January 22, 2007

VIA EMAIL: lippelaw@sonic.net

Law Offices of Thomas N. Lippe
329 Bryant Street, Suite 3D
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Re: Comments on the Draft Environmental Impact Report for the proposed Upper Range Vineyard Project - Rodgers Property (Property)

Dear Thomas:

I have reviewed the Draft EIR for the proposed Upper Range Vineyard Project (Project) on the Rogers Property in Napa County, CA (Figure 1 for site location). I have extensive academic and professional experience investigating pollutant fate and transport, as well as the functional responses of aquatic systems to pollutant loading. Understanding the impacts of anthropogenic nutrient loading and surface water eutrophication is central to recent studies that 2NDNATURE has conducted in Santa Cruz, Malibu and Lake Tahoe. It is my professional opinion that the Draft EIR fails to adequately address the potential for significant impacts of nutrient loading on the downstream surface water and groundwater resources within the Napa River watershed.

The Draft EIR asserts that the conversion of 161 acres of pasture to vineyard will have a neutral effect on water quality, but these statements lack an acceptable level of consideration with respect to nutrients. Any developments under consideration in the Napa River watershed should thoroughly address the potential impact of additional nitrogen and phosphorous loading, as the Napa River is listed on the California State Water Resources Control Board 303(d) list for nutrients. The Napa River Watershed was recognized as nutrient-impaired by the US EPA in 1998. Vineyard land use is characterized by highly disturbed soils and chronic fertilizer applications. These characteristics result in elevated nutrient delivery to the downstream water resources, directly contributing the watershed wide water quality impairment.

In addition to the vineyard land use impacts, the Project location has a high hydrologic connectivity to ecologically and economically important waterways (Figure 1). The Rogers Property boundary is located approximately 1000 feet from the City of Napa's drinking water supply in Lake Hennessey and 1100 feet from Conn Creek. The current eutrophication of Lake Hennessey and the need for active algal management actions are the direct result of land use practice changes in the contributing watershed similar to those requested by this Draft EIR. Below I have provided a problem statement of the impacts of nutrient loading on water resources, followed by an explanation of the specific shortcomings of the Draft EIR.

Human impacts on aquatic systems

Since the industrial revolution, human population growth has resulted in dramatic alterations to the function of our terrestrial and marine environments. Drastic changes in the land uses surrounding our inland and coastal waters have affected the hydrology, biology and chemistry of these ecosystems. Through urbanization, forest clearing, and extensive agriculture and livestock practices, humans have altered the natural cycles of the critical nutrients such as nitrogen (N) and phosphorus (P) (Vitousek et al. 1997a). As a result

cultural eutrophication, or the anthropogenic loading of excess nutrients to aquatic systems, has become the most widespread water quality problem in the U.S. (Carpenter et al. 1998). The perturbations of aquatic ecosystem function resulting from excess nutrient loading account for nearly 50% of all lake impairments and 60% of impaired river reaches (US EPA 1996).

Why eutrophication matters

The primary biological response of nitrogen and phosphorus loading is the stimulation of excessive algal growth in surface waters via photosynthesis. Since a specific ratio of N and P are necessary for plant growth, aquatic systems are considered to be "limited" by the nutrient for which there is an insufficient concentration to support growth (Redfield 1934). Therefore, anthropogenic inputs of a limiting nutrient to a waterbody can cause widespread blooms of microscopic photosynthetic aquatic plants—or phytoplankton—as well as larger aquatic weeds. As these plants die and decompose (i.e. respire) they can deplete the oxygen supply in the water column and can potentially induce massive die-offs of fish, invertebrates and other resident organisms.

Human health is also a concern, as eutrophication can cause shifts in phytoplankton species composition towards potentially toxic bloom-forming cyanobacteria, dinoflagellates or other toxic species. An extreme example of the repercussions of nutrient enrichment is the alarming ecological and human health concerns resulting from seasonal *Pfiesteria piscicida* outbreaks on the eastern seaboard (*http://www.chesapeakebay.net/pfiesteria.htm*).

In drinking water supplies, eutrophication can negatively impact water taste and odor while also creating water filtration difficulties (Smith 1998). The impacts of eutrophication on the biology, chemistry and health of freshwater ecosystems can be severe and have both primary and secondary implications on ecosystem and human health. One example is the chronic application of chemicals, such as copper sulfate, in water supply reservoirs to control algal blooms. Copper additions to natural aquatic resources have an additional long list of ecological implications, an annual practice in Lake Hennessey until recently (Beck 2006).

Current condition of the Napa River watershed

The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) has designated the following beneficial uses for the Napa River: agricultural, municipal, and domestic supply, cold freshwater habitat, fish migration, navigation, preservation of rare and endangered species, water contact and non-water contact recreation, fish spawning, warm freshwater habitat and wildlife habitat (SFBRWQCB 1995). It is the stated responsibility of the SFBRWQCB to manage the loading of nutrients within these watersheds to ensure that they "shall not cause nuisance" or "adversely affect beneficial uses" (SFBRWQCB 1995). Based on the extensive list of beneficial uses for the Napa River, excessive nutrient loading and the associated biogeochemical consequences are a significant concern and must be addressed in any vineyard development EIR.

The Napa River is listed on California's 303(d) list as impaired by nutrients, pathogens and sedimentation, while nearby Lake Hennessey—the City of Napa's drinking water supply—has previously been treated by the City of Napa with copper sulfate ($CuSO_4$) to control the excessive growth of algae and aquatic weeds. The Napa River watershed's current nutrient enrichment can be attributed to development, forest conversion and vineyard activities as illustrated by a nutrient loading watershed model developed by Wang et al. 2004. Vineyards occupy 16.6% of land in the Napa River watershed (NLCD 2001 Dataset, http://www.mrlc.gov/mrlc2k_nlcd.asp) and are estimated to account for upwards of 40% of nitrogen loading to the system (Wang et al. 2004). The findings of Wang et al. (2004) are alarming, considering that vineyard activities contribute as much, if not more, of nitrogen than all of the wastewater treatment plants in the Napa River Watershed combined. A nutrient Total Daily Maximum Load (TMDL) is currently being prepared for the Napa River Watershed. The TMDL

will document and provide a strategy outlining the necessary nutrient load reductions to improve the water quality of the Napa River system. Based on model simulations, Wang et al. (2004) suggest these annual load reductions may need to be over 40% from current annual loading to mitigate the existing eutrophic conditions. The most effective future management actions will have to address the greatest contributors of nutrients to the Napa River. The anthropogenic application of nutrients as fertilizers on vineyards will be an obvious focus of pollutant reduction efforts.

Within the Lake Hennessey watershed, nearly 9% of the land is used for vineyards (Figure 1). The location of the Project has a high hydrologic connectivity, meaning there is likely a direct surface water connection with both Lake Hennessey and Conn Creek during storm runoff events. Due to this hydrologic connectivity the risk of exacerbating the pre-existing eutrophic conditions to downstream aquatic resources as a result of the proposed land use change at this Project is likely significant.

Inadequately addressed issues in "Chapter 4 – Environmental Analysis" of the Draft EIR

The environmental analysis presented in Chapter 4 of the Draft EIR fails to provide a thorough investigation of the potential for significant nutrient loading resulting from the Project. "Section 4.4: Hydrology and Water Quality" discusses the potential impacts on surface water and ground water quality, but there are significant omissions and unjustified assumptions. The conclusions of these sections are that "Impact 4.4-1: Water Quality" and "Impact 4.4-3: Groundwater Recharge and Consumption" are both "Less than Significant". In the context of protecting the beneficial uses of the waterbodies of the Napa River watershed, however, the following essential components of water quality were not adequately addressed:

- **Existing conditions and post-development potential for nutrient loading through surface waters not quantified**

The Draft EIR does not adequately address the potential for increased surface water or nutrient loading resulting from the proposed vineyard development. The Project is assumed to have a non-significant impact on surface water quality with regards to nutrients based solely on comparisons to current land uses on the Property, and no quantitative estimates of existing or predicted post-project conditions are given. The Rogers Property is currently used for the seasonal grazing of approximately 50 cattle (Section 3.3.4), though a site visit conducted by Hydrologic Systems (HSI) mentions that no signs of recent cattle grazing were observed (Appendix C). The Draft EIR claims that these grazing activities are already generating excess nutrients (among other pollutants), and the conversion of a portion of the Property to vineyard would not result in an increased nutrient load. No scientific data is provided to support this claim of non-significant impact.

In order to ensure that the Project would not further compromise the beneficial uses and/or significantly contribute to nutrient loading to the downstream waterbodies, a more comprehensive analysis of potential surface and groundwater nutrient concentrations is needed. There are multiple concerns regarding nutrient loading in the watershed. The Napa River has been shown to be N-limited (San Francisco Bay RWQCB 2003 data cited in Wang et al. 2004), while Lake Hennessey exhibits P-limitation (Beck 2006). Therefore, adequate EIR risk assessment must consider nutrient transport pathways for both N and P. Though P tends to adsorb to sediment and would primarily be delivered through suspended sediment in surface flows, N is extremely mobile in its dissolved form and can be transported through both surface and groundwater flows.

- **Inadequate water quality data to demonstrate non-significant impact**

According to the Draft EIR, there is minimal data available regarding the pollutant concentrations in runoff from vineyards in the scientific literature. In an attempt to assess the potential pollutant load-

ing impacts of the Project, HSI recommended the collection of multiple stormwater runoff samples from adjacent vineyards built on similarly sloped land.

In an attempt to satisfy this need for water quality data, single samples were collected and analyzed at the end of the 2004 rainy season from three sites, and data were presented in "Impact 4.4-1". The sampling frequency of this water quality data collection effort did not meet the recommendations of HSI and is insufficient to characterize vineyard runoff, especially considering the spatial and temporal variability in runoff pollutant concentrations. The most significant shortcoming of this water quality impact analysis is that the samples were not analyzed for nitrogen, phosphorous or suspended sediment. These are the primary pollutants of concern from California's 303(d) list that are already impairing nearby receiving waters including the City's water supply. In order to adequately prove that the vineyards will not cause further water quality impairments, a potential nutrient loading analysis is indispensable.

The water quality analyses that were included in the Draft EIR should be considered low estimates of pollutant concentrations, as they were collected during a rain event late in the wet season after much of the dry season nutrient and pesticide application had most likely already been transported by earlier rains. Maximum pollutant concentrations would be expected in runoff generated by the first major rain of the wet season, also known as the "first flush" phenomenon (Bertand-Krajewski et al. 1998; Klaine et al. 1988).

Using runoff water quality data from nearby vineyards provides only a rough estimate of the potential impacts of the Project on nearby waterbodies. No information is given on the best management practices (BMPs) and mitigating measures used by these reference vineyards, nor are any statements given as to the mitigation measures to reduce nutrient impacts at the Project site. Local variability in hydrologic conditions combined with un-standardized vineyard land management practices make it impossible to determine the impact of the Project based solely on data from these nearby vineyards.

Considering the serious threats to the ecological functions of the Napa River and Lake Hennessey posed by nutrient pollution, measures to mitigate polluted runoff must be inherent in any future vineyard development in the Napa River watershed. Many local resources are available to assist land use planners in implementing such practices, including the California Sustainable Winegrowing Alliance *(http://www.sustainablewinegrowing.org*) and the Vineyard Manual from the Southern Sonoma County Resource Conservation District. A plan for implementing responsible fertilization and irrigation practices is central to mitigating the potential impacts of nutrient loading on the Napa River and Lake Hennessey. The Draft EIR for the Project provides no such plan.

- **Potential for groundwater transport of dissolved nitrogen ignored**

The Draft EIR fails to mention the potential for the transport of dissolved nutrients through groundwater. It is recognized in scientific literature that agricultural N applications often exceed the plants abilities to uptake the nutrients, and excess N has the potential to be mobilized by shallow groundwater flows (Nolan et al. 1997; Vitousek et al. 1997b; Carpenter et al. 1998). The transport of pesticides through groundwater flows is also of concern and is not adequately addressed in the Draft EIR. While a suite of pesticides and herbicides were analyzed in surface waters, the groundwater characteristics and potential impacts were completely ignored. The proposed vineyard's steep slope and proximity to Lake Hennessey (1000 ft.) and Conn Creek (1100 ft.) make it particularly susceptible to groundwater nutrient and hydrophilic pesticide transport to these nearby waterbodies. A thorough investigation of this important pollutant transport pathway is essential to understand the impacts of vineyard development at the Project site.

Extensive agricultural development—and vineyard development in particular—has recently been estimated to be the major source of nutrients to waterbodies in the Napa River watershed. These aquatic resources are of ecological significance, as they provide important habitat for the endangered fish species such as the Chinook Salmon and Steelhead Trout. They also provide drinking water and multiple economic and recreational benefits to the residents of Napa County. As it is presented, the Draft EIR for the proposed Project fails to sufficiently demonstrate that the vineyard conversion will not result in significant water quality impacts to downstream resources.

Sincerely,

Nicole G. Beck

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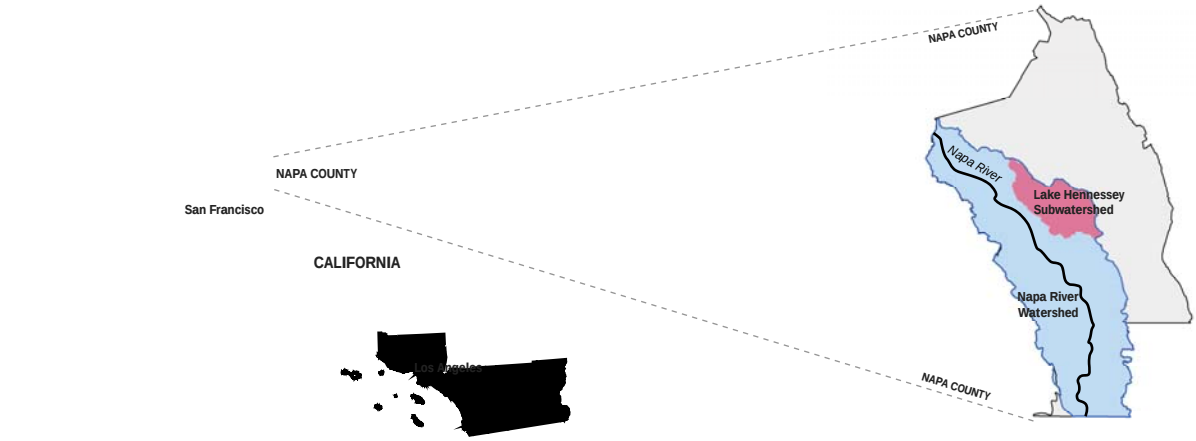

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LEGEND

- VINEYARDS PRESENT IN 2005
- LAKE HENNESSEY WATERSHED BOUNDARY
- PROPOSED SITE OF VINEYARD
- STREAMS / RIVERS

LAKE HENNESSEY WATERSHED AND VINEYARD DENSITY

FIGURE 1