INFORMATION SHEET

ORDER NO. R5-2015-____
E. & J. GALLO WINERY
FRESNO WINERY
FRESNO COUNTY

E. & J. Gallo Winery (Gallo) owns and operates the Fresno Winery at 5610 East Olive Avenue on the eastern edge of the City of Fresno in Fresno County. Gallo submitted a 14 May 2012 *Report of Waste Discharge, E. & J. Gallo Winery, Fresno, California* (RWD) prepared by Kennedy/Jenks Consultants (Kennedy/Jenks) for the discharge from the Gallo's Fresno Winery (Winery). The Fresno Winery is regulated by Waste Discharge Requirements (WDRs) Order 94-103 that allows for the discharge of two waste streams to land. The first, Discharge 001, is crusher/press wastewater. WDRs Order 94-103 allows a maximum daily flow of 0.68 mgd of crusher/press wastewater. The second, Discharge 002, is stillage wastewater. WDRs Order 94-103 allows for a maximum daily flow of 2.3 mgd and an annual limit of 158 million gallons for stillage wastewater. Gallo has made numerous changes to the Winery itself and its processing and disposal of wastewater since the adoption of the WDRs, including the addition of a third waste stream and construction of a wastewater treatment system. The RWD was submitted to provide updated Winery and wastewater disposal information to aid in the development of updated WDRs for the Winery.

Background
Wine making and distillation activities have occurred at the Winery since the 1930s and Gallo purchased the property in 1953. Winery wastewater has been discharged to surrounding farm lands (land application areas) for years and the discharge has contributed to and/or caused the degradation/pollution of groundwater beneath and downgradient of the land application areas with salts and nitrate as nitrogen. Gallo staff is currently working with Central Valley Water Board's Enforcement Unit staff to characterize the lateral and vertical extent of elevated nitrate as nitrogen and salt concentrations in groundwater. Winery wastewater (both treated and untreated) is discharged to either the Fresno/Clovis Regional Wastewater Treatment Facility (Fresno WWTF) or to the 433 acre land application areas to irrigate crops.

Existing Winery and Discharge
The Winery property comprises about 700 acres and includes about 433 acres for the land application of Winery wastewater and an 85-acre composting facility. Gallo makes four primary products at the Fresno Winery; wine, concentrate, distilled spirits, and compost.

Wastewater Generation and Treatment
The Winery currently produces three primary wastewater streams:

1. General process wastewater (from the cleaning of equipment and tanks, boiler blowdown, water softening regenerate, and concentrate condensation) that is generated year round;
2. Crusher/press wastewater, typically generated during the "crush" which typically extends from August through November; and
3. Stillage wastewater, generated year round, but the majority is generated from August through December.

Gallo installed an anaerobic treatment system it calls the Fresno Anaerobic Treatment System (anaerobic treatment system) in 2007 to treat its general process and most of its stillage wastewater prior to discharge to the Fresno-Clovis Regional Wastewater Treatment Facility (Fresno WWTF) or to the land application areas. The effluent data indicates the anaerobic treatment system reduces the BOD and TDS concentrations of the discharge, but the EC results remain about the same. Gallo may discharge an average of 1.37 mgd to the Fresno WWTF. Any portion of the general process wastewater that is not treated is discharged to the Fresno WWTF. Treated anaerobic treatment system wastewater to be land applied is discharged to the land application areas comprising 362 acres north of Olive Avenue. The land application areas north of Olive Avenue are divided into two areas designated Nos. 3 and 4. Area No. 3 is a 273 acre parcel planted with vineyards, and Area No. 4 is an 89-acre parcel double cropped with Sudan grass and winter forage crops.

Crusher/press wastewater is not treated and is discharged directly to the land application areas south of Olive Avenue. The land application areas south of Olive Avenue are divided into two areas designated No. 1 and No. 2. Area No. 1 is identified as a 59-acre parcel that is double cropped with Sudan grass and winter forage. Area No. 2 is identified as a 12-acre parcel cropped with vineyards. Crusher/press wastewater is primarily generated in the months of August through November.

Stillage wastewater is typically treated in the anaerobic treatment system and is not typically land applied, but Gallo does apply untreated stillage wastewater to land application areas on occasion. In 2009, Gallo discharged 14.9 million gallons of untreated stillage wastewater to land. In 2010, Gallo discharged 634,000 gallons of stillage wastewater to land. No stillage wastewater was discharged in 2011 or 2012. Stillage operations primarily occur from August to December of each year, but stillage activities can occur throughout the year.

A fourth waste stream, ion exchange regenerate, is produced at the Winery, but it is not directly land applied. Gallo processes some of its wine through ion exchange units that remove potassium and adjust the color of the wine. Gallo reports it discharges the ion exchange regenerate to the compost windrows for moisture control purposes and averages 8.3 million gallons annually used for moisture control of the compost in 2012 and 2013.

The Winery typically produces from 350 to 400 million total gallons of wastewater annually. In 2011, Gallo produced about 365 million gallons of wastewater, of which about 319 million gallons were discharged to the Fresno WWTF and 46 million gallons were applied to the land application areas.

Effluent Characteristics

Analytical results for the wastewater treated by the anaerobic treatment system, crusher/press wastewater, and stillage wastewater through 2011 were provided in the RWD. The results of the anaerobic treatment system wastewater are divided into the wastewater generated during the Crush Period (August through November), and the wastewater generated the rest of the year. The RWD did not contain any stillage EC or TDS data and Monitoring and Reporting

Program (MRP) Order 94-103 does not require the stillage wastewater to be analyzed for EC or TDS. However, Gallo provided stillage data for EC, TDS, and FDS for 2002 and 2003 in November 2014. The EC and TDS stillage results shown below are from eight samples collected from August 2002 through July 2003. In addition, Gallo provided additional crusher/press results for EC, TDS, and FDS that included results for 2012 and 2013 that were not included in the RWD. Central Valley Water Board staff updated the results by including the updated stillage and crusher/press results and has included the updated results in the table below. The first number listed in the table is the average of the data set followed by the range of results shown in parentheses.

EFFLUENT QUALITY

Constituents[1]	Units[2]	Stillage[3]	Crusher/Press[4]	FATS[5]	FATS Crush[6]
pH	s.u.	5.3 (3.0 – 7.5)	5.2 (3.6 – 8.2)	na[7]	na[7]
EC	umhos/cm	2,834 (1,415 – 3,800)	1,133 (420 – 2,600)	2,949 (1,680 – 6,710)	3,507 (1,680 – 6,710)
TDS	mg/L	7,890 (3,367 – 15,000)	6,587 (460 – 32,000)	1,749 (790 – 4,900)	2,232 (915 – 4,900)
FDS	mg/L	3,527 (1,217 – 6,700)	1,759 (270 – 4,500)	1,509 (680 – 4,260)	1,770 (690 – 4,260)
TKN	mg/L	100 (5 – 350)	60 (5 – 270)	120 (20 – 174)	153 (22 – 394)
Nitrate as Nitrogen	mg/L	5.1 (ND[8] – 61)	1.4 (ND[8] – 3.6)	2 (ND[8] – 21)	1.6 (ND[8] – 5)
Total Nitrogen	mg/L	109 (5 – 350)	62 (5 – 270)	127 (21 – 483)	156 (23 – 400)
BOD	mg/L	6,559 (20 – 14,000)	na[7]	173 (6 – 3,340)	401 (38 – 3,340)

1 EC = electrical conductivity; TDS = total dissolved solids; FDS = fixed dissolved solids; TKN = Total Kjeldahl Nitrogen; BOD = biochemical oxygen demand.

2 s.u. = Standard pH units; umhos/cm = micromhos per centimeter; mg/L = milligrams per liter.

3 The data for stillage wastewater analyzed for pH, TKN, nitrate as nitrogen, total nitrogen, and BOD consists of results from up to 12 monthly sampling events from April 2009 through November 2011. The data for stillage wastewater analyzed for EC, TDS, and FDS are from seven samples collected from August 2002 through July 2003.

4 The data set for the crusher/press wastewater results analyzed for pH, TKN, nitrate as nitrogen, total nitrogen, and BOD, consists of results from up to 15 monthly sampling events from August 2009 through December 2011. The data set for the crusher/press wastewater results analyzed EC, TDS, and FDS are from 21 monthly sampling events from August 2009 to November 2013.

5 FATS = Fresno anaerobic treatment system. The data set for the FATS wastewater consists of 105 samples collected from Jan 2011 through March 2012.

6 The crush period is typically from August through November.

7 na = not available.

8 ND = not detected.

The average EC result for the anaerobic treatment system wastewater is about 2,950 umhos/cm during the non-crush period and about 3,500 umhos/cm during the crush period, and the average EC of the crusher/press wastewater is 1,133 umhos/cm. Crusher/press EC results have increased since 2011, averaging 1,301 umhos/cm from January 2012 through 2013. All of the crusher/press effluent and a portion of the anaerobic treatment system (up to 21 million gallons annually) effluent are discharged to the land application areas.

Total nitrogen in the crusher/press wastewater averages 62 mg/L; averages 109 mg/L in the stillage wastewater; and ranges from about 127 to 156 mg/L in the anaerobic treatment system wastewater during the non-crush and crush periods, respectively. Total nitrogen in the crusher/press and anaerobic treatment system wastewaters have decreased slightly since 2011. Total nitrogen in the crusher/press discharge has averaged 58 mg/L since 2012 (62 mg/L through 2011), while total nitrogen in the anaerobic treatment system discharge has averaged 139 mg/L (156 mg/L through 2011).

The RWD indicates the BOD concentration in the stillage wastewater averages 6,559 mg/L. The BOD concentrations in the anaerobic treatment system wastewater range from 173 to 401 mg/L during the non-crush and crush periods, respectively.

Analysis of the ion exchange regenerate is not required as part of the MRP of Order 94-103, but the Winery record does contain analytical results of the ion exchange regenerate. Two samples were collected in 2001 and the results are summarized in the following table.

Ion Exchange Regenerate Results

Constituents[1]	Units[2]	Sample No. 1	Sample No.2
pH	s.u.	2.9	1.2
EC	umhos/cm	26,000	43,901
TDS	mg/L	24,000	18,503
Sulfate	mg/L	15,000	26,244
Potassium	mg/L	2,800	1,580
Sodium	mg/L	86	123
Hardness	mg/L	1,300	na[3]
BOD	mg/L	na[3]	7,680
Nitrate as Nitrogen	mg/L	15	5
Ammonia Nitrogen	mg/L	2,000	120

1. EC = Electrical Conductivity, TDS = Total dissolved solids, BOD = Biochemical oxygen demand.
2. s.u. = Standard pH units, umhos/cm = micromhos/cm, mg/L = milligrams per liter.
3. na = Not analyzed

Vadose Zone/Groundwater Model

To assess the potential salt and nutrient loading of the proposed discharge, the RWD includes a vadose zone/groundwater model (Model). In general, the Model predicts that the discharge of up to 54.2 million gallons per year of wastewater to four separate land application areas, when diluted with irrigation water, will produce a percolate that will improve groundwater quality so that groundwater leaving the site will be better than groundwater entering the site. At the request of Central Valley Water Board staff, Kennedy/Jenks recalculated the loading values. The recalculated values indicate the proposed discharge may cause some groundwater degradation with TDS, but the degradation will not exceed water quality objectives or adversely impact beneficial uses of groundwater.

Composting Facility

Gallo operates an 85-acre composting facility on the Winery property. Gallo produces about 378,000 cubic yards of compost annually. Winery waste by-products are delivered to a paved

winery by-products storage area, and green waste is delivered to a separate green waste unloading and processing area. Gallo adds an average of about 8.3 million gallons of ion exchange regenerate produced during Gallo's juice making process for moisture control of the compost. The mixture of winery by-products and green waste is formed into windrows and placed to dry on an unlined, but compacted soil composting pad. Storm water, wastewater, and leachate from the composting operations is routed to three onsite storm water/wastewater sumps present to the south and southwest of the composting pad.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Basin Plan indicates the greatest long-term problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Central Valley Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established an incremental EC limitation of 500 µmhos/cm as a measure of the maximum permissible addition of salt constituents through use. Also, the Basin Plan limits discharges to areas that may recharge good quality groundwater's to no more than an EC of 1,000 µmhos/cm, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.

An exception to this EC limit may be permitted for industrial sources when the discharger technically demonstrates that allowing a greater net incremental increase in EC will result in lower mass emissions of salt and in conservation of water, provided that beneficial uses are protected. The RWD did not address the Basin Plan exception related to water conservation, but Kennedy/Jenks addressed the exception in August 2014. Kennedy/Jenks indicates Gallo qualifies for the water conservation exception due to various projects it has initiated since 2002 saving 35 million gallons of wastewater from being discharged to the land application areas annually that result in approximately 400,000 pounds of TDS not discharged to the land application areas. Gallo's current discharge practices have increased the amount/percentage of wastewater discharged to the Fresno WWTF.

Stillage wastewater is not often land applied, but Gallo wants to be able to discharge stillage wastewater to the land application areas when maintenance of the anaerobic treatment system is required. The stillage wastewater has not recently been analyzed for EC and TDS, but Gallo provided values collected in 2002 and 2003 that ranged from 1,415 to 3,800 umhos/cm. This Order requires EC and TDS monitoring of stillage wastewater and includes Discharge Prohibition A.6, which allows the direct discharge of untreated stillage wastewater to the land application areas only during times of maintenance of the anaerobic treatment system.

Gallo's discharges have contributed to and/or caused groundwater pollution with average nitrate as nitrogen concentrations in downgradient wells being four to nearly six times the Primary maximum contaminant level (MCL) of 10 mg/L. Over application of wastewater over sandy soils such as those present at the Winery can push the nitrogen past the root zone and on to the underlying groundwater. Without the proper management (application at agronomic rates and cropping with plants that utilize the nitrogen in the shallow soils) of the discharge, the

potential for continued groundwater nitrogen pollution increases. However, the potential nitrogen uptake of the crops proposed for the land application area's (vineyards, Sudan grass and winter forage crops) is estimated to range from about 150 to 450 pounds per acre per year (lbs/ac/yr), while the nitrogen loading from the discharges is estimated to range from about 40 to 215 pounds per acre per day (lbs/ac/day). The potential nitrogen uptake of the crops is greater than the estimated loading in the wastewater discharges. Discharge at the proposed volumes to land application areas planted with vineyards with cover crops and double cropping in the winter months that can utilize the available nitrogen should be protective of the underlying groundwater quality.

The RWD contained chloride data for the crusher/press and anaerobic treatment system wastewaters and both average just over 20 mg/L, well below the 175 mg/L limit. Boron data was not available, but boron analysis is a part of MRP R5-2015-____.

Source Water

Gallo obtains its source water from four onsite wells. The RWD provides source water analytical results for nitrate as nitrogen and total dissolved solids (TDS). For nitrate as nitrogen, the averages of quarterly sampling results from June 2002 through April 2010 are summarized in the following table. The first number listed is the average concentration and the values within the parentheses underneath are the range of the reported results. The results for PW-8 are from one sample collected in 2010, so no range is shown. The TDS results are from only one sample, so no range is shown except for PW-7, which was sampled twice. This Order requires quarterly monitoring of source water for EC, TDS, nitrate as nitrogen, and General Minerals.

GALLO SOURCE WATER QUALITY

PW-5		PW-6		PW-7		PW-8	
Nitrate as Nitrogen	TDS	Nitrate as Nitrogen	TDS	Nitrate as Nitrogen	TDS	Nitrate as Nitrogen	TDS
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2.7	220	1.5	200	0.8	230	1.5	160
(ND – 4.7)	---	(1.0 – 2.5)		(ND – 1.3)	(200 – 260)	---	---

Groundwater Conditions

Gallo has an eleven well groundwater monitoring well network to monitor first encountered groundwater quality around the land application areas. Groundwater flows primarily to the west/southwest and the depth to first encountered groundwater ranges from about 70 to 100 feet below the ground surface (bgs). However, due to the recent lack of rain and regional groundwater pumping, the depth to groundwater has increased and several wells have recently gone dry (MW-4, MW-5, and MW-8), and well MW-6 had less than two feet of water in it in the September 2014 monitoring event. This Order contains Provision G.15 that requires Gallo to submit a work plan to replace the currently dry monitoring wells, propose additional groundwater monitoring wells within the land application areas, and includes a time schedule for the wells to be installed within 12 months from the adoption of this Order.

MW-1 through MW-3 were installed along the eastern edge of the land application area to serve as upgradient wells. Eight other wells (MW-4 through MW-6, MW-5a, MW-5b, MW-8, MW-18-1, and MW-18-2) have been installed over the years and are within or downgradient of the land application areas. MW-7 was damaged and destroyed in 2002, and MW-8 was installed to replace it in 2003. MW-5a was installed in 2012 to replace the nearly dry MW-5 and was set at a depth of 123 feet bgs (13 feet lower than the base of MW-5) with a 20-foot well screen from 103 to 123 feet bgs. MW-5b was installed to a depth of 168 feet bgs with a 20-foot well screen from 148 to 168 feet bgs. The averages of select constituents from 2011 through the first quarter 2013 are summarized in the following table. Values shown in bold font exceed the MCLs listed at the bottom of the table. The MCLs for EC and TDS are shown with a smaller value placed over a larger value (500/1000). The first number shown in the "recommended" MCL and the second number shown below is the "upper" MCL.

FIRST ENCOUNTERED GROUNDWATER QUALITY

Wells	EC (umhos/cm)	TDS (mg/L)	Nitrate as Nitrogen (mg/L)	Bicarbonate mg/L	Sulfate (mg/L)	Sodium (mg/L)	Chloride (mg/L)
MW-1	764	490	8.7	415	38	44	16
MW-2	178	140	2.2	92	6.6	7.7	3.2
MW-3	829	**544**	**21**	324	57	28	24
MW-4	**1475**	**996**	**41**	762	63	67	21
MW-5	**1457**	**1071**	**58**	746	42	71	37
MW-5a	**1080**	**718**	**24**	522	35	93	31
MW-5b	727	477	**15**	327	33	58	18
MW-6	**1625**	**1075**	**47**	689	106	42	55
MW-8	**1173**	**824**	**22**	488	135	71	33
MW-18-1	682	452	2.5	332	36	39	40
MW-18-2	**1236**	**848**	**24**	601	89	47	48
MCL	900/1600	500/1000	10	na	250	na	250

Regional groundwater data on the United States Geological Survey (USGS) Water Quality Portal web site was available for two wells with depths that would be near first encountered groundwater. The results are presented below.

Data for USGS well 364521119411401 included sampling results from one sample collected in July 1960. Depth to water was 48 feet bgs. The well is or was within Gallo's current land application area south of Olive Avenue.

USGS WELL 364521119411401
GROUNDWATER QUALITY

Units	EC (umhos/cm)	TDS (mg/L)	Nitrate as Nitrogen (mg/L)	Sulfate (mg/L)	Sodium (mg/L)	Chloride (mg/L)
Result	274	210	5.2	16	11	3.6

The water quality in 1960 was high quality. All reported parameters met applicable water quality objectives. Gallo monitoring well MW-3 is in the general vicinity of USGS well 364521119411401 and MW-8 would be downgradient of these wells. The results from both MW-3 and MW-8 are much higher than the 1960 results. Another USGS well, well 364356119374001, was reported to have a well depth of 100 feet bgs, and is or was about 3.5 miles upgradient of the Winery. Groundwater results for this well from sampling events in 1993 and 2001 are shown in the following table.

Date	EC (umhos/cm)	TDS (mg/L)	Nitrate as Nitrogen (mg/L)	Sulfate (mg/L)	Sodium (mg/L)
9/20/93	533	373	5.4	87	22
8/23/01	725	493	8.3	na	23

The RWD evaluates upgradient/background groundwater quality concentrations for several constituents. The concentrations were calculated using analytical results from MW-1 through MW-3. The results for select constituents of concern are included in the following table.

RWD CALCULATED BACKGROUND GROUNDWATER QUALITY

Units	EC (umhos/cm)	TDS (mg/L)	Nitrate as Nitrogen (mg/L)	Sulfate (mg/L)	Sodium (mg/L)	Chloride (mg/L)
Maximum	3,300	870	103	212	54	96
Mean	678	452	15	47	28	15
UCL[1]	825	463	19	51	28	16

1. UCL = Upper Confidence Limit

However, both MW-2 and MW-3 have been impacted by other sources and are not representative of actual background groundwater quality. MW-2 is adjacent an irrigation canal (Mill Ditch) and the canal water dilutes the concentrations in this well. Well MW-3 is downgradient of a former dairy and the salinity and nitrate as nitrogen concentrations in it are elevated due to its location. However, the data from the three wells does provide useful information on upgradient groundwater quality. Concentrations in MW-3 have been decreasing. A dairy was formerly operated upgradient of MW-3. The dairy ceased its operations in 1994, and EC and nitrate as nitrogen results from MW-3 began to decrease in about 2008, or about 14 years after the discharge at the Dairy was discontinued. As a result of the decreasing concentrations, the upgradient groundwater averages have decreased as well. Central Valley Water Board staff updated the upgradient results using data from 2011 through May 2014. The averages/means for the three upgradient wells are shown in the following table.

UPGRADIENT GROUNDWATER RESULTS - 2011 through May 2014

	EC umhos/cm	TDS mg/L	Total Nitrogen mg/L	Sulfate mg/L	Sodium mg/L	Chloride mg/L
MW-1	766	491	9.5	39	44	16

MW-2	184	144	3.2	7	8	2.9
MW-3	855	565	22.2	59	28	24
Maximum	980	660	27.2	70	30	32
Mean	**596**	**401**	**8.1**	**35**	**26**	**15**

Groundwater results from Gallo's groundwater monitoring network are compared to various water quality objectives to assess degradation/pollution. Water quality objectives are discussed in detail in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*. Typical water quality objectives include Primary and Secondary MCLs. Comparing the results of upgradient groundwater results shown in the above table to those from the downgradient wells (MW-4 through MW-6, MW-8, MW-18-1, and MW-18-2) indicates the discharge has degraded/polluted groundwater beneath and downgradient of the Winery with EC, TDS, and nitrate as nitrogen. EC and TDS concentrations exceed their respective "Recommended" Secondary MCLs in all of the downgradient wells except MW-5b. The average EC result in MW-6 is equal to the "Upper" Secondary MCL of 1,600 umhos/cm, and the average TDS results from MW-5 and MW-6 exceeds the "Upper" MCL of 1,000 mg/L. Nitrate as nitrogen concentrations exceed the Primary MCL of 10 mg/L in all of the downgradient wells except well MW-18-1 (set adjacent a ponding basin) and are 1.5 to nearly six times the MCL of 10 mg/L. MW-5a and MW-5b indicate decreasing concentrations with depth of the constituents shown in the First Encountered Groundwater Table (page 7), but concentrations of nitrate as nitrogen in both wells are still in excess of the Primary MCL of 10 mg/L.

Compliance History

Winery Wash Water Discharge Specification B.1 of WDRs Order 94-103 limits the monthly average flow of the crusher/press wastewater to a maximum of 0.68 mgd, which equates to about 70.5 million gallons during the crush period. The RWD indicates Gallo discharged 22.3, 18.0, and 27.8 million gallons of crusher/press wastewater annually, in 2009, 2010, and 2011, respectively. The maximum daily discharge was about 0.32 mgd, which is less than the 0.68 mgd daily maximum. Stillage Waste Discharge Specification C.1 of WDRs Order 94-103 order limits the stillage discharge to a daily average of 2.3 mgd and a total annual discharge of 158 million gallons. Gallo discharged 14.9 million gallons of stillage wastewater in 2009, and 634,000 gallons in 2010, and none in 2011 and 2012. The values are well below the limit. The majority of Gallo's wastewater is now treated in the anaerobic treatment system and discharged directly to the Fresno WWTF, not to the land application areas.

Disposal Field Specification D.4 of WDRs Order 94-103 proscribes the Winery or the land application areas from generating odors that create a condition of nuisance. Nuisance conditions, odors, have been an issue at the Winery in the past. Gallo submitted several supporting documents from 2000 to 2003 documenting its efforts to reduce odors from the composting and stillage operations such as leveling of the land application areas for wastewater application and a rotations schedule to allow for rest periods between applications. The efforts appear to have been successful as the current record only contains a single NOV issued in September 2005 for nuisance conditions due to odors.

Groundwater Limitation E.1 of WDR 94-103 states Gallo's discharge shall not cause groundwater to "contain waste constituents in concentrations statistically greater than receiving water limits, where specified below, or background water quality where not specified." Gallo's past discharge of winery wastewater to the land application areas, has contributed to and/or caused EC and TDS results from all four of the downgradient wells (MW-4, MW-5, MW-6, and MW-8) set along Gallo's western property boundary to exceed the background levels and the respective MCLs for EC and TDS. However, the Kennedy/Jenks Model used in the RWD indicates that with proper application of wastewater and supplemental irrigation water at agronomic rates and with crop uptake of the salts, the proposed discharge will result in groundwater having a TDS concentration ranging from about 510 mg/L to 588 mg/L. These values indicate degradation of the underlying groundwater, but the degradation is within applicable water quality limits (i.e., less than the Upper MCL of 1,000 mg/L). This Order contains Provision G.11 that requires Gallo to submit a Salinity Management Plan, which requires Gallo to further review the potential to decrease salt in its discharge.

Nitrate as nitrogen results in downgradient wells range from one and a half (1.5) to nearly six times the Primary MCL of 10 mg/L. Gallo's historic discharge has contributed and/or caused pollution of the underlying groundwater with nitrate as nitrogen. However, Gallo's current cropping/management plan calls for discharges to land application areas cropped with either vineyards or fields double cropped with Sudan grass and winter forage crops that can utilize from about 150 to 450 lbs/ac/yr of nitrogen. The discharge is estimated to add between 55 and 250 lbs/ac/yr, less than the amount the crops can utilize. This Order contains Provision G.12 that requires Gallo to submit a Nutrient Management Plan that ensures wastewater, irrigation water, commercial fertilizers, and soil amendments are applied at agronomic rates.

Antidegradation

State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:

a. The degradation will not unreasonably affect present and anticipated future beneficial uses.

b. The degradation does not result in water quality less than that prescribed in State and regional policies, including violation of one or more water quality objectives, and

c. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.

d. The degradation is consistent with the maximum benefit to the people of the State.

As described previously, historic discharges of Winery wastewater to the land application areas has contributed to and/or caused degradation/pollution of the underlying groundwater. However, the Kennedy/Jenks Model predicts that with even application of wastewater at agronomic rates and with proposed cropping patterns aimed at the uptake of salts and

nutrients, the resulting percolate will not cause the underlying groundwater to exceed water quality objectives.

The Model predicts TDS concentrations in groundwater will range from about 510 to 588 mg/L (lower than the Upper MCL of 1,000 mg/L). To ensure the Model predictions are accurate, this Order contains Provision G.15 that requires Gallo to submit a work plan to propose additional groundwater monitoring wells within the land application areas and includes a time schedule for the wells to be installed within 12 months from the adoption of this Order.

Direct discharge of wastewater with the existing total nitrogen concentrations to land with no cropping plan could degrade the underlying groundwater. In order to ensure that the discharge will not cause or contribute to groundwater nitrate as nitrogen degradation/pollution, this Order requires that nitrogen loading to the land application areas be at reasonable agronomic rates, and requires the Discharger to prepare a Nutrient and Wastewater Management Plan. At these concentrations and if the discharge is applied at agronomic rates as required by this Order, the discharge should not degrade the underlying groundwater.

The Kennedy/Jenks Model estimates that the proposed discharge will result in BOD loading ranging from five to 242 lbs/ac/day. Historic discharges at Gallo have caused some reducing conditions and increases in groundwater salinity associated with increases in alkalinity. To address organic loading, Gallo installed the anaerobic treatment system to treat its general process and stillage wastewater in 2007. The treatment system has resulted in a significant reduction in BOD loading to the land application areas by reducing the concentration of the waste applied and by allowing Gallo to discharge a significantly larger portion of its discharge to the Fresno WWTF. This Order includes Land Application Area Specification D.3 that limits the BOD daily cycle average to 250 lbs/ac/day, and Provision G.13 that requires vadose zone monitoring for any of the land application areas that receive BOD loading at greater than 150 lbs/ac/day. BOD loading at 250 lbs/ac/day is far less than what was historically authorized (no limits previously) and Gallo will employ best management practices that include even application over the entire land application area, application at agronomic rates, application with appropriate resting periods (minimum of seven days) between applications, and supplementing with fresh irrigation water during the majority of the year. As authorized by this Order, the discharges of organic materials to the land application areas are not expected to cause or contribute to groundwater exceedances of applicable water quality objectives or to adversely affect the beneficial uses of groundwater.

The Order establishes effluent limits and groundwater limits for the Gallo Fresno Winery that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. The Order contains requirements for groundwater monitoring to assure that the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

Degradation of groundwater by some of the typical waste constituents released with discharge from a food processing facility after effective source reduction is consistent with maximum benefit to the people of the State. Gallo contributes to the economic prosperity of the region by

directly employing over 250 workers, it provides incomes for numerous surrounding farmers (estimated $210 million annually on local grape purchases) and associated trucking firms, and provides a tax base for local and county governments. Gallo also contributes over $100,000 annually to educational and charitable causes in the Fresno area. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

Title 27

Title 27 of the California Code of Regulations, section 20005 et seq. (Title 27) contains regulations to address certain discharges to land.

Unless exempt, release of designated waste is subject to full containment pursuant to Title 27 requirements. Title 27 Section 20090(b) exempts discharges of wastewater to land as follows:

"(b) Wastewater -Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

(1) The applicable regional water board has issued waste discharge requirements, or waived such issuance;

(2) The discharge is in compliance with the applicable basin plan; and

(3) The waste is not hazardous waste and need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste."

Discharge of Gallo's Fresno Winery wastewaters to the land application areas and the WWTF authorized herein complies with Title 27 section 20090(b). The discharge of untreated ion exchange regenerate wastewater to the 85-acre composting facility may meet the requirements of Title 27 section 20090(b)(1) and section 20090(b)(3), but as the composting pad is unlined, wastewater, leachate, and storm water have the potential to percolate to the underlying groundwater. Because of the threat to underlying groundwater and the composting pad is not lined, the composting facility may not meet Title 27 requirement 20090(b)(2). This Order includes Provision G.14 that requires Gallo to submit a work plan to:

a. Characterize all discharges of wastewater and leachate to and from the composting facility for consistency with Basin Plan and Title 27 exemption; and

b. Upon approval of the required work plan, submit:

   i. A demonstration with appropriate supporting evidence that the composting facility operations meet the requirements for exemption from Title 27, section 20090(b), or

   ii. A work plan and schedule for implementing modifications to the composting facility and/or composting facility operations that would qualify it for exemption from Title 27, section 20090(b). The work plan shall provide for compliance with the

California Environmental Quality Act and include a Report of Waste Discharge for any proposed structural modifications to the composting facility, or

iii. A Report of Waste Discharge with a schedule for constructing modifications to the composting facility to meet the containment requirements of Title 27.

Proposed Order Terms and Conditions

Discharge Prohibitions, Effluent Limitations, Discharge Specifications, and Provisions
The proposed Order would prohibit discharge to surface waters and water drainage courses.

The proposed Order would prescribe discharge specifications that limit the BOD loading to 250 lbs/ac/day.

The proposed Order requires monitoring of the discharge for pH, BOD, EC, TDS, FDS, TKN, nitrite as nitrogen, nitrate as nitrogen, ammonia, total nitrogen, and general minerals. The Order also requires daily inspections of the land application areas. The proposed Order also includes a provision to establish a vadose zone monitoring system to measure the quality of the percolate beneath the land application areas.

The proposed Order would require the Discharger to submit and implement Salinity and Nutrient Management Plans.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedance of these objectives or natural background water quality, whichever is greatest.

The proposed Order would require the Discharger to evaluate/assess groundwater conditions in the vicinity of the composting facility and in the middle of the land application areas to ensure the discharge is not contributing to and/or causing pollution/degradation from the discharge of winery wastewater.

Monitoring Requirements
Section 13267 of the Water Code authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the State. Water Code section 13268 authorizes assessment of civil administrative liability where appropriate.

The proposed Order includes effluent, groundwater, source water, vadose zone, and land application area monitoring. The monitoring is necessary to evaluate the extent of the potential degradation from the discharge.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. The proposed Order would set limitations based on the information provided thus far. If applicable laws and regulations change, or once new information is obtained that will change the overall discharge and its potential to impact groundwater, it may be appropriate to reopen the Order.