INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS R5-__
DARLING INTERNATIONAL INC., OSCAR HEARD, AND VAL AND MARY AZEVEDO
DARLING INTERNATIONAL RENDERING PLANT
STANISLAUS COUNTY

Background

Darling International, Inc. (Discharger) owns and operates the Darling International Rendering Plant. The rendering plant receives animal mortalities and meat processing by-products that include fat, bone, and offal. Only animal mortalities of a certain quality are accepted. These raw materials are processed into a protein meal that is sold for various applications such as a fertilizer ingredient. Wastewater streams include condensate from the cooker, truck and plant cleaning wash water, boiler blowdown, reverse osmosis reject water, feather plant knockdown tower wastewater, and overflow from a Venturi system associated with the plant odor abatement system.

The wastewater treatment system (WWTS) previously consisted of a paddle wheel skimmer dissolved air floatation (DAF) system and eight unlined ponds that provided aerobic and anoxic treatment. Treated wastewater was and continues to be discharged to land application areas (LAAs). Crops are grown for silage that is used for dairy cow feed.

The discharge was previously regulated by WDRs Order 5-01-171, which established a time schedule for the Discharger to eliminate waste streams or reduce waste characteristics below the site specific TDS background value of 1,620 mg/L; close the existing wastewater ponds; and/or construct new Class II surface impoundments to contain the waste.

Modifications to the Wastewater Treatment Plant

In 2002, the Discharger began using surface water from the Turlock Irrigation District (TID) for rendering plant wash water, which is less saline than previously used source water groundwater wells. In 2009, the Discharger implemented operational modifications to improve salinity source control and wastewater quality. Improvements included minimizing the use of chemicals that contribute salts to the wastewater and upgrading the animal mortality and by-product receiving areas so that collected fluids are processed in the rendering plant rather than being discharged to the WWTS.

In late 2011, the Discharger constructed a new WWTS that began operating in early 2012. The new WWTS consists of the existing primary DAF to remove fats; biological treatment in aboveground tanks to reduce BOD and nitrogen; and a DAF for secondary clarification. The Discharger no longer uses the unlined ponds for wastewater treatment. The following table summarizes the wastewater quality discharged to the ponds resulting from these improvements.

Parameter	Units	Wastewater Quality Discharged to Ponds		
		Prior to Source Control[1]	After Source Control[2]	After Installing New WWTS[3]
BOD_5 at 20˚C	mg/L	5,264	5,945	80
Total Nitrogen	mg/L	– –	– –	40
TDS	mg/L	1,833	829	no change
FDS	mg/L	1,103 [4]	290	no change
Chloride	mg/L	327	78	no change

[1] Average of monthly data from June 2001 through March 2009.
[2] Average of monthly data from April 2009 through November 2011.
[3] Designed effluent quality for new WWTS (started use in Jan 2012).
[4] Average of monthly data from May 2007 (data first collected) through March 2009.

The Discharger states that the salinity concentrations calculated after April 2009 are not representative of actual concentrations discharged to the ponds. As part of the 2009 source control and operational improvements, the low salinity condensate was discharged directly to the ponds instead of being mingled with the process wastewater. A composite sample of three parts condensate to one part primary DAF effluent was prepared to represent effluent quality to the ponds, which has underestimated salinity concentrations.

The Discharger proposes to use two of the existing unlined ponds for storage and drying of wasted sludge from the new wastewater treatment system. The RWD did not propose lined sludge drying beds or specify operational procedures. Therefore the Order requires that the Discharger submit deign and operational details prior to use of on-site sludge drying beds. The RWD also did not describe how the dried sludge will be disposed. Therefore the Order sets appropriate sludge disposal requirements.

The Discharger land applies wastewater to a land application area (LAA) owned by the Discharger and a LAA owned by the Heard family. The Discharger plans to add a third 74-acre property owned by the Azevedo family. The LAAs are double cropped and harvested for silage that is used to feed dairy cows. Wastewater will provide approximately 10 percent of the hydraulic crop irrigation demands, and the landowners will use TID water to satisfy the remaining demand. With the exception of BOD, the treated wastewater is now very similar, if not better quality than TID irrigation water.

The Discharger has significantly improved the wastewater quality and reduced the BOD and nitrogen concentrations discharged to land. Because the discharge does not have the potential to cause excessive BOD loading rates before other limits (e.g., flow limit or nitrogen loading limit) are reached, the Order does not set a BOD loading limit. The Discharger states that there is currently not sufficient data to verify the level of nitrification/denitrification that the system can achieve, and that effluent nitrogen concentrations are likely to fluctuate seasonally depending on seasonal temperature variation. Additionally, the Discharger is not certain how much magnesium hydroxide is

necessary to maintain optimum alkalinity for denitrification and the degree to which effluent salinity will be affected by its use. Therefore, this Order provides for a one-year performance evaluation that will be used to develop final performance based effluent limits for salinity and nitrogen.

The Discharger obtains most of its process water from Lateral Drain No. 5 (also known as the Harding Drain), which is dominated by the City of Turlock discharge under WDRs Order R5-2010-0002-01 (NPDES No. CA0078948). The City is planning to construct a pipeline to convey its effluent directly to the San Joaquin River by 2013. It is not known whether the Discharger will be able to obtain higher quality water from the current surface water supply after the City of Turlock ceases its discharge to the Harding Drain. Therefore, this Order may be reopened to reconsider effluent limits for salinity and nitrogen if the Discharger submits a new Report of Waste Discharge demonstrating that a change in the water supply quality makes compliance with the effluent limits of this Order infeasible.

Groundwater Conditions

Depth to first groundwater at the site typically ranges from 4 to 14 feet. The shallow groundwater typically flows toward the Tuolumne River and the gradient is typically to the southwest. Monitoring well MW-5 is upgradient of the wastewater ponds and LAAs and is representative of background groundwater quality. MW-3 is adjacent to the storage ponds and shows immediate impacts to groundwater resulting from the discharge. MW-6 is downgradient of the ponds and the LAAs, but appears to be influenced by the adjacent TID drain and San Joaquin River. MW-2 and MW-4 show impacts to groundwater resulting from discharge to the LAAs. Monitoring wells MW-1, MW-2 and MW-3 were replaced in early 2012 due to damage to the casings. Data from MW-1R, MW-2R, and MW-3R were not available for analysis and not considered in the Order.

Based on groundwater monitoring data, the Discharger's upgrades have resulted in improved groundwater quality, especially in MW-3. Salinity in MW-2 shows a decreasing trend similar to MW-3, but nitrate concentrations have not changed since the upgrades. The apparent nitrate degradation in MW-2 could be caused by previous discharges to the LAAs or possibly irrigation water intrusion when MW-2 was damaged. The concentration of nitrate in this area is expected to decrease over time as a result of the improved effluent quality. Groundwater in this area will be monitored by replacement well MW-2R.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Local drainage is to the San Joaquin River but the Discharger and Co-Dischargers collect all storm water. The beneficial uses of the San Joaquin River, as stated in the Basin Plan, are municipal and domestic supply; agricultural supply; industrial process supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; migration of aquatic organisms; and spawning, reproduction, and/or early development.

The Basin Plan designates the beneficial uses of underlying groundwater as municipal and domestic supply, agricultural supply, and industrial supply.

Antidegradation Analysis

The Discharger has been monitoring groundwater quality at the site since 1988. Based on the data available, it is not possible to determine pre-1968 groundwater quality. Therefore, determination of compliance with Resolution 68-16 for this facility will be based on existing background groundwater quality.

Constituents of concern that have the potential to degrade groundwater include salts (primarily chloride, TDS, and FDS) and nutrients (primarily nitrate). The average chloride concentration in the upgradient monitoring well (MW-5) is 93 mg/L with a range from 23 mg/L to 215 mg/L. The average chloride concentration in MW-3, which is monitors potential groundwater degradation from the wastewater discharge, has been reduced by 77.6 percent to 110 mg/L since the Discharger implemented source control (post-March 2009). The chloride concentration decrease in MW-3 is consistent with the decrease observed in the treated wastewater Because the Discharger is still evaluating the wastewater treatment system performance, this Order sets a performance-based interim chloride effluent limit and a final effluent limit to protect groundwater quality beneath the effluent storage ponds. The Order also does not allow further groundwater degradation.

The average TDS concentration in MW-5 is 823 mg/L with a range from 340 mg/L to 1,230 mg/L. The average TDS concentration in MW-3 has been reduced by 59.6 percent to 869 mg/L after the Discharger completed operational improvements and salinity source reduction (post March 2009). The TDS concentration decrease in MW-3 is consistent with the decrease in the treated wastewater. Therefore, no further degradation is expected to occur and the Order does not allow groundwater degradation beyond that of background.

A water quality objective does not exist for FDS; however due to degradable organic matter in the wastewater, FDS is the best indicator of actual salinity levels. Therefore, this Order sets a performance based effluent limit for FDS rather than TDS. Because the Discharger is still evaluating the wastewater treatment system performance, this Order sets a performance based interim FDS effluent limit and a final effluent limit based on the current performance (post-March 2012).

For nitrate, the background groundwater on average exceeds the Basin Plan water quality objective (10 mg/L) and downgradient monitoring wells MW-2 and MW-3 on average have exceeded nitrate-nitrogen concentrations in background. However, nitrate concentrations in MW-3 have improved as a result of the improved effluent quality and nitrate concentrations in MW-2 are expected to improve. Because the Discharger is still evaluating the treatment system performance, this Order sets a performance based interim total nitrogen effluent limit based on current performance and a final effluent limit to protect groundwater quality beneath the effluent storage ponds. This Order does not allow further groundwater degradation and sets a time schedule for MW-2R to meet the background nitrate concentration.

Based on recent effluent monitoring data, the discharge is not considered a threat to groundwater quality and the discharge is not expected to threaten groundwater quality in the future. However, depending on the results of the Discharger's treatment system

performance evaluation, further treatment or control may be necessary to protect groundwater quality. Therefore, the Order establishes groundwater limitations and interim and final effluent limits that will not unreasonably threaten groundwater quality.

Other Regulatory Considerations

The discharge of treated wastewater to irrigate the Azevedo property will not present a threat to water quality any greater than the threat posed by the landowner's current use of irrigation water from TID Lateral Drain No. 5. The treated wastewater does not contain constituents of concern that are not already present in the TID water, and it exhibits better quality than the TID water with respect to nitrate and salinity. Additionally, the discharge will utilize existing irrigation systems at the Azevedo site. Therefore, with respect to discharges at the Azevedo property only, the discharge is categorically exempt from CEQA (Class I: Existing Facilities – guidelines section 15301).

Discharge Prohibitions, Specifications, and Provisions
The water balance model shows that the facility provides the following capacity if at least six of the existing ponds are maintained for use as storage ponds:

Treatment System Influent Flow	Flow Limit
Total Annual Flow	117 MG
Monthly Average Flow	0.318 MGD

This Order contains interim and final effluent limits for BOD, total nitrogen, FDS and chloride and a mass loading rate for total nitrogen to the LAAs. This Order also contains groundwater limits that implement the Basin Plan groundwater water quality objectives for total coliform organisms and does not allow groundwater degradation beyond that of ambient background for other constituents. Compliance with background water quality is determined annually based on comparison of compliance well concentrations to background groundwater quality using historical MW-5 monitoring data to represent background groundwater quality and approved statistical methods (i.e., inter -well comparison). Until 1 November 2015 only, for any single well and constituent, an exceedance of background groundwater quality will not constitute a violation of the Order unless the intrawell temporal trend for that constituent exhibits a statistically significant increase for data acquired after adoption of the Order.

The Provisions require the submittal of technical reports that describe the statistical methods used to determine compliance with groundwater limits; install flow meters to monitor hydraulic flow to each LAA; demonstrate the performance of the new WWTP and ability to meet final effluent and groundwater limitations; propose additional treatment or control if necessary; and an engineered design and operational plan of the sludge drying system if the Discharger converts ponds for sludge drying. The Provisions also require the Discharger to submit a Report of Waste Discharge if a change in the process water supply quality makes compliance with the effluent and/or groundwater limitations of the Order infeasible.

The Monitoring and Reporting Program is designed to verify compliance with effluent limitations, groundwater limitations, and operational requirements of the WDRs.