

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0148

WASTE DISCHARGE REQUIREMENTS
FOR
MUSCO FAMILY OLIVE COMPANY AND THE STUDLEY COMPANY
WASTEWATER TREATMENT AND LAND DISPOSAL FACILITY
SAN JOAQUIN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. Musco Family Olive Company and the Studley Company (hereafter jointly referred to as “Discharger”) submitted a Report of Waste Discharge (RWD), dated 30 April 2002, for land application of industrial wastewater. Additional information was submitted on 24 June 2002 and 8 August 2002.
2. Waste Discharge Requirements (WDRs) Order No. 97-037, adopted by the Regional Board on 28 February 1997, prescribes requirements for Musco Olive Products and the Studley Company. The RWD was submitted to revise the existing WDRs, and was required due to the increase in the discharge quantity and quality. The Discharger submitted a January 2000 RWD that was deemed incomplete. The resulting enforcement activities that are described below resulted in submittal of the 30 April 2002 RWD.
3. The facility is at 17950 Via Nicolo, Tracy, in Section 34, T2S, R4E, and Section 4 T3S, R4E, MDB&M. The land application areas are in Sections 3 and 4 of T3S, R4E, MDB&M, as shown in Attachment A, which is attached hereto and made part of the Order by reference. The Studley Company owns all of the parcels (Assessor’s Parcel Numbers 209-11-18, 209-11-31, 209-11-32, 251-32-08, 251-32-09) used for processing and/or land application. Musco Family Olive Company operates the facility.
4. Wastewater generated at the facility is regulated by two separate WDRs. Order No. 96-075 regulates the two surface impoundments regulated under Title 27 of the California Code of Regulations, §20005 et seq., (hereafter Title 27) that are used to store concentrated brines. Order No. 97-037 regulates the less concentrated wastewater that is applied to land. This WDR update only applies to the less concentrated wastewater.
5. As set forth in the detailed findings that follow, the Discharger proposes to continue the discharge of wastes to land, and hence the groundwater, that are herein classified as “designated waste” and subject to full containment under Title 27. However, the discharge of such designated waste to land is not allowed under WDRs No. 97-037, and is also not allowed under this updated Order. The following findings analyze the RWD for requirements under which an exemption from Title 27 may be granted and, as intended by the RWD, for the conditions under which waste may be discharged to a land treatment unit, followed by infiltration to groundwater.

BACKGROUND

6. Musco Family Olive Company processes approximately one-half the total table olive crop in the State. In 1999, the Discharger acquired an olive packing facility in Visalia, closed that facility, and transferred the production to Tracy, without first making improvements to its existing wastewater treatment or disposal system. That consolidation has led to an increase in wastewater flow rates and numerous violations of WDRs Order No. 97-037. The Regional Board responded to the violations with various enforcement actions that are described below.
7. The facility processes and cans olives on a year-round basis and generates wastewater with extremely high concentrations of dissolved solids, sodium, and chloride. Processing consists of receiving olives, storage in acetic acid solutions, curing in sodium hydroxide (lye), pitting, and canning in a brine solution.
8. Fresh olives are received at the facility during the harvest period of September through early November each year. During the harvest period, fresh olive processing and canning occurs. Stored olives are processed the remainder of the year.
9. The facility has approximately 37,000 tons of storage capacity and an additional 10,000 tons can be processed fresh for a total storage capacity of approximately 47,000 tons. The facility can process approximately 1,000 tons per week for a total processing capacity of 52,000 tons per year.
10. The facility is equipped with 734 storage tanks ranging in size from 3,600-gallons to 8,800-gallons and 98 processing tanks that are 2,500-gallons each. Additional olives are stored at the Discharger's Visalia and Orland facilities and are trucked to Tracy for processing.
11. The quality of the individual wastewater streams was described in the RWD. A summary is presented below. The source of each of the streams is presented in the flow diagram found in Attachment B, which is attached hereto and made part of the Order by reference. All of the wastewater streams described below are mixed in the 1-million gallon settling pond prior to discharge to the land application areas. Other waste streams are discharged to the Title 27 ponds.

<u>Wastewater Source</u>	<u>PH</u> <u>(std. unit)</u>	<u>TDS</u> <u>(mg/L)</u>	<u>DIS</u> <u>(mg/L)</u>	<u>Na</u> <u>(mg/L)</u>	<u>Cl</u> <u>(mg/L)</u>	<u>HCO₃</u> <u>(mg/L)</u>
1 st Rinse	5.8	6,080	3,544	1,005	372	2,394
2 nd Rinse	9	13,405	7,055	1,698	408	4,179
3 rd Rinse	12.1	15,236	8,736	2,124	612	5,322
CO ₂ Water	7.1	9,804	7,088	1,903	195	5,078
CO ₂ Water	7.3	9,392	7,292	1,977	239	5,353
2 nd CO ₂ Rinse	7.2	2,084	1,432	541	89	1,159
Ferrous Gluconate	6.8	2,300	1,368	578	168	1,159
Ferrous Gluconate	6.7	2,840	1,808	594	98	1,403
Cooker Cooling Feed	7.5	250	NR	34	62	92
Cooker Cooling Feed	7.8	250	NR	35	53	122

TDS denotes total dissolved solids. DIS denotes dissolved inorganic solids. Na denotes sodium. Cl denotes chloride. HCO₃ denotes bicarbonate.

12. Attachment B presents a process flow diagram and describes the disposal for each waste stream. Review of the data presented in the table above and the disposal location for each waste stream reveals that high strength wastewater is discharged to the land application system.
13. A wastewater system is used to collect and apply the industrial wastewater to land. Wastewater is collected throughout the facility by floor drains and is piped to a central collection area from which it is either directed to the Title 27 ponds or is pumped to a 1-million gallon settling pond. Despite requests for the information, the Discharger has not fully described how it determines whether to discharge the wastewater to the land application system or the Title 27 ponds.
14. From the 1-million gallon pond, the wastewater is directly applied to the land application areas. Once the new 84-million gallon storage pond is completed, all wastewater will be pumped from the 1-million gallon settling pond to the 84-million gallon storage pond prior to land application. The facility consists of 280 acres, of which approximately 200 acres are available as wastewater land application areas.
15. WDRs Order No. 97-037 states that the wastewater flow to the land application areas will be approximately 500,000 gallons per day (gpd). A review of the self-monitoring reports from February 2002 (when a flow meter was installed) through June 2002 shows that daily flow discharged to land ranges from 71,234 to 1,457,810 gpd.
16. The treatment for process wastewater discharged to the land application areas consists of carbon dioxide neutralization of lye rinse solutions, screening solids using a mechanical screen and rake, and discharge to the 1-million gallon settling pond.
17. Lye is reclaimed in above ground stainless steel tanks located near the 1-million gallon settling pond. Lye is reclaimed through the addition of sodium hydroxide to the tank. Lye that is too contaminated for further use is discharged to the Title 27 ponds.
18. The facility is equipped with a clean-in-place system. The clean-in-place system is used to clean piping associated with the accumulation tanks in the cannery. Caustic cleaner is used in the system, and the resulting wastewater is discharged to the land application area.
19. Boiler feed water is treated with an ion exchange column. The ion exchange column is regenerated in place; the RWD reported regeneration brine is discharged to the Title 27 ponds.
20. Wastewater that is discharged to the land application system is characterized by a high organic matter and dissolved solids content. In the time period from 1 January 2002 to 30 June 2002, the average concentrations of analytes in the wastewater discharged to the land application system were:

<u>Constituent</u>	<u>Units</u>	<u>Wastewater</u>
Biochemical Oxygen Demand	mg/l	3,040
Electrical Conductivity	µmhos/cm	4,210

<u>Constituent</u>	<u>Units</u>	<u>Wastewater</u>
Total Dissolved Solids (TDS)	mg/l	4,737
Dissolved Inorganic Solids (DIS)	mg/l	2,718
Total Nitrogen	mg/l	61 ¹
pH	Standard	6.4
Chloride	mg/l	415
Sodium	mg/l	739

¹ All nitrogen was present as total Kjeldahl nitrogen; nitrate was not detected in the wastewater samples.

LAND APPLICATION SYSTEM

21. Wastewater is currently discharged to the land application areas shown on Attachment C, which is attached hereto and made part of the Order by reference. The land application areas, and their approximate acreages are listed below. Construction of the 84-million gallon storage pond reduced the available land application area of Field 55 West and Field 55 East by a total of approximately 20 acres. The presence of the septic system prevents use of half of Evap North.

<u>Land Application Area</u>	<u>Useable Acreage</u>	<u>Comments</u>
18 North	18	Fairly level
Spur North	4.9	Fairly level
Evap East	1.3	Fairly level, adjacent to Hwy 580
Evap South	4.9	Moderate slope
Check Field	8.9	Level terraces
Evap West	4.9	Fairly level
Evap North	1.0	Fairly level
South Ridge	22.2	Moderate slope
Park West	7.5	Moderate to slight slope
Field 55	35 ¹	Moderate to severe slope
Field 95	95	Moderate to severe slope

¹ Available acreage estimated by staff is less than the total area of 55 acres listed in the RWD due to construction of 84-million gallon storage pond.

22. A natural surface water drainage exists in the land application areas. The Discharger will construct tailwater collection ditches to prevent tailwater from draining into the surface water drainage. Collected tailwater will be pumped to the new 84-million gallon storage pond or the 1-million gallon settling pond. The Discharger has proposed allowing uncontaminated stormwater to bypass the storage pond. However, until the Discharger can propose bypass criteria that is approved by the Executive Officer, all tailwater/ stormwater draining from the land application areas shall be collected and stored in either the 1-million gallon settling or the 84-million gallon storage pond.
23. Wastewater application will be by sprinkler irrigation. The RWD states the Discharger will double crop Sudan grass and also grow winter barley. Other crops the Discharger is considering are Bermuda grass and salt tolerant alfalfa (reportedly under development in agricultural laboratories). The

Discharger will stagger planting, irrigation, and harvest so that there are always two or three crops in the land application areas.

24. The RWD presents several properties and uptake rates for the crops that may be planted at the facility. The properties of these selected crops, as listed in the RWD, are:

<u>Crop</u>	<u>ET (inches/yr)</u>	<u>EC (µmho/cm)¹</u>	<u>N Uptake (lbs/ac•yr)</u>	<u>Salt Uptake (lbs/ac•yr)</u>
Sudan Grass	51.4	5,000	325	2,400
Salt Tolerant Alfalfa	54.7	Not Available	480	2,840
Bermuda Grass	51.0	8,500	400	2,700
Winter Barley	13.2	8,500-10,000	160	860

ET denotes evapotranspiration. EC denotes electrical conductivity. N denotes nitrogen. Salt refers to all dissolved solids including plant macronutrients.

¹ EC as presented in this table references the maximum EC value at which at least 90-percent of yield is anticipated.

25. The RWD describes the annual nitrogen loading rate (due to wastewater application) to be between 428 lbs/ac•year to 490 lbs/ac•year. The Discharger anticipates double cropping Sudan grass or Bermuda grass with winter barley will take up the applied nitrogen. However, crop health at the facility has been poor in areas where wastewater has been applied for longer times and staff are uncertain whether the proposed intensive agriculture can be practiced at this facility in the long term. Therefore, the Monitoring and Reporting Program requires that the Discharger submit an annual report, prepared by a Certified Crop Advisor or Certified Agronomist, detailing the effect of the current and continued application of the wastewater on crops.
26. The RWD describes the annual DIS loading rate to be between 34,000 lbs/ac•year and 40,000 lbs/ac•year. However, the Discharger anticipates only approximately 3,260 lbs/ac•year will be taken up by cropping activities. The RWD states leaching of DIS from the root zone must be performed to control soil salinity at levels that do not hinder crop growth. Because the DIS loading rate far exceeds the crop uptake rate, it is anticipated that leaching of DIS will result in interim attenuation of the DIS in the soil, and eventual groundwater degradation with continued application. Therefore, this Order contains an effluent limit, less than that proposed by the Discharger that will protect the underlying groundwater from degradation by salt.
27. The 30 April 2002 RWD presented a water balance that showed that 160 acres of cropped land and use of a 114 million gallon storage pond could accept a yearly average wastewater flow of 1,000,000 gpd. However, this water balance assumed irrigation during times when rainfall exceeds evapotranspiration needs, a 10-percent leaching fraction, and that the facility operates 338 days per year. In addition, some of the calculations did not appear accurate. Staff created its own water balance, based on the 100-year annual rainfall return frequency and irrigation of 200 acres of crops. This water balance shows that Musco can discharge a monthly average of 700,000 gpd of wastewater and stormwater falling on the facility. It should be noted that neither water balance takes into account any contaminated stormwater that must be collected from the land application area and returned to the storage pond.

28. The Discharger submitted another water balance as part of its 8 August 2002 comments to the tentative WDRs. This water balance utilizes an 84-million gallon storage pond, 200 acres of cropland, and a monthly average flow to the storage pond of 800,000 gpd. The water balance appears overly optimistic in estimating the low volume of both irrigation tailwater and stormwater generated in the land application areas that must be returned to the pond. However, this Order allows the proposed flow of 800,000 gpd subject to certain conditions: measurement of the amount of tailwater returned to the pond, measurement/estimation of the amount of stormwater returned to the ponds, and cessation of discharge into either the 1-million gallon settling pond or 84-million gallon storage pond if either pond contains less than two feet of freeboard.
29. Regional Board staff received odor complaints on 22 October 2001, 2 November 2001, 19 November 2001, 3 December 2001, 18 January 2002, 22 March 2002, 11 April 2002, 28 May 2002, 29 May 2002, 5 June 2002, 27 June 2002, 8 July 2002, and 12 August 2002. In addition, an adjacent landowner described the nuisance odor conditions at the 6 June 2002 Regional Board meeting and submitted written comments regarding the odors on 8 August 2002. The odor complaints concerned the Discharger's land application areas, especially the eastern portion where the Discharger constructed and then flooded three irrigation checks. The Regional Board has also received several written complaints addressing wastewater that reportedly discharged from the Discharger's property.
30. The Discharger submitted a 28 June 2002 *Odor Minimization Report* describing the additional steps it will take to prevent current and future nuisance odors. To eliminate the current odors, Musco pumped out the standing water in irrigation checks nos. 2 and 3 in May 2002, has eliminated the water in two of the three ponds built within the intermittent stream, has installed an aerator in the 1-million gallon settling pond (although recent monitoring reports show that the dissolved oxygen levels are still less than 1 mg/l), and will "carefully manage" the application of wastewater on its southeastern fields. However, these steps have not been sufficient to prevent the continuing odor complaints. Because the four fields labeled "irrigation checks" are the closest fields to off-site residences, this Order prohibits the application of wastewater to these fields unless the Discharger can prove to the Executive Officer's satisfaction that wastewater application to this land will not cause offsite odors.
31. To prevent future odors, the *Odor Minimization Report states that* aerators with a capacity to provide at least 1.4 pounds oxygen/pound BOD should be installed in the 84-million gallon storage pond. The *Report* also states that wastewater at a depth of 1-2 feet below the pond surface should always have a dissolved oxygen concentration above 2 mg/l, a dissolved sulfide concentration less than 0.1 mg/l, and a pH between 7.5 and 8.5. Finally, the Report recommends that the Discharger use a portable sprayer tank mounted on a pickup truck to spray an alkaline chemical on the pond banks and water for rapid odor suppression. These recommendations have been incorporated into this Order.
32. Excess Biochemical Oxygen Demand (BOD) in the wastewater can lead to odor problems. The RWD states that the estimated annual BOD loading rate for the year 2002 will be 29 lbs/acre/day, which is well below the US EPA's criteria for the prevention of odors. However, a review of the most recent self monitoring report (June 2002) shows BOD loading rates ranging from 31 to 1,184

lbs/ac•day. These values exceed the BOD effluent limitations presented in Section C. The Discharger is required to take the necessary steps to reduce its BOD to meet the conditions of this Order.

OTHER WASTE STREAMS

33. Solid waste generated at the site includes olive pits, stem waste, waste olives, screened solids, steel cans, and cardboard, plastic, paper, and miscellaneous trash. Olive pits and stems are sold as biomass and burned at cogeneration plants or pulverized and incorporated into compost. Some olive pits are spread onto the dirt roads at the site. Waste olives are transported offsite for animal feed or offsite land disposal. Screened solids are transported offsite for land disposal at a landfill. Steel cans, plastic, paper, and miscellaneous trash are hauled by a disposal company to a landfill.
34. The Discharger submitted a Draft Stormwater Pollution Prevention Plan (SWPPP) on 5 June 2002 to address industrial activities at the facility that are exposed to storm water. Stormwater that falls on areas of industrial activity is collected and discharged to the 1-million gallon settling pond. Stormwater that falls on land application areas is collected and pumped to either the 1-million gallon settling pond or the 84-million gallon storage pond. Stormwater that falls on areas of the facility that are not likely to be contaminated is proposed for bypass around the 84-million gallon storage pond and discharge to the natural drainage feature. In two areas, stormwater that falls on the facility is not collected, and the revised SWPPP must address this issue.
35. The Discharger has stated that approximately 350 employees work on-site. Based on San Joaquin County Environmental Health Department (SJCEHD) records dated 25 October 2001, and as described in the 29 May 2002 *Revised Report, Domestic Wastewater System*, the facility is served by a septic tank system that was sized for 164 employees. The Discharger has reevaluated the domestic wastewater system as required by Time Schedule Order No. R5-2002-0014 and determined an expansion is required. The records indicate the septic tank effluent discharges to eight, 95-foot long leach lines that are equipped with 25-foot deep seepage pits at the ends. In accordance with the SJCEHD requirements, the Discharger will expand the existing septic system by adding four additional 95-foot long leach lines that will each terminate with a 25-foot deep seepage pit. The Discharger has stated that it will no longer apply wastewater over the leach lines or seepage pits. Domestic wastewater is not commingled with the process water that is land applied.

ENFORCEMENT HISTORY

36. Due to numerous violations of its WDRs, on 17 November 2000 the Executive Officer issued Cleanup and Abatement (C&A) Order No. 5-00-717 to the Discharger. The C&A Order required the Discharger to prepare technical reports and construct wastewater treatment system improvements to comply with WDRs No. 97-037 by 1 November 2001.
37. Because the Discharger did not comply with the C&A Order, the Regional Board adopted California Water Code (CWC) Section 13308 Time Schedule Order (TSO) No. R5-2002-0014 on 25 January 2002. The TSO provided interim higher flow and DIS limits, required control of nuisance odors, installation of groundwater monitoring wells, an evaluation of the domestic

wastewater system, construction of the wastewater improvements designed by the Discharger's consultants, and cropping on all land application areas.

38. Administrative Civil Liability (ACL) Complaint No. R5-2002-0502 for \$150,000 was issued by the Executive Officer on 11 April 2002 for violations of WDRs Order No. 97-037 in the time period between issuance of the C&A Order (17 November 2000) and the adoption of the TSO (25 January 2002). The Discharger waived its right to a public hearing and settled the ACL Complaint on 24 May 2002 with the \$150,000 amount split into three \$50,000 payments.
39. In April 2002, the Discharger requested a revision to TSO No. R5-2002-0014 to allow interim higher flow limits and supported that request with a technical report. The technical report addressed hydraulic, nutrient, and BOD loading but did not adequately address the dissolved solids loading. Because the TSO was considered an interim measure to allow the Discharger to continue operation while wastewater problems were addressed, staff supported the interim increase. A revised TSO No. R5-2002-0014-R01 was adopted by the Regional Board on 6 June 2002. In addition to the interim higher flow limits, the Discharger was allowed to apply wastewater as dust control in disturbed areas of the impoundment construction area and was allowed additional time to complete the 84-million gallon storage pond. The Discharger was required to provide an odor control report, evaluate the adequacy of monitoring well MW-9, and perform and submit the results of an additional groundwater monitoring event.
40. Staff have notified the Discharger several times that it has violated provisions of TSO No. R5-2002-0014 and revised TSO No. R5-2002-0014-R01. Violations include incomplete monitoring reports, exceedances of the flow limitations and DIS limitation, verification of nuisance odor conditions, and delayed construction of the 84-million gallon storage pond and tailwater return system. An Administrative Civil Liability Complaint will be prepared shortly after adoption of this Order.
41. As a result of the enforcement actions, the Discharger is constructing an 84-million gallon storage pond and is making improvements to the land application areas. The improvements include planting crops on the land application areas, mechanical equipment to improve distribution of wastewater on the land application areas, construction of tailwater collection ditches, and sumps equipped with pumps to return collected tailwater to either the 1-million gallon settling pond or the 84-million gallon storage pond. The improvements were designed to prevent wastewater from entering the surface water drainage course that flows through the land application areas and the facility. It is noted that the RWD states that the new storage pond will provide 114 million gallons of capacity; however, the Discharger notified staff on 31 July 2002 that the actual storage volume will be closer to 84 million gallons.

GROUNDWATER CONDITIONS

42. The Discharger constructed a groundwater production well in 1983. The well is approximately 607 feet deep with a sanitary seal from the surface to 50-feet below ground surface. A gravel pack exists from 50 to 607 feet below ground surface. Based on five sample events performed from 1982 to 1999, the water quality in the well is as summarized in the table below:

<u>Constituent</u>	<u>Units</u>	<u>Range</u>	<u>Average</u>	<u>Standard Deviation</u>	<u>Average plus two Std Deviations</u>
TDS	mg/L	1,280 – 1,971	1513	267	2,047
Sodium	mg/L	228 – 477	372	112	597
Chloride	mg/L	187 - 514	334	133	601
Nitrogen-N	mg/l	3.7-5.5	4.4	0.7	6

43. Available groundwater quality for wells located within two miles of the site was presented in the RWD. The depth of the wells and screened intervals are variable, and the wells were sampled at various times between 1951 and 1979. The water quality data provides some information on the surrounding groundwater quality. The data is summarized below:

<u>Well ID</u>	<u>Well Depth (ft)</u>	<u>Year Sampled</u>	<u>TDS (mg/L)</u>	<u>Sodium (mg/L)</u>	<u>Chloride (mg/L)</u>
02S04E26D01M	NA	1979	1,400	320	440
Cordes	290	1963	NA	NA	317
02S04E27J02M	300	1966-1969	NA	394 ^a	352 ^a
02S04E28A1	294	1951	NA	390	250
0204E28A1-D	290	1958-1967	1,826	384 ^a	243 ^a
0204E28H1	NA	1957-1959	2,030	432 ^a	295 ^a
024E28P1	NA	1959	NA	NA	120
02S04E33B01	NA	1979	1,360	300	240
02S04E33	NA	1955	2,620	682	560
02S04E33J1-D	NA	1957-1967	2,470	598 ^a	485 ^a
02S04E34H1	273	1959-1967	NA	558	256 ^a
02S04E35D1	NA	1951	NA	360	290
<u>02S04E35H1</u>	NA	1967-1979	<u>NA</u>	<u>402^a</u>	<u>333^a</u>
Average			1,915 ^b	431 ^b	321 ^b

NA denotes Not Available. ^a Denotes value shown is an average of available data. ^b Denotes value calculated from all data available in RWD (not from average values calculated from each well as shown in this table).

44. Thirteen groundwater monitoring wells were installed in March and April 2002; one existing well was redeveloped. The locations of the monitoring wells are shown on Attachment C. The wells were sampled in April and June (with the exception of Well MW-9 because it did not have enough water to collect a sample). Shallow and deep zones of groundwater were identified in the investigation. A summary of the groundwater quality data is presented below. The values shown are an average of the two monitoring events.

<u>Well</u>	<u>TOC Elev. (ft. msl)</u>	<u>Screen Depth (ft. bgs)</u>	<u>TDS (mg/L)</u>	<u>Cl (mg/L)</u>	<u>Na (mg/L)</u>	<u>NO₃ as N (mg/L)</u>
MW-1(S)	443.13	30-45	730	89	245	15
MW-2(S)	403.53	149.5-164	9,900	2,165	2,450	1.6

<u>Well</u>	<u>TOC Elev.</u> <u>(ft. msl)</u>	<u>Screen Depth</u> <u>(ft. bgs)</u>	<u>TDS</u> <u>(mg/L)</u>	<u>Cl</u> <u>(mg/L)</u>	<u>Na</u> <u>(mg/L)</u>	<u>NO₃ as N</u> <u>(mg/L)</u>
W-2 (1985)(S)	261.93	20-50	740	107	265	5
MW-3(S)	308.75	9.5-19.5	2,900	476	780	0.9
MW-5(S)	292.05	25-45	2,200	605	580	ND
MW-6(S)	329.39	40-55	2,600	830	780	16
MW-10(S)	259.68	11.5-21.5	2,600	1,300	800	22.5
MW-11(S)	273.68	35-40	2,000	645	625	15.9
MW-13(S)	372.00	10-25	2,950	1,450	790	41.5
MW-4(D)	333.72	234.5-249.5	1,200	151	340	3.6
MW-7(D)	266.00	154.5-169.5	2,350	485	540	5.9
MW-8(D)	288.56	208.5-228.5	1,300	200	285	9.6
MW-9(D)	291.83	126.5-141.5		Well was dry		
MW-12(D)	269.25	85-100	2,200	555	535	24

EC denotes electrical conductivity. TDS denotes total dissolved solids. Cl denotes chloride. Na denotes sodium. NO₃ as N denotes nitrate as nitrogen. ND denotes not detected. Well MW-2 (1985) is an existing well installed in 1985. Depth zone indicated in well name (S) indicates shallow, (D) indicates deep.

45. The depth to groundwater is highly variable across the site and in some areas exists in confined conditions. Two saturated zones have been identified to date: a shallow water table zone and a deeper confined zone. At this time it is unclear if shallow zones in the upland areas are hydraulically connected to water table zones in lowland areas. The possibility of existence of a water table zone in the northern areas of the site (where the confined zone is identified) has not been fully evaluated. Depth to groundwater varied from 14 to 175 feet below ground surface. Land surface elevations vary from 259 to 443 feet above mean sea level.
46. Groundwater flow directions generally mimic the topography. Overall the flow direction is to the northeast, however, topographic variations can significantly change the local flow direction.
47. While the Discharger has shown that local groundwater is of generally poor quality, the on site monitoring wells show that the Discharger's activities may have impacted the underlying groundwater. The Groundwater Monitoring Well Installation Report identified the chemistry of the groundwater in the shallow and deep zones as distinctly different, with shallow zones tending to have higher concentrations of sodium, chloride, and total dissolved solids.
48. The RWD clearly shows that the Discharger intends to apply significantly more salt than will be taken up by the crops. In order to determine whether the Musco's proposed project is protective of the underlying groundwater, specific background groundwater values for various constituents must be determined. Other than supplying the above data, the Discharger has not proposed a method or rationale for calculating background concentrations. In the tentative WDRs, staff proposed background concentrations using monitoring wells MW-1 and MW-8. The Discharger has provided comments as to why the use of these two wells is inappropriate, and staff agree that further refinement of the site-specific groundwater quality is necessary. As described in the Information Sheet, staff have fully reviewed the above data sources, and have determined that

Musco's onsite production well is most appropriate to use as *interim* background water quality. The Discharger is required to further investigate the shallow groundwater at its site and to propose *final* background groundwater concentrations within two years. During this period, the Discharger is also required to reduce the TDS and sodium concentrations in its effluent, as it is anticipated that final background groundwater concentrations will be at least as stringent as the interim concentrations.

SITE SPECIFIC CONDITIONS

49. Local land use consists of industrial, residential, and agricultural operations. The site is located on an alluvial fan that generally slopes to the northeast. Topography varies from steep to nearly level.
50. The land application areas are located outside the 100-year flood zone.
51. The average annual total precipitation for this area of San Joaquin County is 11.3 inches. The 100-year annual total precipitation for this area is 29.7 inches. The peak monthly 100-year precipitation of 6.4 inches occurs in January.
52. Surface water drainage from the facility is to the Sacramento San Joaquin Delta.
53. Shallow soil samples were collected in the land application areas in November 1999 and April 2001 as part of the 6 April 2001 Soil Salinity Assessment required by C&A Order No. 5-00-717. The samples were collected to evaluate the wastewater application impact to soil quality. Analysis indicated that 22-percent of samples collected in the Field 55 East and Field 55 West (a total of 55 acres) may be impacted by the wastewater application and 28-percent of the samples collected in Field 95 (95 acres) may be impacted. The report stated that the high concentration of sodium in the wastewater has the potential to reduce the already low permeability of the soil.

SPECIAL CONSIDERATIONS FOR FOOD PROCESSING WASTE

54. Excessive application of food processing wastewater to land application areas can create objectionable odors, soil conditions that are harmful to crops, and degradation of underlying groundwater by overloading the shallow soil profile and causing constituents of concern (organic carbon, nitrate, dissolved solids, and metals) to percolate below the root zone.
55. According to *Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency (US EPA Publication No. 625/3-77-0007) (hereafter *Pollution Abatement*), in applying food-processing wastewater to land for biological treatment, the loading of BOD₅ should not exceed 100 lbs/acre•day (average) to prevent development of nuisance odor conditions.
56. Acidic soil conditions can be detrimental to land treatment system function, and may also cause groundwater degradation. If the buffering capacity of the soil is exceeded and soil pH decreases below 5, naturally occurring metals (including iron and manganese) may dissolve and degrade underlying groundwater. *Pollution Abatement* recommends that water applied to crops have a pH

within 6.4 to 8.4 to protect crops from damage by food processing wastewater. Near neutral pH is also required to maintain adequate active microbial populations in the soil.

BASIN PLAN, BENEFICIAL USES, AND REGULATORY CONSIDERATIONS

57. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board. Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.
58. The Regional Board's Basin Plan establishes the beneficial uses of the waters of the Sacramento San Joaquin Delta. These beneficial uses are municipal and domestic supply, irrigation, stock watering, industrial process and service supply, contact recreation, other non-contact recreation, warm and cold freshwater habitat, warm and cold migration, warm water spawning, and navigation.
59. The beneficial uses of underlying groundwater are domestic and municipal supply, agricultural supply, industrial service supply, and industrial process supply.
60. The Basin Plan establishes numeric and narrative water quality objectives for surface and groundwater within the basin. Numeric water quality objectives are limits already quantified. Narrative water quality objectives are unquantified limits expressing the level of protection for beneficial uses from specific constituents and categories of constituents. Objectives for chemical constituents in, and toxicity and tastes and odors of, groundwater take both forms. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use.
61. The Basin Plan sets forth a procedure for translating narrative water quality objectives into numeric water quality limits, directing that relevant numeric criteria and guidelines developed and published by other agencies and organizations and any other relevant information be considered.
62. The CWC requires that waste discharge requirements implement the Basin Plan and consider the beneficial uses and water quality objectives reasonably required to protect the uses, as well as other waste discharges and conditions in the area and groundwater. The Basin Plan requires that waste discharge requirements apply the most stringent objective for each constituent to ensure that discharges do not cause groundwater to contain a chemical constituent, toxic substance, radionuclide, pesticide, or taste- or odor-producing substance in a concentration that adversely affects any beneficial use.
63. The Basin Plan procedure for applying water quality objectives as terms of discharge in waste discharge requirements requires maintenance of the existing quality of groundwater except where

the Board determines an adverse change is consistent with Resolution 68-16. Resolution 68-16 requires the Board to regulate waste discharges in a manner that maintains high quality waters of the State. Any change in quality can only occur after full application of best practicable treatment and control (BPTC) of the waste and must be consistent with maximum benefit to the people of the State, not unreasonably affect a beneficial use, and not result in water that exceeds a water quality objective.

64. To protect the designated use of municipal and domestic supply, water quality objectives correspond to maximum contaminant levels (MCLs) specified in the provisions of Title 22, California Code of Regulations.
65. Protection of agricultural supply requires consideration of narrative objectives and translators. Guidelines for identifying the quality of irrigation water necessary to sustain various crops were compiled by Ayers and Westcot in 1985 (Food and Agriculture Organization of the United Nations – Irrigation Drainage Paper No. 29). The Agricultural Guidelines estimate the potential hazards to crop production associated with long term use of the particular water being evaluated. The Agricultural Guidelines categorize ranges of concentration of each constituent as having “No Problem – Increasing Problems – Severe Problems” based on large numbers of field studies and observations, and carefully controlled greenhouse and small plot research. In general, crops sensitive to sodium or chloride are most sensitive to foliar absorption from sprinkler-applied water. Bicarbonate causes problems when fruit crops or nursery crops are sprinkler irrigated during periods of very low humidity and high evaporation. The following table contains numerical criteria from the Agricultural Guidelines identified as necessary for protection of a range of crops under various circumstances, but the most stringent is not necessarily the concentration that assures no adverse affect on any nonagricultural beneficial use:

<u>Problem and Related Constituent</u>	<u>No Problem</u>	<u>Increasing Problem</u>
Salinity of Irrigation Water (EC, μ mhos/cm)	< 700	700 – 3,000
Salinity of Irrigation Water (TDS, mg/L)*	< 450	450 – 2,000
Specific Ion Toxicity		
from Root absorption		
Sodium (mg/L)	< 69	69 – 207
Chloride (mg/L)	< 142	142 – 355
Boron (mg/L)	< 0.5	0.5 – 2.0
from Foliar Absorption		
Sodium (mg/L)	< 69	> 69
Chloride (mg/L)	< 106	> 106
Miscellaneous		
NH ₄ -N (mg/L) (for sensitive crops)	< 5	5 – 30
NO ₃ -N(mg/L) (for sensitive crops)	< 5	5 – 30
HCO ₃ (mg/L) (only with overhead sprinklers)	< 90	90 - 520
pH	normal range = 6.5 – 8.4	

* Assumes an EC:TDS ratio of 0.6:1

66. The Agricultural Guidelines present the maximum EC that various crops will tolerate before experiencing percent crop reductions (i.e., 0, 10, 25, and 50%). Data below summarizes irrigation water EC data (in $\mu\text{mhos/cm}$) for crops cultivated in the vicinity of the facility at various EC:

<u>Crop</u>	<u>0% Reduction</u>	<u>10% Reduction</u>
Corn (Sweet)	1,100	1,700
Peaches	1,100	1,400
Alfalfa	1,300	2,200
Hay (Barley)	4,000	4,900

67. The Agricultural Guidelines indicate that boron sensitive crops such as stone fruit and grapes may show injury when irrigated with boron ranging from 0.5 to 1.0 mg/L and show reduced yield and vigor when irrigated with boron ranging from 1.0 to 2.0 mg/L.
68. A long-term problem facing the Sacramento-San Joaquin Delta is increasing salinity in waterways and in groundwater, a process accelerated by man’s activities and particularly affected by intensive irrigated agriculture. Basin Plan policies and programs focus on controlling the rate of increase of salt in the Basin from all controllable sources, and particularly point sources of waste. The Board is presently engaged in developing a Total Maximum Daily Load for the San Joaquin River. Proactive management of waste streams by dischargers to control addition of salt through use is a reasonable expectation.

LAND TREATMENT UNIT (LTU) – LAWS AND REGULATIONS

69. Successful treatment and control in the application of waste constituents to land is an inexact science highly dependent upon the constituent, soils, climate, other practices that affect the property, and sound waste management and control. The process depends upon attenuation (decomposition, immobilization, and transformation) in the soil profile and consumption from the root zone by crops to remove waste constituents. Excessive application rates for waste constituents can result in vector conditions and anaerobic waste or soil conditions that can create nuisance odor conditions. Excessive application rates can also overload the shallow soil profile and root zone to impair crops, crop waste constituent consumption, and the waste attenuation process itself, and lead to leaching of waste constituents out of the treatment zone. Excessive application can also result in dissolution of soil minerals such as calcium and magnesium. Excessive hydraulic applications, even if from use of supplemental fresh water, can flush waste constituents, decomposition by-products, and dissolved minerals out of the treatment zone. Absent sufficient sustained reliable attenuation of residual waste constituents in the remaining soil profile, the constituents will eventually discharge into groundwater. Temporary storage of residual waste constituents within the soil column can misrepresent the effectiveness of the process.
70. Section 13173(b) of the CWC, defines designated waste as: “Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses...”

71. Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste, as set forth in Title 27, California Code of Regulations, §20005 et seq., (hereinafter Title 27) specify types of waste that must be fully contained and prescribes standards for containment, including for designated waste.
72. Title 27, §20210, specifies criteria for containment and disposal of designated waste constituents on land. Liquid designated waste in surface impoundments is subject to full containment with double liners in accordance with standards prescribed in Title 27. Land treatment of designated waste is subject to standards prescribed by Title 27 for a Class I or Class II land treatment unit (LTU). Title 27, §20164, defines LTU as a, “waste management unit (Unit) at which liquid and solid waste is discharged to, or incorporated into, soil for degradation, transformation, or immobilization within the treatment zone.” It defines treatment zone as, “a soil area of the unsaturated zone of a land treatment unit within which constituents of concern are degraded, transformed, or immobilized.”
73. Designated waste subject to the Title 27 prescriptive and performance standards for an LTU may qualify for conditional exemption from Title 27 pursuant to section 20090(b). A discharge of decomposable waste that need not be managed as a hazardous waste can be exempted under section 20090(b) if all waste constituents are treated and controlled to a degree that the discharge complies with the Basin Plan. Documentation for such exemption must at least equal the scientific rigor of the test plot required as a prerequisite of approval of a Title 27 LTU.
74. Performance standards of Title 27 applicable to LTUs require that:
 - a. The Discharger demonstrate prior to discharge that the LTU can completely degrade transform, or immobilize designated waste constituents in the treatment zone (§20250(b)), which cannot exceed 5 feet;
 - b. The Discharger establish prior to discharge the appropriate design depth of the treatment zone for each designated waste constituent, not to exceed five feet below the initial ground surface (§20250(b));
 - c. The Discharger establish prior to discharge to the LTU a site-specific Water Quality Protection Standard (§20390) for each designated waste constituent (under §20395), the concentration limits (under §20405), and the Point of Compliance and all Monitoring Points (under §20405);
 - d. Specific standards be prescribed by which to monitor water quality (§20420), including a detection monitoring program (§20420), an evaluation monitoring program (§20425), and an unsaturated zone monitoring program for the LTU (§20435), which requires soil-pore liquid monitoring to assure effective operation.
75. Pursuant to §20090(b), the Board may exempt a discharge from Title 27 only if:
 - a. The Regional Board issues waste discharge requirements;
 - b. The waste discharge requirements implement the Basin Plan and allow discharge only in accordance with the Basin Plan; and

- c. The wastewater is nonhazardous waste and need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.

ANTI-DEGRADATION ANALYSIS

76. State Water Resources Control Board (State Board) Resolution No. 68-16 (hereafter Resolution No. 68-16) requires that waste be discharged in a manner that maintains the high quality waters of the state. Any change in quality can occur only after full application of best practicable treatment and control (BPTC) of the waste, and must be consistent with maximum benefit to the people of the State, not unreasonably affect a beneficial use, and not result in water that exceeds a water quality objective. Where the water quality objective is exceeded in background water quality but nonetheless beneficially used or designated for beneficial use, the background water quality cannot be degraded.
77. Antidegradation factors have been considered pursuant to Resolution No. 68-16. The project as proposed does not threaten to degrade groundwater with nitrogen, assuming that the proposed intensive cropping can be maintained. The project as proposed may degrade or cause degradation of groundwater and possibly create nuisance from organics while waste is ponded and in the manner applied to land. As described in Finding No. 26, the project as proposed will certainly cause pollution with constituents of salt. Degradation of the groundwater with organics and salt is not consistent with maximum benefit to the people of the State. If it were, the Discharger would have to demonstrate its treatment as being best practicable treatment and control (BPTC). The Discharger has made no BPTC demonstration. In short, the project as proposed by the Discharger is not consistent with Resolution 68-16.
78. In considering potential salt degradation of groundwater from the discharge, the salt already within the LTU and underlying soil profile must be considered, and elevated salt is already within the LTU and likely in the soil profile below it given past practices of the Discharger. Given the unacceptability of the salt proposed for discharge, it is not necessary to quantify this factor.
79. Following adoption of WDRs Order No. 97- 037, the Discharger has been provided ample opportunity to justify a discharge and comply with Order No. 97-037. It has not complied. It has been granted interim conditional flow increases while under a series of enforcement actions while developing justification for discharge, and violated those conditions, including repeated failure to monitor waste and submit reports as required, and failure to restrain production in accord with enforcement conditions, resulting in administrative civil liability. The RWD is inadequate to support the requested discharge. Therefore, this Order limits the Discharger to that which will not degrade the underlying groundwater.

GROUNDWATER DISCHARGE ANALYSIS – LAWS, RULES, AND REGULATIONS

80. For the waste constituents present in the discharge in significant concentrations, the water quality objectives determined by the translator process from narrative objectives are all less than observed background water quality, except for nitrate. Because all forms of nitrogen can convert to nitrate

in groundwater, and the most sensitive use for the constituent is domestic drinking water, the nitrate standard of 10 mg/L as nitrogen is the governing water quality objective. Further, to satisfy the taste and odor narrative objective, the ammonia form of nitrogen can be no greater than 0.5 mg/L as nitrogen based on consideration of a published European Union drinking water standard. Where background water quality is unaffected by other discharges and greater than water quality objectives, the background water quality governs.

81. The general concentrations of key waste constituents in the effluent, storage pond, and in wastewater applied to land compare with groundwater and water quality objectives as follows:

	<u>1-million gallon settling pond</u>	<u>On-Site Supply Well (Average)</u>	<u>Background Groundwater⁵</u>	<u>Objectives</u>
DIS	2,718	NM ¹	NM	NA ²
Chloride	415	334	601	106
Sodium	739	372	597	103
TDS	4,737	1,513	2,047	450
Total Nitrogen	61 ³	4.4	6 ⁴	10
BOD	3,040	NM	NM	0

- 82.

¹ NM denotes Not Measured

² NA denotes Not Applicable

³ All nitrogen was present as TKN, nitrate no detected in the samples.

⁴ Reported as the average sum of NO₃ as N and total Kjeldahl nitrogen.

⁵ Background quality defined by the average concentrations plus two standard deviations of samples from the onsite supply well.

83. The discharge is nonhazardous, but exhibits characteristics of “designated waste,” as the concentrations of some waste constituents when treated, stored, and applied to land have potential for causing exceedances of water quality objectives or adversely affecting beneficial uses. The discharge contains decomposable waste constituents (e.g., organic carbon and nutrient compounds) and inorganic dissolved solids in concentrations that are greater than water quality objectives when released from any of these structures or from what is applied to land.
84. The discharge must be categorized as designated waste because of these constituents and subjected to the full containment provisions of Title 27 unless it can be demonstrated that constituents of concern, after release, are effectively and consistently removed by attenuation in the soil profile and the discharge fully compliant with the Basin Plan. For constituents that may infiltrate from inverts of ponds, this means a demonstration of the effectiveness of liners in containing the constituent, a scientific demonstration of attenuation within the soil profile beneath lined and unlined ponds for released waste constituents, and technical evidence that groundwater will not be degraded by the constituents. For waste applied to the land application area, it means a demonstration that controlled land treatment removes waste decomposable constituents within the LTU and, for those not totally decomposable, passes through concentrations that will cause no

degradation of groundwater. Given the applicability of Title 27, some of its definitions and terms are used herein.

85. The waste that is discharged to ponds and land contains TDS and sodium well in excess of governing background quality and is not effectively removed by the LTU. The discharger has made no demonstration that the LTU can achieve salt removal by land treatment, but proposes use of crops for this purpose and has provided theoretical projections of crop uptake of salt. TDS can be effectively controlled by means of source control, treatment, or containment. Source control includes best management practices of selective and judicious chemical use (e.g., potassium-based cleaning solutions instead of sodium-based) and waste stream isolation or segregation where possible (in particular separate handling of CIP wastewater, ion exchange regeneration brine, and boiler blowdown). Such control practices have been employed for some waste streams, but not for cannery floor water or CIP waste. Treatment technology includes reverse osmosis and ion exchange applied to the wastewater, but the record contains no evidence that any have been evaluated or applied to the discharge. Containment technology includes Title 27 prescriptive standards where appropriate, but there is no evidence that these were considered for implementation for all applicable waste streams. The Discharger has not demonstrated failsafe control technology to prevent diversion of designated waste to the land application areas. Automatic sensing devices linked to continuous monitors are available for this purpose, and segregated piping has not been determined as infeasible.
86. The practical demonstration of removal of salt as projected by the Discharger has not been demonstrated as required for an LTU and, in the judgment of this Regional Board, is excessively optimistic. The Discharger has not established the design LTU depth which is dependent upon crop. The Discharger has not established an evaluation monitoring program, unsaturated zone monitoring program, or the water quality protection standards for each waste salt constituent. It is evident that the proposed chloride and sodium concentrations will adversely affect crop health through foliar absorption and adverse affects on soil and reduce yields, and salt uptake. The Discharger has not scientifically quantified what plant salt will be removed through harvesting or from a practical aspect how severe slopes will be harvested, so it remains unclear how much salt, if any, will actually be removed from the site. Cropping with high quality water requires a leaching fraction to leach salt accumulation from the soil, and as water quality decreases the leaching fraction must increase. Successful cropping will require a large leaching fraction that the Discharger estimates at 10-percent. However, the leaching fraction is always more concentrated than the applied water. Water applied by sprinkler in a hot climate will have an application efficiency of about 70%. If Sudan grass requires 49 inches of water per year for evapotranspiration, with a leaching factor of 10%, then it requires 77 inches of applied wastewater, of which 7 inches will be for the soil leaching of salt carried by the total volume of water. Disregarding increased salt due to evaporation within ponds and additives for odor and pH control, and allowing credit for salt removal as yet undemonstrated, the concentration of DIS in leachate would still be about 10,100 mg/L, well in excess of background water quality and, being inconsistent with the Basin Plan, a practice impossible to exempt from Title 27.
87. Neither the settling pond nor the storage pond contain liners which satisfy the prescriptive or performance standards of Title 27.

88. In regards to decomposable waste, the Discharger has not, among other things, demonstrated the appropriate loading of the LTU and operating controls as required to assure no organic constituents leach below the treatment depth, which is also not justified. However, as a general guide, *Pollution Abatement* recommends an LTU for food-processing wastewater not exceed a loading of BOD₅ of 100 lbs/acre•day to prevent development of nuisance odor conditions. The RWD describes the projected BOD average loading rate as approximately 70 lbs/acre•day; however, recent monitoring reports show that the discharge contains much higher BOD loading rates which will not comply with the recommendation in *Pollution Abatement*.
89. The Discharger has not proposed a project that will assure no degradation for constituents that already exceed water quality objectives and therefore is inconsistent with the Basin Plan and cannot be exempted from Title 27 standards.

OTHER REGULATORY CONSIDERATIONS

90. Section 13267(b) of California Water Code provides that: “In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

The technical reports required by this Order and the attached “Monitoring and Reporting Program No. R5-2002-0148” are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

91. State regulations pertaining to water quality monitoring for waste management units are found in Title 27. These regulations prescribe procedures for detecting and characterizing the impact of waste constituents on groundwater. While the facility has been found exempt from Title 27, the data analysis methods of Title 27 are appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.
92. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the State or County pursuant to CWC section 13801, apply to all monitoring wells.
93. On 28 February 1997, the Regional Board adopted a Negative Declaration for this project. The negative declaration described a discharge of 500,000 gpd to 200 acres of cropland, and

wastewater constituent concentrations as follows: total dissolved solids (1280 mg/l), sodium (456 mg/l), chloride 228 (mg/l), BOD 2,000 (mg/l), nitrogen (1 mg/l), and electrical conductivity (2,500 umhos/cm). The discharge described in these WDRs is consistent with the Negative Declaration and no new significant impacts are expected from the discharge allowed by these WDRs.

Therefore, the action to update waste discharge requirements for this facility is exempt from the provisions of the California Environmental Quality (CEQA), in accordance with Title 14, California Code of Regulations (CCR), Sections 15162 and 15301. On 5 April 2001, the San Joaquin County Community Development Department adopted a Negative Declaration for construction of a wastewater storage pond.

94. As stated in CWC, §13263(g), discharge is a privilege, not a right, and this conditional authorization to discharge while obtaining technical documentation for a future decision does not in any way create a vested right to continue the discharge. Failure to provide the level of management required preclude conditions that threaten pollution or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.

PUBLIC NOTICE

95. All the above and the supplemental information and details in the attached Information Sheet, incorporated by reference herein, were considered in establishing the following conditions of discharge.
96. The Discharger and interested agencies and persons were notified of intent to prescribe WDRs for this discharge and provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
97. In a public meeting, all comments pertaining to the discharge were heard and considered.

IT IS HEREBY ORDERED that WDRs Order No. 97-037 are rescinded and pursuant to Section 13263 and 13267 of the California Water Code, Musco Family Olive Company and the Studley Company, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

Note: Other prohibitions, conditions, definitions, and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.

A. Discharge Prohibitions:

1. The direct or indirect discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Unless specifically allowed by the Executive Officer, the direct or indirect discharge of wastes within 100 feet of a surface water or surface water drainage course is prohibited.

3. Bypass or overflow of unscreened waste, or overflow of untreated or partially treated waste, is prohibited.
4. Discharge of percolate from the LTU of waste classified as hazardous, as defined in Sections 2521(a) of Title 23, CCR, Section 2510, et seq., (hereafter Chapter 15), or 'designated', as defined in Section 13173 of the California Water Code, is prohibited.
5. Discharge of domestic wastewater to the process wastewater treatment system or land application areas is prohibited.
6. Discharge of process water to areas other than the designated LTUs described in the "Land Application System" section of the Findings is prohibited.
7. Land application of wastewater to any LTU not having a fully functional tailwater/runoff control system is prohibited.
8. Discharge of wastewater into the storage ponds, or directly from the facility to the land application areas, is prohibited when either the settling or storage pond has less than two feet of freeboard.
9. Bypass of stormwater from the LTUs around the 84-million gallon storage pond is prohibited unless and until the Executive Officer approves the report described in Provision No. G.2.c.
10. Discharge of wastewater to the "irrigation checks" (a total of 8.9 acres) is prohibited unless the Discharger can prove to the Executive Officer's satisfaction that the application of wastewater to this land will not result in objectionable offsite odors.
11. Grazing of animals on the land application areas is prohibited, except on the 95-acre land application area and only then on no more than 10-acres at a time.
12. Industrial wastewater shall not be applied above the septic system leach lines or seepage pits.

B. Discharge Specifications:

1. The monthly average flow of wastewater and stormwater from the facility to the 1-million gallon settling pond shall not exceed 800,000 gpd.
2. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution as defined by the California Water Code, Section 13050.
3. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitation.
4. Nuisance odors originating at this facility shall not be perceivable beyond the limits of the property owned by the Discharger.

5. As a means of discerning compliance with Discharge Specification No. B.4, the wastewater from 1 to 2 feet below the surface of the 1-million and 84-million gallon ponds shall maintain the following at all times:
 - a. A dissolved oxygen concentration greater than 2 mg/l;
 - b. A dissolved sulfide concentration less than 0.1 mg/l; and
 - c. A pH between 7.5 and 8.5 standard pH units.
6. The discharge to conveyance systems, settling basins, ponds, or land application areas not adequately maintained to prevent off-site odor nuisance, fly breeding, or mosquito breeding is prohibited.
7. All storage ponds shall be managed to prevent breeding of mosquitoes. In particular:
 - a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface
8. Any ponds and the land application system shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, and seasonal ancillary inflow and infiltration during the wet season. Design seasonal precipitation shall be based on total annual precipitation using a return of 100 years, distributed monthly in accordance with historical rainfall patterns.
9. Pond freeboard shall never be less than two feet in any pond as measured vertically from the water surface to the upper surface of the lowest adjacent dike or levee.
10. On or about **1 November** each year, available pond storage capacity shall at least equal the volume necessary to comply with Discharge Specifications No. B.9 and B.10.
11. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge.
12. The Discharger's wastewater treatment system and land application system shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

C. Effluent Limitations

1. Wastewater discharged into the 1-million gallon settling pond shall not exceed the following interim effluent limits. Upon completion of the site-specific background groundwater quality study described in the Provisions, the Discharger may submit a Report of Waste Discharge requesting modified effluent limitations.

<u>Constituent</u>	<u>Concentration</u>
Total Dissolved Solids	2,047 mg/l
Sodium	597 mg/l
Chloride	601 mg/l

2. The maximum total nitrogen loading to the LTUs shall not exceed 480 lbs/ac•year, or if the crop uptake is lower, the nitrogen loading shall not exceed the agronomic rate for the crop grown. Plant available nitrogen shall be calculated as 100-percent of the total nitrogen content of the waste, unless and until the Discharger demonstrates that another proportion is technically justified, as described in the Provisions.
3. The maximum BOD₅ loading to the LTUs shall not exceed any of the following:
 - a. 300 lbs/acre on any single day;
 - b. 100 lbs/acre•day as a 7-day average;
 - c. The maximum loading rate that ensures that the discharge will not create a nuisance.
4. Wastewater discharged to the LTUs shall not have a pH of less than 6.5 or greater than 8.5.

D. Land Application Areas Specifications

1. The discharge shall be distributed uniformly on adequate acreage in compliance with the Discharge Specifications.
2. Crops shall be grown on the application areas. Crops shall be selected based on nutrient uptake capacity, tolerance to high soil moisture conditions, and consumptive use of water and irrigation requirements. Cropping activities shall be sufficient to take up all the nitrogen applied. Crops shall be harvested and removed from the land application areas.
3. Planting and harvesting of crops shall be staggered so that there are always two to three crops at a time.
4. As described in the RWD, to prevent erosion, double crops shall be planted into existing stubble from previous crops whenever possible.
5. The Discharger shall use soil moisture monitoring and soil sampling to determine soil fertility status and shall take the necessary steps to maintain fertility.
6. As sprinkler nozzles and heads wear out, they should be replaced with low output, low pressure devices that minimize raindrop impacts on the clay soils. It is anticipated that it will take 2-3 years to accomplish this task.
7. Irrigation with process wastewater shall not be performed within 24 hours of a forecasted storm, during a precipitation event, 24 hours after a precipitation event, or when the ground is saturated.

8. Hydraulic loading of wastewater and irrigation water shall be at reasonable agronomic rates designed to minimize the percolation of process wastewater and irrigation water below the root zone (i.e., deep percolation).
9. The discharge of process wastewater, including runoff, spray or droplets from the irrigation system, shall not occur outside the boundaries of the land application areas.
10. Wastewater conveyance lines shall be clearly marked as such. Wastewater controllers, valves, etc. shall be posted with advisory signs; all equipment shall be of a type, or secured in such a manner, that permits operation by authorized personnel only.
11. No physical connection shall exist between wastewater piping and any domestic water supply or industrial supply well without an air gap or approved reduced pressure device.
12. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.
13. The land application area shall be managed to prevent breeding of mosquitoes. More specifically:
 - a. All applied irrigation water must infiltrate completely within 24 hours.
 - b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.
 - c. Low pressure pipelines, unpressurized pipelines, and ditches that are accessible to mosquitoes shall not be used to store wastewater water.
14. Discharges to the land application area shall be managed to minimize both erosion and runoff from the land application area.
15. There shall be no standing water in the land application areas 24 hours after wastewater is applied, except during periods of heavy rains sustained over two or more consecutive days.
16. The perimeter of the land application areas shall be bermed or graded to prevent ponding along public roads or other public areas.
17. The resulting effect of the wastewater discharge on the soil pH shall not exceed the buffering capacity of the soil profile.
18. Application or impoundment of process wastewater shall not occur within 50 feet of any residential property boundary or occupied commercial building, unless it is demonstrated to the satisfaction of the Executive Officer that a shorter distance is justified.

E. Solids Disposal:

1. Sludge and other solids shall be removed from wastewater treatment equipment, sumps, etc. as needed to ensure optimal plant operation and adequate hydraulic capacity and shall be disposed of in a manner that is consistent with Title 27, Division 2, Subdivision 1 of the CCR and approved by the Executive Officer.
2. Treatment and storage of solids and sludges (including olive pits) shall be conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations.
3. Any storage of process wastewater solids or sludges (including olive pits) on the Discharger's property shall be temporary, controlled, and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils.
4. Storage and disposal of domestic wastewater sludge (septage) shall comply with existing Federal, State, and local laws and regulations, including permitting requirements and technical standards. Sludge and other solids shall be removed from septic tanks as needed to ensure optimal operation and adequate hydraulic capacity. A duly authorized carrier shall haul sludge, septage, and domestic wastewater.
5. Any proposed change in solids use or disposal practice from a previously approved practice shall be reported to the Executive Officer at least 90 days in advance of the change.

F. Groundwater Limitations:

The discharge, in combination with other site-derived sources, shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than background water quality.

G. Provisions:

1. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with sections 415 and 3065 of Title 16, CCR, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
2. All of the following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared by a registered professional as described by Provision G.1.

- a. By **1 November 2002**, the Discharger shall submit a report describing the following:
 - i. The installation of sufficient aerators in both the 1-million gallon and the 84-million gallon ponds such that the requirements of Discharge Specification No. B.5 will be continuously met. The report shall clearly show the calculations used to determine the number and size of the aerators.
 - ii. When a portable sprayer tank was purchased, and how and when the portable sprayer tank will be used to provide rapid odor suppression around the banks and water surface of the ponds.
 - iii. The installation and location of sufficient flow meters to comply with the flow measurement requirements of Monitoring and Reporting Program No. R5-2002-0148.
 - iv. The retrofitting of the irrigation system such that all sprayfields can be operated with short (i.e., 15 minute) irrigation durations.
- b. By **1 November 2002**, the Discharger shall submit a workplan for additional characterization of (a) groundwater quality around the 84-million gallon storage pond consisting of a minimum of one well upgradient and two wells downgradient of the storage pond, (b) percolate quality under the LTUs, and (c) additional studies needed to investigate the groundwater hydrogeology of the facility that will include, at a minimum, investigation of the high TDS concentrations measured at Well MW-2, installation of additional wells to replace monitoring wells that have gone dry since installation, and further investigation of the occurrence and quality of groundwater beneath the land application areas. The goal of the investigation is to determine the background groundwater quality at the site and measure any impact to groundwater quality caused by wastewater storage ponds. Monitoring wells shall be constructed to yield representative samples from the aquifers identified in the July 2002 groundwater monitoring report and shall comply with applicable well standards. In addition, the workplan shall describe the installation of an adequate number of pan lysimeters to determine percolate quality in areas unaffected by wastewater application as well as in areas to which wastewater is applied. The workplan shall be consistent with, and include the items listed in, the first section of Attachment D, "Items to be Included in a Monitoring Well/Lysimeter Installation Workplan and Installation Report of Results."
- c. At least **60 days** prior to allowing stormwater to bypass the 84-million gallon storage pond, the Discharger shall submit a technical report that describes specific numerical water quality criteria to determine if the bypass of stormwater around the storage pond is protective of surface water quality. Upon approval of the Executive Officer, wastewater that is consistent with the criteria may be discharged past the 84-million gallon storage pond. The discharge must remain in compliance with all stormwater permit requirements.
- d. By **31 March 2003**, the Discharger shall submit a BPTC Salinity Source Reduction Plan for each waste constituent. The report shall describe each process that generates wastewater, the estimated daily flow for each waste stream, and chemical

characterization of each waste stream. The report shall determine BPTC measures for each waste stream and discuss the potential for reducing the overall wastewater salinity by reducing or changing chemical additives, changing housekeeping practices, changing the process, segregation of high strength waste streams, and separate treatment and/or disposal of high strength waste streams. The report shall provide a specific schedule subject to the approval of the Executive Officer for implementation of BPTC measures needed to assure full compliance with the interim effluent limitations and the Groundwater Limitations of this Order.

- e. By **5 December 2002**, the Discharger shall submit an Operation and Maintenance (O&M) Plan for the wastewater treatment facility land application areas. The O&M Plan shall instruct field personnel on how to manage the day-to-day discharge operations to comply with the terms and conditions of this order and how to make field adjustments, as necessary, to preclude nuisance conditions (e.g., standing water, runoff from land application areas, and nuisance odors from ponded wastewater). It shall also include a nuisance condition troubleshooting flowchart and a description of notification requirements if bypass occurs. Operating personnel shall keep a copy of the O&M Plan at the facility for reference. Key operating personnel shall be familiar with its contents.
- f. By **1 August 2003**, the Discharger shall submit a technical report describing the waste assimilative capacity of the LTUs (land application areas). The report shall contain the information described in Findings No. 72 through 74.
- g. By **1 March 2003**, the Discharger shall submit a Solid Waste Management Plan that describes the sources, storage, treatment, and disposal of solid waste (including olive pits) generated by the processing facility.
- h. By **1 May 2003**, the Discharger shall submit a Groundwater Well and Lysimeter Installation report. The report shall be consistent with, and include the items listed, in the second section of Attachment D. The report shall describe the installation and development of the new monitoring wells and lysimeters, and explain any deviation from the approved workplan.
- i. By **1 June 2003**, the Discharger shall submit a report showing that it has constructed the additional domestic wastewater leachlines and seepage pits as described in the 29 May 2002 *Revised Report, Domestic Wastewater System*.
- j. By **6 September 2004**, the Discharger shall submit a Background Groundwater Quality and Percolate Quality Report. For each groundwater monitoring parameter/constituent identified in the MRP, the report shall present a summary of monitoring data, a calculation of the concentration in background monitoring wells and lysimeters, and a comparison of background groundwater quality to that in wells and lysimeters used to monitor all land application areas. Determination of background quality shall be made using the methods described in Title 27, Section 20415(e)(10), and shall be based on data from at least four consecutive quarterly (or more frequent) groundwater monitoring

events. For each monitoring parameter/constituent, the report shall compare measured concentrations for compliance monitoring wells and lysimeters with the calculated background concentration. The report shall contain proposed background groundwater limitations for the shallow and deep saturated intervals for TDS, nitrogen, sodium, and chloride. Background values shall be based on site-specific data.

If the Background Groundwater Quality and Percolate Quality Report shows that the wastewater discharge has impacted, or is likely to impact groundwater or percolate quality, then within 90-days of request by the Executive Officer, the Discharger shall submit a Groundwater Mitigation Plan which shall evaluate contaminant control alternatives, describe a preferred alternative, and proposed a timeline to meet the Groundwater Limitations of this Order. The selected contaminant control alternative must comply with State Water Resources Control Board Resolution No. 68-16 and be consistent with the most recent Basin Plan. Failure to reduce the constituent loading rates could result in reclassification of the wastewater as designated waste and/or result in a requirement to cease the discharge.

3. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2002-0148, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.
4. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
5. The Discharger shall submit to the Regional Board on or before each compliance report due date the specified document, or if appropriate, a written report detailing compliance or noncompliance with the specific scheduled date and task. If noncompliance is reported, then the Discharger shall state the reasons for noncompliance and shall provide a schedule to come into compliance.
6. The Discharger shall use the best practicable cost effective control technique(s) currently available to comply with discharge limits specified in this order.
7. The Discharger shall report promptly to the Regional Board any material change or proposed change in the character, location, or volume of the discharge.
8. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, then the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office.
9. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

10. The Discharger shall maintain a copy of a current Operation and Maintenance Plan (O&M Plan) at the facility for reference by operating personnel who shall be familiar with its contents. The O&M Plan shall discuss all aspects of managing the discharge operation to comply with the terms and conditions of this Order and how to make field adjustments as necessary to preclude nuisance conditions. The O&M Plan shall also include the current cropping plan for each processing season.
11. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
12. If the Discharger can demonstrate to the satisfaction of the Executive Officer that higher dissolved solids loadings than that specified in the Effluent Limitations will not cause or contribute to cause waste constituents to leach into and degrade underlying groundwater, or cause any other violation of the terms and conditions of this Order, then this Order may be reopened for consideration of revision of dissolved solids loading limits. The demonstration shall include the submittal of a technical report that describes, at a minimum, the results of a field demonstration project conducted over the course of at least two years on similar soil types as those in the land application areas and using similar food processing wastewater as that described in the Findings. Any proposed field demonstration project will be regulated under the terms and conditions of separate waste discharge requirements. As such, at least 120 days prior to conducting the field demonstration project, the Discharger (and/or other reasonable party) must submit a complete Report of Waste Discharge for the proposed field demonstration project.
13. If the Discharger can demonstrate to the satisfaction of the Executive Officer that higher BOD loadings than that specified in the Effluent Limitations will not cause or contribute to cause waste constituents to leach into and degrade underlying groundwater, or cause any other violation of the terms and conditions of this Order, then this Order may be reopened for consideration of revision of BOD loading limits. The demonstration shall include the submittal of a technical report that describes, at a minimum, the results of a field demonstration project conducted over the course of at least two years on similar soil types as those in the land application areas and using similar food processing wastewater as that described in the Findings. Any proposed field demonstration project will be regulated under the terms and conditions of separate waste discharge requirements. As such, at least 120 days prior to conducting the field demonstration project, the Discharger (and/or other reasonable party) must submit a complete Report of Waste Discharge for the proposed field demonstration project.
14. If the Discharger can demonstrate to the satisfaction of the Executive Officer that higher nitrogen loadings than that specified in the Effluent Limitations will not cause or contribute to cause waste constituents to leach into and degrade underlying groundwater, or cause any other violation of the terms and conditions of this Order, then this Order may be reopened for consideration of revision of nitrogen loading limits. The demonstration shall include the submittal of a technical report that describes, at a minimum, the results of a field demonstration project conducted over the course of at least two years on similar soil types as

those in the land application areas and using similar food processing wastewater as that described in the Findings. Any proposed field demonstration project will be regulated under the terms and conditions of separate waste discharge requirements. As such, at least 120 days prior to conducting the field demonstration project, the Discharger (and/or other reasonable party) must submit a complete Report of Waste Discharge for the proposed field demonstration project.

15. The Discharger is ultimately responsible for the effectiveness of its treatment and control measures in assuring compliance with groundwater limitations, and is liable for remediation of any impact on groundwater not authorized herein. Failure to properly operate and maintain best practicable treatment and control, or failure of such measures to perform effectively, shall be grounds to rescind this Order, reclassify the waste and designated, and require compliance with Title 27 prescribed waste containment standards or initiate enforcement, as appropriate.
16. The Regional Board will review this Order periodically and may revise requirements when necessary.

I, THOMAS R. PINKOS, Acting Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 6 September 2002.

THOMAS R. PINKOS, Acting Executive Officer

AMENDED

TRO: 9/6/02

INFORMATION SHEET

ORDER NO. R5-2002-0148
MUSCO FAMILY OLIVE COMPANY AND THE STUDLEY COMPANY
WASTEWATER TREATMENT AND LAND DISPOSAL FACILITY
SAN JOAQUIN COUNTY

Musco Family Olive Company and the Studley Company (Discharger) operate an olive cannery near Tracy, San Joaquin County. The Tracy facility is equipped with 734 storage tanks ranging in size from 3,600-gallons to 8,800-gallons and 98 processing tanks that are 2,500-gallons each. Additional olives are stored at the Discharger's Visalia and Orland facilities and are trucked to Tracy for processing. The facility has approximately 37,000 tons of storage capacity and an additional 10,000 tons can be processed fresh for a total storage capacity of approximately 47,000 tons. The facility can process approximately 1,000 tons per week for a total processing capacity of 52,000 tons per year.

Olives are stored in an acetic acid solution prior to processing. Processing the olives requires immersing the raw olives in lye solutions to cure the olive, then drawing the lye out of the olives with successive baths of fresh water. The olives are pitted prior to canning in a brine (sodium chloride) solution. Processing occurs year round, with fresh olives processed from September through early November and stored olives processed the remainder of the year.

Process wastewater generated at the facility is regulated by two separate WDRs. Order No. 96-075 regulates the two Title 27 surface impoundments that are used to store concentrated brines; Order No. 97-037 regulates the less concentrated wastewater that is applied to land. This WDR update only applies to the less concentrated wastewater.

Local land use consists of industrial, residential, and agricultural operations. The site is located on an alluvial fan that generally slopes to the northeast. Topography varies from steep to nearly level. Surface water drainage from the facility is to the Sacramento San Joaquin Delta.

WASTEWATER SYSTEM

A wastewater system is used to collect and apply the industrial wastewater to land. Wastewater is collected throughout the facility by floor drains and is piped to a central collection area. Despite requests for information, the Discharger has not fully described how it determines whether to discharge to the land application system or the Title 27 ponds. From the 1-million gallon pond, the wastewater may either be applied directly to the land application areas or it may be stored in a new 84-million gallon storage pond prior to land application. The facility consists of 280 acres, of which approximately 200 acres are available as wastewater land application areas.

Wastewater is characterized by high concentrations of organic matter, total dissolved solids (TDS), sodium, and chloride. Waste lye solutions, carbon dioxide neutralization water, pit floatation brine, ion exchange regeneration brine, and boiler blow down are discharged to the Title 27 ponds. Lye rinse water, cooling water, wash waters (including weak lye solutions), acetic acid storage solutions, pitting machine wastewater, clean-in-place solutions, and cannery floor wastewater (despite high TDS concentration), are sent to the land application system.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0148

FOR
MUSCO FAMILY OLIVE COMPANY AND THE STUDLEY COMPANY
WASTEWATER TREATMENT AND LAND DISPOSAL FACILITY
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring industrial wastewater, wastewater ponds, land application areas, stormwater, and land application soil quality. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Specific sample station locations shall be approved by Regional Board staff prior to implementation of sampling activities.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

INDUSTRIAL WASTEWATER MONITORING

Wastewater effluent samples shall be collected from the 1-million gallon pond, prior to discharge to the 85-million gallon pond. Except for pH and electrical conductivity, grab samples are considered adequately composited to represent the effluent. The Discharger shall use its existing continuous recording devices to monitor pH and EC. Effluent monitoring shall include, at a minimum, the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Flow into the 1-million gallon settling pond ¹	gpd	Meter	Daily	Monthly
pH	S.U.	Meter	Continuous	Monthly
Electrical Conductivity	µmhos/cm	Meter	Continuous	Monthly
BOD ₅	mg/l	Grab	Weekly	Monthly
Nitrates as Nitrogen	mg/l	Grab	Weekly	Monthly
Total Kjeldahl Nitrogen	mg/l	Grab	Weekly	Monthly
Fixed Dissolved Solids	mg/l	Grab	Weekly	Monthly
Total Dissolved Solids	mg/l	Grab	Weekly	Monthly
Sodium	mg/l	Grab	Weekly	Monthly
Chloride	mg/l	Grab	Weekly	Monthly

¹Flow of process wastewater and stormwater from the facility (does not include tailwater return flows or stormwater from the land application area)

WASTEWATER POND MONITORING

Samples shall be collected from all wastewater storage ponds, irrigation checks that contain standing water, and any new or temporary ponds that are constructed. Samples shall be collected from an established sampling station as far as practical from the pond inlet, and in an area which will provide a sample representative of the wastewater in the pond. Samples for dissolved oxygen, sulfide, and pH shall be collected at a depth of 1-2 feet below the pond surface. The Discharger shall notify staff within 24 hours if the freeboard in either pond is less than two feet. Pond monitoring shall include at least the following.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Freeboard	Feet	Measurement	Daily	Monthly
Dissolved Oxygen	mg/l	Grab	Daily	Monthly
Dissolved Sulfide	mg/l	Grab	Daily	Monthly
pH	Std.	Grab	Daily	Monthly
Pond Condition ¹	NA	Observation	Daily	Monthly

¹ Pond condition monitoring shall include daily determination of berm condition, wastewater overflows, and odor conditions (none, slight, moderate, strong).

LAND APPLICATION AREA MONITORING

Application of wastewater to the land application area shall be monitored to prevent overloading the area with wastewater constituents, which can cause objectionable odors and/or groundwater degradation. The following parameters shall be calculated and reported in the monthly monitoring reports.

By **1 October 2002**, the Discharger shall install a sufficient number of meters to continuously monitor the flow out of the settling/storage ponds to the land application areas. No wastewater shall be applied without metering. If portable pumps are used to discharge wastewater to the land application area or a storage pond, additional meters shall be installed at every discharge point.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Flow to Application Area	gpd	Metered	Daily	Monthly
Application Area	acres	Measured ¹	Daily	Monthly
Tailwater Return Flow	gpd	Metered	Daily	Monthly
Stormwater flow into the 84 mg storage pond	gpd	Metered/Estimated ⁵	Daily	Monthly
Crop Planted	acres	Measured ¹	Daily	Monthly
Hydraulic Loading Rate	inches/acre/month	Calculated	Monthly	Monthly
BOD ₅ Loading Rate	lbs/acre/day	Calculated ²	Daily	Monthly
Total Nitrogen Loading Rate	lbs/acre/month	Calculated ³	Monthly	Monthly
Tailwater Generation	Visual Inspection	Observation	Daily ⁴	Monthly

¹ Provide a map identifying field names and acreages.

² BOD₅ loading shall be calculated for each field, using the daily applied volume of wastewater, estimated daily application area, and the most recent results of effluent BOD₅.

- 3 Total nitrogen loading rates shall be calculated for each field using the daily applied volume of wastewater, estimated daily application area, and the most recent total nitrogen results.
- 4 Runoff monitoring of the application areas shall be performed daily. Frequency of monitoring during the day shall be sufficient to determine if runoff is occurring.
- 5 If possible, flows shall be metered. If flows from certain areas cannot be metered, then flows shall be estimated based upon drainage basin and intensity of storm. Calculations shall be shown.

In addition, the Discharger shall maintain a daily log of discharges to the land application area. Notations shall record which area is receiving wastewater, observations of ponding water, saturated soil, odors, insects, or other potential nuisance conditions. The notations shall also document any corrective actions taken. A copy of the entries made in the log during each month shall be submitted along with monthly monitoring reports.

SITE SPECIFIC GROUNDWATER MONITORING

Prior to completion and/or sampling of any groundwater monitoring wells, the Discharger shall submit plans and specifications to the Board for review and approval. Once installed, all new wells shall be added to the MRP and shall be sampled and analyzed according to the schedule below.

Prior to sampling or purging, equilibrated groundwater elevations shall be measured to the nearest 0.01 foot. Depth to groundwater measurements shall be collected from all wells on the same day. The wells shall be purged at least three well volumes until pH and electrical conductivity have stabilized. Sample collection shall follow standard EPA analytical method protocols. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Depth to Groundwater	0.01 ft	Measurement	Quarterly	Quarterly
Groundwater Elevation	0.01 ft	Calculated	Quarterly	Quarterly
Gradient	ft/ft	Calculated	Quarterly	Quarterly
Gradient Direction	Degrees	Calculated	Quarterly	Quarterly
pH	S.U.	Grab	Quarterly	Quarterly
BOD	mg/l	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Fixed Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Total Kjeldahl Nitrogen	mg/l	Grab	Quarterly	Quarterly
General Minerals ¹	mg/l	Grab	Quarterly	Quarterly

¹Including chloride, sulfate, bicarbonate alkalinity, carbonate alkalinity, calcium, magnesium, potassium, sodium, boron, and ammonia.

PAN LYSIMETER MONITORING

Prior to completion and/or sampling of any pan lysimeters, the Discharger shall submit plans and specifications to the Board for review and approval. Pan lysimeters shall collect percolate at a depth of five feet below the ground surface. Once installed, all new pan lysimeters shall be added to the MRP and shall be sampled and analyzed according to the schedule below.

After collection of percolate samples, the lysimeters shall be purged dry. Sample collection shall follow standard EPA analytical method protocols. Lysimeter monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
pH	S.U.	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Fixed Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Total Kjeldahl Nitrogen	mg/l	Grab	Quarterly	Quarterly
General Minerals ¹	mg/l	Grab	Quarterly	Quarterly

¹Including chloride, sulfate, bicarbonate alkalinity, carbonate alkalinity, calcium, magnesium, potassium, sodium, boron, and ammonia

REGIONAL GROUNDWATER MONITORING

As long as the property owner grants access to the well, samples shall be collected from the domestic well located at 26933 South Hansen Road, Tracy. Samples shall be collected upstream of any water treatment equipment at the residence. Sample collection shall follow standard EPA analytical method protocols. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
pH	S.U.	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Total Kjeldahl Nitrogen	mg/l	Grab	Quarterly	Quarterly
General Minerals	mg/l	Grab	Quarterly	Quarterly

STORMWATER MONITORING

Samples shall be collected from the sampling stations established in Kleinfelder's 11 January 2001 Amended Surface Water Sampling Plan and an additional sample location to be established upgradient of all application areas. Stormwater monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Sample Type</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Total Dissolved Solids	mg/l	Grab	Monthly ^{1,2}	Monthly
Fixed Dissolved Solids	mg/l	Grab	Monthly ^{1,2}	Monthly

<u>Constituents</u>	<u>Units</u>	<u>Sample Type</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Sodium	mg/l	Grab	Monthly ^{1,2}	Monthly
Chloride	mg/l	Grab	Monthly ^{1,2}	Monthly
Electrical Conductivity	µmhos/cm	Grab	Monthly ^{1,2}	Monthly
BOD ₅	mg/l	Grab	Monthly ^{1,2}	Monthly
pH	S.U.	Meter	Monthly ^{1,2}	Monthly

¹ Samples shall be collected within three days after the first significant rainfall of the Fall/Winter season.

² Samples shall be collected monthly from December through April.

LAND APPLICATION AREA SOILS MONITORING

The Discharger shall establish, with concurrence of Board staff, ten soil profile monitoring locations and one representative background location (i.e., in an area that historically has not received process wastewater). The samples shall be collected and analyzed for at least the following constituents immediately upon implementation of this MRP, and at an annual frequency thereafter:

<u>Constituents</u>	<u>Units</u>	<u>Soil Profile</u>	<u>Frequency</u>
Sodium	mg/kg	Standard ¹	Annually ²
Chloride	mg/kg	Standard ¹	Annually ²
Sodium Adsorption Ratio	unitless	Standard ¹	Annually ²
Electrical Conductivity	µmhos/cm	Standard ¹	Annually ²
Soil pH	PH	Standard ¹	Annually ²
Cation Exchange Capacity	meq/100 g	Standard ¹	Annually ²
Exchangeable Sodium Percentage	% of CEC	Standard ¹	Annually ²
Nitrate (as N)	mg/kg	Standard ¹	Annually ²
Total Kjeldahl Nitrogen (as N)	mg/kg	Standard ¹	Annually ²

¹ Samples shall be collected at 0.5 feet, 3 feet, and 6 feet.

² Samples shall be collected in September.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, soil, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required by the Monitoring and Reporting Program, shall be reported in the next scheduled monitoring report.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. A status report on expansion or reconfiguration of the facility processing capability or wastewater system configurations.
2. Results of industrial wastewater, wastewater ponds, land application areas, and stormwater monitoring.
3. Land application log book entries and calculations.
4. A map of all stormwater sample locations and fields showing field names, acreages planted with a crop, and type of crop. An evaluation of crop health.
5. The location of each meter used to record flow, pH, and electrical conductivity.
6. Calibration records for all pH and electrical conductivity meters.
7. A comparison of monitoring data to the effluent limitations and an explanation of any violation of those requirements. Data shall be presented in tabular format.
8. If requested by staff, copies of laboratory analytical report(s).

B. Quarterly Monitoring Reports

The Discharger shall establish a quarterly sampling schedule for groundwater and lysimeter monitoring such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Regional Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st) and may be combined with the monthly report. The Quarterly Report shall include the following:

1. Results of the site specific groundwater monitoring, regional groundwater monitoring, and lysimeter monitoring;
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater and lysimeter monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;
3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any;

4. A narrative discussion of the analytical results for all groundwater and lysimeter locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable);
5. A comparison of monitoring data to the groundwater limitations and an explanation of any violation of those requirements;
6. Summary data tables of historical and current water table elevations and analytical results;
7. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum;
8. Copies of laboratory analytical report(s) for groundwater monitoring.

C. Annual Report

An Annual Report shall be prepared as the December monitoring report. The Annual Report will include all monitoring data required in the monthly and quarterly schedules. The Annual Report shall be submitted to the Regional Board by **1 February** each year. In addition to the data normally presented, the Annual Report shall include the following:

1. The contents of the regular quarterly and monthly reports for the last sampling periods of the year;
2. If requested by staff, tabular summaries of all data collected during the year.
3. The results of land application soils monitoring, including a map depicting sample locations.
4. An evaluation of the groundwater quality beneath the wastewater treatment facility.
5. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
6. An annual report, prepared by a Certified Crop Advisor or Certified Agronomist, detailing the effect of the application of the wastewater on crops, the health of the crops grown in the application areas, the effect of continued application of wastewater, and the potential for increased soil salinity and the resulting impacts to future agricultural use. The report shall describe the crop conditions throughout the year, not just at the time of Annual Report preparation, and shall contain recommendations regarding crops to be planted, and actions necessary to improve the crop health for the following year.
7. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
8. Calibration records for all flow meters.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirements violation found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the

corrective action, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of the date of this Order.

THOMAS R. PINKOS, Acting Executive Officer

6 September 2002

(date)

AMENDED

TRO: 9/6/02

The treatment for process wastewater discharged to land consists of carbon dioxide neutralization of lye rinse solutions, screening solids using a mechanical screen and rake, and discharge to the 1-million gallon settling pond.

FLOW LIMITATION

As part of the RWD, the Discharger was required to submit a water balance to demonstrate that it has adequate treatment, storage, and disposal capacity for its requested flow rate. The current WDRs contain an implied flow rate of 500,000 gpd, while the revised TSO allow a weekly flow limit of 820,000 gpd. The RWD contained a water balance with a flow rate of 1,000,000 gpd. Staff carefully reviewed the initial water balance, and spent many hours talking with the Discharger's consultants about our concerns. The consultants have since submitted several revised water balances. One major revision had to do with the capacity of the storage pond (which is currently under construction). The original water balance used a storage capacity of 114 million gallons, but the Discharger now estimates that the pond's actual capacity will be only 84 million gallons.

The most recent water balance was submitted with the 8 August 2002 response to the tentative WDRs. In general, the water balance fails to demonstrate adequate wastewater storage and application capacity for the requested a flow rate of 800,000 gpd. Evaluation of the water balance is complicated by the poor data regarding stormwater runoff and tailwater generation rates. However, because the Discharger can stop operations and limit wastewater flow if needed to prevent overflows of wastewater from the storage pond, staff are recommending the Discharger be allowed the requested flow limit – with some additional restrictions. In the discussion below, the water balance is reviewed and the additional restrictions are described.

Water Balance Review

In preparation of the tentative WDRs, the Discharger has submitted water balances prepared by Kennedy Jenks. Since the original water balance was submitted in the 30 April 2002 RWD, two conference calls to discuss the contents of the water balances have been held. In addition, the Discharger has revealed the actual size of the wastewater storage pond to be 84.1- million gallons (Mgal) (nearly 30-Mgal less than originally stated). This evaluation focuses on Table 2 "Water Balance for 100 Year Rainfall Event Climate Conditions". The water balance addresses some of staff's concerns regarding previously submitted water balances but fails to demonstrate adequate storage capacity for the wastewater flow rate as proposed. In general, the water balance is overly optimistic – especially considering the problems the Discharger has experienced with controlling tailwater at the site. However, because of the nature of the olive processing activities, the facility can stop production if necessary and wait for better climatic conditions.

The water balance indicates wastewater will be stored during the winter months of December, January, and February and applied to land application areas the rest of the year. During the months when wastewater is stored, stormwater that falls on upland application areas is proposed to be bypassed past the storage pond. (Stormwater that falls on the main facility will continue to be discharged to the storage pond). However, the Discharger has not proposed criteria for bypassing stormwater. As written,

the tentative WDRs prohibit bypass until the Discharger provides acceptable criteria to show that wastewater will not be present in the stormwater. The ability to bypass wastewater is a critical assumption in the water balance and may impact the Discharger's ability to operate.

The water balance includes application of wastewater in months when rainfall exceeds evapotranspiration (ET). Such an application is likely to result in considerable generation of tailwater, all of which is required to be collected. For example, March rainfall is 4.1 inches, potential ET is 3.0 inches, yet 5.2 inches of wastewater (approximately 35.3 Mgal) is proposed for application. The water balance's failure to adequately address tailwater generation that might result from such an application is described below.

The water balance is optimistic in calculating the tailwater generation rate and is inconsistent when calculating tailwater generation rates and stormwater runoff. The tailwater generation rate is significantly lower than the anticipated stormwater runoff rate used to calculate the amount of stormwater runoff from land application areas. The discrepancy exists despite the soil moisture content at 100-percent. Stormwater runoff is anticipated to be approximately 26-percent of rainfall; tailwater runoff is anticipated to be in the range of 0.06, when it is reported at all. The Discharger reports wastewater will be applied in short frequent applications to minimize stormwater runoff, but that approach requires the Discharger to operate the entire land application area with computer controlled spray equipment, which the Discharger has not installed. It is noted that the water balance predicts at least 5 inches of wastewater application in both March and April, but only 0.3 and 0.0 inches, respectively, of tailwater runoff is predicted. If the tailwater generation rate is higher than predicted, the wastewater storage pond will run out of capacity and in critical months, the lack of capacity will result in spilling of wastewater.

The water balance's cumulative storage volume scenario is difficult to imagine. For example, at the end of February (with the storage pond containing 83.6 Mgal of wastewater), the storage pond will only accumulate 0.4 Mgal of additional wastewater despite the unfavorable conditions of rainfall exceeding evapotranspiration, 5.2 inches of applied wastewater, and 100-percent saturated soil. With all those factors to overcome, the water balance estimates 0.3 inches of tailwater runoff. Based on observations during site inspections, staff believes considerably more tailwater will be generated than what is described in the water balance.

The water balance addresses the lack of capacity in the wastewater storage pond by establishing higher rates of leaching wastewater when the storage pond nears capacity. For example, the storage pond contains 83.6 Mgal at the end of February; in March the water balance then predicts 5.3 inches of leaching to prevent the pond from overflowing. If the leaching rate is less than expected, the pond will overflow and spill.

Additional Restrictions Due to Water Balance Concerns

One of the major problems with the water balance is that both tailwater and stormwater generation and storage rates are estimated. At this point, there is no way to verify the estimations except through direct measurements over the next few years. However, staff need to propose a flow limitation at this time.

The tentative WDRs contain the Discharger's proposed flow limit of 800,000 gpd (as a monthly average), subject to a number of additional restrictions.

Application of wastewater on the land application areas and then bypassing the wastewater/stormwater mix may result in discharge of wastewater off site, a situation that is expressly prohibited by the WDRs. Therefore, the tentative WDRs included a prohibition against applying wastewater during the three months (December-February) when stormwater bypass is proposed and when the water balance indicates that wastewater will not be applied to land. In response to the tentative WDRs, the Discharger asked that this prohibition be removed. Staff are uncertain how the Discharger will be able to irrigate the LTUs during the winter and still be able to bypass stormwater. However, this proposed prohibition has been deleted with the Discharger's understanding that, as described in the last paragraph of this section, there is a higher likelihood that it may need to cease production at its facility if it has to collect more stormwater than anticipated.

Because of the uncertainties of tailwater generation and the importance to preparation of any future water balances, it is reasonable to require monitoring of the amount of tailwater generated. The Discharger has verbally described a plan (but has yet submitted a written description) to collect tailwater from the application areas in collection ditches and return the water to the storage pond in a sump/pump/piping arrangement. Monitoring of the tailwater will allow a better evaluation of the flow rate for future preparation of water balances. The monitoring might consist of totalizing meters or pump run time meters. If pump run time meters are used, annual calibration of the meters should be required because the Discharger has reported inaccurate metered flow rates in the wastewater discharge self-monitoring data. The Discharger also needs to either directly measure, or accurately estimate, the amount of stormwater which runs off the land application area and is collected in the storage pond.

Finally, because the water balance contains optimistic assumptions, it is reasonable to include a requirement to cease the discharge to the either the 1-Mgal settling pond or the 84-Mgal storage pond if the freeboard in either is less than two feet at any time. This will minimize the possibility of spilling wastewater into the natural surface water drainage. The Discharger is also required to inform Regional Board staff of the freeboard violation immediately.

REGULATORY CRITERIA

Based on the available information regarding groundwater quality, the wastewater contains higher concentration of DIS, sodium, and chloride than the groundwater. It may also contain other analytes in concentrations higher than the underlying groundwater. The discharge is nonhazardous, but exhibits characteristics of "designated waste," as defined by CWC Section 13173(b), as the concentrations of some waste constituents when applied to land have potential for causing exceedances of water quality objectives or affecting beneficial uses. The discharge contains decomposable waste constituents (e.g., organic carbon and nutrient compounds) and inorganic dissolved solids in concentrations orders of magnitude greater than water quality objectives.

The Discharger proposes to continue the discharge of wastes to land, and hence the groundwater, that are subject to full containment under Title 27. However, the discharge of such designated waste to land is not allowed under WDRs No. 97-037, and is also not allowed under this updated Order. The updated Order contains an analysis of the RWD for requirements under which an exemption from Title 27 may be granted and, as intended by the RWD, for the conditions under which waste may be discharged to a land treatment unit, followed by infiltration to groundwater.

The Regional Board has considered antidegradation pursuant to Resolution No. 68-16 and finds that degradation of the groundwater by this discharge is not consistent with maximum benefit to the people of the State. Under ideal conditions, the assimilative capacity of the underlying soil and proper irrigation management practices should prevent degradation of groundwater from the infiltration of incidental waste constituents. Following adoption of WDRs Order No. 97-037, the Discharger has been provided ample opportunity to justify a discharge and comply with Order No. 97-037. It has not complied. It has been granted interim conditional flow increases while under a series of enforcement actions while developing justification for discharge, and violated those conditions, including repeated failure to monitor waste and submit reports as required, and failure to restrain production in accord with enforcement conditions, resulting in administrative civil liability. The RWD is inadequate to support the requested discharge. Therefore, this Order limits the Discharger to that which will not degrade the underlying groundwater. The RWD proposes that wastewater containing over 3,000 mg/l TDS be discharged to land, however, staff's analysis shows that an interim effluent limitation of 2,047 mg/l TDS is necessary to protect the underlying groundwater.

Inorganic dissolved solids can be effectively controlled by means of source control and treatment. Source control includes best management practices of selective and judicious chemical use and waste stream isolation where possible (for example, clean-in-place wastewater, ion exchange regeneration brine, lye bath rinse water, and boiler blowdown). Treatment and containment technology includes reverse osmosis, ion exchange, and evaporation impoundments constructed to Title 27 standards

LOADING RATES

The RWD describes the annual nitrogen loading rate to be between 428 lbs/ac•year to 490 lbs/ac•year. The Discharger will double crop Sudan grass and also grow winter barley. The Discharger states that it will stagger planting, irrigation, and harvest so that there are always two or three crops in the land application areas. The RWD reports double cropping the Sudan grass will remove approximately 325 pounds of nitrogen per acre•year. Winter barley will be planted into Sudan grass stubble in early fall to remove an additional 160 pounds of nitrogen per acre/year. Other crops the Discharger is considering are Bermuda grass and salt tolerant alfalfa (reportedly under development in agricultural laboratories). Recent inspections have shown that crop health at the facility has been poor in areas where wastewater has been applied for longer times. Poor crop health will result in lower nitrogen uptake rates. Therefore, the Order requires that the Discharger consult with a Certified Crop Advisor or Certified Agronomist on a yearly basis regarding the steps needed to maintain the proposed intensive agriculture and high nitrogen uptake.

The RWD describes the annual DIS loading rate to be between 34,000 lbs/ac•year and 40,000 lbs/ac•year. The Discharger anticipates approximately 3,260 lbs/ac•year will be taken up by cropping activities. The RWD states that leaching of DIS from the root zone must be performed to control soil salinity at levels that

do not hinder crop growth. Because the DIS loading rate exceeds the crop uptake rate, it is anticipated that leaching of DIS will result in interim soil attenuation of the DIS and eventual groundwater degradation with continued application. This application procedure is not sustainable with nondegradable constituents. Loading rates must be balanced with uptake rates to protect groundwater quality, and therefore the 1,500 mg/l effluent limit for TDS is necessary.

The Discharger states the BOD limits presented in the WDRs are overly restrictive and that higher loading rates have been employed at land application areas. Staff disagree that higher loading rates than published in the tentative WDRs would be acceptable based on the Discharger's plan to limit treatment of BOD by mechanical treatment equipment and instead rely upon land treatment of BOD constituents. Land treatment is an effective treatment mechanism, however, overloading the land can result in generation of odors. The discharge has resulted in the generation of nuisance odors at the facility and staff has received numerous complaints, the most recent on 29 August 2002.

Staff believes the appropriate BOD value that should be selected from Pollution Abatement is 100 lbs/acre•day. It is noted that the limit published in Pollution Abatement is for the summer season when conditions for land application are favorable. The Discharger is likely to discharge wastewater all year round, when conditions are not optimum. This limit published in the tentative WDRs should be protective of groundwater quality and crop health and should not generate nuisance odor conditions. This position is based on the staff's experience and the loading rate guidance presented in *Small and Decentralized Wastewater Management Systems* (Crites and Tchobanoglous, 1998) which states that loading rates for BOD often exceed 100 lb/acre day and occasionally exceed 300 lb/acre•day; odor problems are avoided by providing adequate drying times between wastewater applications; and loading rates beyond 450 lb/acre•day of BOD should generally be avoided unless special management practices are used. Because of the close proximity of residential areas and the limited land area available for wastewater application, BOD loading rates that require special precautions are not appropriate in this case.

Pollution Abatement also states if the BOD loading is too great, the soil will become anaerobic and the crop and treatment process will fail, but that higher loading rates are possible if the site is irrigated for only a few weeks each year and is well maintained. The Discharger's facility operates 365 days a year, so the application areas will not have the opportunity to rest. Because of the limited land area available there are no alternative application areas to discharge the water to if a system upset occurs."

The Discharger is required to continue characterizing groundwater quality and to begin characterizing the quality of the percolate below the land treatment units. Percolate samples will be collected by pan lysimeters both in areas of land application and areas outside the land application limits. Groundwater monitoring wells will monitor the first saturated interval; percolate samples will be monitored by pan lysimeters installed at a depth of five feet. If groundwater or percolate quality is degraded, the Discharger must take steps such as reducing loading or improving cropping to protect groundwater quality.

NUISANCE ODOR CONDITIONS

The Regional Board has received numerous odor complaints regarding the land application areas. An adjacent landowner described the nuisance odor conditions at the 6 June 2002 Regional Board meeting.

The odor complaints concerned the Discharger's land application areas, especially the eastern portion where the Discharger constructed and then flooded several irrigation checks. The Regional Board has also received several written complaints addressing wastewater that reportedly discharged from the Discharger's property. Staff has documented discharges of wastewater from the site.

During the summer of 2002, the Discharger pumped out the standing water in two of the eastern checks, has pumped out water in two of the three illegal ponds built within the surface water drainage course, and is "carefully managing" wastewater applications on the eastern side of the property. However, these steps have not been sufficient to prevent the continuing odor complaints. Because the four fields labeled "irrigation checks" are the closest fields to off-site residences, this Order prohibits the application of wastewater to these fields unless the Discharger can prove to the Executive Officer's satisfaction that wastewater application to this land will not cause offsite odors. It is anticipated that the installation of aerators in the 84-million gallon pond, and the subsequent reduction in BOD, will lead to a reduction in odors.

The Discharger has stated that to prevent future odors it will rotate wastewater application in the land application areas to minimize tailwater generation, provide soil drying time, and carefully manage wastewater application at the eastern property boundary. Pondered wastewater in the drainage feature will also be controlled, primarily by the installation of collection ditches at land application areas. The 84-million gallon storage pond will be equipped with a total of 390 horsepower of mechanical aerators and monitored on a daily basis. Odors that may arise from sludge being uncovered as the wastewater storage pond level is lowered during the summer will be controlled using a pumped sprayer to deliver alkaline odor control chemicals. Additional odor suppression chemicals (calcium or sodium nitrate) to provide supplemental oxygen in the event the aerators are insufficient will be stored on site. Sulfide precipitating ferrous chloride will also be stored on site. These proposed steps have been incorporated into this Order.

OTHER WASTE STREAMS

Solid waste generated at the site includes olive pits, stem waste, waste olives, screened solids, steel cans, and cardboard, plastic, paper, and miscellaneous trash. Olive pits and stems are sold as biomass and burned at cogeneration plants or pulverized and incorporated into compost. Waste olives are transported offsite for animal feed or offsite land disposal. Screened solids are transported offsite for land disposal at a landfill. Steel cans, plastic, paper, and miscellaneous trash are hauled by a disposal company to a landfill. Because the Discharger has failed to identify the disposal of all waste products generated at the facility, it is required to submit a Solid Waste Management Plan that more fully describes how it manages all of its solid waste products.

Domestic wastewater is discharged to a septic system, leachfield, and seepage pits. The Discharger has reevaluated the domestic wastewater system as required by Time Schedule Order No. R5-2002-014 and determined an expansion is required. The Discharger will expand the existing septic system by adding four additional 95-foot long leach lines that will each terminate with a 25-foot deep seepage pit. The Discharger has stated that it will no longer apply wastewater over the leach lines or seepage pits, and this Order contains a Prohibition to that effect.

DETERMINATION OF BACKGROUND WATER QUALITY

The second major technical issue involves the determination of background water quality. This determination is necessary to analyze whether the Discharger's request to discharge effluent with a TDS concentration exceeding 4,500 mg/l is acceptable. Once background water quality is known, then the Regional Board can set effluent limitations that will result in a discharge that meets the conditions of State Board Resolution No. 68-16 (the Antidegradation Policy).

To determine the appropriate concentration limits for the wastewater discharge, staff reviewed the Regional Board's June 1989 "Designated Level Methodology for Waste Classification." Because the discharge is planned to continue indefinitely, use of an attenuation factor is not appropriate because all the attenuation processes will become saturated over time. Therefore the wastewater limits are set by the background groundwater quality. Although the Discharger presented an evaluation of the available data in the RWD, it did not provide an analysis of the data for proposed limits. As a result of the lack of proposed limits by the Discharger, staff interpreted the April 2002 groundwater sample event (the only available data at the time) and proposed background concentrations and the resulting effluent limits in the Tentative WDRs. The Discharger has taken issue with staff's evaluation, and has provided the results of a second round of on-site groundwater sampling. With additional data available, staff has revised the data interpretation, as discussed below.

Background Water Quality

Background water quality data is limited and due to the limited availability of the data, conclusions based on the data are tentative. The Discharger installed groundwater monitoring wells in 1985 for WDR Order No. 96-075 (the Title 27 WDRs). The wells have been reported as dry in most monitoring events. In April 2002 when the Discharger was required to install groundwater monitoring wells per the Time Schedule Order, Well W-2 was inspected and reported to contain groundwater. That well was added to the recently installed groundwater monitoring network.

In April 2002, the Discharger installed 13 groundwater monitoring wells; however, Well MW-9 went dry during well development and has not recovered. The wells were to be installed in the first saturated interval; however, staff are concerned that some saturated intervals may have been drilled through without detecting groundwater. Because of the anticipated depth of some of the wells, the Discharger's consultant selected air rotary as the drilling technique. Because air rotary drilling might prevent installation of groundwater monitoring wells in the first saturated interval, staff required the Discharger to submit additional information describing how the wells would be constructed. The Discharger submitted a workplan addendum and the wells were installed. However, based on the results of the investigation, staff remains concerned that the first saturated interval may have been missed while drilling the deep wells.

The first sample event for all the wells was performed in April 2002; a second sample event was performed in June 2002. The data collected in the two sample events is found in Finding No. 44 of the WDRs. Because of the limitations of the data and poorly understood hydrogeology of the site, several

alternatives for calculating the background concentrations exist. The Discharger has proposed use of off-site domestic/agricultural/industrial wells as data sources and has presented a discussion in a 7 August 2002 "Revised Background Water Quality Preliminary Evaluation" report prepared by Kleinfelder. It is noted that the report does not calculate background groundwater values and instead proposes additional investigations.

Staff approached the problem of determining the background groundwater concentrations several ways, while considering the available data and the time constraints in arriving at a decision. Five alternatives for calculating background groundwater concentrations were evaluated. Each of the alternatives are presented below. Staff determined that Alternative No. 5 was the best selection of the alternatives available at this time.

Alternative No. 1 – Use of On-Site Groundwater Monitoring Wells

To estimate the wastewater effluent limits, staff's initial approach was to use on-site groundwater monitoring wells to define background groundwater quality. This approach resulted in the effluent limits published in the Tentative WDRs. In the Tentative WDRs analysis, the locations of the wells, groundwater flow direction, and concentrations observed in the wells were considered in selecting wells to represent background groundwater quality. Wells MW-1 and MW-8 were selected as representative. Well MW-2 was considered but removed from the data set as an anomaly; staff believe the extreme concentrations observed in Well MW-2 are the result of an unknown site specific source and deserve more analysis and interpretation before this well can be considered a background well.

The background groundwater quality was calculated by adding one standard deviation to the average concentration and then rounding up. The resulting background concentrations (and therefore the wastewater effluent limits) were: total dissolved solids 1,500 mg/L, chloride 150 mg/L, and sodium 290 mg/L.

Alternative No. 2 – Revised Use of On-Site Groundwater Monitoring Wells

Staff reviewed the additional data collected in the June 2002 sample event and recalculated the background groundwater quality. The background groundwater quality was again calculated by adding one standard deviation to the average concentration of Wells MW-1 and MW-8 and then rounding up. The resulting background concentrations, and wastewater effluent limitations, were: total dissolved solids 1,350 mg/L, chloride 240 mg/L, and sodium 290 mg/L.

Alternative No. 3 – Use of On-Site Monitoring Wells and CCR Title 27 Procedures

The Discharger's documents identify a perched groundwater zone and a deeper groundwater zone. The 31 July 2002 Groundwater Monitoring Report prepared by Kleinfelder states that Wells MW-1, MW-2, MW-3, MW-5, MW-6, MW-10, MW-11, MW-13, and W-2 are perched zone aquifer wells, while Wells MW-4, MW-7, MW-8, MW-9, and MW-12 are classified as deep zone wells. Staff believe additional investigation is required at the site before the aquifer zones can be classified and disagree with the classification of the shallow zone wells as perched. While staff disagree with the nomenclature of the zones, staff agrees that two groundwater zones have been identified by the monitoring well installations.

The Discharger has submitted two quarters (April 2002 and July 2002) of water quality data for the site. With limited data, staff calculated the background groundwater monitoring wells in each zone by calculating the average value, and adding two standard deviations to establish a background water quality for the site. This procedure is consistent with CCR Title 27 Section 20415.

Because two saturated zones have been identified at the site, each zone must include a unique water quality value. Wells MW-1 and MW-8 were selected as the background wells for the water table aquifer (i.e., Kleinfelder's "perched zone") and the confined unit (Kleinfelder's "deep zone") respectively. Well MW-1 was selected because it is the furthest upgradient shallow zone well. Although MW-8 is not the furthest upgradient confined zone well, it is downgradient of the processing facility which is not considered a source area, and it is located in an area that has not historically been used for land application until recently. The other confined zone wells were evaluated for use and determined to be inappropriate for the following reasons: Well MW-12 is located adjacent to the Title 27 surface impoundments, Well MW-9 is dry, and Well MW-4 is located adjacent to the 1 Mgal settling pond. Well MW-7 might be appropriate, however it is located downgradient of the Title 27 surface impoundments and therefore it was not selected.

Staff calculated background groundwater quality values for both the water table and confined zones, as shown on the table below. For the water table aquifer, the limits are: TDS 850 mg/L, chloride 150 mg/L, and sodium 260 mg/L; for the confined aquifer they are: TDS 1,300 mg/L, chloride 400 mg/L, and sodium 300 mg/L.

<u>Well</u>	<u>Date</u>	<u>Units</u>	<u>TDS</u>	<u>Chloride</u>	<u>Sodium</u>
<i>Water Table Aquifer</i>					
MW-1	4/10/02	mg/L	690	67	240
MW-1	6/24/02	mg/L	770	110	250
Average	--	mg/L	730	88.5	245
St. Dev.	--	mg/L	57	30	7
Background	--	mg/L	850	150	260
<i>Confined Aquifer</i>					
MW-8	4/10/02	mg/L	1,300	130	280
MW-8	6/24/02	mg/L	1,300	270	290
Average	--	mg/L	1,300	200	285
St. Dev.	--	mg/L	0	99	7
Background	--	mg/L	1,300	400	300

Alternative No. 4 – Use of Regional Wells

The 7 August 2002 Revised Background Water Quality Preliminary Evaluation Report described problems with the use of the onsite monitoring wells, and instead proposes the use of regional domestic/agricultural/industrial wells to determine the background groundwater quality. Staff disagree with a number of the conclusions in the report and consider a number of the conclusions unsupported based on the technical information presented in the reports. For example:

- Kleinfelder recommends use of off-site wells to establish background groundwater quality. Some data on off-site wells was presented in the RWD and is presented in the Tentative WDRs. The use of the wells is questionable because screened (perforated) intervals are unknown in most cases, the wells are not in close proximity to the facility (over 9,000 feet in one case, and the closest being approximately 800 feet), no information on the potential for any of the wells to have been individually contaminated is available, and the data quality for the little data that is available is unknown.
- Staff do not agree with the unsubstantiated assumption that off-site wells are screened in shallow aquifers. There is nothing to base this assumption on, and in fact there is reason to consider it in error. Agricultural and industrial wells are rarely screened only in shallow zones because a reliable water source is important to their business operation. Fluctuating groundwater elevations and/or drawdown in pumping wells could dewater wells and stop irrigation or business operations if wells were of limited depth.
- Kleinfelder implies that the onsite geology is heterogeneous and that more interpretation is necessary to fully understand the geology and the resulting placement of the monitoring wells. Staff agree. However, Kleinfelder does not address the fact that the geology in the surrounding area is also assumed to be heterogeneous, so that the use of wells from a large area around the facility is not appropriate because they are not expected to accurately describe the site conditions.

Alternative No. 5 – Use of the Discharger’s On-Site Production Well

Staff’s review of the hydrogeology reports revealed that the site conditions are not adequately characterized and understood to establish a final background groundwater quality value. Additional subsurface investigation and groundwater monitoring is required to better understand the site conditions. After reviewing the alternatives for determining a background groundwater quality value, staff determined use of the on-site production well was the best interim measure of groundwater quality that is in use at the site. This well is screened from 50 to 607 feet below ground surface, so the analytical data is a composite of the concentrations in the shallow and deeper aquifers. In addition, five sampling events were conducted at this well, leading to better statistical confidence.

Staff used the same method to calculate the background values as described in Alternative No. 3. The average of the five monitoring events was calculated, and two standard deviations were added, in a method consistent with CCR Title 27 Section 20415. Staff recognize this method of calculating the background groundwater quality is not the optimum method but based on the information and data available, believe it is appropriate for an interim concentration limit. The background groundwater quality, and resulting effluent limits, are: TDS 2,047 mg/L, chloride 601 mg/L, and sodium 597 mg/L.

Additional Hydrogeologic Investigations

The Discharger proposed additional investigations to better characterize the site and regional hydrogeology. The investigations are described in the 7 August 2002 Revised Background Water Quality Preliminary Evaluation Report, prepared by Kleinfelder. While the proposed studies may provide information on the regional groundwater quality, staff believe that additional studies should be focused on the Discharger’s facility. Investigations of groundwater conditions in the region may not be

applicable to the site-specific groundwater conditions. Items that should be addressed in future studies include:

- A better understanding of the occurrence of groundwater at the site. Kleinfelder's model for the hydrogeology of the site contains too many uncertainties. The presence of perched zones in the land application areas is unsupported by Kleinfelder's boring logs presented in the 30 April 2002, "Groundwater Monitoring Well Installation, Sampling, and Analysis" report. The boring logs do not show saturated zones underlain by unsaturated zones. An alternative interpretation is the wells are screened in two zones, an unconfined (water table) and a confined zone. Further study is required to define the subsurface conditions.
- The report recommends the use of Well MW-2 as a background well. Staff believe the excessively high concentrations observed in the well are likely due to an unknown source or other unknown factor. Additional investigation of the groundwater conditions at Well MW-2 is warranted.
- The report describes similar concentrations in samples from Wells W-2 and MW-1 and suggests the data as a proof of no groundwater impact. Review of the Stiff diagrams for the wells on Plate 5 reveals an almost identical shape. However, staff believe the similarity may be a result of both wells defining the background groundwater conditions. Kleinfelder's statement that Well W-2 is the furthest downgradient well doesn't take into consideration the topography and natural drainage configuration. Staff believe if better definition of the groundwater elevation contours were available, groundwater in the area of Well W-2 might be flowing to the east or southeast toward the natural drainage, making the well upgradient of source areas (assuming the Class II ponds are not leaking). If that is the case, Well W-2 may be located in an area upgradient of all land application areas.

Kleinfelder recommended the following additional investigations:

- Research of published databases for groundwater quality in the near vicinity of the site. The research would focus on Sections 33 and 34 and other sections in proximity and with similar depositional environments. Staff believe the research might be interesting but remain cautious about using data from other locations and depth zones that might not be appropriate. Using data from off-site wells that screen deeper aquifers will not produce data that is representative of on-site conditions. The area's heterogeneous nature of the geologic deposits further limit the use of off-site data. Kleinfelder's report notes that shallow groundwater in the Upper Tulare Formation is of poorer quality than the deeper groundwater zone; considering this reported variation of water quality with depth, use of deep wells may add more uncertainty to the problem of defining background groundwater quality.
- Conduct a limited physical search in neighboring areas for groundwater wells and information on the water quality. Staff believe the research could be interesting with the caveats described above. If off-site wells will be investigated, it is important to include all the available data, staff note that the on-site well was not included in the RWD nor in Kleinfelder's evaluation of regional wells; nor was the Harpainter well that is located adjacent to the application areas and irrigation checks. Staff are concerned that selective use of the available data will result in inaccurate conclusions on the region's water quality.

- Limited geological mapping of the railroad cuts and other exposed structural features. Staff believe this could yield useful information but it should build upon the work published in professional papers.
- Kleinfelder recommends preparation of Stiff diagrams to further characterize groundwater quality. Staff agree this action could provide useful information. However, additional wells are needed to better characterize the groundwater quality and hydrogeology of the area. Additional characterization is required to determine if a water table zone exists in the northern area of the site and to allow monitoring of groundwater upgradient and downgradient of the 84-Mgal storage pond.

Effluent Limitations

Based on the above analysis, staff have proposed an *interim* background concentrations for TDS (2,047 mg/l), sodium (597 mg/l), chloride (601 mg/l), and nitrate-N (6 mg/l). The Discharger is required to install and monitor additional groundwater monitoring wells onsite, and within two years to propose final background concentrations. To protect groundwater quality, the WDRs contain effluent limitations that match the background water quality. Musco is currently discharging waste at a higher concentration than the TDS and sodium effluent limitations. Therefore, the Board is asked to consider a companion Cleanup and Abatement Order. The C&A provides a time schedule for Musco to reduce the TDS and sodium in its effluent. Musco must meet the effluent limitations within two years. Staff expect that the final background water quality values, and hence the final effluent limitations, will be less than the interim values. Therefore, once the final background water quality study is completed, it is expected that Musco will need to further reduce the salt in its effluent beyond what is currently required by the C&A.

These WDRs require continued groundwater monitoring to fully evaluate the impacts of the Discharger's past and future disposal practices. However, it is not appropriate to follow the Discharger's recommendation to conduct a year of monitoring to determine if there are groundwater impacts, and then design effluent limits based on the groundwater data. In the last year, the Discharger has substantially increased its wastewater flow and strength, and has begun applying wastewater to a larger area. These recent changes may not yet be reflected in the groundwater quality. In addition, the RWD clearly shows that the Discharger intends to apply significantly more salt than will be taken up by the crops; therefore, these WDRs contain limits to prevent impacts to the underlying groundwater.

Shallow soil samples were collected in the land application areas in November 1999 and April 2001 as part of the 6 April 2001 Soil Salinity Assessment required by C&A Order No. 5-00-717. The samples were collected to evaluate the wastewater application impact to soil quality. Analysis indicated that 22-percent of samples collected in the Field 55 East and Field 55 West (55 acres total) may be impacted by the wastewater application and 28-percent of the samples collected in Field 95 (95 acres) may be impacted. The report stated that the high concentration of sodium in the wastewater has the potential to reduce the already low permeability of the soil permeability. Pan lysimeters are required to allow measurement of percolate quality. If percolate quality is worse than background groundwater quality, additional source control or better cropping will be required.

APPLICABILITY OF WATER RECLAMATION REQUIREMENTS

Musco has requested that the Regional Board should consider Musco's discharge under the "Water Recycling Law", beginning with Section 13500 of the Water Code. This request was contained in the Discharger's 8 August 2002 *Comments to the Tentative Waste Discharge Requirements*. Musco believes that its wastewater should be declared "reclaimed water" and as such, water reclamation requirements, not waste discharge requirements, should be issued. Musco further states "a Regional Board may not deny issuance of water reclamation requirements to a project which violates only a salinity standard in a basin plan." Staff have considered this issue and have consulted with the State Board Office of Chief Counsel. It is our understanding that it is not appropriate to regulate Musco's discharge under the Water Recycling Law and that the most appropriate vehicle for regulation is these waste discharge requirements.

Although not expressly described in this section of the California Water Code, "recycled water" typically applies to domestic wastewater which is treated to an extent that it can be beneficially reused, replacing a use of potable water. Musco's wastewater does not meet either of these criteria. First, the discharge is industrial wastewater, with no domestic component. Section 13523 of the CWC states that water reclamation requirements are to be established in conformance with the uniform statewide recycling criteria established by the California Department of Health Services (DHS). These criteria are found in Title 22 of the California Code of Regulations. Section 60302 of Title 22 states that "the requirements in this chapter shall only apply to recycled water from sources that contain domestic waste, in whole or part." Therefore, Title 22 does not apply to Musco's waste stream, and it is inappropriate to issue water reclamation requirements in lieu of waste discharge requirements.

In regard to CWC Section 13523.5, the salinity standard does not apply to waste discharge requirements. A 7 February 1985 memorandum from the Office of Chief Counsel to the Executive Officer of the San Diego Regional Board concludes that CWC Section 13523.5 "does not create an exception to a Regional Board's responsibility to implement the applicable basin plan through waste discharge requirements." In addition, CWC Section 13527(b) provides that "Nothing in this chapter prevents the appropriate regional board from establishing waste discharge requirements if a discharge is involved." Therefore, waste discharge requirements are both appropriate and necessary for this discharge.

SPECIFIC DISCHARGE SPECIFICATIONS AND LIMITATIONS

Discharge Prohibition A.2

The prohibition of discharge within 100 feet of a surface water drainage course is intended to prevent irrigation tailwater or overspray from entering the drainage course that runs through the land application area. The Discharger has asked that this prohibition be removed as it is constructing a tailwater return system adjacent to the surface water course. However, despite requests, the Discharger has not submitted the plans and specifications for the tailwater return system. If the Discharger submits the information, and the Executive Officer finds that the system is appropriate to protect the surface water drainage course, then the Executive Officer may allow discharge within 100 feet of the drainage.

Discharge Prohibition A.4

This prohibition restricts discharge of percolate from the Land Treatment Unit (LTU) of waste classified as hazardous or designated. This restriction is necessary to protect groundwater quality. The Discharger has not shown that it meets the provisions of State Board Resolution No. 68-16 (as described in Findings No. 76-79). Instead, while the proposed discharge is nonhazardous, it does exhibit characteristics of “designated waste,” as the concentrations of some waste constituents have the potential for causing exceedances of water quality objectives and/or adversely affecting beneficial uses of the groundwater. Therefore, it is appropriate to regulate the quality of the percolate released from the land treatment units (i.e., cropland).

Discharge Prohibition A.7

This prohibition requires each land application area to be equipped with a tailwater/runoff control system to prevent discharge of wastewater to the natural surface water drainage. This prohibition is necessary to protect surface water quality. The Discharger historically has not been able to prevent wastewater from discharging off the facility property but has stated that the construction of the 84-million gallon storage pond will allow control of the discharge to only uncontaminated stormwater. The Discharger has provided a Draft Stormwater Pollution Prevention Plan to the Regional Board; but staff has determined the report is incomplete and requested additional information.

Discharge Prohibition A.9

The Discharger has proposed allowing diversion of stormwater around the 84-million gallon storage pond, however it has failed to present specific criteria to evaluate the acceptability of such a discharge. In addition, the Discharger has not presented an evaluation of the wastewater application areas and the potential for mixing stormwater with wastewater in runoff proposed for diversion. It is noted that the Discharger has requested permission to apply wastewater during rain events. Staff is concerned that due to low permeability rates, applied wastewater will run off the land application areas and could be diverted around the 84-million gallon storage pond. Until the watershed evaluation is completed, specific criteria on diversion is presented to the Regional Board, and the Executive Officer approves the criteria, all diversions are prohibited.

Discharge Prohibition A.11

The Discharger has requested that the prohibition on allowing animals to graze in the land application areas be removed. The Discharger proposes to graze goats or sheep for crop harvesting on an intermittent, short-term basis, particularly for the more steeply sloped 95-acre portion of the land application areas where the area is more difficult to harvest using conventional methods. During the short periods the animals are present for harvesting purposes, process wastewater would not be applied to those areas. Animal harvest of the crops would be limited to 10-acre plots at a given time, therefore, less than five percent of the spray fields will be given over to grazing.

This Order allows limited grazing on the 95-acre land application area but staff remain concerned about the impact of animals on the application areas. The prohibition has been changed to allow grazing on the 95-acre land application area and only 10-acres at a time. Staff’s concerns about the use of animals on the steep slopes are in part based on information the Discharger has previously submitted and information gathered during site inspections. The Discharger has indicated during staff inspections that grazing cows

have damaged sprinkler heads, leading to discharges to the surface water drainage course. It is staff's understanding that the cows have been removed from the land application areas. In addition, the RWD describes a number of problems with grazing animals on the sprayfields, including increased runoff and soil compaction. Those statements are consistent with recommendations contained in the 31 January 2001 "Effects of Wastewater Application of the Health of Crops" report prepared by HDR Engineering which recommended, "Because of the high clay content of the surface soils and the high moisture levels generally found in these soils, animal grazing on spray fields is not recommended due to compaction concerns." The RWD states "It may be prudent to phase out grazing on the sprayfields." Finally, the Discharger needs to use its entire 200 acres of land in order to meet the BOD and nitrogen loading rates. The Discharger will have to address these management issues in the Operation and Management Plan required by WDRs Provision G.2.e.

Discharge Prohibition A.12

This prohibition prohibits industrial wastewater from being applied above the septic system leach lines or seepage pits. Application of wastewater over a leach line/seepage pit can result in wastewater infiltrating the leach lines and traveling to the seepage pits where it can be transported vertically to lower zones with little or no treatment.

Discharge Specification B.1

The monthly average flow limitation of 800,000 gpd applies to wastewater flowing from the facility into the 1-million gallon storage pond. Because the stormwater which falls onto the facility is commingled with wastewater and is also pumped into the 1-million gallon storage pond, the flow limitation includes this stormwater. In a wet winter, the Discharger may need to reduce its processing activities to meet the flow limit. The flow limit is based on staff's understanding that all wastewater enters the 1-million gallon storage pond before it is pumped to either land or the 84-million gallon pond. If the Discharger changes its piping system (i.e., so that some wastewater is pumped directly to the 84-million gallon pond), then it will need to install new flow meters to meet compliance with the limitation. The flow limitation does not apply to wastewater which is pumped from the storage pond onto the land application area. The Discharger is free to apply as much wastewater as necessary to the land application areas, as long as it complies with all other aspects of this Order. The flow limitation also does not apply to tailwater returned to the 84-million gallon pond, or to stormwater from the land application area which is directed to the 84-million gallon pond.

Discharge Specification B.3

This specification limits discharge of wastewater or other waste constituent to storage ponds, storage areas, or land application areas at concentrations that can cause a violation of the Groundwater Limitations. The Groundwater Limitations states the discharge shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than background water quality.

Discharge Specifications B.4 through B.6

These specifications are required to address nuisance odor conditions that have been documented at the facility. The Discharger proposed the Specifications found in B.5.

Effluent Limitation C.1

Loading limits for total dissolved solids are needed for several reasons. “Total dissolved solids” consist of both inorganic salts and a volatile component including sugars and carbohydrates. Crops are unable to take up excessive concentrations of inorganic solids such as sodium and chloride, resulting in leaching and groundwater degradation, especially at the loading rate the Discharger had proposed. When wastewater is evenly applied to soil at appropriate rates, the volatile component of TDS is usually biodegraded within the soil profile and removed from the leachate. However, overloading can lead to the presence of BOD, a measure of the volatile component of TDS, in the groundwater. To determine the appropriate concentration limits for the wastewater, staff reviewed the *Designated Level Methodology for Waste Classification*. Because the discharge is planned to continue indefinitely, the use of an attenuation factor is not appropriate because all the attenuation processes will become saturated over time. Therefore, the effluent limits are set by the background groundwater quality.

The Discharger has requested that the salt limitation be expressed as “dissolved inorganic solids” (DIS) instead of “total dissolved solids” (TDS). The Discharger indicates that the effluent limit should only apply to the inorganic portion. However, the effluent limitation is expressed as TDS for several reasons. First, if wastewater is overloaded onto the land application areas, then the volatile component may not be fully degraded and a DIS value may not fully measure the extent of dissolved solids which reach the groundwater. The limited groundwater monitoring conducted to date shows that there is BOD in six of the shallowest monitoring wells, indicating that the groundwater may already be degraded by the volatile portion of TDS.

Second, neither the 1-million gallon settling pond nor the 84-million gallon storage pond are constructed to meet Title 27 standards. The waste currently produced by the Discharger is considered designated waste and if not treated to reduce concentrations, would have to be stored in a pond constructed with a double liner and leachate collection system. Although the Discharger states that the native clay underlying the 84 million gallon storage pond can be compacted to a hydraulic conductivity of approximately 10^{-6} cm/sec, this does not meet the prescriptive standards nor the performance standards of Title 27 which include a leachate collection system to reduce the hydraulic head and a second liner. If the effluent limit were to be expressed as DIS instead of TDS, then there would be no control over the volatile portion of the waste stored in the pond, and it is expected that the existing elevated BOD in the waste, coupled with the 20-30 feet of hydraulic head in the pond, would cause leaching of the volatile solids and degradation of the shallow (10 feet bgs) groundwater underlying the pond. After the Discharger treats its waste to comply with the effluent limit contained in this Order, the waste should not be designated waste, should not degrade the underlying groundwater, and can be stored in an unlined pond.

Finally, the water quality criteria for groundwater are expressed as TDS, not DIS. This use of TDS as an effluent limitation is consistent with other Orders the Board has adopted for food processors within the last few years. This Order must be fully protective of the groundwater and therefore the effluent limitation must be expressed as TDS.

Effluent Limitation C.2

Loading limits for nitrogen are required because excessive loading of nitrogen can result in a build up of nitrogen in the soil column and eventual leaching to groundwater. The Discharger has presented a plan to crop the land application areas to remove all applied nitrogen. Because crop health in land application areas has historically been poor, the crop may not be able to take up all the applied nitrogen.

The Discharger states that the nitrogen limits presented in the WDRs are overly restrictive. The WDRs contain a Discharge Specification that restricts the total nitrogen loading rate to the agronomic rate, which is equal to the nitrogen requirements of the crop planted on the disposal field. Staff believes the restrictions are appropriate. This is a standard specification that has routinely been imposed on food processors, dairies, and other agricultural dischargers. The purpose of the specification is to ensure that the crop utilizes nitrogen to the maximum practical extent, thereby preventing groundwater quality degradation by nitrate.

Nitrogen in food processing waste is typically present primarily in organic form. According to Irrigation with Reclaimed Municipal Wastewater, Fate of Wastewater Constituents in Soil and Groundwater, (Chapter 12 of Irrigation With Reclaimed Municipal Wastewater, A Guidance Manual, prepared by California State Water Resources Control Board, Report No. 84-1, 1984) organic nitrogen is mineralized to ammonium and then nitrified to form nitrate which is plant available. Mineralization requires aerobic conditions in the soil and sufficient bacteria. Mineralization does not occur at a constant rate because some forms of organic nitrogen mineralize less readily and tend to stay in organic form until the readily mineralized fraction has been fully utilized. Nitrification also requires adequate oxygen and bacteria to produce plant available nitrogen.

For optimal plant uptake, the percolation rate must be slow enough to ensure that nitrogen (whether in organic or mineralized form) stays within the root zone to the maximum practical extent. According to Wastewater Management Systems, nitrogen can be stored in the soil, however, with continued application of wastewater, equilibrium is reached and net storage of nitrogen stops. Wastewater Management Systems states that it is most conservative to assume net storage will be zero. The WDRs are consistent with this conservative approach.

Any nitrogen that percolates below the root zone can potentially degrade groundwater quality. However, under certain circumstances, nitrate can be denitrified to nitrogen gas, which resides within the soil matrix or is released to the atmosphere. Denitrification rates vary substantially (from 0% to 90% of total nitrogen), depending on several variables, most of which are site-specific. These variables include those related to soil type or texture; mass of nitrogen per application per unit area; volume of water per application per unit area; resting or drying time between applications; and climactic conditions. Therefore, determination of the denitrification rate for a given discharge can only be made based on a fully supported site-specific model.

The Discharger has stated that a considerable percentage of nitrogen is lost to the atmosphere through the process of denitrification. Because of the variable denitrification rate that occurs due to wastewater application rates, ambient temperature, and other factors which may not be controllable, staff believes requiring agronomic application rates are justified.

Based on long-standing practice, the agronomic nitrogen loading rate for a given crop is based on the rates presented in the most recent edition of the Western Fertilizer Handbook unless the Discharger demonstrates that another rate is technically justified.

Staff has taken a conservative approach in requiring the Discharger to apply nitrogen at agronomic rates. This limit will apply until the Discharger can provide additional site-specific testing data to support their denitrification assumptions.

Effluent Limitation C.3

Loading limits for BOD are needed because excessive loading can deplete soil oxygen and cause anaerobic conditions. Anaerobic degradation of organic matter can cause severe nuisance odors and promote incomplete biodegradation, thereby allowing dissolved organic material to percolate through the unsaturated zone into groundwater. Anaerobic decomposition of organic wastes also creates organic acids that decrease soil pH. A low pH environment can cause excessive leaching of metals in the soil into underlying groundwater.

This Discharge Specification prescribes a maximum BOD loading of 300 lbs/acre on any one day, and 100 lbs/acre/day as a 7-day (weekly) average. The weekly average loading limit of 100 lbs/acre/day is based on U.S. Environmental Protection Agency Publication (USEPA) guidelines provided in *Pollution Abatement in the Fruit and Vegetable Industry – Wastewater Treatment* (USEPA 625/3-77-0007) (hereafter *Pollution Abatement*). Although the RWD states that the yearly average BOD loading will be less than 70 lb/ac/day, a review of the most recent self-monitoring report (May 2002) shows that the Discharger may not be able to meet the daily or weekly limitations. The Discharger has already proposed to install aerators in its ponds; this step may be all that is necessary to meet the BOD effluent limitation. If not then the Discharger will need to take other steps to improve its treatment system. It is not appropriate to relax the BOD loading rate as staff are still receiving odor complaints.

Land Application Area Specification D.19

Land Application Area Specification D.15 requires that effect wastewater application on the soil shall not exceed the buffering capacity of the soil profile. The Discharger has described the disassociation of the bicarbonate ion under certain soil pH conditions but has failed to describe the pH at which the disassociation is anticipated to occur. *Pollution Abatement* recommends a wastewater pH range of 6.4 to 8.4 for irrigation and Effluent Limitation C.4 requires wastewater discharged to the land application areas to not have a pH of less than 6.5 or greater than 8.5. This limitation alone cannot ensure that soil pH conditions will be optimal for land treatment and preventing leaching of metals, so Land Application Area Specification D.19 requires that the discharge not exceed the soil pH buffering capacity.

Land Application Area Specification D.20

This specification is needed because wastewater application near the property boundary has resulted in nuisance odors for residents. The Discharger's Odor Minimization Report described elimination of standing water in the irrigation checks. Because the soil permeability is so low, staff believe any application of wastewater at the irrigation checks will result in standing water. To prevent anaerobic conditions and associated odor problems in the treatment and storage ponds, this Order also requires the

dissolved oxygen content in the upper 12 inches of any liquid impoundment to be maintained at no less than 1.0 mg/L.

Technical Reports Required by the Provisions

The Discharger is required to submit a workplan for characterization of groundwater quality and percolate quality at the land treatment units (land application areas). The groundwater well workplan will allow further evaluation of groundwater conditions upgradient and downgradient of the newly constructed 84-million gallon storage pond and in the land application areas. In addition, installation of lysimeters are required to determine the quality of the percolate at the bottom of the land treatment units (at a depth of five feet). Lysimeters shall be installed in both the land application areas and in an area where no land application of wastewater has occurred.

The Discharger is required to submit a BPTC Salinity Source Reduction Plan because the available data on groundwater quality, wastewater quality, and crop uptake indicates the wastewater application could impact groundwater quality. This Workplan must contain plans to reduce the concentration of TDS constituents, organic constituents, and hydraulic loading.

The Discharger is required to submit an assimilative capacity report for the LTUs (land application areas). The report shall evaluate the LTU's capacity to treat the wastewater constituents being applied. This requirement is needed to determine the adequacy of the land treatment. The wastewater contains high concentrations of constituents, such as sodium and chloride, that are not biologically treated and an evaluation of the effectiveness of land treatment to protect groundwater quality is needed.

The Discharger shall submit a technical report describing specific numerical water quality criteria prior to being allowed to bypass the 84-million gallon storage pond. This item is discussed above in "Discharge Prohibition A.5."

The Discharger is required to submit an Operation and Maintenance Plan to ensure that all persons responsible for irrigation and monitoring are aware of their responsibilities and are appropriately trained. This is required because a single reference document that includes the WDRs, instructions for operation, odor minimization procedures, and other information must be available to operators of the system in a timely manner. Because the Discharger will be storing odor control chemicals on site that are expected to be used infrequently, it is important for operators to be able to refer to the O&M Plan for use instructions.

The Discharger is required to submit a Groundwater Well and Lysimeter Installation Report to document the installation of the wells and lysimeters.

The Discharger is required to submit a Background Groundwater Quality and Percolate Quality Report. This report is required to allow determination of the effect of wastewater application on the groundwater quality. If a groundwater quality degradation is observed, upon request of the Executive Officer the Discharger will be required to submit a Groundwater Mitigation Plan.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0148

FOR
MUSCO FAMILY OLIVE COMPANY AND THE STUDLEY COMPANY
WASTEWATER TREATMENT AND LAND DISPOSAL FACILITY
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring industrial wastewater, wastewater ponds, land application areas, stormwater, and land application soil quality. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Specific sample station locations shall be approved by Regional Board staff prior to implementation of sampling activities.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

INDUSTRIAL WASTEWATER MONITORING

Wastewater effluent samples shall be collected from the 1-million gallon pond, prior to discharge to the 85-million gallon pond. Except for pH and electrical conductivity, grab samples are considered adequately composited to represent the effluent. The Discharger shall use its existing continuous recording devices to monitor pH and EC. Effluent monitoring shall include, at a minimum, the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Flow into the 1-million gallon settling pond ¹	gpd	Meter	Daily	Monthly
pH	S.U.	Meter	Continuous	Monthly
Electrical Conductivity	µmhos/cm	Meter	Continuous	Monthly
BOD ₅	mg/l	Grab	Weekly	Monthly
Nitrates as Nitrogen	mg/l	Grab	Weekly	Monthly
Total Kjeldahl Nitrogen	mg/l	Grab	Weekly	Monthly
Fixed Dissolved Solids	mg/l	Grab	Weekly	Monthly
Total Dissolved Solids	mg/l	Grab	Weekly	Monthly
Sodium	mg/l	Grab	Weekly	Monthly
Chloride	mg/l	Grab	Weekly	Monthly

¹Flow of process wastewater and stormwater from the facility (does not include tailwater return flows or stormwater from the land application area)

WASTEWATER POND MONITORING

Samples shall be collected from all wastewater storage ponds, irrigation checks that contain standing water, and any new or temporary ponds that are constructed. Samples shall be collected from an established sampling station as far as practical from the pond inlet, and in an area which will provide a sample representative of the wastewater in the pond. Samples for dissolved oxygen, sulfide, and pH shall be collected at a depth of 1-2 feet below the pond surface. The Discharger shall notify staff within 24 hours if the freeboard in either pond is less than two feet. Pond monitoring shall include at least the following.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Freeboard	Feet	Measurement	Daily	Monthly
Dissolved Oxygen	mg/l	Grab	Daily	Monthly
Dissolved Sulfide	mg/l	Grab	Daily	Monthly
pH	Std.	Grab	Daily	Monthly
Pond Condition ¹	NA	Observation	Daily	Monthly

¹ Pond condition monitoring shall include daily determination of berm condition, wastewater overflows, and odor conditions (none, slight, moderate, strong).

LAND APPLICATION AREA MONITORING

Application of wastewater to the land application area shall be monitored to prevent overloading the area with wastewater constituents, which can cause objectionable odors and/or groundwater degradation. The following parameters shall be calculated and reported in the monthly monitoring reports.

By **1 October 2002**, the Discharger shall install a sufficient number of meters to continuously monitor the flow out of the settling/storage ponds to the land application areas. No wastewater shall be applied without metering. If portable pumps are used to discharge wastewater to the land application area or a storage pond, additional meters shall be installed at every discharge point.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Flow to Application Area	gpd	Metered	Daily	Monthly
Application Area	acres	Measured ¹	Daily	Monthly
Tailwater Return Flow	gpd	Metered	Daily	Monthly
Stormwater flow into the 84 mg storage pond	gpd	Metered/Estimated ⁵	Daily	Monthly
Crop Planted	acres	Measured ¹	Daily	Monthly
Hydraulic Loading Rate	inches/acre/month	Calculated	Monthly	Monthly
BOD ₅ Loading Rate	lbs/acre/day	Calculated ²	Daily	Monthly
Total Nitrogen Loading Rate	lbs/acre/month	Calculated ³	Monthly	Monthly
Tailwater Generation	Visual Inspection	Observation	Daily ⁴	Monthly

¹ Provide a map identifying field names and acreages.

² BOD₅ loading shall be calculated for each field, using the daily applied volume of wastewater, estimated daily application area, and the most recent results of effluent BOD₅.

- 3 Total nitrogen loading rates shall be calculated for each field using the daily applied volume of wastewater, estimated daily application area, and the most recent total nitrogen results.
- 4 Runoff monitoring of the application areas shall be performed daily. Frequency of monitoring during the day shall be sufficient to determine if runoff is occurring.
- 5 If possible, flows shall be metered. If flows from certain areas cannot be metered, then flows shall be estimated based upon drainage basin and intensity of storm. Calculations shall be shown.

In addition, the Discharger shall maintain a daily log of discharges to the land application area. Notations shall record which area is receiving wastewater, observations of ponding water, saturated soil, odors, insects, or other potential nuisance conditions. The notations shall also document any corrective actions taken. A copy of the entries made in the log during each month shall be submitted along with monthly monitoring reports.

SITE SPECIFIC GROUNDWATER MONITORING

Prior to completion and/or sampling of any groundwater monitoring wells, the Discharger shall submit plans and specifications to the Board for review and approval. Once installed, all new wells shall be added to the MRP and shall be sampled and analyzed according to the schedule below.

Prior to sampling or purging, equilibrated groundwater elevations shall be measured to the nearest 0.01 foot. Depth to groundwater measurements shall be collected from all wells on the same day. The wells shall be purged at least three well volumes until pH and electrical conductivity have stabilized. Sample collection shall follow standard EPA analytical method protocols. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Depth to Groundwater	0.01 ft	Measurement	Quarterly	Quarterly
Groundwater Elevation	0.01 ft	Calculated	Quarterly	Quarterly
Gradient	ft/ft	Calculated	Quarterly	Quarterly
Gradient Direction	Degrees	Calculated	Quarterly	Quarterly
pH	S.U.	Grab	Quarterly	Quarterly
BOD	mg/l	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Fixed Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Total Kjeldahl Nitrogen	mg/l	Grab	Quarterly	Quarterly
General Minerals ¹	mg/l	Grab	Quarterly	Quarterly

¹Including chloride, sulfate, bicarbonate alkalinity, carbonate alkalinity, calcium, magnesium, potassium, sodium, boron, and ammonia.

PAN LYSIMETER MONITORING

Prior to completion and/or sampling of any pan lysimeters, the Discharger shall submit plans and specifications to the Board for review and approval. Pan lysimeters shall collect percolate at a depth of five feet below the ground surface. Once installed, all new pan lysimeters shall be added to the MRP and shall be sampled and analyzed according to the schedule below.

After collection of percolate samples, the lysimeters shall be purged dry. Sample collection shall follow standard EPA analytical method protocols. Lysimeter monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
pH	S.U.	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Fixed Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Total Kjeldahl Nitrogen	mg/l	Grab	Quarterly	Quarterly
General Minerals ¹	mg/l	Grab	Quarterly	Quarterly

¹Including chloride, sulfate, bicarbonate alkalinity, carbonate alkalinity, calcium, magnesium, potassium, sodium, boron, and ammonia

REGIONAL GROUNDWATER MONITORING

As long as the property owner grants access to the well, samples shall be collected from the domestic well located at 26933 South Hansen Road, Tracy. Samples shall be collected upstream of any water treatment equipment at the residence. Sample collection shall follow standard EPA analytical method protocols. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
pH	S.U.	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/l	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/l	Grab	Quarterly	Quarterly
Total Kjeldahl Nitrogen	mg/l	Grab	Quarterly	Quarterly
General Minerals	mg/l	Grab	Quarterly	Quarterly

STORMWATER MONITORING

Samples shall be collected from the sampling stations established in Kleinfelder's 11 January 2001 Amended Surface Water Sampling Plan and an additional sample location to be established upgradient of all application areas. Stormwater monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Sample Type</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Total Dissolved Solids	mg/l	Grab	Monthly ^{1,2}	Monthly
Fixed Dissolved Solids	mg/l	Grab	Monthly ^{1,2}	Monthly

<u>Constituents</u>	<u>Units</u>	<u>Sample Type</u>	<u>Sampling Frequency</u>	<u>Reporting Frequency</u>
Sodium	mg/l	Grab	Monthly ^{1,2}	Monthly
Chloride	mg/l	Grab	Monthly ^{1,2}	Monthly
Electrical Conductivity	µmhos/cm	Grab	Monthly ^{1,2}	Monthly
BOD ₅	mg/l	Grab	Monthly ^{1,2}	Monthly
pH	S.U.	Meter	Monthly ^{1,2}	Monthly

¹ Samples shall be collected within three days after the first significant rainfall of the Fall/Winter season.

² Samples shall be collected monthly from December through April.

LAND APPLICATION AREA SOILS MONITORING

The Discharger shall establish, with concurrence of Board staff, ten soil profile monitoring locations and one representative background location (i.e., in an area that historically has not received process wastewater). The samples shall be collected and analyzed for at least the following constituents immediately upon implementation of this MRP, and at an annual frequency thereafter:

<u>Constituents</u>	<u>Units</u>	<u>Soil Profile</u>	<u>Frequency</u>
Sodium	mg/kg	Standard ¹	Annually ²
Chloride	mg/kg	Standard ¹	Annually ²
Sodium Adsorption Ratio	unitless	Standard ¹	Annually ²
Electrical Conductivity	µmhos/cm	Standard ¹	Annually ²
Soil pH	PH	Standard ¹	Annually ²
Cation Exchange Capacity	meq/100 g	Standard ¹	Annually ²
Exchangeable Sodium Percentage	% of CEC	Standard ¹	Annually ²
Nitrate (as N)	mg/kg	Standard ¹	Annually ²
Total Kjeldahl Nitrogen (as N)	mg/kg	Standard ¹	Annually ²

¹ Samples shall be collected at 0.5 feet, 3 feet, and 6 feet.

² Samples shall be collected in September.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, soil, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required by the Monitoring and Reporting Program, shall be reported in the next scheduled monitoring report.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. A status report on expansion or reconfiguration of the facility processing capability or wastewater system configurations.
2. Results of industrial wastewater, wastewater ponds, land application areas, and stormwater monitoring.
3. Land application log book entries and calculations.
4. A map of all stormwater sample locations and fields showing field names, acreages planted with a crop, and type of crop. An evaluation of crop health.
5. The location of each meter used to record flow, pH, and electrical conductivity.
6. Calibration records for all pH and electrical conductivity meters.
7. A comparison of monitoring data to the effluent limitations and an explanation of any violation of those requirements. Data shall be presented in tabular format.
8. If requested by staff, copies of laboratory analytical report(s).

B. Quarterly Monitoring Reports

The Discharger shall establish a quarterly sampling schedule for groundwater and lysimeter monitoring such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Regional Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by May 1st) and may be combined with the monthly report. The Quarterly Report shall include the following:

1. Results of the site specific groundwater monitoring, regional groundwater monitoring, and lysimeter monitoring;
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater and lysimeter monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;
3. Calculation of groundwater elevations, an assessment of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any;

4. A narrative discussion of the analytical results for all groundwater and lysimeter locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable);
5. A comparison of monitoring data to the groundwater limitations and an explanation of any violation of those requirements;
6. Summary data tables of historical and current water table elevations and analytical results;
7. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum;
8. Copies of laboratory analytical report(s) for groundwater monitoring.

C. Annual Report

An Annual Report shall be prepared as the December monitoring report. The Annual Report will include all monitoring data required in the monthly and quarterly schedules. The Annual Report shall be submitted to the Regional Board by **1 February** each year. In addition to the data normally presented, the Annual Report shall include the following:

1. The contents of the regular quarterly and monthly reports for the last sampling periods of the year;
2. If requested by staff, tabular summaries of all data collected during the year.
3. The results of land application soils monitoring, including a map depicting sample locations.
4. An evaluation of the groundwater quality beneath the wastewater treatment facility.
5. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
6. An annual report, prepared by a Certified Crop Advisor or Certified Agronomist, detailing the effect of the application of the wastewater on crops, the health of the crops grown in the application areas, the effect of continued application of wastewater, and the potential for increased soil salinity and the resulting impacts to future agricultural use. The report shall describe the crop conditions throughout the year, not just at the time of Annual Report preparation, and shall contain recommendations regarding crops to be planted, and actions necessary to improve the crop health for the following year.
7. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
8. Calibration records for all flow meters.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirements violation found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the

corrective action, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of the date of this Order.

THOMAS R. PINKOS, Acting Executive Officer

6 September 2002

(date)

AMENDED

TRO: 9/6/02

INFORMATION SHEET

ORDER NO. R5-2002-0148
MUSCO FAMILY OLIVE COMPANY AND THE STUDLEY COMPANY
WASTEWATER TREATMENT AND LAND DISPOSAL FACILITY
SAN JOAQUIN COUNTY

Musco Family Olive Company and the Studley Company (Discharger) operate an olive cannery near Tracy, San Joaquin County. The Tracy facility is equipped with 734 storage tanks ranging in size from 3,600-gallons to 8,800-gallons and 98 processing tanks that are 2,500-gallons each. Additional olives are stored at the Discharger's Visalia and Orland facilities and are trucked to Tracy for processing. The facility has approximately 37,000 tons of storage capacity and an additional 10,000 tons can be processed fresh for a total storage capacity of approximately 47,000 tons. The facility can process approximately 1,000 tons per week for a total processing capacity of 52,000 tons per year.

Olives are stored in an acetic acid solution prior to processing. Processing the olives requires immersing the raw olives in lye solutions to cure the olive, then drawing the lye out of the olives with successive baths of fresh water. The olives are pitted prior to canning in a brine (sodium chloride) solution. Processing occurs year round, with fresh olives processed from September through early November and stored olives processed the remainder of the year.

Process wastewater generated at the facility is regulated by two separate WDRs. Order No. 96-075 regulates the two Title 27 surface impoundments that are used to store concentrated brines; Order No. 97-037 regulates the less concentrated wastewater that is applied to land. This WDR update only applies to the less concentrated wastewater.

Local land use consists of industrial, residential, and agricultural operations. The site is located on an alluvial fan that generally slopes to the northeast. Topography varies from steep to nearly level. Surface water drainage from the facility is to the Sacramento San Joaquin Delta.

WASTEWATER SYSTEM

A wastewater system is used to collect and apply the industrial wastewater to land. Wastewater is collected throughout the facility by floor drains and is piped to a central collection area. Despite requests for information, the Discharger has not fully described how it determines whether to discharge to the land application system or the Title 27 ponds. From the 1-million gallon pond, the wastewater may either be applied directly to the land application areas or it may be stored in a new 84-million gallon storage pond prior to land application. The facility consists of 280 acres, of which approximately 200 acres are available as wastewater land application areas.

Wastewater is characterized by high concentrations of organic matter, total dissolved solids (TDS), sodium, and chloride. Waste lye solutions, carbon dioxide neutralization water, pit floatation brine, ion exchange regeneration brine, and boiler blow down are discharged to the Title 27 ponds. Lye rinse water, cooling water, wash waters (including weak lye solutions), acetic acid storage solutions, pitting machine wastewater, clean-in-place solutions, and cannery floor wastewater (despite high TDS concentration), are sent to the land application system.

The treatment for process wastewater discharged to land consists of carbon dioxide neutralization of lye rinse solutions, screening solids using a mechanical screen and rake, and discharge to the 1-million gallon settling pond.

FLOW LIMITATION

As part of the RWD, the Discharger was required to submit a water balance to demonstrate that it has adequate treatment, storage, and disposal capacity for its requested flow rate. The current WDRs contain an implied flow rate of 500,000 gpd, while the revised TSO allow a weekly flow limit of 820,000 gpd. The RWD contained a water balance with a flow rate of 1,000,000 gpd. Staff carefully reviewed the initial water balance, and spent many hours talking with the Discharger's consultants about our concerns. The consultants have since submitted several revised water balances. One major revision had to do with the capacity of the storage pond (which is currently under construction). The original water balance used a storage capacity of 114 million gallons, but the Discharger now estimates that the pond's actual capacity will be only 84 million gallons.

The most recent water balance was submitted with the 8 August 2002 response to the tentative WDRs. In general, the water balance fails to demonstrate adequate wastewater storage and application capacity for the requested a flow rate of 800,000 gpd. Evaluation of the water balance is complicated by the poor data regarding stormwater runoff and tailwater generation rates. However, because the Discharger can stop operations and limit wastewater flow if needed to prevent overflows of wastewater from the storage pond, staff are recommending the Discharger be allowed the requested flow limit – with some additional restrictions. In the discussion below, the water balance is reviewed and the additional restrictions are described.

Water Balance Review

In preparation of the tentative WDRs, the Discharger has submitted water balances prepared by Kennedy Jenks. Since the original water balance was submitted in the 30 April 2002 RWD, two conference calls to discuss the contents of the water balances have been held. In addition, the Discharger has revealed the actual size of the wastewater storage pond to be 84.1- million gallons (Mgal) (nearly 30-Mgal less than originally stated). This evaluation focuses on Table 2 "Water Balance for 100 Year Rainfall Event Climate Conditions". The water balance addresses some of staff's concerns regarding previously submitted water balances but fails to demonstrate adequate storage capacity for the wastewater flow rate as proposed. In general, the water balance is overly optimistic – especially considering the problems the Discharger has experienced with controlling tailwater at the site. However, because of the nature of the olive processing activities, the facility can stop production if necessary and wait for better climatic conditions.

The water balance indicates wastewater will be stored during the winter months of December, January, and February and applied to land application areas the rest of the year. During the months when wastewater is stored, stormwater that falls on upland application areas is proposed to be bypassed past the storage pond. (Stormwater that falls on the main facility will continue to be discharged to the storage pond). However, the Discharger has not proposed criteria for bypassing stormwater. As written,

the tentative WDRs prohibit bypass until the Discharger provides acceptable criteria to show that wastewater will not be present in the stormwater. The ability to bypass wastewater is a critical assumption in the water balance and may impact the Discharger's ability to operate.

The water balance includes application of wastewater in months when rainfall exceeds evapotranspiration (ET). Such an application is likely to result in considerable generation of tailwater, all of which is required to be collected. For example, March rainfall is 4.1 inches, potential ET is 3.0 inches, yet 5.2 inches of wastewater (approximately 35.3 Mgal) is proposed for application. The water balance's failure to adequately address tailwater generation that might result from such an application is described below.

The water balance is optimistic in calculating the tailwater generation rate and is inconsistent when calculating tailwater generation rates and stormwater runoff. The tailwater generation rate is significantly lower than the anticipated stormwater runoff rate used to calculate the amount of stormwater runoff from land application areas. The discrepancy exists despite the soil moisture content at 100-percent. Stormwater runoff is anticipated to be approximately 26-percent of rainfall; tailwater runoff is anticipated to be in the range of 0.06, when it is reported at all. The Discharger reports wastewater will be applied in short frequent applications to minimize stormwater runoff, but that approach requires the Discharger to operate the entire land application area with computer controlled spray equipment, which the Discharger has not installed. It is noted that the water balance predicts at least 5 inches of wastewater application in both March and April, but only 0.3 and 0.0 inches, respectively, of tailwater runoff is predicted. If the tailwater generation rate is higher than predicted, the wastewater storage pond will run out of capacity and in critical months, the lack of capacity will result in spilling of wastewater.

The water balance's cumulative storage volume scenario is difficult to imagine. For example, at the end of February (with the storage pond containing 83.6 Mgal of wastewater), the storage pond will only accumulate 0.4 Mgal of additional wastewater despite the unfavorable conditions of rainfall exceeding evapotranspiration, 5.2 inches of applied wastewater, and 100-percent saturated soil. With all those factors to overcome, the water balance estimates 0.3 inches of tailwater runoff. Based on observations during site inspections, staff believes considerably more tailwater will be generated than what is described in the water balance.

The water balance addresses the lack of capacity in the wastewater storage pond by establishing higher rates of leaching wastewater when the storage pond nears capacity. For example, the storage pond contains 83.6 Mgal at the end of February; in March the water balance then predicts 5.3 inches of leaching to prevent the pond from overflowing. If the leaching rate is less than expected, the pond will overflow and spill.

Additional Restrictions Due to Water Balance Concerns

One of the major problems with the water balance is that both tailwater and stormwater generation and storage rates are estimated. At this point, there is no way to verify the estimations except through direct measurements over the next few years. However, staff need to propose a flow limitation at this time.

The tentative WDRs contain the Discharger's proposed flow limit of 800,000 gpd (as a monthly average), subject to a number of additional restrictions.

Application of wastewater on the land application areas and then bypassing the wastewater/stormwater mix may result in discharge of wastewater off site, a situation that is expressly prohibited by the WDRs. Therefore, the tentative WDRs included a prohibition against applying wastewater during the three months (December-February) when stormwater bypass is proposed and when the water balance indicates that wastewater will not be applied to land. In response to the tentative WDRs, the Discharger asked that this prohibition be removed. Staff are uncertain how the Discharger will be able to irrigate the LTUs during the winter and still be able to bypass stormwater. However, this proposed prohibition has been deleted with the Discharger's understanding that, as described in the last paragraph of this section, there is a higher likelihood that it may need to cease production at its facility if it has to collect more stormwater than anticipated.

Because of the uncertainties of tailwater generation and the importance to preparation of any future water balances, it is reasonable to require monitoring of the amount of tailwater generated. The Discharger has verbally described a plan (but has yet submitted a written description) to collect tailwater from the application areas in collection ditches and return the water to the storage pond in a sump/pump/piping arrangement. Monitoring of the tailwater will allow a better evaluation of the flow rate for future preparation of water balances. The monitoring might consist of totalizing meters or pump run time meters. If pump run time meters are used, annual calibration of the meters should be required because the Discharger has reported inaccurate metered flow rates in the wastewater discharge self-monitoring data. The Discharger also needs to either directly measure, or accurately estimate, the amount of stormwater which runs off the land application area and is collected in the storage pond.

Finally, because the water balance contains optimistic assumptions, it is reasonable to include a requirement to cease the discharge to the either the 1-Mgal settling pond or the 84-Mgal storage pond if the freeboard in either is less than two feet at any time. This will minimize the possibility of spilling wastewater into the natural surface water drainage. The Discharger is also required to inform Regional Board staff of the freeboard violation immediately.

REGULATORY CRITERIA

Based on the available information regarding groundwater quality, the wastewater contains higher concentration of DIS, sodium, and chloride than the groundwater. It may also contain other analytes in concentrations higher than the underlying groundwater. The discharge is nonhazardous, but exhibits characteristics of "designated waste," as defined by CWC Section 13173(b), as the concentrations of some waste constituents when applied to land have potential for causing exceedances of water quality objectives or affecting beneficial uses. The discharge contains decomposable waste constituents (e.g., organic carbon and nutrient compounds) and inorganic dissolved solids in concentrations orders of magnitude greater than water quality objectives.

The Discharger proposes to continue the discharge of wastes to land, and hence the groundwater, that are subject to full containment under Title 27. However, the discharge of such designated waste to land is not allowed under WDRs No. 97-037, and is also not allowed under this updated Order. The updated Order contains an analysis of the RWD for requirements under which an exemption from Title 27 may be granted and, as intended by the RWD, for the conditions under which waste may be discharged to a land treatment unit, followed by infiltration to groundwater.

The Regional Board has considered antidegradation pursuant to Resolution No. 68-16 and finds that degradation of the groundwater by this discharge is not consistent with maximum benefit to the people of the State. Under ideal conditions, the assimilative capacity of the underlying soil and proper irrigation management practices should prevent degradation of groundwater from the infiltration of incidental waste constituents. Following adoption of WDRs Order No. 97-037, the Discharger has been provided ample opportunity to justify a discharge and comply with Order No. 97-037. It has not complied. It has been granted interim conditional flow increases while under a series of enforcement actions while developing justification for discharge, and violated those conditions, including repeated failure to monitor waste and submit reports as required, and failure to restrain production in accord with enforcement conditions, resulting in administrative civil liability. The RWD is inadequate to support the requested discharge. Therefore, this Order limits the Discharger to that which will not degrade the underlying groundwater. The RWD proposes that wastewater containing over 3,000 mg/l TDS be discharged to land, however, staff's analysis shows that an interim effluent limitation of 2,047 mg/l TDS is necessary to protect the underlying groundwater.

Inorganic dissolved solids can be effectively controlled by means of source control and treatment. Source control includes best management practices of selective and judicious chemical use and waste stream isolation where possible (for example, clean-in-place wastewater, ion exchange regeneration brine, lye bath rinse water, and boiler blowdown). Treatment and containment technology includes reverse osmosis, ion exchange, and evaporation impoundments constructed to Title 27 standards

LOADING RATES

The RWD describes the annual nitrogen loading rate to be between 428 lbs/ac•year to 490 lbs/ac•year. The Discharger will double crop Sudan grass and also grow winter barley. The Discharger states that it will stagger planting, irrigation, and harvest so that there are always two or three crops in the land application areas. The RWD reports double cropping the Sudan grass will remove approximately 325 pounds of nitrogen per acre•year. Winter barley will be planted into Sudan grass stubble in early fall to remove an additional 160 pounds of nitrogen per acre/year. Other crops the Discharger is considering are Bermuda grass and salt tolerant alfalfa (reportedly under development in agricultural laboratories). Recent inspections have shown that crop health at the facility has been poor in areas where wastewater has been applied for longer times. Poor crop health will result in lower nitrogen uptake rates. Therefore, the Order requires that the Discharger consult with a Certified Crop Advisor or Certified Agronomist on a yearly basis regarding the steps needed to maintain the proposed intensive agriculture and high nitrogen uptake.

The RWD describes the annual DIS loading rate to be between 34,000 lbs/ac•year and 40,000 lbs/ac•year. The Discharger anticipates approximately 3,260 lbs/ac•year will be taken up by cropping activities. The RWD states that leaching of DIS from the root zone must be performed to control soil salinity at levels that

do not hinder crop growth. Because the DIS loading rate exceeds the crop uptake rate, it is anticipated that leaching of DIS will result in interim soil attenuation of the DIS and eventual groundwater degradation with continued application. This application procedure is not sustainable with nondegradable constituents. Loading rates must be balanced with uptake rates to protect groundwater quality, and therefore the 1,500 mg/l effluent limit for TDS is necessary.

The Discharger states the BOD limits presented in the WDRs are overly restrictive and that higher loading rates have been employed at land application areas. Staff disagree that higher loading rates than published in the tentative WDRs would be acceptable based on the Discharger's plan to limit treatment of BOD by mechanical treatment equipment and instead rely upon land treatment of BOD constituents. Land treatment is an effective treatment mechanism, however, overloading the land can result in generation of odors. The discharge has resulted in the generation of nuisance odors at the facility and staff has received numerous complaints, the most recent on 29 August 2002.

Staff believes the appropriate BOD value that should be selected from Pollution Abatement is 100 lbs/acre•day. It is noted that the limit published in Pollution Abatement is for the summer season when conditions for land application are favorable. The Discharger is likely to discharge wastewater all year round, when conditions are not optimum. This limit published in the tentative WDRs should be protective of groundwater quality and crop health and should not generate nuisance odor conditions. This position is based on the staff's experience and the loading rate guidance presented in Small and Decentralized Wastewater Management Systems (Crites and Tchobanoglous, 1998) which states that loading rates for BOD often exceed 100 lb/acre day and occasionally exceed 300 lb/acre•day; odor problems are avoided by providing adequate drying times between wastewater applications; and loading rates beyond 450 lb/acre•day of BOD should generally be avoided unless special management practices are used. Because of the close proximity of residential areas and the limited land area available for wastewater application, BOD loading rates that require special precautions are not appropriate in this case.

Pollution Abatement also states if the BOD loading is too great, the soil will become anaerobic and the crop and treatment process will fail, but that higher loading rates are possible if the site is irrigated for only a few weeks each year and is well maintained. The Discharger's facility operates 365 days a year, so the application areas will not have the opportunity to rest. Because of the limited land area available there are no alternative application areas to discharge the water to if a system upset occurs."

The Discharger is required to continue characterizing groundwater quality and to begin characterizing the quality of the percolate below the land treatment units. Percolate samples will be collected by pan lysimeters both in areas of land application and areas outside the land application limits. Groundwater monitoring wells will monitor the first saturated interval; percolate samples will be monitored by pan lysimeters installed at a depth of five feet. If groundwater or percolate quality is degraded, the Discharger must take steps such as reducing loading or improving cropping to protect groundwater quality.

NUISANCE ODOR CONDITIONS

The Regional Board has received numerous odor complaints regarding the land application areas. An adjacent landowner described the nuisance odor conditions at the 6 June 2002 Regional Board meeting.

The odor complaints concerned the Discharger's land application areas, especially the eastern portion where the Discharger constructed and then flooded several irrigation checks. The Regional Board has also received several written complaints addressing wastewater that reportedly discharged from the Discharger's property. Staff has documented discharges of wastewater from the site.

During the summer of 2002, the Discharger pumped out the standing water in two of the eastern checks, has pumped out water in two of the three illegal ponds built within the surface water drainage course, and is "carefully managing" wastewater applications on the eastern side of the property. However, these steps have not been sufficient to prevent the continuing odor complaints. Because the four fields labeled "irrigation checks" are the closest fields to off-site residences, this Order prohibits the application of wastewater to these fields unless the Discharger can prove to the Executive Officer's satisfaction that wastewater application to this land will not cause offsite odors. It is anticipated that the installation of aerators in the 84-million gallon pond, and the subsequent reduction in BOD, will lead to a reduction in odors.

The Discharger has stated that to prevent future odors it will rotate wastewater application in the land application areas to minimize tailwater generation, provide soil drying time, and carefully manage wastewater application at the eastern property boundary. Pondered wastewater in the drainage feature will also be controlled, primarily by the installation of collection ditches at land application areas. The 84-million gallon storage pond will be equipped with a total of 390 horsepower of mechanical aerators and monitored on a daily basis. Odors that may arise from sludge being uncovered as the wastewater storage pond level is lowered during the summer will be controlled using a pumped sprayer to deliver alkaline odor control chemicals. Additional odor suppression chemicals (calcium or sodium nitrate) to provide supplemental oxygen in the event the aerators are insufficient will be stored on site. Sulfide precipitating ferrous chloride will also be stored on site. These proposed steps have been incorporated into this Order.

OTHER WASTE STREAMS

Solid waste generated at the site includes olive pits, stem waste, waste olives, screened solids, steel cans, and cardboard, plastic, paper, and miscellaneous trash. Olive pits and stems are sold as biomass and burned at cogeneration plants or pulverized and incorporated into compost. Waste olives are transported offsite for animal feed or offsite land disposal. Screened solids are transported offsite for land disposal at a landfill. Steel cans, plastic, paper, and miscellaneous trash are hauled by a disposal company to a landfill. Because the Discharger has failed to identify the disposal of all waste products generated at the facility, it is required to submit a Solid Waste Management Plan that more fully describes how it manages all of its solid waste products.

Domestic wastewater is discharged to a septic system, leachfield, and seepage pits. The Discharger has reevaluated the domestic wastewater system as required by Time Schedule Order No. R5-2002-014 and determined an expansion is required. The Discharger will expand the existing septic system by adding four additional 95-foot long leach lines that will each terminate with a 25-foot deep seepage pit. The Discharger has stated that it will no longer apply wastewater over the leach lines or seepage pits, and this Order contains a Prohibition to that effect.

DETERMINATION OF BACKGROUND WATER QUALITY

The second major technical issue involves the determination of background water quality. This determination is necessary to analyze whether the Discharger's request to discharge effluent with a TDS concentration exceeding 4,500 mg/l is acceptable. Once background water quality is known, then the Regional Board can set effluent limitations that will result in a discharge that meets the conditions of State Board Resolution No. 68-16 (the Antidegradation Policy).

To determine the appropriate concentration limits for the wastewater discharge, staff reviewed the Regional Board's June 1989 "Designated Level Methodology for Waste Classification." Because the discharge is planned to continue indefinitely, use of an attenuation factor is not appropriate because all the attenuation processes will become saturated over time. Therefore the wastewater limits are set by the background groundwater quality. Although the Discharger presented an evaluation of the available data in the RWD, it did not provide an analysis of the data for proposed limits. As a result of the lack of proposed limits by the Discharger, staff interpreted the April 2002 groundwater sample event (the only available data at the time) and proposed background concentrations and the resulting effluent limits in the Tentative WDRs. The Discharger has taken issue with staff's evaluation, and has provided the results of a second round of on-site groundwater sampling. With additional data available, staff has revised the data interpretation, as discussed below.

Background Water Quality

Background water quality data is limited and due to the limited availability of the data, conclusions based on the data are tentative. The Discharger installed groundwater monitoring wells in 1985 for WDR Order No. 96-075 (the Title 27 WDRs). The wells have been reported as dry in most monitoring events. In April 2002 when the Discharger was required to install groundwater monitoring wells per the Time Schedule Order, Well W-2 was inspected and reported to contain groundwater. That well was added to the recently installed groundwater monitoring network.

In April 2002, the Discharger installed 13 groundwater monitoring wells; however, Well MW-9 went dry during well development and has not recovered. The wells were to be installed in the first saturated interval; however, staff are concerned that some saturated intervals may have been drilled through without detecting groundwater. Because of the anticipated depth of some of the wells, the Discharger's consultant selected air rotary as the drilling technique. Because air rotary drilling might prevent installation of groundwater monitoring wells in the first saturated interval, staff required the Discharger to submit additional information describing how the wells would be constructed. The Discharger submitted a workplan addendum and the wells were installed. However, based on the results of the investigation, staff remains concerned that the first saturated interval may have been missed while drilling the deep wells.

The first sample event for all the wells was performed in April 2002; a second sample event was performed in June 2002. The data collected in the two sample events is found in Finding No. 44 of the WDRs. Because of the limitations of the data and poorly understood hydrogeology of the site, several

alternatives for calculating the background concentrations exist. The Discharger has proposed use of off-site domestic/agricultural/industrial wells as data sources and has presented a discussion in a 7 August 2002 "Revised Background Water Quality Preliminary Evaluation" report prepared by Kleinfelder. It is noted that the report does not calculate background groundwater values and instead proposes additional investigations.

Staff approached the problem of determining the background groundwater concentrations several ways, while considering the available data and the time constraints in arriving at a decision. Five alternatives for calculating background groundwater concentrations were evaluated. Each of the alternatives are presented below. Staff determined that Alternative No. 5 was the best selection of the alternatives available at this time.

Alternative No. 1 – Use of On-Site Groundwater Monitoring Wells

To estimate the wastewater effluent limits, staff's initial approach was to use on-site groundwater monitoring wells to define background groundwater quality. This approach resulted in the effluent limits published in the Tentative WDRs. In the Tentative WDRs analysis, the locations of the wells, groundwater flow direction, and concentrations observed in the wells were considered in selecting wells to represent background groundwater quality. Wells MW-1 and MW-8 were selected as representative. Well MW-2 was considered but removed from the data set as an anomaly; staff believe the extreme concentrations observed in Well MW-2 are the result of an unknown site specific source and deserve more analysis and interpretation before this well can be considered a background well.

The background groundwater quality was calculated by adding one standard deviation to the average concentration and then rounding up. The resulting background concentrations (and therefore the wastewater effluent limits) were: total dissolved solids 1,500 mg/L, chloride 150 mg/L, and sodium 290 mg/L.

Alternative No. 2 – Revised Use of On-Site Groundwater Monitoring Wells

Staff reviewed the additional data collected in the June 2002 sample event and recalculated the background groundwater quality. The background groundwater quality was again calculated by adding one standard deviation to the average concentration of Wells MW-1 and MW-8 and then rounding up. The resulting background concentrations, and wastewater effluent limitations, were: total dissolved solids 1,350 mg/L, chloride 240 mg/L, and sodium 290 mg/L.

Alternative No. 3 – Use of On-Site Monitoring Wells and CCR Title 27 Procedures

The Discharger's documents identify a perched groundwater zone and a deeper groundwater zone. The 31 July 2002 Groundwater Monitoring Report prepared by Kleinfelder states that Wells MW-1, MW-2, MW-3, MW-5, MW-6, MW-10, MW-11, MW-13, and W-2 are perched zone aquifer wells, while Wells MW-4, MW-7, MW-8, MW-9, and MW-12 are classified as deep zone wells. Staff believe additional investigation is required at the site before the aquifer zones can be classified and disagree with the classification of the shallow zone wells as perched. While staff disagree with the nomenclature of the zones, staff agrees that two groundwater zones have been identified by the monitoring well installations.

The Discharger has submitted two quarters (April 2002 and July 2002) of water quality data for the site. With limited data, staff calculated the background groundwater monitoring wells in each zone by calculating the average value, and adding two standard deviations to establish a background water quality for the site. This procedure is consistent with CCR Title 27 Section 20415.

Because two saturated zones have been identified at the site, each zone must include a unique water quality value. Wells MW-1 and MW-8 were selected as the background wells for the water table aquifer (i.e., Kleinfelder's "perched zone") and the confined unit (Kleinfelder's "deep zone") respectively. Well MW-1 was selected because it is the furthest upgradient shallow zone well. Although MW-8 is not the furthest upgradient confined zone well, it is downgradient of the processing facility which is not considered a source area, and it is located in an area that has not historically been used for land application until recently. The other confined zone wells were evaluated for use and determined to be inappropriate for the following reasons: Well MW-12 is located adjacent to the Title 27 surface impoundments, Well MW-9 is dry, and Well MW-4 is located adjacent to the 1 Mgal settling pond. Well MW-7 might be appropriate, however it is located downgradient of the Title 27 surface impoundments and therefore it was not selected.

Staff calculated background groundwater quality values for both the water table and confined zones, as shown on the table below. For the water table aquifer, the limits are: TDS 850 mg/L, chloride 150 mg/L, and sodium 260 mg/L; for the confined aquifer they are: TDS 1,300 mg/L, chloride 400 mg/L, and sodium 300 mg/L.

<u>Well</u>	<u>Date</u>	<u>Units</u>	<u>TDS</u>	<u>Chloride</u>	<u>Sodium</u>
<i>Water Table Aquifer</i>					
MW-1	4/10/02	mg/L	690	67	240
MW-1	6/24/02	mg/L	770	110	250
Average	--	mg/L	730	88.5	245
St. Dev.	--	mg/L	57	30	7
Background	--	mg/L	850	150	260
<i>Confined Aquifer</i>					
MW-8	4/10/02	mg/L	1,300	130	280
MW-8	6/24/02	mg/L	1,300	270	290
Average	--	mg/L	1,300	200	285
St. Dev.	--	mg/L	0	99	7
Background	--	mg/L	1,300	400	300

Alternative No. 4 – Use of Regional Wells

The 7 August 2002 Revised Background Water Quality Preliminary Evaluation Report described problems with the use of the onsite monitoring wells, and instead proposes the use of regional domestic/agricultural/industrial wells to determine the background groundwater quality. Staff disagree with a number of the conclusions in the report and consider a number of the conclusions unsupported based on the technical information presented in the reports. For example:

- Kleinfelder recommends use of off-site wells to establish background groundwater quality. Some data on off-site wells was presented in the RWD and is presented in the Tentative WDRs. The use of the wells is questionable because screened (perforated) intervals are unknown in most cases, the wells are not in close proximity to the facility (over 9,000 feet in one case, and the closest being approximately 800 feet), no information on the potential for any of the wells to have been individually contaminated is available, and the data quality for the little data that is available is unknown.
- Staff do not agree with the unsubstantiated assumption that off-site wells are screened in shallow aquifers. There is nothing to base this assumption on, and in fact there is reason to consider it in error. Agricultural and industrial wells are rarely screened only in shallow zones because a reliable water source is important to their business operation. Fluctuating groundwater elevations and/or drawdown in pumping wells could dewater wells and stop irrigation or business operations if wells were of limited depth.
- Kleinfelder implies that the onsite geology is heterogeneous and that more interpretation is necessary to fully understand the geology and the resulting placement of the monitoring wells. Staff agree. However, Kleinfelder does not address the fact that the geology in the surrounding area is also assumed to be heterogeneous, so that the use of wells from a large area around the facility is not appropriate because they are not expected to accurately describe the site conditions.

Alternative No. 5 – Use of the Discharger’s On-Site Production Well

Staff’s review of the hydrogeology reports revealed that the site conditions are not adequately characterized and understood to establish a final background groundwater quality value. Additional subsurface investigation and groundwater monitoring is required to better understand the site conditions. After reviewing the alternatives for determining a background groundwater quality value, staff determined use of the on-site production well was the best interim measure of groundwater quality that is in use at the site. This well is screened from 50 to 607 feet below ground surface, so the analytical data is a composite of the concentrations in the shallow and deeper aquifers. In addition, five sampling events were conducted at this well, leading to better statistical confidence.

Staff used the same method to calculate the background values as described in Alternative No. 3. The average of the five monitoring events was calculated, and two standard deviations were added, in a method consistent with CCR Title 27 Section 20415. Staff recognize this method of calculating the background groundwater quality is not the optimum method but based on the information and data available, believe it is appropriate for an interim concentration limit. The background groundwater quality, and resulting effluent limits, are: TDS 2,047 mg/L, chloride 601 mg/L, and sodium 597 mg/L.

Additional Hydrogeologic Investigations

The Discharger proposed additional investigations to better characterize the site and regional hydrogeology. The investigations are described in the 7 August 2002 Revised Background Water Quality Preliminary Evaluation Report, prepared by Kleinfelder. While the proposed studies may provide information on the regional groundwater quality, staff believe that additional studies should be focused on the Discharger’s facility. Investigations of groundwater conditions in the region may not be

applicable to the site-specific groundwater conditions. Items that should be addressed in future studies include:

- A better understanding of the occurrence of groundwater at the site. Kleinfelder's model for the hydrogeology of the site contains too many uncertainties. The presence of perched zones in the land application areas is unsupported by Kleinfelder's boring logs presented in the 30 April 2002, "Groundwater Monitoring Well Installation, Sampling, and Analysis" report. The boring logs do not show saturated zones underlain by unsaturated zones. An alternative interpretation is the wells are screened in two zones, an unconfined (water table) and a confined zone. Further study is required to define the subsurface conditions.
- The report recommends the use of Well MW-2 as a background well. Staff believe the excessively high concentrations observed in the well are likely due to an unknown source or other unknown factor. Additional investigation of the groundwater conditions at Well MW-2 is warranted.
- The report describes similar concentrations in samples from Wells W-2 and MW-1 and suggests the data as a proof of no groundwater impact. Review of the Stiff diagrams for the wells on Plate 5 reveals an almost identical shape. However, staff believe the similarity may be a result of both wells defining the background groundwater conditions. Kleinfelder's statement that Well W-2 is the furthest downgradient well doesn't take into consideration the topography and natural drainage configuration. Staff believe if better definition of the groundwater elevation contours were available, groundwater in the area of Well W-2 might be flowing to the east or southeast toward the natural drainage, making the well upgradient of source areas (assuming the Class II ponds are not leaking). If that is the case, Well W-2 may be located in an area upgradient of all land application areas.

Kleinfelder recommended the following additional investigations:

- Research of published databases for groundwater quality in the near vicinity of the site. The research would focus on Sections 33 and 34 and other sections in proximity and with similar depositional environments. Staff believe the research might be interesting but remain cautious about using data from other locations and depth zones that might not be appropriate. Using data from off-site wells that screen deeper aquifers will not produce data that is representative of on-site conditions. The area's heterogeneous nature of the geologic deposits further limit the use of off-site data. Kleinfelder's report notes that shallow groundwater in the Upper Tulare Formation is of poorer quality than the deeper groundwater zone; considering this reported variation of water quality with depth, use of deep wells may add more uncertainty to the problem of defining background groundwater quality.
- Conduct a limited physical search in neighboring areas for groundwater wells and information on the water quality. Staff believe the research could be interesting with the caveats described above. If off-site wells will be investigated, it is important to include all the available data, staff note that the on-site well was not included in the RWD nor in Kleinfelder's evaluation of regional wells; nor was the Harpainter well that is located adjacent to the application areas and irrigation checks. Staff are concerned that selective use of the available data will result in inaccurate conclusions on the region's water quality.

- Limited geological mapping of the railroad cuts and other exposed structural features. Staff believe this could yield useful information but it should build upon the work published in professional papers.
- Kleinfelder recommends preparation of Stiff diagrams to further characterize groundwater quality. Staff agree this action could provide useful information. However, additional wells are needed to better characterize the groundwater quality and hydrogeology of the area. Additional characterization is required to determine if a water table zone exists in the northern area of the site and to allow monitoring of groundwater upgradient and downgradient of the 84-Mgal storage pond.

Effluent Limitations

Based on the above analysis, staff have proposed an *interim* background concentrations for TDS (2,047 mg/l), sodium (597 mg/l), chloride (601 mg/l), and nitrate-N (6 mg/l). The Discharger is required to install and monitor additional groundwater monitoring wells onsite, and within two years to propose final background concentrations. To protect groundwater quality, the WDRs contain effluent limitations that match the background water quality. Musco is currently discharging waste at a higher concentration than the TDS and sodium effluent limitations. Therefore, the Board is asked to consider a companion Cleanup and Abatement Order. The C&A provides a time schedule for Musco to reduce the TDS and sodium in its effluent. Musco must meet the effluent limitations within two years. Staff expect that the final background water quality values, and hence the final effluent limitations, will be less than the interim values. Therefore, once the final background water quality study is completed, it is expected that Musco will need to further reduce the salt in its effluent beyond what is currently required by the C&A.

These WDRs require continued groundwater monitoring to fully evaluate the impacts of the Discharger's past and future disposal practices. However, it is not appropriate to follow the Discharger's recommendation to conduct a year of monitoring to determine if there are groundwater impacts, and then design effluent limits based on the groundwater data. In the last year, the Discharger has substantially increased its wastewater flow and strength, and has begun applying wastewater to a larger area. These recent changes may not yet be reflected in the groundwater quality. In addition, the RWD clearly shows that the Discharger intends to apply significantly more salt than will be taken up by the crops; therefore, these WDRs contain limits to prevent impacts to the underlying groundwater.

Shallow soil samples were collected in the land application areas in November 1999 and April 2001 as part of the 6 April 2001 Soil Salinity Assessment required by C&A Order No. 5-00-717. The samples were collected to evaluate the wastewater application impact to soil quality. Analysis indicated that 22-percent of samples collected in the Field 55 East and Field 55 West (55 acres total) may be impacted by the wastewater application and 28-percent of the samples collected in Field 95 (95 acres) may be impacted. The report stated that the high concentration of sodium in the wastewater has the potential to reduce the already low permeability of the soil permeability. Pan lysimeters are required to allow measurement of percolate quality. If percolate quality is worse than background groundwater quality, additional source control or better cropping will be required.

APPLICABILITY OF WATER RECLAMATION REQUIREMENTS

Musco has requested that the Regional Board should consider Musco's discharge under the "Water Recycling Law", beginning with Section 13500 of the Water Code. This request was contained in the Discharger's 8 August 2002 *Comments to the Tentative Waste Discharge Requirements*. Musco believes that its wastewater should be declared "reclaimed water" and as such, water reclamation requirements, not waste discharge requirements, should be issued. Musco further states "a Regional Board may not deny issuance of water reclamation requirements to a project which violates only a salinity standard in a basin plan." Staff have considered this issue and have consulted with the State Board Office of Chief Counsel. It is our understanding that it is not appropriate to regulate Musco's discharge under the Water Recycling Law and that the most appropriate vehicle for regulation is these waste discharge requirements.

Although not expressly described in this section of the California Water Code, "recycled water" typically applies to domestic wastewater which is treated to an extent that it can be beneficially reused, replacing a use of potable water. Musco's wastewater does not meet either of these criteria. First, the discharge is industrial wastewater, with no domestic component. Section 13523 of the CWC states that water reclamation requirements are to be established in conformance with the uniform statewide recycling criteria established by the California Department of Health Services (DHS). These criteria are found in Title 22 of the California Code of Regulations. Section 60302 of Title 22 states that "the requirements in this chapter shall only apply to recycled water from sources that contain domestic waste, in whole or part." Therefore, Title 22 does not apply to Musco's waste stream, and it is inappropriate to issue water reclamation requirements in lieu of waste discharge requirements.

In regard to CWC Section 13523.5, the salinity standard does not apply to waste discharge requirements. A 7 February 1985 memorandum from the Office of Chief Counsel to the Executive Officer of the San Diego Regional Board concludes that CWC Section 13523.5 "does not create an exception to a Regional Board's responsibility to implement the applicable basin plan through waste discharge requirements." In addition, CWC Section 13527(b) provides that "Nothing in this chapter prevents the appropriate regional board from establishing waste discharge requirements if a discharge is involved." Therefore, waste discharge requirements are both appropriate and necessary for this discharge.

SPECIFIC DISCHARGE SPECIFICATIONS AND LIMITATIONS

Discharge Prohibition A.2

The prohibition of discharge within 100 feet of a surface water drainage course is intended to prevent irrigation tailwater or overspray from entering the drainage course that runs through the land application area. The Discharger has asked that this prohibition be removed as it is constructing a tailwater return system adjacent to the surface water course. However, despite requests, the Discharger has not submitted the plans and specifications for the tailwater return system. If the Discharger submits the information, and the Executive Officer finds that the system is appropriate to protect the surface water drainage course, then the Executive Officer may allow discharge within 100 feet of the drainage.

Discharge Prohibition A.4

This prohibition restricts discharge of percolate from the Land Treatment Unit (LTU) of waste classified as hazardous or designated. This restriction is necessary to protect groundwater quality. The Discharger has not shown that it meets the provisions of State Board Resolution No. 68-16 (as described in Findings No. 76-79). Instead, while the proposed discharge is nonhazardous, it does exhibit characteristics of “designated waste,” as the concentrations of some waste constituents have the potential for causing exceedances of water quality objectives and/or adversely affecting beneficial uses of the groundwater. Therefore, it is appropriate to regulate the quality of the percolate released from the land treatment units (i.e., cropland).

Discharge Prohibition A.7

This prohibition requires each land application area to be equipped with a tailwater/runoff control system to prevent discharge of wastewater to the natural surface water drainage. This prohibition is necessary to protect surface water quality. The Discharger historically has not been able to prevent wastewater from discharging off the facility property but has stated that the construction of the 84-million gallon storage pond will allow control of the discharge to only uncontaminated stormwater. The Discharger has provided a Draft Stormwater Pollution Prevention Plan to the Regional Board; but staff has determined the report is incomplete and requested additional information.

Discharge Prohibition A.9

The Discharger has proposed allowing diversion of stormwater around the 84-million gallon storage pond, however it has failed to present specific criteria to evaluate the acceptability of such a discharge. In addition, the Discharger has not presented an evaluation of the wastewater application areas and the potential for mixing stormwater with wastewater in runoff proposed for diversion. It is noted that the Discharger has requested permission to apply wastewater during rain events. Staff is concerned that due to low permeability rates, applied wastewater will run off the land application areas and could be diverted around the 84-million gallon storage pond. Until the watershed evaluation is completed, specific criteria on diversion is presented to the Regional Board, and the Executive Officer approves the criteria, all diversions are prohibited.

Discharge Prohibition A.11

The Discharger has requested that the prohibition on allowing animals to graze in the land application areas be removed. The Discharger proposes to graze goats or sheep for crop harvesting on an intermittent, short-term basis, particularly for the more steeply sloped 95-acre portion of the land application areas where the area is more difficult to harvest using conventional methods. During the short periods the animals are present for harvesting purposes, process wastewater would not be applied to those areas. Animal harvest of the crops would be limited to 10-acre plots at a given time, therefore, less than five percent of the spray fields will be given over to grazing.

This Order allows limited grazing on the 95-acre land application area but staff remain concerned about the impact of animals on the application areas. The prohibition has been changed to allow grazing on the 95-acre land application area and only 10-acres at a time. Staff’s concerns about the use of animals on the steep slopes are in part based on information the Discharger has previously submitted and information gathered during site inspections. The Discharger has indicated during staff inspections that grazing cows

have damaged sprinkler heads, leading to discharges to the surface water drainage course. It is staff's understanding that the cows have been removed from the land application areas. In addition, the RWD describes a number of problems with grazing animals on the sprayfields, including increased runoff and soil compaction. Those statements are consistent with recommendations contained in the 31 January 2001 "Effects of Wastewater Application of the Health of Crops" report prepared by HDR Engineering which recommended, "Because of the high clay content of the surface soils and the high moisture levels generally found in these soils, animal grazing on spray fields is not recommended due to compaction concerns." The RWD states "It may be prudent to phase out grazing on the sprayfields." Finally, the Discharger needs to use its entire 200 acres of land in order to meet the BOD and nitrogen loading rates. The Discharger will have to address these management issues in the Operation and Management Plan required by WDRs Provision G.2.e.

Discharge Prohibition A.12

This prohibition prohibits industrial wastewater from being applied above the septic system leach lines or seepage pits. Application of wastewater over a leach line/seepage pit can result in wastewater infiltrating the leach lines and traveling to the seepage pits where it can be transported vertically to lower zones with little or no treatment.

Discharge Specification B.1

The monthly average flow limitation of 800,000 gpd applies to wastewater flowing from the facility into the 1-million gallon storage pond. Because the stormwater which falls onto the facility is commingled with wastewater and is also pumped into the 1-million gallon storage pond, the flow limitation includes this stormwater. In a wet winter, the Discharger may need to reduce its processing activities to meet the flow limit. The flow limit is based on staff's understanding that all wastewater enters the 1-million gallon storage pond before it is pumped to either land or the 84-million gallon pond. If the Discharger changes its piping system (i.e., so that some wastewater is pumped directly to the 84-million gallon pond), then it will need to install new flow meters to meet compliance with the limitation. The flow limitation does not apply to wastewater which is pumped from the storage pond onto the land application area. The Discharger is free to apply as much wastewater as necessary to the land application areas, as long as it complies with all other aspects of this Order. The flow limitation also does not apply to tailwater returned to the 84-million gallon pond, or to stormwater from the land application area which is directed to the 84-million gallon pond.

Discharge Specification B.3

This specification limits discharge of wastewater or other waste constituent to storage ponds, storage areas, or land application areas at concentrations that can cause a violation of the Groundwater Limitations. The Groundwater Limitations states the discharge shall not cause underlying groundwater to contain waste constituents in concentrations statistically greater than background water quality.

Discharge Specifications B.4 through B.6

These specifications are required to address nuisance odor conditions that have been documented at the facility. The Discharger proposed the Specifications found in B.5.

Effluent Limitation C.1

Loading limits for total dissolved solids are needed for several reasons. “Total dissolved solids” consist of both inorganic salts and a volatile component including sugars and carbohydrates. Crops are unable to take up excessive concentrations of inorganic solids such as sodium and chloride, resulting in leaching and groundwater degradation, especially at the loading rate the Discharger had proposed. When wastewater is evenly applied to soil at appropriate rates, the volatile component of TDS is usually biodegraded within the soil profile and removed from the leachate. However, overloading can lead to the presence of BOD, a measure of the volatile component of TDS, in the groundwater. To determine the appropriate concentration limits for the wastewater, staff reviewed the *Designated Level Methodology for Waste Classification*. Because the discharge is planned to continue indefinitely, the use of an attenuation factor is not appropriate because all the attenuation processes will become saturated over time. Therefore, the effluent limits are set by the background groundwater quality.

The Discharger has requested that the salt limitation be expressed as “dissolved inorganic solids” (DIS) instead of “total dissolved solids” (TDS). The Discharger indicates that the effluent limit should only apply to the inorganic portion. However, the effluent limitation is expressed as TDS for several reasons. First, if wastewater is overloaded onto the land application areas, then the volatile component may not be fully degraded and a DIS value may not fully measure the extent of dissolved solids which reach the groundwater. The limited groundwater monitoring conducted to date shows that there is BOD in six of the shallowest monitoring wells, indicating that the groundwater may already be degraded by the volatile portion of TDS.

Second, neither the 1-million gallon settling pond nor the 84-million gallon storage pond are constructed to meet Title 27 standards. The waste currently produced by the Discharger is considered designated waste and if not treated to reduce concentrations, would have to be stored in a pond constructed with a double liner and leachate collection system. Although the Discharger states that the native clay underlying the 84 million gallon storage pond can be compacted to a hydraulic conductivity of approximately 10^{-6} cm/sec, this does not meet the prescriptive standards nor the performance standards of Title 27 which include a leachate collection system to reduce the hydraulic head and a second liner. If the effluent limit were to be expressed as DIS instead of TDS, then there would be no control over the volatile portion of the waste stored in the pond, and it is expected that the existing elevated BOD in the waste, coupled with the 20-30 feet of hydraulic head in the pond, would cause leaching of the volatile solids and degradation of the shallow (10 feet bgs) groundwater underlying the pond. After the Discharger treats its waste to comply with the effluent limit contained in this Order, the waste should not be designated waste, should not degrade the underlying groundwater, and can be stored in an unlined pond.

Finally, the water quality criteria for groundwater are expressed as TDS, not DIS. This use of TDS as an effluent limitation is consistent with other Orders the Board has adopted for food processors within the last few years. This Order must be fully protective of the groundwater and therefore the effluent limitation must be expressed as TDS.

Effluent Limitation C.2

Loading limits for nitrogen are required because excessive loading of nitrogen can result in a build up of nitrogen in the soil column and eventual leaching to groundwater. The Discharger has presented a plan to crop the land application areas to remove all applied nitrogen. Because crop health in land application areas has historically been poor, the crop may not be able to take up all the applied nitrogen.

The Discharger states that the nitrogen limits presented in the WDRs are overly restrictive. The WDRs contain a Discharge Specification that restricts the total nitrogen loading rate to the agronomic rate, which is equal to the nitrogen requirements of the crop planted on the disposal field. Staff believes the restrictions are appropriate. This is a standard specification that has routinely been imposed on food processors, dairies, and other agricultural dischargers. The purpose of the specification is to ensure that the crop utilizes nitrogen to the maximum practical extent, thereby preventing groundwater quality degradation by nitrate.

Nitrogen in food processing waste is typically present primarily in organic form. According to Irrigation with Reclaimed Municipal Wastewater, Fate of Wastewater Constituents in Soil and Groundwater, (Chapter 12 of Irrigation With Reclaimed Municipal Wastewater, A Guidance Manual, prepared by California State Water Resources Control Board, Report No. 84-1, 1984) organic nitrogen is mineralized to ammonium and then nitrified to form nitrate which is plant available. Mineralization requires aerobic conditions in the soil and sufficient bacteria. Mineralization does not occur at a constant rate because some forms of organic nitrogen mineralize less readily and tend to stay in organic form until the readily mineralized fraction has been fully utilized. Nitrification also requires adequate oxygen and bacteria to produce plant available nitrogen.

For optimal plant uptake, the percolation rate must be slow enough to ensure that nitrogen (whether in organic or mineralized form) stays within the root zone to the maximum practical extent. According to Wastewater Management Systems, nitrogen can be stored in the soil, however, with continued application of wastewater, equilibrium is reached and net storage of nitrogen stops. Wastewater Management Systems states that it is most conservative to assume net storage will be zero. The WDRs are consistent with this conservative approach.

Any nitrogen that percolates below the root zone can potentially degrade groundwater quality. However, under certain circumstances, nitrate can be denitrified to nitrogen gas, which resides within the soil matrix or is released to the atmosphere. Denitrification rates vary substantially (from 0% to 90% of total nitrogen), depending on several variables, most of which are site-specific. These variables include those related to soil type or texture; mass of nitrogen per application per unit area; volume of water per application per unit area; resting or drying time between applications; and climactic conditions. Therefore, determination of the denitrification rate for a given discharge can only be made based on a fully supported site-specific model.

The Discharger has stated that a considerable percentage of nitrogen is lost to the atmosphere through the process of denitrification. Because of the variable denitrification rate that occurs due to wastewater application rates, ambient temperature, and other factors which may not be controllable, staff believes requiring agronomic application rates are justified.

Based on long-standing practice, the agronomic nitrogen loading rate for a given crop is based on the rates presented in the most recent edition of the Western Fertilizer Handbook unless the Discharger demonstrates that another rate is technically justified.

Staff has taken a conservative approach in requiring the Discharger to apply nitrogen at agronomic rates. This limit will apply until the Discharger can provide additional site-specific testing data to support their denitrification assumptions.

Effluent Limitation C.3

Loading limits for BOD are needed because excessive loading can deplete soil oxygen and cause anaerobic conditions. Anaerobic degradation of organic matter can cause severe nuisance odors and promote incomplete biodegradation, thereby allowing dissolved organic material to percolate through the unsaturated zone into groundwater. Anaerobic decomposition of organic wastes also creates organic acids that decrease soil pH. A low pH environment can cause excessive leaching of metals in the soil into underlying groundwater.

This Discharge Specification prescribes a maximum BOD loading of 300 lbs/acre on any one day, and 100 lbs/acre/day as a 7-day (weekly) average. The weekly average loading limit of 100 lbs/acre/day is based on U.S. Environmental Protection Agency Publication (USEPA) guidelines provided in *Pollution Abatement in the Fruit and Vegetable Industry – Wastewater Treatment* (USEPA 625/3-77-0007) (hereafter *Pollution Abatement*). Although the RWD states that the yearly average BOD loading will be less than 70 lb/ac/day, a review of the most recent self-monitoring report (May 2002) shows that the Discharger may not be able to meet the daily or weekly limitations. The Discharger has already proposed to install aerators in its ponds; this step may be all that is necessary to meet the BOD effluent limitation. If not then the Discharger will need to take other steps to improve its treatment system. It is not appropriate to relax the BOD loading rate as staff are still receiving odor complaints.

Land Application Area Specification D.19

Land Application Area Specification D.15 requires that effect wastewater application on the soil shall not exceed the buffering capacity of the soil profile. The Discharger has described the disassociation of the bicarbonate ion under certain soil pH conditions but has failed to describe the pH at which the disassociation is anticipated to occur. *Pollution Abatement* recommends a wastewater pH range of 6.4 to 8.4 for irrigation and Effluent Limitation C.4 requires wastewater discharged to the land application areas to not have a pH of less than 6.5 or greater than 8.5. This limitation alone cannot ensure that soil pH conditions will be optimal for land treatment and preventing leaching of metals, so Land Application Area Specification D.19 requires that the discharge not exceed the soil pH buffering capacity.

Land Application Area Specification D.20

This specification is needed because wastewater application near the property boundary has resulted in nuisance odors for residents. The Discharger's Odor Minimization Report described elimination of standing water in the irrigation checks. Because the soil permeability is so low, staff believe any application of wastewater at the irrigation checks will result in standing water. To prevent anaerobic conditions and associated odor problems in the treatment and storage ponds, this Order also requires the

dissolved oxygen content in the upper 12 inches of any liquid impoundment to be maintained at no less than 1.0 mg/L.

Technical Reports Required by the Provisions

The Discharger is required to submit a workplan for characterization of groundwater quality and percolate quality at the land treatment units (land application areas). The groundwater well workplan will allow further evaluation of groundwater conditions upgradient and downgradient of the newly constructed 84-million gallon storage pond and in the land application areas. In addition, installation of lysimeters are required to determine the quality of the percolate at the bottom of the land treatment units (at a depth of five feet). Lysimeters shall be installed in both the land application areas and in an area where no land application of wastewater has occurred.

The Discharger is required to submit a BPTC Salinity Source Reduction Plan because the available data on groundwater quality, wastewater quality, and crop uptake indicates the wastewater application could impact groundwater quality. This Workplan must contain plans to reduce the concentration of TDS constituents, organic constituents, and hydraulic loading.

The Discharger is required to submit an assimilative capacity report for the LTUs (land application areas). The report shall evaluate the LTU's capacity to treat the wastewater constituents being applied. This requirement is needed to determine the adequacy of the land treatment. The wastewater contains high concentrations of constituents, such as sodium and chloride, that are not biologically treated and an evaluation of the effectiveness of land treatment to protect groundwater quality is needed.

The Discharger shall submit a technical report describing specific numerical water quality criteria prior to being allowed to bypass the 84-million gallon storage pond. This item is discussed above in "Discharge Prohibition A.5."

The Discharger is required to submit an Operation and Maintenance Plan to ensure that all persons responsible for irrigation and monitoring are aware of their responsibilities and are appropriately trained. This is required because a single reference document that includes the WDRs, instructions for operation, odor minimization procedures, and other information must be available to operators of the system in a timely manner. Because the Discharger will be storing odor control chemicals on site that are expected to be used infrequently, it is important for operators to be able to refer to the O&M Plan for use instructions.

The Discharger is required to submit a Groundwater Well and Lysimeter Installation Report to document the installation of the wells and lysimeters.

The Discharger is required to submit a Background Groundwater Quality and Percolate Quality Report. This report is required to allow determination of the effect of wastewater application on the groundwater quality. If a groundwater quality degradation is observed, upon request of the Executive Officer the Discharger will be required to submit a Groundwater Mitigation Plan.