

22 April 2011

Jo Anne Kipps
1568 East Loftus Lane
Fresno, CA 93710

Ms. Lani Andam
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

VIA: Electronic Submission
Hardcopy if Requested

Tentative Waste Discharge Requirements Order for Bogle Vineyards, Inc., Bogle Delta Winery, Yolo County

This letter transmits my written comments on the subject Tentative Waste Discharge Requirements Order (TWDRs). I am a Fresno County resident and a California registered civil engineer with expertise in evaluating the effects to soil and groundwater from discharges of food processing and winery wastewater to land for treatment and disposal. I submit the following comments and recommendations in the hope that Central Valley Water Board staff will revise the Tentative Order accordingly, or provide justification to the Central Valley Water Board why staff does not concur with my recommendations.

1. Finding 9 tabulates the winery's estimated monthly process wastewater flow rates, and indicates the total projected annual wastewater flow is 29.252 million gallons (Mgal). Meanwhile, Finding 6 indicates the winery will accept, treat, and dispose of process wastewater from the Discharger's Old River Vineyard winery. It is not clear whether the flow rates shown in Finding 9 include the monthly wastewater flows from the Discharger's Old River Vineyard winery.
Recommendation 1: Revise Finding 9 to indicate the tabulated monthly flow rates includes the process wastewater flows from Old River Vineyard winery, or revise the monthly flow rates (and annual total) to include these flows.
2. Finding 10 indicates that process wastewater will be treated to remove solids and reduce Biochemical Oxygen Demand (BOD) prior to land application. Finding 10.e presents certain design elements of the winery's three process wastewater treatment ponds. The finding identifies the function of Pond 1, the first-stage treatment pond, as "Primary Treatment." Primary Treatment typically refers to physical operations that remove floating and settleable solids (e.g., screening and sedimentation). Finding 13.n indicates that Pond 1 will be equipped with six aerators, which means the pond will serve as a winery's first-stage biological treatment reactor.
Recommendation 2: Revise Finding 10.e to identify the function of Pond 1 as "Secondary Treatment."
3. The TWDRs do not indicate whether Pond 2 and/or Pond 3 will be equipped with aerators.
Recommendation 3: If the Discharger does not propose to install and operate aerators in these ponds, then the TWDRs should present technical information demonstrating that sufficient BOD-removal treatment will occur in Pond 1 to ensure adequate dissolved oxygen levels are maintained in Ponds 2 and 3 in the absence of mechanical aeration.
4. The TWDRs do not provide a characterization of the wastewater that will be impounded in the treatment ponds. Winery process wastewater typically contains high concentrations of BOD,

nitrogen, and salinity constituents. The discharge site features shallow groundwater conditions. Therefore, it is reasonable to expect that the impoundment of this wastewater, absent adequate containment, will cause or contribute to exceedances of water quality objectives or affect beneficial uses of underlying groundwater. These characteristics of the wastewater and the discharge site warrant classification of the discharge as a designated waste as defined in California Water Code (CWC) Section 13173(b). **Recommendation 4: The TWDRs should include a projected characterization of the process wastewater that will be impounded in the winery's ponds for applicable waste constituents of concern and state that the winery's process wastewater is designated waste as defined in CWC Section 13173(b).**

5. The TWDRs do not provide a characterization of the solids and sludge generated from the process wastewater treatment. Because the TWDRs authorize the discharge of this waste to the land application area (LAA), it should include a finding that characterizes this waste for applicable constituents of concern (e.g., total nitrogen, potassium). **Recommendation 5: Add a finding that presents a projected characterization of the major solid waste streams that will be discharged to the LAA. Recommendation 6: Require the nitrogen loading from the applied solids to be included in the LAA monthly and annual nitrogen loading calculations. Recommendation 7: Include a requirement that applied solids and sludge shall be disked into LAA soils within 48 hours of application to preclude the development of nuisance odor and vector conditions.**
6. Finding 6 indicates that this is a new winery and elsewhere the TWDRs provide information characterizing wastewater flows and quality after treatment based on similar-sized facilities. Yet, inexplicitly, Finding 28 states that average monthly total dissolved solids (TDS) concentration of the wastewater is 700 mg/L. **Recommendation 8: Delete Finding 28 or explain why the TWDRs characterize the wastewater TDS as 700 mg/L and, as appropriate, specify whether this TDS concentration pertains to the wastewater discharged to Pond 1 (the first-stage treatment pond) or discharged from Pond 3 (the terminal treatment pond) to the LAA.**
7. Finding 10.d indicates that a rotary screen will be used for solids removal prior to biological treatment in the winery's three-pond wastewater treatment system. It is not clear elsewhere in the TWDRs whether the rotary screen will be placed on a concrete pad equipped with drainage and leachate collection to divert spilled wastewater back to the pond treatment system. **Recommendation 9: If applicable, revise Finding 13.i to include the rotary screen as one of the wastewater operations that will be placed on concrete pads. If the Discharger does not propose to place the rotary screen on a concrete pad, the TWDRs should require the rotary screen area be equipped with containment to preclude the infiltration of leachate into the ground.**
8. Finding 10.e indicates that the winery's wastewater treatment ponds will be equipped with a single 60-mil high-density polyethylene liner, and that two layers of liner will be placed under all pond equipment. Given the high strength of wastewater impounded in the ponds and the shallow groundwater conditions of the discharge site (described in Finding 25), the TWDRs should explain why the ponds will not be equipped with a secondary liner to collect leachate that will be released from the ponds due to leaks and punctures in the primary liner. **Recommendation 10: The TWDRs should provide technical information explaining why the ponds are not equipped with a secondary liner and a leachate collection and return system to preclude the infiltration of waste constituents into the soil as a best practicable control measure.**

Recommendation 11: The TWDRs should identify the cost of installing a secondary liner and leachate collection system for all three ponds and explain why the economic benefit to the Discharger by not installing these containment features is consistent with the maximum benefit of the people of the State of California.

9. Finding 10.h refers to “Biological Oxygen Demand (BOD).” The correct term for this wastewater parameter is “Biochemical Oxygen Demand.” **Recommendation 12: Revise Finding 10 to correct the spelling of BOD.**

10. Finding 10.h indicates that the Discharger’s three-pond wastewater treatment system will reduce process wastewater BOD to 100 mg/L or less. Finding 19.c indicates that the BOD loading rate to the LAA from the sprinkler application of treated wastewater will average less than 2 lb/ac/day. Despite this low projected BOD loading rate, the TWDRs inexplicitly establish an effluent limitation for BOD loading of 100 lb/ac/day. The TWDRs do not provide sufficient technical information to justify that the 100 lb/ac/day BOD loading rate is protective of groundwater quality, or why the TWDRs authorize a BOD loading that substantially greater than the Discharger’s projection. Indeed, the question of what constitutes a protective BOD loading in land treatment systems has not been satisfactorily addressed in the technical literature. The issue of BOD loading and its potential to degrade groundwater was discussed in two staff presentations to the Central Valley Water Board on 28 January 2005 and 17 March 2006.¹
Recommendation 13: The TWDRs should reduce the prescribed BOD loading rate to reflect the loading rate projected by the Discharger (i.e., 5 lb/ac/day). Recommendation 14: Because evaluating compliance with prescribed BOD loading rates is complicated due to the large amount of monitoring required, the TWDRs should establish an effluent limitation for BOD of 100 mg/L applicable to the discharge from Pond 3 to the LAA. Recommendation 15: The TWDRs should require Pond 3 effluent be applied to the LAA by sprinkler irrigation.

11. Finding 10.h states that the Discharger anticipates the effluent quality to have a pH ranging from 6 to 9. Finding 20.d indicates that the EPA Publication, *Pollution Abatement in the Fruit and Vegetable Industry*, recommends that wastewater applied to crops have a pH within 6.4 to 8.4 to protect crops. The TWDRs require effluent pH not be less than 6.5 or greater than 10.0. Finding 20.d justifies this higher pH limitation by stating, “low frequency dosing allows ample time for soil recovery between doses. Therefore, soils and underlying groundwater are expected to adequately buffer a wider range of pH.” The TWDRs do not address the potential for wastewater with a pH greater than 9 to cause upset or otherwise interfere with the biological processes in the pond treatment system. **Recommendation 16: The TWDRs should provide technical justification that the prescribed pH limitation is adequately protective of the biological processes in the three-pond treatment system or, if this is not possible, revise the pH limit to reflect the pH range identified by the Discharger in its Report of Waste Discharge (i.e., 6.0 to 9.0).**

12. Finding 18 states, “Total annual irrigation demand for the crops is estimated to be approximately 168 Mgal.” It is probable that a considerable amount of the crop demand will be met by shallow groundwater. **Recommendation 17: Revise Finding 18 to indicate whether the identified crop demand accounts for the demand that will be met by shallow groundwater.**

¹ Documents regarding these two staff presentations are currently available for download from http://www.swrcb.ca.gov/centralvalley/water_issues/waste_to_land/

13. Finding 24 presents the results of a single sample of groundwater from the winery's supply well. The finding does not provide basic construction details such as well depth and screened interval. This information is necessary to evaluate groundwater conditions at the discharge site. The sample results indicate that groundwater extracted by the winery's supply well is of high quality for most constituents of concern. **Recommendation 18: Revise Finding 24 to include well depth and screened interval(s) and provide technical justification that the sample results are representative of the groundwater extracted from the well.**
14. Finding 25 describes the winery's three groundwater monitoring wells, and indicates groundwater occurs at around six feet below ground surface. The finding does not identify any of the wells as representing upgradient groundwater. Additionally, Finding 26.b presents groundwater gradient data that indicates groundwater flow direction fluctuates from east to east/northeast to east/southeast to west. This suggests that none of the wells installed to date will be capable of monitoring groundwater unaffected by the discharges to the wastewater pond treatment system and LAA. **Recommendation 19: The TWDRs should require the Discharger install a groundwater monitoring well in an area that will remain unaffected by discharges to the pond treatment system and LAA.**
15. Finding 26.a summarizes the analytical results of monitoring groundwater passing through the winery's three monitoring wells from March to September 2010. The results show groundwater passing through all three wells contain manganese in concentrations exceeding the applicable water quality objective of 0.05 mg/L, and MW-2 contains nitrate (as N) in concentrations approaching twice the water quality objective of 10 mg/L. This data suggests that groundwater passing under the winery property contains sufficient organic carbon to mobilize manganese, which implies that the groundwater has no assimilative capacity for additional loadings of organic carbon. To further evaluate this possibility, the TWDRs should also summarize monitoring data for total organic carbon, if available. **Recommendation 20: Revise Finding 26.a to include a summary of monitoring results for total organic carbon, if available.**
16. The TWDRs provide information in various locations that allow for a determination of the separation distance between wastewater treatment pond invert and shallow groundwater. For example, Finding 10.e indicates that the water depth in each pond will be 12 feet. The TWDRS require a minimum pond freeboard of two feet. Finding 25.d provides data indicating groundwater occurs at depths ranging from 4.41 to 5.94 feet below ground surface. And, Page 3 of the Information Sheet states that the "tops of the wastewater pond berms were designed at 17-foot mean sea level with the capability to increase to 21 feet." **Recommendation 21: The TWDRs should identify the separation distance between the pond inverts to highest anticipated groundwater. If the separation distance is less than five feet, then the TWDRs should explain why a separation distance of less than five feet reflects best practicable control.**
17. Finding 35 states that the winery's domestic wastewater will be discharged to a septic system regulated by Yolo County. Attachment C, Site Plan, does not depict the location of the winery's septic system. Due to the shallow groundwater conditions at discharge site, the TWDRs should evaluate whether the winery's septic system complies with the minimum requirements of the Central Valley Water Board as contained in *Water Quality Control Plan for the Sacramento and San Joaquin River Basins, Fourth Edition* (Basin Plan). **Recommendation 22: Revise Finding 35 to include a determination of whether the winery's septic system complies with minimum Basin Plan requirements, particularly the requirement for a minimum five feet of vertical**

separation between the bottom of leachfield trenches and highest anticipated groundwater. Recommendation 23: Revise Attachment C, Site Plan, to depict the location of the winery's septic system.

18. Finding 42 states, "Groundwater limitations in this Order are based on background water quality because the background concentrations of constituents of concern exceed water quality objectives in the shallow aquifer as shown in Finding No. 26.a." The TWDRs do not contain an adequate characterization of "background water quality." **Recommendation 24: Include one or more findings characterizing background water quality, and describe the data and method(s) used to characterize background water quality.**
19. Finding 47 classifies the discharge's threat to water quality as "2" and the discharge's complexity as "B." Title 23, California Code of Regulations, Section 2200 defines Category A complexity as: "Any discharge of toxic waste, any small volume discharge containing toxic waste or having numerous discharge points **or ground water monitoring**, or Class 1 waste management unit" (emphasis added). Because the TWDRs require groundwater monitoring, the proper classification of the discharge's complexity is "A." **Recommendation 25: Revise Finding 47 to classify the discharge's complexity as "A."**
20. Land Application Area Requirement D.3 allows the Discharger to apply wastewater to the LAA via sprinklers, flood, or drip irrigation. The Discharger indicated it plans to apply wastewater via sprinkler irrigation. Sprinkler application allows for greater control of BOD loading and maximizes the uniform distribution of wastewater to the entire LAA and is a best practicable treatment or control measure. **Recommendation 26: Revise this requirement to require wastewater be applied to the LAA only by sprinkler irrigation. Recommendation 27: Include a requirement for flushing with fresh water all pressurized pipelines conveying wastewater to the LAA as necessary to preclude odor nuisance.**
21. Land Application Requirement D.10 establishes setback requirements, including a 50-foot setback between the edges of the land application area to industrial, domestic, or irrigation well. To minimize the potential for wastewater to enter shallow groundwater monitoring wells, and thereby compromise the representativeness of groundwater monitoring data, the requirement should include groundwater monitoring wells. **Recommendation 28: Revise this requirement to include groundwater monitoring wells as among the wells requiring a 50-foot setback.**
22. Groundwater Limitation F.1 establishes "interim groundwater limitations" based on "background concentration limit" or water quality objective, whichever is greater. As indicated above, the TWDRs do not include findings that explicitly characterize background groundwater quality. The Information Sheet states, "Interim groundwater limitations are based on statistical analyses of background groundwater data using a 0.025 critical t-score." However, the Information Sheet does not provide any information on this background groundwater data (e.g., where does it come from? How many samples were taken to characterize background quality, etc.). The interim limitation for nitrate (as N) of 38 mg/L is over twice the highest concentration of nitrate (as N) in winery's monitoring wells. And, nitrate is a constituent subject to control and, as such, the interim limitation for this constituent should be set no higher than the water quality objective of 10 mg/L (as N). **Recommendation 29: Include a finding in the TWDRs that thoroughly characterizes background groundwater and provide supporting data, as appropriate, regarding the data used to characterize background groundwater in the Information Sheet.**

Recommendation 30: Revise the interim groundwater limitation for nitrate (as N) to 10 mg/L.

23. The TWDRs do not, but should, include a reopener provision to allow the Central Valley Water Board to reopen the Order for consideration of adding or revising numerical effluent or groundwater limitations for problem constituents. **Recommendation 31: Include a Provision that states, "If the Central Valley Water Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of any groundwater quality objective, this Order may be reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for the problem constituents.**
24. The Tentative Monitoring and Reporting Program (TMRP) requires composite samples be collected from the ponds for determining electrical conductivity (EC). Given the amount of flow equalization provided in the pond treatment system, grab samples for determining wastewater EC should be adequate. **Recommendation 32: Revise the TMRP to specify grab samples of pond wastewater for EC analysis.**
25. The TMRP states, "Loading rates for the land application areas shall be calculated using applied wastewater and any supplemental irrigation water." This directive appears to conflict with the methods specified in the TWDRs for calculating BOD and nitrogen loading rates (Effluent Limitations C.1.a and C.1.b, respectively). **Recommendation 33: Revise the TMRP to require the calculation of BOD and nitrogen loading rates as specified in Effluent Limitation C.1). Recommendation 34: Require nitrogen loading rates to include loadings from applications of winery solids and sludge and farm fertilizers.**
26. The TMRP does not, but should, require groundwater monitoring for total organic carbon or arsenic. The discharge of winery waste to land has the potential for increasing the concentrations in groundwater of these two constituents. In order to evaluate the extent to which the discharge is overloading the LAA with organics, the TRMP should require quarterly monitoring of groundwater for total organic carbon and arsenic. **Recommendation 35: Revise the TRMP to require quarterly monitoring of groundwater for total organic carbon and arsenic.**
27. The TMRP does not, but should, require periodic monitoring of pond sludge depth. In my 12 years experience working for the Central Valley Water Board in the WDR Program, many dischargers with pond treatment systems tend to delay monitoring for pond sludge depth until excessive suspended solids degrade effluent quality. Once this happens, sludge removal and dewatering can be a considerable and costly undertaking that may generate nuisance odors. Requiring periodic monitoring of pond sludge depth will provide necessary information to the discharger to ensure it optimizes pond operation and maintenance. **Recommendation 36: Revise TMRP to require sludge depth be monitored in all wastewater ponds at least once every three years.**
28. The TRMP does not, but should, require periodic monitoring of pond liners for containment integrity. **Recommendation 37: Revise TMRP to require leak detection monitoring of all pond liners (e.g., via geoelectrical leak detection methods) at least once every five years.**

I appreciate the opportunity to comment on the TWDRs. I commend the Discharger for proposing to provide a level of process wastewater treatment that far exceeds that of most Central Valley Region wineries, and for initiating groundwater monitoring prior to commencing discharge.

A handwritten signature in black ink that reads "Jo Anne Kipps". The signature is written in a cursive style with a large, looping initial "J".

JO ANNE KIPPS
RCE 49278