Table 2-1 Vineyard Unit Areas	
Unit	**Acres**
1a	13.1
1b	2.1
1c	4.3
1d	6.0
2	14.3
3	1.6
4	6.1
5a	9.5
5b	6.2
5c	0.4
6a	3.7
6b	6.4
6c	9.9
7a	19.9
7b	6.3
7c	0.4
8a	5.8
8b	9.0
8c	10.0
Net Vineyard Area	**135 Ac**
Corporation Yard	1Ac
Reservoir and Sump	9 Ac
Perimeter Avenues	23 Ac
Driveway and Roads	2 Ac
Perimeter Grading	20 Ac
Total Project Area	**190 Ac**
CONSERVATION EASEMENT	**20.0**

although water use would be of a seasonal nature and be unlikely to exceed 20 gallons per day. The well and water tank would only provide potable water and would not be used for irrigation or for recharge of the proposed reservoir.

Project Phasing

Site preparation activities are expected to occur in three phases, and would be subject to all applicable water quality protection measures as designated in the Forest Practice Rules.

Phase I – Timber Harvest

Phase I would consist of timber harvesting activities (Figure 2-11, Timberland Conversion Operations Map). Land clearing activities are proposed to begin upon approval of the applicant's TCP and THP by the California Department of Forestry and Fire Protection (CAL FIRE). Timber operations proposed as a part of the timberland conversion would comply with the California Forest Practice Rules, which are enforced by CAL FIRE. (Please refer to the project THP [Draft EIR Appendix E] for information pertaining to implementation of the Forest Practice Rules.) The proposed timber harvest would remove all trees within the conversion area. Felled trees suitable for the production of commercial forest products (such as sawlogs, chiplogs, and pulplogs) would be removed from the project area after being hauled to landings (See Figure 2-12, "Potential Landing") by the tractor yarding method. Fuelwood would be cut in place and trucked from the project area. Any remaining woody material not suitable for commercial use would be piled to create habitat and chipped. Wood chips would be used onsite for erosion control purposes. The amount of merchantable redwood and Douglas fir timber to be recovered from the site has been estimated at approximately 1.25 million board-feet. Timber conversion activities would occur between April 1st and November 15th, with restriction on activities between April 1st and May 1st, and October 15th and November 15th. Timber conversion activities would not occur during the winter period, between November 15th and April 1st.

The proposed timber conversion area does not contain any watercourses, and timber harvesting and conversion operations would not occur in or immediately adjacent to any watercourses on the project site. Class I streams do not exist on the project site, and the Class II and Class III watercourses on-site would be protected by Watercourse and Lake Protection Zones (WLPZs), as per Forest Practice Rules guidelines. WLPZ buffer widths are designated according to side slope. For Class II watercourses with side slopes under 30 percent, the buffer is 50 feet; for those with side slopes between 30 and 50 percent, the buffer is 75 feet; and for those with side slopes greater than 50 percent, the buffer is 100 feet. For Class III watercourses with a side slope less than 30 percent, the buffer is 25 feet, and for those with slopes greater than 30 percent, the buffer is 50 feet. In addition, all Class III watercourses near conversion areas would be protected by variable Equipment Exclusion Zones (EEZs) ranging in width from 25 feet to 50 feet. Trees and brush will not be removed from any portion of the WLPZs or EEZs. In addition, all

timber being removed adjacent to a WLPZ or EEZ will be felled away from the protected area to protect the integrity of the watercourses.

Comment points labeled "1"through "7" in Figure 2-12, below, indicate the location of areas of erosion where water draining from the open meadows and old orchard area enters a Class III watercourse. Previous operations have altered the natural drainage patterns of the area resulting in the erosion that is occurring. The erosion areas will be improved through the implementation of the Erosion Control Plan, which details measures that will disperse runoff from the area. Temporary erosion control measures would be utilized around the work areas, and timber harvesting or vineyard clearing operations would not occur on slopes over 30 percent or on other unstable areas. Timber harvesting access would be provided primarily via the existing seasonal roads; these roads would require minimal grading for maintenance purposes during timber hauling operations. The installation of three temporary roads would be required for timber harvesting operations. The roads would be constructed on stable slopes of less than 15 percent, and would require a minimal amount of excavation. The roads would not be located either wholly or partially within any WLPZ. It should also be noted that two temporary truck road crossings exist on Class III watercourses within the project area; these are shown in Figure 2-12 at the points labeled "8" and "9." These crossings were used during previous operations and soil/fill material was left in the watercourse channel. A temporary truck road will cross at these points and the watercourse crossings will be removed as a part of timber operations. Fill material that exists in the watercourse channel will be removed to form a channel that is as close as feasible to the natural watercourse grade and orientation, and is wider than the existing channel in compliance with Forest Practice Rule 14 CCR 923.3(d)(1) such that stormwater velocities and potentially resulting erosion is reduced. The excavated material and any resulting cut bank will be sloped back from the channel and stabilized to prevent slumping and to minimize soil erosion. The disturbed soil on the approaches to the crossing will be seeded and mulched. The operations will be completed prior to October 15th of the first timber operations season. With the exception of the two permanent roads indicated on Figure 2-12, which provide access to neighboring residences, all existing seasonal roads, tractor roads, and landings located within the project area would be abandoned following completion of timber harvest operations. Vehicle access to the vineyard units will be via encroachments at the existing permanent roads that access the vineyard units and then along "vineyard avenues" within the vineyard units. Finally, two ephemeral channels would be modified to allow for an all-season ford stream crossing; these are shown in Figure 2-12 at the points labeled "10" and "11." While rock would be used to construct these crossings, it would be installed in contour with the channel, assuring that the original flow capacity in the channel is not restricted in any manner or fashion.

Phase II – Site Preparation

Phase II would involve the removal of the remaining non-merchantable or noncommercial timber, other vegetation, and stubs. The discarded material, or slash, would generally be piled by brush rake-equipped tractor or excavator. The majority of the slash will be chipped onsite for erosion control purposes. Some piles will be left in place

to provide wildlife habitat. Burning of slash would not occur. Following the chipping and piling of slash, the ground surface would be restored to as near the natural grade as possible. Cavities created by stump removal would be backfilled and smoothed to facilitate ripping operations.

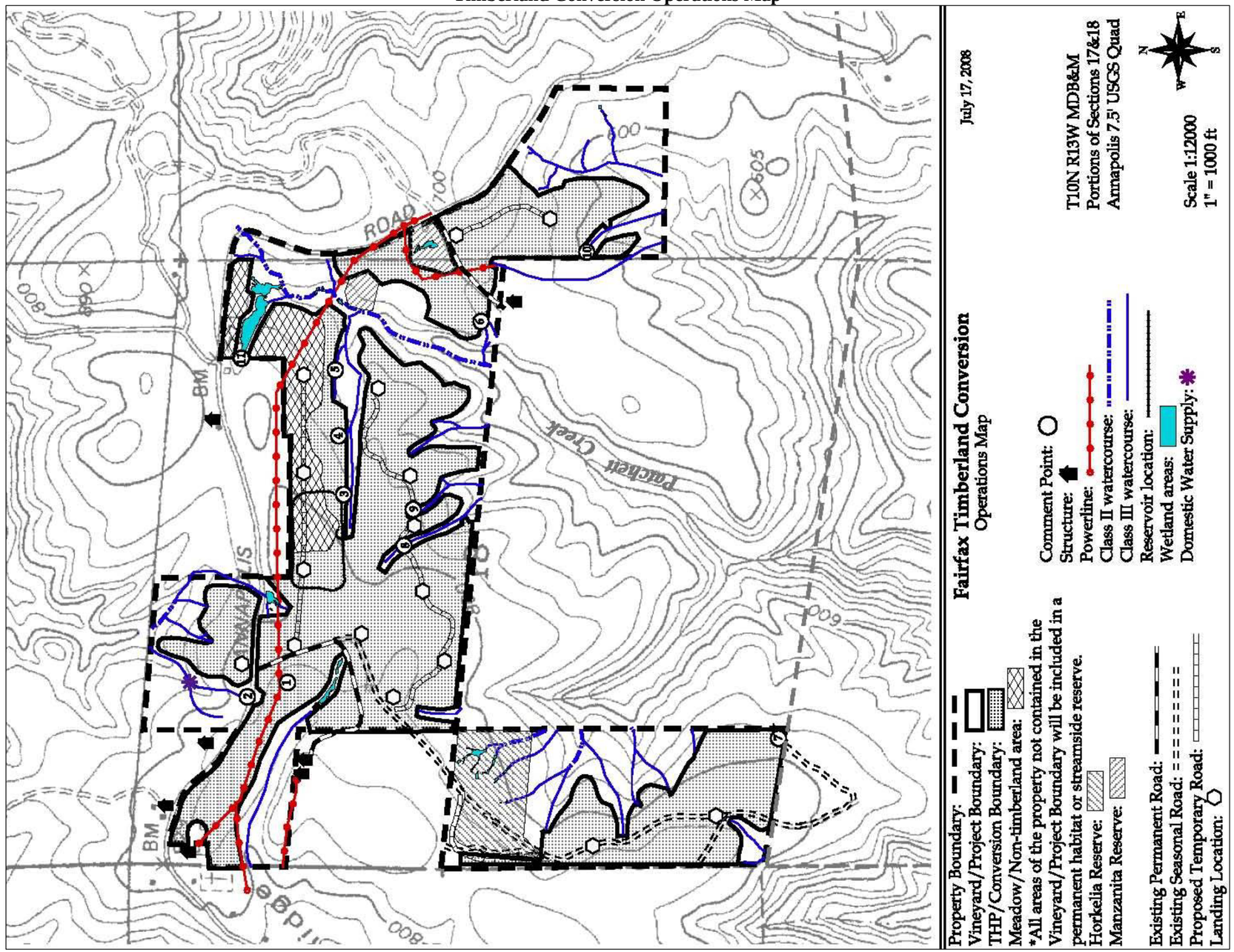
Phase III – Reservoir Installation

Reservoir and sump construction would occur after timber harvest and cleanup of residual organic matter is completed in the respective work areas. Work would begin in spring or early summer after the rainfall season while soil moisture is still present. Moist soil would minimize the creation of airborne dust and would expedite construction by minimizing need for water trucks and operations to obtain optimal moisture content for fill compaction. Work would be conducted in accordance with approved plans and within the context of a Stormwater Pollution Prevention Plan as required by Mitigation Measure 3.7-2(h) in Chapter 3.7, Hydrology and Water Quality. The individual sites would be staked for horizontal and vertical control in accordance with the grading and drainage plans approved by Sonoma County. Any downslope sensitive habitat areas would be protected by exclusionary fencing, and erosion controls would be in place prior to construction.

Equipment and vehicles involved in construction would include one or more of each of the following: backhoe, excavator, water truck, earthmoving scraper of 20-30 cubic yard capacity, bulldozer sized D3-D8, self-propelled compactor, foreman's truck, equipment operator's commute vehicles, surveyor-grade staker truck, Geotechnical Engineer site technician's truck, concrete truck, miscellaneous pipe and materials supply trucks, and other miscellaneous items as required. Traditional industry-standard mass-grading earthwork methods would predominate.

Sod and topsoil would be salvaged and stockpiled in a designated work area. Grading work would be conducted by a licensed contractor hired by the owner and under the direction of the Geotechnical Engineer of record. The Geotechnical Engineer would monitor excavations and backfill and evaluate the engineering properties of the soil by compaction testing and other means deemed appropriate by the Geotechnical Engineer. The Civil Engineer responsible for the earthwork plan would provide grade staking and dimensional controls either in person or by direction of the contractor or a licensed surveyor. Earthwork would progress by excavation of embankment support keyways inspected and approved by the Geotechnical Engineer. Subdrain installation within the keyways is expected for control of any incidental shallow groundwater under the impoundment, with drainage by gravity flow to rock armored outlets. The keyway would be filled and the embankment created using compacted lifts of engineered fill under direction of the Geotechnical Engineer. Trenching and installation of concrete encased drain lines and overflow pipe would occur within the earthwork area at the appropriate locations and times. Fill material would be excavated from within the impoundment area. Earthwork cut and fill volumes are balanced, such that import or export of soil or bulk materials is not anticipated. A low permeability impoundment liner made out of a synthetic material would be installed to reduce seepage.

Figure 2-12
Timberland Conversion Operations Map



Phase IV – Vineyard Development

Phase IV of the proposed project would entail vineyard development. The applicant proposes to perform all land clearing and development activities during spring, summer, and fall months. However, earthwork construction activities would be limited to summer months. Phase III would begin with subsurface ripping and tilling of the existing non-native annual grasses, as well as the simultaneous incorporation of soil amendments. These activities would be conducted with a crawler tractor (D-8 or smaller) slowly pulling a large metal shank through the soil at a depth of two to three feet, and would facilitate the removal of subterranean organic matter and rocks, as well as improve physical and chemical soil characteristics for the proposed vineyard. This operation would last from approximately four to eight weeks with one to two workers.

Following subsurface preparation, organic material (e.g., roots with a one-inch or larger diameter) would be gathered by hand or mechanical means, and would be either piled and burned or removed from the site. The soil surface would then be smoothed and/or re-contoured using tractor equipment. This operation would involve "floating" the soil with a blade to create relatively smooth fields suitable for planting. According to the applicant, the vineyard layout is designed to minimize the need for grading. Smoothing would take approximately one week and would require a crew of one to two people and the use of a crawler tractor (D-6 or smaller). A farm tractor would then disc the soil in preparation for planting. Field terrace, row, and avenue locations would be laid out following discing.

The vineyard trellises and irrigation system would be installed concurrently, and the applicant expects that the installation would require a crew of four to ten workers using post-pounding tractors, trenchers, and/or backhoes for a period of approximately four to eight weeks. The post-pounding tractor would place the vineyard trellis posts, and a trencher or backhoe would be used to install the irrigation pipeline trenches. These trenches would be roughly one foot wide and two feet deep, and would be backfilled after installation of the irrigation pipelines.

Planting of the grapevines would take place over an approximately four- to six-week period. The rootstock chosen for the site would be drought-tolerant and provide deep rooting patterns. Planting would require a crew of eight to 16 workers and a 60-hp tractor. Vineyard blocks would be pre-irrigated using the installed drip irrigation system; then holes would be dug to accommodate roots, the vines would be placed, and soil around the roots would be compacted to support the vines.

Erosion control and sediment retention components of the project would be installed on a temporary basis as required during the April 1 to October 15 construction season. In general, erosion control measures would seek to reduce runoff flow lengths and impede flows, preventing them from reaching erosive velocities. Temporary erosion control measures installed in conjunction with ground surface smoothing would include silt fencing, straw bale dikes, fiber rolls, and water bars; in addition, all exposed slopes would be revegetated by seeding as well as mulched with straw. Permanent erosion

control measures identified by the ECP for the site include drainage swales with underground drain lines, rock-lined ditches, armored drain inlets and outlets, and design features such as cross-slope vineyard rows, maximum 500-foot drain inlet spacing, and outsloped roads. In accordance with Sonoma County requirements and the recommendations in the ECP, seasonal and permanent erosion control measures would be in place on the site after vineyard improvements are completed, but no later than October 15.

The applicant would also plant a cover crop of appropriate annual and perennial erosion-controlling vegetation between the rows. The annual plants would grow quickly, providing immediate erosion control, while the perennial plants, once established, would provide long-term erosion control. The perennial plants proposed for the site are a mix of permanent native grasses, annual rye, and fescue and clover species. The first cover crop would be planted concurrently with grape planting, and the permanent hillside cover crops of annual and perennial grasses would likely be established within the "Year 1" growing season. Permanent cover cropping between the vine rows would also provide a competitive barrier to weeds and woody growth.

For maximum effectiveness, the ECP recommends that the applicant inspect and maintain all erosion and sediment control measures on an annual basis. A detailed timeline for installation and maintenance of these control measures is provided in the ECP.

Project Operation

Pest and Disease Control

The applicant intends to use integrated pest management (IPM) in the maintenance of the vineyard. IPM focuses on long-term prevention or suppression of pest problems with minimal impacts to human health, the environment, and non-target organisms by emphasizing the use of non-chemical pest control methods. As a part of the proposed vineyard development and maintenance, chemicals would only be used when feasible alternatives do not exist. Non-chemical methods of pest control may include, but are not limited to, selection of disease-resistant planting stock; timing of activities to avoid peak infestation periods; proper organic waste disposal and irrigation practices; use of traps; use of fencing; enhancement of predator habitat, such as installation of nest boxes for raptors or bats; and importation of beneficial insects and/or bacteria. While common applications such as fungicides do not call for Pest Control Advisor (PCA) consultation, a PCA would be consulted for any new or atypical pest issues. All pesticide applications for the project will be preceded by thorough monitoring of pest and natural enemy populations, careful selection of the least disruptive material, and meticulous planning of applications timing and technique. Even then, only when sustained economic damage is occurring are pesticides applied. Furthermore, in conformance with State guidelines a PCA's recommendation is obtained before ordering any restricted pesticide. All pesticide applications would be conducted under the direction and supervision of a licensed Qualified Applicator (QA), trained in the proper use and application of pesticides and IPM techniques. All chemicals would be mixed in a specified area adjacent to onsite

storage structure. The chemicals used would be low-toxicity materials with minimal biological hazard (Please refer to Impact Statement 3.8-4 of Chapter 3.8, Hazards, for an in-depth discussion of potential pesticide and herbicide use). If deemed necessary, pesticide applications would generally take place between April and July, and could include the application of sulfur dust or synthetic fungicides to prevent the growth of powdery mildew. The selection of specific fungicides would be dependent upon various climatic, seasonal, and biological factors. In the event that chemicals are deemed necessary, application would take place approximately every seven to 14 days throughout the April to July period. Heavy stormwater runoff is not typical during this annual period; thus, the potential for residues to enter nearby waterways would be minimized. Furthermore, chemical use would be reduced during periods of moderate to heavy rain. In addition, fungicides would typically be applied between 3:00 AM and 9:00 AM, reducing potential drift due to wind. As the planned utilization of phylloxera-resistant rootstock by vineyard managers would eliminate or reduce the need to fumigate the soil, the applicant has stated that Artesa would not use methyl bromide fumigation on the site prior to vineyard development.

Growth of unwanted vegetation within the vineyard blocks would be suppressed predominantly through the use of natural and mechanical means. The permanent cover crops planted concurrently with grape planting would provide a competitive barrier to weeds and woody growth, and mechanical methods of control would involve manual hoeing and tractor mowing between vine rows. Chemical weed control would be used minimally, and would involve the application of non-leaching pre- or post-emergence formulations applied two to three times each year between February and June.

Deer fencing would be installed around the vineyard blocks. Although the fencing would prevent most animals from getting trapped inside the vineyard blocks, each block would contain a minimum of two gates in order to allow the escape of any such animals. The applicant has also indicated that owl boxes would be installed to help suppress rodent predation, if deemed necessary. Reflective tape would be used to deter bird pests. The applicant would not use bird exclusion netting or noise cannons as bird deterrents on the proposed project site.

Irrigation

The grapevines would be expected to utilize stored soil moisture from the winter until roughly June of each year. In summer months during the vine establishment phase (approximately the first three years), the vineyard would be irrigated by means of a drip system supplied by the proposed 73 acre-foot on-site reservoir. The reservoir would capture sheet flow runoff from vineyard Blocks 2 and 3, as well as capturing direct precipitation. Soil moisture monitoring would indicate the proper time to begin drip irrigation each season, taking into account the specific soil characteristics of each vineyard block. As noted in the ECP, during vineyard establishment, small vines do not normally require the full design application rate. Additionally, vine growth during the summer months has undesirable effects on grape characteristics; therefore, only the minimum amount of water needed to keep the leaves healthy would be used. The ECP

notes that in the event of unfavorably dry conditions during the establishment phase, sub-optimal irrigation practices would conserve water, yet still result in healthy vines and good productivity. Frost protection irrigation is believed unnecessary at this high-elevation ridgetop location with good air flow.

According to the applicant, irrigation runoff would not occur with use of the drip system, and the ECP notes that water losses due to reservoir seepage would be eliminated through the use of a synthetic liner. Annual evaporation losses are estimated at 40 inches in the ECP; however, because evaporative losses are factored into the reservoir design, viticultural demand can be met throughout the season under such conditions. The ECP calculated annual water demands using the following assumptions regarding the proposed vineyard: approximately 1,090 vines per acre would be planted based on an estimated 8-foot by 5-foot vine spacing. The row layouts would generally be at an angle relative to slopes, with regularly spaced, intermittent cross-slope drainage ditches provided in some blocks and sheet flow controls in other blocks. The applicant estimates that irrigation would be necessary every one to three weeks. According to data in the ECP, total annual irrigation demand during the vine establishment phase would come to approximately 53 acre-feet per year (afy), resulting in residual storage volume at the end of the irrigation season.

The applicant has stated that once the vines are established (typically three years after planting), dry-farming would be used to the extent feasible. That is, water from the proposed reservoir would not be applied to the vineyard for irrigation purposes under average climatic conditions. However, the applicant notes that in the event of dry climatic conditions during the post-establishment phase, water stored in the proposed reservoir could be used for irrigation. It should also be noted that per CAL FIRE's request, the project applicant has agreed to allow CAL FIRE to utilize the on-site reservoir for short-term water supply purposes in the event of a nearby wildfire. The following discussion demonstrates that even if it is assumed that CAL FIRE would temporarily utilize the on-site reservoir for fire protection purposes -- an event which is considered somewhat unlikely given that, typically, CAL FIRE does not require supplemental water sources -- a more than adequate surplus of water would remain in the reservoir for vineyard irrigation purposes, if necessary.

The proposed reservoir design is for 73 acre-foot (ac-ft) plus a two (2) ac-ft sump. One (1) acre-foot is 43,560 cubic feet (cu. ft.) x 7.49 gallons/cu. ft. = 326,264 gallons. Fire season is typically in the September-October time-frame, prior to onset of winter rains. Thus, approximately 2/3 -3/4 of the irrigation season will have been completed when the typical fire season commences, and the least critical irrigation time-frame would remain. Assuming 1/4 of 73 ac-ft remains (total reservoir storage volume), there would be approximately 18.25 ac-ft = 5.95 million gallons of water remaining in storage at time of potential CAL FIRE demand. According to the project engineer, any fire service demand will be negligible relative to total storage capacity, and minor relative to probable storage capacity during the fire season.

Pruning Operations

Pruning would take place between February and April of each year. The grapevines would be pruned by hand over the course of approximately twenty days, assuming a work crew of ten employees. Vineyard managers have indicated that the same seasonal employees typically return to work on the project area's existing vineyards each year, and that these employees would likely also tend to the proposed vineyard conversion area. These seasonal employees are primarily residents of Sonoma County.

Fertilization

The ECP notes that nutrients are applied to vineyards on an as-needed basis through foliar or irrigation methods, based on annual monitoring results. In the spring and through the growing season fertilizer may need to be injected into the drip irrigation system using approximately 10 to 15 gallons of concentrated fertilizer per acre per year. The application is likely to be done once during the growing season, but only during those years when needed. In addition, an application of 12-26-26 fertilizer or gypsum may be used at a rate of 500 to 1,000 pounds per acre when called for, but not every year. As previously noted, any agricultural chemical applications would be at low, safe, and least-cost agronomic rates, utilizing permitted materials according to label directions and under the supervision of a qualified, trained vineyard manager.

Harvest Operations

Grape harvesting would take place in the fall, generally during the months of September and October, between approximately 11:00 PM and 9:00 AM each day. Harvesting would be performed either manually or with mechanical harvesting equipment. In the case of manual harvesting, two crews of approximately twenty workers each (typically, the total is 35 harvesters and a few tractor drivers) would hand-harvest grapes and load them into half-ton boxes. It should be noted, however, that after the proposed vineyard is fully established, Artesa Vineyards might choose to use mechanical harvesting equipment rather than manual harvesting. As with the manual harvesting, mechanical harvesting would typically occur during nighttime hours.

A forklift would be used to load the grapes into a 20-ton truck for transport from the site between the hours of 5:00 AM and 10:00 AM each day. According to vineyard managers, a typical grape harvest would yield 3.5 to 4.5 tons of grapes per acre. For the proposed project, this would equate to roughly 550 to 710 tons of grapes per harvest season. Grapes are usually delivered in double gondola trucks carrying 22 tons of grapes each, or on flatbed trucks carrying 11 tons of grapes each. Using a truck composition of 80 percent gondola trucks and 20 percent flatbed trucks (as estimated by the project traffic consultant), each truck would carry approximately twenty tons of grapes per load on average. Therefore, the proposed project would require transportation of roughly 28 to 36 truckloads during the two- to three-week harvest season, or approximately two truckloads per harvest day.

Plans do not exist for future housing or winery facilities on the project site. In addition, the vineyard would be closed to the general public.

Project Entitlements

Development of the proposed project would require a variety of discretionary and ministerial entitlements and permits. Discretionary permits are those which are reviewed and approved based on the discretion of public officials in compliance with federal, State, and county regulations. Ministerial permits and approvals are those which are automatically conferred upon demonstrating compliance with permit requirements and the payment of any related fees.

California Department of Forestry and Fire Protection

- Discretionary – Timber Harvest Plan
- Discretionary – Timberland Conversion Permit
- Ministerial – Conservation Easement Management Plan
- Ministerial – Habitat Management Plan
- Ministerial – Post-Construction Monitoring Plan
- Ministerial – Channel Erosion and Sedimentation Basin Monitoring Plan
- Ministerial – Agricultural Chemical Use and Storage Contingency Plan

United States Army Corps of Engineers

- Discretionary – Section 404 Permit

United States Fish and Wildlife Service

- Ministerial – Northern Spotted Owl Letter of Technical Assistance

California Department of Fish and Game

- Discretionary – Streambed Alteration Agreement

North Sonoma County Air Pollution Control District

- Ministerial – Burn Permit

North Coast Regional Water Quality Control Board

- Ministerial – Section 401 Water Quality Certification
- Ministerial – Stormwater Pollution Prevention Plan

Sonoma County

- Ministerial – Erosion Control Plan

- Ministerial – Grading Permit
- Ministerial – Erosion Prevention and Dust Control Plan
- Ministerial – Conservation Easement Management Plan
- Ministerial – Paleontological and Archaeological Resource Preservation Plan
- Ministerial – Post-Construction Monitoring Plan
- Ministerial – Channel Erosion and Sedimentation Basin Monitoring Plan
- Ministerial – Agricultural Chemical Use and Storage Contingency Plan
- Ministerial – Construction Traffic Management Plan

Endnotes

[1] California Department of Forestry and Fire Protection, *California Forest Practice Rules*, 2008.

3.1 INTRODUCTION TO THE ANALYSIS

3.1 INTRODUCTION TO THE ANALYSIS

Introduction

Chapter 3 analyzes the potential impacts of the Fairfax Conversion Project on a range of environmental issue areas. Subchapters 3.2 through 3.11 describe the focus of the analysis, references and other data sources for the analysis, the environmental setting as it relates to the specific issue, project-specific impacts and mitigations measures, and cumulative impacts of the proposed project for each issue area. The format of each of these sections is described below.

Determination of Significance

Under CEQA, a significant effect is defined as a substantial or potentially substantial adverse change in the environment (Public Resources Code §21068). The Guidelines implementing CEQA direct that this determination be based on scientific and factual data. The specific criteria for determining the significance of a particular impact are identified within the impact discussion in each section, and are consistent with significance criteria set forth in the CEQA Guidelines.

Initial Study

The Initial Study (see Appendix C) prepared for Fairfax Conversion Project as a part of this EIR includes a detailed environmental checklist addressing a range of technical environmental issues. For each technical environmental issue, the Initial Study identifies the level of impact for the proposed project. The Initial Study identifies the environmental effects as either "no impact," "less-than-significant," "potentially significant with mitigation incorporated," or "potentially significant." The Initial Study arrived at the following conclusions:

> The proposed project would result in either no impact or less-than-significant impacts requiring no mitigation, pertaining to the following issues:
>
> - *Agricultural Resources:* The Sonoma County Zoning Ordinance designates the project site as Resources and Rural Development (RRD-40), which provides for the protection of lands needed for timber production, geothermal, mineral, or agricultural production, as well as lands needed for protection of watershed, fish and wildlife habitat, and biotic resources. The proposed project objectives conform to the purpose and permitted uses of the RRD zone. In addition, the project site does not contain State-designated Important Farmlands (such as Prime Farmland),

and is not under a Williamson Act contract. As a result, the proposed project would have no impact relating to the loss of agricultural land.

- *Mineral Resources:* The primary extractive resource in Sonoma County is aggregate, and Sonoma County regulates the development of aggregate resources through its Aggregate Resources Management (ARM) Plan. Because the project area does not contain any identified mineral resources, including aggregates, no impact to mineral resources would result from implementation of the proposed project.

- *Population/Housing:* Residences do not currently (July 2008) exist on the project site. A corporation yard is proposed as part of the project; however permanent housing is not proposed. Vineyard operations would require the use of approximately 50 seasonal employees for two to six months during the harvest season. Six full-time employees would also be needed for year-round vineyard operations. The proposed project would utilize a workforce base that lives primarily in the Healdsburg and Geyserville areas, and would carpool in to the site. The project is not expected to have any influence on growth trends in the area and would not induce additional population growth. Furthermore, the project would not require the displacement of existing housing or people. Therefore, the impact to population growth would be considered less-than-significant.

- *Public Services:* The proposed project involves the conversion of existing forest, orchard, and grassland areas to vineyards, and would not create a need for new facilities to maintain acceptable service ratios, response times, or other performance objectives for fire protection and police services. The proposed project would not result in any adverse physical impacts associated with the provision of new or physically altered public facilities. Nor would the project create new residential areas or a corresponding demand for schools, parks, or other public facilities. Therefore, no impact relating to public services would occur.

- *Recreation:* The public park closest to the project site is Soda Springs Reserve, located approximately 1.5 miles north of the project area. The development and operation of the proposed project would not contribute to an increase in local population levels, and would not be likely to alter present recreational use patterns. The proposed project is located on private land, and a project-related increase in the use of existing recreational facilities in the area would not be anticipated. Furthermore, the proposed project does not include or require the construction or expansion of recreational facilities. Therefore, no impact pertaining to recreation would occur.

All remaining issues were identified in the Initial Study as potentially significant and are discussed in this Draft EIR.

Issues Addressed in this Draft EIR

The Initial Study identified environmental impacts as potentially significant and required further analysis. This EIR provides the additional analysis necessary to address the technical environmental impacts not fully resolved in the Initial Study. Consistent with the conclusions of the Initial Study, the following environmental issues are addressed in this chapter of the Draft EIR:

- Land Use;
- Air Quality;
- Biological Resources;
- Cultural Resources;
- Hazards;
- Hydrology and Water Quality;
- Geology;
- Transportation and Circulation;
- Noise; and
- Aesthetics.

Section Format

Each section in Chapter 3 addressing a specific environmental issue begins with an **introduction** describing the purpose of the section. The introduction is followed by a description of the project's **environmental setting** as it pertains to that particular issue. The setting description is followed by the **regulatory context** and the **impacts and mitigation measures** discussion. This discussion contains the **significance criteria**, followed by the **methods of analysis**. The **impact and mitigation** discussion includes impact statements prefaced by a number in bold-faced type. An explanation of each impact and an analysis of its significance follow each impact statement. All mitigation measures pertinent to each individual impact follow directly after the impact statement (see below). The degree of relief provided by identified mitigation measures is also evaluated. An example of the format is shown below:

3.x-1 Statement of Impact

Discussion of impact for the proposed project in paragraph format.

Statement of ***level of significance*** of impact prior to mitigation is included at the end of each impact discussion.

<u>Mitigation Measure(s)</u>
Statement of *level of significance* after the mitigation is included immediately preceding mitigation measures.

3.x-1(a) *Recommended mitigation measure(s) presented in italics and numbered in consecutive order.*

3.x-1(b) *Mitigation Measure.*

3.2 LAND USE

3.2 LAND USE

Introduction

The Land Use chapter describes the existing land use setting of the project site and the adjacent area; and then assesses the compatibility of the proposed project with the surrounding land uses, both existing and proposed. The chapter also evaluates the consistency of the proposed project with the regulations of the California Department of Forestry and Fire Protection (CAL FIRE). In addition, although the County of Sonoma does not have any discretionary authority over the proposed project, as indicated in Chapter 2, *Project Description*, nine ministerial approvals are required for the project by the County: approval of an Erosion Control Plan; approval of a Grading Permit; approval of an Erosion Prevention and Dust Control Plan; approval of a Conservation Easement Management Plan; Paleontological and Archaeological Resource Preservation Plan; Post-Construction Monitoring Plan; Channel Erosion and Sedimentation Basin Monitoring Plan; Agricultural Chemical Use and Storage Contingency Plan; and a Construction Traffic Management Plan. As a result, this chapter evaluates the consistency of the proposed project with applicable County policies and ordinances, including the 1989 Sonoma County General Plan, and the applicable sections of the County Municipal Code. Lastly, this chapter provides an evaluation of the loss of timberland locally and regionally relative to applicable policies and regulations.

The impacts are measured against the thresholds of significance, and if needed, appropriate mitigation measures and monitoring strategies consistent with the policies of CAL FIRE and Sonoma County are identified.

Environmental Setting

Compatibility

CEQA Guidelines §15125 states, “an EIR must include a description of the physical environmental conditions in the vicinity of the project…and shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans.” The following provides the existing land uses of the project site, as well as the existing plans and policies that guide the development of the project site.

Project Location and Site Description

The project site is located roughly one-half mile southeast of the community of Annapolis in northwestern Sonoma County, California. The site is located on a broad, flat ridge between Grasshopper Creek and the Wheatfield Fork of the Gualala River, south of Annapolis Road. Elevation on the project site ranges from 660 feet to 860 feet above sea level.

Past and present land uses in the Annapolis area, as noted in the project Timber Harvest Plan (THP), have included agriculture/grazing, rural subdivisions, timber harvesting, and associated land uses such as road building and wildland burning. Historically, a large portion of the project site was utilized as an apple orchard and for sheep farming. The project site has remained fallow since approximately 1964. Currently, the project site is composed primarily of second-growth timberlands, with an approximately 19-acre grassland area. In addition, the project site contains approximately 0.4 acres of jurisdictional wetlands and several class II and III streams that drain to Patchett Creek.

Surrounding Land Uses

The areas surrounding the project site include similar stands of timber with openings containing grassland and chaparral. The areas south and southwest of the site are currently being used for timber production. Existing vineyards are located north and east of the property boundary, and the general vicinity surrounding the project site also includes other areas that are in the process of being converted into vineyards (See Figure 3.2-1). Additionally, the Starcross Monastic Community is located directly north of the property across Annapolis Road; rural residences exist immediately west and south of the property boundary; and a waste disposal site is located southeast of the property boundary.

California Department of Forestry and Fire Protection (CAL FIRE)

Various parcels in the project vicinity are zoned Timber Production (TP) by Sonoma County, as directed under the 1982 California Timberland Productivity Act (TPA). The Sonoma County Zoning Code defines the purpose of the TP zone as follows:

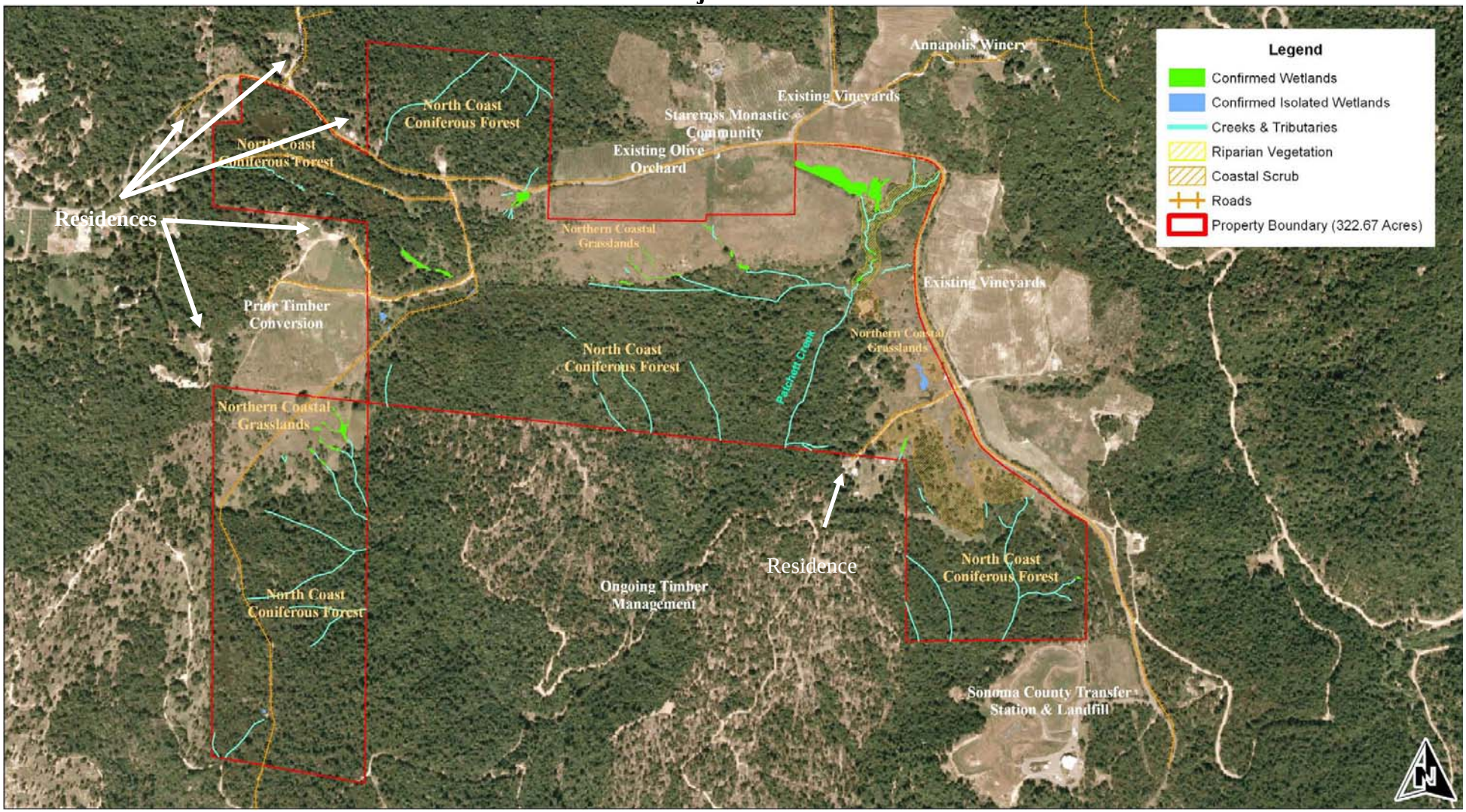
> … to provide for timberland zoning, a yield tax imposed at the time of harvest, and the conservation and protection of land capable of producing timber and forest products. The compatible uses specified in this section will be included in this zone and are consistent with the Forest Taxation Reform Act of 1976.

The TP zone was formerly known as the Timberland Preserve Zone (TPZ) under the Forest Taxation Reform Act, and restricted the use of land to the growing and harvesting of timber and compatible uses approved by the County in return for tax assessment benefits. As of March 2002, the County had approximately 94,000 acres of land zoned TP. Because some TPZ parcels contained grassland or brush and were not split when rezoned to TP, actual countywide timberland acreage in the TP zone is estimated at 69,000 acres (County staff report, June 20, 2002).

On timber-bearing lands outside the TP/TPZ designation, Section 1100(g) of the California Code of Regulations (CCR) defines “timberland conversion” as “transforming timberland to a non-timber growing use through timber operations where:

1. Future timber harvests will be prevented or infeasible because of land occupancy and activities thereon; or

Figure 3.2-1
Project Area



2. Stocking requirements of the applicable district forest practice rules will not be met within five years after completion of timber operations; or
3. There is a clear intent to divide timberland into ownerships of less than three acres. In these cases, a timberland conversion permit is required."

Because the proposed project meets the qualifications of Section 1100(g), a timberland conversion permit and a timber harvest plan are required for the proposed project.

Sonoma County

The project site is located in the Sonoma Coast/Gualala Basin planning area as designated by the Sonoma County General Plan. The Sonoma Coast/Gualala Basin planning area runs the 40-mile length of the Pacific Coast (See Figure 3.2-2). In addition to several coastal communities, the planning area extends inland to include Annapolis, Cazadero, Duncan Mills, Bodega, Freestone, Camp Meeker, and Occidental. Roughly paralleling the San Andreas Fault Zone, the Sonoma Coast is a scenic area of regional, state, and national significance.

Existing Land Use Designations

The General Plan (p. 52) designation of the project site is Resources and Rural Development, which is defined as follows:

(a) Intent

The purpose of natural resource land use policy is to protect lands used for timber, geothermal and mineral resource production and for natural resource conservation. The Resources and Rural Development category allows residences at very low densities due to lack of infrastructure, greater distance from public services, poor access, conflicts with resource conservation and production, and significant physical constraints and hazards. Proposed amendments to the land use map in this category shall consider all of the preceding criteria. The intent is that natural resource areas be managed and conserved and that production activities avoid depletion and promote replenishment of renewable resources.

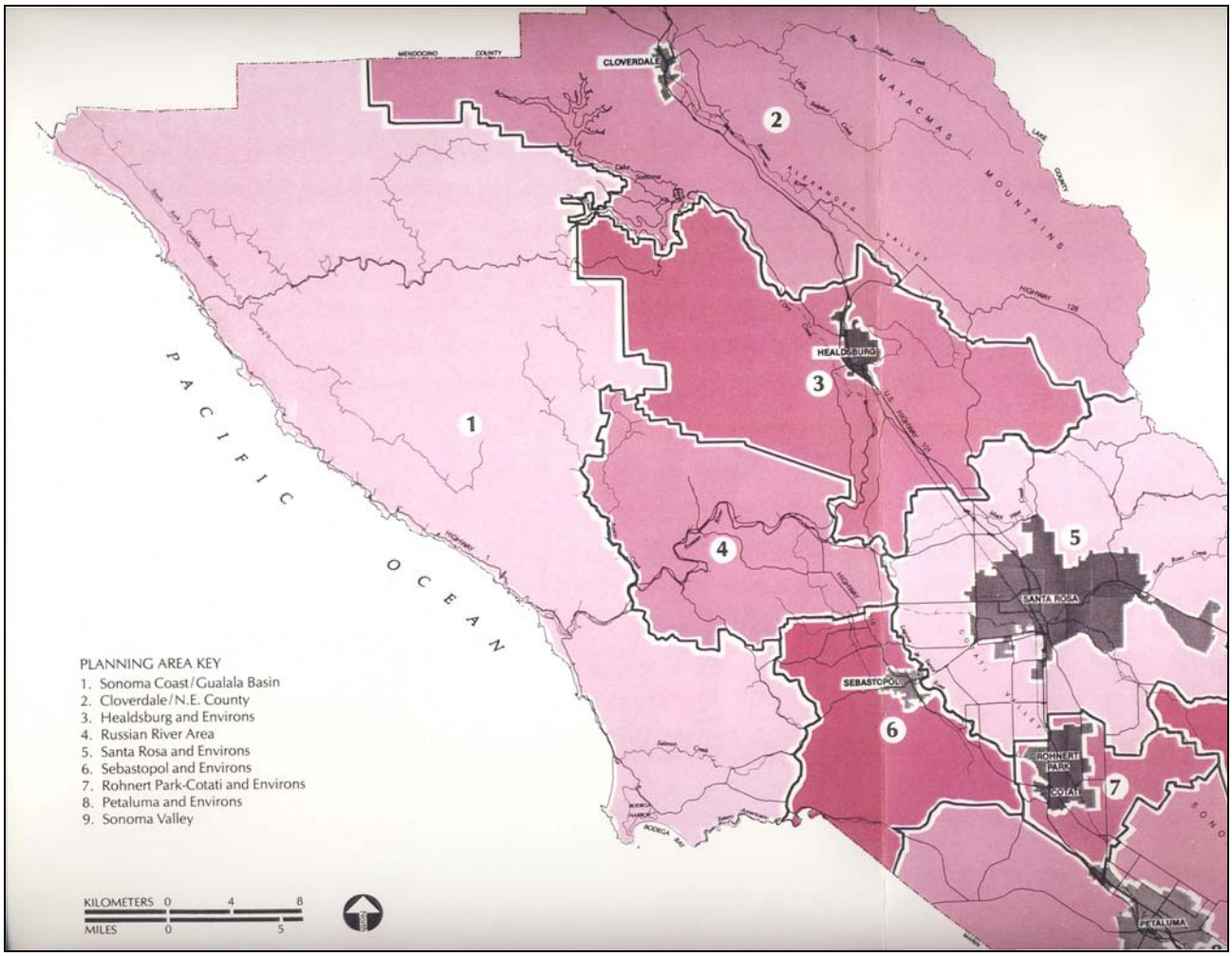
(b) General Uses

Single family dwellings, resource management and enhancement activities including but not limited to the management of timber, geothermal and aggregate resources, fish and wildlife habitat, and watershed. Livestock farming, crop production, firewood harvesting and public and private schools and churches are included. Lodging, campgrounds, and similar recreational and visitor-serving uses provided that they shall not be inconsistent with the purpose and intent of this category.

(c) Minimum Parcel Size

640 acres.

Figure 3.2-2
Sonoma County Planning Areas



(d) Maximum Building Intensity

General Plan includes minimum lot sizes for residences within the Resources and Rural Development category; however, the proposed project will not include residences. Rather, the proposed project involves the construction of a vineyard and associated structures.

Existing Zoning

The project site is currently zoned Resources and Rural Development with minimum 40-acre lot size (RRD-40). Article 10 of the Sonoma County Zoning Ordinance defines the RRD zone as follows:

> To implement the provisions of the Resources and Rural Development land use category (Section 2.8.1) of the General Plan, namely to provide protection of lands needed for commercial timber production, geothermal production, aggregate resources production; lands needed for protection of watershed, fish and wildlife habitat, biotic resources, and for agricultural production activities that are not subject to all of the policies contained in the Agricultural Resources Element of the General Plan. The Resources and Rural Development district is also intended to allow very low density residential development and recreational and visitor-serving uses where compatible with resource use and available public services.

The Zoning Ordinance states that the following uses, applicable to the proposed project are allowed without a use permit:

(d) The outdoor growing and harvesting of shrubs, plants, flowers, trees, vines, fruits, vegetables, hay, grain, and similar food and fiber crops, including wholesale nurseries, except as follows:

1) Agricultural cultivation shall not be permitted on Site Class I and II timberland if a major or minor timberland conversion is required; and

2) Except as noted below, agricultural cultivation shall not be permitted in the following areas:

i. Within 100 feet from the top of the bank in the "Russian River Riparian Corridor."

ii. Within 50 feet from the top of the bank in designated "flatland riparian corridors."

iii. Within 25 feet from the top of the bank in designated "upland riparian corridors."

Agricultural cultivation may be allowed in (d)(2)(i-iii) above upon approval of a management plan, which includes appropriate mitigations for potential erosion, bank stabilization, and biotic impacts. This plan may be approved by the Director of the Permit and Resource Management Department or by use permit pursuant to Section 26-10-020(c);

(f) Incidental cleaning, grading, packing, polishing, sizing, or similar preparation of crops which are grown on the site, but not including agricultural processing;

(u) Contractor equipment storage incidental to the on-site growing and harvesting of forest products, including parking, repairing and storage of equipment so used. Construction of permanent structures will be subject to Article 82 (Design Review);

(q) Accessory buildings and uses appurtenant to the operation of the permitted uses. Accessory buildings may be constructed on vacant parcels of two acres or more in advance of a primary permitted use. On vacant parcels less than two acres, accessory buildings may only be constructed if less than 120 square feet or as incidental to an existing agricultural use;

(cc) Minor timberland conversions, subject to compliance with requirements of Section 26-88-140.

Regulatory Context

State

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE is the lead agency for the proposed project. The following regulations are enforced by CAL FIRE and applicable to the proposed project.

State Board of Forestry

The Board of Forestry and Fire Protection is a government-appointed body within CAL FIRE. The Board is responsible for developing the general forest policy of the state, for determining the guidance policies of CAL FIRE and for representing the state's interest in federal forestland in California. Together, the Board and CAL FIRE work to carry out the California Legislature's mandate to protect and enhance the state's unique forest and wildland resources.

The Board is charged with protecting the forest resources of all the wildland areas of California that are not under federal jurisdiction. These resources include; major commercial and non-commercial stands of timber, areas reserved for parks and recreation, the woodland, brush-range watersheds, and all such lands in private and state ownership that contribute to California's forest resource wealth. The Board has delegated

the authority to approve or deny Timber Conversion Permit requests to CAL FIRE. All Timber Conversion permitting is handled by CAL FIRE under the Forest Practice Rules; however, in the event of a Timber Conversion Permit denial the decision could be appealed to the Board.

Regulations

Under various statutes, the Board is authorized to adopt regulations to implement specified programs. To become effective, the Office of Administrative Law must approve these regulations. They must meet tests of necessity, authority, clarity, consistency, reference, and non-duplication as spelled out in Section 11349.1 of the Government Code. Once adopted, Board regulations are placed in Title 14 of the California Code of Regulations (CCR). The Department then implements these regulations.

Currently, the Board has regulations in the following areas: forest practices (14 CCR 895.1-1111.8), hazardous fire areas and conditions (14 CCR 1200 et seq.), fire protection (14 CCR 1220 et seq.), state forest use and sales (14 CCR 1400 et seq.), forest improvement (14 CCR 1525 et seq.), urban forestry (14 CCR 1550 et seq.), chaparral management (14 CCR 1560 et seq.), Professional Forester Registration (14 CCR 1601 et seq.), and policy for administration of the Department (14 CCR 1655).

Forest Practice Rules - Title 14, California Code of Regulations, Chapter 4

The purpose of the Forest Practice Rules is to implement the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 in a manner consistent with other laws, including but not limited to, the Timberland Productivity Act of 1982, the California Environmental Quality Act (CEQA) of 1970, the Porter Cologne Water Quality Act, and the California Endangered Species Act. The provisions of these rules shall be followed by Registered Professional Foresters (RPFs) in preparing Timber Harvesting Plans, and by the Director in reviewing such plans to achieve the policies described in Sections 4512, 4513, of the Act, 21000, 21001, and 21002 of the Public Resources Code (PRC), and Sections 51101, 51102 and 51115.1 of the Government Code.

The California Department of Forestry and Fire Protection (CAL FIRE) enforces the Forest Practice Rules, which regulate logging on privately-owned lands in California. In 1973, the State Legislature adopted the Z'berg-Nejedly Forest Practices Act (FPA) regulating the conduct of timber operations. In passing the FPA, the legislature authorized the State Board of Forestry and CAL FIRE to adopt and implement Forest Practice Rules (FPR). The Forest Practice Rules were established to ensure that logging is done in a manner that will preserve and protect fish, wildlife, forests and streams. Additional rules enacted by the State Board of Forestry and Fire Protection are also enforced to protect these resources.

CAL FIRE ensures that private landowners abide by the Forest Practice Rules when harvesting trees. Although there are specific exemptions in some cases,

compliance with the Forest Practice Act and Board rules apply to all commercial harvesting operations.
The following are pertinent sections of the Forest Practice Rules:

Article 7 Conversion of Timberland

1100 Definitions

(g) "Timberland Conversion":
(1) Within non-Timberland Production Zone (TPZ) timberland, transforming timberland to a nontimber growing use through timber operations where:
(A) Future timber harvests will be prevented or infeasible because of land occupancy and activities thereon; or
(B) Stocking requirements of the applicable district forest practice rules will not be met within five years after completion of timber operations; or
(C) There is a clear intent to divide timberland into ownerships of less than three acres (1.214 ha.).

(m) "Timberland." timberland as defined in PRC 4526, for land outside a TPZ […].

4526. Timberland
"Timberland" means land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis after consultation with the district committees and others.

1103 Conversion of Timberland
Any person, firm, corporation, company, partnership or government agency owning timberland for which the timberland owner proposes conversion […] shall apply to the Director on a form prescribed by him for issuance of a Timberland Conversion Permit.

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.

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

(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.

1106.2 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.

1106.4 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.

Timber Harvest Productivity Act - Division 4, Chapter 8, Public Resources Code

In 1982, the State Legislature adopted the California Timberland Productivity Act (TPA). The TPA was intended to protect timberland and ensure that properly conducted timber operations would not be prohibited based on conflicts with surrounding land uses. To accomplish this goal, the TPA directed counties to designate and zone lands for the primary use of timber production. Sonoma County applied local "Timber Production" (TP) zoning to lands intended for preservation in timber production use. Within the TP district, land uses are limited to the growing and harvesting of timber and compatible uses. However, timber harvest operations may also be conducted on timberlands outside of the TP zone in compliance with a THP that has been approved by CAL FIRE.

Policies[1]

Where the Board gives direction to itself or to the Department, it may choose to enact policy statements. It can also enact informational policies on important issues, such as forest taxation and timber supply. Policies do not have the effect of regulations and hence are not found in the Administrative Code.

General Policies. The Board of Forestry has established General Board Policies to guide the formulation of policy for California forests. These general goals can be succinctly stated as follows:

A. Resource Protection - The State must maintain and improve protection of forests and related resources from damage from wildfire and natural enemies, and to resist more effectively the pressures for unwise diversion of forests to nonforest use.
B. Resource Enhancement - The State must strengthen the incentives which encourage investment in needed enhancements of forest resource productivity.

C. Research and Information - The State must enlarge and sustain forestry research and information programs, focused on high priority needs, so that a factual basis for resource policy and management decision making can be provided for.
D. Public Understanding - The State must provide members of the several key audiences that ultimately influence forest use and management with sufficient information about the forest resource problems. This will ensure that they act in the light of accurate broadly based information.

To accomplish these goals, the Board recognizes the need for detailed policies with respect to maintenance of timberland availability, development of optimum management and utilization practices, provision of adequate growing stock, and encouragement of adequately balanced timber size classes and adequate diversity of quality characteristics. Such policies will clearly recognize the Board's differing responsibilities with respect to State forests, the State's interest in Federal land matters pertaining to forestry, and the State's interest in forest resources on private lands, and shall reflect the State's concern that major consideration be given to preventing environmental damage.

The Board recognizes that land-use decisions affecting timber production should be taken in the light both of this policy and of review of the public's need for non-timber values derived from forests and forest land, particularly as those needs are recognized by responsible public bodies.

Maintenance of Timber Supply

The following policy information is found within the General Board Policies, under “Maintenance of Timber Supply.”

DEFINITIONS 0334.2 "Prime timberland" is forest land capable of growing 120 cu. ft. per acre per year or more, in perpetuity, when fully stocked and measured at culmination of mean annual increment. Generally, it is land with relatively favorable natural endowments or rainfall, soil characteristics, including porosity and permeability, drainage, water storage capability and nutrient availability, length of growing season, and topographic characteristics.

LAND AVAILABILITY 0334.3 In order to maintain timber growing land in California as a permanent source of current and future timber supply, the Board has found that it is in the public interest:

A. To oppose diversion to uses which preclude timber growing and harvesting or such privately owned prime timberland and other lands which have been classified as timberland preserve zone (TPZ) under provisions of the Z'berg-Warren-Keene-Collier Forest Taxation Reform Act of 1976, except where the public values to be achieved by such diversion exceed the public values

derivable from timber growing. This policy applies both to diversion proposed by the owner of the land and to proposals for public acquisition of such land;

B. To manage all prime timberland on State forests to investigate and demonstrate management for optimum long-run timber production. Where such forest lands contain or adjoin areas of high recreation value in State or other ownership, timber growing and harvesting practices may be modified in order to minimize conflicts between other land uses and to demonstrate the costs and effectiveness of such practices;

C. To support designation in specific land management plans of such "commercial forest" on the federal public lands as is prime timber uses, except where the public values to be realized from precluding timber use exceed the public values derivable from timber growing.

2007 Policy Statement and Strategic Program of the Board of Forestry and Fire Protection

The most recent Board policies have been defined within the context of the Board's Strategic Plan. A policy statement is prepared following a comprehensive assessment by the CAL FIRE's Fire and Resource Assessment Program (FRAP). The most recent assessment was completed at the end of 2003.

After the Assessment was completed, the Board began developing the framework for its mandatory policy statement. It was decided after discussion in committee, and following three public hearings, to utilize a framework (in the policy statement) that would allow for ongoing evaluation of current status and the ability to adapt strategies after that evaluation. The framework would clearly describe the mission and goals of the organization. After the completion of the framework, the next phase in the process shifted to determination of goals and strategies.

The goals and strategies applicable to the proposed project are listed below:

1. Biological Diversity

Goal: Contribute to the preservation, conservation, and maintenance of wildlife and native plant resources, so that the beneficial uses of those resources, both intrinsic and ecological, are available to the citizens of the State.

Objectives:
1. Reduce forest and rangeland plant community structure gaps to enhance fish, wildlife, and native plant habitats.
2. Where achievable as a result of forest and rangeland management, reduce declines in native species.

3. Ensure sustainability of species and natural communities found on forests and rangelands.

Strategies: *Actions for forest or rangeland habitat structure gaps*

A. Provide incentives for creation of diverse habitat.
B. Strengthen analysis of cumulative impacts of land uses on terrestrial and aquatic habitat.
C. Improve mapping and monitoring technologies and systems.
D. Strengthen collaboration between regulatory agencies, the public, and the industry in addressing fish, wildlife, and native plant habitat concerns.
E. Use long-term plans for larger scale analysis and monitoring schemes.
F. Expand and focus use of conservation easements and incentives.
G. Develop focused research program on State Forests for fish, wildlife, and native plant habitat.

2. Productive Capacity

Goal: Encourage prudent and responsible forest resource and rangeland management to serve the public's need for timber and other forest products, while giving consideration to the public's need for watershed protection, fisheries and wildlife, and recreational opportunities in this and future generations.

Objectives:

1. Create the necessary environment for a sustainable forest and rangeland products sector for California.
2. Protect and enhance the forest and rangeland resource base.
3. Reduce dependency on the importation of timber products.

Strategies: *Land Development*

A. Maintain tax-related zoning, encourage county governments to support timber production through Timber Production Zoning.
B. Support livestock and other range-based enterprises by preserve high quality rangeland through the Williamson Act or other local zoning.
C. Focus part of local general plans and related project design on integration and protection of productive areas.

D. Increase use of easements and land banks.
E. Anticipate growth areas and focus them away from the most productive forests and rangelands.

Local

Sonoma County General Plan

The Sonoma County General Plan provides the following goals and policies pertaining to land use and agricultural resources:

Land Use Element (Part 2, Policy Section 2.8.1) – Policy for Resources and Rural Development Areas

1. Protect lands needed for commercial timber production under the California Timberland Productivity Act;
2. Protect lands within the Known Geothermal Resource Area (KGRA);
3. Protect lands for aggregate resource production as identified in the Aggregate Resources Management Plan;
4. Protect natural resource lands including, but not limited to watershed, fish and wildlife habitat and biotic area;
5. Protect against intensive development of lands constrained by geologic hazards, steep slopes, poor soils or water, fire and flood prone areas, biotic and scenic areas, and other constraints;
6. Protect lands needed for agricultural production activities that are not subject to all of the policies of the Agricultural Resource Element;
7. Protection of County of Sonoma residents from proliferation of growth in areas in which there are inadequate public services and infrastructure.

Agricultural Resources Element

The Agricultural Resources Element promotes the County's agricultural industry by establishing policies, which allow specific, limited visitor serving uses in agricultural areas.

Goal AR-5 Facilitate agricultural production by allowing certain agricultural support services to be conveniently and accessibly located in agricultural production areas when related to the primary agricultural activity in the area.

Objective AR-5.2 Facilitate County agricultural production by permitting limited agricultural support service uses that support local agricultural activities and are not harmful to the long term agricultural use in the area.

Policy AR-5b — Define "agricultural support services" as processing services, maintenance and repair of farm machinery and equipment, custom farming services, agricultural waste handling and disposal services, and other similar related services.

Resource Conservation Element

2.1 Conservation of Lands with Soils Suitable for Agriculture and Timber Production

Goal RC-1: Encourage the conservation of soil resources to protect their long term productivity and economic value;

Objective RC-1.1 — Preserve lands containing prime agricultural and productive woodland soils and avoid their conversion to incompatible residential, commercial or industrial uses;

Policy RC-1b — Apply the "Resources and Rural Development" land use category to all lands with timberland production zoning to protect timber production soils.

2.2 Prevention of Soil Erosion

Goal RC-2 Promote and encourage soil conservation and management practices that maintain the productivity of soil resources;

Objective RC-2.1 — Ensure that permitted uses are compatible with reducing potential damage due to soil erosion;

Policy RC-2b — Include soil erosion control measures for any discretionary project involving construction or grading near waterways or lands with slopes over 10 percent.

Policy RC-2e — Retain natural vegetation and topography to the extent economically feasible for any discretionary project improvements near waterways or in areas with a high risk of erosion as noted in the Sonoma County Soil Survey.

3.0 Water Resources

Goal RC-3 Conserve, enhance, and manage water resources, protect their quality, and assure adequate long term supply of water for domestic, fishing, industrial and agricultural use;

Objective RC-3.1 Preserve watersheds and groundwater recharge areas by avoiding the placement of potential pollution sources in areas with high percolation rates.

Objective RC-3.3 Preserve and enhance the quality of surface and groundwater resources.

Objective RC-3.4 Insure that land uses in rural areas be consistent with the availability of groundwater resources.

Policy RC-3a Grading, filling and construction should not substantially reduce or divert any stream flow that would affect groundwater recharge.

4.0 Forest and Woodland Resources

Goal RC-4 Preserve, sustain and restore forestry resources for their economic, conservation, recreation, and open space values.

Objective RC-4.1 Identify and preserve areas with timber soils and commercial timber stands for timber production. Avoid incompatible uses in these areas.

Objective RC-4.2 Minimize the potential adverse impacts of timber harvesting on economic, conservation, recreation and open space values and restore harvested areas to production for a future yield.

Policy RC-4b Review all timber harvest plans for compatibility with general plan policies and economic viability of the industry.

Policy RC-4c Where applicable, comment on timber harvest plans in support of increased protections of Class III streams.

Sonoma County Vineyard Erosion & Sediment Control Ordinance (VESCO)

The Sonoma County Agricultural Commissioner's Office administers the Sonoma County Vineyard Erosion and Sediment Control Ordinance (VESCO) passed by the Board of Supervisors in June 1999. The VESCO was enforced beginning in February 2000. Growers planting new vineyards or replanting existing vineyards are required to utilize recognized conservation practices and best management practices (BMPs), and provide for riparian setback to protect the environment and watersheds of the County.

The VESCO identifies seven soil types as "highly erodible." These include the Diablo, Los Osos, Goldridge, Dibble, Suther, Steinbeck, and Laughlin soil series. Of these, only the Goldridge series is found on the project site.

The ordinance assigns new vineyards to one of three levels, based on slope and soil series:

- Level I: Vineyards planted on slopes shallower than 15 percent (10 percent for highly erodible soils). Requirements include a 25-foot stream setback and notification of the Agricultural Commissioner.
- Level II: Vineyards planted on slopes averaging 15 to 30 percent (10 to 15 percent for highly erodible soils). Requirements include a 50-foot stream setback and a certified erosion control plan prepared by a qualified civil engineer who is recognized by the County for creating such plans. The proposed project is considered a Level II planting.
- Level III: Vineyards planted on slopes averaging 30 to 50 percent slopes (15 to 50 percent for highly erodible soils). Requirements include a 50-foot stream setback and a certified erosion control plan prepared by a qualified civil engineer recognized by the County.

With few exceptions, the VESCO prohibits vineyard plantings on slopes greater than 50 percent.

Sonoma County Right-to-Farm Ordinance

The purpose of the Sonoma County Right-to-Farm Ordinance (Sonoma County Zoning Code, Chapter 30, Article II) is to "conserve, protect, enhance, and encourage agricultural operations on agricultural land within the unincorporated area of the county," by limiting the circumstances in which such activities can be deemed a nuisance. The ordinance also provides for notification of current and prospective property owners of the County's recognition and support, through the ordinance, of the right to farm. The right-to-farm notification requirement applies to any property "adjacent to agricultural land," i.e. within 300 feet of any property zoned for agriculture.

Sonoma County Ordinance 5651

Ordinance Number 5651 was passed to amend Chapter 26 of the Sonoma County Ordinances to restrict the conversion of timberland to establish use permit requirements for major timberland conversions in the Resources and Rural Development, Resources and Rural Development (Agricultural Preserve), and Timber Production zones. The Ordinance prohibits agricultural cultivation on Site Class I and II Timberland if a major or minor timberland conversion is required. However, the Ordinance includes an exemption for all projects that have submitted a complete application to the California Department of Forestry and Fire Protection and Sonoma County Permit and Resource Department prior to October 4, 2005; including those projects that subsequently undergo changes to their project description or additional environmental review. The complete application for the proposed Fairfax Conversion THP/TCP was submitted to both of the above agencies by May 4, 2001, which is prior to October 4, 2005; therefore, the proposed project is exempted from Ordinance 5651.

Impacts and Mitigation Measures

Standards of Significance

A land use impact may be considered significant if any potential effects of the following conditions, or potential thereof, would result with the proposed project's implementation:

- Results in a land use which is inconsistent with existing County plans and policies; or
- Results in substantial potential for conflict as a result of incompatible land uses.

Method of Analysis

The land use impact evaluation qualitatively compares the uses proposed for the project to the existing and other proposed uses in the vicinity of the project site in order to determine if proposed land uses are compatible with existing or proposed uses. The determination of compatibility is based on the anticipated environmental effects of proposed uses and the sensitivity of adjacent uses to those effects. The evaluation also assesses the consistency of the proposed project with the goals and policies of the Sonoma County General Plan.

Project-Specific Impacts and Mitigation Measures

3.2-1 Compatibility with surrounding land uses.

The Sonoma County Right-to-Farm Ordinance was established to facilitate agricultural operations on agricultural lands by limiting the circumstances in which farming activities can be deemed a nuisance. Growing and harvesting of vine crops is an allowed use under the project site's existing zoning designation. Therefore, as the proposed project site is zoned for agricultural use, the Right-to-

Farm Ordinance applies to farming activities that would take place on the project site under the proposed vineyard.

Because the Fairfax Conversion project is agricultural in nature, the proposed project is consistent with the General Plan land use and zoning designations for the project site. In addition, the Sonoma County General Plan emphasizes the need to conserve natural and agricultural resources in the County, and to encourage commercial development that does not include intensive urban development, which requires extensive infrastructure. As a result, because the surrounding uses are natural resource-related, the addition of approximately 135 net acres of vineyards to the vicinity would be compatible with the surrounding General Plan land use designations, which are also Resources and Rural Development.

Even though the proposed uses are compatible with the site's General Plan designation and is sanctioned by the Sonoma County Right-to-Farm Ordinance, the possibility exists that incompatibilities with adjacent uses could occur. The determination of compatibility of land uses typically relies on a general discussion of the types of adjacent uses to a proposed project and whether any sensitive receptors exist either on the adjacent properties or associated with the proposed project. Incompatibilities typically exist when uses such as residences, parks, churches, and schools are located adjacent to more disruptive uses such as heavy industrial, major transportation corridors, and regional commercial centers where noise and traffic levels may be high. The identification of incompatible uses occurs if one land use is anticipated to be disruptive of the existing or planned use of an adjacent property. The project site was utilized as an apple orchard and for sheep farming, but has remained fallow since approximately 1964. One vineyard is located adjacent to the project site's northeast border, and the general vicinity surrounding the project site includes areas that are in the process of being converted into vineyards.

The area southwest of the site is currently being used for timber production, while the area north of Annapolis Road is the site for the Starcross Monastic Community. Immediately west of the project property boundary is a rural residence, and southeast of the project site is a waste disposal site. The proposed project would generate air pollutants in both the construction and operations phases. Impacts to air quality are discussed in Chapter 3.3 of this DEIR, and all impacts are reduced to a less-than-significant level through the application of the required mitigation. The proposed project would primarily utilize Integrated Pest Management practices to control pests; however, when necessary, pesticides may be used. Impacts related to the use of pesticides are evaluated in Chapter 3.8 of this DEIR, and were found to be less-than-significant with implementation of mitigation measures. The proposed project would result in increases in truck traffic during the logging operations and during the harvest season. Impacts to traffic are discussed in Chapter 3.9 of this DEIR, and all impacts were found to be less-than-significant with implementation of mitigation measures. Logging and

vineyard operations would increase the noise level beyond what is currently generated by the project site. Impacts related to noise are assessed in Chapter 3.10; all impacts related to noise were found to be less-than-significant with implementation of mitigation measures. During vineyard operations early morning harvesting activities could potentially generate light. Impacts to aesthetics are evaluated in Chapter 3.11 of the DEIR, and all impacts were found to be less-than-significant with implementation of mitigation measures. The DEIR contains extensive mitigation to ensure that the proposed project does not have a significant impact on adjacent land uses.

The proposed project use is consistent with the General Plan, is sanctioned by the Sonoma County Right-to-Farm Ordinance, and all potential land uses compatibility impacts related to implementation of the proposed project would be mitigated to a less-than-significant level as demonstrated throughout the remaining technical chapters of the EIR. Consequently, the proposed project would result in ***less-than-significant*** impacts regarding conflicts with surrounding land uses.

Mitigation Measure(s)
None required.

3.2-2 Consistency of the Proposed Timber Conversion with Applicable Policies.

In 1982, the State Legislature adopted the California Timberland Productivity Act (TPA). The TPA was intended to protect timberland and ensure that properly conducted timber operations would not be prohibited based on conflicts with surrounding land uses. To accomplish this goal, the TPA directed counties to designate and zone lands for the primary use of timber production. Land Use Policy 1 of the Sonoma County General Plan requires the protection of lands needed for commercial timber production under the California Timberland Protection Act. According to the General Plan, Sonoma County has approximately 232,000 acres of timberland. In compliance with the Timberland Protection Act, Sonoma County has set aside approximately 69,000 acres of timberlands under the Timber Production (TP) zoning designation. The proposed project is not located in an area designated by the County expressly for timber production under the TP zoning designation. The proposed project is zoned Resources and Rural Development, which allows for a variety of uses including the growing and harvesting of vine crops as proposed. Per Article 7 of the Forest Practice Rules, a Timber Harvest Plan (THP) and Timber Conversion Permit (TCP) application is required for the transformation of non-Timberland Production Zone (TPZ) timberland to a nontimber use. Both THP and TCP applications have been submitted for the project in conformance with the Forest Practice Rules and are included as Appendix E and F to this Draft EIR.

In addition, the 2007 Policy Statement and Strategic Program of the Board of Forestry and Fire Protection outlined a broad set of policies that would be

applicable to the proposed project. In addition to directly addressing preservation of timber resources, these policies address secondary affects related to timber conversion, such as impacts to biological diversity. The loss of timber is largely an issue of resultant impacts to special-status species and water resources. These issues are addressed in detail in Chapter(s) 3.4 - *Biological Resources*; and 3.7 - *Hydrology and Water Quality*. It should be noted here that existing hardwood trees would be retained within streamside conservation areas that have been included in the design to protect Patchett Creek from the impacts of vineyard conversion. The streamside conservation area would be a minimum of 100 feet in width, on either side of the creek as measured from the top of bank. All other tributaries would be protected in buffers that are 25 to 75 feet in width, on either side of the top-of-banks. All streamside conservation areas on the project site would be dedicated in permanently protected deed restricted areas. The deed restrictions will total 133 acres, be recorded on the title of the property, and shall run with the land in perpetuity.

Protection of hardwoods surrounding all on-site watercourses would maintain hardwood cover and diversity on the project site. According to the project forester, during the course of timber clearing operations, some of the felled hardwoods would be placed within the WLPZ zones surrounding the vineyard blocks, thereby providing for additional wildlife habitat.

Conclusion

As stated above, under Section 1105.2 of the Forest Practice Rules, the CAL FIRE Director is required to determine that the applicant has the intent and ability to carry out the proposed conversion. In addition, the environmental feasibility of the conversion is to be assessed, including the suitability of soils, slope, feasibility of mitigation, and numerous other factors. If the Director determines that the above outlined standards have been met the project would comply with applicable CAL FIRE policies. If the Director determines that the proposed project does not meet the standards, then the TCP would be denied, the project would not occur, and a conflict with applicable policies would not result. Furthermore, the proposed project would comply with applicable forestry regulations, including the Forest Practice Rules, and the Director would review compliance with all applicable policies as part of the TCP approval process. Other chapters of this DEIR address the impacts to wildlife and hydrology that would result from the logging and conversion of the project site. Therefore, the proposed project would have a ***less-than-significant*** impact on policies related to timber conversion.

Mitigation Measure(s)

None required.

3.2-3 Consistency with the project site's General Plan land use designation.

The Sonoma County General Plan (p. 52) states that the intent of the Rural and Resources Development designation is to protect lands used for timber,

geothermal and mineral resource production and for natural resource conservation. The Resources and Rural Development category allows residences at very low densities due to lack of infrastructure, greater distance from public services, poor access, conflicts with resource conservation and production, and significant physical constraints and hazards. The intent is that natural resource areas be managed and conserved and that production activities avoid depletion and promote replenishment of renewable resources. Agricultural use is an allowed use on lands designated Resources and Rural Development.

The proposed project includes the conversion of approximately 190-acres of existing timber and grassland into vineyards. The proposed project involves the construction of minimal structures, including a storage shed within a corporation yard and a detention basin to capture irrigation water for agricultural service purposes; residences would not be constructed on the project site. Therefore, as the proposed project would replace the existing timberlands with a vineyard, the project is consistent with the types of allowable uses (agricultural) allowed on the project site by the General Plan. In addition, the project remains consistent with the maximum building intensity for the project site by not constructing residences, and only minimal service structures on site; thereby not proliferating intensive infrastructure requirements on site. In addition, the on-site well would only serve to provide potable water for on-site service personnel, and is not intended for irrigation purposes. Furthermore, as a ministerial entitlement of the EIR, the applicant is requesting the approval of an Erosion Control Plan, which would contribute to the protection of agriculture, watersheds, and floodplain tributaries from erosion, as stated in the Sonoma County General Plan. Therefore, the proposed project would be consistent with General Plan's specific intent and general vision for the area and would result in a ***less-than-significant*** impact.

Mitigation Measure(s)
None required.

3.2-4 Consistency with County Ordinances.

Zoning

Article 5 of the Sonoma County Zoning Ordinance states that the Resources and Rural Development (RRD) zoning designation is intended to be applied in lands needed for commercial timber production, geothermal production, aggregate resources production; lands needed for protection of watershed, fish and wildlife habitat, biotic resources, and for agricultural production activities that are not subject to all of the policies contained in the Agricultural Resources Element of the General Plan. Permitted uses under this zoning includes the outdoor growing and harvesting of shrubs, plants, flowers, trees, vines, fruits, vegetables, hay, grain and similar food and fiber crops, including wholesale nurseries. As discussed above, Ordinance 5651 amended the standards for timberland conversion in the RRD; however, the ordinance includes an exemption for

projects submitted prior to October 4, 2005. The proposed project submitted a complete application prior to the above mentioned date; therefore, the amended ordinance does not apply to the proposed project. Further discussion of timberland conversion is included in Impact Statement 3.2-2 below.

The sole land use proposed for the site by the applicant is a vineyard, which is consistent with the outdoor growing and harvesting of vines - an explicitly allowed use under RRD zoning. Therefore, the proposed project would be consistent with Sonoma County Zoning Ordinance.

Vineyard Erosion and Sedimentation Control Ordinance

As an entitlement of the EIR, the applicant is requesting the approval of an Erosion Control Plan, which would ensure compliance with the Sonoma County Vineyard Erosion and Sediment Control Ordinance (VESCO) and the protection of agriculture, watersheds, and floodplain tributaries from erosion.

The purposes of VESCO is to safeguard public health, safety, and welfare; minimize erosion and sedimentation in connection with vineyard planting and replanting in the County; protect the lands, streams, and riparian habitat of the County; and ensure the long-term economic viability of the County's viticultural resources. In conformance with VESCO, the project engineer, Erickson Engineering, has designed an Erosion Control Plan (ECP). The ECP was evaluated by O'Connor Environmental, who found that with application of the appropriate mitigation the proposed project would result in a net reduction of sediment flowing to area waterways of 10-20 tons/year. (See Chapter 3.7, Hydrology and Water Quality, for a complete discussion of erosion and sediment.) In addition, the project would comply with the required setbacks for Class II and III streams. Therefore, the proposed project would comply with VESCO, and would not have an adverse impact related to erosion and sedimentation.

Conclusion

The proposed project would be in compliance with the existing zoning designations for the project site. In addition, the proposed project would comply with VESCO, and would result in a net reduction in sedimentation. Therefore the proposed project would result in ***no impact*** to County ordinances.

Mitigation Measure(s)
None required.

3.2-5 Consistency with applicable General Plan goals and policies.

The pertinent Sonoma County General Plan goals and policies applicable to the proposed project are included within the Land Use Element and Resource

Conservation Element. Therefore, the following discussion is divided into two sections, each section focusing on a separate Element of the General Plan.

Land Use Element

The General Plan goals listed in the regulatory context are primarily concerned with conserving agricultural areas and preventing the proliferation of intensive urban development in areas of Sonoma County with little or no infrastructure. In addition, the General Plan Agricultural policies expressly seek to protect agricultural areas from encroachment of urban and other non-agricultural uses and preserve the economic benefits generated by agricultural land uses.

The proposed project involves the conversion of approximately 190-acres of timber and grassland into vineyards. Buildings or structures do not currently exist on-site. The project would involve the construction of minimal agricultural service buildings for the sole purpose of supporting the on-site agricultural activities. The proposed project would be consistent with the goals and policies as stated within the Land Use Element because the project conserves agricultural production activity in Sonoma County. In addition, the project does not involve intensive urban land uses or the proliferation of growth in areas in which there are inadequate public services and infrastructure.

In particular, Land Use Policy 6 states that the Resources and Rural Development designation is intended to protect lands needed for agricultural production activities that are not subject to all of the policies of the Agricultural Resources Element. Many of the policies contained in the Agricultural Resources Element are designed to regulate the processing and selling of agricultural products. The proposed project would grow grapes for harvest only, processing and sale would occur off-site. The proposed project would maintain the project site in agricultural production, while preserving the non-vineyard timberlands in perpetuity with a conservation easement. Therefore, Land Use Policy 6 protects the right of the project applicant to engage in agricultural production on the project site.

Resource Conservation Element

The General Plan Resource Conservation Element provides for the conservation of natural resources including water, forests, soils, rivers, harbors, fisheries, wildlife, minerals, and other natural resources. Conservation and maintenance of natural resources helps support the County's economic base by promoting the production and use of the County's resources. The Resource Conservation Element guides land use decisions that will contribute to the long term maintenance of resource production.

The proposed project would enhance the agricultural environment of Sonoma County by increasing the number of agricultural acres, while simultaneously preserving portions of the project site's natural environment. In addition, as an

entitlement of the EIR, the applicant is requesting the approval of an Erosion Control Plan, which would contribute to the protection of agriculture, watersheds, and floodplain tributaries from erosion, as stated in the Sonoma County Zoning Ordinance. Permanent cover cropping between the vine rows will provide a competitive barrier to weeds and woody growth. As discussed in depth in Chapter 3.7, Hydrology and Water Quality, the proposed project has been designed to reduce net sedimentation of waterways by 10 to 21 tons/year following project implementation. Therefore, the proposed project would not degrade soil, water resources, or fish habitat. The decrease in sedimentation could in fact result in improvements to water resources and fish habitat.

As a result, the proposed project would be consistent with the General Plan goals and policies, including those stated within the Land Use Element, and the Resources Conservation Element. Consequently, the proposed project would result in a ***less-than-significant*** impact.

Mitigation Measure(s)
None required.

Cumulative Impacts

Cumulative impacts to Land Use are analyzed in Impact Statement 4.0-1 of Chapter 4.0, *Cumulative Impacts*.

Endnotes

[1]PT http://www.bof.fire.ca.gov/board/board_policies.asp.

3.3 AIR QUALITY

3.3 AIR QUALITY

Introduction

The Air Quality section describes the effects of the Fairfax Conversion Project on local and regional air quality. The section includes a discussion of the existing air quality; construction-related air quality impacts resulting from construction equipment emissions; direct and indirect emissions associated with operation of the project; the impacts of these emissions on both the local and regional scale; and mitigation measures identified to reduce or eliminate any identified potentially significant impacts. The section is based on the *Air Quality Impact Evaluation for the Artesa Vineyards Project in the County of Sonoma* prepared by Donald Ballanti, Certified Consulting Meteorologist[1] (see Appendix G to the DEIR).

Environmental Setting

The following setting information provides an overview of the existing air quality in the Fairfax Conversion Project area.

Air Pollutant Terminology

Ozone

Ozone is the most prevalent of a class of photochemical oxidants formed in the atmosphere. The creation of ozone is a result of a complex chemical reaction between ozone precursors, namely reactive organic gases (ROG) and nitrogen oxide (NO_X) emissions, in the presence of sunlight. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. Factories, automobiles, and evaporation of solvents and fuels are the major sources of ozone precursors. The health effects of ozone may include difficulty breathing, lung tissue damage, and eye irritation.

Particulate Matter

Respirable particulate matter (PM_{10}) consists of solid and liquid particles of dust, soot, aerosols, and other matter, which are small enough to remain suspended in the air for a long period of time. A portion of the particulate matter in the air is due to natural sources such as windblown dust and pollen. Man-made sources include combustion, automobiles, field burning, factories, and road dust. A portion of the particulate matter in the atmosphere is also a result of photochemical processes. The effects of high concentrations of PM_{10} on humans may include increased respiratory disease, lung damage, cancer, and premature death.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by incomplete burning of carbon-based fuels such as gasoline, oil, and wood. When CO enters the body, the CO combines with chemicals in the body, which prevents blood from carrying oxygen to cells, tissues, and organs. Symptoms of exposure to CO can include problems with vision, reduced alertness, and general reduction in mental and physical functions. Exposure to CO can result in chest pain, headaches, and reduced mental alertness.

Nitrogen Oxide

Nitrogen oxides (NO_X) are produced from burning fuels, including gasoline and coal. Nitrogen oxides react with ROG (found in paints and solvents) to form smog, which can harm health, damage the environment, and cause poor visibility. Additionally, NO_X emissions are a major component of acid rain. Health effects related to NO_X include lung irritation and lung damage.

Sulfur Dioxide

Sulfur dioxides (SO_2) are colorless gases and constitute a major element of pollution in the atmosphere. SO_2 is commonly produced by fossil fuel combustion. In the atmosphere, SO_2 is usually oxidized by ozone and hydrogen peroxide to form sulfur trioxide (a secondary pollutant). If SO_2 is present during condensation, acid rain may occur.

Lead

The present sources of lead include but are not limited to, lead smelters, battery manufacturing, and recycling facilities. The predominant past source of lead is the combustion of leaded gasoline. Health effects related to lead include disturbance of the gastrointestinal system, anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).

Existing Conditions

The proposed project is located in the coastal mountains of northwestern Sonoma County. The site is located on a broad, flat ridge between Grasshopper Creek and the Wheatfield Fork of the Gualala River, and is just east of the community of Annapolis.

Sonoma County's climate consists of wet, cool winters and dry summers. Seasonal temperature differences vary greatly across the County. Coastal areas are subject to the moderating effect of the ocean and tend to have cool temperatures in all seasons. Interior areas have more extreme cold temperatures in winter and hotter temperatures in summer.

The overall wind flow over the County is from the northwest. However, the mountainous nature of the County locally modifies winds. During daylight hours, up-canyon local

winds predominate, and in the evening hours, down-canyon "drainage" flows along watercourses predominate.

All areas of the County are affected by inversion layers. Inversion layers, where warm air overlays cooler air, frequently occur and trap pollutants close to the ground. In the coastal areas these inversions are typically elevated above the ground and are located at the top of the cool marine layer near the ground. In winter, ground-based inversions are formed during windless, clear-sky conditions as cold air collects in low-lying areas such as valleys and canyons.

Northern Sonoma County is part of the North Coast Air Basin, consisting of Del Norte, Humboldt, Trinity, Mendocino, and northern Sonoma County. The project is within the Northern Sonoma County Air Pollution Control District (NSCAPCD). The NSCAPCD is primarily rural and mountainous, and contains only two urbanized areas (Healdsburg and Cloverdale). Southern Sonoma County is part of the nine-county San Francisco Bay Air Basin and the Bay Area Air Quality Management District (BAAQMD).

Ambient Air Quality Standards

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air quality standards represent contaminant levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents.

The federal and California ambient air quality standards are summarized in Table 3.3-1 for important pollutants. The federal and state ambient standards were developed independently with differing purposes and methods, although both federal and state standards are intended to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent, particularly for ozone and PM_{10}.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are also considered pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

Local Air Quality Monitoring

The Northern Sonoma APCD operates a network of monitoring sites in the larger communities of the County, but none are located near the project site. In general, air quality within Northern Sonoma County is very good (Ballanti, p. 4). The Northern Sonoma APCD currently has attained all federal ambient air quality standards, and for the past several years has attained all most of the state ambient air quality standards. However, in 2006, the Northern Sonoma APCD was classified by the State as a non-

attainment zone for ozone. Based on communication with the NSAPCD, the non-attainment designation was the result of insufficient air quality monitoring data and the standards have not been physically exceeded since 2002[2]. The NSAPCD is currently working with the State to be classified as "unclassified" for ozone.

Table 3.3-1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	State Standard
Ozone	1-Hour	--	0.09 PPM
	8-Hour	0.08 PPM	0.07 PPM
Carbon Monoxide	Annual Average	0.053 PPM	--
	8-Hour	9.0 PPM	9.0 PPM
	1-Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual Average	0.03 PPM	--
	1-Hour	--	0.25 PPM
Sulfur Dioxide	24-Hour	0.14 PPM	0.04 PPM
	1-Hour	--	0.25 PPM
PM_{10}	Annual Average	50 µg/m^3	20 µg/m^3
	24-Hour	150 µg/m^3	50 µg/m^3
$PM_{2.5}$	Annual Average	15 µg/m^3	12 µg/m^3
	24-Hour	35 µg/m^3	--
Lead	30-day Average	--	1.5 ug/m^3
	3-Month Average	1.5 ug/m^3	--

PPM = Parts-per-Million
µg/m^3 = Micrograms-per-Cubic Meter
Source: California Air Resources Board, www.arb.ca.gov

Global Climate Change

As recognized by the passage of Assembly Bill 32, the California Climate Solutions Act of 2006, Global Climate Change is a growing concern both in California and around the world. Scientists have determined with a high degree of certainty that the observable warming of the global climate is influenced by the emission of greenhouse gases (GHG). Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and synthetic halocarbons (chlorofluorocarbons (CFCs), hydrofluorocarbons, perfluorocarbons, halons, and sulphur hexafluoride). The primary GHG is CO_2, which is a byproduct of fossil fuel combustion. Carbon dioxide is widely used as the reference gas for comparison of equivalent global warming potential. The CO_2 equivalent is a good way to assess emissions because the use of an equivalent gives weight to the global warming potential of the gas. Methane gas, for example, is estimated by the Association of Environmental Professionals and the U.S. EPA to have a comparative global warming potential 21 times greater than that of CO_2 (See Table 3.3-2). At the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative global warming potential 23,900 times that of CO_2.

Table 3.3-2
Global Warming Potentials and Atmospheric Lifetimes of Select Greenhouse Gases

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50-200	1
Methane	12 ±3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF_4)	50,000	6,500
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: U.S. Environmental Protection Agency, Non CO_2 Gases Economic Analysis and Inventory, 2006. U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005, April 15, 2007.

The "specified time horizon" is related to the atmospheric lifetimes of such GHGs, which are estimated by the U.S. EPA to vary from 50-200 years for CO_2, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming potential of a gas.

In addition to combustion of fossil fuels, changes in land uses, including deforestation, can alter the ability of the earth to absorb GHG emissions. Currently, the project site is covered in a mix of forest and grasslands. The USEPA information states that reforestation of previously harvested lands results in sequestration of approximately 1.1 to 7.7 metric tons of carbon per acre annually.[3] The USEPA information for grasslands indicates that carbon is sequestered at a rate of 0 to 1.9 tons per acre annually. Therefore, the project site likely currently sequesters between 335.5 and 2,348.5 tons of CO_2 equivalent per year. Sequestration typically refers to the absorption of carbon dioxide in vegetation and water. Experiments are being conducted on the feasibility of sequestering GHGs in underground oil and natural gas fields; however, the technology is not yet viable in the United States. Changes in cropping practices, such as from conventional to conservation tillage, have been shown to sequester about 0 – 1.1 metric tons of CO_2 equivalent per acre per year on croplands.

Regulatory Context

Air quality is monitored through the efforts of various federal, state, regional, and local government agencies pursuant to authority granted by legislative and executive acts. These agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. Applicable legislative and executive acts, as well as the agencies responsible for regulating and improving the air quality within the Sonoma County area are discussed below.

Federal

U.S. Environmental Protection Agency

The USEPA has established air quality standards for common pollutants. These ambient air quality standards represent the safest levels for each contaminant, according to the various thresholds of each pollutant for causing adverse health effects. The standards cover what are called "criteria" pollutants because health and other effects of each pollutant are described in criteria documents. Although the State and federal ambient standards were developed independently, with differing purposes and methods, both processes shared an attempt to avoid health-related effects. As a result, some differences between federal and State standards are known to exist, as illustrated in Table 3.3-1.

State

California Clean Air Act

The California Clean Air Act (CCAA) requires that air quality plans be prepared for areas of the State that have not met State air quality standards for ozone, CO, NO_X, and SO_2. Among other requirements of the CCAA, the plans must include a wide range of implemental control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls.

Assembly Bill 1493

Adopted in 2002, AB 1493 requires the California Air Resources Board (ARB) to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial transportation in the state."

Executive Order S-3-05

Executive Order S-3-05 was signed by Governor Schwarzenegger in 2005 to establish total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency to coordinate a multi-agency effort to reduce greenhouse gas emissions to the above listed target levels.

Assembly Bill 32, The California Climate Solutions Act of 2006

AB 32 requires that statewide greenhouse gas emissions be reduced to 1990 levels by the year 2020. The reduction is to be accomplished through an enforceable statewide cap on

greenhouse gas emissions, as opposed to the targets in Executive Order S-3-05, which will be phased starting in 2012. AB 32 directs the ARB to develop and implement regulations to reduce statewide greenhouse gas emissions from stationary sources. In addition, AB 32 provides ARB with the authority to implement measures to reduce greenhouse gas emissions from vehicles.

Technical Advisories

The Governor's Office of Planning and Research[4] and the California Air Pollution Control Officer's Association[5] have released technical advisories on how to address climate change in CEQA documents. Both documents encourage lead agencies to measure emissions, compare emissions levels to standards of significance established by the lead agency, and make a significance determination. If a significant impact is identified, implementation of feasible mitigation measures is required by CEQA. Neither document establishes standards of significance, and both documents recognize that not all projects that result in greenhouse gas emissions would result in significant impacts.

Local

Northern Sonoma County Air Pollution Control District

The Northern Sonoma County Air Pollution Control District (NSCAPCD) has permitting authority for stationary air pollutant sources in the region. The NSCAPCD has adopted various regulations pertaining to air emissions, including: restrictions on open burning, wood fired appliances, vineyard heaters, and petroleum storage. Activities within the NSCAPCD are required to comply with the applicable regulations.

Sonoma County General Plan

The following goals and objectives are from the Sonoma County General Plan Resource Conservation Element:

Goal RC-13	Preserve and maintain good air quality and provide for an air quality standard that will protect human health and preclude crop, plant and property damage in accordance with the requirements of the Federal and State Clean Air Acts.	
	Objective RC-13.1	Maintain the projected county air quality as set forth in the Final Environmental Impact Report and minimize air pollution.
	Objective RC-13.2	Encourage reduced motor vehicle use as a means of reducing resultant air pollution.
	Policy RC-13b	Encourage public transit, ridesharing and van pooling, shortened and combined motor

	vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.
Policy RC-13c	Refer projects to the local air quality districts for their review.

Impacts and Mitigation Measures

Standards of Significance

The California Environmental Quality Act (CEQA) guidelines state that a project would normally be considered to have a significant effect on air quality if the project would do any of the following:

- 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 non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Northern Sonoma County Air Pollution Control District (NSCAPCD)

The ambient air quality standards shown in Table 3.3-1 represent thresholds of significance applicable to all projects. While the NSCAPCD has not formally adopted additional thresholds of significance for project evaluation, in District Rule 130 the District recommends a threshold equivalent to the definition of a "significant source." These emission thresholds are as follows:

- Volatile Organic Compounds (VOC): 40 tons/year (220 pounds/day)
- Oxides of Nitrogen (NO_x): 40 tons/year (220 pounds/day)
- Carbon Monoxide (CO): 100 tons/year (550 pounds/day)
- Particulate Matter, 10 microns (PM_{10}): 15 tons/year (82 pounds/day)[6]

Carbon Dioxide

Currently, the NSCAPCD has not identified a significance threshold for GHG emissions or a methodology for analyzing air quality impacts related to greenhouse gas emissions. The state has identified 1990 emission levels as a goal through adoption of AB 32. To meet this goal, California would need to generate lower levels of GHG emissions than current levels. However, standards have not yet been adopted quantifying 1990 emission

targets. In addition, the regulations created pursuant to AB 32 only apply to stationary source emissions. Consumption of fossil fuels in the transportation sector accounted for over 40% of the total GHG emissions in California in 2004. Current standards for reducing vehicle emissions considered under AB 1493 call for "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles," and do not provide a quantified target for GHG emissions reductions for vehicles.

Emitting GHGs into the atmosphere is not itself an adverse environmental affect. However, the cumulative effect of the increased concentration of GHGs in the atmosphere is global climate change. Climate change in turn could result in adverse environmental affects (e.g., drought, sea level rise, loss of snowpack, and severe weather events). The following discussion will include an estimate of the proposed project's incremental contribution to GHG emissions. However, climate models lack the detail to determine whether or how an individual project's relatively incremental contribution might translate into physical effects on the environment. For this project a significant impact is defined as an action that would block the implementation of an ARB established regulation to reduce GHG emissions.

Method of Analysis

Donald Ballanti, Certified Consulting Meteorologist prepared an air quality report for the proposed project (*Air Quality Impact Evaluation For The Artesa Vineyards Project In The County Of Sonoma*), and the following information outlines the methods of analysis in the report.

Mobile Source Emissions

The EMFAC-2002 program was used to calculate auto and truck emissions associated with the project.[7] EMFAC 2002 is the latest emissions program for California vehicles developed by the California Air Resources Board (CARB). Per-mile emission rates of light duty trucks (pick-ups) and heavy-duty diesel trucks were obtained for the statewide vehicle population for the year 2004.

Emissions were estimated based on an average trip length of 25 miles. Maximum daily auto trip generation was assumed to be 128 trips and maximum daily truck trip generation was assumed to be 2 trucks per day.

"Land preparation" emissions shown in Table 3.3-3 are particulate emissions produced during the preparation of agricultural lands for planting and harvest activities. Operations included are discing, tilling, leveling, and other mechanical operations used to prepare the soil. The methodology used to predict these emissions was developed by the California Air Resources Board (CARB) as part of the statewide emissions inventory.[8] Particulate emissions from land preparation are computed by multiplying a crop-specific emission factor for wine grapes by the number of acres being farmed.

Table 3.3-3 Project Regional Emissions in Pounds Per Day			
	Reactive Organic Gases	**Nitrogen Oxides**	**PM_{10}**
Auto Traffic	0.44	1.63	0.08
Truck Traffic	0.02	0.71	0.01
Land Preparation	-	-	0.86
Harvesting Operations	-	-	0.09
Unpaved Road Dust	-	-	5.43
Wind Erosion	-	-	2.72
Total	0.46	2.34	9.19
NSCAPCD Recommended Significance Threshold	220.0	220.0	82.0
Source: Ballanti 2004.			

The activities used to harvest agricultural commodities entrain soil and plant material into the air. Harvesting emissions were estimated using the methodology developed by CARB as part of the statewide emissions inventory.[9] Particulate emissions from harvesting are computed by multiplying a crop-specific emission factor by the number of acres.

Unpaved road dust was estimated using the methodology developed by CARB as part of the statewide emissions inventory.[10] The method utilizes estimates of annual vehicle miles traveled (VMT) for agricultural acreage and an emission factor of 2.27 pounds of PM_{10} per VMT to estimate annual emissions. These were converted to daily emissions by dividing by 365 days per year.

Wind blowing across exposed agricultural land results in particulate matter emissions. The methodology used to estimate these emissions was developed by CARB as part of the statewide emissions inventory.[11] Particulate emissions from windblown dust were calculated by multiplying the number of farmed acres by an emission factor for non-pasture agricultural lands. The value for Santa Cruz County (0.002485 tons/acre/year) was used to obtain annual emissions. Santa Cruz County was selected as the closest representative coastal county because CARB's methodology did not contain a specific emission factor for Sonoma County.

Project-Specific Impacts and Mitigation Measures

3.3-1 Air quality impacts related to site preparation activities such as logging, grading, and excavation.

The conversion of forestland to vineyards requires logging, clearing, grading, and excavation activities, which have a potential to generate dust. The project site is located in a rural area with few receptors; however, site preparation activities would have the potential to cause nuisance at neighboring properties. The overall wind flow over the County is from the northwest. However, the mountainous nature of the County locally modifies winds. During daylight hours, up-canyon

local winds predominate. In the evening hours, down-canyon "drainage" flows along watercourses predominate. The majority of sensitive receptors are located on the northwest corner of the project site. Therefore, the prevailing winds are expected to blow project-related emissions away from the homes. However, the local topography can significantly alter the wind patterns, raising the possibility that project odors and emissions would flow uphill towards sensitive receptors during the day, and downhill away from the residences during the evening.

During construction, various diesel-powered vehicles and equipment in use on the site would create odors. These sources are mobile and transient in nature and the emissions would occur at a substantial distance from nearby receptors, enabling the dilution of odor-producing constituents. Therefore, due to the temporary nature of these odors, they are unlikely to be noticeable beyond the project boundaries.

Another concern associated with excavation activities in many areas is the potential presence of natural-occurring serpentine rock and soils, which contain asbestos. Asbestos is classified as a known human carcinogen by state and federal health agencies. When rock or soil are crushed or broken, asbestos fibers may be freed. In addition, asbestos fibers may be released into the environment through natural weathering processes. The California Department of Conservation, Division of Mines and Geology, has prepared a statewide map of areas likely to contain naturally occurring asbestos. This map does not indicate evidence of naturally occurring asbestos on the site.[12]

The burning of cleared vegetation is another possible source of temporary emissions during site preparation. The burning of vegetation is strictly regulated by the NSCAPCD and because the applicant would comply with all NSCAPCD regulations pertaining to burning, adverse impacts would not result.

While the project would not result in the construction of a new development, conversion of the project site to vineyards has the potential to generate dust. Although the site is located in a rural area with few receptors, the generation of dust by the project would be considered a ***potentially significant*** impact.

<u>Mitigation Measure(s)</u>
The following mitigation measures for construction emissions would be applicable to an agricultural site. Implementation of the measures such as compliance with Air District burning rules, would reduce construction impacts of the project to a *less-than-significant* level by controlling the amount of dust and smoke that is generated by the project.

3.3-1 Prior to the issuance of a grading permit, the project contractor shall prepare an Erosion Prevention and Dust Control Plan. The plan shall be followed by the project's grading contractor and submitted for review and approval by the County Permit and Resource Management Department,

which will be responsible for field verification of the plan during construction. The plan shall include the following control measures necessary for the proposed project:

- *Water all active and disturbed areas at least twice daily and more often during windy periods. Active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.*
- *Apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas.*
- *Limit traffic speeds on unpaved areas and roads to 15 mph.*
- *Burning of cleared vegetation shall be conducted according to Regulation II – Open Burning, of the Northern Sonoma County APCD.*

3.3-2 Air quality impacts associated with additional vehicles and agricultural activities on the project site.

The incremental daily emission increases associated with the project are identified in Table 3.3-3 for reactive organic gases (ROG), oxides of nitrogen (two precursors of ozone), and PM_{10}. The emissions shown can be considered worst-case estimates, as the assumption is made that all emissions are additive (although peak emissions from several categories would occur at different times of the year). As shown in Table 3.3-3, proposed project emissions would not exceed the thresholds of significance; therefore, the proposed project would have a ***less-than-significant*** impact on regional air quality.

<u>Mitigation Measure(s)</u>
None required.

3.3-3 Impacts related to an increase in traffic volumes and congestion levels, resulting in a change of carbon monoxide (CO) concentrations.

On the local scale, the project would change traffic on the local street network, thereby, changing CO levels along roadways used by project vehicles. CO is an odorless, colorless, poisonous gas, which is primarily generated by automobiles. Concentrations of CO are highest near intersections of major roads. New vehicle trips would add to existing CO concentrations near streets providing access to the site.

The traffic study prepared for the proposed project found that project traffic would not adversely affect any existing intersections, nor cause significant deterioration of the Level of Service (LOS) on affected arterial roads.[13] Therefore,

the low level of CO that would be generated by project vehicles would not result in an exceedance of CO thresholds on or near local roadways.

Given that the proposed project is in an attainment area for CO (the state and federal ambient standards are met), coastal Sonoma County has relatively low background levels of CO, and the project would not lead to roadway congestion, the project's impact on CO concentrations would be ***less-than-significant.***

Mitigation Measure(s)
None required.

Cumulative Impacts

Cumulative impacts to Air Quality are analyzed in Impact Statements 4-2 and 4-3 of Chapter 4, Cumulative Impacts.

Endnotes

[1] Donald Ballanti, Certified Consulting Meteorologist, Air Quality Impact Evaluation for the Artesa Vineyards Project in the County of Sonoma, May 2004.
[2] Alex Saschin, Air Quality Engineer, Northern Sonoma APCD, personal communication, August 21, 2007, 3:10 pm.
[3] *Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture*; 2005. Accessed on www.epa.gov June 2007.
[4] Governor's Office of Planning and Research, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review, June 19, 2008.
[5] California Air Pollution Control Officer's Association, CEQA and Climate Change, January 2008.
[6] Alex Saschin, Air Quality Engineer, Northern Sonoma APCD, personal communication, May 7, 2004 (as cited in *Air Quality Impact Evaluation for the Artesa Vineyards Project in the County of Sonoma*).
[7] California Air Resources Board, Emfac2002, Version 2.2 User's Guide, 2002.
[8] California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.4, Agricultural Land Preparation, January 2003.
[9] California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.5, Agricultural Harvest Operations, January 2003.
[10] California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.11, updated August 1997.
[11] California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.12, updated July 1997.
[12] TJKM Transportation Consultants, Traffic Impact Study for the Artesa Vineyards Project in the County of Sonoma, December 2, 2004.
[13] California Energy Commission, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, Final Staff Report. Accessed on www.energy.ca.gov in June 2007.