

AIR QUALITY IMPACT EVALUATION FOR THE  
ARTESA VINEYARDS PROJECT IN THE COUNTY OF SONOMA

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## **ENVIRONMENTAL SETTING**

### **Air Basin Characteristics**

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.

The climate of Sonoma County is one 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. 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 9-county San Francisco Bay Air Basin and the Bay Area Air Quality Management District.

### **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 are levels of contaminants which represent safe 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 1 for important pollutants. The federal and state ambient standards were developed independently with differing purposes and methods, although both federal and state

Table 1

Federal and State Ambient Air Quality Standards

<b>Pollutant</b>	<b>Averaging Time</b>	<b>Federal Primary Standard</b>	<b>State Standard</b>
Ozone	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.09 ppm --
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.05 ppm --	-- 0.25 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm --	-- 0.05 ppm 0.5 ppm
PM <sub>10</sub>	Annual 24-Hour	50 ug/m <sup>3</sup> 150 ug/m <sup>3</sup>	20 ug/m <sup>3</sup> 50 ug/m <sup>3</sup>
PM <sub>2.5</sub>	Annual 24-Hour	15 ug/m <sup>3</sup> 65 ug/m <sup>3</sup>	12 ug/m <sup>3</sup> --
Lead	30-Day Avg. 3-Month Avg.	-- 1.5 ug/m <sup>3</sup>	1.5 ug/m <sup>3</sup> --

ppm = parts per million

ug/m<sup>3</sup> = Micrograms per Cubic Meter

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. This is particularly true for ozone and PM<sub>10</sub>.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of 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.

### **Current Air Quality**

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. The Northern Sonoma APCD currently has attained all federal ambient air quality standards, and for the past several years has attained all state ambient air quality standards.

### **Attainment Status**

The federal Clean Air Act and the California Clean Air Act of 1988 require that the California Air Resources Board (CARB), based on air quality monitoring data, designate air basins within the state where the federal or state ambient air quality standards are not met as "non-attainment areas". Because of the differences between the federal and state standards, the designation of non-attainment areas is different under the federal and state legislation.

The Northern Sonoma County APCD is a nonattainment area for the state PM<sub>10</sub> standard and is currently attainment or unclassified for other standards.

## **IMPACTS AND MITIGATION MEASURES**

### **Significance Thresholds**

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

Volatile Organic Compounds (VOC):	40 tons/year (220 pounds/day)
Oxides of Nitrogen (NOx):	40 tons/year (220 pounds/day)
Carbon Monoxide (CO):	100 tons/year (550 pounds/day)

Particulate Matter, 10 Microns (PM<sub>10</sub>): 15 tons/year (82 pounds/day)<sup>1</sup>

**Impact 1: Site preparation activities would have the potential to cause nuisance related to dust and PM<sub>10</sub>.**

Conversion of forest land to vineyards requires logging, clearing, grading and excavation activities with a potential to generate dust. The site is located in a rural area with few receptors; nevertheless site preparation activities would have the potential to cause nuisance at neighboring properties. This impact is potentially significant, although normally mitigable.

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 emission occurs at a substantial distance from nearby receptors (which provides for dilution of odor-producing constituents). These odors would be temporary and unlikely to be noticeable beyond the project boundaries.

A concern associated with construction 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. Asbestos fibers are freed from the rock or soil when it is crushed or broken and 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 indicates no evidence of naturally-occurring asbestos on the site.<sup>2</sup>

The burning of cleared vegetation would be another source of temporary emissions during site preparation. Such burning is strictly regulated by the Northern Sonoma Air Pollution Control District.

**Mitigation 1:** The following measures are measures for dust control applicable to agricultural site preparation:

- Water all active and disturbed areas at least twice daily and more often during windy periods. Active areas adjacent 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.

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<sup>1</sup> Alex Saschin, Air Quality Engineer, Northern Sonoma APCD, personal communication, May 7, 2004.

<sup>2</sup> California Department of Conservation, Division of Mines and Geology, A General Location Guide for Ultramafic Rocks in California- Areas More Likely to Contain Naturally-Occurring Asbestos, 2000.

- Limit traffic speeds on unpaved areas and roads to 15 mph.
- Burning of cleared vegetation shall be conducted according to the rules and regulations of the Northern Sonoma County APCD.

The above measures include feasible measures applicable to an agricultural site and would reduce construction impacts of the project to a less-than-significant level.

**Impact 2: The project would attract additional vehicles to the site and would agricultural activities would result in new regional emissions. The increase would not exceed the recommended significance thresholds and therefore would be a less-than-significant impact.**

### Methodology

The EMFAC-2002 program was used to calculate auto and truck emissions associated with the project.<sup>3</sup> EMFAC 2002 is the latest emissions program for California vehicles developed by the California Air Resources Board. Per-mile emission rates of light duty trucks (pick-ups) and heavy-duty diesel trucks were obtained for the state-wide 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 are particulate emissions produced during the preparation of agricultural lands for planting and after 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 as part of the statewide emissions inventory.<sup>4</sup> Particulate emissions from land preparation are computed by multiplying a crop-specific emission factor for wine grapes by the number of acres being farmed.

The activities used to harvest agricultural commodities entrain soil and plant material into the air. Harvesting emissions were estimated using the methodology developed by the California Air Resources Board as part of the statewide emissions inventory.<sup>5</sup>

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<sup>3</sup> California Air Resources Board, Emfac2002, Version 2.2 User's Guide, 2002.

<sup>4</sup> California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.4, Agricultural Land Preparation, January 2003.

<sup>5</sup> California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.5, Agricultural Harvest Operations, January 2003.

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 the California Air Resources Board as part of the statewide emissions inventory.<sup>6</sup> The method utilizes estimates of annual Vehicle Miles Traveled for agricultural acreage and an emission factor of 2.27 pounds of PM<sub>10</sub> per VMT to estimate annual emissions. These were converted to daily emissions by dividing by 365.

Wind blowing across exposed agricultural land results in particulate matter emissions. The methodology used to estimate these emissions was developed by the California Air Resources Board as part of the statewide emissions inventory.<sup>7</sup> 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 closest representative coastal county, as the CARB's methodology did not contain a specific emission factor for Sonoma County.

### Impact Discussion

The incremental daily emission increase associated with the project is identified in Table 3 for reactive organic gases and oxides of nitrogen (two precursors of ozone) and PM<sub>10</sub>. The emissions shown can be considered worst-case estimates, as it is assumed that all emissions are additive although peak emissions from several categories would occur at different times of the year. The Northern Sonoma County Air Pollution Control District's recommended thresholds of significance for these pollutants are also shown. Proposed project emissions shown in Table 3 would exceed not these thresholds of significance, so the proposed project would have a less-than-significant effect on regional air quality.

### **Impact 3: The project would change traffic volumes and congestion levels, changing carbon monoxide concentrations. This is a less-than-significant impact.**

On the local scale, the project would change traffic on the local street network, changing carbon monoxide levels along roadways used by project traffic. Carbon monoxide is an odorless, colorless poisonous gas whose primary source is automobiles. Concentrations of this gas are highest near intersections of major roads. New vehicle trips add to carbon monoxide concentrations near streets providing access to the site.

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<sup>6</sup> California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.11, updated August 1997.

<sup>7</sup> California Air Resources Board, Emission Inventory Procedural Manual Volume III: Methods for Assessing Area Source Emissions, Section 7.12, updated July 1997.

**Table 3**  
**Project Regional Emissions in Pounds Per Day**

	<b>Reactive Organic Gases</b>	<b>Nitrogen Oxides</b>	<b>PM<sub>10</sub></b>
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

The traffic study prepared for the project found that project traffic would not significantly affect any intersections, nor cause significant deterioration of the Level of Service (LOS) on affected arterial roads.<sup>8</sup>

Considering that the proposed project is in an attainment area for carbon monoxide (the state and federal ambient standards are met) and that coastal Sonoma County has very low background levels of carbon monoxide, it is concluded that the project's impact on carbon monoxide concentrations would be less-than-significant.

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<sup>8</sup> TJKM Transportation Consultants, Traffic Impact Study for the Artesa Vineyards Project in the County of Sonoma, January 2004.

