GUIDANCE: GENERAL WASTE DISCHARGE REQUIREMENTS FOR WINERY PROCESS WATER

SPRING 2022

DISCLAIMER

All guidance materials are intended to provide the regulated community and the public with a general understanding of the Statewide Winery General Order from a staff perspective. Such materials are informational only, and are not intended to implement, interpret, or create new requirements. In the case of any conflict with existing statutes, regulations, or orders, the actual statute, regulation, or order governs.

EXAMPLE FLOW MEASUREMENT RESOURCE

The Winery Order requires all wineries enrolled in Tiers 1 to 4 to measure the winery effluent, as described in the monitoring and reporting program (Winery Order, Attachment G Winery Effluent Monitoring Section). Tier 1 wineries also have the option to estimate the winery effluent. Winery effluent is the amount of process water produced at the winery and outside processing areas and measured prior to treatment. Examples of flow and volume measurement methods are provided in Section 10.2.1 of the California League of Food Processors (CLFP), 2007 Manual of Good Practice for Land Application of Food Processing/Rinse Water (Manual of Good Practice) CLFP, 2007.

EXAMPLE BIOCHEMICAL OXYGEN DEMAND LOADING CALCULATION FOR LAND APPLICATION AREAS

The Winery Order requires all wineries enrolled in Tiers 2 to 4 to comply with applicable effluent limits (Winery Order, Section B). Wineries that land apply process water must not exceed the cycle average biochemical oxygen demand (BOD) loading limit of 100 pounds per acre per day (lb/ac/d) (Winery Order, Section B.3). The BOD loading rate is the amount of BOD applied to a site in one loading cycle divided by the area and the cycle period (i.e., irrigation cycle) California League of Food Processors (CLFP), 2007 Manual of Good Practice for Land Application of Food Processing/Rinse Water (Manual of Good Practice) CLFP, 2007. The BOD loading rate is determined using the discharge flow volume (amount applied to land), days of process water application, subsequent dry days between successive applications, application acreage, and a moving average of the three most recent BOD process water sample results. The process water samples must be representative of the discharge applied to the land application area (LAA). The monitoring requirements for BOD loading are described in the Winery Order Attachment G, Monitoring and Reporting Program Effluent to Land Application Area Monitoring and Land Application Area Monitoring Sections.

An example BOD loading rate calculation, as adapted from Section 7.4 of the Manual of Good Practice (CLFP, 2007), is provided as follows.

1. If a hypothetical 7-acre site each has a cycle period of seven days (one day of process water application plus six days of drying), then one acre receives water every day. If 1,400 lb of BOD is applied in each daily application, the instantaneous (day-of-application) BOD loading is 1,400 pounds per acre (lb/ac) and the BOD loading rate (i.e., cycle average) is 200 lb/ac/d. (CLFP, 2007)

   Instantaneous BOD loading = 1,400 lb / 1 ac = 1,400 lb/ac

   Cycle average BOD loading = 1,400 lb / 1 ac / 7 days = 200 lb/ac/d

2. If instead, process water is applied for five days followed by two days of drying, then five one-acre fields receive water every day (one field is rotated on and one field is rotated off each day). If the BOD is also sampled weekly, the cycle average BOD loading would be calculated as follows.

   a. The average of the three most recent BOD process water sample results is initially 2,600 mg/L (Table 1). When a new sample is collected, the new result replaces the oldest sample result, and the moving average becomes 2,833 mg/L.

      Table 1. Example calculation: average of three most recent BOD sample results

Sample date	BOD (mg/L)	BOD, 3-sample avg (mg/L)
9/2/2020	1,800	--
9/9/2020	2,500	--
9/16/2020	3,500	2,600
9/23/2020	2,500	2,833

      9/16/2020: 3-sample avg = (1,800 mg/L + 2,500 mg/L + 3,500 mg/L) / 3 = 2,600 mg/L

      9/23/2020: 3-sample avg = (2,500 mg/L + 3,500 mg/L + 2,500 mg/L) / 3 = 2,833 mg/L

   b. The daily BOD loading to each one-acre field ranges from 119 lb/ac to 154 lb/ac as the BOD 3-sample average and daily process water flow change (Table 2). A total of 673 lb/ac of BOD is applied over the 7-day irrigation cycle and the cycle average BOD loading is 96 lb/ac/d.

Table 2. Example calculation: instantaneous and cycle average BOD loading

Date	BOD, 3-sample avg (mg/L)	Field 1A (1 acre)		
		Daily flow (gal)	BOD loading, instantaneous (lb/ac)	BOD loading, cycle avg (lb/ac/d)
9/20/2020	2,600	6,000	130	96
9/21/2020	2,600	6,800	147	96
9/22/2020	2,600	5,500	119	96
9/23/2020	2,833	5,200	123	96
9/24/2020	2,833	6,500	154	96
9/25/2020	2,833	--	--	96
9/26/2020	2,833	--	--	96
Total	**--**	**30,000**	**673**	**--**
Average	**--**	**6,000**	**--**	**96**

Instantaneous BOD loading

= (flow, mgd) * (BOD, mg/L) * 8.34 conversion factor / (area, acre)

= 6,000 gal/d * 2,600 mg/L * 8.34 * / 1 ac * (1 MG/10^6 gal) = 130 lb/ac

Conversion factor

= (1 g/1,000 mg) * (1 lb/454 g) * (10^6 gal/1 MG) * (3.785 L/1 gal) = 8.34

Cycle average BOD loading

= (total BOD loading during cycle, lb/ac) / (cycle period, days)

= (130 lb/ac + 147 lb/ac + 119 lb/ac + 123 lb/ac + 154 lb/ac) / (7 days) = 96 lb/ac/d

Citation

California League of Food Processors (CLFP). March 14, 2007. Manual of Good Practice for Land Application of Food Processing/Rinse Water. https://assets.noviams.com/novi-file-uploads/clfp/pdfs-and-documents/Member_Resources/CLFP-Manual_COMPLETE_FINAL_3-14-07-2-1.pdf