minimize effect of operations on slope stability below. Provide explanation and justification in section III as required per 14 CCR 914 (934, 954) .2 (d). CDF requests the RPF consider flagging tractor road locations if “a.” is yes.
If b., c., d. or e. is yes:
1) the location of tractor roads must be flagged on the ground prior to the PHI or start of operations if a PHI is not required, and
2) you must clearly explain the proposed exception and justify why the standard rule is not feasible or would not comply with 14 CCR 914 (934, 954).
The location of heavy equipment operation on unstable areas or any use beyond the limitations of the standard rules must be shown on the map. List specific instructions to the LTO below.

Geological conclusions and recommendations found in attached Engineering Geological Evaluation Draft EIR Appendix G

CONCLUSIONS AND RECOMMENDATIONS

"Based on our review of our files and the site conditions observed on 4 February 2013, the proposed vineyard development appears feasible from the standpoint of erosion control and slope stability. We observed favorable slope stability conditions with low inclinations, combined with very strong and little weathered andesite and volcanic tuff underlying the site.

The minor erosion and creep observed in the swales south of the site appears to be associated with man-placed materials. The cut slope in the western swale is inclined at between 1.5 to 1:1, horizontal to vertical and appears to be performing very well. This artificial cut provides a baseline on which to judge the slope stability within the two swales south of the site. In our opinion, the performance of this cut over the period of 50 to 100 years during which annual and multi-year cumulative precipitation have varied by at least +/-50% of the average annual, strongly suggests that the slopes within these swales should not be impacted by the small potential changes in infiltration modeled by the project design team."

22. [ ] Yes [**X**] No Are any alternative practices to the standard harvesting or erosion control rules proposed for this plan? If yes, provide all the information as required by 14 CCR 914 (934, 954) .9 in Section III.

List specific instructions to the LTO below.

N/A

WINTER OPERATIONS

23. a. [**X**] Yes [ ] No Will timber operations occur during the winter period? If yes, complete "b, c, or d." State in space provided if exempt because yarding method will be cable, helicopter, or balloon.
b. [ ] Yes [**X**] No Will mechanical site preparation be conducted during the winter period? If yes, complete "d".
c. [ ] I choose the in-lieu option as allowed in 14 CCR 914 (934, 954) .7 (c). Specify below the procedures listed in subsections (1) and (2), and list the site specific measures for operations in the WLPZ and unstable areas as required by subsection (3), if there will be no winter operations in these areas, so state.
d. [**X]** I choose to prepare a winter operating plan per 14 CCR 914 (934, 954) .7 (b).

NOTE***: "Winter period" means the period between November 15 and April 1, except as noted under special County Rules at Title 14 CCR 925.1, 926.18, 927.1, and 965.5… (a) except as otherwise provided in the rules: (1) All waterbreaks shall be installed no later than the beginning of the winter period of the current year of timber operations. (2) Installation of drainage facilities and structures is required from October 15 to November 15 and April 1 to May 1 on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours.***

Winter Period operating limitations and requirements.

No THP operations will take place during the winter period. (November 15th through April 1st) Except for timber falling. See winter period operating limitations on below.

Wet Weather Operating Plan

The wet weather operating plan applies to timber operations in the non-winter period (**May 1st through October 15th**). The following practices will take place in the event that the Weather Service predicts 30% chance of rain, at Saint Helena CA, in the next 24-hour period.

1. Erosion control facilities will be installed on all skid trails and logging roads prior to the end of the day if the U.S. Weather Service forecast is for a chance (30%) of rain. Rainfall prediction shall be secured from the U.S. Weather Service forecast, internet, radio, television or newspapers, by the Licensed Timber Operator.

   Internet site location http://www.weather.com/weather/tenday/94559?from=36hr_topnav_undeclared
2. All landings and truck roads will have appropriate erosion control facilities installed.
3. Routine use of roads and landings shall not take place when, due to general wet conditions, equipment cannot be operated under its own power. Log hauling on the associated roads may take place when the roads are generally firm and passable.
4. All haul roads will be outsloped and berms breached to keep water from accumulating and causing erosion in the event of rainfall occurring during the non-winter period.
5. If an excess of one inch of precipitation falls as measured at Saint Helena CA, all harvesting operations will cease for 24 hours after the last precipitation is recorded.

Excerpt from the Forest Practice Rules

MAXIMUM DISTANCE BETWEEN WATERBREAKS
Guidelines for the LTO to use during waterbar installation

Estimated Erosion Hazard Rating	Log Truck Road or Skid Trail Gradient			
	10% or less	11% - 25%	26% - 50%	>50%
	Feet	Feet	Feet	Feet
Extreme	100	75	50	50
High	150	100	75	50
Moderate	200	150	100	75
Low	300	200	150	100

Winter Period Operating Plan per 916.9 (k) within a watershed subject to Anadromous Salmonid Protection

This winter period operating plan will cover only the period **October 15th through November 15th and April 1st through May 1st.** No logging operations are proposed during the winter period defined as November 15th through March 31st, This winter plan is provided pursuant to 14 CCR 916.9(k), except for timber falling, see bottom of page 30.

The following is in response to CCR 14 section 916.9 (k) and applies to this plan.

From October 15 to May 1, the following shall apply:

(1) Timber operations shall take not place unless the approved plan incorporates a complete winter period operating plan pursuant to 14 CCR (914.7(a)

(2) Timber operations shall not take place unless an extended period with low antecedent soil wetness occurs, no tractor roads shall be constructed, reconstructed, or used on slopes that are over 40 percent and within 200 feet of a Class I, II, or III watercourse, as measured from the watercourse or lake transition line, and

(3) Operations of trucks and heavy equipment on roads and landings shall be limited to those with a stable operating surface.

(4) No logging roads are proposed to be constructed with this plan. Use of logging roads, tractor roads, or landings shall not take place at any location where saturated soil conditions exist, where a stable logging road or landing operating surface does not exist, or when visibly turbid water from the road, landing, or skid trail surface or inside ditch may reach a watercourse or lake. Grading to obtain a drier running surface more than one time before reincorporation of any resulting berms back into the road surface is prohibited.

(5) All roads (no tractor roads will be constructed or used on this plan) shall have drainage and/or drainage collection and storage facilities installed as soon as practical following yarding and prior to either the start of any rain which causes overland flow across or along the disturbed surface within a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection, or any day with a National Weather Service forecast of a chance of rain of 30 percent or more, a flash flood warning, or a flash flood watch.

(6) Within the WLPZ of all watercourses, treatments to stabilize soils, minimize soil erosion, and prevent the discharge of sediment into waters in amounts deleterious to aquatic species or the quality and beneficial uses of water, or that threaten to violate applicable water quality requirements, shall be applied in accordance with the following standards: The following requirements shall apply to all such treatments.

There are no watercourse on or adjacent to the project area.

(A) They are described in the plan, see the **ECP DRAFT EIR Appendix B attached,** Project Notes.

(B) For areas disturbed by the THP from May 1 through October 15, treatment shall be completed prior to the start of any rain that causes overland flow across or along the disturbed surface. See Wet Weather Operating limitations and requirements in the THP.

(C) For areas disturbed by the THP from October 16 through April 30, treatment shall be completed prior to any day for which a chance of rain of 30 percent or greater is forecast by the National Weather Service or within 10 days, whichever is earlier.

(7) The traveled surface of logging roads shall be treated to prevent waterborne transport of sediment and concentration of runoff that results from timber operations.

(8) The treatment for other disturbed areas, including: areas exceeding 100 contiguous square feet where timber operations have exposed bare soil and any other area of disturbed soil that threatens to discharge sediment into waters in amounts deleterious to the quality and beneficial uses of water, and which may include, but need not be limited to, mulching, rip-rapping or grass seeding. Where straw, mulch, or slash is used, the minimum coverage shall be 90%, and any treated area that has been subject to reuse or has less than 90% surface cover shall be treated again prior to the end of timber operations. The RPF may propose alternative treatments that will achieve the same level of erosion control and sediment discharge prevention. See the **ECP attached,** Project Notes.

(9) Where the undisturbed natural ground cover cannot effectively protect beneficial uses of water from timber operations, the ground shall be treated by measures including, but not limited to, seeding, mulching, or replanting, in order to retain and improve its natural ability to filter sediment, minimize soil erosion, and stabilize banks of watercourses and lakes. See the **ECP attached,** Project Notes.

(10) Skidding, loading or trucking operations will not occur at any time conditions on the ground meet the definition of saturated soils or when visibly turbid water from roads, skid trails, landings or inside ditches could reach a watercourse. Skidding, loading and trucking operations will cease for 24 hours after the last precipitation exceeding 1" is recorded at **St. Helena, CA**. The probable form of precipitation during this period on this operating area will be a low intensity short duration rainstorm of approximately 1 inch of rainfall.

Winter period operating plan November 15 to January 31

No THP operations will take place during the winter period (defined for this THP as November 15th through Jan 31st) except for timber falling. The following limitations apply at all times during the winter period. **THP Mitigation #17,** page 55

1. No heavy equipment is allowed at any time.
2. Fallers vehicles will operate on rocked road surfaces at all times.
3. All aspects of the winter period operating plan found on the previous page are in effect.
4. Trees shall be felled to lead in a direction away from WLPZ, fencing and not allowed to fall outside of the project area.
5. Trees shall be felled in conformance with watercourse and lake protection measures incorporated in the timber harvesting plan and consistent with Article 6 of the rules.

The following is in response to CCR Section 914.7 (b) and applies to the plan.

Specific operating measures to be taken during the winter period to minimize damage due to erosion and soil movement into watercourses, and to minimize damage due to soil compaction from felling, yarding, loading, mechanical site preparation, and erosion control activities.

1. The erosion hazard rating for the project area is moderate.
2. No mechanical site preparation is allowed during the winter period. Mechanical site preparation is associated with the ECP and under direction by Napa County. "All ground disturbing activities associated with the application of the ECP shall be completed by September 1 of each year, and all erosion control measures shall be in place by September 15. " See **ECP attached.**
3. No skid trails will be built under this THP.
4. The operating period for winter operations on the THP is **November 15th to Jan 31st.**
5. All erosion control facilities associated with the ECP must be in place by September 15th, , See **ECP attached**
6. All erosion control facilities associated with the THP must be in place by October 15th
7. All disturbed area must have erosion control treatment completed prior to the start of any rain that causes overland flow across or along the disturbed surface. Skidding, loading and trucking operations will cease for 24 hours after the last precipitation exceeding 1" is recorded at **St. Helena, CA.** The probable form of precipitation during this period on this operating area will be a low intensity short duration rainstorm of approximately 1 inch of rainfall.
8. Silvicultural system-ground cover. Not applicable, no equipment allowed to operate and no vehicles allowed off of rocked roads. No ground disturbance will take place, activities limited to falling only.
9. Operations within the WLPZ. No operations allowed in the WLPZ, no equipment allowed to operate and no vehicles allowed off of rocked roads. No WLPZ is present on or adjacent to the project or property area.
10. Equipment use limitations. No equipment allowed to operate and no vehicles allowed off of rocked roads. No ground disturbance will take place.
11. Known unstable areas. No unstable areas present. See **Engineering Geological evaluation attached**.

Definitions 895.1

Saturated soil conditions means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during timber operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.

In tractor yarding or the use of tractors, this condition may be evidenced by:

The production of sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III or IV waters or that violate Water Quality Requirements.

In using heavy equipment, this condition maybe evidenced by:

The production of sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III or IV waters; that violate Water Quality Requirements; or when it cannot operate under its own power due to wet conditions.

On logging roads and landings this may be evidenced by:

The production of sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III or IV waters or that violate Water Quality Requirements.

Stable Operating Surface means a road or landing surface that can support vehicular traffic and that routes water off of the road surface or into drainage facilities without concentrating flow in ruts (tire tracks), pumping of the road bed, or ponding flow in depressions. A stable operating surface shall include a structurally sound road base appropriate for the intended use. The number, placement, and design of drainage facilities or drainage structures on a stable operating surface prevents the transport of fine-grained materials from the road or landing surface into watercourses in quantities deleterious to the beneficial uses of water.

ROADS AND LANDINGS

24. Will any roads be constructed? [ ] Yes [**X**] No, or reconstructed? [ ] Yes [**X**] No. If yes, check items "a." through "g."
Will any landings be constructed? [ ] Yes [**X**] No, or reconstructed? [ ] Yes [**X**] No. If yes, check items "h." through "k."

a. [ ] Yes [**X**] No Will new or reconstructed roads be wider than single lane with turnouts?
b. [ ] Yes [**X**] No Are logging roads proposed in areas of unstable soils or known slide-prone areas?
c. [ ] Yes [**X**] No Will new roads exceed a grade of 15% or have pitches of up to 20% for distances greater than 500 feet? Map must identify any new or reconstructed road segments that exceed an average 15% grade for over 200 feet.
d. [ ] Yes [**X**] No Are roads to be constructed or reconstructed, other than crossings, within the WLPZ of a watercourse? If yes, completion of THP Item 27 a. will satisfy required documentation.
e. [ ] Yes [**X**] No Will roads be located across more than 100 feet of lineal distance on slopes over 65%, or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
f. [ ] Yes [**X**] No Will any roads or watercourse crossings be abandoned?
g. [ ] Yes [**X**] No Are exceptions proposed for flagging or otherwise identifying the location or roads to be constructed?
h. [ ] Yes [**X**] No Will any landings exceed one half acre in size? If any landing exceeds one quarter acre in size or requires substantial excavation the location must be shown on the map.
i. [ ] Yes [**X**] No Are any landings proposed in areas of unstable soils or known slide prone areas?
j. [ ] Yes [**X**] No Will any landings be located on slopes over 65% or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
k. [ ] Yes [**X**] No Will any landings be abandoned?

25. If any section in "item 24" above is answered yes, specify site-specific measures to reduce adverse impacts and list any additional or special information needed by the LTO concerning the construction, maintenance, and/or abandonment of roads or landings, as required by 14 CCR Article 12. Include required explanation and justification in THP Section III.

No active erosion sites exist within the project area. All areas of soils disturbed by project construction will be stabilized as per section 18 of the THP and the ECP, attached..

Several section of existing ranch roads within the project footprint will be abandoned and graded into the surrounding landscape. These ranch roads do not meet the definition of "Logging Road" found in section 895.1 "**Logging Road** means a road other than a public road used by trucks going to and from landings to transport logs and other forest products." Mitigation measures proposed in the ECP will adequately address sediment transport on these ranch roads.

OPERATOR DIRECTION FOR GENERAL ROAD AND SKID TRAIL WORK

- Out slope road surfaces whenever possible to avoid water accumulation and erosion.
- Avoid inside ditches and related water accumulation, unless directed by the ECP
- Follow all aspects of the Erosion Control Plan

FLAGGING

THP boundary	----------	Solid Blue
WLPZ and ELZ	----------	NA
Truck Road	----------	None
Skid Trail	----------	None
Point location	----------	Pink Glow, Solid Blue and hand written notes

All Flagging is in place and available during the preharvest inspection.

WATERCOURSE AND LAKE PROTECTION ZONE (WLPZ) AND DOMESTIC WATER SUPPLY PROTECTION MEASURES

1) [ ] Yes [**X**] No Is a 1603 permit necessary?

2) [ ] Yes [**X**] No Do you need to apply for a standard 1603 permit?

26. a. [ ] Yes [**X**] No Are there any watercourse or lakes which contain Class I through IV waters on or adjacent to the plan area? If yes, list the class, WLPZ or ELZ width, and protective measures determined from Table I and/or 14 CCR 916 (936, 956) .4 (c) of the WLPZ rules for each watercourse. Specify if Class III or IV watercourses have WLPZ , ELZ or both.

No watercourses are present on or adjacent to the project or the property area. No harvesting or vegetation removal is proposed within any WLPZ or ELZ of any Class I, II or III watercourse.

b. [ ] Yes [**X**] No Are there any watercourse crossings that require mapping per 14 CCR 1034 (x) (7)?
c. [ ] Yes [**X**] No Will tractor road watercourse crossings involve the use of a culvert? If yes state minimum diameter and length for each culvert (may be shown on map).

No watercourses are present on or adjacent to the project or the property area.

WATERCOURSE	**< 30% Slope**	**30 – 50% Slope**	**>50% Slope**	
Class I WLPZ	**150**	**150**	**150**	**None present**
Class II-L WLPZ	**100**	**100**	**100**	**None Present**
Class II-S WLPZ	**50**	**75**	**100**	**None present**
Class III WLPZ	**30**			**None present**

Explanation of additional documentation.

The project is located in Napa County California, as such an Erosion Control Plan (ECP) has been designed to meet Napa County regulations and is attached to this THP. An Environmental Impact Report has been prepared by Analytical Environmental Services to satisfy CEQA requirements for the Timberland Conversion and Napa Counties Erosion Control Plan. Frequent reference to the DRAFT EIR will be made throughout this document.

See the attached Environmental Impact Report for a discussion of Hydrology and Water Quality. **DRAFT EIR page 4.9-1**

Findings (DRAFT EIR page 4.9-17)

"Development of the Proposed Project would alter the drainage pattern of the property, but would not result in an increased rate or volume of runoff. In fact, the Proposed Project would result in a slight decrease in both the peak discharge and volume of surface runoff at the property. Therefore, this is a less than significant impact. The primary reason for the decrease in runoff is the construction of retention basins that would delay peak flow timing. Another factor contributing to the reduction in runoff, or lower curve numbers, are the use of a cover crop within all the vineyard blocks and application of compost mulch. Drainage system features onsite would not result in flooding because the rate and volume of runoff would not increase from the Proposed Project, and because these drainage features were determined to be appropriate for local hydrology conditions during development of the ECP. "

As a result of implementation of this Timber Harvest Plan along with the Erosion Control Plan, post project sediment erosion conditions and peak hydrological runoff are projected to be below pre project conditions. Implementation of this plan will not cause significant cumulative watershed effects. The ECP is used as mitigation to insure post project sediment erosion conditions and peak hydrological runoff are below pre project conditions**, THP mitigation #5**

THP Mitigation #5, Erosion Control Plan

Implement all aspects of the Napa County Erosion Control plan (File #P-05-0376 ECPA) in order to meet Napa County Conservation Regulations

d. [ ] Yes [**X**] No Is this THP Review Process to be used to meet Department of Fish and Game CEQA review requirements? If yes, attach the 1603 Addendum below or at the end of this Section II; provide the background information and analysis in Section III; list instructions for LTO below for the installation, protection measures, and mitigation measures; as per THP Form Instructions or CDF Mass Mailing, 07/02/1999, "Fish and Game Code 1603 Agreements and THP Documentation".

Anadromous Salmonid Protection Rules

The project area lies in the northern portion Conn Creek Planning Watershed (Calwater ID #2206.500503, http://frap.fire.ca.gov/projects/esu/esulookup.asp) which drains into the Napa River. The watershed contains anadromous fish, and as such the Anadromous Salmonid Protection (ASP) rules apply. The Napa River is listed by the federal Clean Water Act 303(d) as impaired due to fine sediment deposition. See the following site for additional information.
http://www.bof.fire.ca.gov/board_committees/forest_practice_committee/current_projects/ANADROMOUS_SALMONID_PROTECTION_RULES_2009/revised_post-workshop_asp_q&a_doc__4_2_2010-final_.pdf

The California Regional Water Quality Control Board adopted Resolution R2-2009-0064 for the San Francisco Bay Region. The Napa River is listed pursuant to Federal Clean Water Act 303(d) requirements as an impaired waterbody due to fine sediment deposition. The board approved the following for the Napa River on 1-23-09, see portions of resolution R2-2009-0064 below.

Napa River Sediment Reduction and Habitat Enhancement Plan

http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/napariver_sediment/rs_r2_2009_0064.pdf

The goals of the Napa River Sediment Reduction and Habitat Enhancement Plan (Plan) are to:

- Conserve the steelhead trout population
- Establish a self-sustaining Chinook salmon population
- Enhance the overall health of the native fish community
- Enhance the aesthetic and recreational values of the river and its tributaries

To achieve these goals, specific actions are needed to:

- Attain and maintain suitable gravel quality and diverse streambed topography in freshwater reaches of Napa River and its tributaries
- Protect and/or enhance base flows in tributaries and the mainstem of the Napa River
- Reduce the number and significance of human-made structures in channels that block or impede fish passage
- Maintain and/or decrease summer water temperatures in tributaries to the Napa River

IMPLEMENTATION PLAN

The actions described below, including the processes by which sediment and runoff control practices are proposed and implemented, are necessary to achieve TMDL targets and allocations and habitat enhancement goals. In addition, actions specified in this plan are expected to enhance steelhead run size and facilitate establishment of a self-sustaining Chinook salmon run.

Regulatory Tools

The only point sources of sediment identified in Tables 2 and 3b are those associated with urban stormwater runoff (e.g., municipal stormwater, runoff from State highways, and industrial and construction discharges) and wastewater treatment plants, which are regulated by NPDES permits. Table 4.0 shows implementation measures required of these sources.

The state's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program requires regulation of nonpoint source discharges using the Water Board's administrative permitting authorities, including waste discharge requirements (WDRs), waiver of WDRs, Basin Plan Discharge Prohibitions, or some combination of these. Consistent with this policy, Tables 4.1 – 4.4 specify actions and performance standards by nonpoint source category, as needed to achieve TMDL sediment targets and allocations in Napa River watershed. The Water Board will consider adopting conditions for waiving WDRs that apply to the nonpoint sources (vineyards, grazing, roads, etc.) listed in Tables 4.1 – 4.4, address all pollutants of concern, protect all beneficial uses, and balance the agricultural, environmental, recreational, and residential needs of the watershed.

Table 1. TMDL sediment targets for the Napa River and its Tributaries

Spawning gravel permeability	Median value ≥ 7000 cm/hr[a]
Streambed scour	Mean depth of scour ≤ 15 cm[b]

[a] Target applies to all potential spawning sites for steelhead and salmon in the Napa River and its tributaries, excluding those upstream of municipal water supply reservoirs.

[b] Target applies to the response of the streambed to peak flows less than the bankfull event at all potential spawning sites for salmon in gravel-bedded reaches of: 1) mainstem Napa River; and 2) alluvial reaches of tributaries where streambed slope is between 0.001 and 0.02. Potential spawning sites can be identified based on the following: 1) dominant substrate size in the streambed surface layer is between 8 and 128 mm; 2) minimum surface area of gravel deposit is 0.2 square meters in tributaries and 1.0 square meter in mainstem Napa River; or 3) located within mainstem Napa River at a riffle head, pool tail, and/or pool margin or in tributary reaches where streambed slope < 0.03, or in tributary reaches where streambed slope > 0.03 in pool tails, backwater pools, and/or in gravel deposits associated with flow obstructions (e.g., woody debris, boulders, banks, etc.).

Table 4.1 Required and Trackable TMDL Implementation Measures for Sediment Discharges Associated with Vineyards[1]

Land Use Category	Performance Standards	Actions	Implementing Parties	Completion Dates
Vineyards	**Surface Erosion associated with vineyards**: Control excessive rates of sediment delivery to channels resulting from vineyard surface erosion[5]; **and** **Roads**: Road-related sediment delivery to channels ≤ 500 cubic yards per mile per 20-year period; **and** **Gullies and/or shallow landslides:** Accelerate natural recovery and prevent human-caused increases in sediment delivery from unstable areas; **and** **Effectively attenuate significant increases in storm runoff**, so that the runoff from vineyards shall not cause or contribute to downstream increases in rates of bank or bed erosion.	Submit a Report of Waste Discharge[2] (RoWD) to the Water Board that provides, at a minimum, the following: a description of the vineyard; identification of site-specific erosion control measures needed to achieve performance standard(s) specified in this table; and a schedule for implementation of identified erosion control measures. Or Develop and begin implementing a farm plan certified under Fish Friendly Farming Environmental Certification Program or other farm plan certification program, approved as part of a waiver of WDRs. All dischargers applying for coverage under a waiver of WDRs also will be required to file a notice of intent (NOI) for coverage, and to comply with all conditions of the WDR waiver.[4]	Vineyard owner and/or operator	October 2014
		Comply with applicable waste discharge requirements (WDRs) or waiver of WDRs.	Vineyard owner and/or operator	As specified in applicable WDRs or waiver of WDRs
		Report progress on implementation of site specific erosion control measures.[3]	Vineyard owner and/or operator	As specified in applicable WDRs or waiver of WDRs

[1]To achieve TMDL allocations and consistent with the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (State Board, 2004).
[2]Or compliance with applicable conditional waivers of WDRs that may be adopted by the Water Board.
[3]Reports may be submitted individually or jointly through a recognized third party.
[4]Additional conditions may be required under a General WDR and/or waiver program consistent with *the Policy for Implementation and Enforcement of the Non-Point Source Control Program* (State Board 2004), and/or as needed to avoid potentially significant environmental impacts.
[5]Napa County Conservation Regulations (County Code, Chapter 18.108) are effective in the control of excessive rates of sediment delivery resulting from vineyard surface erosion. Rates of sediment delivery are "excessive" when the predicted soil loss rate exceeds the tolerable soil loss rate (T), calculations as described in "The Universal Soil Loss Equation, Special Applications for Napa County, California" (USDA, 1994).

The project is impacted by CCR 14 section 916.9(a) since it is within a watershed with anadromous fish.

916.9(a)

It is the goal of this project to be planned and conducted to prevent deleterious interference with the watershed conditions that primarily limit the values set forth in 14 CCR 916.2 [936.2, 956.2](a) (e.g., sediment load increase where sediment is a primary limiting factor; thermal load increase where water temperature is a primary limiting factor; loss of instream large woody debris or recruitment potential where lack of this value is a primary limiting factor; substantial increase in peak flows or large flood frequency where peak flows or large flood frequency are primary limiting factors). To achieve this goal, every timber operation shall be planned and conducted to meet the following objectives where they affect a primary limiting factor:

(1) Comply with the terms of a Total Maximum Daily Load (TMDL) that has been adopted to address factors that may be affected by timber operations if a TMDL has been adopted, or not result in any measurable sediment load increase to a watercourse system or lake.

The project lies within the Napa River watershed. The State Water Resources Control Board has amended the Water Quality Control Plan for the San Francisco Bay Region to establish a TMDL for sediment in the Napa River.

See, http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/napariver_sediment/rs_r2_2009_0064.pdf

See table 1 above

The project has an Erosion Control Plan that will meet Napa County Conservation Regulations. Per the California Regional water Quality Control Board, these County Regulations are "effective in the control of excessive rates of sediment delivery resulting from vineyard surface erosion. Rates of sediment delivery are excessive when the predicted soil loss rate exceeds the tolerable soil loss rate (T), calculations as described in the "Universal Soil Loss Equation, Special Applications for Napa County, California" (USDA 1994)" See inserted Table 4.1 above and http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/napariver_sediment/rs_r2_2009_0064.pdf.
Analysis of the Erosion Control Plan show that post project sediment production for this project is projected to be below pre project levels. See **the DRAFT EIR section 4.9 Hydrology and Water Quality** .

(2) Not result in any measurable decrease in the stability of a watercourse channel or of a watercourse or lake bank. There are no watercourses on or adjacent to the project or the property area.

(3) Not result in any measurable blockage of any aquatic migratory routes for anadromous salmonids or listed species. There are no watercourses on or adjacent to the project or the property area.

(4) Not result in any measurable stream flow reductions during critical low water periods except as part of an approved water drafting plan pursuant to 14 CCR 916.9(r) [936.9(r), 956.9(r)]. There are no watercourses on or adjacent to the project or the property area.

(5) Consistent with the requirements of 14 CCR § 916.9(i), 14 CCR § 936.9(i), or 14 CCR § 956.9(i); protect, maintain, and restore trees (especially conifers), snags, or downed large woody debris that currently, or may in the foreseeable future, provide large woody debris recruitment needed for instream habitat structure and fluvial geomorphic functions. There are no watercourses on or adjacent to the project or the property area.

(6) Consistent with the requirements of 14 CCR § 916.9(g), 14 CCR § 936.9(g), or 14 CCR § 956.9(g); protect, maintain, and restore the quality and quantity of vegetative canopy needed to: (A) provide shade to the watercourse or lake, (B) minimize daily and seasonal temperature fluctuations, (C) maintain daily and seasonal water temperatures within the preferred range for anadromous salmonids or listed species where they are present or could be restored, and (D) provide hiding cover and a food base where needed. There are no watercourses on or adjacent to the project or the property area.

(7) Result in no substantial increases in peak flows or large flood frequency. There are no watercourses on or adjacent to the project area or the property. "The Proposed Project would result in a slight decrease in both the peak discharge and volume of surface runoff at the property." **Findings (DRAFT EIR page 4.9-17)**

916(b)

Pre-plan adverse cumulative watershed effects on the populations and habitat of anadromous salmonids shall be considered. The plan shall specifically acknowledge or refute that such effects exist. When the proposed timber operations, in combination with any identified pre-plan watershed effects, will add to significant adverse existing cumulative watershed effects, the plan shall set forth measures to effectively reduce such effects.
Pre-plan adverse cumulative watershed effects presently exist on populations and habitat of anadromous salmonids. These adverse impacts include sediment transport and habitat degradation. The plan as proposed does not increase the offsite transportation of sediment. Per the analysis based on the ECP, no net increase in sediment transport can be expected. No additional measures are needed. The plan as proposed will have no significant adverse cumulative watershed effects.

916.9(c)

Objectives for timber operations or Silvicultural prescriptions in WLPZs - Any timber operation or silvicultural prescription within any watercourse or lake protection zone shall have protection, maintenance, or restoration of the beneficial uses of water, and properly functioning salmonid habitat and listed aquatic or riparian-associated species as significant objectives. Specific objectives are described below. No timber operations or silvicultural prescriptions are proposed in any WLPZ. There are no watercourses on or adjacent to the project or the property area.

Significant Objectives

The project is located in the Conn Creek watershed a tributary of the Napa River Watershed, a watershed where populations of anadromous salmonids are listed as threatened, endangered, or candidate under the State or Federal Endangered Species Acts. Protection, maintenance, or restoration of the beneficial uses of water or the populations and habitat of anadromous salmonids or listed aquatic or riparian-associated species is a significant objective of this plan.

Present condition

The THP area is naturally disconnected from downslope waterways due to the hydrogeology, soils, vegetation, and topography of the hilltop; all sediment and runoff generated on the hilltop flow to three natural swales on the property and infiltrate in the forest floor, and do not affect downstream waterways (Trso, 2013). See **DRAFT EIR page 4.9**

Objectives and mitigations: the following have been considered and proposed to minimize impacts to downstream waterways and thereby impacts to downstream anadromous fisheries habitat.

1. Reduce the transport of sediment by application of an Engineered Erosion Control Plan.
   The ECP proposes a permanent cover crop, non-tilled vineyard, earth berm spreaders, rock slope protection and detention ponds. These best management practices along with the fact that the project area is hydrologically disconnected from downstream water sources reduce the availability of sediment to transport into any downstream water system. The ECP proposes non tillage, a permanent cover crop and detention ponds. These practices will reduce the production of sediment by minimizing soil disturbance and retaining sediment onsite.

   Analysis of the USLE shows soil loss to be less for the post project than pre project due to implementation of ECP measures and mitigation measures. See the **DRAFT EIR section 4.6 and 4.9**

2. Reduce the impacts of potential water runoff by application of the ECP.
   The ECP proposes a permanent cover crop and non-tilled vineyard, straw waddles, rock slope protection, earth berm spreaders and detention ponds to reduce water concentration, encourage sheet flow of storm water and detain water in detention ponds to increase infiltration, reduce sediment transport and meter water out flow during the winter period.

   Analysis of the TR-55 model show no increase in hydrologic flow as a result of implementation of the ECP, See the **DRAFT EIR section 4.6 and 4.9.**

3. Reduce potential for chemical pollutants to enter down stream watercourse by application of an Sustainable Pest Management Plan and best management practices.

The vineyard proposes a Sustainable Integrated Pest Management Plan and application of Best Management Practices approved by Napa County. Impacts to down stream watercourses as a result of chemical use will be reduced and/or eliminated. See IPM **Appendix J of the DRAFT EIR**. **THP Mitigation #4**

27. Are site specific practices proposed in-lieu of the following standard WLPZ practices?

a. [ ] Yes [**X**] No Prohibition of the construction or reconstruction of roads, construction or use of tractor roads or landings in Class I, II, III, or IV watercourses, WLPZs, marshes, wet meadows, and other wet areas except as follows:
   (1) At prepared tractor road crossings.
   (2) Crossings of Class III watercourses which are dry at time of timber operations.
   (3) At existing road crossings.
   (4) At new tractor and road crossings approved by Department of Fish and Game.

b. [ ] Yes [**X**] No Retention of non-commercial vegetation bordering and covering meadows and wet areas?

c. [ ] Yes [**X**] No Directional felling of trees within the WLPZ away from the watercourse or lake?

d. [ ] Yes [**X**] No Decrease of width(s) of the WLPZ(s)?

e. [ ] Yes [**X**] No Protection of watercourses which conduct class IV waters?

f. [ ] Yes [**X**] No Exclusion of heavy equipment from the WLPZ except as follows:
   (1) At prepared tractor road crossings.
   (2) Crossings of Class III watercourses which are dry at time of timber operations.
   (3) At existing road crossings.
   (4) At new tractor and road crossings approved by Department of Fish and Game.

g. [ ] Yes [**X**] No Establishment of ELZ for Class III watercourses unless sideslopes are <30% and EHR is low?

h. [ ] Yes [**X**] No Retention of at least 50% of the overstory canopy in the WLPZ?

i. [ ] Yes [**X**] No Retention of at least 50% of the understory in the WLPZ?

j. [ ] Yes [**X**] No Are any additional in-lieu or any alternative practices proposed for watercourse or lake protection?

NOTE: A yes answer to any of items "a." through "j." constitutes an in-lieu practice. If any item is answered yes, refer to 14 CCR 916.1 (936.1, 956.1) and address the following for each item checked yes:

1. The RPF shall state the standard rule;
2. Explain and describe each proposed practice;
3. Explain how the proposed practice differs from the standard practice;
4. The specific location where it shall be applied, see map requirements of 14 CCR 1034 (x) (15) and (16);
5. Provide in THP Section III an explanation and justification as to how the protection provided is equal to the standard rule and provides for the protection of the beneficial uses of water, as per 14 CCR 916 (936, 956) .1 (a). Reference the in-lieu and location to the specific watercourse to which it will be applied.

28. a. [**X**] Yes [ ] No Are there any landowners within 1000 feet downstream of the THP boundary whose ownership adjoins or includes a class I, II, or IV watercourse(s) which receives surface drainage from the proposed timber operations? If yes, the requirements of 14 CCR 1032.10 apply. Proof of notice by letter and newspaper should be included in THP Section V. If No, "28 b." need not be answered.

b. [ ] Yes [**X**] No Is an exemption requested of the notification requirements of 14 CCR 1032.10? If yes, an explanation and justification for the exemption must appear in THP Section III. Specify if requesting an exemption from the letter, the newspaper notice or both.

c. [ ] Yes [**X**] No Was any information received on domestic water supplies that required additional mitigation beyond that required by standard Watercourse and Lake Protection rules? If yes, list site specific measures to be implemented by the LTO.

Notification was sent to all down stream landowners within 1000' of the project boundary. See **page 89 of the THP** for a list of downstream landowners. As of **3-1-2013** no responses have been received. See **page 90.1 of the THP** for copies of comment letters and responses from the RPF if any.

Notification was also sent to all landowners within 300 feet of the boundaries of the project area. See **page 89 of the THP** for a list of adjacent landowners. As of **3-1-2013** no response has been received. See **page 90.1 of the THP** for copies of comment letters and responses from the RPF if any.

A legal notice was placed in the Napa Valley Register on 2-16-2013, see **page 94** for verification.

29. [ ] Yes [**X**] No Is any part of the THP area within a Sensitive Watershed as designated by the Board of Forestry and Fire Protection? If yes, identify the watershed and list any special rules, operating procedures or mitigation that will be used to protect the resources identified at risk?

HAZARD REDUCTION

30. a. [ ] Yes [**X**] No Are there roads or improvements which require slash treatment adjacent to them? If yes, specify the type of improvement, treatment distance, and treatment method.

b. [ ] Yes [**X**] No Are any alternatives to the rules for slash treatment along roads and within 200 feet of structures requested? If yes, RPF must explain and justify how alternative provides equal fire protection. Include a description of the alternative and where it will be utilized below.

Slash clean up

All slash created by this harvest operation will be mulched, chipped, burned or removed from the site, i.e. firewood. Mulch will be spread on the forest floor as part of the ECP

THP Mitigation #13 BMP's (DRAFT EIR mitigation 4.8-1, page 4.8-7) see THP **page 42**

In addition to the erosion control measures described in Section 3.0 of the DRAFT EIR, personnel shall follow written BMP's for filling and servicing construction equipment and vehicles. The BMP's which are designed to reduce the potential for incidents involving hazardous materials , shall include:

- Refueling shall be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans shall be placed under equipment to catch potential spills during servicing.
- All disconnected hoses shall be placed in containers to collect residual fuel from the hose.
- Vehicle engines shall be shut down during refueling.
- No smoking, open flames, or welding shall be allowed in refueling or service areas.
- Refueling and all construction work shall be performed outside of any onsite stream buffer zones to prevent contamination of water in the event of a leak or spill.
- Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents.
- A spill containment kit that is recommended by the Napa County Department of Environmental Management or local FIRE department will be onsite and available to staff if a spill occurs.

In the event that contaminated soil and/or groundwater or other hazardous materials are generated or encountered during construction, all work shall be halted in the affected area and the type and extent of the contamination shall be determined. Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with federal, state, and local regulations. If containment and size of the spill is beyond the scope of the contractor, proper authorities shall be notified. The potential release of hazardous materials during construction of the Proposed Project is reduced to less than significant with the implementation of the mitigation measure above.

THP mitigation #14, Certified Pest Applicator (DRAFT EIR Mitigation 4.8-2 page 4.8-8) **THP page 42**

In the event pesticides are used onsite, only a certified pest applicator shall apply the pesticides and personnel shall follow Standard Operating Procedures (SOPs) when applying chemicals to the vineyard. SOPs for pesticide use, shall include the following:

- Purchase only enough pesticide that would be used per season.
- All chemicals will be stored in their original containers.
- Labels on the containers will not be removed.
- Chemicals will be kept in a well-ventilated locked area.
- Chemical storage areas will be 100 feet from any drainage area, stream, or groundwater well.

- If a chemical must be disposed of, contact the Napa County Agricultural Commissioner to locate a hazardous waste facility for proper disposal.
- Chemicals will never be poured down the sink, toilet, or stream.
- Proper personal protection equipment will be utilized when working with chemicals.

Implementation of the mitigation measure above reduces potential impacts from improper chemical use and storage to a less than significant level.

THP Mitigation 15, Hazardous Materials (DRAFT EIR mitigation 4.8-3 page 4.8-9) **THP page 43**

In addition to mitigation measure 4.8-1 and 4.8-2, fuel loading and chemical mixing areas should be established outside the proposed set backs and away from any areas that could potentially drain off site or potentially affect surface and groundwater quality. When farm equipment is cleaned at the existing facility, only rinse water that is free of gasoline residues, pesticides and other chemicals, and waste oils should be allowed to diffuse back into vineyard areas. In the event pesticides, herbicides or fungicides are used, all rinse water from farm equipment and rinse water from application equipment used to apply chemicals should be collected and stored in containers that are of sufficient size to contain the water until hazardous materials transporter can remove the rinse water. No rinse water shall be drained to a septic system or discharged to ground or surface water to prevent the release of hazardous materials into the environment during operation and maintenance of the proposed project. Impacts after mitigating would be less than significant.

31. [**X**] Yes [ ] No Will piling and burning be used for hazard reduction? See 14 CCR 917.1-.11, 937.1-.10, or 957.1-.10, for specific requirements. Note: LTO is responsible for slash disposal. This responsibility cannot be transferred.

The LTO is responsible for all slash disposal.

BIOLOGICAL AND CULTURAL RESOURCES

32. a. [**X**] Yes [ ] No Are any plant or animal species, including their habitat, which are listed as rare, threatened or endangered under federal or state law, or a sensitive species by the Board, associated with the THP area? If yes, identify the species and the provisions to be taken for the protection of the species.

b. [ ] Yes [**X**] No Are there any non-listed species which will be significantly impacted by the operation? If yes, identify the species and the provisions to be taken for the protection of the species.

NOTE: See THP Form Instructions or the CDF Mass Mailing, 07/02/1999, section on "CDF Guidelines for Species Surveys and Mitigations" to complete these questions.

Botanical and Biological Resources

A detailed scoping process has been performed for the assessment of impacts related to the proposed project. This process is included in the DRAFT EIR and in the biological report. See attached **DRAFT EIR Section 4.4, page 4.4-1**. A description of the scoping process can be found in the Biological Report.

Findings:

- The project footprint is within conifer woodlands, annual grasslands and ruderal acreage.
- No special-status plants or animal species were observed during floristic surveys of the property. The habitat types present and historic use of the property, as well as field results, concludes that the proposed project will have a less than significant impact on local or regional special-status species;
- No sensitive wildlife species were detected on the project site. No nesting raptors were observed;
- Northern Spotted Owl (NSO) surveys were conducted according to USFWS and Cal- Fire protocol. (See Attached NSO Survey). According to the data base there are two known NSO territory within 1.5 miles of the proposed Timber Conversion. Timber operations will not result in the take of these owls;
- The proposed project will not impact any riparian vegetation, or have a substantial adverse effect on Sensitive Natural Communities regulated by the California Department of Fish and Game, US Fish and Wildlife Service, or Napa County sensitive biotic communities;
- The project will not significantly reduce bat roosting/breeding habitat;
- The proposed project will not impact any federal or state protected wetlands, drainages, or vernal pools as defined by section 404 of the Clean Water Act;
- The proposed project will not substantially interfere with native wildlife species, migratory corridors, and/or native wildlife nursery sites. Habitat loss for species listed by the Department of Fish and Game Wildlife Habitat Relationships system will be less than significant;
- The DFG California Natural Diversity Data Base five-mile search does not show any records of special-status species for the property or confidence interval overlaps on the property;
- The are no significant biological resources on the property.
- There is no evidence to indicate that the project will significantly result in wildlife habitat loss, impact any of the regional special-status species, or result in the loss of sensitive or critical habitat.

Assessment of Impacts and mitigation measures.

The DRAFT EIR proposes the following four mitigations to reduce impacts. See detail in the **DRAFT EIR page 4.4-43**.

THP Mitigation #6, Raptor Surveys (DRAFT EIR Mitigation Measure 4.4-1, page 4.4-44), See **THP page 45**

The Applicant shall implement the following measures to avoid disturbing any special status bird species nesting on the project parcel.

1. Vegetation removal conducted during the nesting period (February 1 through August 31) shall require a pre-construction survey for active bird nests, conducted by a qualified biologist.
2. Surveys for nesting birds should be conducted within 14 days prior to tree removal and/or ground breaking activities. A qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. If active bird nests are found during pre-construction surveys, a 500 foot no-disturbance buffer shall be created around active nests during the breeding season or until it is determined that all young have fledged.
3. If a lapse in project-related work of 15 days or longer occurs, another focused nesting bird survey will be required before project work can be reinitiated.

THP Mitigation #7, NSO (DRAFT EIR Mitigation Measure 4.4-2 page 4.4-44), See **THP page 45**

While there are two northern spotted owl activity centers (NP28 and NP29) within 1.5 miles, there are no activity centers located within 0.7 miles of the project parcel (Town, 2013). Northern spotted owl take avoidance will be achieved via compliance with California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention. These activity centers are located greater than 1,000 feet from the project parcel; additionally, as discussed above in Section 4.4.4-8 NP28 has not been reported as active for more than 10 to 15 years (ERM, 2013).

All information regarding northern spotted owl shall be submitted to CAL FIRE, and annual operations will not commence until a take avoidance letter has been obtained from CAL FIRE and amended into the THP. Protocol survey calling procedures shall follow the revised (January 9, 2012) *Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owl* (USFWS, 2012).

The Applicant shall implement the following measures to avoid take of the northern spotted owl (USFWS, 2012):

1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan.
2. No harvesting of trees shall occur until NP29 is detected/located within their historic activity center during the year of planned timber harvest activities. The owl's activity center is located on private project parcel; therefore, daytime monitoring of the owl may not be possible due to access issues. If the owl is not detected within their historic activity centers, the project parcel must be surveyed according to the current acceptable NSO protocol.
3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NP29. The activity centers for NP29 are further than 1/4 mile from the THP boundary; therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the project parcel boundary, the following seasonal restrictions may be applied by CAL FIRE.

a. Seasonal Restrictions: No operations from February 1 to July 30 within ¼ mile of the activity centers of NP29, except on the use of existing roads.

THP Mitigation #8, Bat Surveys (DRAFT EIR Mitigation Measure 4.4-3, page 4.4-46), See **THP page 46**
Pre-construction surveys for bats shall be conducted two to three days prior to tree removal. If bats are discovered during the surveys then a buffer of 100 to 150 feet will be established. Optimal time to remove trees is September 15 to October 15 and February 15 to April 1. Pre-construction surveys shall also focus on habitat adjacent to the Proposed Project.

THP Mitigation #9, HRA (DRAFT EIR Mitigation Measure 4.4-4, page 4.4-47), See **THP page 46**
Potential impacts of habitat fragmentation to forested habitat onsite would be reduced to a less than significant level through a combination of onsite avoidance, protection, and enhancement of retained forested areas outside of the 17± acre THP footprint.

A habitat retention area (HRA) will be designated onsite for the remainder of the southern portion of the project parcel outside of the 17± acre THP footprint (refer to Figure 4.4-1). The creation of a habitat retention area (totaling 16.5± acres) would allow for the retention of approximately 11.94 acres of Douglas Fir-Ponderosa Pine habitat and the entirety of the 4.58 acres of oak woodland habitat onsite (Figure 4.4-1). Numerous enhancement techniques would be employed throughout the habitat retention area to improve the quality of forest habitat on the property for wildlife. These techniques include the careful placement of slash piles, snags, and large woody debris on the forest floor as well as the installation of nest boxes on trees for songbirds and roosting boxes for bats. Brush piles, tree branches and small downed trees will be used to create shelter habitat for small mammals and birds. Mulch may also be used to improve the groundcover within the forested areas onsite.

Anadromous Fisheries

Potential downstream impact does exist for anadromous fisheries. See Anadromous Salmonid Protection section in **Appendix D page 4.32**

Onsite review of the project by the Biologist and the Forester find potential for impact to rate threatened or endangered species unless the above mitigation is incorporated in the plan. Mitigations proposed for species considered have been applied and reduce impacts to negligible if not none. The project as proposed will not have any significant impact on rare, threatened or endangered species.

33. [ ] Yes [**X**] No Are there any snags which must be felled for fire protection or safety reasons? If yes, describe which snags are going to be felled and why.

Snags

Snags and other live trees have been designated to be retained for wildlife within the balance of the landowners parcel. No harvest has been proposed in these areas. Snags which pose an immediate threat to workers safety will be felled**.**

34. [ ] Yes [**X**] No Are any Late Succession Forest Stands proposed for harvest? If yes, describe the measures to be implemented by the LTO that avoid long-term significant adverse effects on fish, wildlife and listed species known to be primarily associated with late succession forests.

35. [ ] Yes [**X**] No Are any other provisions for wildlife protection required by the rules? If yes, describe.

36. a. [**X**] Yes [ ] No Has an archaeological survey been made of the THP area?

b. [**X**] Yes [ ] No Has a current archaeological records check been conducted for the THP area?

c. [ ] Yes [**X**] No Are there any archaeological or historical sites located in the THP area? Specific site locations and protection measures are contained in the Confidential Archaeological Addendum in Section VI of the THP, which is not available for general public review.

Cultural Resources

During the course of plan preparation an Archaeological Survey Report and Confidential Archaeological Addendum (CAA**)** were prepared by Tom Origer and Associates. This included a scoping process of the following resources. **See the CAA, Draft EIR Appendix K**

See section 4.5-1 of the DRAFT EIR for a detailed discussion of the Archaeology and the CAA

- Archival research of library and project files of Tom Origer and Associates.
- An Archaeological records check with the Northwest information center/
- Native American Consultation.
- Pre-field research.
- An Archaeological survey performed by Tom Origer and Associates.

Survey Results

No cultural sites were found.

Potential Impacts and mitigations

THP Mitigation #10, Archaeology (Mitigation Measure 4.5-1, page 4.5-11), See THP page 47

There is a possibility that unanticipated subsurface archaeological deposits may exist within the proposed vineyard areas, as archaeological sites may be buried with no surface manifestation, or may be obscured by vegetation. In accordance with CEQA *Guidelines* Section 15064.5 (f), should any previously unknown prehistoric or historic resources, such as, but not limited to, obsidian and chert flaked-stone tools or tool making debris; shellfish remains, stone milling equipment, concrete, or adobe footings, walls, filled wells or privies, deposits of metal, glass, and/or ceramic refuse be

encountered during onsite construction activities, earthwork within 100 feet of these materials shall be stopped and the Applicant shall consult with a professional archaeologist. Once the archaeologist has had the opportunity to evaluate the find he/she shall consult the local CAL FIRE Archaeologist regarding the results of the evaluation and appropriate site treatment options, as necessary. Said measures shall be carried out prior to any resumption of related ceased earthwork. All significant cultural resource materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards and a copy of the draft report provided to the local CAL FIRE Archaeologist for review and approval prior to finalization of it.

THP Mitigation #11, Archaeology (DRAFT EIR Mitigation Measure 4.5-2, page 4.5-11), See **THP page 48**
In the event that human remains are discovered, the provisions of the California Health and Safety Code Section 7050.5 (b) shall be followed, including contacting the Napa County Coroner within 24 hours of the find. Upon determining the remains as being Native American in origin, the Coroner would be responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The NAHC has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant (MLD), who is designated by the NAHC. Implementation of this mitigation measure would reduce this impact to less than significant.

Post Review Site Discovery Procedures: 14 CCR 929.3, Mitigation Measure 4.5-3

If a person discovers a potentially significant archaeological or historical site after a plan, Emergency Notice, or Exemption is accepted by the Director, the following procedures apply:

(a) The person who made the discovery shall immediately notify the Director, LTO, RPF, or timberland owner of record.
(b) The person first notified in (a) shall immediately notify the remaining parties in (a).
(c) No timber operations shall occur within 100 feet of the identified boundaries of the new site until the plan submitter proposes, and the Director agrees to, protection measures pursuant to 14 CCR Sec. 929.2 (949.2,969.2).
(d) A minor deviation shall be filed to the plan. The minimum information provided shall include:
    (1) A statement that the information is confidential.
    (2) The mapped location of the site.
    (3) A description of the site.
    (4) Protection measures, and
    (5) Site records, if site records are required pursuant to 14 CCR Sec. 929.l (g) (Z) (b) and 929.5 I949.5, 969.51.
(e) Upon receipt, the Director shall immediately provide the proposed minor deviation or portions of the minor deviation, to Native Americans when Native American archaeological or cultural sites are involved.

37. [ ] Yes [**X**] No Has any inventory or growth and yield information designated "trade secret" been submitted in a separate confidential envelope in Section VI of this THP?

38. Describe any special instructions or constraints that are not listed elsewhere in Section II.

List of general mitigations, responsibilities and reminders for LTO, this list is not all inclusive.

Copies of ECP, THP and TCP must be available onsite at all times.

For compliance purposes a complete copy of the Erosion Control Plan, Timber Harvest Plan and Timber Conversion Plan must be available onsite at all times activities covered under these permits are taking place.

THP Mitigation #1, Completion meeting. See **THP page 4**

There shall be a meeting at the end of timber harvesting operations between the RPF, LTO and the vineyard manager to discuss each person's responsibilities when logging is complete. CDF and any other reviewing agency may be invited to this meeting.

THP Mitigation #2, SOD Mitigation, See **THP page 14**

1. RPF (or LTO for most Exemptions) should inform personnel that they are working in an area with Sudden Oak Death disease, unauthorized movement of plant material is prohibited, and the intent of mitigation measures is to prevent disease spread (14 CCR 1035.2). If some sites in the general operating area are found to be disease-free or have a low incidence of disease, consider initiating operations on these sites before moving to more heavily infested sites.
2. To the extent practical and feasible, route equipment away from host plants and trees, especially in areas with disease symptoms. Locate landings, log decks, logging roads, tractor roads, and other sites of equipment activity away from host plants, especially areas with disease symptoms.
3. Each time equipment or vehicles leave the site, the equipment or vehicles should be inspected by operations personnel for host plant debris (leaves, twigs, and branches). Host plant debris should be removed from equipment and vehicles prior to their departure. This applies to all equipment and vehicles associated with the operation, including logging equipment, log-hauling trucks, pick-up trucks, employee's personal vehicles, etc. An exception will be granted for equipment or vehicles that leave the site temporarily and will be not be traveling to uninfested areas prior to their return.
4. Conduct operations during the dry season. Utilize paved and rocked roads and landings to the extent possible.
5. After working in an infested area, remove or wash off accumulations of soil, mud, and organic debris from shoes, boots, vehicles and heavy equipment, etc. before traveling to an area that is not infested with Sudden Oak Death. Lysol® or a bleach solution can be used to disinfect shoes and boots after cleaning.
6. Inspect loads of logs and equipment leaving the site to ensure that no host material is being transported without a permit. This may require cleaning mud from vehicle to remove host plant material imbedded in mud depending on conditions when the timber harvest is conducted. Consider establishing an equipment power wash station. The station should be: located within the generally infested area, paved or rocked, well drained so that vehicles exiting the station do not become contaminated by the wash water, located where wash water and displaced soil does not have the potential to carry fines to a watercourse (see "Saturated Soil Conditions" in 14 CCR 895.1), pay particular attention to sites where soil and organic debris may accumulate.

THP Mitigation #3, Pine Slash reduction, see **THP page 19**

Pine Slash Hazard Reduction Mitigations implemented under this THP/Conversion

Treatment of Pine slash as directed by Board Of Forestry Technical Rule Addendum No. 3. See **THP page 18** for details.

THP Mitigation #4, Integrated Pest Management Plan, **See THP page 20**

Implementation of the Integrated Pest Management Plan, see **the DRAFT EIR section 4.8.1-2 and the IPM Appendix J.**

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THP Mitigation #5, Erosion Control Plan (DRAFT EIR Mitigation Measure 4.6-1 page 4.6-12), **See THP page 33**

Implement all aspects of the Napa County Erosion Control plan (File #P-05-0376 ECPA) in order to meet Napa County Conservation Regulations

THP Mitigation #6, Raptor Surveys (DRAFT EIR Mitigation Measure 4.4-1, page 4.4-44), See **THP page 45**

The Applicant shall implement the following measures to avoid disturbing any special status bird species nesting on the project parcel.

1. Vegetation removal conducted during the nesting period (February 1 through August 31) shall require a pre-construction survey for active bird nests, conducted by a qualified biologist.
2. Surveys for nesting birds should be conducted within 14 days prior to tree removal and/or ground breaking activities. A qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat for birds within 500 feet of earthmoving activities. If active bird nests are found during pre-construction surveys, a 500 foot no-disturbance buffer shall be created around active nests during the breeding season or until it is determined that all young have fledged.
3. If a lapse in project-related work of 15 days or longer occurs, another focused nesting bird survey will be required before project work can be reinitiated.

THP Mitigation #7, NSO (DRAFT EIR Mitigation Measure 4.4-2 page 4.4-44), See **THP page 45**

While there are two northern spotted owl activity centers (NP28 and NP29) within 1.5 miles, there are no activity centers located within 0.7 miles of the project parcel (Town, 2013). Northern spotted owl take avoidance will be achieved via compliance with California Forest Practice Rule 14 CCR 919.9(e) Scenario 4: Avoidance of Disturbance and Direct Take through Habitat Retention. These activity centers are located greater than 1,000 feet from the project parcel; additionally, as discussed above in Section 4.4.4-8 NP28

has not been reported as active for more than 10 to 15 years (ERM, 2013).

All information regarding northern spotted owl shall be submitted to CAL FIRE, and annual operations will not commence until a take avoidance letter has been obtained from CAL FIRE and amended into the THP. Protocol survey calling procedures shall follow the revised (January 9, 2012) *Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owl* (USFWS, 2012).

The Applicant shall implement the following measures to avoid take of the northern spotted owl (USFWS, 2012):

1. No timber operations shall occur until such time as a current years' NSO survey (following the appropriate and most current NSO survey protocol) has been completed, the results have been provided to the appropriate agency, and the results of a take avoidance determination has been incorporated into the plan.

2. No harvesting of trees shall occur until NP29 is detected/located within their historic activity center during the year of planned timber harvest activities. The owl's activity center is located on private project parcel; therefore, daytime monitoring of the owl may not be possible due to access issues. If the owl is not detected within their historic activity centers, the project parcel must be surveyed according to the current acceptable NSO protocol.
3. No timber harvest operations other than the use of existing roads will occur within 1,000 feet of the activity centers of NP29. The activity centers for NP29 are further than 1/4 mile from the THP boundary; therefore, at this time, no seasonal or harvest restrictions apply. However, if the activity center moves within 1/4 mile of the project parcel boundary, the following seasonal restrictions may be applied by CAL FIRE.

    a. Seasonal Restrictions: No operations from February 1 to July 30 within ¼ mile of the activity centers of NP29, except on the use of existing roads.

THP Mitigation #8, Bat Surveys (DRAFT EIR Mitigation Measure 4.4-3, page 4.4-46), See **THP page 46**
Pre-construction surveys for bats shall be conducted two to three days prior to tree removal. If bats are discovered during the surveys then a buffer of 100 to 150 feet will be established. Optimal time to remove trees is September 15 to October 15 and February 15 to April 1. Pre-construction surveys shall also focus on habitat adjacent to the Proposed Project.

THP Mitigation #9, HRA (DRAFT EIR Mitigation Measure 4.4-4, page 4.4-47), See **THP page 46**
Potential impacts of habitat fragmentation to forested habitat onsite would be reduced to a less than significant level through a combination of onsite avoidance, protection, and enhancement of retained forested areas outside of the 17± acre THP footprint.

A habitat retention area (HRA) will be designated onsite for the remainder of the southern portion of the project parcel outside of the 17± acre THP footprint (refer to Figure 4.4-1). The creation of a habitat retention area (totaling 16.5± acres) would allow for the retention of approximately 11.94 acres of Douglas Fir-Ponderosa Pine habitat and the entirety of the 4.58 acres of oak woodland habitat onsite (Figure 4.4-1). Numerous enhancement techniques would be employed throughout the habitat retention area to improve the quality of forest habitat on the property for wildlife. These techniques include the careful placement of slash piles, snags, and large woody debris on the forest floor as well as the installation of nest boxes on trees for songbirds and roosting boxes for bats. Brush piles, tree branches and small downed trees will be used to create shelter habitat for small mammals and birds. Mulch may also be used to improve the groundcover within the forested areas onsite.

THP Mitigation #10, Archaeology (Mitigation Measure 4.5-1, page 4.5-11), See **THP page 47**
There is a possibility that unanticipated subsurface archaeological deposits may exist within the proposed vineyard areas, as archaeological sites may be buried with no surface manifestation, or may be obscured by vegetation. In accordance with CEQA *Guidelines* Section 15064.5 (f), should any previously unknown prehistoric or historic resources, such as, but not limited to, obsidian and chert flaked-stone tools or tool making debris; shellfish remains, stone milling equipment, concrete, or adobe footings, walls, filled wells or privies, deposits of metal, glass, and/or ceramic refuse be encountered during onsite construction activities, earthwork within 100 feet of these materials shall be stopped and the Applicant shall consult with a professional archaeologist. Once the archaeologist has had the opportunity to evaluate the find he/she shall consult the local CAL FIRE Archaeologist regarding the results of the evaluation and appropriate site treatment options, as necessary. Said measures shall be carried out prior to any resumption of related ceased earthwork. All significant cultural resource materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards and a copy of the draft report provided to the local CAL FIRE Archaeologist for review and approval prior to finalization of it.

THP Mitigation #11, Archaeology (DRAFT EIR Mitigation Measure 4.5-2, page 4.5-11), See **THP page 48**

In the event that human remains are discovered, the provisions of the California Health and Safety Code Section 7050.5 (b) shall be followed, including contacting the Napa County Coroner within 24 hours of the find. Upon determining the remains as being Native American in origin, the Coroner would be responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. The NAHC has various powers and duties to provide for the ultimate disposition of any Native American remains, as does the assigned Most Likely Descendant (MLD), who is designated by the NAHC. Implementation of this mitigation measure would reduce this impact to less than significant.

Post Review Site Discovery Procedures: 14 CCR 929.3, Mitigation Measure 4.5-3

If a person discovers a potentially significant archaeological or historical site after a plan, Emergency Notice, or Exemption is accepted by the Director, the following procedures apply:

a) The person who made the discovery shall immediately notify the Director, LTO, RPF, or timberland owner of record.
b) The person first notified in (a) shall immediately notify the remaining parties in (a).
c) No timber operations shall occur within 100 feet of the identified boundaries of the new site until the plan submitter proposes, and the Director agrees to, protection measures pursuant to 14 CCR Sec. 929.2 (949.2,969.2).
d) A minor deviation shall be filed to the plan. The minimum information provided shall include:
    1. A statement that the information is confidential.
    2. The mapped location of the site.
    3. A description of the site.
    4. Protection measures, and
    5. Site records, if site records are required pursuant to 14 CCR Sec. 929.l (g) (Z) (b) and 929.5 I949.5, 969.51.
e) Upon receipt, the Director shall immediately provide the proposed minor deviation or portions of the minor deviation, to Native Americans when Native American archaeological or cultural sites are involved.

THP Mitigation #12, Dust Abatement (DRAFT EIR Mitigation Measure 4.3-1, see page 4.3-8) see **THP page 24**

The Applicant shall implement a fugitive dust abatement program during the construction of the county ECP #P05-0376-ECPA, which shall include the following elements:

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Cover all exposed stockpiles.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent paved streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

In addition to the above measures, the Applicant shall also implement the required basic construction mitigation measures as recommended by the BAAQMD during the construction of the Proposed Project, which shall include the following elements:

- All exposed surfaces (e.g., parking areas, staging areas, and unpaved access roads) shall be watered as needed to ensure dust abatement.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- All heavy duty construction equipment shall be fitted with diesel particulate matter filters and use only aqueous diesel fuel.

The measures above are in addition to the permanent erosion control measures specified in #P05-0376-ECPA, which include establishing a permanent no till cover crop on all disturbed areas. As shown in **Table 4.3-3**, construction of the Proposed Project would not exceed the BAAQMD criteria pollutant threshold. The permanent erosion control measures would avoid the creation of nuisance dust and PM_{10} during operation of the Proposed Project, which would reduce these potentially significant impacts to a less than significant level. These measures are additive to those required during the timber harvest prior to conversion.

THP Mitigation #13, BMP's (DRAFT EIR mitigation 4.8-1, page 4.8-7) see THP **page 42**

In addition to the erosion control measures described in Section 3.0 of the DRAFT EIR, personnel shall follow written BMP's for filling and servicing construction equipment and vehicles. The BMP's which are designed to reduce the potential for incidents involving hazardous materials , shall include:

- Refueling shall be conducted only with approved pumps, hoses, and nozzles.
- Catch-pans shall be placed under equipment to catch potential spills during servicing.
- All disconnected hoses shall be placed in containers to collect residual fuel from the hose.
- Vehicle engines shall be shut down during refueling.

- No smoking, open flames, or welding shall be allowed in refueling or service areas.
- Refueling and all construction work shall be performed outside of any onsite stream buffer zones to prevent contamination of water in the event of a leak or spill.
- Service trucks shall be provided with fire extinguishers and spill containment equipment, such as absorbents.
- A spill containment kit that is recommended by the Napa County Department of Environmental Management or local FIRE department will be onsite and available to staff if a spill occurs.

In the event that contaminated soil and/or groundwater or other hazardous materials are generated or encountered during construction, all work shall be halted in the affected area and the type and extent of the contamination shall be determined. Should a spill contaminate soil, the soil shall be put into containers and disposed of in accordance with federal, state, and local regulations. If containment and size of the spill is beyond the scope of the contractor, proper authorities shall be notified. The potential release of hazardous materials during construction of the Proposed Project is reduced to less than significant with the implementation of the mitigation measure above.

THP mitigation #14, Certified Pest Applicator (DRAFT EIR Mitigation 4.8-2 page 4.8-8) **THP page 42**

In the event pesticides are used onsite, only a certified pest applicator shall apply the pesticides and personnel shall follow Standard Operating Procedures (SOPs) when applying chemicals to the vineyard. SOPs for pesticide use, shall include the following:

- Purchase only enough pesticide that would be used per season.
- All chemicals will be stored in their original containers.
- Labels on the containers will not be removed.
- Chemicals will be kept in a well-ventilated locked area.
- Chemical storage areas will be 100 feet from any drainage area, stream, or groundwater well.
- If a chemical must be disposed of, contact the Napa County Agricultural Commissioner to locate a hazardous waste facility for proper disposal.
- Chemicals will never be poured down the sink, toilet, or stream.
- Proper personal protection equipment will be utilized when working with chemicals.

Implementation of the mitigation measure above reduces potential impacts from improper chemical use and storage to a less than significant level.

THP Mitigation 15, Hazardous Materials (DRAFT EIR mitigation 4.8-3 page 4.8-9) **THP page 43**

In addition to mitigation measure 4.8-1 and 4.8-2, fuel loading and chemical mixing areas should be established outside the proposed set backs and away from any areas that could potentially drain off site or potentially affect surface and groundwater quality. When farm equipment is cleaned at the existing facility, only rinse water that is free of gasoline residues, pesticides and other chemicals, and waste oils should be allowed to diffuse back into vineyard areas. In the event pesticides, herbicides or fungicides are used, all rinse water from farm equipment and rinse water from application equipment used to apply chemicals should be collected and stored in containers that are of sufficient size to contain the water until hazardous materials transporter can remove the rinse water. No rinse water shall be drained to a septic system or discharged to ground or surface water to prevent the release of hazardous materials into the environment during operation and maintenance of the proposed project. Impacts after mitigating would be less than significant.

THP Mitigation #16, Vehicle use (DRAFT EIR Mitigation 4.12-1, page 4.12-4) **THP page** 55

The following mitigation measures provided in the Timber Conversion Plan (**Appendix I**) shall be required for construction vehicles using off-site roadways during construction activities.

- All oversized construction vehicles are advised to use extreme caution when transporting milled lumber along county roads, especially in areas of limited site visibility.
- Oversized construction vehicles are to operate with headlights on for safety and are not to exceed 25 miles per hour while on rural county roads.
- Oversized vehicles are not to use Jake brakes in the immediate vicinity of residential neighborhoods.
- All construction activities are restricted to Monday through Saturday 7 am to 7 pm. No activities may take place on Sundays & holidays.
- To further ensure no significant traffic impacts, delivery and removal of heavy equipment and trucks, including those hauling lumber from the project site, will be limited to nonpeak hours.
- Signs indicating slow trucks entering the roadway will be placed at a distance of 300 feet in both directions of the project site if warranted.

THP mitigation #17, Winter operations, timber falling only.

No THP operations will take place during the winter period (defined for this THP as November 15th through Jan 31st) except for timber falling. The following limitations apply at all times during the winter period. **THP Mitigation #17,** page 55

1. No heavy equipment is allowed at any time.
2. Fallers vehicles will operate on rocked road surfaces at all times.
3. All aspects of the winter period operating plan found on the previous page are in effect.
4. Trees shall be felled to lead in a direction away from WLPZ, fencing and not allowed to fall outside of the project area.
5. Trees shall be felled in conformance with watercourse and lake protection measures incorporated in the timber harvesting plan and consistent with Article 6 of the rules.

CDF Approval Signature

This Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry and Fire Protection and the Forest Practice Act:

By: **See page 3 for signature** _____

(Signature) (Date)

_____ _____

(Printed Name) (Title)

SECTION III SUPPORT DOCUMENTATION

Non-operational information helpful or required for review

Project Description and Environmental Setting, see AES DRAFT EIR section 2-1

The Proposed Project is located on Las Posadas Road, approximately one mile southeast of the town of Angwin in northeast Napa County, California. The project site is situated within an unsectioned area of Township 8 North, Range 5 West of the Mount Diablo Baseline and Meridian (MDB&M) on the "Saint Helena, California," U.S. Geological Society (USGS) 7.5- minute quadrangle (quad). The project site is located within the Napa County assessor's parcel number (APN) 024-080-028. The property is located within the upper Conn Creek watershed (Calwater 2206.500305). Onsite elevations range from approximately 1,700 to 1,860 feet above mean sea level with up to 14 percent slopes, although the project site sits on a hilltop and is relatively flat.

Moore Creek is located approximately 2,700 feet to the east of the project site and Conn Creek lies approximately 2,900 feet to the west. Both Moore Creek and Conn Creek flow south into Lake Hennessey, which is approximately five miles south of the project site. The project site contains no U.S. Geological Survey (USGS) blue line streams, Class I, II, or III watercourses, or jurisdictional wetlands.

Between the 1940s and 1990s, the property was periodically logged and managed for timber production that involved localized thinning of the tree canopy and understory vegetation, additional clearcutting, and the subsequent conversion of the area to orchard and non-native grassland. As a result of historic timber operations, the hilltop project site supports only 12.8 acres of second-growth tree stands; there is little to no understory in the forested area. Evidence has been found of previous vineyard use on this site for approximately 20 years dating back to before Prohibition in the 1920s, before it was returned to timber management from the 1920s to present (Appendix F).

Napa County conservation regulations 48 and 50 (c) have been met by implementation of the ECP.

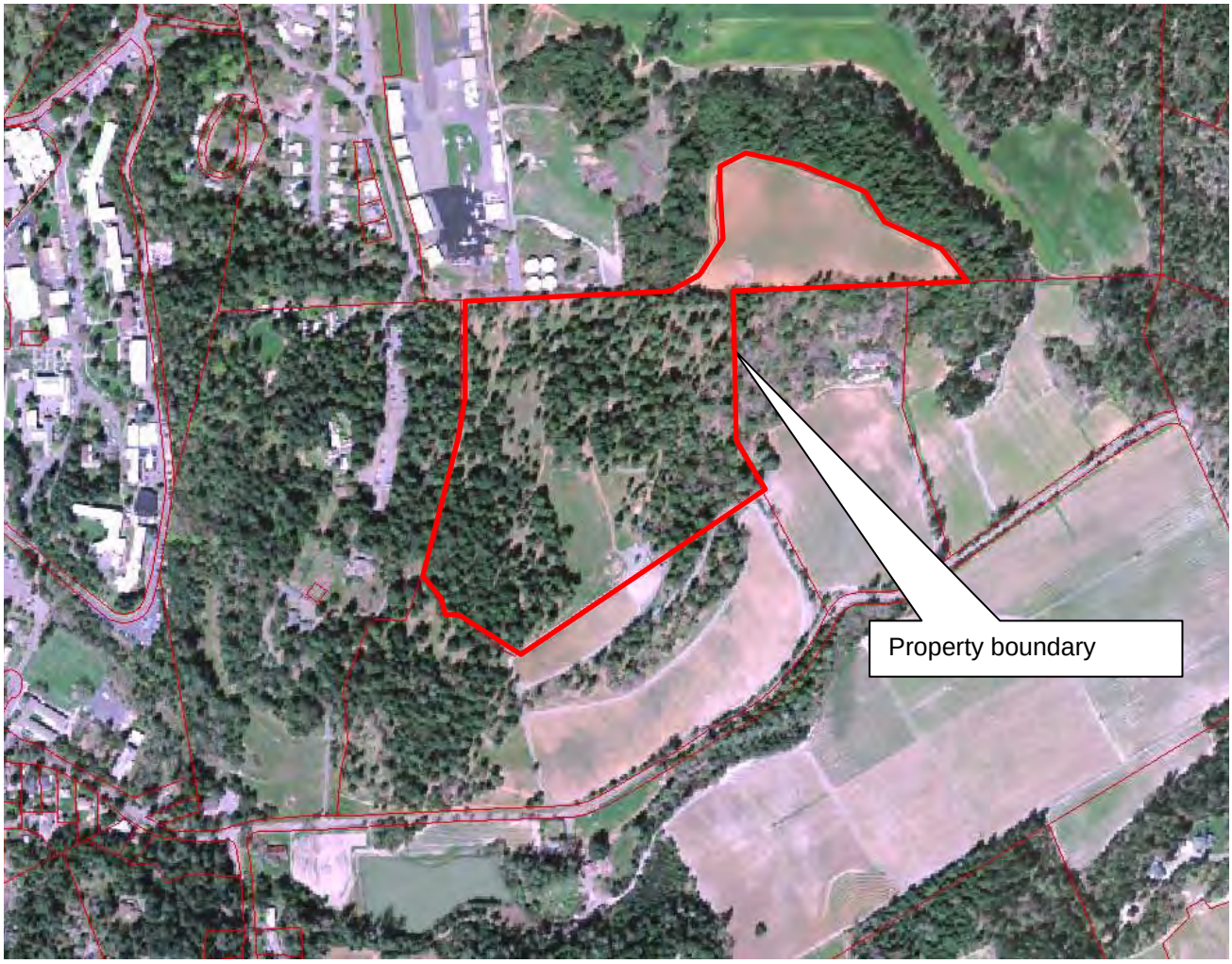
- Con reg 48 states "Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control…"
- Con reg 50 "The County shall require discretionary projects to meet performance standards designed to ensure peak runoff in 2-, 10-, 50-, and 100-year events following development is not greater than predevelopment conditions."

As a result of implementation of the Erosion Control Plan, post project sediment erosion conditions and peak hydrological runoff are projected to be below pre-project conditions. See **DRAFT EIR Appendix F Erosion, Sedimentation, and Hydrologic**

Assessment.

Approximately 12.8± acres of timberland would be harvested on the property under a Timber Harvest Plan (THP) consistent with Forest Practice Rules and will be processed under a separate CEQA-equivalent process by CAL FIRE (Appendix H). Subsequent to the timber harvest, there is a Timber Conversion Plan (TCP) for the 12.8-acre TCP area, which is the focus of this CEQA document. The County must also approve and authorize an ECP before planting of the vineyard to manage impacts from erosion and sedimentation. The TCP and ECP are the direct components through which discretionary actions by CAL FIRE and the County are subject to analysis in this DRAFT EIR.

As described above, the timber harvest is the precursor action to the Proposed Project, which consists of two direct elements: the conversion of timberland to vineyard and installation of the ECP. All of these actions effect the development of the Proposed Project on the property and would occur in the following order: 1) the separate harvest of 12.8± acres of timberland on the property and clearing of approximately 3.7± acres of grassland and 0.5± acres of ruderal, permitted separately under a THP approved by CAL FIRE; 2) the conversion of 15.3± acres within the 17± acre clearing limits to a vineyard block; and 3) the implementation of a County-approved ECP, which is required per County guidelines for the vineyard development since onsite slopes exceed a five percent grade. The ECP is attached to this Draft EIR in Appendix B, is part of the description of the Proposed Project found in Section 3.0, and is analyzed throughout the document, where appropriate.



Surrounding Land Uses:

The photo above shows the property ownership.

North: Pacific Union College and Parrett Field airport border the project area on the north and west. . The college sold Mr. Abreu a portion of their property for this vineyard project. The airport runway ends immediately north of the proposed vineyard. Federal flight line requirements have required past harvesting of many of the taller trees within the proposed project area in order to meet these height regulations. The installation of the vineyard will eliminate future height problems for the airport and college. An existing equestrian, cycling and hiking path runs along the northern edge of the proposed project. .

West: Several buildings and facilities associated with the college , including parking lots , lie to the west of the project. These buildings house employees, students and college facilities.

South: South of the project are existing vineyards owned by Mr. Abreu and Los Posadas County road. Los Posadas Road is a dead end road and is used by local residences, agricultural, primarily in the form of vineyards and the CDF state forest. South of Los Posadas road is another vineyard, residence and agricultural pond.

East: A recently established vineyard and residence..

Proximity to residences, communities, and towns:

The project is located in a rural part of Napa County. Pacific Union College Campus and the town of Angwin lie to the west and north of the project area. Single family residences are located on larger parcels to the South and East of the property. Forests are intermixed with agriculture and rural residential on all sides of the project. See **aerial photo above.**.

Adjacent ownership (public, private, industrial, etc.):

Properties to the West and North are part of the Pacific Union College. Properties to the South and East are private ownerships. There are no industrial ownerships. Agriculture in the form of grazing and vineyards is practiced on both the College property, the adjacent landowners and in the general area.

Parkland, open space, etc.:

There are no public open spaces in the immediate area. Pacific Union College does have equestrian, cycling and hiking trails on their property. The creation of the parcel sold to Mr. Abreu took these trails into consideration.

How does the proposed use fit the neighboring landscape?

The surrounding area is a mosaic of rural residential, college campus, forest and agriculture. Past fires in the areas have added to the mosaic by creating open areas and brush fields. Open areas that are not suitable to agriculture are used for grazing. Open areas suitable to intensive agriculture have been planted to vineyard. The town of Angwin and other residences continue to spread into surrounding agricultural and forest lands. See **Aerial photo above.** The proposed conversion and planting to vineyard will be consistent with other land uses in the area.

ALTERNATIVES: The following are excerpts from the DRAFT EIR alternative analysis prepared by Analytical Environmental Services (AES). See **DRAFT EIR section 5-1 for details**

2.3 ALTERNATIVES TO THE PROPOSED PROJECT

CEQA *Guidelines* require EIRs to describe and evaluate a range of reasonable alternatives to a project, or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. Although there are no significant unmitigable project impacts identified for the Proposed Project, **Section 5.0** evaluates the alternatives considered to the Proposed Project. These include the No Project Alternative and a Three Vineyard Block Alternative, which are briefly described below. Refer to **Section 5.0** for a complete description of these alternatives.

2.3.1 NO PROJECT ALTERNATIVE

With the No Project / No Development Alternative, the property would continue to remain in its existing state as partially forested with areas of open, non-native grassland. The timber within the flight path of the Angwin-Parrett Field airport would continue to grow. No changes to the existing forested areas, access road, or open space areas would occur.

2.3.2 THREE VINEYARD BLOCK ALTERNATIVE

This alternative is similar to the project previously proposed for the Project Site. Under the Three Vineyard Block Alternative, 17± acres would be harvested for timber and cleared of grassland but in different locations on the site, and the subsequent conversion to vineyard would create three vineyard blocks covering the entire 17± acre cleared area. One vineyard block would be in the same general location as the Proposed Project, but the Three Vineyard Block Alternative would create two additional vineyard blocks at the southwest and northeast corners of the project area, where slopes range from six to eight percent. The timber in the immediate flight path of the airport would not be fully cleared. This alternative would require the ECP to be re-designed to account for vineyard conversion on steeper slopes at the edges of the conversion area, similar to the project previously proposed for this parcel, and may result in development on two parcels instead of one.

5.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA *Guidelines* Section 15126.6(d) requires an evaluation of alternatives to the Proposed Project.

> *"The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed."*

Consistent with this CEQA requirement, a summary matrix has been prepared which qualitatively compares the effectiveness of each of the alternatives in reducing environmental impacts. This matrix, presented in **Table 5-1**, identifies for each impact area whether the alternatives would have greater, lesser, or similar impacts compared with the Proposed Project. As stated above in **Section 5.2.1**, there would be no significant and unavoidable impacts as a result of the Proposed Project. Each of the impacts identified under the Proposed Project would be considered less than significant after mitigation. Therefore "greater" and "lesser" impacts identified in **Table 5-1** are referring to varying degrees of impacts below established significance thresholds. In summary, the environmentally superior alternative is the alternative that would cause the least impact to the biological and physical environment.

TABLE 5-1
ENVIRONMENTAL IMPACT COMPARISON
BETWEEN THE PROPOSED PROJECT AND PROJECT ALTERNATIVES

Impact Area	Project Alternatives		
	No Project Alternative	**Three Vineyard Block Alternative**	**No Timber Harvest Alternative**
Aesthetics	Lesser	Similar	Lesser
Agriculture and Forestry Resources	Lesser	Similar	Lesser
Air Quality	Lesser	Similar	Similar
Biological Resources	Lesser	Greater	Similar
Cultural Resources	Lesser	Similar	Similar
Geology and Soils	Greater	Greater	Greater
Greenhouse Gas Emissions	Lesser	Similar	Similar
Hazards and Hazardous Materials	Lesser	Similar	Similar
Hydrology and Water Quality	Greater	Greater	Greater
Land Use/Planning	Similar	Similar	Similar
Noise	Lesser	Similar	Similar
Transportation and Traffic	Lesser	Similar	Similar

Source: AES, 2013

As discussed above, implementation of the No Project / No Development Alternative would result in no change in land use on the property; however, it fails to meet the objectives of the project. Under the No Project /No Development Alternative, impacts to hydrology and water quality as well as geology and soils would likely be greater than the Proposed Project since the drainages on the property would not be improved. Therefore, the current erosion and sedimentation occurring from this source would continue. Without implementation of the ECP, the water quality of off-site watercourses would not be improved. This could lead to greater impacts to water quality in the long term for off-site watercourses such as the Napa River, which is currently listed as a Section 303 (d) impaired water body under the CWA.

The Three Vineyard Block Alternative would result in similar impacts as those of the Proposed Project, specifically for the timber harvest operations, installation of the ECP measures, installation of the vineyard, as well as operation of the vineyard. However, the Three Vineyard Block Alternative would require the re-design of the ECP and implementation of mitigation measures (in relative proportion to the re-assessment of actual impacts), which could result in significant impacts to hydrology and water quality as well as geology and soils as compared to the Proposed Project. Overall, the Three Vineyard Block Alternative would likely result in similar environmental impacts as those of the Proposed Project; however, since the Proposed Project was specifically designed to accommodate the onsite topography, re-design of the ECP would require greater erosion control measures to lessen potential impacts to hydrology and water quality as compared to the Proposed Project.

The No Timber Harvest Alternative would result in slightly lesser impacts as compared to those of the Proposed Project because it has a lesser footprint and does not involve timber harvest operations. The No Timber Harvest Alternative would not result in an action by a public agency (no timber harvest or timber conversion and development on slopes less than five percent removes all components that trigger analysis under CEQA), and therefore the property owner would not be required to implement a THP, TCP, or ECP. Therefore, the No Timber Harvest Alternative will not have some of the benefits of the Proposed Project, including improvement of onsite drainage via an engineered ECP or enhancement of onsite forested habitat within a habitat retention area. Overall, the No Timber Harvest Alterative would likely result in lesser direct impacts to the environment than the Proposed Project, but it would not result in any of the environmental benefits of the Proposed Project.

Generally, the environmentally superior alternative is the alternative that would cause the least damage to the biological and physical environment. Since implementation of the No Project / No Development Alternative would result in fewer adverse environmental effects than would occur under the Proposed Project, the Three Vineyard Block Alternative, and the No Timber Harvest Alternative, the No Project / No Development Alternative would be considered the environmentally superior alternative. However, the No Project / No Development Alternative would not achieve the central project objective of development of vineyard and improvement of safety to the Angwin-Parrett Field airport.

If the No Project / No Development Alternative is the environmentally superior alternative, CEQA *Guidelines* Section 1526.6(e)(2) requires identification of an environmentally superior alternative among the other alternatives considered in the EIR. When comparing the remaining development alternatives, the Proposed Project is the most environmentally superior alternative. The Proposed Project is the only alternative which fully meets the project objectives and has been designed to lessen impacts to the environment to less-than-significant levels through implementation of the recommended mitigation measures provided in **Section 4.0**.

SECTION IV CUMULATIVE IMPACTS ASSESSMENT

Technical Rule addendum #2

Assessment areas

Projects approved by CDF within the last 10 years

Watershed

Soil productivity

Biological

Recreation

Visual

Traffic

Green House Gas Emissions

List of resources used

ASSESSMENT AREAS

The **Watershed** and **Biological** assessment area as it relates to this plan, is the Conn Creek watershed. Conn Creek is listed as Calwater ID #2206.500305. In order to assess the movements of raptors an additional 1.5 mile radius surrounding the plan area was also assessed. This area include an additional 1,520 acres. It should be pointed out that this plan submitter owns and controls a very minor portion of this watershed. As such this RPF and plan submitter are limited to assessments within their control and knowledge. Reasonable efforts have been made to research and access additional information from local, state and federal agencies. See **DRAFT EIR Section 4.0.** See watershed assessment map, below. This area was chosen because it represents the watershed surrounding the area influenced by this THP/Conversion. The biological assessment area represents the area that contains the wildlife that frequents the THP/Conversion, watershed and 1.5 mile radius surrounding the area. The activities of the wildlife that frequent this area are not limited to the ridges that represent the boundary of the watershed unit. The THP is near the northern 1/4 of the assessment area. Bird activity in the area is assessed by visual observation, NDDB reference, and discussion with local people in the area, consultation with biologists and review of adjacent THP's, if any. All of these activities have been taken into account.

Soil productivity assessment is limited to the area of operations (i.e. the THP/Conversion). This area was chosen because it represents the area actually disturbed by this activity and is controlled by this landowner.

Recreational assessment area is the THP and surrounding property under control of this landowner. This area was chosen because it represents the area actually disturbed by this activity and is controlled by this landowner.

Visual assessment area is limited to the area visible by large numbers of people. Due to the location of the project area, on a flat plan above and east of the town of Angwin, the project area is not visible by a large number of people. The future vineyard will not be visible from Los Posadas road to the south. It will be visible from the air port to the north, this is consistent with existing agricultural views from the airport.. There are no public roads that access the property or are in close proximity of the property. Pacific Union College does have an existing access road to their airport and an equestrian, cycling and hiking path adjacent to the northern boundary of the project property.

Traffic assessment issues are assessed as they apply to Los Posadas Road, Cold Springs and Howell Mountain Road and Hwy 128 through the Napa valley. This was chosen because it is the area impacted by the traffic associated with this THP/Conversion.

(1) Do the assessment areas of resources that may be affected by the proposed project contain any past, present, or reasonably foreseeable probable future projects?

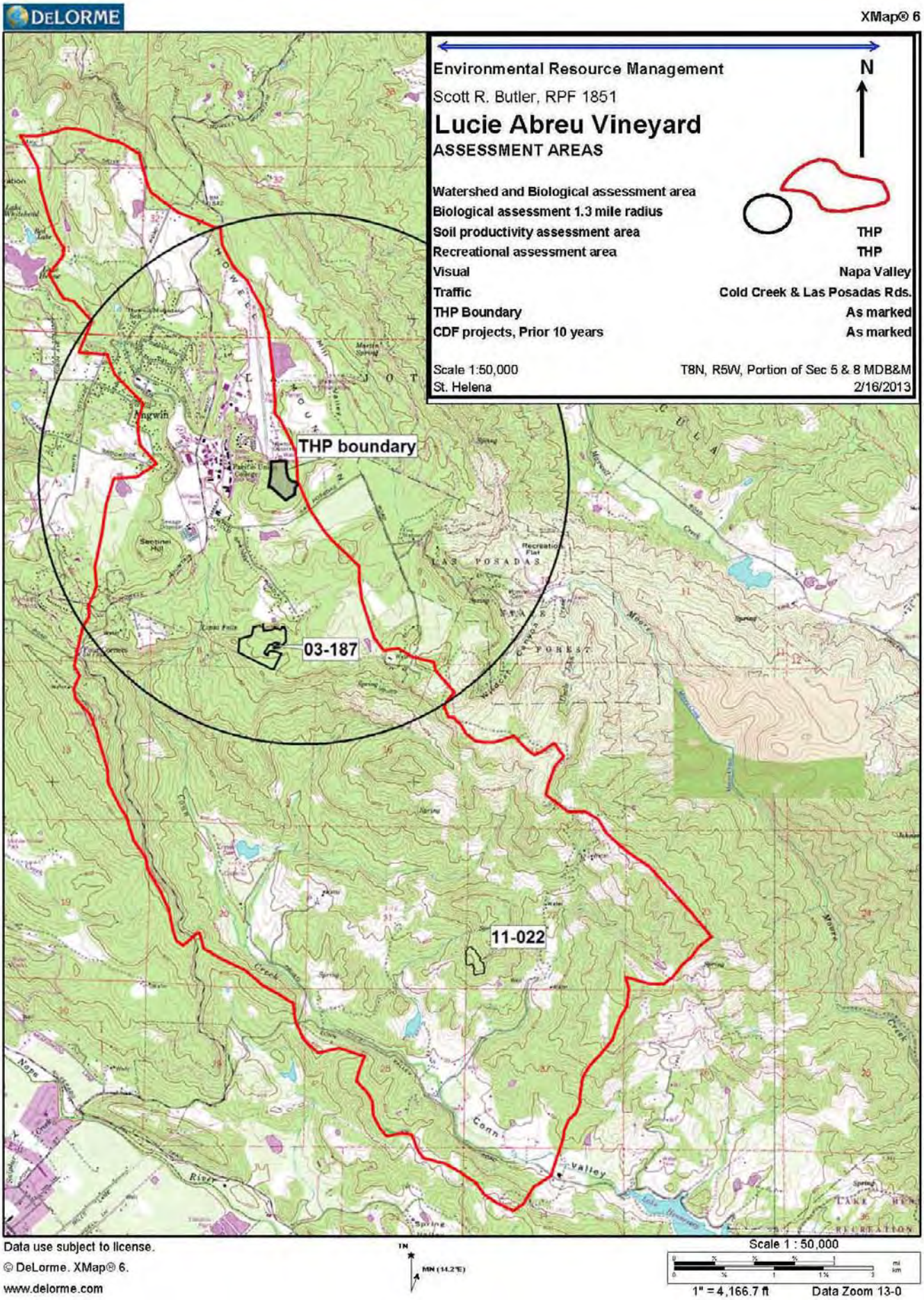
*Yes [**X**] No [ ]*

If the answer is yes, identify the projects and affected resource subjects.

Research performed in February of 2013 showed 2 timber harvest plans in the assessment area during the past 10 years. Both plans were timberland conversions and totaled 37 acres.

	10 Year Assessment History					
	Property Owner	**RPF**	**Acres**	**Silviculture**	**Logging Method**	**Status**
THP Conversion						
1-03-187 NAP	Mondavi	Davis	29	Conversion	Tractor	Complete
1-11-022 NAP	Rogers	Butler	8	Conversion	Tractor	Complete
	Conversion Totals		37			

See assessment map and 10 year history below.


DeLORME
XMap® 6
Environmental Resource Management
Scott R. Butler, RPF 1851
Lucie Abreu Vineyard
ASSESSMENT AREAS
N
Watershed and Biological assessment area THP
Biological assessment 1.3 mile radius THP
Soil productivity assessment area Napa Valley
Recreational assessment area Cold Creek & Las Posadas Rds.
Visual As marked
Traffic As marked
THP Boundary
CDF projects, Prior 10 years
Scale 1:50,000
St. Helena
T8N, R5W, Portion of Sec 5 & 8 MDB&M
2/16/2013
THP boundary
03-187
11-022
Angwin
Pacific Union College
Sentinel Hill
Recreation Flat
LAS POSADAS
Wildcat Canyon
Moore Creek
Conn Valley
Napa River
Data use subject to license.
© DeLorme. XMap® 6.
www.delorme.com
Scale 1 : 50,000
1" = 4,166.7 ft
Data Zoom 13-0

Past Historical Activities

Since the later part of the 1800's agriculture, mining, and to a lesser degree timber harvesting, have been the primary activity in the area. Most of the timber harvesting activities occurred late in the 1800s and sporadically during the early part of the last century. Poor agricultural practices, mining practices, poor road building techniques and poor timber harvesting activities conducted prior to modern day regulations and the Forest Practice Act had significant impacts on and contributed to the bed load of the streams in the Assessment Area. However a significant amount of time has elapsed and many of the problems relating to these types of operations have naturally corrected themselves. Recent agricultural practices, mining practices, road building practices and timber harvesting techniques have utilized modern and environmentally friendly practices to avoid deleterious effects to watercourses and the environment.

The early agricultural activities of the late 1800s and early 1900s were primarily in the form of grazing and orchards. These practices dwindled during the later 1900s and have been replaced with grape production as wine making has become more profitable. In many areas agricultural acreage levels are approaching those that existed early in the 1900s. Although many of the erosion problems created early this century have been corrected, some have not. These areas are being corrected as new permit applications are applied for and landowners are educated in modern, environmentally friendly, erosion control practices. Scrutiny by county, state and federal permitting agencies has and will continue to correct these problems. This increase in attention paid to erosion control activities and related land use has significantly reduced the amount of sediment transport to downstream anadromous fisheries. It has also helped to reduce the impact of habitat modification and loss due to the fragmentation created by the increased infrastructure associated with agricultural and residential practices. Many of these impacts have been reduced by education of landowners toward the requirements of wildlife.

Stabilization and recovery of these habitats and watercourses is an ongoing process. Due to the rules and mitigation proposed for this Harvest Plan/Conversion and subsequent Erosion Control Plan, it is not anticipated that this plan will combine with past, present, and/or reasonably foreseeable future projects to create significant adverse impacts or to impede the recovery of the Assessment Area. In fact, the proposed project will reduce the current production of sediment from the project area by implementation of the ECP and its associated mitigations. See **DRAFT EIR section 4.0** for additional detail.

Non-Timber Harvesting Activities:

Non-timber harvesting activities conducted in the Watershed Assessment Area consist primarily of watershed, grazing, vineyard production, residential housing and recreation. Camping, hiking, fishing, and cattle and equine management also occur within the Assessment Area.

Timber Harvesting Activities:

Due to the vegetation types present in the assessment area and due to the high land values, timber harvesting has been limited to vineyard conversion on 37 acres of the watershed during the past 10 years. There is no reason to expect this to change anytime in the foreseeable future. In fact, the number of timberland conversion applications have dropped significantly over the past 5 years.

Present Operations

Harvesting activities in the assessment area are limited due to present land use economics and vegetation. The economics are directed toward watershed management, agriculture and rural housing. These types of activities included some of the following management practices within the assessment area.

- Maintaining and/or recruiting late seral habitat characteristics adjacent to watercourses to provide habitat for wildlife and fisheries resources.
- Locating new roads on ridge tops or midslope instead of near sensitive riparian areas and the inner gorge.
- Use of excavators to construct roads in sensitive areas.
- Placing road fills in stable locations and compaction of disturbed material.
- Improved drainage facilities, including culvert sizes, rocked fjords and bridges.
- Maintaining vegetative buffers and restrictive measures within water and lake protection zones.
- Applications of erosion control measures designed by licensed civil engineers.
- Enhancing wildlife habitat, by planting vegetation, creating artificial housing, recruiting snags, protecting watercourse zones, etc.

Vineyard Management

Vineyard conversions have seen a significant increase in recent decades. Early in the last century agriculture was the primary activity in the watershed. This included grazing and some intensive agricultural activities such as orchards and vineyards. Due to fluctuating market conditions and the high demand on rural properties, much of these agriculture practices ceased. Many areas previously cleared reverted to their natural vegetation. Today, the high price of grapes justifies the reestablishment of these previous agricultural practices. Due to the existing vegetation, topography and land use constraints, county and state regulations require conversion permits and erosion control plans to develop new projects such as vineyards. This permit system insures environmentally friendly practices and reduced impact on the environment.

Rural Roads

Poor road construction practices, installation of undersized culverts and poor culvert spacing has increased erosion as a result of county rural roads. In addition unpaved rural roads in the assessment area that are used year round for residential access and agriculture have had an impact on sediment production into watercourses. These impacts have been reduced to some degree by increasing the awareness of county road departments and small landowners through education and the implementation of better road building & maintenance practices through permit regulation. As this process continues, it is expected that the production of these sediments will continue to be reduced. The regulatory input on these roads by city, county and state planning processes has also caused many roads to be upgraded with culverts, rock and/or asphalt. This ongoing process is continually improving road caused erosion and reducing downstream sediment transport.

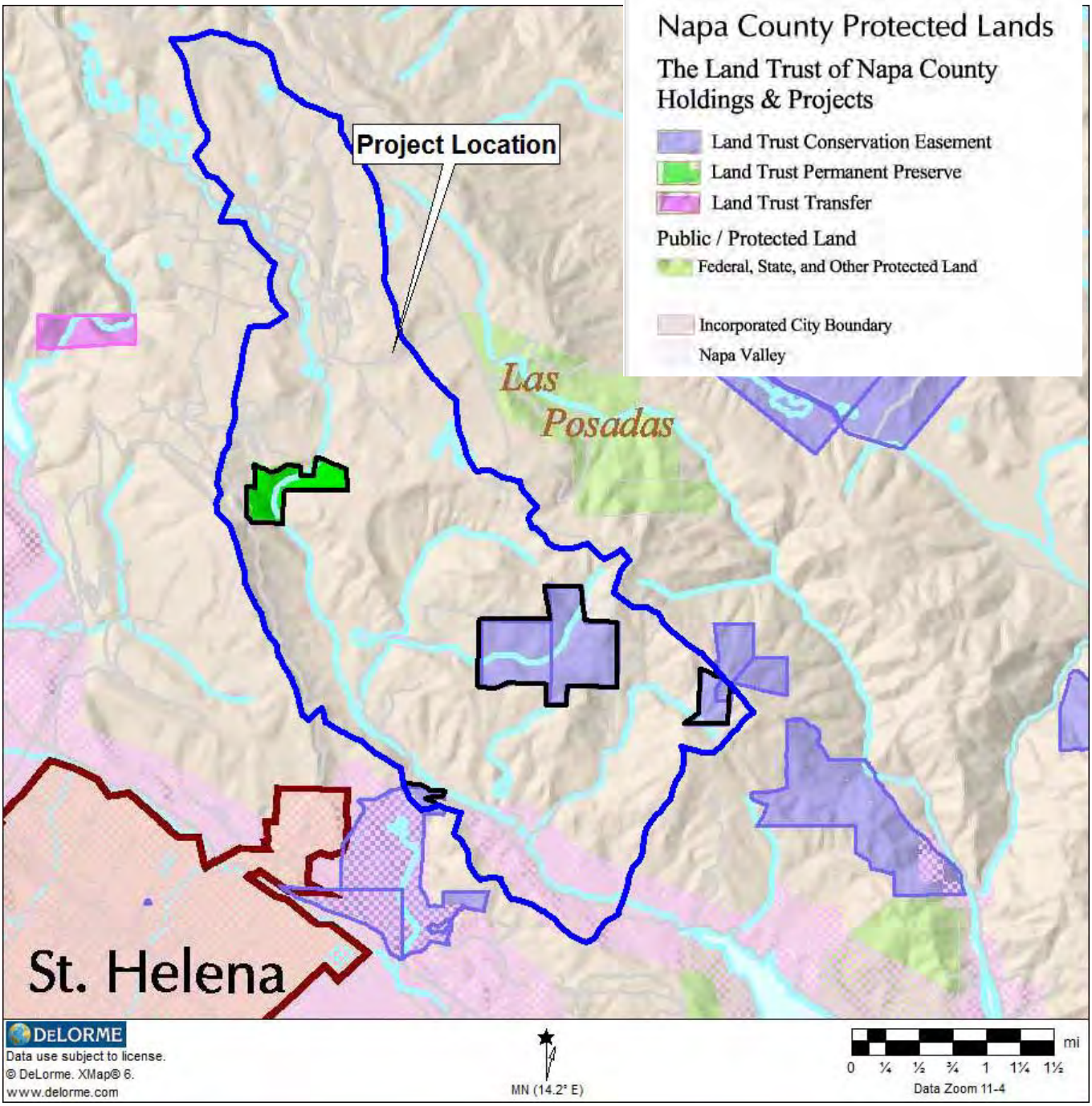
The erosion control plan proposes measures that will reduce sediment production to below pre-project levels. See **the ECP and DRAFT EIR section 4.6 and 4.9** for additional detail.

Proposed Future Projects

The assessment area has seen more intensive land use practices with increases in residential housing and agriculture occurring during the later quarter of the last century. These increases have impacted wildlife and fisheries resources with loss of habitat and increases in sediment transport. The increase in agriculture is primarily in the form of vineyards. The number of acres converted annually to vineyard has in all probability reached its peak and will be dropping during the next decade for several reasons. Cost (both permit and installation), lack of suitable land, environmental limitations and lack of demand for additional acres of vineyard are all part of the reasons for the anticipated decline. On the other hand, demand for residential housing will probably increase as the recession ends. Both of these land use activities are monitored and controlled by local, state and federal agencies interested in protecting environmental resources. This monitoring, in the form of permits, will control, reduce and mitigate future demands on the environment. In combination with recent past activities and expected future activities, impacts to the environment related to sediment transport and habitat modification will continue to be reduced over time.

Additionally, the area is increasingly desirable for exclusive estate-type residential development with its consequential impacts upon erosion, water supply, wildlife, aesthetics and agriculture. This urbanization is increasingly impacting the resources required to be evaluated under addendum #2. Residential development on small parcel/large lot sites continues throughout the assessment area. Competition between residential interests and agricultural interests for land with suitable topographical characteristics is at a high level.

Significant areas of land in the Assessment Area of Conn Creek are being acquired by non-governmental preservation organizations and/or have been placed in preservation easements established to prevent development. This activity has both positive and negative environmental impacts. These areas do buffer impacts from adjacent land use activities, but do little to prevent the natural and man made adverse environmental impacts that managed land use practices can ameliorate. An example of this would be the build up of ground and ladder fuels that could promote disastrous wildfires. See Land Trust map below.


Napa County Protected Lands
The Land Trust of Napa County
Holdings & Projects
Land Trust Conservation Easement
Land Trust Permanent Preserve
Land Trust Transfer
Public / Protected Land
Federal, State, and Other Protected Land
Incorporated City Boundary
Napa Valley
Project Location
Las Posadas
St. Helena
DELORME
Data use subject to license.
© DeLorme. XMap® 6.
www.delorme.com
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Data Zoom 11-4

Article 2 Preparation and Review of Timber Harvesting Plans

898 Feasibility Alternatives

"After considering the rules of the Board and any mitigation measures proposed in the plan, the RPF shall indicate whether the operation would have any significant adverse impact on the environment. On TPZ lands, the harvesting per se of trees shall not be presumed to have a significant adverse impact on the environment. If the RPF indicates that significant adverse impacts will occur, the RPF shall explain in the plan why any alternatives or additional mitigation measures that would significantly reduce the impact are not feasible.

Cumulative impacts shall be assessed based upon the methodology described in Board Technical Rule Addendum Number 2, Forest Practice Cumulative Impacts Assessment Process, and shall be guided by standards of practicality and reasonableness. The RPF's and plan submitter's duties under this section shall be limited to closely related past, present and reasonably foreseeable probable future projects within the same ownership and to matters of public record. The Director shall supplement the information provided by the RPF and the plan submitter when necessary to insure that all relevant information is considered.

When assessing cumulative impacts of a proposed project on any portion of a waterbody that is located within or downstream of the proposed timber operation and that is listed as water quality limited under **Section 303(d)** of the Federal Clean Water Act, the RPF shall assess the degree to which the proposed operations would result in impacts that may combine with existing listed stressors to impair a waterbody's beneficial uses, thereby causing a significant adverse effect on the environment. The plan preparer shall provide feasible mitigation measures to reduce any such impacts from the plan to a level of insignificance, and may provide measures, insofar as feasible, to help attain water quality standards in the listed portion of the waterbody.

The Director's evaluation of such impacts and mitigation measures will be done in consultation with the appropriate RWQCB."

Section 303(d)(1)(A) of the Clean Water Act (CWA) requires that "Each State shall identify those waters within its boundaries for which the effluent limitations...are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking for waters on the 303(d) list of impaired waters and establish Total Maximum Daily Loads (TMDLs) for such waters. As part of the 1996 303(d) list submittal, the State identified the Napa River Watershed # 20650010 as a Medium to Low priority for TMDL development.

The elements of a TMDL are described in 40 CFR 130.2 and 130.7 and Section 303(d) of the CWA, as well as in U.S. Environmental Protection Agency guidance (U.S. EPA, 1991). A TMDL is defined as "the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background" (40 CFR 130.2) such that the capacity of the waterbody to assimilate pollutant loadings (the Loading Capacity) is not exceeded. A TMDL is also required to be developed with seasonal variations and include a margin of safety to address uncertainty in the analysis. In addition, pursuant to the regulations at 40 CFR 130.6, states must develop water quality management plans to be used to directly implement the plan elements, including TMDLs.

http://www.swrcb.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/swrcb/r2_final303dlist.pdf2002 CWA

The San Francisco Bay Regional Water Quality Control Board lists the Napa River Watershed as having Pollutant/Stressors as listed below. The Conn Creek watershed is a tributary of the Napa River.

See **the THP page 33 and DRAFT EIR section 4.0** for detailed discussion.

(2) Are there any continuing, significant adverse impacts from past land use activities that may add to the impacts of the proposed project?

*Yes [**X**] No [ ]*

Activities identified within the THP area.

The following activities are associated with present land management and the proposed THP/Conversion. Their impacts are related to the production of sediment into watercourses located near the THP, downstream and the modification of habitat located in the THP. These activities impact water quality, riparian habitat, fisheries resources and wildlife resources. Each of the listed activities identifies mitigation proposed in this THP to minimize or eliminate the impact.

- **Present land management activities**
- **Soil and vegetation disturbance of the planned THP/Conversion**
- **Wildlife habitat modification associated with the THP/Conversion.**
- **Erosion control and sediment production**

  See the list of general mitigations proposed in the **THP page 49+**

Activities identified outside of the THP area.

- Fire: In the past, large fires that were annually lit by Native Americans kept the valley and surrounding hills open with grasses and younger seral stages of vegetation. With the reduction in Native American occupation of the area these fires have been eliminated. The removal of these fires has allowed native vegetation to develop and significantly increase on the site. Some fires have burned through the area as recently as 60 to 100 years ago. These fires burned much hotter than those set by Native Americans and had a much more significant impact on the intensity of the burn and impacts to wildlife. Due to modern fire suppression efforts and the reduction in the use of fire within the landscape, fuel levels, vegetation density and vegetation age classes have increased significantly. This increase has allowed wildlife associated with this type of vegetation to increase. Wildlife associated with open areas of grass and brush have diminished in population.

  As vegetation levels have increased, vegetation age and structure has also increased. This has allowed oak woodland and conifer forests to develop from grasslands and brush lands of the past. The fragmentation of habitat as a result of recent historical fires suppression is being reduced as the developing forest is becoming more connected, and with wider diversity, over time.

- Agriculture: The primary use of the valley during the late 1800 and early 1900 was for the use of farming, mainly in the form of grazing. Some of the more open areas with gentle topography were planted to orchard, hay and pasture, particularly during the first part of the last century. As Napa County and the bay area counties have become more populated toward the middle of the last century, more pressure was placed on the valley with increases in rural residential use and farming. The increasing demand for premium quality grapes has significantly increased the amount of vineyards within the valley. The increases in these types of intensive agricultural practices has overpowered land values to the point that much of the grazing practices of the last century have come to a close. Less grazing takes place within the grasslands of the valley and more intensive agricultural activities are now the norm. The loss of this grazing pressure has allowed some open areas to become revegetated and resume the cycle of plant succession. As a result many of the open areas surrounding the valley are revegetating to brush and then forest. This plant succession has had impacts on plant and animal species associated with the open grasslands of the past. This type of habitat improvement has been increasing since the middle of the last century, while the management of fewer agricultural lands has become much more intensive. See the assessment of vegetative changes below. These intensive

agricultural practices are now regulated by Napa County and other state and federal agencies. Present management practices are significantly better at reducing sediment and storm water run off than existed during the last century.

- Rural residences: As pressure on land use increased due to the increase in the population centers of the Bay area, so have land values. This increase in land values has reduced grazing as mentioned above. Although these land values have increased in Napa County, they have been less than those found within the heavily populated areas of the Bay area. As a result, more and more people have moved to get out of the big city and live in areas more rural and less expensive. This increased pressure in the residential aspects of the area has had an impact on the fragmentation of wildlife habitat. Homes, driveways, gardens, fencing, noise, waterlines, power lines, septic tanks and traffic have all increased to the deterrent of wildlife. As this pressure increased, parcel sizes have decreased, allowing more and more residences to be built on the landscape. The overall impact of the increased infrastructure associated with these rural residences has been to increase the fragmentation of the native wildlife habitat. This impact continues today. As the Bay area continues to increase in affluence, we will see an increase in demand, and values, associated with a fixed land resource. Although this type of fragmentation will continue, county, state and federal regulations are reducing the impact of habitat fragmentation by regulating future development.

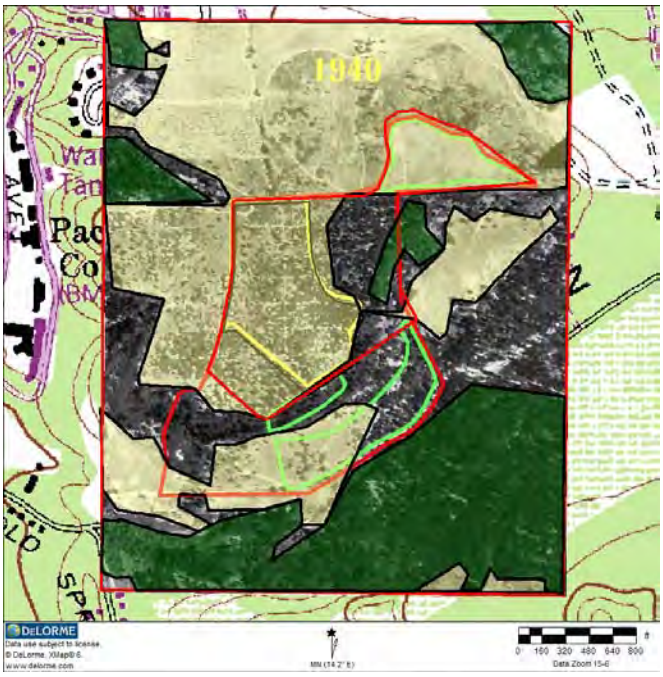
- Commercial timberland use: The preservationist and antagonistic attitudes of the general public toward commercial timber harvest has significantly reduced the use of this land management tool in Napa County. The increase in land values and lack of increase in timber values has also reduce the application of timber harvests as a land management tool. The use of properly applied silvicultural practices can increase the mosaic of vegetation associated within a watershed, thereby increasing the diversity and availability of wildlife habitat. Commercial timber harvesting, however, is not expected to be economically viable in the present or near future in Napa County or the State of California.

No significant changes in activity are presently occurring in the surrounding areas of the project.

Watershed and Biological Assessment Area Changes

- Vegetation changes from 1940 to 2011 (71 years of development):

  To quantify some of the changes that have taken place in the watershed, aerial photos were reviewed for 1940 and 2011. The acreage used (although somewhat arbitrary) was based on the photo used by TRSO. This was compared to the 2011 photo in this analysis. Changes during the last 71 years were noted. The 1940 photos are good quality and show the details of the different types of vegetation. In order to justify the comparison agriculture is defined as grazing, orchards, vineyards and I included housing. No housing existed in the 1940 photo, the comparison is use vs brush and forest. For this area all land not in forest and or brush is being used to some degree. Forest is defined as canopy cover and includes conifer and oak woodland. Agricultural activities are discernable, buildings and vegetation density are hard to compare. Typing of the two photos was limited to agricultural versus brush and forest. It should be noted that these are very broad definitions and open to personal interpretation of the aerial photos examined. The trend, although general, can be seen. See photos below.



Vegetation analysis comparison, 1940 - 2011
Green = Forest, Yellow = Agriculture
All other areas are considered Brush Area.

Color	Vegetation	1940 Acres	2010 Acres	Change Acres	Percent Change
Yellow	**Agriculture**	142	143	1	0%
Green	**Forest**	69	132	63	23%
No color	**Brush**	64	0	(64)	-23%
	Total	275	275		

Interpretation

For the area reviewed, agricultural activities (which included housing) are the same in both photos. This shows disturbed areas, housing and agriculture to be basically unchanged over the 71 year period. The forest component of the area analysised increase by 23 percent. The brush component was reduced by 23%. This decrease in brush is attributed to plant succession as vegetation matured over the landscape as a result of fire suppression. It should be pointed out that all of the proposed 17 acres were at one time cleared and planted to orchards or vineyards.

The intensity level of the agriculture practiced today is much greater than that found during the middle of the last century. Modern vineyard management practices are more intensive than the grazing of animals practiced 60 years ago. However the present awareness of and attention paid to sediment control is much greater due to increased land values, education and permit processes. The erosion control measures used early in the last century were lacking. Today's modern erosion control measures and best management practices are a significant improvement over sediment losses that were acceptable 70 years ago. The increase in housing between 1940 and 2011 is significant.

The improvement in forest canopy is the result of natural plant succession and the increase in fire suppression efforts of the past 100 years. The following general assumptions can be applied to the assessment area.

1. Generally speaking agricultural acreages are similar to those of 70 years ago.
2. Agriculture is more intensively managed today.
3. Erosion control practices are significantly improved over 50 years ago.
4. Brush and Forest vegetation are more developed than 50 years ago due to fire suppression and plant succession.
5. The aerial photo shows an extensive increase in rural housing and infrastructure.
6. Sediment transport due to poor management practices has been reduced due to increased awareness of the landowner and regulatory agencies.

Conclusion

Even when considering the change in vegetation as the result of the proposed project, overall use of the area remains much the same as it was 71 years ago. Habitat will continue to develop as successional vegetation types mature over time. Fire suppression efforts will continue to allow habitat to mature. Habitat fragmentation will not significantly increase as a result of the proposed project.

(3) Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable, probable, future projects identified in items (1) and (2) above, have a reasonable potential to cause or add to significant cumulative impacts in any of the following resources?

	Resource	*Yes, after mitigation*	*No, after mitigation*	*No reasonable potential for Significant effects*
1.	*Watershed*	____	***X***	____
2.	*Soil Productivity*	____	***X***	____
3.	*Biological*	____	***X***	____
4.	*Recreational*	____	____	***X***
5.	*Visual*	____	____	***X***
6.	*Traffic*	____	____	***X***

a) ***Yes****, means that potential significant adverse impacts are left after application of the forest practice rules, mitigations or alternatives proposed by the plan submitter.*

b) ***No****,* ***after mitigation*** *means that any potential for the proposed timber operation to cause significant adverse impacts has been substantially reduced or avoided by mitigation measures or alternatives proposed in the THP and application of the forest practice rules and or erosion control plan.*

c) ***No reasonable potential significant effects,*** *means that the operations proposed under the THP do not have reasonable potential to join with the impacts of any other projects to cause cumulative impacts.*

The DRAFT EIR prepared by Analytical Environmental Services has addressed all of the following environmental issues and the impact that the project will have on each one of them. See the DRAFT EIR for a detailed analysis of each one. Due to existing state and local regulations and with the addition of mitigations proposed in the THP and DRAFT EIR the project will not have significant impacts on these environmental receptors.

Environmental Issues	**DRAFT EIR page**
1. Aesthetics	**4.1-1**
2. Agriculture and Forestry	**4.2-1**
3. Air Quality	**4.3-1**
4. Biological Resources	**4.4-1**
5. Cultural Resources	**4.5-1**
6. Geology and Soils	**4.6-1**
7. Greenhouse Gas Emissions	**4.7-1**
8. Hazards and Hazardous Materials	**4.8-1**
9. Hydrology and Water Quality	**4.9-1**
10. Land Use	**4.10-1**
11. Noise	**4.11-1**
12. Traffic	**4.12-1**

See the table at the end of Section 2 of the Draft EIR, page 2.5 This table lists the environmental impacts and mitigation measure proposed.

List of Resources Used in Compilation of this Document:

1. Theodore Wooster, Consulting Wildlife Biologist, 6645 Yount Street, Yountville CA 94599, (707) 944-8451
2. Pam Town, Consulting Wildlife Biologist, 3904 North Cable Rd, Anaconda, MT 57911, (406) 490-7427
3. CCR 912.9 (932.9, 952.9), Technical Rule Addendum No. 2, Cumulative Impacts Assessment
4. California Department of Forestry and Fire Protection Guidelines for Assessment of Cumulative Impacts
5. 14 CCR 912.5 (932.5, 952.5) Technical Rule Addendum No. 1. Estimating Surface Soil Erosion Hazard Rating
6. Napa County Assessors Records, 1195 Third St., Napa CA 94559. (707) 253-4416
7. Napa County GIS records available on the internet, Napa County GIS
8. Various THP records maintained by CDF Santa Rosa
9. California Natural Diversity Data Base
10. Soil maps of Napa County (Soil Conservation Service)
11. Cumulative impact for Foresters Handbook CLFA
12. California Wildlife Habitat Relationships System Version 8.0
13. California Wildlife Pub. CDF & G 1990
14. California Department of Fish and Game personnel, Stephanie Buss, (707) 944-5568
15. Brian Bordona, Planner, Napa Co., 1195 Third St., Napa CA 94559 (707) 253-4416
16. Various reports written and attached as appendices to this application.
17. Matt O'Connor, PHD, GES, O'Connor Environmental, P. O. Box 794 Healdsburg, CA (707) 431-2810
18. Lou Gilpin, Gilpin Geosciences, Inc. 3228 Siverado Trail, St. Helena, Ca 94574, (707) 251-8543
19. Tom Origer, Origer and Associates, P. O. Box 1531, Rohnert Park, CA 94927

SECTION V CONFIDENTIAL ARCHAEOLOGICAL ADDENDUM

Sensitive Archaeological material may have been removed from this file and can be seen in the CDF Santa Rosa office. Contact Chuck Whatford CDF Archaeologist, (707) 576-2966. The CAA has been attached to the **Draft EIR, Appendix K**.

SECTION VI ATTACHMENTS

Attachments not required elsewhere

Environmental Resource Management
Scott R. Butler, RPF #1851
889 Hwy 20-26
Ontario, Oregon 97914
Office: (707) 468-8466 Fax: (707) 220-0111
email: scott.butler@sbcglobal.net

David Abreu Vineyard Management 2-12-2013
P. O. Box 89
Rutherford, CA 94573

Dear David,
I am required by the California Department of Forestry to inform you of the following Forest Practice Rule requirements. I have made some footnotes below to try to explain if needed. Please contact me if you still have questions.

Erosion Control responsibilities
Per Page 4, item 5(c) of the THP, you are responsible for erosion control operations after timber operations have ceased and after the work completion report has been filed. The prescribed maintenance period for erosion is three years. As the landowner, you are also responsible for all vineyard development as outlined in the erosion control plan.

Prescribed Maintenance Period means the period, beginning with filing of the Timber Harvest Plan (THP) work completion report provided the report is approved, during which erosion controls which are required and constructed as part of a timber operation must be maintained in a functional condition. The period shall not exceed three years from the filing of the work completion report provided that the report is subsequently approved by the director.

912.7, 932.7, 952.7 Resource Conservation Standards for Minimum Stocking
[All Districts, note (b)(1)(D)]
The following resource conservation standards constitute minimum acceptable stocking in the Coast [Northern, Southern] Forest District after timber operations have been completed.

- **(a)** Rock outcroppings, meadows, wet areas, or other areas not normally bearing commercial species shall not be considered as requiring stocking and are exempt from such provisions.
- **(b)** An area on which timber operations have taken place shall be classified as acceptably stocked if either of the standards set forth in (1) or (2) below are met within five (5) years after completion of timber operations unless otherwise specified in the rules.
  - **(1)** An area contains an average point count of 300 per acre on Site I, II and III lands or 150 on site IV and V lands to be computed as follows:
    - **(A)** Each countable tree [Ref. PRC § 4528(b)] which is not more than 4 inches d.b.h. counts 1 point.
    - **(B)** Each countable tree over 4 inches and not more than 12 inches d.b.h. counts 3 points.
    - **(C)** Each countable tree over 12 inches d.b.h. counts as 6 points.
    - **(D)** [**Coast**] Root crown sprouts will be counted using the average stump diameter 12 inches above average ground level of the original stump from which the sprouts originate, counting one sprout for each foot of stump diameter to a maximum of 6 per stump. **(D)** [**Northern**] Sprouts over 1 foot in height will be counted, counting one sprout for each 6 inches or part thereof of stump diameter to a maximum of 4 per stump. **(D)** [**Southern**] Root crown sprouts over 1 foot in height will be counted, using the average stump diameter at 1 foot above the average ground level of the original stump, counting 1 sprout for each foot of stump diameter to a maximum of 6 per stump.
  - **(2)** The average residual basal area measured in stems 1 inch or larger in diameter, is at least 85 square ft. per acre on Site I lands, and 50 square ft. per acre on lands of Site II classification or lower. Site classification shall be determined by the RPF who prepared the plan.
  - **(3)** To the extent basal area standards are specified in the rules in excess of 14 CCR § 912.7(b)(2) [932.7(b)(2), 952.7(b)(2)], up to 15 square feet of basal area of those standards higher than the minimum may be met by counting snags, and decadent or deformed trees of value to wildlife in the following sizes:
    - **(A)** 30 inches or greater d.b.h and 50 feet or greater in height on site I and II lands;
    - **(B)** 24 inches or greater d.b.h and 30 feet or greater in height on site III lands; and
    - **(C)** 20 inches or greater d.b.h and 20 feet or greater in height on site IV and V lands.

The substitution provided for in 14 CCR § 912.7(b)(3) [932.7(b)(2), 952.7(b)(2)] may only be done when the potential spread of insects and diseases will not have a significantly adverse impact on long term productivity or forest health.

(c) The resource conservation standards of the rules may be met with Group A and/or B commercial species. The percentage of the stocking requirements met with Group A species shall be no less than the percentage of the stand basal area they comprised before harvesting. The site occupancy provided by Group A species shall not be reduced relative to Group B species. When considering site occupancy, the Director shall consider the potential long term effects of relative site occupancy of Group A species versus Group B species as a result of harvest. If Group A species will likely recapture the site after harvest, Group B species do not need to be reduced. The time frames for recapturing the site shall be consistent with achieving MSP. The Director may prohibit the use of Group A and/or B commercial species which are non-indigenous or are not physiologically suited to the area involved.

Exceptions may be approved by the Director if the THP provides the following information and those exceptions are agreed to by the timberland owner:

(1) Explain and justify with clear and convincing evidence how using Group A nonindigenous, or Group B species to meet the resource conservation standards will meet the intent of the Forest Practice Act as described in PRC § 4513. The discussion shall include at least:

(A) The management objectives of the post-harvest stand;

(B) A description of the current stand, including species composition and current stocking levels within the area of Group B species. The percentage can be measured by using point-count, basal area, stocked plot, or other method agreed to by the Director.

(C) The percentage of the post-harvest stocking to be met with Group B species. Post harvest percentages will be determined on the basis of stocked plots. Only the methods provided by 14 CCR §§ 1070-1075 shall be used in determining if the standards of PRC § 4561 have been met.

(D) A description of what will constitute a countable tree, as defined by PRC § 4528 for a Group B species and how such a tree will meet the management objectives of the post-harvest stand.

The Director, after an initial inspection pursuant to PRC § 4604, shall approve use of Group B species, as exceptions to the pre-harvest basal area percentage standard, if in his judgment the intent of the Act will be met, and there will not be an immediate significant and long-term harm to the natural resources of the state.

Comments: These are the planting standards CDF will hold you to if you do not complete the conversion process. This means complete and does not apply until operations have been started.

923, 943, 963 Logging Roads and Landings [All Districts]

All logging roads and landings in the logging area shall be planned, located, constructed, reconstructed, used, and maintained in a manner which: is consistent with long-term enhancement and maintenance of the forest resource; best accommodates appropriate yarding systems, and economic feasibility; minimizes damage to soil resources and fish and wildlife habitat; and prevents degradation of the quality and beneficial uses of water. The provisions of this article shall be applied in a manner which complies with this standard. Factors that shall be considered when selecting feasible alternatives (see 14 CCR 897 and 898) shall include, but are not limited to, the following:

(a) Use of existing roads whenever feasible.

(b) Use of systematic road layout patterns to minimize total mileage.

(c) Planned to fit topography to minimize disturbance to the natural features of the site.

(d) Avoidance of routes near the bottoms of steep and narrow canyons, through marshes and wet meadows, on unstable areas, and near watercourses or near existing nesting sites of threatened or endangered bird species.

(e) Minimization of the number of watercourse crossings.

(f) Location of roads on natural benches, flatter slopes and areas of stable soils to minimize effects on watercourses.

(g) Use of logging systems which will reduce excavation or placement of fills on unstable areas.

Comments: These are the requirements for locating roads. In your case they don't apply since no roads are being built. All roads are existing. Avenues are not considered roads.

1035 Plan Submitter Responsibility

The plan submitter, or successor in interest, shall:

(a) Ensure that an RPF conducts any activities which require an RPF.

(b) Provide the RPF preparing the plan or amendments with complete and correct information regarding pertinent legal rights to, interests in, and responsibilities for land, timber, and access as these affect the planning and conduct of timber operations.

(c) Sign the THP certifying knowledge of the plan contents and the requirements of this section.

(d) **(1)** Retain an RPF who is available to provide professional advice to the LTO and timberland owner upon request throughout the active timber operations regarding:

A) the plan,

B) the Forest Practice Rules, and

C) other associated regulations pertaining to timber operations,

(2) The plan submitter may waive the requirement to retain an RPF to provide professional advice to the LTO and timberland owner under the following conditions:

A) the plan submitter provides authorization to the timberland owner to provide advice to the LTO on a continuing basis throughout the active timber operations provided that the timberland owner is a natural person who personally performs the services of a professional forester and such services are personally performed on lands owned by the timberland owner;

B) the timberland owner agrees to be present on the logging area at a sufficient frequency to know the progress of operations and advise the LTO, but not less than once during the life of the plan; and

C) the plan submitter agrees to provide a copy of the portions of the approved THP and any approved operational amendments to the timberland owner containing the General Information, Plan of Operations, THP Map, Yarding System Map, Erosion Hazard Rating Map and any other information deemed by the timberland owner to be necessary for providing advice to the LTO regarding timber operations.

(3) All agreements and authorizations required under 14 CCR § 1035(d)(2) shall be documented and provided in writing to the Director to be included in the plan.

(e) Within five working days of change in RPF responsibilities for THP implementation or substitution of another RPF, file with the Director a notice which states the RPF's name and registration number, address, and subsequent responsibilities for any RPF required fieldwork, amendment preparation, or operation supervision. Corporations need not file notification because the RPF of record on each document is the responsible person.

(f) Provide a copy of the portions of the approved THP and any approved operational amendments to the LTO containing the General Information, Plan of Operations, THP Map, Yarding System Map, Erosion Hazard Rating Map and any other information deemed by the RPF to be necessary for timber operations.

(g) Notify the Director prior to commencement of site preparation operations. Receipt of a burning permit is sufficient notice.

(h) Disclose to the LTO, prior to the start of operations, through an on-the-ground meeting, the location and protection measures for any archaeological or historical sites requiring protection if the RPF has submitted written notification to the plan submitter that the plan submitter needs to provide the LTO with this information.

Comments: As the plan submitter you will have this responsibility. As long as everything is going well these technicalities are not a problem. But if something goes wrong this is where individuals get into trouble.

1035.1 Registered Professional Forester Responsibility

(a) Upon submission of a THP, the RPF who prepares and signs a plan is responsible for the accuracy and completeness of its contents.

(1) The RPF preparing the plan shall state in the THP the work which will be performed by the RPF plan preparer (beyond preparation of the THP and attending the pre-harvest inspection if requested by the Director), and any additional work requiring an RPF which the plan preparer does not intend to perform. This may include, but is not limited to, field work in identifying watercourse and lake protection zones or special treatment areas, marking trees, or other activities. The RPF is only responsible for the activities set forth in the plan when employed for that purpose, or required by the rules of the Board. The RPF shall state whether or not he or she has been retained to provide professional advice throughout the timber operations.

(2) The RPF preparing the plan shall in writing, inform the plan submitter(s) of their responsibility pursuant to Section 1035 of this Article, and the timberland owner(s) of their responsibility for compliance with the requirements of the Act and where applicable, Board rules regarding site preparation, stocking, and maintenance of roads, landings, and erosion control facilities.

(b) Upon entering into an agreement to accept responsibility for any part of the preparation or implementation of a plan or any work beyond the preparation of a plan, including providing professional advice; all responsible RPFs shall disclose to the real party of interest for whom the RPF is providing professional forestry services any known current or potential conflict of interest the RPFs have with regard to the timber or land that is subject to operations under the plan. All responsible RPFs shall disclose to the timberland owner and plan submitter whether they are the real party of interest for whom the RPF is providing professional forestry services.

(c) Disclosure of newly discovered conflicts of interest an RPF has with regard to the plan submitter, timberland owner, timber

owner, the LTO and timber purchaser, pertaining to the timber or land that is subject to operations under the plan, shall be required as long as an RPF has responsibilities relative to a plan. The disclosure shall include identification of the real party of interest for whom the RPF is providing professional forestry services.

(d) All disclosures made between an RPF and an affected party pursuant to this section may be kept confidential.

(e) An RPF retained by the plan submitter to provide professional advice throughout the timber operations shall be present, or ensure that the RPF's supervised designee is present, on the logging area at a sufficient frequency to know the progress of operations and advise the LTO and timberland owner, but not less than once during the life of the plan.

(f) An RPF retained by the plan submitter to provide professional advice throughout the timber operations shall inform the LTO during operations of any mitigation measures incorporated into the plan that are intended to address operations that have a high likelihood of resulting in immediate, significant and long-term harm to the natural resources of the State if such mitigation measures are not strictly applied to minimize such impacts.

(g) The RPF shall without delay notify in writing the LTO, the plan submitter, and the Department of a decision to withdraw professional services from the plan.

Comments: These are my responsibilities, unless the landowner and/or plan submitter take them over.

1035.2 Interaction Between RPF and LTO

After the start of the plan preparation process but before commencement of operations, the responsible RPF or supervised designee familiar with on-site conditions, shall meet with either the LTO, or supervised designee, who will be on the ground and directly responsible for the harvesting operation. The meeting shall be on-site if requested by either the RPF or LTO. An on-site meeting is required between the RPF or supervised designee familiar with on-site conditions and LTO to discuss protection of any archaeological or historical sites requiring protection if any such sites exist within the site survey area pursuant to Section 929.2[949.2,969.2](b). If any amendment is incorporated to the plan by an RPF after the first meeting, that RPF or supervised designee familiar with on-site conditions shall comply with the intent of this section by explaining relevant changes to the LTO; if requested by either that RPF or LTO, another on-site meeting shall take place. The intent of any such meeting is to assure that the LTO:

(a) Is advised of any sensitive on-site conditions requiring special care during operations.

(b) Is advised regarding the intent and applicable provisions of the approved plan including amendments.

Comments: These are my responsibilities, unless the landowner and/or plan submitter take them over.

1035.3 Licensed Timber Operator Responsibilities

Each affected licensed Timber Operator shall:

(a) Sign the plan and major amendments to the plan, or sign and file with the Director a facsimile of such plan or amendments, agreeing to abide by the terms and specifications of the plan. This shall be accomplished prior to implementation of the following; which the affected LTO has responsibility for implementing:

- **1)** those operations listed under the plan and
- **2)** those operations listed under any amendments proposing substantial deviations from the plan.

(b) Inform the responsible RPF or plan submitter, whether in writing or orally, of any site conditions which in the LTO's opinion prevent implementation of the approved plan including amendments.

(c) Be responsible for the work of his or her employees and familiarize all employees with the intent and details of the operational and protection measures of the plan and amendments that apply to their work.

(d) Keep a copy of the applicable approved plan and amendments available for reference at the site of active timber operations. The LTO is not required to possess any confidential addenda to the plan such as the Confidential Archaeological Addendum, nor is the LTO required to keep a copy of such confidential plan addenda at the site of active timber operations.

(e) Comply with all provisions of the Act, Board rules and regulations, the applicable approved plan and any approved amendments to the plan.

(f) In the event that the LTO executing the plan was not available to attend the on-site meeting to discuss archaeological site protection with the RPF or supervised designee familiar with on-site conditions pursuant to Section 929.2 [949.2,969.2] (b), it shall be the responsibility of the LTO executing the plan to inquire with the plan submitter, timberland owner, or their authorized agent, RPF who wrote the plan, or the supervised designee familiar with on-site conditions, in order to determine if any mitigation measures or specific operating instructions are contained in the Confidential Archaeological Addendum or any other confidential addendum to the plan.

(g) Provide the RPF responsible for professional advice throughout the timber operations an on-site contact employee authorized by the LTO to receive RPF advice.

(h) Keep the RPF responsible for professional advice throughout the timber operations advised of the status of timber operation activity.

- **(1)** Within five days before, and not later than the day of the start-up of a timber operation, the LTO shall notify the RPF of the start of timber operations.
- **(2)** Within five days before, and not later than the day of the shutdown of a timber operation, the LTO shall notify the RPF of the shutdown of timber operations.

(A) The notification of the shutdown of timber operations is not required if the period of the shutdown does not extend beyond a weekend, including a nationally designated legal holiday.

(i) Upon receipt of written notice of an RPF's decision to withdraw professional services from the plan, the LTO or on-site contact employee shall cease timber operations, except for emergencies and operations needed to protect water quality, until the LTO has received written notice from the plan submitter that another RPF has visited the plan site and accepts responsibility for providing advice regarding the plan as the RPF of record.

Comments: These are the responsibilities of the Licensed Timber Operator, LTO.

1104 Operations Requiring Conversion

Except as exempted by Sec. 1104.1 and 1104.2 of this article a timberland conversion permit issued by the Director is required for conversion of timberland as defined in Sec. 1100. Issuance of the Timberland Conversion Permit to the timberland owner must be completed before conversion operations begin. "Conversion operations" include final immediate rezoning of timberland production zone lands, and timber operations as defined in PRC 4527 on nontimberland production zone timberlands.

Comments: I think this is straight forward. You do not have Timberland Production Zoning (TPZ), so no zoning change is required.

1104.3 Timberland Conversion Permit Fees

The applicant shall pay an application fee in the amount of $600 *[NOTE: The fee is $700 if the land is zoned TPZ, see 1105.1. Also, there are DFG fees.]* for the cost of processing an application for the conversion of timberland to a non-timber growing use. Where the land proposed to be converted lies within a TPZ the applicant shall also follow the requirements of Section 1105.1. The fee(s) shall be submitted with the application to the appropriate regional headquarters. Where actual state cost exceeds the application fee, the additional charge equal to the excess cost will be computed using State Administrative Manual Sections 8752.1 and 8740 (dated March 1990). The Department will keep the applicant informed of any additional charges and will advise the applicant of any estimated future costs. All additional charges shall be paid by the applicant to the Department's Accounting Office before the issuance of the Timberland Conversion Permit. Costs of recording the documents pursuant to this article shall be paid by the applicant.

Comments: Again, no TPZ. The $600 usually does not change, but they have the ability to ask for more. The CDF&G fee is around $2000, they keep changing it so we won't know until CDF (acting in CDF&G's behalf) tells us.

All of the following are somewhat self explanatory,

1105 Application

The conversion permit application shall be in a form prescribed by the Director and shall require but not be limited to the following information:
The name and address of the applicant;
The name and address of the timberland owner of record;
The name and address of the timber owner;
The legal description, general plan designation, and zoned status of the proposed conversion area;
The proposed future use or uses of said area;
The dates when conversion is to be commenced and completed;
The approximate number of acres to be converted;
The zoned status of adjacent property;
A description of other land owned by the applicant in the surrounding area which could accommodate the proposed use or used;
Together with a copy of the conversion plan.
The application shall be executed under penalty of perjury.

1105.1 Application Fees
In addition to the requirements of Section 1104.3, the applicant shall pay a fee in the amount of $100 for the cost of processing an application for conversion where the land proposed to be converted lies within a TPZ. *[NOTE: The total of CDF fees is $700. There may be additional fees from DFG.]* Fees for the recording of documents pursuant to this article shall be borne by the applicant.

1105.2 Director's Determination
The Director shall determine the applicant's bona fide intention to convert in light of the present and predicted economic ability of the applicant to carry out the proposed conversion; the environmental feasibility of the conversion, including, but not limited to, suitability of soils, slope, aspect, quality and quantity of water, and micro-climate; adequacy and feasibility of possible measures for mitigation of signification adverse environmental impacts; and other foreseeable factors necessary for successful conversion to the proposed land use.

1105.3 Conversion Plan
A conversion plan in a form prescribed by the Director shall become a part of the application. The plan conversion shall set forth in detail information pertaining to present and future use, soils, topography, conversion techniques, conversion time schedule and such other information as may be required and is applicable to the particular future use to which the land will be devoted.

1105.4 Additional Proof
The Director or the Board upon appeal may require that the applicant provide such further or additional proof or information as in the Director's or Board's judgment is necessary to allow him to decide whether or not to issue a conversion permit pursuant to PRC 4621.2 and 4623.

1106 Conversion Permit Issuance
(a) The Director shall issue a conversion permit if:
- **(1)** In his judgment the bona fide intent of the applicant to convert is established;
- **(2)** He makes the written findings pursuant to PRC 4621.2, when applicable;
- **(3)** He makes the written findings pursuant to PRC 21081, if an environmental impact report has been prepared;
- **(4)** He finds that necessary and feasible mitigation measures have been incorporated into the proposed conversion; and
- **(5)** He finds that no other proximate and suitable land not within a TPZ is available for the proposed alternative use for lands within a TPZ, if PRC 4621.2 applies.

(b) The Board upon appeal shall apply the same standards as the Director in subsection (a) above in determining whether to issue a conversion permit.

1106.1 Contents of Conversion Permit
The conversion permit shall include, but not be limited to, the name of the permittee, identification of code section of the forest practice rules and regulations from exempt, description of the lands to which the conversion permit is applicable, and the period of time during which the conversion permit is valid.

1106.2 Timber Harvesting Plan Processing
Prior to the start of timber operations, the applicant shall submit to the Director a Timber Harvesting Plan applicable to timber operations set forth in the conversion plan. The THP may be submitted concurrently with the Timberland conversion Permit application but the Director may not approve the THP until the Timberland Conversion Permit is issued.

1106.3 Recordation, Renewal, Transferability
- **(a)** The permittee shall submit the conversion permit to the County Recorder for recording in each county in which the property is located before beginning any operations contemplated under said permit. Amendments, suspensions, revocations, and cancellations of conversion permits shall be recorded in the same manner.
- **(b)** A conversion permit may be renewed by the Director upon a proper showing of cause and necessity by the permittee. The Director may deny renewal and require a new application if he finds that circumstances have substantially changed.
- **(c)** The privilege granted to the permittee is nontransferable and nonassignable for any purpose without written approval of the Director.

1106.4 Conversion Permit Denial
- **(a)** The Director shall deny a conversion permit:
  - **(1)** For any of the reasons set forth in PRC 4624;
  - **(2)** If, in the Director's judgment, the applicant has failed to provide satisfactory proof of his bona fide intent to convert;
  - **(3)** If the Director cannot make the findings required by PRC 21801, if an environmental impact report has been prepared;
  - **(4)** If the Director finds that necessary and feasible mitigation measures have not been incorporated into the proposed conversion; or
  - **(5)** For lands within a TPZ, if PRC 4621.2 applies and the Director finds that other proximate and suitable land not within a TPZ is available for the proposed alternative use.
- **(b)** The Board upon appeal shall deny a conversion permit for any of the reasons specified in subsection (a) above.

1106.5 Denial, Suspension, Revocation
- **(a)** Except as provided in subsection (b), the Director may deny, suspend or revoke a conversion permit in accordance with the

requirements of Article 9 (commencing with Sec. 4621) of Chapter 8, Part 2, Division 4 of the PRC, provided that all proceedings in connection with such action shall be conducted in accordance with the provisions of Chapter 5 (commencing with Sec. 11500) of Part 1, Division 3, Title 2 of the Gov. C.

(b) The Director may deny a conversion permit pursuant to PRC 4621.2(d) provided that all proceedings in connection with such action shall be conducted in accordance with the provisions of subsection (a) above, except that the applicant must request a hearing before the Board within 15 days of service of the denial. The hearing shall be commenced within 60 days from the filing of the appeal unless a later hearing date is mutually agreed upon by the applicant and the Board.

1107 Cancellation by Permittee

Upon application by the permittee for cancellation, the conversion permit may be cancelled by the Director upon such terms and conditions as he may set forth. Upon cancellation of the conversion permit, an agreement of cancellation, executed by the permittee and the Director, shall be recorded by the permittee in those counties in which the permit was originally recorded. Upon such recording, the subject land shall revert back to timberland and stocking shall be established pursuant to PRC 4561 and 4561.3. The Director shall provide a copy of the cancellation agreement to the county assessors and the county planning directors of those counties in which the property is located.

Contact me if you have further questions.

Sincerely

Scott R. Butler, RPF #1851

Adjacent landowners within 300' and 1000' downstream of the project boundary. Updated 2-12-2013, mailed 2-13-2013

Lucia Abreu Vineyard Howell
Mountain LLC.
P.O. Box 89
Rutherford Ca 94573

Marc & Janice Mondavi
P.O. Box 342
St. Helena, CA 94574

Pacific Union College
1 Angwin Ave.
Angwin, CA 94508

David Abreu Vineyard Mgmt., Inc.
P.O. Box 89
Rutherford Ca 94573

Environmental Resource Management
Scott R. Butler, RPF #1851
889 Hwy 20-26
Ontario, Oregon 97914
Office: (707) 468-8466 Fax: (707) 220-0111
email: scott.butler@sbcglobal.net

Adjacent Landowner 2-12-2013
Conn Creek Watershed
Napa, California

To Whom It May Concern:
You are listed as an adjacent landowner of a proposed timber harvest. Your property is within 300 feet, or within 1,000 feet downstream, and has the potential to receives surface drainage from the proposed timber operation. State law requires that I notify you of this activity.

I am a Registered Professional Forester preparing a Timber Harvest Plan (THP) on property near you. The proposed project consists of a 12.8 acre timber harvest, 4.2 acre grass/brush removal and installation of a 17 acre vineyard. The project is located within the Conn Creek Watershed (Calwater #2206.500305). The project is located on an unnamed tributary of the Conn Creek, approximately 7 miles above Lake Hennessey. Conn Creek lies approximately 2900 feet west of the proposed project. Legal description: A portion of Sections 5 and 8, T8N, R5W, MDB&M (Projected). The town of Angwin in, Napa County California lies approximately 1 mile North West of the project. See the attached map, a portion of the St. Helena quadrangle for the exact location.

Harvesting is expected to take place within the next year.

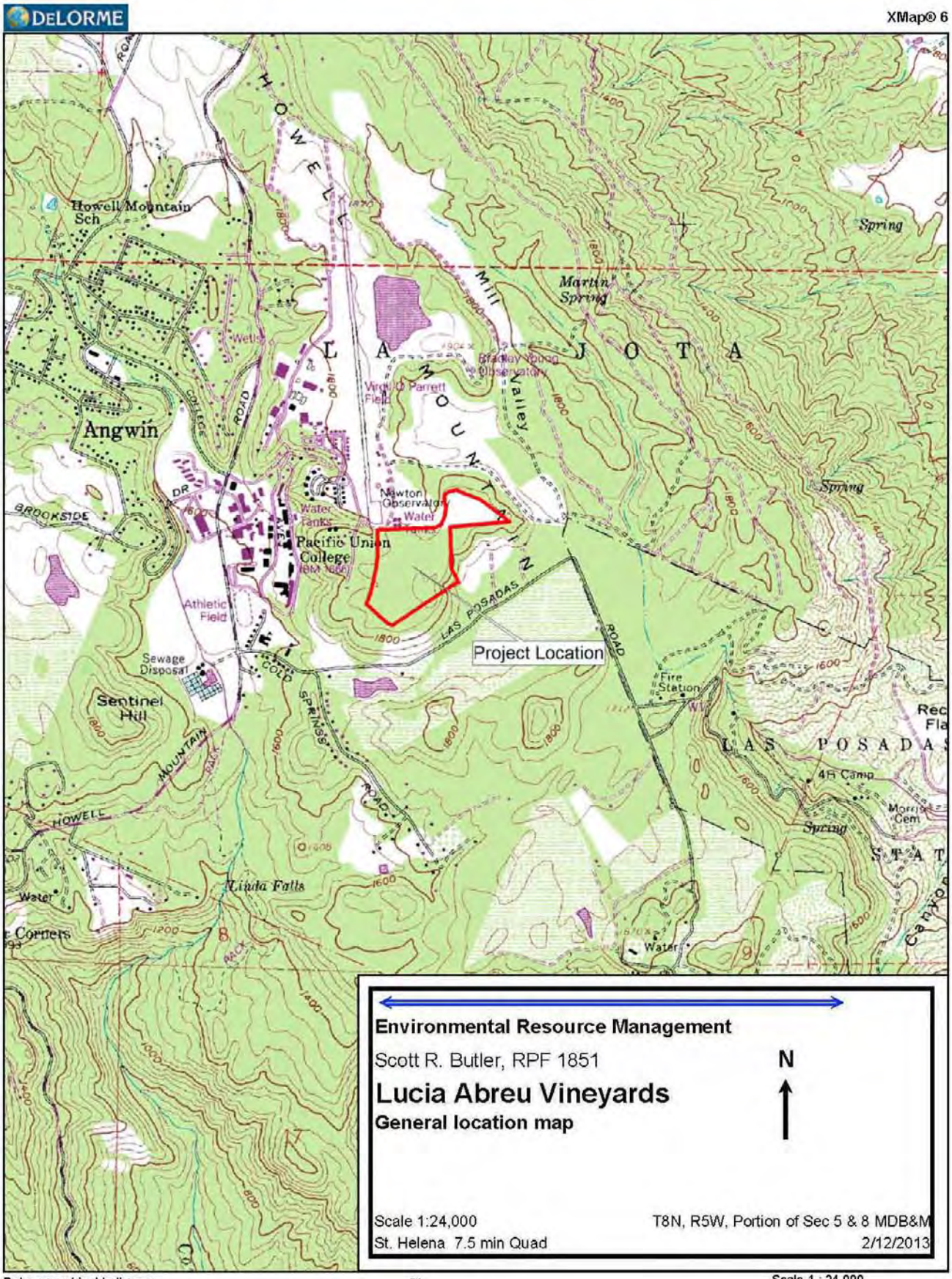
This letter is an official request for information. You (the property owner) are requested to respond within ten days of the post-marked date on this letter if you have any information or concerns. Please contact me at the above address in writing or by email.

Sincerely,

Scott R. Butler, RPF 1851

Plan submitter
David Abreu
P. O. Box 89
Rutherford, CA 94573

Attached, Notice of intent
General Area Map
Project Area Map



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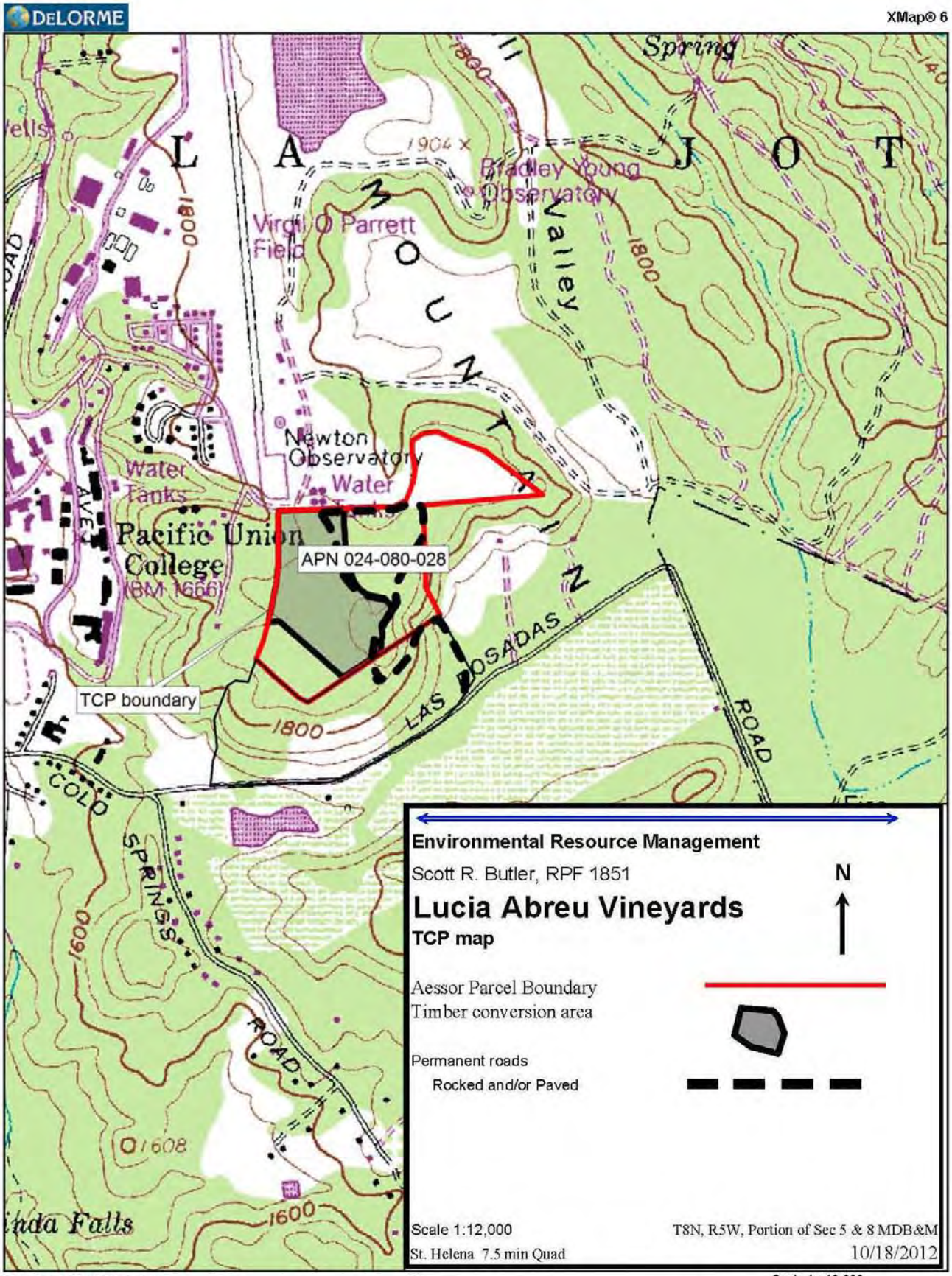
www.delorme.com

TN MN (14.2°E)

Scale 1 : 24,000

1" = 2,000.0 ft Data Zoom 14-0


DELORME
XMap® 6
Spring
L A M O U N T A I N
Bradley Young Observatory
Virgil O Parrett Field
Valley
Newton Observatory
Water Tanks
Pacific Union College
APN 024-080-028
TCP boundary
LAS POSADAS ROAD
COLD SPRINGS ROAD
1800
1600
Environmental Resource Management
Scott R. Butler, RPF 1851
Lucia Abreu Vineyards
TCP map
N
Aessor Parcel Boundary
Timber conversion area
Permanent roads
Rocked and/or Paved
Scale 1:12,000
St. Helena 7.5 min Quad
T8N, R5W, Portion of Sec 5 & 8 MDB&M
10/18/2012
Data use subject to license.
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www.delorme.com
Scale 1 : 12,000
1" = 1,000.0 ft
Data Zoom 14-0

Environmental Resource Management
Scott R. Butler, RPF #1851
889 Hwy 20-26
Ontario, OR 97914
Phone: (707) 468-8466 Fax: (707) 220-0111
Email: scott.butler@sbcglobal.net

Napa Valley Register 2-12-2013
Attn: Margaret, Legal notices
P. O. Box 150
Napa, CA 94559
Fax: 256-0743

Email: nvrlegals@napanews.com

To Whom It May Concern:
Please place the following Legal notice in the Napa Valley Register on the earliest date possible.

This is a request for information on any domestic water supply located within 1,000 feet downstream from a proposed 12.8 acre timber harvest and conversion. The proposed project consists of a 12.8 acre timber harvest, 4.2 acre removal of grass/brush and installation of a 17 acre vineyard. The project is located within the Conn Creek Watershed (Calwater #2206.500305). The project is located on an unnamed tributary of the Conn Creek, approximately 7 miles above Lake Hennessey. Conn Creek lies approximately 2900 feet west of the proposed project in Napa County California. Legal description: Portion of Section 5 & 8, T8N, R5W MDB&M. The town of Angwin in Napa County California, lies 1 mile North West of the project The nearest road intersection is Los Posadas Road and Cold Springs Road 1500 feet South West of the proposed project. Send information within 10 days of the publication of this notice to: Environmental Resource Management 889 Hwy 20-26 Ontario, OR 97914

Please call me, at the number listed above, or email to confirm, thank you for your assistance.
Sincerely

Scott R. Butler

AFFIDAVIT OF PUBLICATION NAPA VALLEY PUBLISHING

Environmental Resource Mgmt.
889 Hwy 20-26,
Ontario, OR 97914

ACCOUNT # 11078

AD NUMBER 0000164721-01

STATE OF CALIFORNIA

COUNTY OF NAPA

I AM A CITIZEN OF THE UNITED STATES AND A RESIDENT OF THE COUNTY AFORESAID; I AM OVER THE AGE OF EIGHTEEN YEARS, AND NOT A PART TO OR INTERESTED IN THE ABOVE-ENTITLED MATTER. I AM THE PRINCIPAL CLERK OF THE NAPA VALLEY REGISTER, A NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED DAILY IN THE CITY OF NAPA, COUNTY OF NAPA, AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATION BY THE SUPERIOR COURT OF THE COUNTY OF NAPA, STATE OF CALIFORNIA, UNDER THE DATE OF NOVEMBER 16, 1951, CASE NUMBER 12752,

THAT I KNOW FROM MY OWN PERSONAL KNOWLEDGE THE NOTICE, OF WHICH THE ANNEXED IS A PRINTED COPY (SET IN TYPE NOT SMALLER THAN NONPAREIL), HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO WIT:

PUBLISHED IN NVR:: 2/16/2013

FILED ON: 02/18/2013

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

DATED AT NAPA COUNTY, CALIFORNIA,

THIS DAY 18 OF Feb, 2013

SIGNATURE J Busch

Ad Content Proof

PUBLIC NOTICE

This is a request for information on any domestic water supply located within 1,000 feet downstream from a proposed 12.8 acre timber harvest and conversion. The proposed project consists of a 12.8 acre timber harvest, 4.2 acre removal of grass/brush and installation of a 17 acre vineyard. The project is located within the Conn Creek Watershed (Calwater #2206.500305). The project is located on an unnamed tributary of the Conn Creek, approximately 7 miles above Lake Hennessey. Conn Creek lies approximately 2900 feet west of the proposed project in Napa County California. Legal description: Portion of Section 5 & 8, T8N, R5W MDB&M. The town of Angwin in Napa County California, lies 1 mile North West of the project The nearest road intersection is Los Posadas Road and Cold Springs Road 1500 feet South West of the proposed project. Send information within 10 days of the publication of this notice to: Environmental Resource Management 889 Hwy 20-26 Ontario, OR 97914
164721 2/16/2013

NOTICE OF INTENT TO HARVEST TIMBER

A Timber Harvesting Plan (Plan) or Amendment has been submitted to the California Department of Forestry & Fire Protection (CAL FIRE). CAL FIRE will be reviewing the proposed timber operation for compliance with State law and rules of the Board of Forestry and Fire Protection. The following briefly describes the proposed timber operation and where and how to get more information. In accordance with the timeline stated under Public Resources Code Section 4582.7, you may submit written public comments on the Plan or Amendment for CAL FIRE to consider.

This notice applies to (select one below):

☒ New Timber Harvesting Plan ☐ Amendment to an Approved Timber Harvesting Plan

Applicant Information (Timberland Owner(s), Registered Professional Forester who prepared the plan and Plan Submitter should match those listed in the plan or amendment.)

1. The name(s) of the Timberland Owner(s) where timber operations are to occur: **David Abreu Vineyard Management**
2. Registered Professional Forester who prepared the plan or amendment: **Scott R. Butler**
   Registered Professional Forester Phone (optional): **707 468-8466**
3. The name of the Plan or Amendment Submitter: **David Abreu**

Project Summary (County, legal description, acres proposed to be harvested and treatments to be used should match those listed in the plan or amendment.)

4. Location of the proposed timber operation (county, legal description, approximate direction & approximate distance of the timber operation from the nearest community or well-known landmark):
   Napa County California. Legal description: Portion of Section 5 & 8, T8N, R5W MDB&M. The town of Angwin in Napa County California, lies 1 mile North West of the project.
5. The name of, and distance from, the nearest perennial stream and major watercourse flowing through or downstream from the timber operation:
   The project is located within the Conn Creek Watershed (Calwater #2206.500305). The project is located on an unnamed tributary of the Conn Creek, approximately 7 miles above Lake Hennessey. Conn Creek lies approximately 2900 feet west of the proposed project.
6. Acres proposed to be harvested: **12.8**
7. The regeneration methods and intermediate treatments to be used:
   Timberland Conversion, 12.8 acres, 4.2 acres cleared of grass/brush. Installation of a 17 acre Vineyard.
8. ☐ Yes ☒ No Is there a known overhead power line, except lines from transformers to service panels, within the plan area?

Public Information: The review times allowed for CAL FIRE to review the proposed timber operation are variable in length, but limited. To ensure CAL FIRE receives your comments please read the following:

The estimated earliest possible date CAL FIRE may **APPROVE** the Plan or Amendment is: **3-1-2013**
(This date is 15 calendar days from receipt of the Plan or Amendment by CAL FIRE, except in counties for which special rules have been adopted where the earliest date is 45 calendar days after receipt.)

NOTE: THE ESTIMATED EARLIEST APPROVAL DATE IS PROBABLY NOT THE ACTUAL APPROVAL DATE. Normally, a much longer period of time is available for public comment and preparation of CAL FIRE's responses to public comments. Please check with CAL FIRE, prior to the above listed date, to determine the actual date that the public comment period closes.

The public may review, or purchase a copy of, the Plan or Amendment at the CAL FIRE Review Team Office shown below. The cost to obtain a copy is 37 cents for each page, $2.50 minimum per request. The cost to obtain a copy of this plan or amendment is: _____
(to be completed by CAL FIRE upon receipt of plan).

Questions or concerns regarding this plan should be directed to the CAL FIRE Review Team Office shown below or emailed to **SantaRosaPublicComment@fire.ca.gov** for incorporation into an Official Response Document. Please include the plan number on all correspondence.

Forest Practice Program Manager
CAL FIRE
135 Ridgway Avenue
Santa Rosa, CA 95401
(707) 576-2959

The plan may be viewed online at ftp://thp.fire.ca.gov/THPLibrary/North_Coast_Region

A map showing the approximate boundary of the THP area, a map legend, and a scale is attached to help in locating where the proposed timber operation is to occur.

For CAL FIRE Use Only

Timber Harvest Plan Number: Date of Receipt:

Abreu THP
From: Pam Town <cptown@blackfoot.net>
To: Scott Butler <scott.butler@sbcglobal.net>

2 Files View Slideshow Download All
Abreu 2013.jpg (4342KB); Abreu 2013 001.jpg (732KB)

Scott,

Using the most current protocol and NSO database I have created the attached.

Map: Map shows approximate boundary of Abreu - as we are in the redwood zone, you are required to survey the THP area and within 0.7 miles of the boundary (CalFire approval). The area to the west (Angwin area) is considered unsuitable habitat and therefore does not require surveys.

There are no known NSO activity centers within 0.7 miles of the property boundary.

The activity centers that you indicated are within 1.5 miles of the property boundary (NAP029 & NAP028). Surveys are not required within 1/2 mile of an active territory - this area overlaps the 0.7 mile assessment area by a small piece, so monitoring these 2 territories in 2013 would remove a small portion of the assessment area.

The map shows 4 survey stations that can be used to survey in 2013, these stations can be moved a bit as access/safety allows. There is an additional station along Cold Springs Road that can be used, but due to access and houses, this may not be a feasible station and could be dropped.

There will be 6 surveys required in 2013 to meet the current NSO protocol.

Current database - report #1: I checked the database to make sure no new NSO territories have been identified in the area. There are no new territories.

The attached is what is required for CalFire approval (0.7 mile assessment area). If you have gone through the County, you may require a larger assessment area; therefore, monitoring NAP029, NAP028, & NAP014 may be required.

I am sending a copy of the attached to Theodore Wooster to determine if he is available for surveys. If you are in the area and want to complete a nocturnal survey, please let Ted know so surveys can be properly spread apart. If Ted is not available, I can complete the surveys. I would prefer to have Ted complete the surveys as he will be coming from Yountville and I'm primarily based along the coast.

To complete the paperwork, I would like a day visit to see the property and surrounding habitat. I am somewhat familar with the area (and it looks easy to locate), but will contact Ted for a "show me" trip and try to combine with one of the surveys.

Let me know if you need more information and feel free to pass this email along to the landowner.

Pam Town
Consulting Wildlife Biologist
(406) 490-7427
cptown@blackfoot.net

California Department of Fish and Wildlife

Spotted Owl Database Management System

Report # 1 - Spotted Owl Sites Found

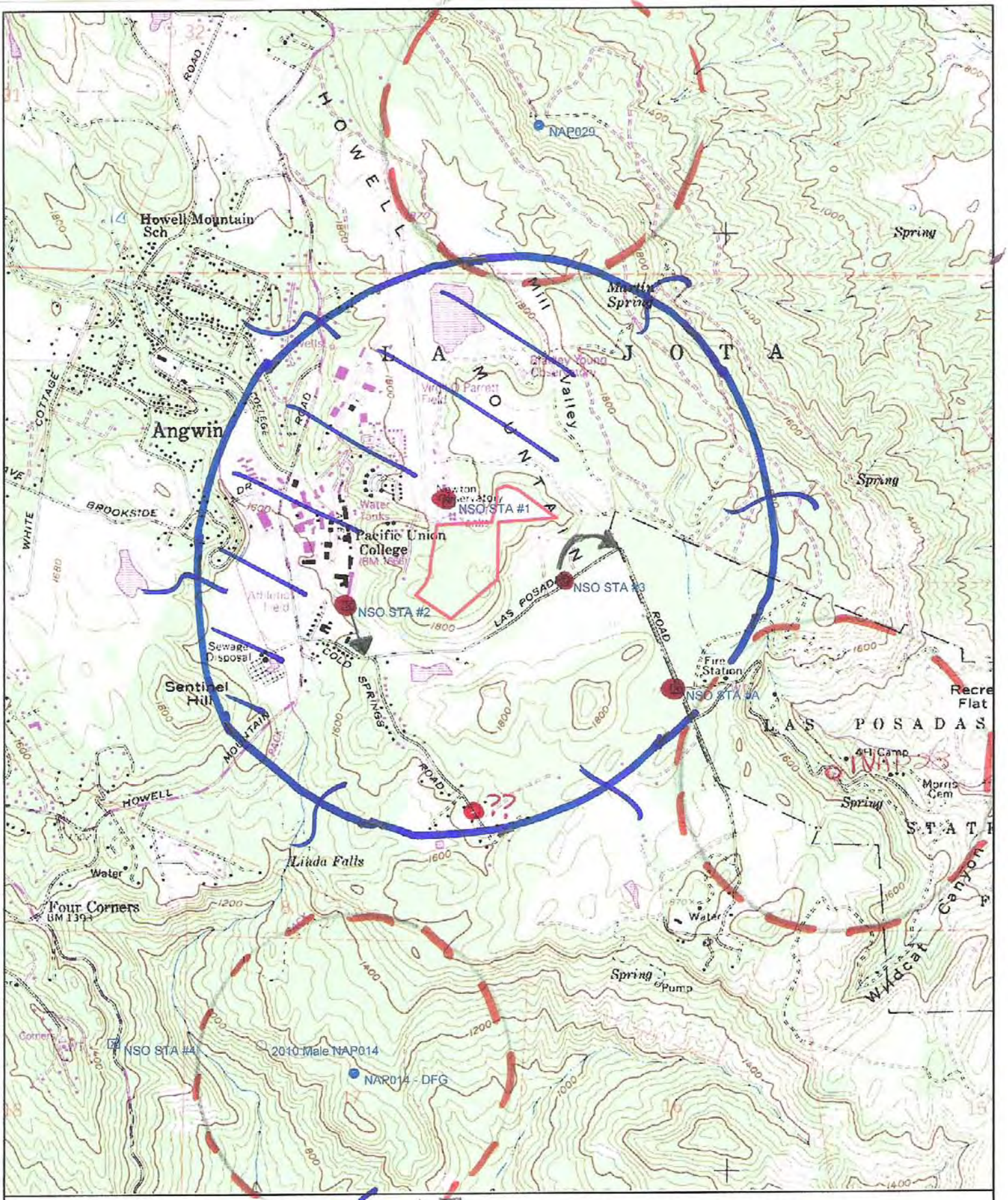
Known Spotted Owl sites having observations within the search area.

Meridian, Township, Range, Section (MTRS) searched:

M_09N_05W Sections(31,32,33);
M_08N_05W Sections(06,05,04,07,08,09);

Masterowl	Subspecies	Lat DD N83	Lon DD N83	MTRS	Coordinate Source	
NAP0014	NORTHERN	38.54590100	-122.43846400	M 08N 05W 17	Contributor	8N 5W Sec 17
NAP0028	NORTHERN	38.55919800	-122.41184800	M 08N 05W 09	Contributor	8N 5W Sec 9
NAP0029	NORTHERN	38.58857200	-122.42906100	M 09N 05W 33	Contributor	9N 5W Sec 33

NAP0014 - Active 2012 - Pair
NAP0028 - Last Activity 1992
NAP0029 - Active 2012 (Nested w/49)



Name: ST HELENA
Date: 2/11/2013
Scale: 1 inch equals 2000 feet

0.7 mile

Location: 038.5669058° N 122.4304357° W NAD 83
Caption: Abru

?? may not be able to access

unsuitable habitat

Copyright (C) 1997, Maptech, Inc.

NSO Station → move to

1/2 mile around AC

Forest Ecosystem Management, PLLC
PO Box 455; Potomac, MT 59823
(406) 490-7427 * cptown@blackfoot.net

July 17, 2013

Scott Butler, RPF
Environmental Resource Management
889 Hwy 20-26
Ontario, OR 97914

RE: Abreu Timber Conversion (New Plan)

Scott,

Attached you will find information regarding northern spotted owls (NSO) for the above mentioned timber harvest plan (THP). This is an 18-acre timber conversion located in Section 5 & 8 T8N, R5W MDB&M in Napa County.

Included is a discussion on known NSO territories, NSO survey history, and NSO habitat of the property and 0.7-mile assessment area. Pre and post harvest habitat maps of the THP are attached as well as tables for the habitat analysis. There are no known NSO territories within 0.7 miles of the conversion project; therefore, there are no habitat maps for NSO territories. I also provided a current Spotted Owl Database Report run on July 17, 2013.

Northern Spotted Owl Habitat

Pre-harvest, the plan area is approximately 18-acres of unsuitable NSO habitat. The area is considered unsuitable habitat as the area is fragmented within 0.25 miles or more of the property boundary by a college, airport runway, extensive vineyards, housing, water reservoirs, County roads, and hiking trails. The property is at the top of the hill and is hot and dry in the summer and fall. There are no watercourses or incised areas within the project area. In 2003, the majority of the site was harvested to remove any large trees per Federal Aviation Administration regulations (area is at the end of the Pacific Union College Airport Runway). In 2004, the understory was removed and all woody debris was chipped. Any remaining trees were pruned.

There are no known NSO territories within 0.7 miles of the Project boundary. The closest known NSO territory is NAP028, which is 1.1 miles to the southeast, although the territory has not been active since 1992.

Northern Spotted Owl Surveys

The THP and surrounding area has been historically surveyed in the past (1990s) by Theodore Wooster with no northern spotted owls detected. In 2012 & 2013, the area was surveyed following the most current protocol. No new northern spotted owls have been detected. Much of the habitat within the 0.7-mile assessment area is unsuitable NSO habitat due to vineyards, housing, college, and airport.

Proposed Operations

Timber harvest operations are converting the area to a new vineyard.

Northern Spotted Owl Protection Measures

- The project area is unsuitable habitat for northern spotted owls prior to the completion of this project; therefore, there will be no additional negative impact to northern spotted owls.
- At this time, there are no known NSO activity centers within 0.7-miles of the project area, therefore, there are no seasonal or harvest restrictions.
- No helicopter operations are proposed.

Please feel free to contact me at (406) 490-7427 (cptown@blackfoot.net) if you have any questions.

Sincerely,

Pamela Town
Consulting Wildlife Biologist

Northern Spotted Owl Habitat Analysis
Abreu Vineyard Conversion
Plan Portions of Secs. 5 & 8 T8N, R5W MDB&M

Northern Spotted Owl Habitat on Abreu Vineyard Conversion (Pre & Post Harvest)

Description	Pre Harvest (Acres)	Post Harvest (Acres)
Nesting/Roosting NSO Habitat	0	0
Foraging NSO Habitat	0	0
Unsuitable NSO Habitat	18	18
Total THP Acres	**18**	**18**

Northern Spotted Owl Monitoring
For Known Territories within 0.7 Miles Abreu THP

There are no known NSO territories within 0.7 miles of the project area. The closest known NSO territories are:

NAP014 – approximately 1.5 miles – pair in 2012 and 2013
NAP028 – approximately 1.1 miles – territory not active since 1992
NAP029 – approximately 1.2 miles – pair in 2012 and 2013

NSO Protocol Review

- Protocol Followed: 2011 Protocol for Surveying Proposed Management Activity that may impact NSOs.
- 2012 is Year 1 – 6 Surveys
- 2013 is Year 2 – 6 Surveys

- 10 – Minute Point Count Survey Used
- Tape or Digital Recording Used

- Barred Owls Detected: None
- Years Northern Spotted Owls were Detected: 2012 & 2013 NAP029 & NAP014 both found active; however, both further than 0.7 miles from the project area.
- Other Owl Species Detected: Western Screech Owl and Great Horned Owl

- Survey Stations ¼ to ½ mile apart: Yes
- Surveys Spread over Breeding Season: Yes
- 7 Days between Surveys: Yes
- Surveys completed between 01MAR – 31JUL: Yes
- Surveys Between Sunset and Sunrise: Yes

- Daytime follow-up within 48 hours if NSO Detected: N/A – known NSOs further than 0.7 miles from the project area and located on private property.

- Activity Center Survey (ACS) Completed: Known NSOs further than 0.7 miles from the project area and located on private property.

- 2011 Protocol: Survey Coverage to 0.7 miles of Harvest Boundary: Yes, on suitable habitat.

Abreu

Data Version Date: 7/1/2013

Report Generation Date: 7/17/2013

California Department of Fish and Wildlife

Spotted Owl Database Management System

Report # 1 - Spotted Owl Sites Found

Known Spotted Owl sites having observations within the search area.

Meridian, Township, Range, Section (MTRS) searched:

M_09N_05W Sections(31,32,33,34);
M_08N_05W Sections(06,05,04,03,07,08,09,10,18,17,16,15);

Masterowl	Subspecies	Lat DD N83	Lon DD N83	MTRS	Coordinate Source	
NAP0014	NORTHERN	38.54590100	-122.43846400	M 08N 05W 17	Contributor	1.5 Miles
NAP0028	NORTHERN	38.55919800	-122.41184800	M 08N 05W 09	Contributor	1.1 Miles
NAP0029	NORTHERN	38.58857200	-122.42906100	M 09N 05W 33	Contributor	1.2 Miles

All further than 0.7 Miles

Northern Spotted Owl Territories within 0.7 Miles of Abreu

Plan Portions of Section 5 & 8 T8N, R5W MDB&M

1" = 2,000' * St. Helena USGS * Map Date: July 2013

Legend

Property Boundary: THP Boundary:

0.7 Mile Assessment Area: NSO Territory:

No NSO Territories within 0.7 Miles of Abreu

Date	Weather	Station #	Survey Time	Owl Response
2012 - Protocol Year #1				
8-Mar-12	Clear & Calm	1	1815 - 1825	N/R
		3	1831 - 1841	N/R
		A	1849 - 1859	N/R
26-Mar-12	Overcast & Calm	1	2240 - 2255	N/R
		3	2300 - 2310	N/R
		A	2314 - 2324	N/R
18-Apr-12	Cloudy & Calm	ACS - NAP029	1823 - 1925	Non-nesting Pair
		1	2000 - 2014	N/R
7-May-12	Clear & Clam	A	1953 - 2003	N/R (dogs)
		2	2010 - 2020	N/R
		3	2031 - 2041	N/R (dogs)
		1	2051 - 2101	N/R
		NAP14	2112 - 2122	Unknown Sex NSO
13-May-12	Clear & breeze	Near 3	2139 - 2202	N/R (Adjacent Plan survey)
		Near A	2233 - 2243	N/R (Adjacent Plan survey)
14-May-12	Clear & Calm	1	2205 - 2215	N/R
		3	2223 - 2233	N/R
		A	2238 - 2248	N/R
		2	2251 - 2301	N/R (dogs)
21-May-12	Clear & breeze	1	2003 - 2028	N/R
		A	2031 - 2102	N/R
		NAP14	2116 - 2123	Unknown Sex NSO
1-Jun-12	Clear & calm	Near 3	2131 - 2154	N/R (Adjacent Plan survey)
		Near A	2227 - 2237	N/R (Adjacent Plan survey)
15-Jun-12	Clear & Calm	Near 3	2206 - 2239	N/R (Adjacent Plan survey)
		Near A	2116 - 2126	N/R (Adjacent Plan survey)
27-Jun-12	Clear & Calm	Near 3	2201 - 2224	N/R (Adjacent Plan survey)
		Near A	2115 - 2125	N/R (Adjacent Plan survey)
14-Jul-12	Clear & Calm	Near 3	2136 - 2202	N/R (Adjacent Plan survey)
		Near A	2054 - 2107	N/R (Adjacent Plan survey)
3-Aug-12	Clear & Calm	Near 3	2152 - 2217	N/R (Adjacent Plan survey)
		Near A	2112 - 2124	N/R (Adjacent Plan survey)
2013 - Protocol Year #2				
15-Mar-13	Clear & Calm	1	2036 - 2046	N/R (dogs)
		3	2058 - 2108	N/R (dogs)
		A	2112 - 2122	N/R (WSOW)
		2	2128 - 2138	N/R (frogs & dogs)
		NAP14	2144 - 2154	Pair
25-Mar-13	Cloudy & Breeze	1	2001 - 2011	N/R
		A	2023 - 2033	N/R (dogs)
		3	2041 - 2051	N/R (dogs)
		2	2057 - 2107	N/R
11-Apr-13	Cloudy & calm	1	2124 - 2134	N/R
		A	2143 - 2153	N/R (WSOW)
		3	2157 - 2207	N/R
		2	2213 - 2223	N/R (frogs)
11-Apr-13		NAP029	2002 - 2014	Pair NSO - possible nesting
28-Apr-13	Clear & Calm	1	2102 - 2112	N/R
		A	2123 - 2133	N/R (tractor operating)
		3	2136 - 2146	N/R
		2	2151 - 2201	N/R
		NAP14	2211 - 2216	Female NSO
7-May-13	Cloudy & calm	1	2049 - 2059	N/R (dog & people)
		A	2110 - 2120	N/R (tractor operating)
		3	2125 - 2135	N/R
		2	2139 - 2149	N/R (frogs)

23-May-13	Clear & breeze	A	2054 - 2104	N/R
		3	2107 - 2117	N/R
		2	2122 - 2132	N/R
		1	2143 - 2153	N/R (frogs)
		NAP14	2210 - 2215	Female NSO

Northern Spotted Owl Survey Stations for Abreu
Plan Portions of Section 5 & 8 T8N, R5W MDB&M
1" = 2,000' * St. Helena USGS * Map Date: July 2013

N

Legend

Property Boundary:
0.7 Mile Assessment Area:
NSO Survey Station:
THP Boundary:
NSO Territory:

Pre & Post Harvest NSO Habitat for Abreu
Property Portions of Sections 5 & 8 T8N, R5W MDB&M
1" = 1,000' St. Helena USGS Map Date: July 2013

N

Legend

Property Boundary:
Nesting/Roosting Habitat: None
Unsuitable Habitat: Project Area
Vineyard Conversion Boundary:
Foraging Habitat: None

NSO Habitat within 0.7 Miles of Abreu

Property Portions of Sections 5 & 8 T8N, R5W MDB&M

1" = 1,000' St. Helena USGS Map Date: July 2013

Legend

Property Boundary:

0.7 Mile Assessment Area:

Foraging Habitat:

NSO Territory:

Vineyard Conversion Boundary:

Nesting/Roosting Habitat:

Unsuitable Habitat:

Angwin
Eastern Ave
Clark Way
Circle Dr
White Cottage Rd N
College Drive
Brookside Dr
La Jota Drive
Las Posadas Rd
Cold Springs Rd
Howell Mountain Rd
© 2013 Google
Google earth
Google earth
miles
km
1
2

Abreu

United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Napa County, California

Lucia Abreu Vineyard

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

122° 26' 8"
122° 25' 45"
38° 34' 18"
38° 33' 54"
38° 33' 53"
549210
549300
549390
549480
549570
549660
4269390
4269300
4269210
4269120
4269030
4268940
4268850
4268760
4268670
College Ave
Airport Way
Las Posadas Rd
100
102
Map Scale: 1:3,650 if printed on A size (8.5" x 11") sheet.
N
Meters
0 35 70 140 210
Feet
0 100 200 400 600

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:3,650 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
Survey Area Data: Version 4, Dec 10, 2007

Date(s) aerial images were photographed: 6/22/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Lucia Abreu Vineyard)

Napa County, California (CA055)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
100	Aiken loam, 2 to 15 percent slopes	35.9	91.3%
102	Aiken loam, 30 to 50 percent slopes	3.4	8.7%
Totals for Area of Interest		**39.4**	**100.0%**

Map Unit Descriptions (Lucia Abreu Vineyard)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Napa County, California

100—Aiken loam, 2 to 15 percent slopes

Map Unit Setting

Elevation: 300 to 3,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 54 to 55 degrees F
Frost-free period: 200 to 250 days

Map Unit Composition

Aiken and similar soils: 85 percent

Description of Aiken

Setting

Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from volcanic rock

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability (nonirrigated): 3e

Typical profile

0 to 8 inches: Loam
8 to 14 inches: Clay loam
14 to 44 inches: Clay
44 to 48 inches: Unweathered bedrock

102—Aiken loam, 30 to 50 percent slopes

Map Unit Setting

Elevation: 300 to 3,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 54 to 55 degrees F

Frost-free period: 200 to 250 days

Map Unit Composition

Aiken and similar soils: 85 percent

Description of Aiken

Setting

Landform: Hillsides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from volcanic rock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability (nonirrigated): 6e

Typical profile

0 to 8 inches: Loam
8 to 14 inches: Clay loam
14 to 44 inches: Clay
44 to 48 inches: Unweathered bedrock

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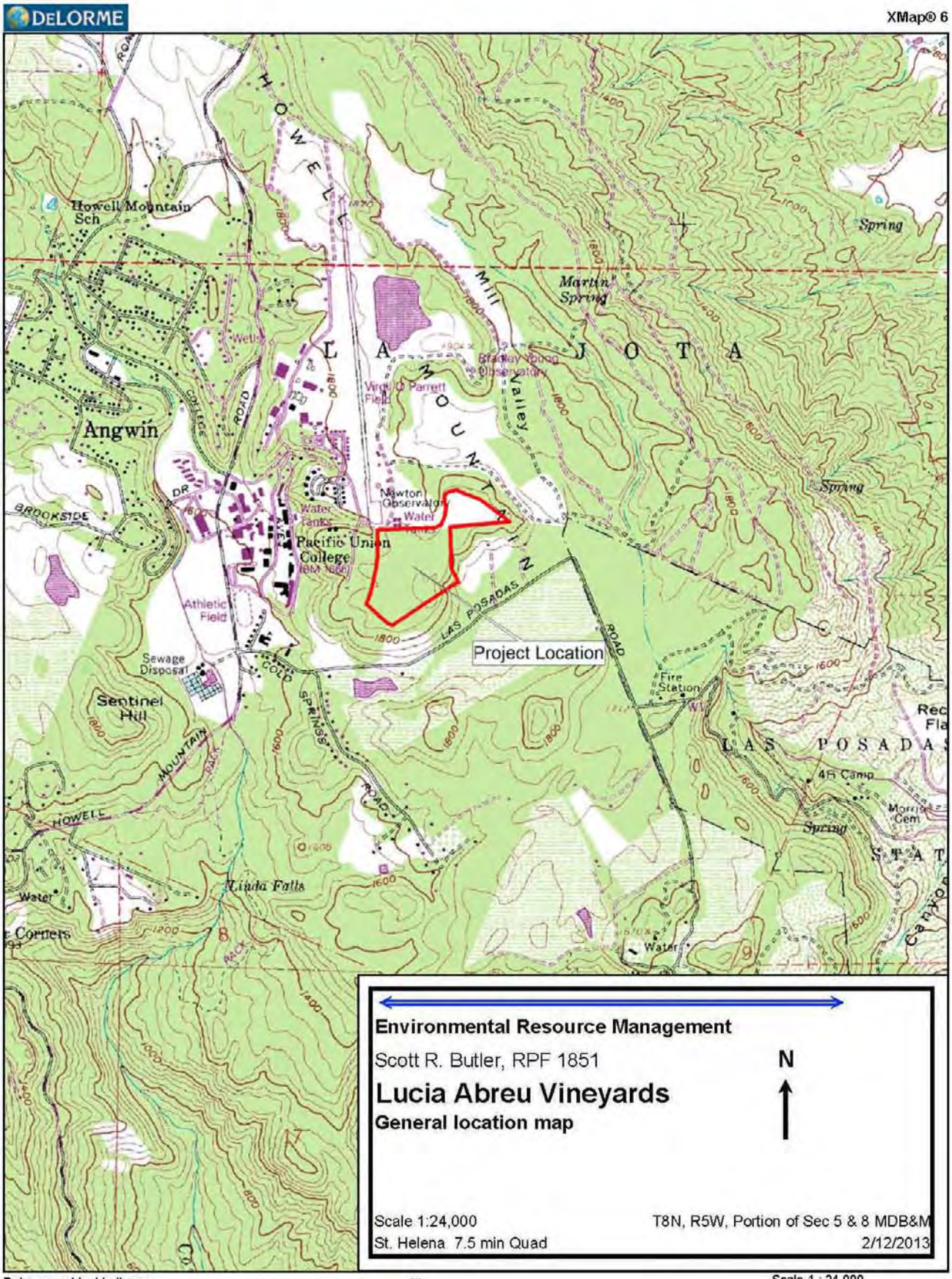
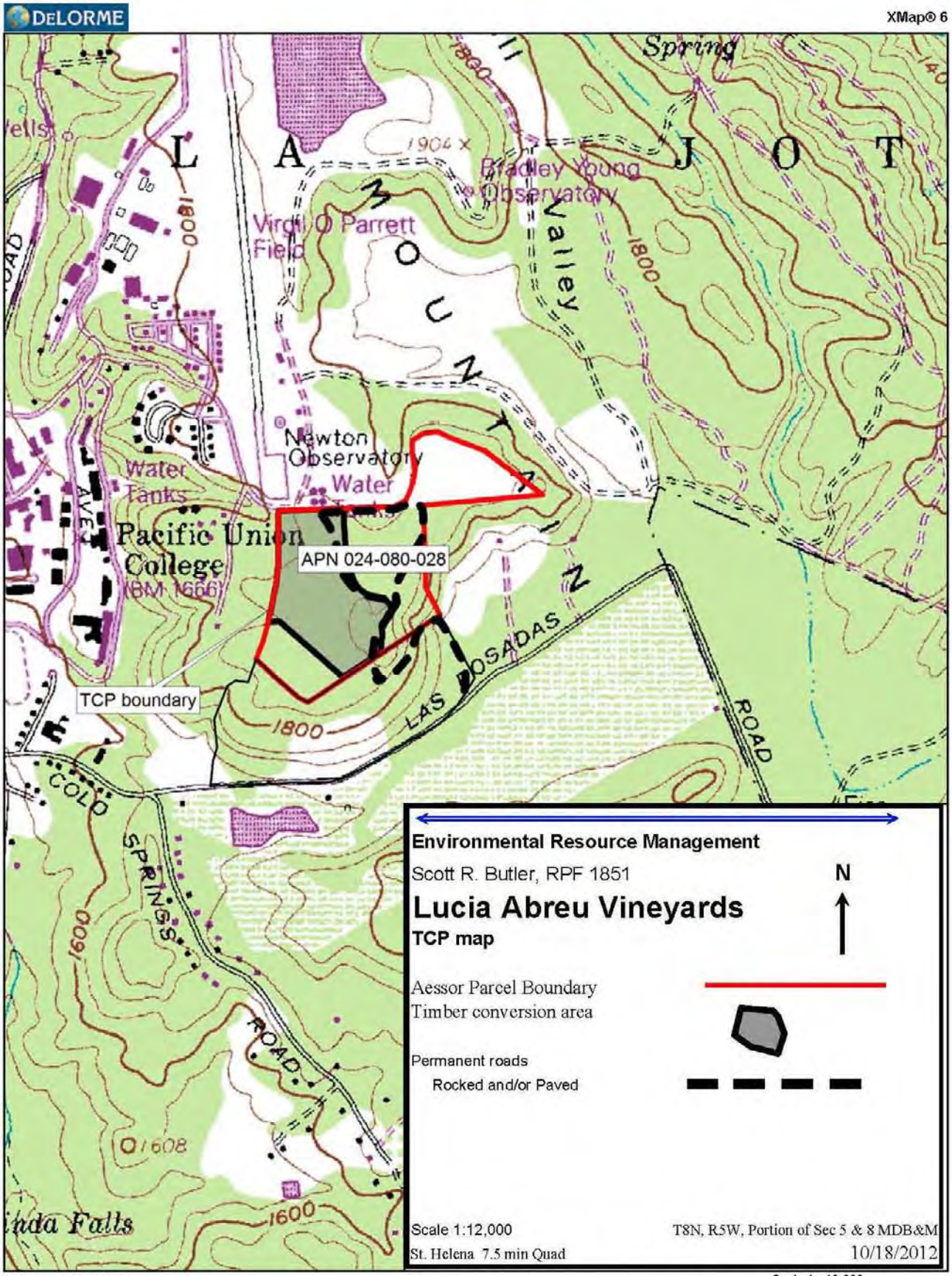

DELORME
XMap® 6
Howell Mountain Sch
Angwin
Pacific Union College
Newton Observatory
Water Tanks
Athletic Field
Sewage Disposal
Sentinel Hill
Linda Falls
Martin Spring
Spring
Fire Station
4H Camp
Project Location
Environmental Resource Management
Scott R. Butler, RPF 1851
Lucia Abreu Vineyards
General location map
N
Scale 1:24,000
St. Helena 7.5 min Quad
T8N, R5W, Portion of Sec 5 & 8 MDB&M
2/12/2013
Data use subject to license.
© DeLorme. XMap® 6.
www.delorme.com
Scale 1 : 24,000
1" = 2,000.0 ft
Data Zoom 14-0


DELORME
XMap® 6
Spring
L A M O U N T A I N
Bradley Young Observatory
Virgil O Parrett Field
Valley
Newton Observatory
Water Tanks
Water
Pacific Union College
APN 024-080-028
TCP boundary
LAS POSADAS ROAD
COLD SPRINGS ROAD
1800
1600
Environmental Resource Management
Scott R. Butler, RPF 1851
Lucia Abreu Vineyards
TCP map
N
Aessor Parcel Boundary
Timber conversion area
Permanent roads
Rocked and/or Paved
Scale 1:12,000
St. Helena 7.5 min Quad
T8N, R5W, Portion of Sec 5 & 8 MDB&M
10/18/2012
Data use subject to license.
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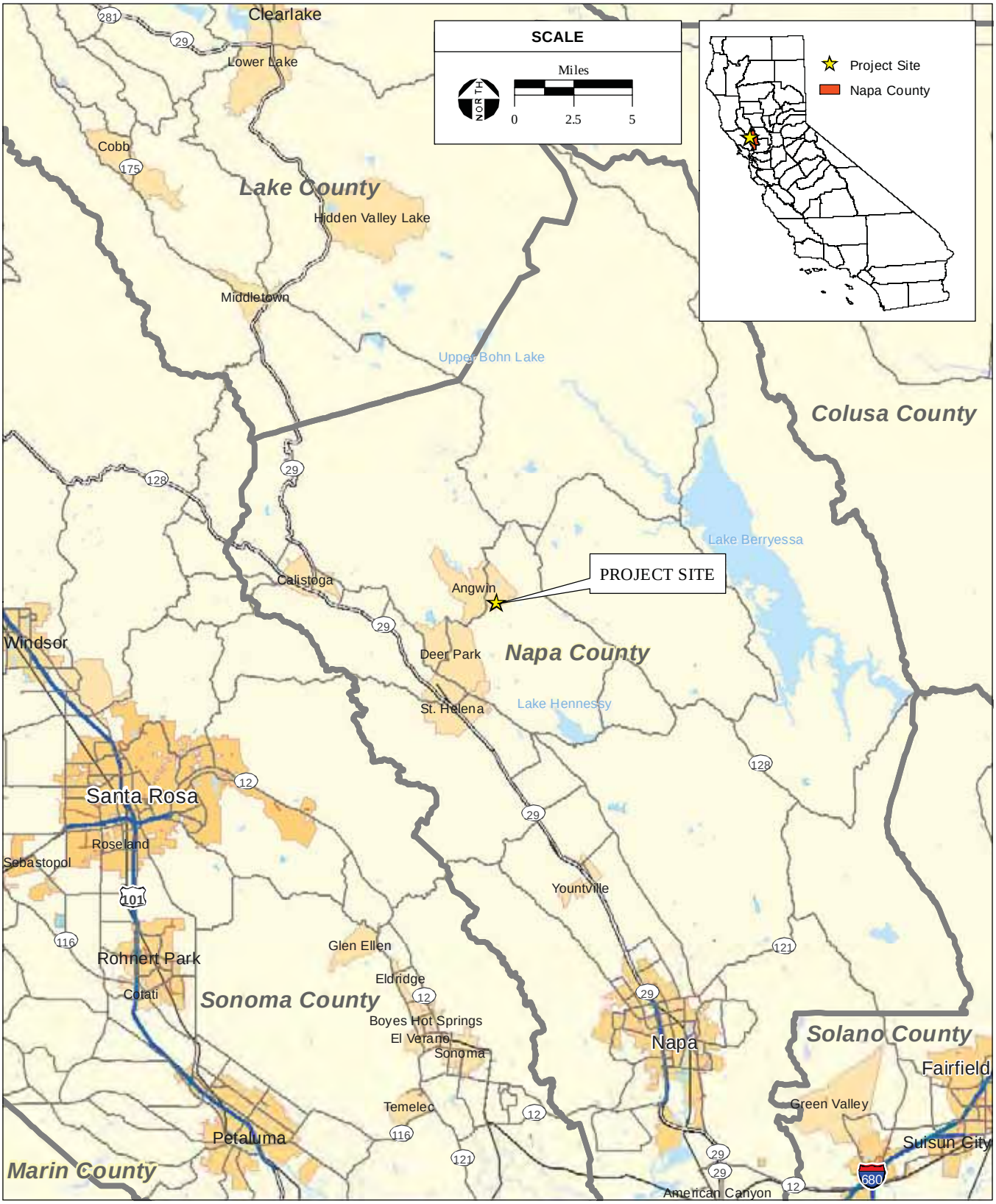
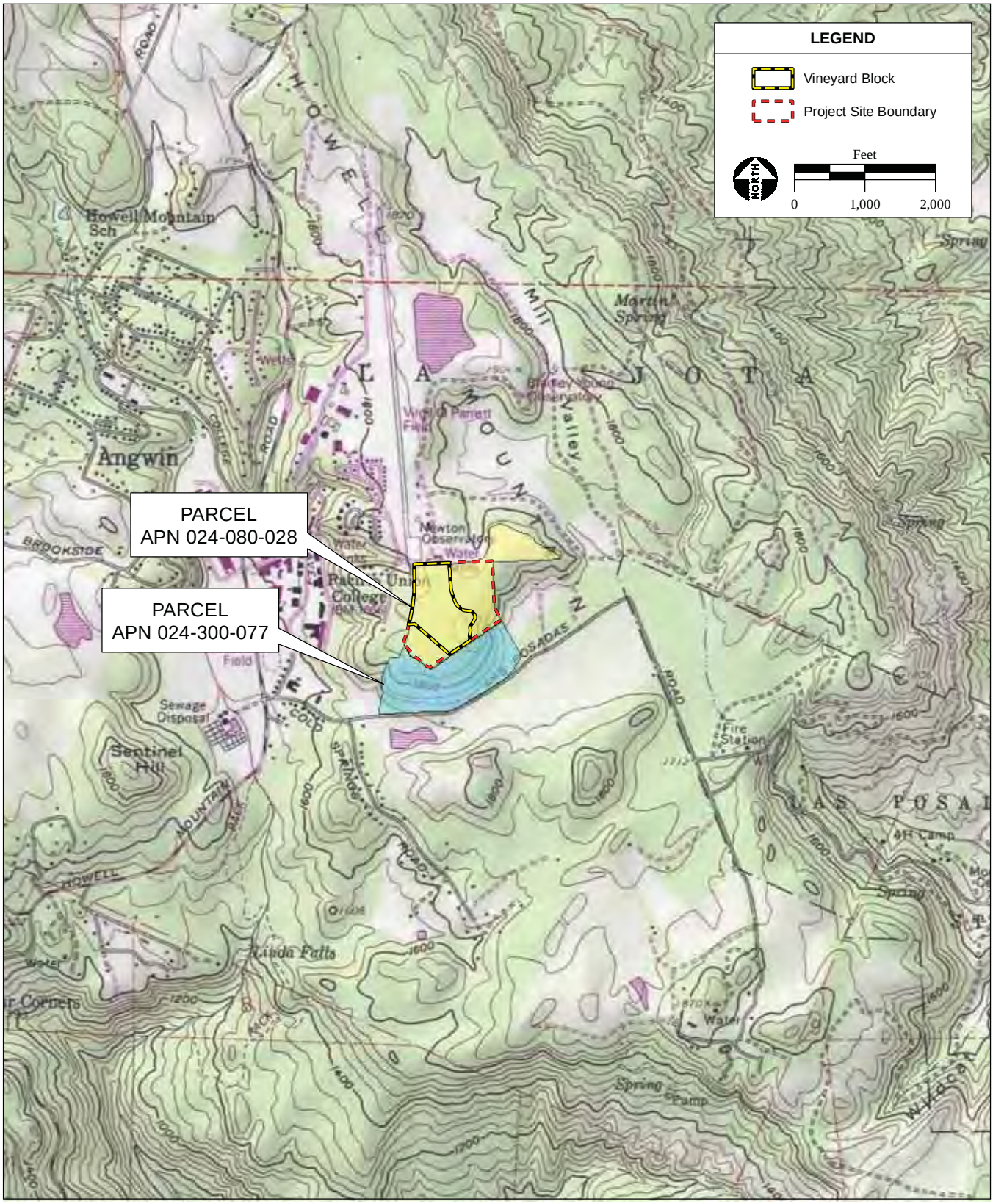
www.delorme.com
Scale 1 : 12,000
1" = 1,000.0 ft
Data Zoom 14-0



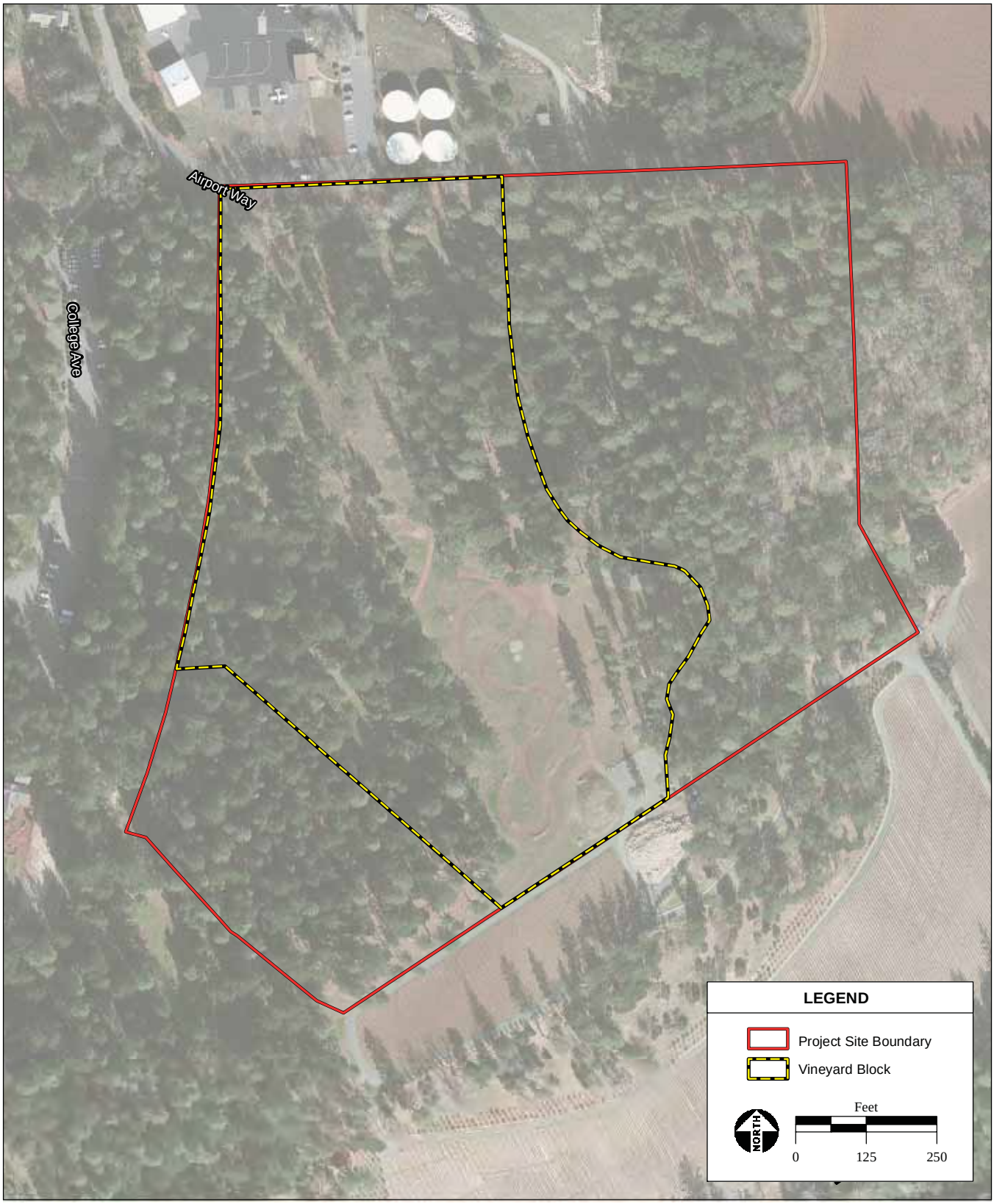
SOURCE: StreetMap North America, 2009; AES, 2012

Figure 3-1
Regional Location



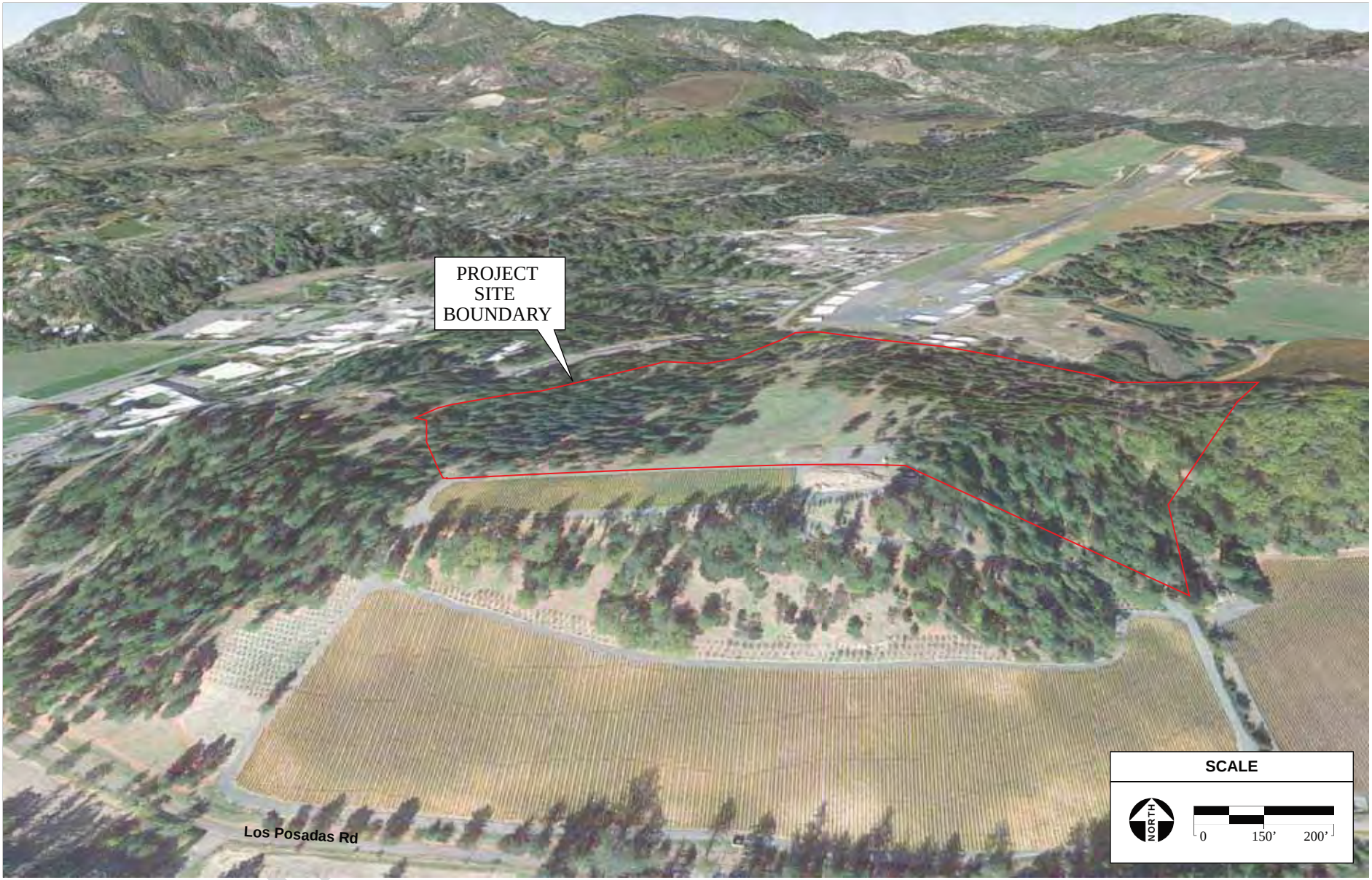
SOURCE: "Saint Helena, CA" USGS 7.5 Minute Topographic Quadrangle
T8N, R5W, Unsectioned Area of Howell Mountain; AES, 2012

Figure 3-2
Proposed Site and Vicinity



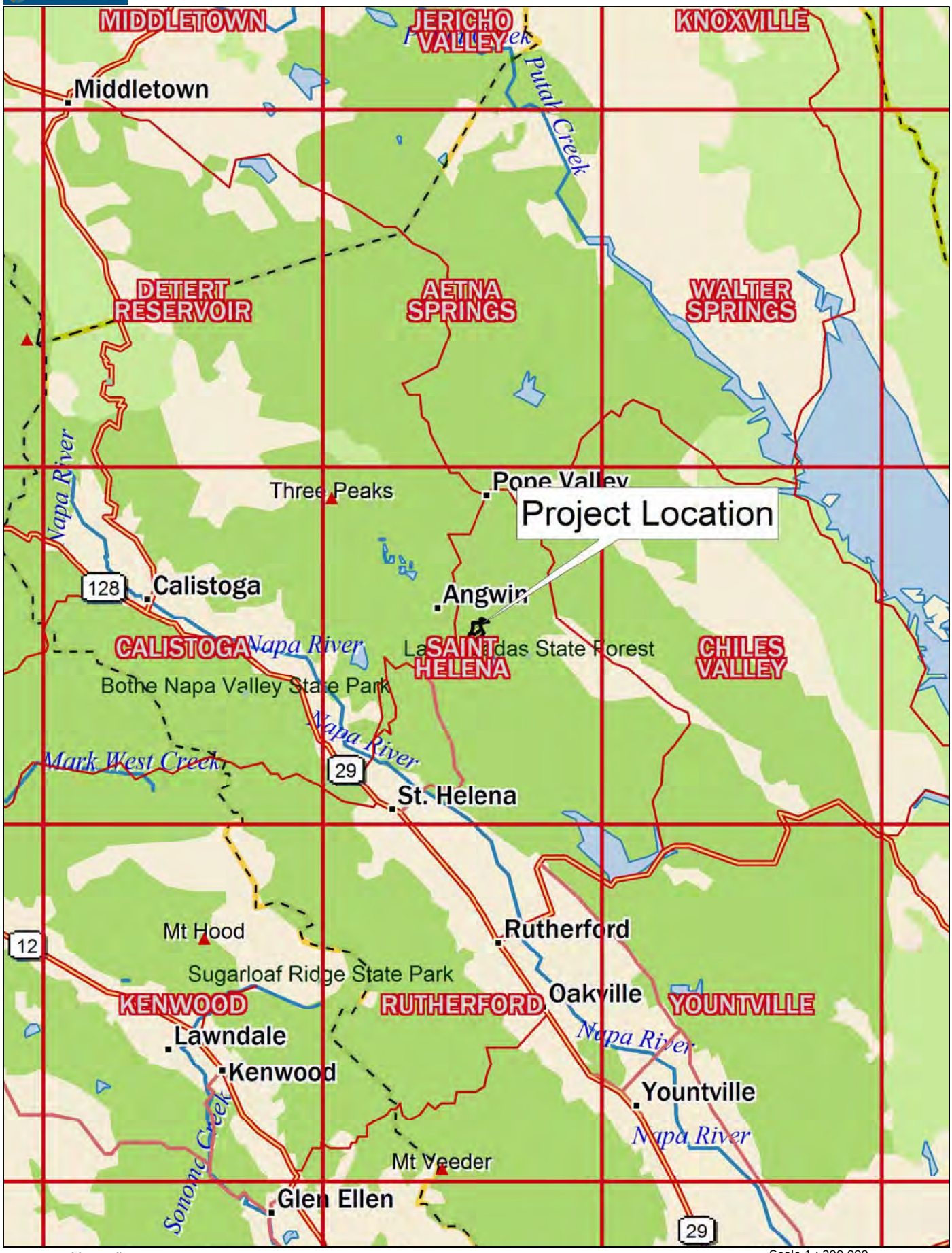
SOURCE: Napa Valley Vineyards Engineering, 7/2005; AES, 2012

Figure 3-3
Aerial Photograph



SOURCE: GeoEye, 2013; AES, 2013

Figure 4.1-1
Perspective View of the Project Area



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www.delorme.com

TN
MN (14.2°E)

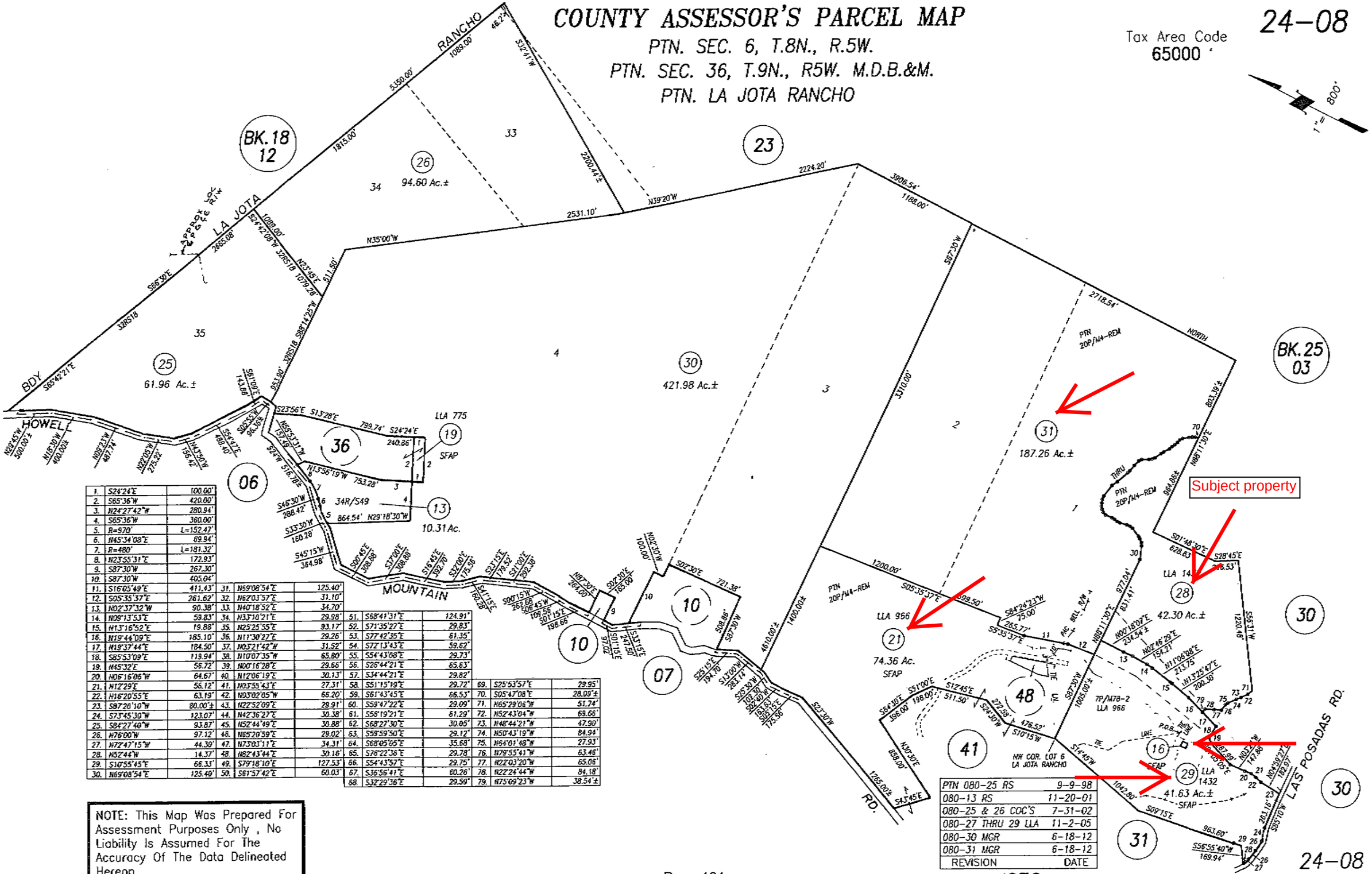
Scale 1 : 200,000
1" = 3.16 mi
Data Zoom 9-0

COUNTY ASSESSOR'S PARCEL MAP

PTN. SEC. 6, T.8N., R.5W.
PTN. SEC. 36, T.9N., R5W. M.D.B.&M.
PTN. LA JOTA RANCHO

Tax Area Code
65000

24–08



1.	S24°24'E	100.00'
2.	S65°36'W	420.00'
3.	N24°27'42"W	280.94'
4.	S65°36'W	360.00'
5.	R=970'	L=152.47'
6.	N45°34'08"E	69.94'
7.	R=480'	L=181.32'
8.	N23°55'31"E	172.93'
9.	S87°30'W	267.30'
10.	S87°30'W	405.04'
11.	S16°05'49"E	411.43'
12.	S05°35'37"E	261.62'
13.	N02°37'32"W	90.38'
14.	N08°13'53"E	59.83'
15.	N13°16'52"E	19.88'
16.	N19°44'09"E	185.10'
17.	N19°37'44"E	184.50'
18.	S85°53'09"E	119.94'
19.	N45°32'E	56.72'
20.	N06°16'06"W	64.67'
21.	N12°29'E	56.12'
22.	N16°20'55"E	63.19'
23.	S87°20'10"W	80.00'±
24.	S73°45'30"W	123.07'
25.	S84°27'40"W	93.87'
26.	N76°00'W	97.12'
27.	N72°47'15"W	44.30'
28.	N52°44'W	14.37'
29.	S10°55'45"E	66.33'
30.	N69°08'54"E	125.40'

31.	N69°08'54"E	125.40'
32.	N62°03'57"E	31.10'
33.	N40°18'52"E	34.70'
34.	N33°10'21"E	29.98'
35.	N25°25'55"E	93.17'
36.	N11°30'27"E	29.26'
37.	N03°21'42"W	31.52'
38.	N10°07'35"W	65.80'
39.	N00°16'28"E	29.66'
40.	N12°06'19"E	30.13'
41.	N03°55'43"E	27.31'
42.	N03°02'05"W	66.20'
43.	N22°52'09"E	29.91'
44.	N42°36'27"E	30.38'
45.	N52°44'49"E	30.88'
46.	N65°20'59"E	29.02'
47.	N73°03'11"E	34.31'
48.	N82°43'44"E	30.16'
49.	S79°18'10"E	127.53'
50.	S61°57'42"E	60.03'

51.	S68°41'31"E	124.91'
52.	S71°35'27"E	29.83'
53.	S77°42'35"E	61.35'
54.	S72°13'43"E	59.62'
55.	S54°43'08"E	29.73'
56.	S26°44'21"E	65.63'
57.	S34°44'21"E	29.82'
58.	S51°15'19"E	29.72'
59.	S61°43'45"E	66.53'
60.	S59°47'22"E	29.09'
61.	S56°19'21"E	61.29'
62.	S68°27'30"E	30.05'
63.	S59°59'50"E	29.12'
64.	S68°05'05"E	35.68'
65.	S76°22'36"E	29.78'
66.	S54°43'57"E	29.75'
67.	S36°56'41"E	60.26'
68.	S32°29'36"E	29.59'

69.	S25°53'57"E	29.95'
70.	S05°47'08"E	28.09'±
71.	N65°29'06"W	51.74'
72.	N52°43'04"W	69.66'
73.	N46°44'21"W	47.90'
74.	N50°43'19"W	84.94'
75.	N64°01'48"W	27.93'
76.	N79°55'41"W	63.46'
77.	N22°03'20"W	65.06'
78.	N22°24'44"W	84.18'
79.	N75°09'23"W	38.54'±

NOTE: This Map Was Prepared For Assessment Purposes Only , No Liability Is Assumed For The Accuracy Of The Data Delineated Hereon.

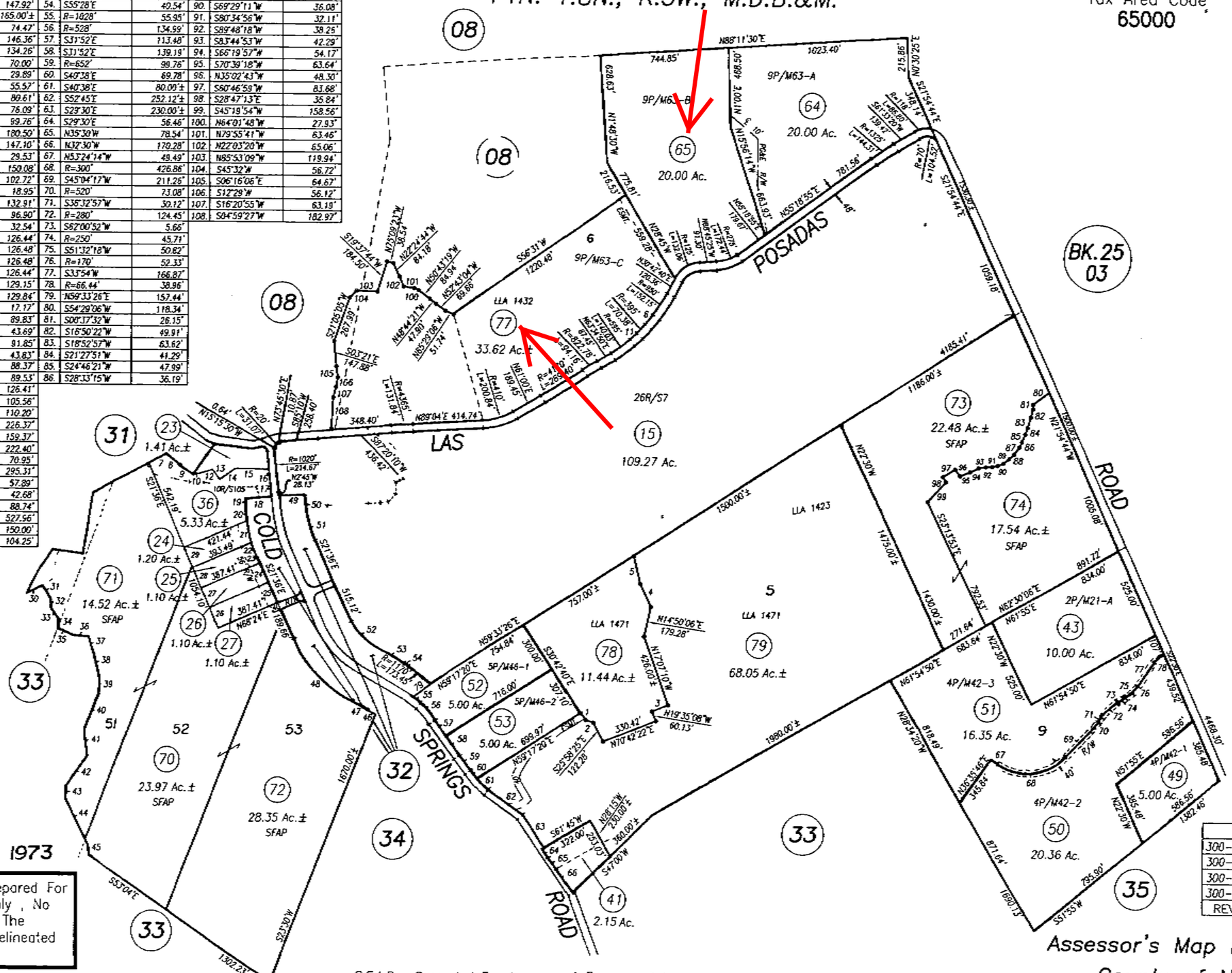
PTN. LA JOTA RANCHO
PTN. T.8N., R.5W., M.D.B.&M.

Tax Area Code
65000

24–30
PTN. 24–21

1" = 600'

1.	S31°22'32"E	46.82'	51.	R=430'	138.97'	87.	S37°46'44"W	50.53'
2.	S66°48'16"E	46.41'	52.	R=410'	288.62'	88.	S47°22'37"W	37.79'
3.	N70°35'21"E	100.87'	53.	S61°36'E	102.61'	89.	S54°32'32"W	41.56'
4.	N22°43'38"W	147.92'	54.	S55°28'E	49.54'	90.	S69°29'11"W	36.08'
5.	N10°55'36"W	165.00'±	55.	R=1028'	55.95'	91.	S80°34'56"W	32.11'
6.	N39°53'15"E	74.47'	56.	R=528'	134.99'	92.	S89°48'18"W	38.26'
7.	S62°20'30"W	146.36'	57.	S31°52'E	113.48'	93.	S83°44'53"W	42.29'
8.	S54°00'E	134.26'	58.	S31°52'E	139.19'	94.	S66°19'57"W	54.17'
9.	N53°05'W	70.00'	59.	R=652'	99.76'	95.	S70°39'18"W	63.64'
10.	N82°15'W	29.89'	60.	S40°38'E	69.78'	96.	N35°02'43"W	48.30'
11.	N50°05'45"E	55.57'	61.	S40°38'E	80.00'±	97.	S60°46'59"W	83.68'
12.	S76°43'W	89.61'	62.	S52°45'E	252.12'±	98.	S28°47'13"E	35.84'
13.	N37°14'W	76.09'	63.	S29°30'E	230.00'±	99.	S45°19'54"W	158.56'
14.	S57°48'W	99.76'	64.	S29°30'E	56.46'	100.	N64°01'48"W	27.93'
15.	N87°49'W	180.50'	65.	N35°30'W	78.54'	101.	N79°55'41"W	63.46'
16.	R=980'	147.10'	66.	N32°30'W	170.28'	102.	N22°03'20"W	65.06'
17.	N03°05'W	29.53'	67.	N53°24'14"W	49.49'	103.	N85°53'09"W	119.94'
18.	N86°59'E	150.08'	68.	R=300'	426.86'	104.	S45°32'W	56.72'
19.	N03°02'W	102.72'	69.	S45°04'17"W	211.26'	105.	S06°16'06"E	64.67'
20.	R=779'	18.95'	70.	R=520'	73.08'	106.	S12°29'W	56.12'
21.	R=770'	132.91'	71.	S36°32'57"W	30.12'	107.	S16°20'55"W	63.19'
22.	R=770'	96.90'	72.	R=280'	124.45'	108.	S04°59'27"W	182.97'
23.	S21°36'E	32.54'	73.	S62°00'52"W	5.66'			
24.	S21°36'E	126.44'	74.	R=250'	45.71'			
25.	S21°36'E	126.48'	75.	S51°32'18"W	50.62'			
26.	N21°36'W	126.48'	76.	R=170'	52.33'			
27.	N21°36'W	126.44'	77.	S33°54'W	166.87'			
28.	N21°36'W	129.15'	78.	R=66.44'	38.96'			
29.	N21°36'W	129.84'	79.	N59°33'26"E	157.44'			
30.	N87°20'10"E	17.17'	80.	S54°29'06"W	118.34'			
31.	S31°27'E	89.83'	81.	S00°37'32"W	26.15'			
32.	S05°36'E	43.69'	82.	S16°50'22"W	49.91'			
33.	S27°29'E	91.85'	83.	S18°52'57"W	63.62'			
34.	S03°51'W	43.83'	84.	S21°27'51"W	41.29'			
35.	S63°11'E	88.37'	85.	S24°46'21"W	47.99'			
36.	S83°20'E	89.53'	86.	S28°33'15"W	36.19'			
37.	S16°14'E	126.41'						
38.	S14°11'E	105.56'						
39.	S06°16'30"W	110.20'						
40.	S24°53'30"W	226.37'						
41.	S05°03'30"E	159.37'						
42.	S38°38'30"W	222.40'						
43.	S06°52'W	70.95'						
44.	S24°27'E	295.31'						
45.	S03°47'E	57.89'						
46.	S55°48'E	42.68'						
47.	S61°56'E	88.74'						
48.	R=750'	527.96'						
49.	S87°15'W	150.00'						
50.	S02°45'E	104.25'						



Assessor of Napa County 1973

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300-73 & 74 LSE	8-14-00
300-75 & 76 LLA	8-5-05
300-77 LLA	11-2-05
300-78 & 79 LLA	5-19-06
REVISION	DATE

S.F.A.P.= Separated For Assessment Purposes Only

Assessor's Map Bk. 24 Pg. 30
County of Napa, Calif.

Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address:

Ownership

Parcel# (APN):	**024-080-028-000**
Parcel Status:	**ACTIVE**
Owner Name:	**DAVID ABREU VINEYARD MANAGEMENT INC**
Mailing Addr:	**PO BOX 89 RUTHERFORD CA 94573**
Legal Description:	

Assessment

Total Value:	**$3,253,789**	Use Code:	**34**	Use Type:	**AGRICULTURAL**
Land Value:	**$3,221,012**	Tax Rate Area:	**065-000**	Zoning:	
Impr Value:	**$32,777**	Year Assd:	**2012**	Census Tract:	
Other Value:		Property Tax:	**$34,316.56**	Price/SqFt:	
% Improved:	**1%**	Delinquent Yr:			
Exempt Amt:		HO Exempt:	**N**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:	**11/02/2005**			**11/02/2005**
Recording Doc:	**2005R0045367**			**2005R0045367**
Rec. Doc Type:				
Transfer Amount:				
Seller (Grantor):	**FIRST AMERICAN TITLE COM**			
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:		Fireplace:		Units:	
Baths (Full):		A/C:		Stories:	
Baths (Half):		Heating:		Quality:	
Total Rooms:		Pool:		Building Class:	
Bldg/Liv Area:		Park Type:		Condition:	
Lot Acres:	**42.300**	Spaces:		Site Influence:	
Lot SqFt:	**1,842,587**	Garage SqFt:		Timber Preserve:	
Year Built:		Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

**The information provided here is deemed reliable, but is not guaranteed. © 2013 PARCELQUEST www.parcelquest.com (888) 217-8999

Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address: ANGWIN CA 94508

Ownership

Parcel# (APN):	**024-080-031-000**
Parcel Status:	**ACTIVE**
Owner Name:	**PACIFIC UNION COLLEGE**
Mailing Addr:	**1 ANGWIN AVE ANGWIN CA 94508-9713**
Legal Description:	

Assessment

Total Value:		Use Code:	**51**	Use Type:	**COMMERCIAL**
Land Value:		Tax Rate Area:	**065-000**	Zoning:	
Impr Value:		Year Assd:	**2012**	Census Tract:	**2017.00/2**
Other Value:		Property Tax:		Price/SqFt:	
% Improved:		Delinquent Yr:			
Exempt Amt:		HO Exempt:	**N**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:				**06/18/2012**
Recording Doc:				**2012R0015824**
Rec. Doc Type:				
Transfer Amount:				
Seller (Grantor):				
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:		Fireplace:		Units:	
Baths (Full):		A/C:		Stories:	
Baths (Half):		Heating:		Quality:	**6.0**
Total Rooms:		Pool:		Building Class:	**S**
Bldg/Liv Area:	**3,500**	Park Type:		Condition:	
Lot Acres:	**187.260**	Spaces:		Site Influence:	
Lot SqFt:	**8,157,045**	Garage SqFt:		Timber Preserve:	
Year Built:	**2008**	Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

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Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address: 181 OAK PL ANGWIN CA 94508-9719

Ownership

Parcel# (APN):	**024-080-021-000**
Parcel Status:	**ACTIVE**
Owner Name:	**PACIFIC UNION COLLEGE ASSN**
Mailing Addr:	**1 ANGWIN AVE ANGWIN CA 94508-9713**
Legal Description:	

Assessment

Total Value:	**$3,371,377**	Use Code:	**51**	Use Type:	**COMMERCIAL**
Land Value:	**$392,322**	Tax Rate Area:	**065-000**	Zoning:	
Impr Value:	**$2,979,055**	Year Assd:	**2012**	Census Tract:	**2017.00/2**
Other Value:		Property Tax:	**$23,416.68**	Price/SqFt:	
% Improved:	**88%**	Delinquent Yr:			
Exempt Amt:	**$1,177,524**	HO Exempt:	**N**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:				**10/05/1995**
Recording Doc:				**1995R022016**
Rec. Doc Type:				
Transfer Amount:				
Seller (Grantor):				
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:		Fireplace:		Units:	
Baths (Full):		A/C:		Stories:	
Baths (Half):		Heating:		Quality:	
Total Rooms:		Pool:		Building Class:	
Bldg/Liv Area:		Park Type:		Condition:	
Lot Acres:	**74.360**	Spaces:		Site Influence:	
Lot SqFt:	**3,239,121**	Garage SqFt:		Timber Preserve:	
Year Built:		Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

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Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address: 55 LAS POSADAS RD ANGWIN CA 94508-9600

Ownership

Parcel# (APN):	**024-080-029-000**
Parcel Status:	**ACTIVE**
Owner Name:	**PACIFIC UNION COLLEGE ASSOCIATION**
Mailing Addr:	**1 ANGWIN AVE ANGWIN CA 94508-9713**
Legal Description:	

Assessment

Total Value:	**$3,827,332**	Use Code:	**51**	Use Type:	**COMMERCIAL**
Land Value:	**$95,485**	Tax Rate Area:	**065-000**	Zoning:	
Impr Value:	**$3,731,847**	Year Assd:	**2012**	Census Tract:	**2017.00/2**
Other Value:		Property Tax:	**$1,008.64**	Price/SqFt:	
% Improved:	**97%**	Delinquent Yr:			
Exempt Amt:	**$3,736,621**	HO Exempt:	**N**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:				**11/02/2005**
Recording Doc:				**2005R0045368**
Rec. Doc Type:				
Transfer Amount:				
Seller (Grantor):				
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:		Fireplace:		Units:	
Baths (Full):	**3**	A/C:		Stories:	
Baths (Half):		Heating:		Quality:	**7.5**
Total Rooms:		Pool:		Building Class:	**D**
Bldg/Liv Area:	**3,071**	Park Type:	**GARAGE/CARPORT**	Condition:	
Lot Acres:	**41.630**	Spaces:		Site Influence:	
Lot SqFt:	**1,813,402**	Garage SqFt:	**702**	Timber Preserve:	
Year Built:	**2005**	Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

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Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address: 3 COLLEGE AVE ANGWIN CA 94508-9721

Ownership

Parcel# (APN):	**024-080-016-000**
Parcel Status:	**ACTIVE**
Owner Name:	**PACIFIC UNION COLLEGE**
Mailing Addr:	**ONE ANGWIN AVE ANGWIN CA 94508**
Legal Description:	

Assessment

Total Value:	**$500,000**	Use Code:	**31**	Use Type:	**RESIDENTIAL**
Land Value:	**$165,000**	Tax Rate Area:	**065-000**	Zoning:	
Impr Value:	**$335,000**	Year Assd:	**2012**	Census Tract:	**2017.00/2**
Other Value:		Property Tax:	**$5,283.44**	Price/SqFt:	**$154.75**
% Improved:	**67%**	Delinquent Yr:			
Exempt Amt:		HO Exempt:	**N**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:	**09/09/2011**	**01/12/2006**	**04/29/2005**	**09/09/2011**
Recording Doc:	**2011R0020779**	**2006R0001226**	**2005R0016596**	**2011R0020779**
Rec. Doc Type:	**GRANT DEED**	**GRANT DEED**	**GRANT DEED**	
Transfer Amount:	**$500,000**	**$519,000**	**$587,500**	
Seller (Grantor):	**PACIFIC UNION COLLEGE**			
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:	**4**	Fireplace:	**1**	Units:	
Baths (Full):		A/C:		Stories:	
Baths (Half):		Heating:	**CENTRAL**	Quality:	**6.5**
Total Rooms:		Pool:		Building Class:	**D**
Bldg/Liv Area:	**3,231**	Park Type:	**GARAGE/CARPORT**	Condition:	
Lot Acres:	**0.060**	Spaces:		Site Influence:	
Lot SqFt:	**2,613**	Garage SqFt:	**576**	Timber Preserve:	
Year Built:	**1991**	Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

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Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address: 383 LAS POSADAS RD ANGWIN CA 94508

Ownership

Parcel# (APN):	**024-300-065-000**
Parcel Status:	**ACTIVE**
Owner Name:	**MONDAVI MARC C & JANICE E**
Mailing Addr:	**PO BOX 342 SAINT HELENA CA 94574**
Legal Description:	

Assessment

Total Value:	**$2,456,007**	Use Code:	**39**	Use Type:	**AGRICULTURAL**
Land Value:	**$959,735**	Tax Rate Area:	**065-000**	Zoning:	
Impr Value:	**$1,156,694**	Year Assd:	**2012**	Census Tract:	**2017.00/2**
Other Value:	**$339,578**	Property Tax:	**$27,908.44**	Price/SqFt:	**$380.79**
% Improved:	**54%**	Delinquent Yr:			
Exempt Amt:	**$7,000**	HO Exempt:	**Y**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:	**02/09/2001**			**03/21/2003**
Recording Doc:	**2001R0003680**			**2003R0014679**
Rec. Doc Type:	**GRANT DEED**			
Transfer Amount:	**$1,725,000**			
Seller (Grantor):	**ANDERSON BRUCE N & AUDRE**			
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:	**5**	Fireplace:	**1**	Units:	
Baths (Full):		A/C:		Stories:	
Baths (Half):		Heating:	**CENTRAL**	Quality:	
Total Rooms:		Pool:		Building Class:	**S**
Bldg/Liv Area:	**4,530**	Park Type:	**GARAGE/CARPORT**	Condition:	
Lot Acres:	**20.000**	Spaces:		Site Influence:	
Lot SqFt:	**871,200**	Garage SqFt:	**739**	Timber Preserve:	
Year Built:	**1980**	Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

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Napa, CA **JOHN TUTEUR, ASSESSOR** **ParcelQuest**

Property Address:

Ownership

Parcel# (APN):	**024-300-077-000**
Parcel Status:	**ACTIVE**
Owner Name:	**LUCIA ABREU VINEYARD HOWELL MOUNTAIN LLC**
Mailing Addr:	**PO BOX 89 RUTHERFORD CA 94573-0089**
Legal Description:	

Assessment

Total Value:	**$2,825,752**	Use Code:	**34**	Use Type:	**AGRICULTURAL**
Land Value:	**$2,282,340**	Tax Rate Area:	**065-000**	Zoning:	
Impr Value:	**$218,096**	Year Assd:	**2012**	Census Tract:	
Other Value:	**$325,316**	Property Tax:	**$30,046.40**	Price/SqFt:	
% Improved:	**8%**	Delinquent Yr:			
Exempt Amt:		HO Exempt:	**N**		

Sale History

	Sale1	Sale2	Sale3	Transfer
Recording Date:	**11/02/2005**			**11/02/2005**
Recording Doc:	**2005R0045366**			**2005R0045366**
Rec. Doc Type:				
Transfer Amount:				
Seller (Grantor):	**FIRST AMERICAN TITLE COM**			
1st Trust Dd Amt:				
2nd Trust Dd Amt:				

Property Characteristics

Bedrooms:		Fireplace:		Units:	
Baths (Full):		A/C:		Stories:	
Baths (Half):		Heating:		Quality:	
Total Rooms:		Pool:		Building Class:	
Bldg/Liv Area:		Park Type:		Condition:	
Lot Acres:	**33.620**	Spaces:		Site Influence:	
Lot SqFt:	**1,464,487**	Garage SqFt:		Timber Preserve:	
Year Built:		Bsmt SqFt:	**N/A**	Ag Preserve:	
Effective Year:					

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NAPA COUNTY

RCD

RESOURCE CONSERVATION

Napa, California 94559

Phone: (707) 252-4188

Fax: (707) 252-4219

www.naparcd.org

Interoffice Memorandum

Date: March 22, 2013

To: Napa County PBES

From: Dave Steiner, Senior Soil Conservationist

Re: Revised Erosion Control Plan for Abreu, new vineyard development, file #P05-0376, AP #024-300-069

cc: David Abreu
Napa Valley Vineyard Engineering
Martin Trso
Scott Butler, RPF

NAPA COUNTY

RCD

RESOURCE CONSERVATION

Napa County Resource Conservation District

1303 Jefferson St., Ste. 500B

Napa, California 94559

Phone: (707) 252-4188

Fax: (707) 252-4219

www.naparcd.org

RCD finds the February 27, 2013 iteration of the referenced Plan technically adequate for erosion and sediment control. This finding is based, in part, on RCD's in-house soil loss modeling, as well as peer review of the administrative draft of the "Hydrologic Evaluation" section of Martin Trso's *Erosion, Sedimentation, and Hydrologic Assessment* of the proposal, dated January 20, 2013. Please let me know if you have any questions or if I may otherwise be of assistance.

Note: this finding **does not constitute Plan approval**, authority for which rests with the Napa County Department of Planning, Building, and Environmental Services.

PHOTO 1: View southwest of Ponderosa Pine Alliance habitat with Douglas Fir and Madrone trees integrated.

PHOTO 2: View to the north of Ponderosa Pine Alliance with Douglas Fir and Madrone trees integrated.

PHOTO 3: View to the north of annual grassland located in the center of the project parcel.

PHOTO 4: View to south of fence surrounding the project parcel taken from the western boundary.

INTERNAL D

SOURCE: AES, 2013

Figure 4.4-2a
Site Photographs (May 2012)

PHOTO 5: View to the south of rockpile and disturbed/ ruderal gravel area.

PHOTO 6: View of Mixed Oak Alliance habitat with Ponderosa Pine integrated on the eastern portion of the project parcel.

PHOTO 7: View to the north of the airport, Parret field, located to the north of the project parcel.

INTERNAL

SOURCE: AES, 2013

Figure 4.4-2b
Site Photographs (May 2012)

LUCIA ABREU VINEYARD
EROSION CONTROL PLAN

PORTION OF ST. HELENA 7.5 MIN QUAD

Vicinity Map

1" = 12000'

Narrative

This project is the development of approximately 17 gross acres (±15.3 net acres) of new vineyard, as part of a Timber Conversion Permit, within APNs (024-080-028). Some mitigation measures may extend onto APN (024-300-077) to the south. These two parcels total ±78.5 acres located along Las Posadas Road in Angwin. Primary access is from Las Posadas Road and access to the proposed vineyard site is via existing roads. Within the project parcel (APN (024-080-028)), there are ±8 acres of existing vineyard, the proposed 17 acre development, and areas of conifer forest and open grassland. The southern parcel (APN (024-300-077)) contains ± 12 acres of existing vineyard.

Existing ground slopes within the project area range from 4% to 14%. Vineyard rows will be planted 6 feet apart and will run generally in a northsouth direction. A new drip irrigation system will be installed to irrigate the vineyard, with existing wells as the water source. Water use on the proposed vineyard is expected to be ± 11.2 af per annum (afa), and the long term irrigation water use on both parcels is estimated to be ± 25 afa.

Certain measures contained in this plan are to be implemented to mitigate impacts of surface water hydrology. These measures are fully detailed in a report prepared by Martin Trso, Professional Geologist. That report, dated January 20, 2013 is titled:

Erosion, Sedimentation, & Hydrologic Assessment
Lucia Abreu Vineyard Howell Mountain Conversion Project, Napa County, California

This report is hereby incorporated into these plans, and any reference to the "Trso Report", shall mean the above-named document. Any conditions, specifications, or directions so referenced shall be construed to be a part of these plans.

There are no blueline, or county definition streams within, or adjacent to, the project area. The project lies within Lake Hennessey watershed.

Vegetation Removal will be in accordance with the Timber Conversion Plan. All organic material to be burned shall be stacked at strategic locations within the cleared areas. Burning of the organic material only shall take place after obtaining approval from all the governing agencies.

Soils within the block boundaries have been classified in the USDA Soil Conservation Service, Napa County Soil Survey, as SCS#100, Aiken loam, 2 to 15% slope, with an erosion hazard of slight.

No known special species or cultural sites occur in the project area, and there are no known landslides within 500 feet of the project.

Temporary Erosion Control Measures consist of the installation of fiber rolls, and the application of straw mulch. The installation of all fiber rolls shall be completed in accordance with the appropriate Details at all locations as shown on the Plan Sheet. A straw mulch cover shall be applied over all open and/or disturbed and seeded areas at the rate specified in the seeding requirements.

Permanent Erosion Control Measures consist of the following:

1) Construction and/or installation of Fiber Rolls, Rock Stabilization, and Concrete Weirs and Detention Ponds as described in the Project Notes.

2) a. An annual winter cover crop, using *Floradora Legumes* (see Project Notes), will be established after harvest for the first two years following planting. This cover crop shall be disked each spring, and shall be reseeded and mulched each fall as part of the winterization.

b. At the end of the second growing season after planting, a permanent no-till cover crop, using the *Wex Mix*, or *Abreu Perennial Mix* (see Project Notes), shall be planted within the entire vineyard area. This permanent cover crop shall be mowed and may be strip sprayed to a maximum width of 2' from vine row. Spraying will be done using spot/glyphosate applications of "contact" sprays. NO PREEMERGENT SPRAYS WILL BE USED. To encourage water penetration and to aid in mulch and growth, alternate vineyard middles may be disked/tilled annually. After harvest each year, the disked/tilled middles shall be reseeded with a winter cover crop using either the *Wex Mix*, or *Abreu Perennial Mix* or the *Floradora Legumes* presented in the Project Notes. Every other year, the tilled/non-tilled middles shall be rotated, resulting in an "alternate middle-alternate year" cultivation scheme. No areas outside the vineyard proper shall be cultivated or sprayed. Optimally, a ground cover of 70% or greater will be obtained over the entire vineyard each winter.

3) A compost mulch or other high quality ground cover shall be spread on the forest floor of the property hilltop outside of the existing and proposed vineyard. The mulch shall be spread mechanically or by hand at a rate of 2 tons/acre; see Project Notes - Straw Mulch and Trso Report.

Costs: The total cost of all erosion control measures is estimated to be $1500/ac including materials, labor and equipment.

The project site was last visited by the plan preparer in January, 2013 for a site inspection, and will be visited during and after redevelopment to check for proper erosion control features.

Project Notes

APNs: 024-300-077		024-080-028	
Owner: Lucia Abreu Vineyard Howell Mt. LLC		David Abreu Vineyard Mgmt, Inc	
Contact: David Abreu @ 963-7487 David Abreu Vineyard Mgmt, Inc PO Box 89 Rutherford, CA 94573		Drew L. Aspegren, P.E. @ 963-4927 Napa Valley Vineyard Engineering, Inc. 176 Main St., Suite B St. Helena, CA 94574	
Mapping: Albion Surveys, Inc. April 27, 2004			

Implementation Schedule: The work will be scheduled as follows:

Preplant Year April 1 thru September 15	PREPLANT SEASON OPERATIONS: Harvest timber and remove vegetation; burn vegetative materials; ripping and disking; staking; installation of irrigation system; installation of appropriate permanent and all temporary erosion control measures; winterize site.
Rainy Season September 16 thru March 31	Maintain erosion control measures.
Planting Year April 1 thru September 15	PLANTING SEASON OPERATIONS: Complete unfinished preplant operations, plant vineyard, begin cultural practices; install remaining permanent erosion control measures; winterize site. Maintain all erosion control measures.
Rainy Season After planting - forward	Maintain erosion control measures.

All ground disturbing activities shall be completed by September 1 of each year, and all erosion control measures shall be in place by September 15.

Seeding Requirements: All exposed or disturbed soils shall be seeded (using one of the mixes listed below). Seed and fertilizer shall be applied hydraulically or broadcast at the rates specified below:

Napa Valley Ag Supply "Floradora Legumes" mix @ 100 lbs/ac	Bell Beans Forage Peas, VAS Forage Peas, VAS Common Vetch	40% 20% 20% 20%
Napa Valley Ag Supply "Wex Mix" mix @ 100 lbs/ac	Barley Zorro Fescue (Dwarfed) Dwarf Perennial Rygrass Hykon Rose Clover, RK Creeping Red Fescue Chewings Fescue	70% 14% 7% 3% 3% 3%
Napa Valley Ag Supply "Abreu Perennial Mix" mix @ 50 lbs/ac	California Brome Hykon Rose Clover, RK White Yarrow	65% 27% 8%

Fertilizer Ammonium phosphate sulfate (16-20-0) 200-240 lbs/ac

An alternate seed mix and/or fertilizer may be used after review and approval by the Napa County RCD.

Straw Mulch shall be spread over all disturbed and seeded areas, within the proposed vineyard blocks. Outside the vineyard area, a high quality ground cover shall be established and maintained on the property hilltop. (Trso Report, p. 1, Mitigation #1). These areas are indicated on the plan. Initially this forest cover shall be established using compost mulch, with maintenance of grass cover and/or forest litter. Compost mulch shall be spread over the forest floor outside of the existing and proposed vineyard. All mulch shall be spread mechanically or by hand at the rate of 2 tons/acre.

Fiber Rolls shall be installed at the locations shown on the plan in accordance with the appropriate detail. Fiber Rolls shall be maintained through the winter after planting, after which it may be removed.

Rock Stabilization shall be constructed of Rock Slope Protection (see below) at low spots in the perimeter avenues as shown on the plan in accordance with the appropriate detail. Vegetated earthen berms shall be constructed below the rock stabilization as shown on the Plan.

Rock Slope Protection (RSP) shall be loosely gathered fieldstone, or class light as defined in Caltrans Standard Specifications, Sec. 72-2.02. A non-woven filter fabric (Mirafi 140N, or equal) shall be placed between all RSP and earthen material.

Concrete Weirs and Detention Ponds shall be constructed at two locations where shown, in accordance with Detail 2. Prior to construction, detailed plans shall be prepared; minor grading may be required to achieve the desired water storage. (Trso Report, p. 29, Mitigation #2).

Maintenance: A cover crop shall be planted prior to September 15. An annual winter cover crop shall be planted during the preplant year, and for the first two years after planting. After the first two years, a permanent cover crop shall be planted on alternating rows. The cover crop shall be mowed each spring after the seed has fully matured (hard dough stage) to ensure annual grass species regeneration for the following year. Minimum mowing height of 4" shall be maintained for establishing annual and perennial grasses. Disking/tilling may take place only as described in the *Narrative* under *Permanent Erosion Control Measures*. The vineyard may be strip sprayed as described in the *Narrative* under *Permanent Erosion Control Measures*. Optimally, a ground cover of 75% or greater will be obtained with the owner being responsible for reseeding and maintenance in order to reach the desired degree of cover.

Annual Winterization: Each year, after harvest and prior to first rains each year, but no later than September 15, the following winterization shall be completed:

1) All disked areas shall be seeded and mulched as described in the *Narrative*.

2) The condition of the non-tilled cover crop, including those areas outside the vineyard, and the suitability and effectiveness of the seed mix and fertilizer shall be evaluated. Weak areas shall be reseeded as necessary; if addition of soil amendments is indicated, they shall be incorporated and those areas shall be seeded and mulched.

3) All diversion ditches and roadside ditches shall be cleaned and reshaped as necessary.

4) The concrete weirs and detention ponds shall be inspected, and cleaned and repaired as necessary.

5) All roads and turnspaces which are not rocked or paved shall be seeded, fertilized and mulched, and shall remain undisturbed throughout the rainy season.

6) All existing erosion control and drainage features shall be inspected and cleaned, or repaired as necessary.

All erosion control measures shall be inspected after each storm event, and repairs shall be promptly performed.

SHEET INDEX

1. TITLE SHEET
2. PLAN & DETAILS

Legend

Symbol	Meaning
(hatched band)	APPROX. LIMIT OF VINEYARD AVENUE/TURNSPACE LIMIT OF NEW DISTURBANCE
AC	ACRES
AF	ACRE-FEET
(2)	DETAIL 2
ELEV	ELEVATION
(chain line)	FIBER ROLL
(dashed line)	PROPERTY LINE
(hatched box)	ROCK STABILIZATION
SCS	SOIL CONSERVATION SERVICE
(159)	SCS SOIL MAPPING UNIT
(arrowed line)	SCS SOIL TYPE BOUNDARY
WS	WATER SURFACE

ABREU VINEYARD MANAGEMENT
LUCIA ABREU VINEYARD
EROSION CONTROL PLAN

Rev #4 2-27-15; Deleted Blocks A & C, Enlarge Block B
Rev #3 1-22-08; Rev. per Hydrologic Assessment, November 29, 2007
Rev #2 1-23-06; Rev. per Jan. 17, 2006 RCD comments
Rev #1 8-25-05; Add "Abreu Perennial Mix"

Napa Valley Vineyard Engineering, Inc.
176 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927

DREW L. ASPEGREN PE
RCE 31418

July 13, 2005
DATE

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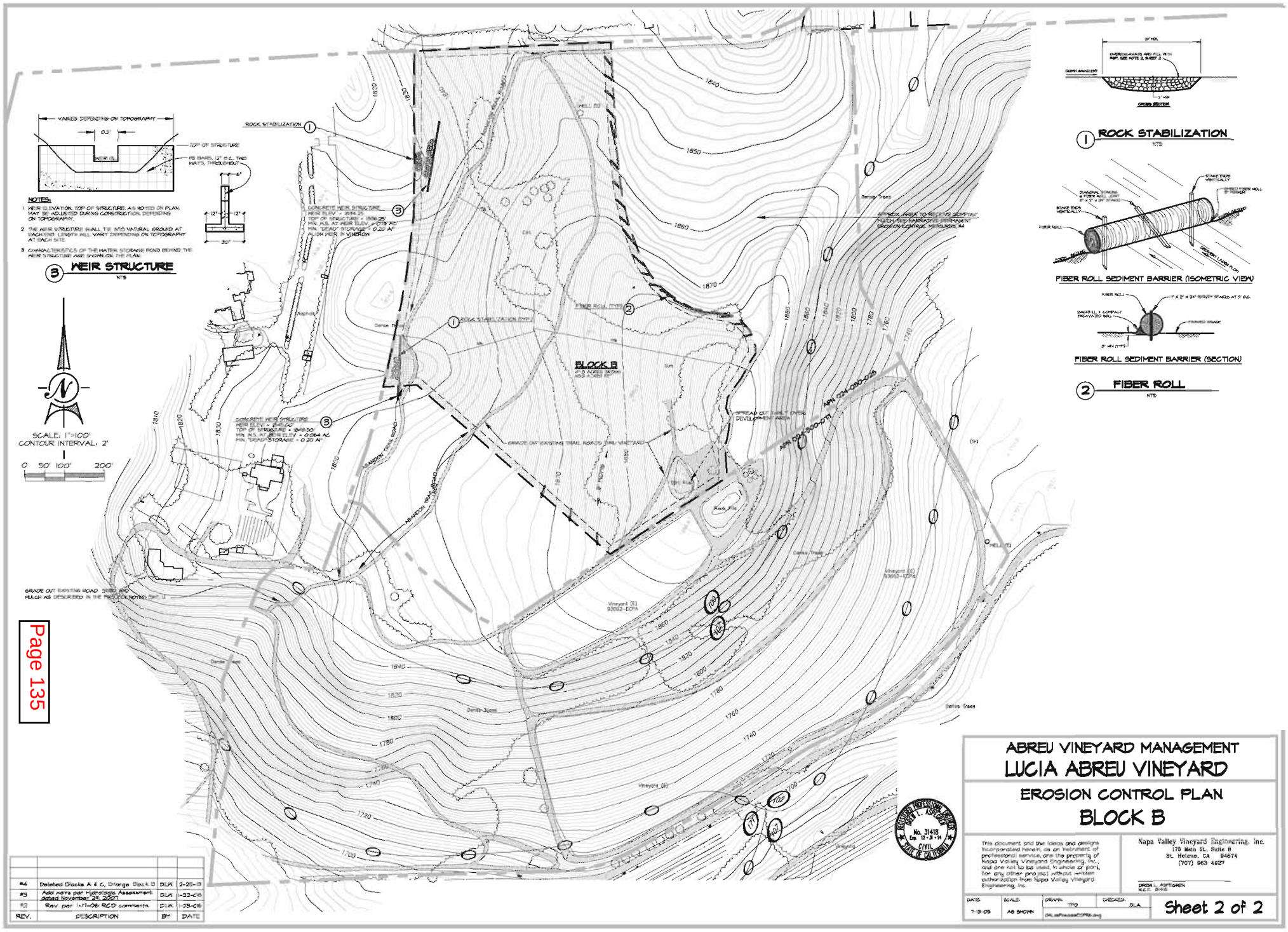


Page 135

REV.	DESCRIPTION	BY	DATE
#4	Deleted Blocks A & C, Enlarge Block B	DLA	2-25-13
#3	Add note per Hydrologic Assessment dated November 25, 2007	DLA	1-22-08
#2	Rev per 1-17-08 RCD comments	DLA	1-29-08

ABREU VINEYARD MANAGEMENT
LUCIA ABREU VINEYARD
EROSION CONTROL PLAN
BLOCK B

This document and the ideas and designs incorporated herein, as an instrument of professional service, are the property of Napa Valley Vineyard Engineering, Inc., and are not to be used, in whole or part, for any other project without written authorization from Napa Valley Vineyard Engineering, Inc.

Napa Valley Vineyard Engineering, Inc.
1715 Main St., Suite B
St. Helena, CA 94574
(707) 963 4927
DAVID L. ASHTGAREN
R.C.E. 31418

DATE	SCALE	DRAWN	DESIGNED
7-19-05	AS SHOWN	TTO	DLA

Sheet 2 of 2

APPENDIX I

Timber Conversion Plan

Lucia Abreu Vineyard
Timberland Conversion Plan (TCP)

Prepared for
Abreu Vineyard Management
P. O. Box
89
Rutherford, CA
94573

By:
Scott R. Butler, RPF #1851
889 Hwy 20-26
Ontario, OR 97914

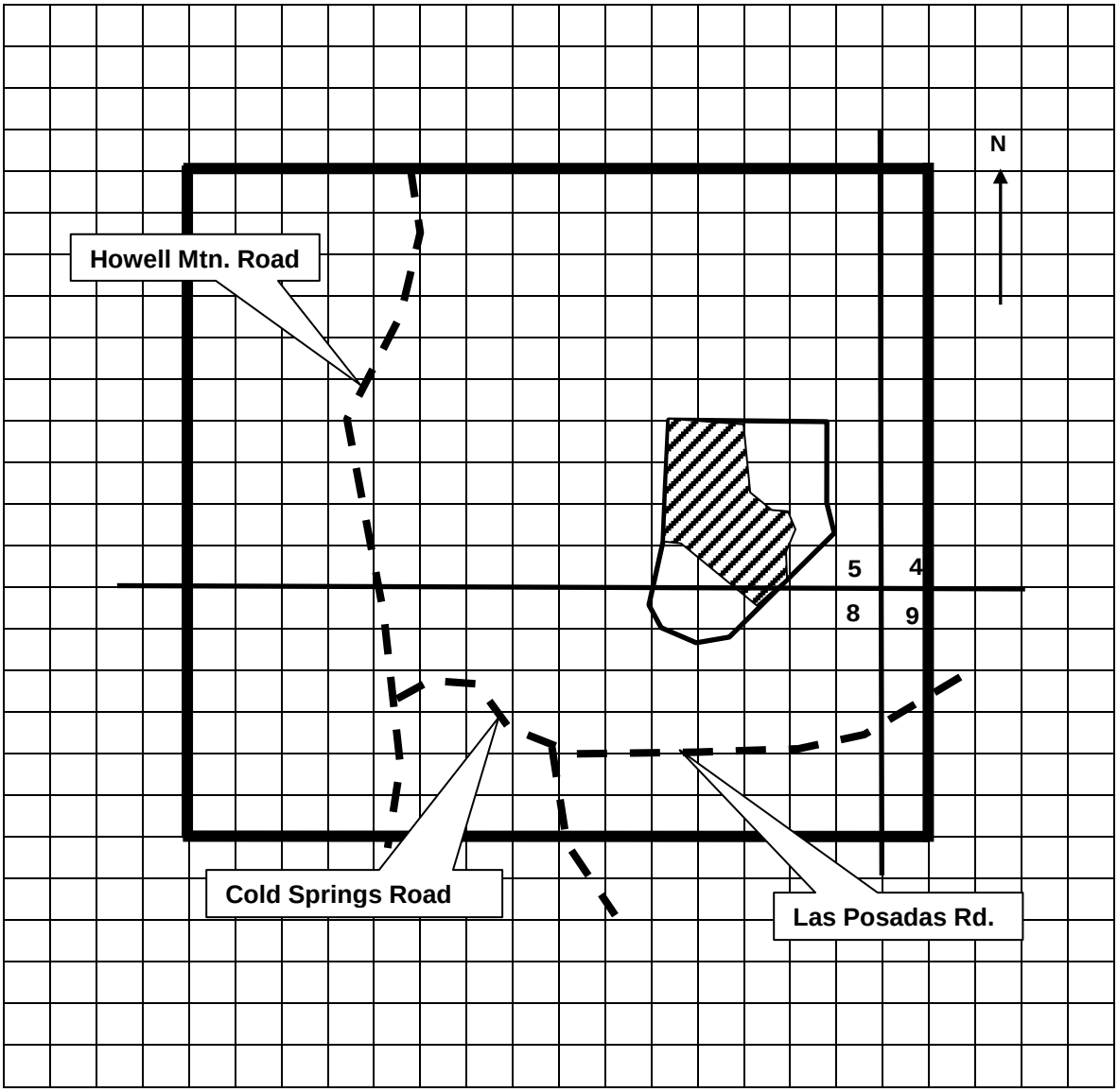
Timberland Conversion Index, applies to Timberland Conversion only

Description	Appendix	Page
Plat Map		3
THP/Conversion Map		Attached
Timberland Conversion Permit Application and Plan		4
Plan		7
Professional reports	Some attached, others to be submitted.	
Agriculture-Grazing		11
Soils		11
Archaeology		15
Surrounding Land Uses		16
Alternatives		19
Water Availability Analysis		20
Environmental Information Form		22
Project Description		23
Environmental Setting		27
Aerial Photo		28
Photos		Attached

TIMBERLAND CONVERSION PLAT

Applicant (s) Name (s) **David Abreu Vineyard Management**

Section (s) **5 & 8** Township **9N** Range **5W** **MD** B & M



Scale 4 Inch (es) = 1 mile

Show section numbers in center of section on plat. Entire plat may be used as one section or as halves of adjoining sections if needed for large scale detail.

Show the conversion area not in a Timberland Production Zone or Coastal Zone by:

Show the conversion area in Timberland Production Zone by:

Show the conversion area in the Coastal Zone by:

See THP conversion map

TIMBERLAND CONVERSION PERMIT APPLICATION AND PLAN

Pursuant to Sections 4621-4628, Resources Code, and regulations contained in Title 14, California Code of Regulations, I (we)

Name(s) **David Abreu Vineyard Management Inc.**

Address(s) **P. O. Box 89, Rutherford, Ca** (ZIP) **94573**

hereby apply to the Director of Forestry and Fire Protection for a Timberland Conversion Permit to exempt the timberland described herein, and shown on the attached map or plat as a part of this application, from forest practice stocking requirements for conversion to a non-timber growing use and/or to enable final immediate rezoning from TPZ.

1. Property description of area to be converted, **Portion of A.P.N. 024-080-028**

2. Subdivision(s) Section Township Range B&M
   Portion of 5 & 8 T8N R5W MDB&M

3. Acres of timberland to be converted **The total project area is 17 acres, of which 12.8 acres are forested and will be converted. The balance of the 17 acres (4.5) is composted of grass, brush and ruderal acreage. The net acres of the vineyard will be 15.3 acres.**

4. The owner(s) of record of this timberland is (are) **David Abreu Vineyard Management Inc.**

5. The recorded interest in this timberland is held under deed dated **11-02-05,** recorded in **Document # 2005R0045367** of official records in **Napa County**.

6. This timberland is assessed in the name of: **David Abreu Vineyard Management Inc.**

7. I (we) intend to use this timberland in the future for **commercial production of premium varietal grapes**.

8. Conversion will begin about **June, 2013** and be completed by **October 15, 2013**.

9. Is all or part of conversion area in a Timberland Production Zone (TPZ)?
   _____yes ____**X**____ no If yes show the area in TPZ with diagonal black lines on the conversion plat or map, and complete the following items a through e.

   a. Is check or money order for $100 payable to the California Department of Forestry and Fire Protection enclosed with this rezoning application as required?
      _____yes _____no **N/A**

   b. Has application for immediate rezoning from TPZ been made to the county or city having property tax jurisdiction?
      _____yes _____no **N/A**

   c. If applied for, has the county or city tentatively approved immediate rezoning from TPZ'?

      _____yes _____no **N/A**
      If yes, give date _____ **N/A**

   d. Is there any other property zoned TPZ within one mile of the boundary of the TPZ area proposed for immediate rezoning?
      _____yes _____ no **N/A**

   e. Are there any proximate non-TPZ lands (on or off the property containing the TPZ proposed for rezoning) suitable for the proposed conversion use?
      _____yes _____no **N/A**
      If no, explain why such non-TPZ lands are not suitable.

10. a. Is check or money order for the basic **$600 CDF** timberland conversion fee (payable to the California Department of Forestry and Fire Protection) enclosed with this application?
____**X**____ yes _____no (See Title 14, 1104.2 CCR.)

b. Is check or money order for the **$1,250 Fish** and Game impact fee (Section 711.4(d)(2), Fish and Game Code) payable to the State of California enclosed?
____**X**____ yes _____no

_____ I will submit the fee when notified seven days in advance of filing the Notice of Determination and issuance of the permit.

11. Is any of the conversion area in a Coastal Zone as provided for by the California Coastal Act of 1976?
_____yes ____**X**____ no If yes, show the area in the Coastal Zone by horizontal black lines on the conversion plat or map, and complete the following item a.

a. Has a Coastal Zone permit for the proposed conversion use been issued?
_____ yes _____no If yes, date of issuance _____, 20____. **N/A**

12. What element(s) of the county or city general plan apply to the area within which the timberland proposed for conversion is located? **Agricultural Resources**

13. What is the zoning classification for all or part of the proposed conversion area that is neither TPZ nor Coastal Zone (use the designated zone term such as "Agriculture - Forest", not a letter - number designation)? **AW, Agriculture - Watershed**

14. Does the county, city or a district have a permit zoning, or other approval jurisdiction for the project that is the purpose of the conversion?
____**X**___yes _____no If yes, complete the following items a. through d.

See **Draft Erosion Control Plan attached.**

a. Name of local government entity ___**County of Napa, Conservation, Development and Planning Department.**____

b. Name the type of approval, zoning, or permit required. **Erosion Control Plan, application number**_____

c. Has the local government agency submitted an environmental impact report or negative declaration to the State Clearinghouse as required by the California Environmental Act (CEQA) and regulations? _____ yes ___**X**___no

d. What is the State Clearinghouse Number? __**N/A This will be added later**_____(The Timberland Conversion Permit cannot be issued until this is done and local government adopts the documents.)

e. Has the local government granted the necessary approvals. zoning, or permits required for the project?__yes __**X**__no
If no, explain in the appropriate section of the Timberland Conversion Plan.

The Erosion Control Plan required by Napa County has been applied for and will rely on the CEQA document developed by CDF's environmental review of the Timber Harvest Plan (THP) and Timber Conversion Plan (TCP). A signed copy of the THP and TCP will be submitted to Napa County when they are approved. The ECP will be made a part of the THP.

15. All property owners must sign the following affidavit unless the owner is a partnership, corporation or other organization, in which case the signer must be a partner, corporate officer, or organization officer respectively. An owner's agent may sign the affidavit, if power of attorney designating the agency, and signed by all the owners, a partner, or corporate or organization officer, for these respective kinds of ownership's accompanies the application. If the affidavit or power of attorney is signed in a state other than California, the signatures) must be notarized.

AFFIDAVIT

I (We) own the herein described property, and declare a bona fide intent as defined in Section 1100(b), Title 14, California Code of Regulations to successfully complete conversion of the herein described timberland for the stated purpose in accordance with the conversion plan and plat or map, all hereby acknowledged as a part of this application, and in accordance with the timberland conversion permit, timber harvesting plan, and conditions required through the California Environmental Quality Act and related regulations.

I (We) understand that if the conversion fails or is abandoned, that I (we) can be required to restock with trees those areas that do not comply with forest practice stocking requirements, so that such areas meet forest practice stocking requirements. I (We) understand that if we fail to do so, the Director of Forestry and Fire Protection can have the restocking done, including necessary site preparation, and charge me (us) with the costs.

I (We) declare under penalty of perjury that I (we) have fully read this application, conversion plan and plat or map, and that the information given therein is correct to the best of my (our) knowledge.

Executed on March 5 2013, at Napa
State of California

Signature(s) of Property Owner(s) Title(s)

owner

3-2-2013 6

TIMBERLAND CONVERSION PLAN

Instructions -Omitted-

General

Timberland Owner **David Abreu Vineyard Management**

1. The responsible person who may be contacted if different from those given in the Application section. **As above**

2. Have you received professional advice or assistance in planning this conversion?
   ____**X**____Yes _____No List name and address of people professionally trained in land management who are advising you on this conversion.

See the consultation list below.

Consultant List

Landowner-Applicant
David Abreu Vineyard Management
P. O. Box 89
Rutherford CA 94573
Contact Person: David Abreu
Phone: (707) 963-7487
Email address: Sarah@abreuvineyard.com

CEQA Consultant
Analytical Environmental Services
Jessica Alexander
1801 7th Street, Suite 100
Sacramento, CA 95811
Office: (916) 447-3479
Fax: (916) 447-1665
Email address: jalexander@analyticalcorp.com

Civil Engineer
Napa Valley Vineyard Engineering, INC.
Drew Aspegren
176 Main St Ste B
Saint Helena, CA
Office: (707) 963-4927
Cell: (707) 287-7700
Email address: napavve@aol.com

Registered Professional Forester
Environmental Resource Management
Scott R. Butler
889 hwy 20-26
Ontario, OR 97914
Office & Cell: (707) 468-8466
Home: (541) 823-0066, Fax (707) 220-0111
Email address: scott.butler@sbcglobal.net

Hydrologist/Geologist
Martin Trso, P.G.
PMB 442m 1442A Walnut Street
Berkeley, CA 94709
Office: (510) 559-8036
Email address: martintrso@sbcglobal.net

Botanist & Biologist
Analytical Environmental Services
Jessica Alexander
1801 7th Street, Suite 100
Sacramento, CA 95811
Office: (916) 447-3479
Fax: (916) 447-1665
Email address: jalexander@analyticalcorp.com

Archaeologist
Tom Origer & Associates
Tom Origer
Archaeology/Historical Research
P.O. Box 1531
Rohnert Park, California, 94927.
Office (707) 584-8200, Fax (707) 584-8300.
Email address: origer@origer.com

Geologist
Gilpin Geosciences, Inc.
Lou M. Gilpin
3228 Silverado Trail
St. Helena, CA 94574
Office: (707) 968-9408
Email address: lmgilpin@earthlink.net

Agencies involved

Napa County Resource Conservation District
Dave Steiner
1303 Jefferson St., Ste 500B
Napa CA 94559
Office: (707) 252-4188 ext 107
Email: dave@naparcd.org

Napa County Planning
Brian Bordona
1195 Third Street, Rm 210
Napa CA 94559
Office: (707) 259-5935
Email address: brian.bordona@countyofnapa.org

California Department of Forestry, Sacramento
Dennis Hall
Cal Fire
P. O. Box 944246
Sacramento, CA 94244-2460
Office: (916) 653-9422
Email: Dennis.Hall@fire.ca.gov

California Department of Forestry, Santa Rosa
Kim Sone
135 Ridgeway Ave
Santa Rosa CA 95401
Office: (707) 576-2344
Cell: (707) 889 4217
Email: kim.sone@fire.ca.gov

California Department of Fish & Game

California Department of Mines and Geology
Michael Huyette
135 Ridgeway Ave
Santa Rosa CA 95401
Office: (707) 576-2275
Email: michael.huyette@fire.ca.gov

3. Do you have or can you obtain sufficient financial resources to carry out this conversion?
   ___**X**___Yes _____No

   Should the conversion fail or be abandoned do you have or can you obtain sufficient financial resources to return the land to timber production?
   ___**X**___Yes _____No

4. How will the timber be logged? (Will all or only some trees be cut? Will area be tractor-logged or cable-logged, etc.?) Describe:

   All non merchantable trees and vegetation will be removed, chipped and/or burned on the site. Crawler tractors and/or skidders will be utilized to move merchantable forest products to landings on existing roads. Suitable minor forest products will be removed as appropriate and as can be marketed. Slash, brush and non-commercial vegetation will be windrowed for burning.

5. Slope percent ranges in gradient generally **4%** to **14%.** Slopes face generally toward the **South**.
   See the Draft Erosion Control Plan attached.

6. Describe special measures to be taken during and after logging, including road and skid road construction, and use to prevent erosion, protect soil, and to protect local streams, ponds, or lakes on or near the conversion area. EXPLAIN IN DETAIL:

   No new roads will be built. Due to the gentle nature of the ground no skid trails will be built. Stumps will be removed with an excavator and crawler tractor. All exposed soils will be stabilized under the direction of the Erosion Control Plan approved by Napa County.

7. Describe how the area will be prepared for new use after logging. Describe methods of slash disposal and woody vegetation treatment, and any additional land treatment measure that will be taken:

   All merchantable material will be utilized for sawlogs, fuelwood, chips or minor forest products. The remaining slash, roots and stumps will be mechanically concentrated chipped and/or burned. The area will be ripped, rock picked and cultivated. Soil amendments such as gypsum and lime will be applied as needed upon recommendation of vineyard consultants. Other soil treatments may also be applied according to the recommendations of the vineyard manager and/or consultant. Drip irrigation will be installed prior to planting. The vineyard will then be seeded for a permanent non till cover crop. The vineyard will require a "strip spray" herbicide application around the newly planted vines to avoid future weed competition. Installation of an appropriate trellis system will be required after the vines are in the ground and established. This system is usually installed in stages during the first couple of years of planting.

8. If conversion fails, or is abandoned for any reason, how will the area be returned to timber growing use to meet the purpose of the Forest Practice Act? Describe land preparation, and seeding or planting measures:

   The vineyard will be mechanically site prepared and planted to Douglas-fir and Ponderosa Pine under a professional forester's supervision. Planting of seedlings would be on 12 foot spacing, yielding 300 per acre.

9. Areas which conversion will be completed within 5 years ___**+/- 12.8**___ Acres. Date by which logging will be completed: **Fall the year of start up of operations.** Date by which final conversion to new use will be completed: **Fall of the year after the area is cleared.**

10. What assurances can you give that this conversion is feasible?

Established vineyards in Napa County have been producing premium grapes for several generations. Many of these vineyards have been developed on timberlands that are the same and/or similar to that of the project area. This landowner presently owns vineyards on the same parcel with the same soil types, slopes and aspect. Several major commercial wineries exist in the same growing region of Napa County. Comparable neighboring property has been successfully planted to grapes and has been producing for many years.

Vineyard development within Napa County is occurring in many areas. This reflects the increasing demand for high quality varietal grapes from Napa County. The proposed project area is adjacent to several existing vineyards. This planting will supply grapes to the local wineries in the area.

The acreage to be converted and developed as vineyard has been selected because of the favorable topography, suitable soils and climate. The applicants and their advisors are competent growers with a history, of developing and management of vineyards. They have an intimate knowledge of the wine industry.

Significant financial resources exist to insure completion of the project. Professionals familiar with all aspects of developing and managing a productive vineyard have been consulted. These knowledgeable advisors have indicated that given appropriate cultural practices the proposed area will be able to grow premium varietal grapes on an economically feasible basis.

11. Describe the specific plans for development of the new use:
List and attach any documents and sketches illustrating or showing proposed use.

The tentative plan of development is to complete the timber harvest portion of the project beginning in the spring of 2013. All sawlogs, fuelwood and miscellaneous wood products are expected to be removed prior to summer of 2013. Clearing, ripping, rock picking and permanent erosion control measures will then be installed prior to the fall of 2013. Burning of residue piles will occur as permitted by the California Department of Forestry and Fire Protection and the Bay Area Air Quality Management District. Basic irrigation installation is expected to be completed by the end of the 2013 season, if not it will be completed during the 2014 season. Vineyard planting will commence as soon as the vines become available. It must be emphasized that these schedules are estimates only and may be changed by factors beyond the control of the applicant. All erosion control measures of the ECP will be implemented prior to the 2013 winter period.

AGRICULTURE-GRAZING

The following additional information is needed for lands to be devoted to agricultural purposes including grazing.

1. Has the suitability of the soil for the intended agricultural use been determined through examination by and consultation with farm advisors, Soil conservation District specialists, or other qualified professionals?
   ___**X**___Yes _____No

   If "YES", give name and title of specialists and describe findings:

Registered Professional Forester # 1851 **Scott R. Butler** **13,333 Low Gap Rd.** **Ukiah, CA 95482** **(707) 468-8466**	"This forest area is comparable to other producing vineyards in the area. Forest site quality is moderate over the area. Slopes, soils and aspect have been considered by the applicant and their advisors. Implementation of the erosion control plan will control sediment transport and protect valuable resources associated with this environment."
Crop Care Associates, Inc. **P. O. Box 2419** **Yountville, CA 94599** **(707) 944-2998**	"Based on this analysis, these soils are quite suitable for wine grape production and are expected to impart relatively high vigor potential to whichever rootstock/scion combination is selected."

2. Describe the soils now supporting timber or other woody vegetation: (clay, loam, sand, decomposed granite, etc.) Give soil series if known**: 100 Aiken Loam 2-15%**

   See Soil Resource Report for Napa County California, attached.

3. Describe soil treatments necessary or desirable for the new use: (lime, fertilizers, mulch, etc., and rate of application).

   See the Erosion Control Plan Appendix V, page 203.

4. How will other woody vegetation left after logging be eliminated?
   (Check method) Mechanical removal__**X**__ Burn__**X**__ Chemical eradication ____ Other ____.

   After removal of merchantable logs, firewood and chip material is economically feasible, the remaining slash, stumps and roots will be concentrated with heavy equipment and burned. The area will then be raked and ripped. Hand picking of roots and debris will be necessary. Burning according to Bay Area Air Pollution Control District regulations and CDF fire rules will occur as soon as permissible after timber removal.

5. How will natural woody growth be prevented from revegetating the area?
   (Check method) Mechanical removal__**X**__ Reburn_____ Chemical eradication _____ Other ____.

6. What kind and rate of application of seed or kind and spacing of planting stock will be used?

Seedling Requirements: All exposed or disturbed soils shall be seeded (using one of the mixes listed below). Seed and fertilizer shall be applied hydraulically or broadcast at the rates specified below. (See the ECP attached)

Napa Valley Ag supply	**Ball Beans**	**40%**
"Plowdown legumes"	**Forage Peas, VNS**	**20%**
@ 100 lbs/ac	**Forage Peas, VNS**	**20%**
	Common Vetch	**20%**
Napa Valley Ag supply	**Barley**	**70%**
"Wrex Mix":	**Zorro Fescue (Deawned)**	**14%**
@ 100 lbs/ac	**Dwarf Perennial Ryegrass**	**7%**
	Hykon rose Clover RK	**3%**
	Creeping Red Fescue	**3%**
	Chewings Fescue	**3%**
Napa Valley Ag Supply	**California Brome**	**68%**
"Abreu Perennial Mix"	**Hykon Rose Clover, RK**	**23%**
@ 100 lbs/ac	**White Yarrow**	**9%**

An alternative seed mix and/or fertilizer may be used after review and approval by Napa County Resource Conservation Department.

Fertilizer: Ammonium Phosphate sulfate (16-20-0) 200-240 lbs/ac

Straw Mulch: During the life of plan, straw mulch shall be spread annually over all disturbed and seeded areas. The mulch shall be spread mechanically or by hand at the rate of 2 tons/acre. Straw mulch may be crimped in place after spreading. Straw spread after reseeding or repair may also be crimped.

The conversion area will be planted to vineyard following implementation of the ECP. Vineyard rows will be planted 5 feet apart and will generally run in a north/south direction.

7. If conversion is for grazing, what kind and number of livestock are being grazed now on this property?
N/A
What kind and number of livestock will be grazed after conversion is completed?
N/A

8. What water developments exist now on the property?
The existing well currently produces 350 gallons per min. The 350 gallons per min. was determined by a 72 hour production test.

9. What additional water developments are planned for conversion?
None are planned at this time.

10. What length of fence exists now in connection with the conversion area?
The entire perimeter of the property is fenced. These fences were built by neighboring vineyards and Pacific Union College. These fences are in an ongoing state of repair as needed.

11. How much additional length of fence will be added in connection with conversion?
None

12. Describe buildings or improvements now on property where conversion is planned: (Residence, barn, other and other farm structures)
None

13. Describe buildings or improvements to be added in connection with conversion:
No additional buildings are planned for the conversion area.

SUBDIVISION **Not Applicable**

Applicable only for lands in Timberland Production Zone. See item 8, informational page.

The following additional information is needed for lands to be devoted to real estate subdivisions:

1. Has "Combined Notice of Intention" per Section 11010, Business and Professions Code been filed with State Division of Real Estate?
_____YES_____NO If "YES", DATE FILED: _____

2. Is area approved for subdivision? _____YES_____NO
If "YES", by what local governing authority?_____
_____

3. Name the fire protection jurisdiction in which the subdivision will be (name of incorporated city, fire district, or other, name and describe):
_____

4. Will meeting fire protection standards of the fire protection jurisdiction, or of the safety element of the county or city general plan and county or city ordinance be a condition for county or city approval of the final subdivision map?
_____YES_____NO
(If not, this may be made a condition of the Timberland Conversion Permit.)

5. Provide copy of proposed general development plan and indicate plan is included by "X"____

RECREATION **Not Applicable**

The following additional information is needed for lands to be devoted to recreational development:

1. Provide evidence of county or district zoning and approval with this plan, and list copies of document(s) submitted herewith showing such approval:
   a. _____
   b. _____
   c. _____

2. Are documents attached with this conversion plan: __YES __NO

3. Does your plan comply with local health and sanitation requirements, and have approval?
_____YES_____NO

4. Will your plan meet county road standards, and have county approval of the roads?
_____YES_____NO

5. Provide copy of development plan and indicate plan is included by "X"_____

WATER DEVELOPMENT PROJECTS **Not Applicable**

The following additional information is needed for lands to be devoted to reservoirs or other water development projects:

1. Is the reservoir to be built and operated for private use or by a government agency?
_____

2. If for a public agency, show name of agency:
_____

3. If privately owned and operated, do you have a permit, certificate or similar documents from the State (California) Department of Water Resources? _____YES_____NO

4. Is a reservoir to be built under the Agricultural Conservation program?
_____YES_____NO
If so, have you filed application? _____YES_____NO
Attach copy of application, document of approval, or copy of evidence of professional planning and design and indicate it is attached by "X": _____

5. Provide a map showing the high water line in relation to your property and indicate map is included by "X": _____

6. Is a permit to appropriate water required from the State Water Resources Control Board? _____YES_____NO

7. If 6 above is "YES", has application been made? _____YES_____NO

8. If 6 above is "YES", give date of application: _____

MINING **Not Applicable**

The following additional information is needed for lands to be devoted to mining purposes:

1. Has an assay or feasibility report been made to determine the quality and the economics of the venture?
_____YES_____NO
If "YES", summarize findings:
_____

2, Describe nature and extent of necessary disturbance.
_____
_____

3. Provide map of proposed development and indicate map is included by "X": _____

4. If a county approved reclamation plan required by the Surface Mining and Reclamation Act and county ordinance for this mine? _____YES_____NO

5. If 4 above is "YES", has the county approved a Reclamation Plan for this mine? _____YES_____NO
(If "NO", issuance of the conversion permit may be delayed until the county approves the reclamation plan.)

OTHER

Complete application detail for intended conversion purpose:
Provide other pertinent information. -- Attach separate sheets if necessary:

A. Archeology

No significant adverse impacts are expected to occur. The proposed project is very similar to a project proposed in 2005. The following information is based on the archaeological report done in 2005. This archaeological report is presently being updated to reflect changes made for this application. No significant changes are expected.

A record search by the Northwestern Information Center, Sonoma State University, disclosed no archaeological sites on or near the project area. Letters were sent to Native American tribes in the County requesting input, no sites were disclosed in or near the project area. This RPF has been through archaeological training by the California Department of Forestry and has reviewed the project area, no evidence of Native American activities or historical buildings were found. The complete Archaeological report can be seen at the CDF Archaeologist office in Santa Rosa.

Protection Measures:

No archaeological or historical sites were found, no protection measures are needed.
See the Archaeological addendum found in the THP.

B. Rare and Endangered Species.

No significant adverse impacts are expected to occur. The proposed project is very similar to a project proposed in 2005. The following information is based on the biological and botanical assessment done in 2005. This assessment is presently being updated to reflect changes made for this application. This updated assessment will be added to this application at a later date. No significant changes are expected.

All proposed mitigation found in the updated assessment will be included in this application. As a result of this mitigation no significant adverse impacts are expected to occur.

C. Visual, see the THP

VISUAL

No significant adverse impacts are expected to occur.

The visual assessment area is limited to the area visible by large numbers of people. There are no public roads that access the property or are in close proximity of the property. Pacific Union College does have an existing access road to their airport and an equestrian, cycling and hiking path adjacent to the northern boundary of the project property.

Due to the location of the project area on top of a flat ridge, long distance views of the project are not available. Review of topographic maps and profiles indicate that the trending ridge and gentle nature of the slope, combined with the retained surrounding tree canopy combine to block the project from distant views. No significant, if any, view change can be expected.

Surrounding Land Uses

North

Pacific Union College property lies due north of the project area. The college sold Mr. Abreu a portion of their property for this vineyard project. The colleges airport runway ends immediately north of the proposed vineyard. Federal flight line requirements have required past harvesting of many of the taller trees within the proposed project area in order to meet these height regulations. The installation of the proposed vineyard will eliminate future height problems for the airport and college. An existing equestrian, cycling and hiking path runs along the northern edge of the proposed project on the college property. Changes in the views from this path are comparable to the views presently available along the path. The proposed project and will not impact the use or enjoyment of this path.

West

Several college buildings including residences lie to the west of the project. These buildings house employees, students and college facilities. The college has done a lot line adjustment to create the parcel that will contain the proposed project. These property lines take into consideration topography and vegetation for the buildings and proposed vineyard. Vegetative buffers were retained on the college property to screen these buildings from view of the proposed project.

South

South of the project is an existing vineyard owned by Mr. Abreu and Los Posadas County road. Los Posadas Road is a dead end road and is used primarily by local residences, the road is bordered by vineyards, residences and Los Posadas State Forest.

East

A new vineyard in conjunction with an existing residences has recently been established east of the proposed project.

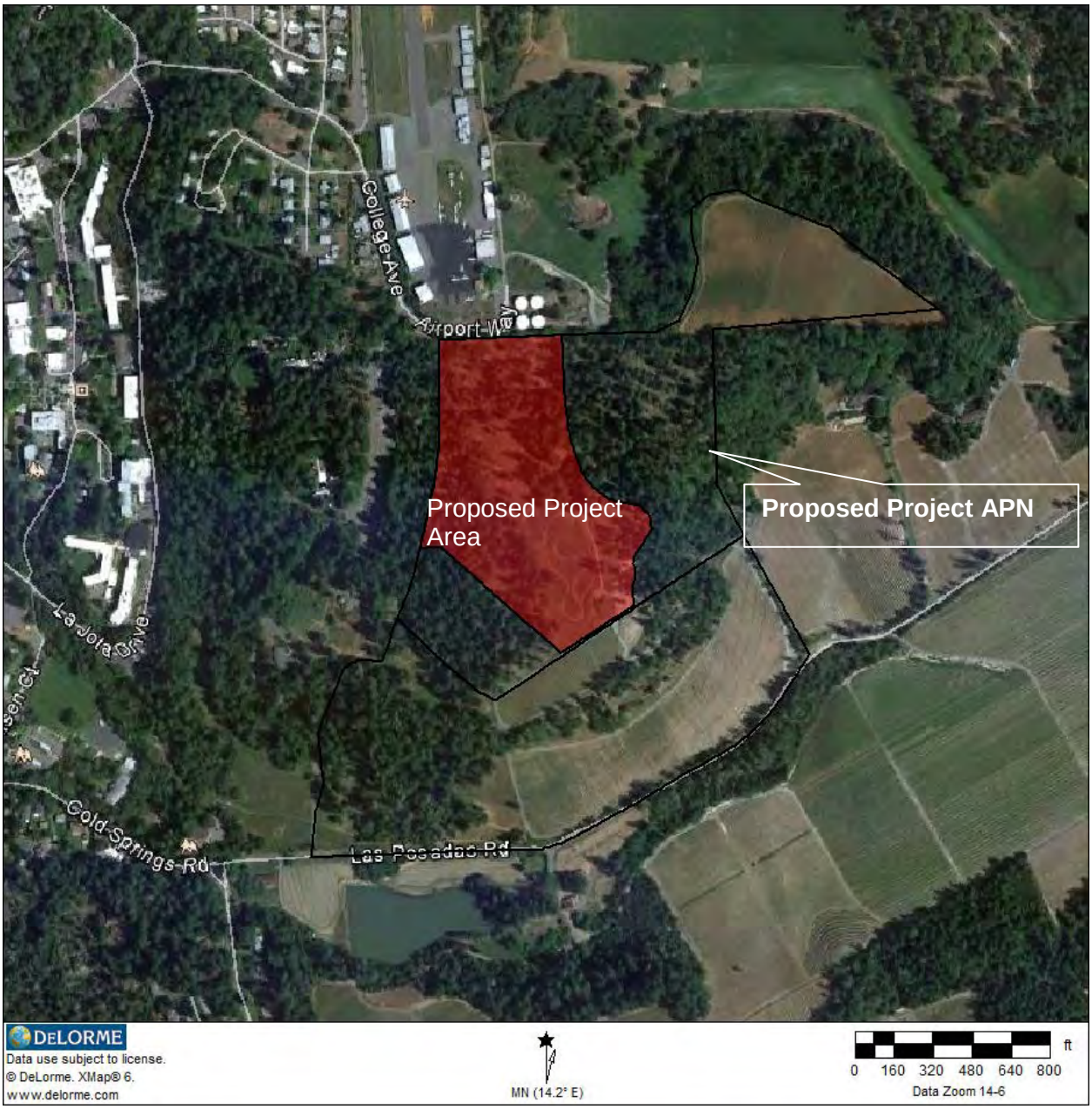
Forested areas are intermixed within all of the adjacent ownerships. See below.

Proximity to residences, communities, and towns: The project is located in a rural part of Napa County. Pacific Union College Campus and the town of Angwin lie to the west and north of the project area. Single family residences are located on larger parcels to the South and East of the property. Forests are intermixed with agriculture and rural residential on all sides of the project. See figure below

Adjacent ownership (public, private, industrial, etc.): Properties to the West and North are part of the Pacific Union College. Properties to the South and East are private ownerships. There are no industrial ownerships. Agriculture in the form of grazing and vineyards is practiced on both the College property, the adjacent landowners and in the general area.

Parkland, open space, etc.: There are no public open spaces in the immediate area. Pacific Union College does have equestrian, cycling and hiking trails on their property. The creation of the parcels sold by Pacific Union College to Mr. Abreu took these trails into consideration.

How does the proposed use fit the neighboring landscape? The surrounding area is a mosaic of rural residential, college campus, forest and agriculture. Past fires in the areas have added to the mosaic by creating open areas and brush fields. Open areas that are not suitable to agriculture are used for grazing. Open areas suitable to intensive agriculture have been planted to vineyard. The town of Angwin and other residences continue to spread into surrounding agricultural and forest lands. See figure below. The proposed conversion and planting to vineyard will be consistent with other land uses in the area.



In conclusion, the area surrounding the proposed THP/Conversion will retain a forested appearance. The combination of vineyard and forest is compatible and similar to other ownerships in the area. This THP/conversion as proposed will not increase the vistas of the general public driving on county roads. The present views will remain the same along county roads in the area and therefore not present a significant adverse impact.

D. Roads, see Traffic in the THP **Appendix A, page 130**

TRAFFIC

No significant adverse impacts are expected to occur.

Traffic assessment issues are assessed as they apply to Los Posadas road which runs into Cold Springs road which runs into Howell Mountain road which runs into Deer Valley road and then into Hwy 128. All of these roads presently support heavy truck traffic similar to the truck traffic propose in this project. Truck traffic to the proposed project will utilize the existing gated entrance to the existing vineyard on Los Posadas road, see **above figures**. Howell Mountain road will be used to Hwy 128 which will be used in both directions to access destinations within the Napa Valley and abroad. These roads have and are being used for the transport of agricultural crops by a wide variety of landowners. Many of the roads in the area were originally built to transport agricultural products, including forest products and grapes, early in the last century. All trees harvested on the project will be milled onsite, cut into firewood and or chipped onsite. Milling products will be lumber and or cants. This material will be utilized onsite and or hauled to other locations within the valley. Transport will be with 10 wheelers, pickups and or trailers. The grape harvest will be transported in farm trucks to wineries in the Napa Valley area.. Approximately three 20-ton truckload of grapes will utilize the road over a 30-day harvest period each year. This type of traffic is minimal and very similar to other agricultural activities (Grapes, Cattle, Sheep, Horses, Apples, Rock aggregates, Fire wood etc.) presently taking place on these roads and will not be a significant increase in traffic.

These county and state roads have been used for agricultural products for well over a century, they are maintained by the county and the state for this and residential use. Residential use has increased significantly during the last century compared to agricultural use, which has probably decreased or remained the same. Neither the timber hauling nor the agricultural crop transport is a significant increase in traffic or traffic load on these roads. Due to the nature of large trucks, some limitations have been placed on their operation. It should be noted that the Pacific Union College is used to the noise generated from the air port. Any noise associated with logging is similar in nature and for a short duration compared to the operation of the air port.

LTO operational information relative to traffic mitigation measures.

- The LTO shall advise all log truck drivers to use extreme caution when transporting timber products along county roads, especially in areas of limited sight visibility.
- Log trucks are to operate with headlights on for safety and are not to exceed 25 miles per hour while on rural county roads.
- Log truck drivers are not to use Jake Brakes in the immediate vicinity of residential neighborhoods.
- All logging activities shall be restricted to Monday through Saturday 7 am. to 7 pm. No activities may take place on Sundays & Holidays. Emergencies are excepted from this restriction.
- Signs indicating slow trucks entering the roadway will be placed at a distance of 300 feet in both directions from the entrance of the logging operation on the county road.

E. California Environmental Quality Act: An Environmental Impact Report is being proposed for this project. The following professionals and their associated reports, some included with this application others to be attached prior to approval, document review and analysis required by CEQA**.**

- Registered Professional Forester
- Botanist
- Wildlife Biologist
- Geologist
- Hydrologist
- Erosion Control Specialist and Engineer
- California Department of Forestry, Forester
- California Department of Forestry, Archaeologist
- California Department of Fish and Game Biologist
- California Department of Fish and Game Botanist
- California Department of Mines and Geology, Geologist
- Regional Water Quality Control Board, Hydrologist
- US Fish and Wildlife Service, Biologist
- National Marine Fisheries Service, Biologist

The proposed project reflects rules, mitigation and suggestions to protect the environment. The various reports prepared to satisfy CEQA requirements should be consulted for further information on this project. They are a part of this application and the proposed timber harvest plan.

F. Zoning and Land Use

The project property is zoned Agriculture/Watershed (AW). The proposed conversion to vineyard is compatible with this zoning.

> **"The AW district classification is intended to be applied in those areas of the county where the predominant use is agriculturally oriented, where watershed areas, reservoirs and floodplain tributaries are located, where development would adversely impact on all such uses, and where the protection of agriculture, watersheds and floodplain tributaries from fire, pollution and erosion is essential to the general health, safety and welfare. "**

Agricultural uses, such as timber harvesting and vineyard production, is a permitted use. The Napa County Code of Regulations requires preparation of an Erosion Control Plan for any development or changed land use unless exempted. An Erosion Control Plan is been prepared to Napa County Technical Standards by a professional vineyard engineering firm for this project. The major land uses in the area are Pacific Union College, the City of Angwin, urban, agricultural and rural residential. Most of the agricultural use is vineyard production of ultra premium grapes. The residential use is primarily rural residences. See the current aerial photo attached. A draft copy of the ECP has been made a part of this plan. An approved copy of the ECP will be submitted to CDF upon approval by Napa County Planning Department.

G. Alternatives to the Proposed Project

STATEMENT OF ALTERNATIVES

No potentially significant environmental effects have been identified in the THP as proposed. The RPF has analyzed alternatives that could avoid or substantially lessen environmental effects that are typically identified in the preparation and review of a timber harvest. In accordance with CEQA principles the alternatives selected for detailed examination in this project are limited to ones that would avoid or substantially lessen the significant effects of the project.

Conclusion:

After considering these alternatives it is the conclusion of the landowners and their advisors that this project, the conversion of forestland to a vineyard, is their best alternative. Adverse environmental effects have been considered and have been mitigated to levels of insignificance. The project as proposed is the least damaging alternative given the objectives of the landowner. **See the draft EIR for details**

.

H. Timber Harvesting Plan

The Timber Harvesting Plan required for this project will be submitted at approximately the same time as the Environmental Impact Report.

I. Land Use Plans

The vineyard development on this property will allow annual income to carry the property financially. Only a portion of the land topographically suitable for vineyard on this property is included in this project. The areas suitable for vineyard are moderate site quality timber areas. The steeper and rough forested areas will be reserved for visual objectives and wildlife diversity.

J. Analysis of Timber Supply Depletion and Habitat fragmentation for Napa County as a Result of the Proposed Timberland Conversion.

See the THP for a detailed analysis.

K. Watercourses

No watercourses exist on or adjacent to the project area. The proposed conversion will not directly impact any watercourse or lake protection zones. No anadromous fisheries nor their habitat will be impacted by the proposed project Sediment control has been proposed for the project in the form of a Timber Harvest Plan and Erosion Control Plan designed by a professional forester and engineer. Napa County sediment and hydrology ordinances requiring no net increase over preproject conditions will be met with this project.

L. Water Usage

See Phase 1 Water Availability Analysis for Napa County **attached.**

Water usage will be minimal on the proposed vineyard. It is the owner's objective to use drip irrigation. The young vines will require water almost daily during the heat of the summer for the first year to insure the highest rate of survival as possible. Calculated from a vine count of 3000 per acre and a usage of 80 gallons during the irrigation period water usage is expected to be 240,000 gallons per acre for the first year. After establishment the maturing vines will require approximately half this amount for the four-month irrigation season. As a perspective the average residential use is about 160,000 gallons of water per household per year. The vineyard will require 15.3 acres x 120,000 = 5.6 acre feet. This amount is less than that presently taking place due to the Evapotranspiration of the existing forest proposed for conversion.

Water for drip irrigation will be supplied from the existing well. The well presently produces 135 gal/min. This well is supported by surface water infiltration and ground water aquifers. Napa county does not show this area as having a ground water shortage (see **Figure 11, page 67**).

The hydrologic effect of this small agricultural project will be insignificant. In a water balance equation replacement of forest cover by a no-till drip irrigated vineyard can yield a net positive increase in ground water yield. Forest cover, both conifers and hardwoods are notorious water consumers. Grapes are a relatively low water usage crop. Removal of tree cover and soil tilling will allow more water percolation into the soil mantle and ultimately into the ground water table. Exact water usage figures for forest cover are difficult to secure. An estimate, as per James' 1988 study of Redwood forest cover usage, is approximately 20,000 gallons per acre per day (Waste Water Disposal in a Forest Evapotranspiration System: B.B James PE-88). Obviously this figure would be less for the montane hardwood conifer forest on the project area, but it does provide a point of reference.

The commonly accepted Forest Hydrology proposition is that forest cover is a greater water user than agricultural crops. Actual experience shows that cleared or burned forest areas yield increased amounts of water.

ENVIRONMENTAL INFORMATION FORM
(To Be Completed By Applicant)

Date Filed **October 2012**

General Information

1. Name and address of developer or project sponsor:

   David Abreu Vineyard Management

   P. O. Box 89

   Rutherford, CA 94573

2. Address of project

   Los Posadas Road

   Angwin, CA 94508

   Assessor Parcel Number **APN 024-080-028**

3. Name, address, and telephone number of person to be contacted concerning this project

   Scott R. Butler

   889 Hwy 20-26

   Ontario, OR 97914 (707) 468-8466

4. Indicate number of the permit application to which this form pertains: **None**

5. List and describe any other related permits and other public approvals required for this project, including those required by city regional, state and federal agencies:
   a. **Timber Harvest Plan: California Department of Forestry and Fire Protection**
   b. **Timberland Conversion Permit: California Department of Forestry and Fire Protection**
   c. **Erosion Control Plan: Napa County Planning Department**
   d. **Environmental Impact Report, CDF lead agency**

6. Existing zoning district: **Ag/Watershed**

7. Proposed use of site (Project for which this form is filed):

   Commercial production of premium varietal grapes (vineyard)

PROJECT DESCRIPTION

8. Site size. **The total project area is 17 acres, of which 12.8 acres are forested and will be converted. The balance of the 17 acres (4.5) is composted of grass, brush and ruderal acreage. The net acres of the vineyard will be 15.3 acres.**
9. Square footage. **N/A**
10. Number of floors of construction. **N/A**
11. Amount of off-street parking provided. **N/A**
12. Attach plans. **N/A**
13. Proposed scheduling. **Logging and clearing 2013, Vineyard Planting 2014**
14. Associated project. **None**
15. Anticipated incremental development. **None**
16. If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected. **N/A**
17. If commercial, indicate the type, whether neighborhood, city or regionally oriented, footage of sales area., and loading facilities. **N/A**
18. If industrial, indicate type, estimated employment per shift, and loading facilities. **N/A**
19. If institutional, indicate the major function, estimated employment per shift, estimated occupancy loading facilities, and community benefits to be derived from the project. **N/A**
20. If the project involves a variance, conditional use or remaining application, state this and Indicate clearly why the application is required. **None**

Are the following items applicable to the project or its effects? Discuss below all items checked yes (attach additional sheets as necessary).

	Yes	No
21. Change in existing features of any bays, tideland, beaches or hill, or substantial alteration of ground contours.		X

No changes in topography will occur during development of this vineyard. Minor shaping will occur to smooth and cultivate the ground surface. This will include filling minor depressions and cutting minor high spots. Soil movement to accomplish these tasks will be minimal and not exceed one-quarter acre. Shaping will not significantly alter ground contours. See the Erosion Control Plan attached.

	Yes	No
22. Change in scenic views or vistas from existing residential areas or public lands or roads.		X

See detailed description in the THP, to be submitted.

	Yes	No
23. Change in pattern, scale or character of general area of project.		X

The general area is forest/brush vegetation areas intermixed with agriculture, commercial wineries, Pacific Union College and rural residences. No significant change is expected to occur. See the attached aerial photo.

	Yes	No
24. Significant amounts of solid waste or litter.		X

	Yes	No
25. Change in dust, ash, smoke, fumes or odors in vicinity.	X	

The clearing and agricultural operations will generate small amounts of dust and smoke. Trees, slash, roots and stumps, estimated at 25 tons per acre, will be burned and or chipped. The time period during which the burning will be done will be short. Burning will be done under both Bay Area Air Pollution Control District and California Department of Forestry and Fire Protection regulations on designated burn days. During vineyard operations some dust will be generated, but will not leave the property. Generation of dust and smoke will be insignificant due to small amounts, the limited work area and the general topography. Because of the size of the property and the distance to any developed area, most dust generated will remain on the property. Smoke impacts will be determined by weather conditions existing at the time burning under permit is allowed.

	Yes	No
26. Change in ocean, bay, lakes, stream or ground water quality or quantity, or alteration of existing drainage patterns.		X

Napa County ordinance requires the following.

Napa County General Plan Policy: Con 48 and 50 (c) have been meet by implementation of the ECP.

- Con reg 48 states "Proposed developments shall implement project-specific sediment and erosion control measures (e.g., erosion control plans and/or stormwater pollution prevention plans) that maintain pre-development sediment erosion conditions or at minimum comply with state water quality pollution control…"
- Con reg 50 states "The County shall require discretionary projects to meet performance standards designed to ensure peak runoff in 2-, 10-, 50-, and 100-year events following development is not greater than predevelopment conditions. See hyperlink for complete text. http://countyofnapa.org/pages/departmentcontent.aspx?id=4294971554

As a result of implementation of the Erosion Control Plan and the Forest Practice Act, post project sediment erosion conditions and peak hydrological runoff are projected to be below pre project conditions. See the hydrological report to be submitted.

	Yes	No
27. Substantial change in existing noise or vibration levels in the vicinity.		X

See the EIR, to be submitted.

	Yes	No
28. Site on filled land or on slope of 10 percent or more.	X	

The vineyard site has been selected for slope and topographical conditions that will permit agricultural operations. The slope varies form 4 to 14 percent. The owner's intent is to plant only on gentle sloping ground.

The main concern with agricultural operations on slopes exceeding 10% is accelerated erosion. Both vineyard development and the vineyard operational plans take into account these slopes and incorporate the necessary measures to protect them. (See the Erosion Control Plan. The NVVE Erosion Control Plan has proposed several drainage improvements for the new vineyard blocks that include fiber rolls, water bars, a roadside diversion ditch, earth diversion berms, and rock stabilization to control the surface runoff and prevent erosion.

Specific erosion control measures, in addition to those required by the Forest Practice rules, are:

1. Temporary cover crop seeding with an erosion control seed mix.
2. Straw mulching of all bare soil areas after clearing
3. Staked straw bale sediment filter at waterbars on slopes exceeding 20%.
4. Monitor and patrol during winter period by the landowner and his vineyard crews.
5. Installation of 18" high level compacted earthen berms.
6. Site specific rock stabilization.
7. Development as per Erosion Control Plan.

The soils involved are Aiken loam, see soil repot attached for more detail. These soils have a moderate to rapid permeability rate and limited potential for overland water flow. In an analysis of Erosion Hazard Rating done under the California Board of Forestry Technical Rule Addendum #1 protocol, the erosion hazard rating for the entire project area was found to be Moderate. No recent evidence of overland flow, which would cause significant accelerated erosion, has been found on the project site.

Vineyard erosion control practices recommended by competent advisors, both governmental and private, will be utilized for this project. The California Forest Practice Act erosion control regulations will apply during the harvesting phase and the Erosion Control Plan specifications during the vineyard development phase. As a result of implementation of the Erosion Control Plan and the Forest Practice Act, post project sediment erosion conditions and peak hydrological runoff are projected to be below pre project conditions. See the hydrological report to be submitted.
.

	Yes	No
29. Use of and disposal of potentially hazardous materials, such as toxic substances, flammables or explosives	X	

See attached Sustainable Integrated Pest Management Report.

	Yes	**No**
30. Substantial change in demand for municipal services (police, fire, water, sewage, etc.).		**X**

The general area in which this project will occur is at risk from wildfire. Past forest fires have destructively burned over this area. Access for fire fighting resources in the area is good. Three sides of the property have existing road access and the property itself has an existing road access through the middle. Due to fuel management by the land owner fuel loading is low to moderate, with some of the vegetation types present in the area being broken and discontinuous. Installation of the proposed vineyard will further reduce fire susceptibility by breaking up some of the overstory fuels and providing a less fire sensitive irrigated agricultural crop than presently exist. Topography as it relates to fire sensitivity is moderate.

This proposed project will help reduce fire problems by providing improved access, breaking up continuous vegetation types with vineyard green belts, reducing fuel loading, furnishing safety islands with green belt vineyards and by providing water sources for professional fire fighters. Potential demands on the fire services will be reduced with the completion of this project.

Since no additional residences are proposed with this project no additional demands will be placed on Police, water districts or sewage.

	Yes	**No**
31. Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.).		**X**

	Yes	**No**
32. Relationship to a larger project or series of projects.		**X**

This proposed project represents the agricultural plan for this parcel. No other project other than the existing property management is planned to take place.

ENVIRONMENTAL SETTING

33. Describe the project site as it exists before the project, including information on topography, soil stability, plants and animals, and any cultural, historical or scenic aspects. Describe any existing structures on the site, and the use of the structures. Attach photographs of the site. Snapshots or Polaroid photos will be accepted.

See the excerpt below from the Notice of Preparation for an EIR attached.

"The total project area is 17 acres, of which 12.8 acres are forested and will be converted. The balance of the 17 acres (4.5) is composted of grass, brush and ruderal acreage. The net acres of the vineyard will be 15.3 acres. This proposed project is consistent with the current Napa County zoning designation. The project site is not located within a Timberland Production Zone (TPZ) (California Government Code § 51104 (g)). However, because the proposed project will convert "non-TPZ timberland to a non-timber growing use" through timber harvesting operations in which "future timber harvests will be prevented or infeasible because of land occupancy and activities thereon," a Timberland Conversion Permit (TCP) and approval is required from CAL FIRE consistent with the Z'berg-Nejedly Forest Practice Act (Division 4, Chapter 8, Public Resources Code) and California Forest Practice Rules (Title 14, California Code of Regulations).

CAL FIRE is the CEQA Lead Agency because its approval of the TCP and THP for the proposed project is a prerequisite to other actions which require CEQA. Avoidance and protective measures for natural and biological resources included in the TCP and THP will be incorporated into the EIR, and the THP will be an appendix to the EIR. The interrelated nature of the two approvals will be discussed as a single proposed project in the EIR. In addition, the proposed project also includes an Erosion Control Plan (ECP) that has been prepared by a Licensed Civil Engineer pursuant to Chapter 18.108 of the Napa County Code (Conservation Regulations). An ECP is required for agricultural projects involving grading and earthmoving activities on slopes over 5 percent. The Napa County action of approving the ECP is subject to CEQA **and therefore Napa County is a Responsible Agency for the proposed EIR"**

34. Describe the surrounding properties, including information on plants and animals and any cultural, historical or scenic aspects. Indicate the type of land use (residential, commercial, etc.), intensity of land use (one-family, apartment houses, shops, department stores, etc.), and scale of development (height, frontage, setback, rear yard, etc.). Attach photographs of the vicinity. Snapshots or Polaroid photos will be accepted.

See surrounding land uses and aerial photo on pages 16 and 17 of this application.

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and the facts, statements and information presented are true and correct to the best of my knowledge and belief.

3/5/13
Date

Signature

Proposed Project Area
Photo Date 2012

APPENDIX J

Integrated Pest Management (IPM) Plan

crop care associates, inc.

August 19, 2009

To Whom It May Concern:

Re: The Sustainable Integrated Pest Management (IPM) Plan for Howell Mountain AVA Vineyard

The Sustainable Integrated Pest Management (IPM) Plan for Howell Mountain AVA Vineyard, written by Daniel Fischl, Agricultural Scientist at David Abreu Vineyard Management, outlines the company's planned approach to farming the Howell Mountain property following sustainable practices with minimal environmental impact. The pest and disease control practices, proposed pesticide and herbicide products, fertilization and irrigation practices, and strategy to maintain biodiversity described appear consistent with current Napa County sustainable practices, and follow integrated pest management concepts that are practical and reasonable to implement. The plan states that low environmental impact pesticide and fertilizer products will be used preferentially. In the case of extreme pest pressure, consultation with a licensed Pest Control Advisor can provide options for pest control with minimal worker toxicity.

Pesticide use in California (CA) is regulated through a network of federal, state, and local agencies. The United States Environmental Protection Agency (EPA) conducts environmental research and education, and develops and enforces regulations surrounding national environmental law. All pesticides must be registered with the EPA through the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In California, the Department of Pesticide Regulation (DPR) is the state agency tasked with evaluating and controlling pesticide use through a number of regulatory branches. Among other responsibilities, the DPR evaluates and registers pesticides before they can be legally used in CA. It performs residue testing of CA produce, and sets guidelines for acceptable levels. It monetarily supports a system of Agriculture Commissioners that serve as the local enforcement agents for all pesticide use laws and regulations. Agriculture Commissioners have a number of duties, including issuing permits for restricted use pesticides, and dealing with compliance issues surrounding pesticide use. In addition all pesticides applied for agriculture use must be reported on a monthly basis to the local Agriculture Commissioner.

p.o. box 2419 • yountville, ca 94599 • (707)944-2998 • fax (707)944-2163

The DPR is also the state agency that can license individuals to legally give advice or recommendations about pesticide use. Individuals wishing to obtain a Pest Control Advisor (PCA) license must first have pertinent education requirements and pass a number of exams issued by the DPR. For individuals to legally supervise the application of chemicals, they must first obtain a Qualified Applicator (QA) license following requirements and exams laid by the DPR.

Detailed information regarding the chemistry, toxicology, environmental impact, and human toxicity of the pesticides included in Itemized Fertilizer and Pesticide Information table (page 4 of Attachment A) can be found on the label and MSDS sheet for each product, or from the manufacturer. Below is a brief summary of some general properties of these materials, directly taken from these documents.

Kristin Lowe PhD

Robert Gallagher

Material	Mode of Action	Worker Toxicity*	Environmental Hazards/ Toxicity	Solubility in water	Potentially Hazardous Breakdown Products
Micronized Sulfur (ex. Sulfur DF)	Multi-site contact	Caution	Do not apply directly to water Avoid drift	Insoluble	H2S, COx, SOx
Copper (ex. Nordox)	Contact- inhibits spore formation and mycelial growth	Caution	Do not apply directly to water Avoid drift Toxic to primitive marine organisms	Insoluble	Copper fumes if heated above melting point
JMS Stylet Oil	Contact- various	Caution	Do not apply directly to water Avoid drift Toxic to fish	Miscible	Thermal decomposition in the presence of air may yield major amounts of oxides of carbon and minor amounts of sulfur and nitrogen
Sonata	Contact- various	Caution	Do not apply directly to water Avoid drift	Dispersible in water	None known
Serenade	Contact- various	Caution	Do not apply directly to water Avoid drift	Dispersible in water	None known
Roundup	Systemic- enzyme inhibitor	Caution	Do not apply directly to water Avoid drift Moderate toxicity to some species of fish	Soluble	Combustion products: carbon monoxide, phosphorous oxides, nitrogen oxides

* The signal words "Caution, Warning, Danger, or Danger-Poison" appear on all pesticide labels categorizing their human toxicity level. These words mean the following:

- Caution- Products are slightly toxic or may cause slight skin or eye irritation
- Warning- Products are moderately toxic and can cause moderate skin or eye irritation
- Danger- Products are corrosive and can cause irreversible eye damage or skin injury
- Danger-Poison- Products are highly toxic and potentially deadly at low doses

Daniel Fischl
Agricultural Scientist
David Abreu Vineyard Management
PO Box 89
Rutherford CA 94573

August 19, 2009

Sustainable Integrated Pest Management (IPM) Plan for Howell Mountain AVA Vineyard

The intent of this report is to provide an outline of the practices to be performed at the proposed new vineyard development site on Howell Mountain (THP 1-05-212NAP and ECP P05-376-ECPA). It will include a description of materials to be applied, cultural practices to be performed, and a discussion of how the use and implementation of these materials and practices could potentially affect the surrounding environment.

1. Outline and Farming Philosophy
2. Accountability Practices
3. Disease Management
    a. Grapevine Viral Disease
    b. Grapevine Fungal Disease
    c. Weed Management
    d. Invertebrate Pests of Grapevine
    e. Vertebrate Pests of Grapevine
4. Fertilization and Irrigation Management
    a. Fertilization
    b. Irrigation
5. Erosion Control Practices
6. Biological Refugia
    a. Buffer Strips
    b. Insectaries / Nectaries
    c. Forest Rehabilitation
    d. Other Similar Habitat

7. Environmental Impact and Risk Assessment
    a. Neighboring Land Use
    b. Risk Mitigation
8. Regulatory Environment and Reporting
9. Signatory

Outline and Farming Philosophy

Our intention on this site is to use an integrated approach to farming and management, derived from the best possible combination of **sustainable practices, integrated pest management (IPM)**, and the use of **certified organic materials** wherever possible.

The recent trend in Napa County has been of gentle progress toward sustainable practices, whilst recent statistics show that County-wide incorporation of organic farming principles has been on the increase. We feel that this approach is the best solution for the long-term vitality of both the viticultural industry and the County ecosystem as a whole, and is in the best interests of all communities as the separations between agriculture and habitat ever shrink.

The recent in-house addition of a highly-trained agricultural scientist with a strong background in agroecology and sustainable land use management is pivotal to David Abreu Vineyard Management to devise a highly integrated, strongly sustainable management program on the proposed site. The program we will be devising will incorporate the latest understanding of whole-systems biology, agroforestry and agroecology to provide key habitat, promote positive environmental interaction, and mitigate negative impacts from the vineyard itself.

Accountability Practices

Throughout this document we will refer to our planned vineyard management practices for this site in the definitive. We feel that these practices will be representative and true of our program as stated, however it is possible that in extreme instances, such as for example under severe disease infestation, we may feel the best management practice might temporarily differ from that stated. In all cases of change, we will include the consultation of a licensed Pest Control Advisor (PCA; information available at http://www.cdpr.ca.gov/docs/license/adviser.htm).

We will implement the following accountability practices:

1. Utilize **closed systems** for materials applications where appropriate. A closed system is defined in the California Department of Pesticide Regulations (CDPR) Code of Regulations (http://www.cdpr.ca.gov/docs/legbills/calcode/010101.htm)

2. Maintain a **wastewater capture or containment** program for equipment washing where appropriate. These methodologies are addressed in CDPR Pesticide Management Plan for Water Quality (http://www.cdpr.ca.gov/docs/emon/surfwtr/maaplan.htm)
3. Implement a **"no spill" protocol** to ensure that all existing surface runoff systems and groundwaters remain free of contaminants from farming practices
4. Maintain a log of all materials transport
5. Maintain a record of all irrigation and fertilization applications
6. Maintain and report to Napa County, all applications of pesticide, including rates and method of application.

Disease Management

A. Grapevine Viral Disease

We will utilize grapevine plant material known as 'Certified' to the State of California (Regulations viewable at http://groups.ucanr.org/iv/files/28206.pdf). We also intend to perform far more exhaustive testing of the requisite plant material for the presence of all known grapevine viral (and fungal) diseases, and intend to avoid any material not deemed "clean".

B. Grapevine Fungal Disease

We will similarly perform exhaustive testing of all grapevine materials prior to planting to eliminate any material that might be harboring known fungal pathogens.

Attachment A contains the list of materials that will be used on this vineyard. Sustainable management practice combined with the use of Organic (as certified by the Organic Materials Review Institute (OMRI; http://www.omri.org) and low-impact materials will be performed as follows:

a) Pruning strategies will be implemented to minimize the trunk canker diseases – *Eutypa* spp, *Botryosphaeria* spp etc.
b) Round-Up – may be used at the lowest rate for strip spraying in spring for efficient control of under-vine weed populations.
c) Copper (OMRI-listed) – for early-season botrytis and phomopsis control
d) Sulfur (OMRI-listed) – During the pre-veraison period to control powdery mildew
e) JMS Stylet Oil (OMRI-listed) – Biological oil used at budbreak for mildew suppression or during May-June for powdery mildew suppression and control, and mite / leafhopper control
f) Sonata / Serenade (OMRI-listed) – biological fermentation byproducts used pre-veraison to reduce powdery mildew growth
g) Other materials – may be used as recommended by a licensed PCA.

P.O. BOX 89, RUTHERFORD, CA 94573
P 707.963.7487 F 707.963.5104

All materials used will be applied by a **Qualified Applicator** (QA; as licensed by CDPR; see http://www.cdpr.ca.gov/docs/license/qal.htm), and all materials will be chosen for their low residual impact and **non-contamination of groundwater resources.**

Information regarding a material's likelihood for contamination of groundwater resources is derived from each specific material's MSDS and Label, as listed at the Crop Data Management Systems Inc (CDMS) database (http://www.cdms.net/LabelsMsds/LMDefault.aspx?t=). Labels describe the known environmental hazards, breakdown products, restrictions on use and timing, and describe rates that are allowable per EPA / CDPR regulations.

C. Weed Management

We will use the following to reduce weed pressure:

a) **Cover cropping** programs to suppress the growth of weeds
b) **Under-vine treatment** may include the use of Round-up at the lowest rate in a strip spray no more than 12 inches in diameter, while shovels will be used in maintenance throughout the season
c) The use of **drip irrigation**
d) **Mowing** and/or **tilling** will be used where appropriate, and as provided for in the Napa County Erosion Control Plan (**ECP P05-376-ECPA**)
e) **Round-Up** - may be used at the lowest rate for strip spraying in spring for efficient control of under-vine weed populations; Round-Up is a **non-residual, contact only** material
f) Use **shredded vine clippings** to act as **mulch** and suppress weeds in active weed banks

We will not be using any herbicides that have any known residual activity, pre-emergent or otherwise.

D. Invertebrate Pests of Grapevine

The main invertebrate pests of grapevines in this area include **leafhoppers, sharpshooters, Willamette mites, whiteflies, Grape/Longtail/Obscure mealybugs** and **Vine mealybugs**. Recent quarantine efforts from the County include the listing of the **Light Brown Apple Moth (LBAM)** as a potential agricultural threat.

General biological control principles will be employed to keep populations of these insects at or below tolerable levels using the following **IPM** techniques:

a) **Biological Refugia** – buffer strips, insectaries, nectaries and other habitat designed to foster the sustained population of predators of vineyard pests
b) **Releases of biocontrol predators** – see below
c) **Artificial Habitat for predators** – bluebird houses, e.g.
d) **Persistent monitoring** using regular seasonal counts to recognize if treatable thresholds have been exceeded. Last resort management would be to implement a limited and targeted spray program using Organic materials (preferable) or low-impact synthetics.

We intend to specifically manage these pests as follows:

a) **Leafhoppers / Sharpshooters** – bluebird habitat, biocontrol with lacewings, spiders; if populations severely exceed treatable levels, pesticide materials would include Pyganic (OMRI-listed) or Provado.
b) **Mites** – releases of predatory mites, suppression of dust using misting of water on avenues or OMRI-listed dust suppressants such as Dust-Off; if populations severely exceed treatable thresholds, Acramite or similar might be spot-applied.
c) **Whiteflies** – Rarely noted in this area, whiteflies are best managed with tolerance, or spot treatment of Pyganic (OMRI-listed) if excessive / severe damage is present.
d) **Grape / Long-tail / Obscure Mealybug** – Refugia, insectaries, and cover cropping will foster habitat for mealybug predators such as the mealybug destroyer and Anagris *spp.* wasps. Argentine ant colonies (commensal for mealybug) will be managed by trapping. Good canopy and crop management will minimize mealybug proliferation. If populations become excessive, materials include Admire or Applaud, used at the lowest rates.
e) **Vine Mealybug** – similar to Grape mealybug, however tolerance levels are much lower due to the serious nature of this pest.
f) **LBAM** – full compliance with all requirements of the County-mandated Quarantine procedures.

E. Vertebrate Pests of Grapevine

The main vertebrate pests of grapevine in this area include **gophers, voles / field mice,** and **bird predation of ripe fruit**. We intend to set up and maintain raptor, barn owl and nesting bird habitat, using **barn owl boxes, raptor perches**, **bird boxes** and **snags** as required in the Timber Harvesting Plan (**THP 1-05-212NAP**). Vineyard canopy **bird netting** will be used late season to discourage bird predation of berries. We may implement additional individual gopher traps in spots of significant damage.

Fertilization and Irrigation Management

A. Fertilization

Soil analysis and **seasonal plant tissue analysis** will be performed to identify nutritional and mineral deficiencies. Amendment will be performed based upon the results noted. All materials used will be chosen to ensure there is **no groundwater contamination**. As noted previously, all applied materials will be considered safe to groundwater resources based upon review of Label and MSDS listing of environmental hazard.

Rates and application methods will be as required on the labels. "Ground-based application" (http://www.cdpr.ca.gov/docs/legbills/calcode/010101.htm) will be used, which will target feeder root zones or be precisely directed at grapevine foliage only.

Amendment strategies could include:

a) **Lime and/or gypsum application** – this would occur if needed pre-plant, and on rare occasions during the life of the vineyard. Material use is not expected to exceed 5 T/ac pre-plant and 1 T/ac thereafter. These materials are immobile, or scarcely mobile, in the soil.
b) **Liquid NPK fertilizers** – materials will be chosen for their sustainable record, preferably OMRI-certified. No materials will be used if there is a potential for any groundwater contamination. Application will be to the feeder root zone only.
c) **Foliar fertilizers** – materials applied will include Zinc and Boron to assist in fruit set. OMRI-listed materials are available.

B. Irrigation

Information from the existing network of weather stations, integration of the latest understanding and knowledge of grapevine deficit irrigation strategies, and judicious and regular monitoring of vine water status will ensure that the vines receive only the minimum quantity of water required to optimize wine quality.

Frost control will be initiated using weather station reconnaissance, and performed using microsprinklers in the field.

Irrigations will be performed using a drip-irrigation system.

Canopy management will be performed to ensure pruning to crop-weight ratios are desirable and do not contribute to excessive use of water reserves. Water use for this development is expected to fall substantially below available and permitted water use.

Erosion Control Practices

All erosion control devices will be installed as outlined in the Napa County Erosion Control Plan (**ECP P05-376-ECPA**), and as detailed elsewhere in this submission.

In addition to those listed, we intend to use:

a) Some **hand application of farming practices,** and
b) **tractors with rubber tracks,** to minimize soil compaction

Cover cropping will be implemented using any combination of **oat, vetch, pea, clover and native grasses**, as outlined in the ECP (**ECP P05-376-ECPA**). This combination will allow the fixation of nitrogen, mine available phosphorus, promote habitat, and minimize soil loss through structural degradation and erosion.

Combined, these efforts will minimize input of external materials into the agricultural system, hence reducing disturbance and flux into buffer zones. Likewise, efforts to facilitate positive interaction with the environment and buffer zones outside of the vineyard boundaries are achieved in part through a reduction in the net boundary input:output ratios.

Biological Refugia

We intend to install, using appropriate consultation, **biological refugia** consisting of any combination of the following:

a) **Buffer strips** consisting of native and ecosystem-appropriate plant species, designed to modulate soil loss, trap sediments, nutrients and surface runoff, fix C and N, and exchange invertebrate biodiversity with the vineyard.
b) **Insectaries / nectaries** consisting of appropriate plant species designed to support invertebrate and vertebrate biodiversity, both as habitat and food supply, including habitat for biocontrol species.
c) **Forest rehabilitation** as determined in the THP (**THP 1-05-212NAP**) to return natural and native biomes to the perimeter zones, and to provide additional habitat for avian species.
d) **Other similar habitat.**

The intention is to foster **zones of biological diversity** to aid in **colonization of native insect and bird species**, and the promotion of **biocontrol**. In addition, refugia will provide habitat for native **pollinators**, and **promote biological diversity** in the region. These measures will help to offset potential habitat fragmentation occurring in surrounding communities as development increases in the greater region.

We will source all plant materials from indigenous and endemic genetic material where appropriate. Organizations such as the Napa Chapter of the California Native Plant Society (http://www.napacnps.org) are a strong source for this material.

Environmental Impact and Risk Assessment

A. Neighboring Land Use

Regional land uses include the following:

a) Vineyard lands at a distance of 0.0 miles
b) Vineyard lands at a distance of 0.25 miles
c) Mountain bike track at a distance of 0.25 miles
d) Fragmented forest at a distance of 0.25 miles
e) Local Airport at a distance of 0.25 miles
f) College dormitory at a distance of 0.25 miles
g) Wastewater treatment facility at a distance of 0.25 miles
h) Preschool at a distance of 0.25 miles
i) College at a distance of 0.5 miles
j) Local community at a distance of 0.5 miles
k) Forest at a distance of 0.5 miles
l) Vineyard lands at a distance of 0.5 miles

There are no known wetlands or watercourses present within or immediately adjacent to the proposed site.

B. Risk Mitigation

All measures for mitigation of soil loss, erosion, material application, and material composition will be performed as detailed in the Erosion Control Plan (**ECP P05-376-ECPA**), **Attachment A**, and this report.

a) There will be no permanent storage of fertilization and pesticide materials on site.
b) We will wash all equipment away from runoff hazards, using containment systems and controls where appropriate.
c) We will utilize County, State and Federal procedures for movement of materials to and from the site.
d) We will, through the sustainability procedures described above, minimize the need to bring materials to the site.
e) We intend to avoid the use of inputs on the site; however when necessary, we will use Organic (OMRI-certified) materials where appropriate.
f) We will respect all local noise ordinances.

g) We will ensure all non-biodegradable wastes and residual materials are transported offsite in closed containers.
h) All vineyard prunings and clippings will either be biodegraded in situ in the vineyard proper, or chipped and used as mulch for biocontrol in the vineyard proper or immediately adjacent to the vineyard.
i) The suggested materials described here are not known to be bio-accumulators, and have sufficiently rapid degradative half-life or sufficient non-toxicity to pose little threat as an environmental accumulator.

Regulatory Environment and Reporting

All registered materials will be purchased, transported, applied and disposed off as described by the requirements of local, State and Federal Regulatory Agencies. In addition, all reporting will be performed as required by those same agencies. The full set of regulations is available at the California Department of Pesticide Regulation website (www.cdpr.ca.gov). Labels of registered products are available at the CDMS website (http://www.cdms.net/LabelsMsds/LMDefault.aspx?t=), while a record for all reportable applied materials and further information is available at the Napa County Agricultural Commissioners Office (http://www.co.napa.ca.us/GOV/Departments/DeptDefault.asp?DID=26400).

In addition, a summary of the regulatory environment and reporting requirements will be provided attached to this document by **Crop Care Associates, Inc** (http://www.cropcareassociates.com/index.html/), an independent agricultural consultancy company consisting of licensed PCAs and agricultural advisors.

Signatory

Daniel Fischl

David Abreu

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P 707.963.7487 F 707.963.5104

APPENDIX K

Cultural Resources Report and
Confidential Archeological Addendum

Confidential Archeological Addendum
(Bound Separately*)

*The Confidential Archeological Addendum has been bound separately to protect potentially sensitive information about the location and nature of cultural resources.

Cultural Resources Report
(Bound Separately*)

*The Cultural Resources Report has been bound separately to protect potentially sensitive information about the location and nature of cultural resources.

APPENDIX L

Technical Adequacy Letter for ECP

NAPA COUNTY
RCD
RESOURCE CONSERVATION DISTRICT

Napa County Resource Conservation District
1303 Jefferson St., Ste. 500B
Napa, California 94559
Phone: (707) 252-4188
Fax: (707) 252-4219
www.naparcd.org

Interoffice Memorandum

Date: March 22, 2013

To: Napa County PBES

From: Dave Steiner, Senior Soil Conservationist

Re: Revised Erosion Control Plan for Abreu, new vineyard development, file #P05-0376, AP #024-300-069

cc: David Abreu
Napa Valley Vineyard Engineering
Martin Trso
Scott Butler, RPF

RCD finds the February 27, 2013 iteration of the referenced Plan technically adequate for erosion and sediment control. This finding is based, in part, on RCD's in-house soil loss modeling, as well as peer review of the administrative draft of the "Hydrologic Evaluation" section of Martin Trso's *Erosion, Sedimentation, and Hydrologic Assessment* of the proposal, dated January 20, 2013. Please let me know if you have any questions or if I may otherwise be of assistance.

Note: this finding **does not constitute Plan approval**, authority for which rests with the Napa County Department of Planning, Building, and Environmental Services.