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Comments— Tentative WDRs for Bronco Wine Company, Stanislaus County

This letter transmits my comments on the 4 June 2020 “Tentative Revision to Waste Discharge Requirements Order 96-247 for Bronco Wine Company, Stanislaus County” (Tentative Order). The Tentative Order’s cover letter requests comments by 2 July 2020. I was unaware of the Tentative Order until 5 August, when I read the 4 August email from lyris@swrcb18.waterboards.ca.gov regarding the 13-14 August 2020 Meeting Notice and Agenda for Central Valley Water Quality Control Board (Board or Region 5). I was busy trying to meet the 5 August noon deadline for my comment letter to the State Water Resources Control Board’s tentative “General Waste Discharge Requirements for Winery Process Water.” Consequently, I did not open the email until yesterday afternoon. It was then when I became aware that the Tentative Order was on the Board meeting’s uncontested calendar. The cover letter states, “Although it is not required, we would appreciate receiving comments before the due date above.” Yesterday, I contacted the staff named in the cover letter, Maxine Cottell, and she indicated to me that management (and, by extension, the Board Chair) might accept my comment letter despite the late submittal date.

The facility owned and operated by Bronco Wine Company (Bronco or Discharger) south of Ceres isn’t, but should be, named in the Tentative Order’s title. The “Bronco Winery” (or perhaps “Ceres Winery” – whatever Bronco calls it) has played a significant role in field studies sponsored by the Wine Institute in the early 2000s. This study collected a suite of analytical data on soil, soil pore water, and groundwater at the Bronco Winery land application area (LAA).

The manner in which Bronco has historically discharged winery waste to land (infiltration basins) and the elevated salinity concentrations in groundwater underlying Bronco’s discharge operation compared to background has long been a concern to me. It is not often that the Board updates the Waste Discharge Requirements (WDRs) Order for a major winery, and it is important that the Tentative Order reflects the most up-to-date understanding of the discharge’s groundwater impacts.

The changes I request are more extensive than that typically handled in late revisions. It is my hope that management will pull the Tentative Order from the upcoming meeting’s agenda so that staff may have time to review my comments and, I hope, revise the Tentative Order accordingly.

If the item is not pulled, I will contest the item and consolidate my concerns and recommendations into a three-minute oral presentation with the hope of persuading the Board to postpone its consideration of the item. During the postponement, I will confer with staff on my requested changes and, provided we reach a mutual agreement, I will not contest the revised Tentative Order when it is rescheduled for a subsequent meeting.

I am a resident of Fresno County and a California registered civil engineer with 12 years experience working for the Central Valley Regional Water Quality Control Board (CVRWQB or Region 5). During my employment from February 1998 through December 2010 in Region 5's Fresno Office, I worked primarily in the WDR regulatory program. As a result, I was fortunate to have gained expertise in evaluating the effects to soil and groundwater from discharges of food processing and winery wastewater to land for treatment and disposal. As part of my regulatory duties, I served on the BOD Loading Rate subcommittee that prioritized and defined the revisions to the 2006 version of the 2007 *Manual of Good Practice for Land Application of Food Processing/Rinse Water* prepared for the California League of Food Processors by Brown and Caldwell and Kennedy/Jenks Consultants (CLFP Manual).¹ I also prepared technical commentary to Region 5 management on documents proposing and then describing the results of field studies conducted on the land application of winery wastewater sponsored by the Wine Institute and performed by Kennedy/Jenks Consultants. This work is cited or otherwise appears in the 2009 *Comprehensive Guide to Sustainable Management of Winery Water and Associated Energy* prepared by Kennedy/Jenks Consultants for the Wine Institute (Wine Institute Guide).²

General Comments and Recommendations

Winery wastewater is potent and putrescible. Its discharge to land for passive soil treatment and ultimate disposal to groundwater requires careful management to preclude the development of nuisance odor and vector conditions, as well as unreasonable groundwater degradation. In terms of the concentrations of waste constituents such as BOD₅, FDS, and total nitrogen, winery wastewater is "high strength" compared to domestic wastewater. To comprehend the magnitude of the difference between winery and domestic wastewater, it is instructive to estimate the "population equivalent" of Bronco's winery discharge with respect to BOD₅.

Most, if not all, WDR Orders include a finding indicating surface water drainage courses near the general discharge area.

Finding 9 indicates that the winery's wastewater includes reverse osmosis reject or brine and "distilling material generated at an offsite facility owned by" Bronco. Due to the high strength of these wastes, the Tentative Order should characterize each separately to characterize their discharge flow and quality, especially with respect to salinity constituents. If it is determined that these wastes are, by themselves, "designated waste," its discharge to land (even when blended with winery wastewater) should be prohibited.

Finding 11 in indicates Bronco's use of "unlined percolation-evaporation ponds" that later Finding 15 states are also "known as infiltration basins IB-1 to IB-5." I recommend this Discharger-specific designation be presented here. The Finding also uses the term "Effluent" to reference Bronco's untreated winery wastewater. Since Bronco does not provide treatment per se, beyond solids screening, the correct term is "wastewater." But, understandably because of regulatory convention, the Tentative Order uses the term "Effluent Limitation" as well as "effluent" elsewhere. Here is the place to indicate that effluent refers to winery wastewater following screening.

Finding 12 presents monthly average daily discharge flow rates by month. From this I derived an average discharge flow of 123.6 MG/year. Using this value and discharge's average BOD₅ of 2,373 mg/L presented in Finding 13, I determined the discharge's BOD₅ load as 2,446,886 lb/year or 6,703 lb/day on average. Using a population equivalent of 0.12 lb BOD₅/capita-day,³ Bronco's current daily BOD₅ discharge is equivalent to the domestic wastewater flow of 55,865 people! The maximum annual allowable discharge flow, 175 MG is almost 30 percent higher than current discharge flow, so the population equivalent is potentially much greater. Finding 5 indicates Bronco's land application area (LAA) encompasses 122 acres. This means that, at current flows, Bronco's BOD₅ loading to its LAA is equivalent to the untreated domestic wastewater discharge of about 450 people/acre.

As such, Bronco's discharge of winery wastewater to land represents an organic loading significantly higher than domestic wastewater, which, with the exception of septic tank/leachfield discharges, is typically subjected to at least secondary treatment prior to discharge. While winery wastewater may not be loaded with human pathogens, its discharge to land has a high potential for degrading groundwater.

Finding 18 presents Table 5 identifying average hydraulic and constituent loading rates to the LAA, identified in Finding 5 as encompassing 122 acres, including 15.7 acres of unlined percolation-evaporation ponds ("infiltration basins") (Finding 15). Table 5 inexplicitly presents a summation of monthly average discharge flow, a meaningless value. Based on the monthly "Average BOD (mg/L)" and monthly average discharge flow, I calculated the average amount (lb) of BOD generated each day for each month. Then, I divided these values by 122, the acreage of Bronco's LAA (including its ponds). Because the values I determined for "BOD Loading (lb/ac/day)" differed from that presented in Table 5, I "back calculated" acreage reflected in these values. The back-calculated averages in four months (August, September, October, and January) all exceed 122 acres. I didn't bother to check the nitrogen loading calculations, but I suggest staff confirm that they were determined correctly. It appears that the discharge flow to the infiltration basins were included in the flows to the LAA. To accurately characterize Bronco's BOD & Nitrogen loadings to land, they should be calculated for each type of discharge (i.e., infiltration basins and cropped areas) (more on this elsewhere).

Finding 20 discusses the hydraulic loading of wastewater to the LAA employs the word "agronomic" in the second sentence: "Based on the water balances, wastewater is being

applied at agronomic rates.” The term, agronomic, is typically used to describe amount of nitrogen and other plant nutrients required for crop production. The finding should be revised to specify that it is discussing crop water demand. Further, the infiltration basins are apparently not cropped. The finding needs to clarify this (also Land Application Area Specification G.4).

Finding 25 describes a planned addition of a 20-acre almond orchard to the LAA. The combined area of the three existing LAA fields (RR-1 through RR-3) is 85.6 acres. When combined with the 15.7 acres of existing infiltration basins, the existing LAA is 101.3 acres, not the 122 acres identified in Finding 5. The 20.7-acre difference between these values needs to be explained. What is the LAA acreage that is already authorized under Bronco’s current WDR Order? The Information Sheet pegs it at 106 acres. Does Bronco already discharge to the 20-acre orchard? If so, when did it start? Did Bronco include this 20-acre orchard in its LAA acreage identified in its report of waste discharge? Clarify.

Finding 26 is apparently missing, as Finding 27 follows Finding 25.

Finding 27 states Bronco is “considering installing additional ponds in land currently used for land application.” Does the Tentative Order evaluate the potential groundwater impacts from this change in discharge operation? In any event, the discharge of winery wastewater to unlined ponds does not reflect best practicable control. It never has and never will. The State Water Resource Control Board’s Tentative General Order for “Winery Process Water Treatment Systems” addresses this. Finding 28 of the Tentative General Order declares that it “requires new or expanding ponds to be lined to meet a hydraulic conductivity standard of 1×10^{-6} centimeters per second (cm/s) or less.”

Bronco’s discharge to infiltration basins has the potential to release waste constituents to groundwater at concentrations exceeding applicable water quality limitations. That is, this disposal method should be considered a discharge of designated waste subject to Title 27 requirements. Bronco’s continued discharge to infiltration basins threatens to violate the Tentative Order’s Discharge Prohibition A.3 and, as such, should be prohibited.

Finding 34 states that area groundwater is about 25 to 45 feet below ground surface. It states, “Depth to groundwater has **increased** [emphasis added] historically in the area due to increased groundwater pumping for agricultural use.” How can that be? Are the laws of physics different in the discharge area? Explain or correct. Also, the Information Sheet is more informative, naturally, and states: “In the fourth quarter of 2017, depth to groundwater beneath the facility ranged from 23.1 to 28.5 feet below ground surface (bgs).” This information should be included in this finding, as it demonstrates groundwater is mounding under the discharge site (especially under the infiltration basins).

Findings 38 and 39 characterize groundwater quality in upgradient and downgradient monitoring wells. Attachment B depicts MW-8 and MW-12R adjacent to a Turlock Irrigation District Canal, which conveys high quality surface water. The finding should indicate whether or not this canal is equipped with a concrete liner. If not, then the

percolation of high-quality surface water will influence the quality of groundwater passing through these two monitoring wells to the extent that they may not be representative of background conditions (to the Discharger's detriment, I may add). The salinity of groundwater passing through these two wells is the lowest of all the monitoring wells, suggesting canal seepage does influence groundwater quality.

Finding 40 indicates that nitrate concentrations in all downgradient wells are less than upgradient MW-9 (49 mg/L nitrate-nitrogen). It also indicates that groundwater salinity is higher in downgradient wells. The combination of lower or non-detect nitrate and elevated salinity in groundwater underlying winery (and food processing) wastewater discharge sites, compared to upgradient groundwater, is a red flag indicating organic overloading.

Nitrate is non-detect in MW-11R and low in MW-4. Groundwater passing through these wells will likely contain elevated concentrations of total organic carbon, hardness, bicarbonate alkalinity, and possibly elevated iron and manganese, and possibly arsenic. So, to characterize groundwater degradation (and possibly pollution) by Bronco's discharge, it is imperative for the MRP to include the following in monitored groundwater constituents: bicarbonate alkalinity, hardness, arsenic, and total organic carbon.

Additionally, Finding 40 presents average TDS values of all monitoring wells. This is really a meaningless calculation unless explained. The finding should elaborate on the quality differences in groundwater upgradient and downgradient from the LAA, especially in the groundwater mound created under the infiltration basins. The salinity in groundwater in the two wells immediately adjacent to these basins (MW-3 and MW-5) and the two that may be within the mound (MW-4 and MW-6) are the highest of all the monitoring wells. The low nitrate in MW-4, close to the area labeled "SOLIDS" in Attachment B, suggests that leachate from solids handling and storage is causing excessive organic overloading. The Tentative Order should require Bronco to evaluate the integrity of the concrete slab upon which solids are stored, as it appears it is cracked and leaking potent leachate to groundwater.

Finding 41 states:

Although groundwater shows an increase in total salts over time, it is not clear whether the increase is due to the discharge described in this Order or whether it is due to increased upgradient agricultural activities unrelated to this discharge.

I am sorry to be the bearer of bad news, but this finding shows a lack of technical knowledge and understanding on the part of staff and management alike. It is staff's responsibility to attempt to understand why salinity is elevated in groundwater affected by the discharge. Didn't the report of waste discharge contain a complete characterization of groundwater in all monitoring wells? If not, why didn't staff request this? The Board's consideration of the Tentative Order must be postponed in order for staff to request Bronco (via invoking section 13267 if necessary) to sample groundwater in all monitoring wells for constituents already identified in the MRP along with calcium and magnesium (hardness), bicarbonate

alkalinity, total organic carbon, iron, manganese, and arsenic. Only until staff receives these data can staff revise this finding to the level of specificity required for Board consideration.

Please be advised that Bronco's discharge to infiltration basins is atypical among California's wineries, large and small. It represents an extremely cheap way of disposing of winery wastewater and, as such, saves Bronco many thousands of dollars annually in wastewater treatment and disposal costs. The cost savings Bronco enjoys by essentially injecting untreated winery wastewater to groundwater is no doubt why it was able to sell its wine for years at Trader Joe's for \$1.99 a bottle ("Two Buck Chuck").⁴ If the Board adopts the Tentative Order in its current form, it will be complicit in perpetuating an existing unequal economic playing field for other wineries that do the right thing (sorry, but it's true).

Finding 67 states there is "no evidence to date of development of anoxic conditions in the vadose zone." What is meant by "no evidence"? What studies or data were reviewed to confirm this statement? If there are no studies or data, then the absence of evidence is not the same as "no evidence." I strongly encourage staff (and management alike) to review *Land Application of Winery Stillage and Non-Stillage Process Water: Study Results and Proposed Guidelines* by Kennedy/Jenks Consultants for the Wine Institute. This report contains soil pore liquid quality at the Bronco site and, if my memory serves me correctly, soil pore water often contained non-detect nitrate concentration and extremely high concentrations of iron and manganese concentrations. This pattern is the hallmark of anoxic soil conditions. This is another reason why the Board must postpone consideration of the Tentative Order—to allow staff to review this data and revise Finding 67 accordingly.

Also, what about the BOD loading to the infiltration basins? What are these? If they far exceeded the 300 lb/ac/day prescribed for cropped areas, why isn't this flagged as a water quality concern? I strongly urge staff (and management) to reassess the water quality impacts of Bronco's infiltration basin discharge. To reflect best practicable treatment or control, ostensibly required by the Tentative Order, Bronco must cease and desist its infiltration basin discharge. For that to occur, Bronco will have to expand its LAA to ensure it can consistently meet the Tentative Order's requirements. Since this won't likely happen overnight, the Board should contemporaneously adopt a cease and desist order to establish a time schedule for Bronco to wean itself off its historically cheap method of winery wastewater disposal.

Finding 71 identifies downgradient monitoring wells as MW-1R, MW-2, MW-3, MW-4, and MW-11R. Wells near the infiltration basin, MW-5 and MW-6, have recently been dry and should be replaced. The Tentative Order should include a general provision requiring the replacement of monitoring wells that go dry.

Finding 77 determines the facility's threat to water quality as "Category 2" and its complexity as "Category B. The discharge has apparently already caused groundwater salinity to exceed upper secondary maximum contaminant levels (TDS 1,000 mg/L and EC 1,600 umhos/cm). As such, it threatens the long-term loss of groundwater's beneficial use as domestic and municipal supply. Accordingly, Board should determine its threat to

water quality as “Category 1.” Additionally, because the discharge operation features numerous discharge points to the cropped fields comprising the LAA and numerous groundwater monitoring wells, the Board should determine its complexity as “Category A.”

IT IS HEREBY ORDERED Section

A general comment about terminology. When I supervised permit writing staff, I emphasized the need for consistent terminology throughout a WDRs Order, including its Monitoring and Reporting Program (MRP), Information Sheets, and all attachments. Also, I instructed staff to use the terms typically used by the Discharger to designate the various aspects of its discharge operation. I recommend that the language throughout the Tentative Order (and its accompanying MRP, Information Sheet, and attachments) be reviewed carefully and revised as necessary for consistency (e.g., always use “infiltration basins” to refer Bronco’s percolation / evaporation ponds, etc.).

Discharge Prohibition A.2 should specify the pH range associated with hazardous waste (pH less than or equal to 2.0 or greater than or equal to 12.5). Bronco has an apparent history of exceeding pH limits established by its existing WDRs Order (Finding 24). What are the current pH “range limits” anyway? Do they simply reflect hazardous waste levels? If the pH limits are more stringent (e.g., to be protective of soil quality and conducive to soil biological treatment), why aren’t they carried over in the Tentative Order?

Discharge Prohibition A.11 should also prohibit the discharge of reverse osmosis brine, which by any measure is a designated waste. While the salt in this brine is derived by its removal from source water, its salinity is also composed of chemicals used periodically to clean the membranes. The Tentative Order needs to characterize this high salinity waste stream (flow and quality) and evaluate alternative methods for disposal rather than blending it with winery wastewater, which already is characterized by high salinity.

Effluent Limitations prescribe only one for TDS (1,200 mg/L flow weighted annual average). To ensure the discharge is not deleterious to soil bacteria responsible for attenuating applied BOD (as well as to protect crop health), an effluent limitation for pH should be prescribed (e.g., Effluent discharged to the LAA shall not have a pH of less than 6.5 or greater than 10.0).

Mass Loading Limitations D.1 does not establish mass loading limits for infiltration basin discharges. Why? Could it be that staff and management have simply thrown up their hands and admitted defeat on trying to effectively regulate this discharge to protect groundwater quality? There should be findings that at least attempt to justify continued discharge to infiltration basins. If this discharge cannot be justified as protective of water quality then it should be prohibited as explained earlier.

The “BOD mass loading” limitation of 300 lb/ac/day will invariably require dilution with groundwater or high quality surface water. There should be a finding discussing this. Unless the Tentative Order can justify it is absolutely necessary for Bronco to use

supplemental water for crop irrigation, Bronco's use of supplemental water to dilute wastewater to meet the BOD mass loading limitation brings into question whether Bronco's use of the water is both "reasonable and beneficial" as required by the California Constitution (Constitution's Article X, Section 2).

Discharge Specification E.12 is a prohibition pertaining to solids storage area leachate and stormwater control and, as such, should be moved to the Prohibitions section or rephrased and incorporated in Solid Disposal Specification H.2.

The following discharge specifications should be included as best practicable control:

Wastewater shall not be stored in ditches or low-pressure or unpressurized pipelines. Irrigation pipelines shall be flushed with fresh water after wastewater application as often as needed to ensure continuous compliance with Discharge Specification E.6.

The resulting effect of the wastewater discharge on the soil pH shall not exceed the buffering capacity of the soil profile and shall not cause significant mobilization of soil constituents such as iron and manganese.

The Discharger shall not discharge wastewater to the LAA within 24 hours of a predicted storm event, during periods of precipitation, and for at least 24 hours after cessation of precipitation, or when soils are saturated.

All applied wastewater must infiltrate before the next wastewater irrigation event. No pooling or ponding of irrigated wastewater shall occur beyond 24 hours after application.

Provision I.3 describes the details required in any report proposing the installation of "a new pond or land application area." I recommend that this be covered in two provisions: one for new land application areas, the other for new ponds. To reflect best practicable control and consistency with the State Board's Tentative General Winery Order, the new pond provision should require all new ponds to be lined to meet a hydraulic conductivity standard of 1×10^{-6} centimeters per second (cm/s) or less. And, of course, the provision should identify the submittal of the usual reports associated with such surface impoundments (e.g., proposed pond construction details, after-construction certification). Refer to the State Water Board's Tentative "General Waste Discharge Requirements for Process Winery Water" dated 3 July 2020 for more specifications for surface impoundments, and revise the Tentative Order to be at least as stringent as this State Board Order.

Provision I.4 regarding increasing waste flows typically applies only to municipal wastewater dischargers. Bronco's winery wastewater flows appear fairly stable and so, without explanation or justification, this provision appears unnecessary (perhaps a cut-

and-paste mistake?). In any event, this scenario is covered by Standard Provisions and Provision I.12.

MONITORING AND REPORTING PROGRAM

SOURCE WATER MONITORING

The MRP requires source monitoring be performed every three years for EC, TDS, and Nitrate nitrogen. For a major winery authorized to discharge up to 175 MG/year, this is inadequate. Unless data exists to show source water quality varies little through time, the frequency should be increased to annually to evaluate the efficacy of Bronco's salinity control measures. To aid in this evaluation, source water for wine production should also be monitored for standard minerals.

Elsewhere, in effluent monitoring, standard minerals are identified as chloride, sodium, dissolved iron, and dissolved manganese. **To adequately characterize the standard mineral content of production source water, wastewater, and groundwater, the suite of standard mineral constituents should also include potassium, calcium, magnesium, hardness, bicarbonate alkalinity, and sulfate.**

WASTEWATER EFFLUENT MONITORING

Revise 1st sentence to read: "Wastewater samples shall be obtained ~~from the effluent~~ at the outlet of the wastewater storage tank, ... and shall be representative of wastewater quality that is ~~sent discharged to the percolation ponds~~ infiltration basins or is applied to the LAAs."

The bi-weekly monitoring frequency for most constituents and parameters, including pH, is inadequate for pH given Bronco's history of violating existing effluent pH limits (or discharge prohibition for hazardous waste). To evaluate Bronco's compliance with Prohibition A.2 and any effluent limitation for pH as recommended previously, the frequency of effluent pH monitoring should be increased to weekly, if not daily. And, pH (and EC) sample type should be grab, not composite. Monitoring of pH (and EC) is typically via grab samples likely using facility-owned and operated probes. As such, it should not be burdensome for Bronco to perform daily pH monitoring.

POND MONITORING

As I explained previously, since the Discharger refers to its ponds as infiltration basins, the header for this section should read: **INFILTRATION BASIN MONITORING**. The 1st sentence should be revised to read: "A permanent marker (e.g. staff gauge) shall be placed in all ~~WWTF treatment and evaporation / percolation ponds~~ (infiltration basins). For consistency, the term "pond" should be replaced with "infiltration basin" throughout in this section. Sample type for "Odors" should be "NA" and not "Observation."

To document the hydraulic and waste constituent loadings to each infiltration basin, it is essential to monitor and report (1) daily wastewater discharge flow to each infiltration basin (gallons/day and inches/day) and (2) loading rates (lb/ac/day) of BOD and total nitrogen. This data is essential in characterizing the infiltration basin discharge and evaluating the extent to which it is impacting groundwater.

LAND APPLICATION AREA MONITORING

To evaluate compliance with the Tentative Order's BOD mass loading rate and hydraulic and nitrogen loading rates, it is essential that this data be collected and reported for each individually managed field receiving wastewater applications, not just to the entire LAA. The Discharger should provide in its monitoring reports a scaled map detailing each of these areas, along with their acreages.

GROUNDWATER MONITORING

To get a timely and ongoing characterization of groundwater passing through monitoring wells, especially for any statistical analysis, groundwater monitoring well sampling frequency should be increased to quarterly. Don't take my word for this, just ask any of the dozens of registered hydrogeologists working in Region 5.

Add total organic carbon to the suite of monitored constituents in groundwater as this will provide essential information on the extent to which the discharge is overloading groundwater with organic carbon.

GROUNDWATER LIMITATIONS

This entire section is not germane to the MRP and belongs in the Tentative Order proper. Table 8 identifies which wells will be used to evaluate compliance with the groundwater limitations (i.e., Compliance Wells). This table should be moved in its entirety to the Groundwater Limitations section. All the language regarding how groundwater quality is to be determined, what happens when groundwater limitations are exceeded, and BPTC Workplan submittal requirements should all be moved to the Provisions section. Some language can be incorporated into Provision I.2, the rest, in a separate provision or provisions.

REPORTING

On Page 9, Facility is identified as "Bronco Wine Company," which is the name of the Discharger, not its facility. What does Bronco call its winery? If it's just "winery" then I recommend the Facility Name be "Bronco Winery."

Program: Is the antiquated program term of Non-15 actually still in use? I thought the current term was "WDR Program."

On Page 10, Results of LAA Monitoring, the equation used for FDS loading rate, the variable "A" is defined as "area of the irrigated LAA in acres (ac.)."

Somehow, the Discharger has to calculate the FDS loading to each individually managed field within the large plots of land that comprise the LAA. Somewhere, in a finding perhaps, staff can identify the acreage used on a daily basis to dispose of the winery's wastewater flow (currently via flood irrigation). The finding should discuss how the Discharger currently calculates daily loadings of flow and BOD, as well as annual loadings of nitrogen and TDS.

It is important that the wastewater discharges to the LAA be reported in "granular detail" to ensure some portions of the LAA are not more heavily loaded than others. Without specifying this, the Discharger will be inclined to treat the entire LAA as receiving wastewater applications when clearly this is not the case. This is one of the most challenging aspects of regulating land application areas. Some dischargers do a better job than others. What is necessary is for the discharger to identify discrete areas that receive wastewater applications on a daily basis, not only for FDS but particularly also for BOD and nitrogen.

Thank you for the opportunity to submit these comments.



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¹ Available for download from:

<http://clfp.com/wp-content/uploads/CLFP-Manual COMPLETE FINAL 3-14-07-2-1.pdf>

² Available for download from:

<https://www.sustainablewinegrowing.org/amass/library/7/docs/Comprehensive%20Guide%20to%20Sustainable%20Management%20of%20Winery%20Water%20and%20Associated%20Energy.pdf>

³ This value assumes a daily domestic wastewater flow of 70 gallons/day ("Typical Home" per capita-day domestic wastewater flow in Reference 1), a domestic BOD concentration of 200 mg/L ("Medium" strength in Reference 2). Per capita BOD: (70 gallons/capita-day)/(1,000,000 gallons/MG)*(2,767 mg/L BOD)*(8.34 conversion factor) = 0.11676, round to 0.12 lb BOD/capita-day

Reference 1:

https://www.pollutioncontrolsystem.com/Uploads/images/Pages/SEWAGE%20FLOW%20RATE%20ESTIMATING%20GUIDE%20Nov%202014_20170105.pdf

Reference 2:

<http://www.thewatertreatments.com/wastewater-sewage-treatment/typical-characteristics-wastewater/>

⁴ https://en.wikipedia.org/wiki/Charles_Shaw_wine