CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2012-0104

WASTE DISCHARGE REQUIREMENTS

FOR
DARLING INTERNATIONAL INC., OSCAR HEARD
AND VAL AND MARY AZEVEDO
DARLING INTERNATIONAL RENDERING PLANT
STANISLAUS COUNTY

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

1. On 7 April 2011, Darling International, Inc. submitted a Report of Waste Discharge (RWD) to apply for revised Waste Discharge Requirements (WDRs) for a rendering plant. An amended RWD and additional information to complete the RWD was submitted on 15 December 2011, 16 April 2012, and 18 June 2012.

2. Darling International, Inc. (hereafter "Discharger") owns and operates the Darling International Rendering Plant and associated land discharge areas referred to herein as the "Darling property", and is primarily responsible for compliance with these WDRs. Oscar Heard, and Val and Mary Azevedo (hereafter "Co-Dischargers") own farmland that will be irrigated with treated wastewater generated by Darling International, Inc. Oscar Heard owns the "Heard property" and Val and Mary Azevedo own the "Azevedo property."

3. The rendering plant is at 11946 Carpenter Road near Crows Landing (Section 30, T5S, R9E, MDB&M). The rendering plant and Darling property occupy Assessor's Parcel Number (APN) 058-022-005; the Heard property occupies APNs 058-022-042, 058-022-044, 058-022-046, and 058-022-047; and the Azevedo property occupies APN 058-002-005 The facility location is shown on Attachment A, which is attached hereto and made part of this Order by reference.

4. Waste Discharge Requirements (WDRs) Order 5-01-171, adopted by the Central Valley Water Board on 14 June 2001, prescribes requirements for the rendering plant's discharges to land. Because the discharge previously caused groundwater degradation, Order 5-01-171 established a time schedule for the Discharger to eliminate waste streams or reduce waste characteristics below the site-specific total dissolved solids (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. Pursuant to the WDRs, the Discharger constructed a new treatment system and upgraded operations to improve salinity source control and wastewater quality. The Discharger applies treated wastewater, which is blended with Turlock Irrigation District (TID) Lateral No. 5 water, to irrigate crops grown on the Darling and Heard properties. The Discharger proposes to expand the land application areas to include the Azevedo

property for land application of treated wastewater. Therefore, the WDRs are no longer adequate to regulate the discharge, and it is appropriate to revise the WDRs.

Facility and Discharge Regulated Under Previous WDRs

5. 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 recycled into fats and proteins that are sold into animal feed, fertilizer, oleochemical, and biofuel markets.

6. 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.

7. The following table summarizes recent influent wastewater flows.

Flow Parameter	Average Daily Influent Flow (gpd)
2006 Annual Average	117,245
2007 Annual Average	107,415
2008 Annual Average	106,919
2009 Annual Average	138,788
2010 Annual Average	142,293
2011 Annual Average	145,944

8. Prior to 2012, wastewater was treated by a wastewater treatment system (WWTS) that consisted of a paddle wheel skimmer dissolved air floatation (DAF) system and eight unlined ponds[1]. The pond locations are shown on Attachment B, which is attached hereto and made part of this Order by reference. Wastewater was first discharged to Pond 1A and flowed sequentially through the ponds to provide settling and aerobic and anoxic treatment of organic matter. Wastewater from the ponds was used for supplemental irrigation water on the Darling and Heard properties by blending with Turlock Irrigation District (TID) Lateral No. 5 water.

9. Wastewater generated by the rendering plant is high in BOD, nitrogen, and salinity. The following table summarizes the quality of wastewater that was discharged to and from the ponds prior to source control and completion of the new WWTS.

[1] The Discharger states that the ponds are lined with clay, but the liners were not engineered or constructed under a Construction Quality Assurance (CQA) Plan to verify thickness or the as-built permeability of the clay.

		Influent Wastewater Quality (Pond 1A)[1]		Effluent Wastewater Quality (Pond 6)[1]	
Parameter	Units	Average	Range	Average	Range
BOD_5 at 20˚C	mg/L	5,264	394 to 25,000	334	ND to 1,570
Nitrate (as nitrogen)	mg/L	1.85	ND to 48.4	1.29	ND to 10.0
Total Nitrogen	mg/L	– –	– –	– –	– –
TDS	mg/L	1,833	570 to 5,000	1,727	409 to 4,000
FDS [2]	mg/L	1,103	557 to 2,220	900	564 to 1,540
Chloride	mg/L	327	69 to 1,050	445	71 to 1,200

[1] Monthly data from June 2001 through March 2009 (before source control and wastewater treatment upgrades).
[2] Monthly data from May 2007 through March 2009 (before source control and wastewater treatment upgrades).

10. Because the previous discharge had degraded groundwater quality, WDRs Order 5-01-171 established a time schedule for the Discharger to cease discharge of wastewater containing total dissolved solids greater than 1,620 mg/L to the seven unlined ponds, or to construct Class II surface impoundments that meet the performance standard specified in Section 20310(a) of Title 27. The effluent limit was based on the upper tolerance limit of TDS in MW-5, which is the background monitoring well for the site. At the time the WDRs were adopted, the TDS concentration of wastewater discharged to the ponds was greater than 1,620 mg/L, and the Central Valley Water Board found that the discharge was not exempt from the requirements of Title 27.

11. Monitoring and Reporting Program (MRP) 5-01-171 required the Discharger to determine effluent concentration limits each year based on background groundwater monitoring data for the last three years. The following table summarizes the annual average TDS concentration for wastewater to Pond 1A and the calculated concentration limit.

Year	Wastewater TDS Annual Avg. Concentration (mg/L)	TDS Concentration Limit (mg/L)
2002	2,974	1,620
2003	1,623	1,810
2004	1,548	1,212
2005	1,269	1,076
2006	1,326	1,218
2007	1,522	1,231
2008	2,331	1,199
2009	1,113	1,192

Year	Wastewater TDS Annual Avg. Concentration (mg/L)	TDS Concentration Limit (mg/L)
2010	634	1,440
2011	1,058	1,705

The Discharger did not meet all of the compliance dates in the WDRs, but requested an extension of time to implement upgrades to improve wastewater quality. As described below, the Discharger has completed major upgrades to improve wastewater quality.

Changes in the Facility and Discharge

12. In 2002, the Discharger began using surface water from TID for rendering plant wash water, which is less saline than the two on-site source water supply wells used previously. Water from the facility's supply wells is still used for boiler feed water after reverse osmosis (RO) treatment. The RO reject water is sent to the wastewater treatment system.

13. In 2009, the Discharger implemented operational modifications to improve salinity source control and wastewater quality. Improvements include upgrading the animal mortality and by-product receiving areas, upgrading the rendering plant, and minimizing use of chemicals that contribute salts to the wastewater. By-products are now received directly into receiving pits rather than a paved receiving area, which reduces rinse water flows. Fluids collected in the pits are processed in the rendering plant rather than being discharged to the wastewater treatment system.

14. In late 2011, the Discharger completed construction of a new wastewater treatment system that first became operational in early 2012. The Discharger no longer uses the unlined ponds for wastewater treatment. The new WWTS consists of the existing paddle wheel skimmer DAF system for primary treatment to remove fats; biological treatment in aboveground tanks to reduce BOD and nitrify/denitrify; and a DAF for secondary clarification.

15. Based on monitoring data reported by the Discharger through November 2011, source control has reduced the average concentration of salinity constituents. The following table compares wastewater quality before and after the Discharger implemented source control.

Parameter	Units	Wastewater Quality Discharged to Ponds	
		Prior to Source Control[1]	After Source Control[2]
BOD_5 at 20˚C	mg/L	5,264	5,945
TDS	mg/L	1,833	829
FDS	mg/L	1,103 [3]	290

Parameter	Units	Wastewater Quality Discharged to Ponds	
		Prior to Source Control[1]	After Source Control[2]
Chloride	mg/L	327	78

[1] Average of monthly data from June 2001 through March 2009.

[2] Average of monthly data from April 2009 through November 2011.

[3] Average of monthly data from May 2007 (data first collected) through March 2009.

However, in a letter dated 30 August 2012, the Discharger stated that the TDS, FDS, and chloride concentrations reported in monitoring reports after April 2009 are not representative of actual concentrations discharged to the ponds. The Discharger stated that, as part of the 2009 source control and operational improvements, the low salinity condensate was discharged directly to the ponds instead of being comingled with the process wastewater. The Discharger stated that, since May 2009, composite samples consisting of three parts condensate to one part primary DAF effluent have been analyzed to characterize effluent quality for its monitoring reports, but that the composite samples underestimated the salinity of the combined waste streams.

16. The RWD projected effluent quality for the new WWTS as follows:

Constituent	Effluent Concentration (mg/L)
BOD	80
TSS	60
TKN	<40
Nitrate nitrogen	1
TDS	800
FDS	400

In April 2012, the Discharger provided post-start-up effluent monitoring data showing that the weekly average concentration of total nitrogen was approximately 13.5 mg/L, and the weekly average COD concentration was 41 mg/L. Current BOD monitoring data were not provided but BOD concentrations are expected to be less than the COD concentration. However, in a 27 August 2012 meeting, the Discharger stated 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. Current BOD monitoring data were not provided but the Discharger states that the effluent BOD concentration is expected to be less than the COD concentration.

On 30 August 2012, the Discharger submitted all monitoring data from the new wastewater treatment system. The following data summarizes available sampling results from 22 March 2012 through 15 August 2012. The treatment system suffered

an upset on 16 August, so results for 16 August through 21 August were excluded from the averages shown in the table.

Constituent	Number of Samples	Average Effluent Concentration (mg/L)[1]
BOD	8	24
Nitrate nitrogen	8	<2
TKN	5	31
Total nitrogen	5	31
FDS	11	680
Chloride	8	181

[1] Average of available data from 22 March 2012 through 15 August 2012.

17. In 2002, the Discharger began using TID water for plant cleaning in place of groundwater from on-site supply wells. The Discharger relies in part on the low salinity concentration of the TID water to achieve salinity source control. A summary of the TID Lateral Drain No. 5 water quality is provided in the following table.

		TID Water Quality	
Parameter	Units	Average	Range
BOD[1]	mg/L	3.2	ND to 12
Nitrate (as nitrogen)[1]	mg/L	21.9	3.3 to 97
TDS[2]	mg/L	505	222 to 928
FDS[3]	mg/L	418 [2]	128 to 853 [2]
Chloride[1]	mg/L	81	33 to 180

[1] Quarterly data from June 2001 through November 2011.

[2] Monthly data from June 2001 through November 2011.

[3] Monthly data from May 2007 through November 2011.

The last ten years of monitoring data show that salinity in the TID water has been relatively stable with some seasonal fluctuation. A significant increase of salinity in the TID water would affect the effluent quality.

The Discharger also adds magnesium hydroxide to control pH for denitrification in the biological treatment system. Because the treatment system is new, the Discharger is not certain how much magnesium hydroxide is necessary to maintain optimum alkalinity or the degree to which effluent salinity will be affected by its use. Therefore, this Order provides for a one-year performance evaluation to demonstrate whether the system can comply with the final effluent limitations of this Order.

18. As discussed above, the Discharger obtains most of its process water from Lateral Drain No. 5 (also known as the Harding Drain). The City of Turlock discharges up to 20 million gallons per day (MGD) to the Harding Drain under WDRs Order R5-2010-

0002-01 (NPDES No. CA0078948). Because of the City's discharge, the Harding Drain is an effluent dominated stream. The City is currently planning to construct a pipeline to convey its effluent directly to the San Joaquin River, and the pipeline is expected to be completed in 2013. It is currently 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. Such a change would increase the salinity of the waste and thereby increase the threat to groundwater quality. Therefore, this Order requires that the Discharger submit a new Report of Waste Discharge if there is a change in the water supply quality.

19. The eight unlined ponds are no longer used for wastewater treatment. The Discharger is proposing to use at least six of the eight ponds for storage of treated wastewater prior to land application.

20. Currently sludge from the DAF units and wasted sludge from wastewater treatment system is returned to the rendering plant and incorporated into the end product. However, 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 to protect groundwater quality and prevent nuisance conditions associated with drying sludge. Therefore it is appropriate to require that the Discharger submit design and operational details prior to use of on-site sludge drying beds.

21. On 20 August 2012, the Discharger requested to be allowed to land apply wastewater treatment system sludge to the LAAs. However, the Discharger has not characterized the sludge, determined the sludge mass that will be generated, or developed an operations plan for sludge application. Additionally, based on the high organic matter content of the raw wastewater, it appears that the LAAs may not have the additional assimilative capacity to accommodate the additional nitrogen loading from sludge. Therefore, this Order does not allow the Discharger to land apply wastewater treatment system sludge. This Order may be revised to allow land application of sludge if the Discharger submits a new Report of Waste Discharge that provides the information above and shows that the LAAs can assimilate the sludge without violating the groundwater limitations of this, or any subsequent, Order.

22. As noted above, the Discharger land applies wastewater to the Darling and Heard properties, and plans to add the 74-acre Azevedo property as a new LAA.

23. Treated wastewater is pumped to the LAAs from the storage ponds and blended with TID water prior to land application. Hydraulic flows to the LAAs are currently not metered.

24. Each property is irrigated using a border check flood irrigation method. A typical application consists of approximately 6 to 12 inches applied over the irrigated area. Border checks are rotated every 14 to 21 days depending on the time of year.

25. Irrigation and storm water runoff for the Darling and Heard properties are collected by a tailwater ditch system and recycled. Irrigation and storm water on the Azevedo

property is contained onsite by a system of berms and allowed to accumulate at the eastern and western boundaries were it percolates and evaporates.

26. The LAAs are double cropped typically with corn in the winter and mixed forage (e.g. alfalfa or sorghum sudan) in the winter. Crops are harvested for silage that is used to feed dairy cows. Typically the LAAS are not irrigated during the crop harvest and rotation, which occurs in May and October.

27. Based on nutrient utilization rates provided in the Western *Fertilizer Handbook*. The annual nitrogen needs of the crops are summarized in the following table. Sorghum sudan is used as a representative crop during the winter rotation.

Crop	Nitrogen Uptake (pounds/acre/year)	Phosphate Uptake (pounds/acre/year)	Potassium Uptake (pounds/acre/year)
Corn (silage)	250	105	250
Sorghum sudan	325	125	475
Double Crop Total	575	225	725

28. On 30 August 2012, the Discharger proposed the following as interim effluent limitations pending determination of optimal WWTS performance. These values were proposed based on data from recent monitoring of the new treatment system during non-upset conditions and generally represent the maximum reported effluent concentrations between 19 March and 15 August 2012.

Constituent	Annual Average Effluent Concentration (mg/L)
BOD	100
Total nitrogen	45
FDS	770
Chloride	250

29. Wastewater will provide approximately 10 percent of the hydraulic crop irrigation demands, and the landowners will use TID water to satisfy the remaining demand. The following table compares key waste constituent loading rates for the proposed discharge and hypothetical alternative irrigation scenarios.

	Land Application Area		
	Darling	**Heard**	**Azevedo**
Acreage	40	255	74
Total Applied Irrigation Water (Mgal/yr)	59.8	374.4	108.5
Interim Loading Rates – 10% Discharger's wastewater and 90% TID water			
BOD (lb/ac/yr) [1]	155	152	152
Total Nitrogen (lb/ac/yr) [2]	572	562	562

	Land Application Area		
	Darling	**Heard**	**Azevedo**
FDS (lb/ac/yr) [3]	5,649	5,549	5,539
Hypothetical Loading Rates – TID water as sole irrigation supply			
BOD (lb/ac/yr) [1]	37	37	37
Total Nitrogen (lb/ac/yr) [2]	574	563	562
FDS (lb/ac/yr) [3]	5,225	5,131	5,124

[1] BOD concentration: wastewater = 80 mg/L (design annual average of new treatment plant effluent); TID water = 3mg/L (average concentration from June 2001 to November 2011).

[2] Total nitrogen concentration: wastewater = 40mg/l (design annual average of new treatment plant effluent); TID water = 46mg/L (average nitrate-N concentration from March 2009 to November 2011).

[3] FDS concentration: wastewater = 290mg/l (avg. after upgrades); TID water = 419mg/L (average May 2007 to November 2011).

30. The Discharger submitted a nitrogen balance showing that a total nitrogen load of 540 lb/ac/yr (621 lb/ac/yr after accounting for 15 percent irrigation loss) is needed to meet double-cropping crop demands with corn (silage) and forage crops. This nitrogen load correlates with the values referenced above. Other cropping scenarios might exert less nitrogen demand, but supplemental nitrogen may be needed because the proposed loading rates will provide no more than 572 pounds of total nitrogen per acre per year.

31. The Discharger submitted a revised water balance dated 15 June 2012. The water balance was conservative (i.e., no pond evaporation or percolation was assumed), but did not determine whether the facility has sufficient pond storage volume to accommodate the 100-year, 365-day precipitation event. Additionally, the water balance did not account for rainfall on the LAAs and its effect on irrigation needs. However, Central Valley Water Board staff revised the water balance to include reasonable estimates of pond evaporation, pond percolation, and rainfall on the LLAs. 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	Capacity
Total Annual Flow	117 MG
Monthly Average Flow	0.318 MGD

Site-Specific Conditions

32. The ground elevation in the area of the WWTS and LLAs is relatively flat and approximately 50 to 55 feet above mean sea level (MSL) with drainage to the southwest towards the San Joaquin River.

33. Geologically, the WWTS and LAAs lie within the western boundary of the Great Valley geomorphic province. The uppermost stratigraphic sequence of the province consists of coalescing low alluvial fans and river flood plain deposits. Well logs show that the

first ten feet below ground surface is primarily silty sand with some clayey sand. The minimum reference coefficient of permeability for silty sand is 1 x 10^{-6} cm/s.

34. The WWTS is located within the 100-year flood plain of the San Joaquin River. Prior to constructing the new WWTS, the Discharger determined that the Base Flood Elevation (BFE) at the site is 57.0 feet above MSL. To prevent pond inundation and potential release of wastewater during a 100-year flood event, the lowest point on top of the pond dikes is at least one foot above the BFE and the wastewater treatment tanks were built on a slab foundation approximately six inches above the BFE.

35. Surrounding land uses are primarily agricultural. Annual precipitation in the vicinity averages approximately 10.7 inches, the 100-year total annual precipitation is approximately 21.4 inches, and the average reference evapotranspiration rate is approximately 57 inches per year.

36. Domestic wastewater generated at the facility is discharged to a septic system north of the office building.

Groundwater Conditions

37. At least two aquifers underlie the facility; an upper unconfined aquifer and a lower confined aquifer separated by the Corcoran Clay (a unit of the Riverbank formation). The RWD states that the unconfined aquifer is the most extensively developed aquifer in the Modesto-Merced area, yielding well water for domestic, irrigation, industrial, and public-supply use. Groundwater in the unconfined aquifer generally flows westward towards the San Joaquin River, but local gradients can be affected by groundwater pumping. The confined aquifer occurs in unconsolidated deposits below the Corcoran Clay. According to the RWD, the bottom of the confined aquifer is approximately 800 to 1,000 feet below ground surface.

38. Six groundwater monitoring wells monitor first groundwater at the site and their locations are shown in Attachment B. The well casings of three monitoring wells (MW-1, MW-2, MW-3) became damaged so the Discharger installed three new wells (MW-1R, MW-2R, MW-3R) in 2012 near the original locations. Groundwater monitoring data for the new wells are not yet available and data from MW-1 are not available after June 2008. The following table summarizes the current monitoring wells and their function.

Monitoring Well	Average Depth to Groundwater (ft. bgs)[1]	Description
MW-1R	12.6 [2]	Compliance well crossgradient of LAA; installed in 2012
MW-2R	13.7 [2]	Compliance well downgradient of LAA; installed in 2012
MW-3R	9.7 [3]	Compliance well downgradient of ponds; installed in 2012
MW-4	10.3	Compliance well downgradient of LAA
MW-5	3.8	Background well upgradient of discharge

Monitoring Well	Average Depth to Groundwater (ft. bgs)[1]	Description
MW-6	13.4	Downgradient of ponds; may be influenced by surface water (TID or San Joaquin River)

[1] Average ground elevation (52.5 ft.) minus average groundwater elevation (March 2008 through September 2011).

[2] Groundwater elevation datum from 2012 monitoring well installation report.

[3] Groundwater elevation data from MW-3.

39. Depth to first groundwater at the site typically ranges from four to 14 feet. The shallow groundwater typically flows towards 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. The groundwater elevation at MW-3 is typically shallower than other monitoring wells in the area (i.e., MW-4 and MW-6), which is likely due to groundwater mounding below the wastewater ponds and monitors groundwater quality immediately downgradient of the wastewater ponds. MW-6 is downgradient of the ponds and the Darling and Heard LAAs, but appears to be influenced by the adjacent TID drain and San Joaquin River.

40. Groundwater monitoring data for the site are summarized in the table below.

		Groundwater Concentrations Prior to WWTP Upgrades [1]		Groundwater Concentrations After WWTP Upgrades [2]		Average % Change
Parameter	Units	Average	Range	Average	Range	
MW-5*						
TDS	mg/L	823	340 to 1,230	– –	– –	– –
FDS	mg/L	725 [3]	287 to 1,090 [3]	– –	– –	– –
Chloride	mg/L	93	23 to 215	– –	– –	– –
Nitrate-N	mg/L	21	3 to 56	– –	– –	– –
MW-2						
TDS	mg/L	1424	833 to 1,900	948	567 to 1,110	-33.4%
FDS	mg/L	1098 [3]	646 to 1,430 [3]	756	384 to 1,030	-31.1%
Chloride	mg/L	240	ND to 400	124	67 to 187	-48.3%
Nitrate-N	mg/L	69	ND to 117	66	43 to 75	-4.3%
MW-3						
TDS	mg/L	2,153	1,770 to 2,800	869	474 to 1,270	-59.6%
FDS	mg/L	1,832 [3]	1,550 to 2,100 [3]	744	428 to 931	-59.4%
Chloride	mg/L	490	ND to 837	110	29 to 287	-77.6%
Nitrate-N	mg/L	60	ND to 185	3	ND to 9	-95.0%

Parameter	Units	Groundwater Concentrations Prior to WWTP Upgrades [1]		Groundwater Concentrations After WWTP Upgrades [2]		Average % Change
		Average	Range	Average	Range	
MW-4						
TDS	mg/L	675	458 to 1,300	596	389 to 766	-11.7%
FDS	mg/L	522 [3]	452 to 583 [3]	437	225 to 598	-16.3%
Chloride	mg/L	88	41 to 192	84	50 to 118	-4.5%
Nitrate-N	mg/L	5	ND to 14	2	ND to 15	-60.0%
MW-6						
TDS	mg/L	501	357 to 676	678	524 to 911	+35.3%
FDS	mg/L	455 [3]	221 to 516 [3]	571	390 to 787	+25.5%
Chloride	mg/L	79	49 to 144	125	77 to 181	+58.2%
Nitrate-N	mg/L	7	2 to 11	6	2 to 14	-14.3%

[1] Quarterly data from June 2001 through March 2009 (before source control).

[2] Quarterly data from April 2009 through November 2011 (after source control).

[3] Data from May 2007 through March 2009 (before source control).

* Background groundwater monitoring well. Data from June 2001 through November 2011

Based on the data summarized above, the Discharger's upgrades have resulted in improved groundwater quality, especially in MW-3. For all constituents, concentrations in MW-3 are similar to or better than background. Salinity in MW-2 (within the Darling property) 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 Darling and Heard properties 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. Constituents in MW-4 show some reduction since the upgrades but are largely unchanged. Salinity concentrations have increased in MW-6, but the increase may not be due to the discharge since the Discharger has implemented salinity source control and salinity concentrations in MW-3, which is upgradient of MW-6, have subsequently declined. Water from TID Lateral Drain No. 5, which is adjacent to MW-6, is relatively high in salinity and nitrate and may influence groundwater quality. However, nitrate has not increased in MW-6, so the cause of the salinity increase in MW-6 is questionable.

Basin Plan, Beneficial Uses, and Regulatory Considerations

41. 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 Board. Pursuant to Water Code section 13263(a), waste discharge requirements must implement the Basin Plan.

42. Local drainage is to the San Joaquin River. 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.

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

44. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. It also sets forth a numeric objective for total coliform organisms.

45. The Basin Plan's numeric water quality objective for bacteria requires that the most probable number (MPN) of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN groundwater. The applicability of this objective to groundwater designated as MUN has been affirmed by State Water Board Order WQO-2003-0014 and by subsequent decisions of the Sacramento County Superior Court and California Court of Appeal, 3rd Appellate District.

46. The Basin Plan's narrative water quality objectives for chemical constituents, at a minimum, require waters designated as domestic or municipal supply to meet the MCLs specified in Title 22 of the California Code of Regulations (hereafter Title 22). The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

47. In summary, the narrative toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, animal, plant, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.

48. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective.

49. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an EC less than 700 µmhos/cm. There is, however, an eight- to ten-fold range in salt tolerance for agricultural crops and the appropriate salinity values to protect agriculture in the Central Valley are considered on a case-by-case basis. It is

possible to achieve full yield potential with waters having EC up to 3,000 µmhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

50. The list of crops in Finding 26 is not intended as a definitive inventory of crops that are or could be grown in the area. The discharge previously degraded groundwater quality to levels that could affect plant growth if the shallow groundwater were to be used for irrigation of crops such as almonds. However, after the improvements completed by the Discharger, the salinity of the treated wastewater is now similar to TID lateral Drain No. 5 water, which is generally used by agricultural operations in the area. Additionally, the groundwater quality in MW-3, which is immediately downgradient of the unlined ponds, is now similar to the background well MW-5. Therefore, the land application of treated wastewater does not threaten to further degrade groundwater.

Special Considerations for High Strength Waste

51. Excessive application of high organic strength wastewater to land can create objectionable odors, soil conditions that are harmful to crops, and degradation of underlying groundwater with nitrogen species and metals, as discussed below. Such groundwater degradation can be prevented or minimized through implementation of best management practices which include planting crops to take up plant nutrients and maximizing oxidation of BOD to prevent nuisance conditions.

52. With regard to BOD, excessive application can deplete oxygen in the vadose zone and lead to anoxic conditions. At the ground surface, this can result in nuisance odors and fly-breeding. Typically, irrigation with high strength wastewater results in high BOD loading on the day of application. It is reasonable to expect some oxidation of BOD at the ground surface, within the evapotranspiration zone and below the root zone within the vadose (unsaturated) zone. The maximum BOD loading rate that can be applied to land without creating nuisance conditions or leaching of metals can vary significantly depending on soil conditions and operation of the land application system.

53. *Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency, cites BOD loading rates in the range of 36 to 600 lb/acre-day to prevent nuisance, but indicates the loading rates can be even higher under certain conditions. The studies that supported this report did not evaluate actual or potential groundwater degradation associated with those rates. There are few studies that have attempted to determine maximum BOD loading rates for protection of groundwater quality. Those that have been done are not readily adapted to the varying soil, groundwater, and climate conditions that are prevalent throughout the region.

54. The Discharger has significantly improved the wastewater quality and reduced the BOD concentration discharged to land. Based on the loading rates presented above, the discharge does not have the potential to cause excessive BOD loading

rates before other limits (e.g. the flow limit) are reached. Therefore this Order does not set a BOD loading limit.

Antidegradation Analysis

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

    a. The degradation is consistent with the maximum benefit to the people of the state.

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

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

    d. The Discharger employs best practicable treatment or control (BPTC) to minimize degradation.

56. Degradation of groundwater by some of the typical waste constituents associated with discharges from a rendering facility is consistent with the maximum benefit to the people of the state after effective source control, treatment, and control measures are implemented. The water recycling, waste management advantages, and services provided by such a rendering facility far exceed any benefits derived from requiring individuals to properly handle the waste, which would likely have a greater detrimental impact on water quality. The Discharger has 40 full-time employees. The economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and provides sufficient justification for allowing the limited groundwater degradation that may occur pursuant to this Order.

57. 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.

58. Prior to the source control and WWTS upgrades described above, the discharge degraded groundwater quality for TDS, chloride, and nitrate. Current constituents of concern that have the potential to degrade groundwater include salts (primarily chloride, TDS, and FDS) and nutrients (primarily nitrate), as discussed below:

    a. The Central Valley Water Board is currently implementing the CV-SALTS initiative to develop a Basin Plan Amendment that will establish a salt and nitrate Management Plan for the Central Valley. Through this effort the Basin Plan will be amended to define how the narrative water quality objective is to be interpreted for the protection of agricultural use. All studies conducted through this Order to establish an agricultural limit to implement the narrative objectives will be reviewed and consistent with the efforts underway by CV-SALTS.

The secondary MCL for chloride is 250 mg/L as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The Central Valley Water Board must determine the applicable numeric limit to implement the narrative objective for the protection of agricultural supply. The most limiting agricultural water quality goal may be as low as 106 mg/L as a long-term average[1], which is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers. However, the water quality goal is not a site-specific goal or objective, but rather a general measure to protect salt-sensitive crops. Site specific chloride levels of the receiving waters are necessary to interpret the narrative chemical constituent objective for protection of agricultural supply.

A review of the Discharger's monitoring reports shows that 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 monitors potential groundwater degradation resulting 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 of 250 mg/L and a final effluent limit of 200 mg/L to protect groundwater quality beneath the unlined effluent storage ponds. This Order does not allow further groundwater degradation. The one-sided upper tolerance interval (with 95% confidence of covering 95% of the population) of the current background groundwater chloride concentration was determined to be 218 mg/L. Depending on the results of the Discharger's treatment system performance evaluation, further treatment or control may be necessary to protect groundwater.

b. The secondary MCL for TDS is 500 mg/L as a recommended level, 1,000 mg/L as an upper level, and 1,500 mg/L as a short-term maximum. The Central Valley Water Board must determine the applicable numeric limit to implement the narrative objective for the protection of agricultural supply. The most limiting agricultural water quality goal may be as low as 450 mg/L as a long-term average based on Ayers and Westcot[1], which evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. However, the water quality goal is not a site-specific goal or objective, but rather a general measure that was determined to protect salt-sensitive crops. Only the most salt-sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm.

   A review of the Discharger's monitoring reports shows that the average TDS concentration in the up-gradient monitoring well MW-5 is 823 mg/L with a range from 340 mg/L to 1,230 mg/L. The average chloride concentration in MW-3, which is expected to monitor immediate impacts to groundwater resulting from the wastewater discharge, has been reduced by 59.6 percent to 869 mg/L since the Discharger implemented source control (post March 2009). The TDS concentration

[1] *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1, R.S. Ayers and D.W. Westcot, Rome, 1985.

decrease in MW-3 is consistent with the decrease in the treated wastewater. This Order does not allow further groundwater degradation. The one-sided upper tolerance interval (with 95% confidence of covering 95% of the population) of the current background groundwater TDS concentration was determined to be 1,300 mg/L. Depending on the results of the Discharger's treatment system performance evaluation, further treatment or control may be necessary to protect groundwater quality.

c. 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 of 770mg/L and a final effluent limit of 700 mg/L based on the current performance (post-March 2012). However, depending on the results of the Discharger's treatment system performance evaluation, further treatment or control may be necessary to protect groundwater quality.

d. For nutrients such as nitrate, the potential for degradation depends not only on the quality of the treated effluent, but the nutrient uptake of the LAA crops and the ability of the vadose zone below the LAAs and unlined effluent storage ponds to provide an environment conducive to further nitrification and denitrification to convert the residual effluent nitrogen to nitrate and the nitrate to nitrogen gas before it reaches the water table. Background groundwater on average exceeds the Basin Plan water quality objective for nitrate-nitrogen (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 also expected to improve. Because the Discharger is still evaluating the treatment system performance this Order sets a performance based interim total nitrogen effluent limit of 45 mg/L based on current performance and a final effluent limit of 30 mg/L to protect groundwater quality beneath the unlined 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 one-sided upper tolerance interval (with 95% confidence of covering 95% of the population), which was determined to be 27 mg/L. This value was calculated based on MW-5 data after March 2008 to represent current groundwater conditions. Nitrate data prior to March 2008 was not considered due to a temporary elevated shift in background quality from June 2004 through December 2007. Depending on the results of the Discharger's treatment system performance evaluation, further treatment or control may be necessary to protect groundwater quality.

59. The Discharger provides treatment and control of the discharge that incorporates:
    a. Salinity source control;
    b. Use of a relatively high quality process water supply
    c. Solids separation before and after wastewater treatment;
    d. Aboveground tanks for biological BOD and nutrient removal (nitrification and denitrification);

e. Collection of facility storm water to prevent runoff to surface waters; and
f. Land application of wastewater at agronomic rates for water and plant nutrients;
g. Utilizing tailwater and storm water runoff control systems on all LAAs.

60. The operational upgrades and salinity source control have effectively reduced salinity in the WWTS influent. The new wastewater treatment system is expected to further reduce the nitrogen and BOD concentrations in the effluent. Moving the treatment process from the unlined ponds to the aboveground tanks has reduced the threat to groundwater quality. However, while recent effluent monitoring data show that the treatment system has the potential to be protective of groundwater, the Discharger needs to demonstrate the reliability of the system. If the treatment system is found not capable of producing effluent that meet the final effluent limitations, further treatment or control may be necessary. This Order requires that the Discharger evaluate the optimal performance of the new wastewater treatment system and determine whether the final effluent limitations of this Order are feasible with the current treatment system.

61. This Order establishes groundwater limitations and interim and final effluent limitations that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. Current groundwater monitoring data indicates that shallow groundwater has previously been degraded beyond background groundwater quality, but has recently improved with respect to salinity and nitrate. Shallow groundwater quality is expected to improve further with respect to nitrate. The requirements of this Order do not allow any further degradation to occur. However, because the sustainability of the current high quality process water supply is uncertain and the optimal performance of the WWTS has not been evaluated, this Order may be reopened to consider revision of the effluent and/or groundwater limitations if the Discharger submits a new Report of Waste Discharge demonstrating that compliance with those limits is infeasible and that the proposed limits will ensure compliance with the Basin Plan.

Other Regulatory Considerations

62. Title 27 of the California Code of Regulations (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste. However, Title 27 exempts certain activities from its provisions. Discharges regulated by this Order are exempt from Title 27 pursuant to provisions that exempt domestic sewage, wastewater, and reuse. Title 27, section 20090 states in part:

> The following activities shall be exempt from the SWRCB-promulgated provisions of this subdivision, so long as the activity meets, and continues to meet, all preconditions listed:
>
> (…)(b) Wastewater - Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

(1) the applicable RWQCB has issued WDRs, reclamation requirements, or waived such issuance;

(2) the discharge is in compliance with the applicable water quality control plan; and

(3) the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste. (…)

63. The discharge authorized herein (except for the discharge of residual sludge and solid waste), and the treatment and storage facilities associated with the discharge, are exempt from the requirements of Title 27 as follows:

    a. The wastewater treatment plant DAF units, aerated tanks, and appurtenant structures, are exempt pursuant to Title 27, Section 20090(i) because they are fully enclosed units used to treat the waste.

    b. The effluent storage ponds, future sludge drying beds (if any), and the land application areas are exempt pursuant to Title 27, section 20090(b) because they are wastewater land discharge areas and:

        i. The Central Valley Water Board is issuing WDRs.

        ii. The discharge is in compliance with the Basin Plan, and;

        iii. The treated effluent and solids do not need to be managed as hazardous waste.

64. Although the facility is exempt from Title 27, the statistical data analysis methods of Title 27, section 20415(e) are appropriate for determining whether the discharge complies with Groundwater Limitations specified in this Order.

65. The State Water Board adopted Order 97-03-DWQ (NPDES General Permit CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. All storm water from the facility is collected, and mingled and disposed with the process wastewater. The Discharger is therefore not required to obtain coverage under NPDES General Permit CAS000001.

66. Water Code section 13267(b) states:

> In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports 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 R5-2012-0104 are necessary to ensure compliance with these

waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

67. 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 Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal governed by this Order.

68. With respect to discharges to the existing wastewater ponds and Darling and Heard LAA sites, the action to adopt waste discharge requirements for this existing facility is categorically exempt from the provisions of the California Environmental Quality (CEQA), in accordance with the California Code of Regulations, title 14, section 15301.

69. 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).

70. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

71. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

72. The Discharger, Co-Discharger's, and interested agencies and persons have been notified of the Central Valley Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.

73. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that Order 5-01-171 is rescinded except for purposes of enforcement, and, pursuant to Water Code sections 13263 and 13267, the Discharger and Co-Discharger's, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted hereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses, including irrigation ditches or agricultural drains outside of control of the Discharger and Co-Dischargers, is prohibited.

2. Discharge of waste classified as 'hazardous', as defined in the California Code of Regulations, title 23, section 2510 et seq., is prohibited.

3. Discharge of waste classified as 'designated', as defined in Water Code section 13173, is prohibited.

4. Treatment system bypass of untreated or partially treated waste is prohibited, except as allowed by Standard Provision E.2 of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*.

5. Discharge of waste at a location or in a manner different from that described in the Findings is prohibited.

6. Discharge of treated wastewater outside of the LAAs identified in this Order is prohibited.

7. Discharge of toxic substances into the wastewater treatment system or land application areas such that biological treatment mechanisms are disrupted is prohibited.

8. Discharge of domestic wastewater to the process wastewater treatment system is prohibited.

9. Application of residual solids to the land application areas is prohibited.

10. Discharge of industrial wastewater to septic systems is prohibited.

B. Flow Limitations

1. **Effectively immediately**, flows from the secondary DAF to the ponds shall not exceed the following limits:

Flow Measurement	Flow Limit
Total Annual Flow [1]	117 MG
Monthly Average Flow[2]	0.318 MGD

[1] As determined by the total flow for the calendar year.

[2] As determined by the total flow for each calendar month divided by the number of days in that month.

C. Effluent Limitations

1. **Effectively immediately**, effluent from the secondary DAF to the ponds shall not exceed the following limits:

Constituent	Units	Quarterly Average Limit[1]	Annual Average Limit[2]
BOD_5 [3]	mg/L	100	– –
Total Nitrogen	mg/L	45	– –
FDS	mg/L	– –	770
Chloride	mg/L	– –	250

[1] Calculated as the average from all sampling results acquired each calendar quarter (i.e., January through March, etc.)

[2] Calculated as a flow-weighted average for the calendar year.

[3] 5-day biochemical oxygen demand at 20˚C.

2. **Effective 1 November 2014**, effluent from the secondary DAF to the ponds shall not exceed the following limits:

Constituent	Units	Quarterly Average Limit[1]	Annual Average Limit[2]
BOD_5 [3]	mg/L	80	– –
Total Nitrogen	mg/L	30	– –
FDS	mg/L	– –	700
Chloride	mg/L	– –	200

[1] Calculated as the average from all sampling results acquired each calendar quarter (i.e., January through March, etc.)

[2] Calculated as a flow-weighted average for the calendar year.

[3] 5-day biochemical oxygen demand at 20˚C.

Compliance with the annual average limits shall be determined using the following flow-weighted formula:

$$C = \frac{\sum_{i=1}^{12} C_i \times V_i}{\sum_{i=1}^{12} V_i}$$

Where

C = annual flow weighted average in mg/L;

i = the number of the month (i.e., January = 1, February = 2, etc.);

C_i = arithmetic mean of monitoring results for calendar month i in mg/L;

V_i = total effluent flow for calendar month i in million gallons;

D. Mass Loading Limitations

1. The total nitrogen mass loading to each LAA shall not exceed the agronomic rate for the crop grown. Compliance with this requirement shall be determined using published nitrogen uptake rates for the crops grown and the following formula:

$$M = \sum_{i=1}^{12} \frac{C_i \times V_i \times 8.345}{A} + M_{supplemental}$$

Where

M = annual total nitrogen loading rate in pounds per acre per year;

i = the number of the month (i.e., January = 1, February = 2, etc.);

C_i = arithmetic mean of total nitrogen monitoring results for calendar month i in mg/L;

V_i = total effluent flow to the LAA for calendar month i in million gallons;

A = the area of the LAA or field in acres; and

$M_{supplemental}$ = additional total nitrogen loading in the form of fertilizer or other sources in pounds per acre per year.

E. Groundwater Limitations

Effective immediately except as noted, release of waste constituents from any portion of the facility and LAAs shall not cause groundwater to:

1. Contain total dissolved solids, chloride, nitrate nitrogen, arsenic, iron, and manganese in concentrations statistically greater than background groundwater quality.

2. Exceed a total coliform organism level of 2.2 MPN/100mL.

3. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.

4. Contain taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

Compliance with these limitations shall be 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) in accordance with the approved workplan

submitted pursuant to Provision I.1.a. Compliance wells are defined in Monitoring and Reporting Program R5-2012-0104.

Effective until 1 November 2015 only, for any single well and constituent, an exceedance of background groundwater quality will not constitute a violation of this Order unless the intrawell temporal trend for that constituent exhibits a statistically significant increase since adoption of this Order.

F. Discharge Specifications

1. No waste constituent shall be released, discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations of this Order.

2. The discharge shall not cause degradation of any water supply.

3. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by Water Code section 13050.

4. The discharge shall remain within the permitted waste treatment/containment structures and land application areas at all times.

5. The Discharger shall operate all systems and equipment to optimize the quality of the discharge.

6. All conveyance, treatment, storage, and disposal systems shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

7. Objectionable odors shall not be perceivable beyond the limits of the facility property at an intensity that creates or threatens to create nuisance conditions.

8. As a means of discerning compliance with Discharge Specification F.7, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for three consecutive weekly sampling events. If the DO in any single pond is below 1.0 mg/L for three consecutive sampling events, the Discharger shall report the findings to the Regional Water Board in writing within 10 days and shall include a specific plan to resolve the low DO results within 30 days.

9. The Discharger shall operate and maintain all ponds sufficiently to protect the integrity of containment dams and berms and prevent overtopping and/or structural failure. Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of overflow). As a means of management and to discern compliance with this requirement, the

Discharger shall install and maintain in each pond a permanent staff gauge with calibration marks that clearly show the water level at design capacity and enable determination of available operational freeboard.

10. The treatment, storage, and disposal ponds or structures shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration during the winter while ensuring continuous compliance with all requirements of this Order. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

11. On or about **1 October** of each year, available capacity shall at least equal the volume necessary to comply with Discharge Specifications F.9 and F.10.

12. All ponds and open containment structures shall be managed to prevent breeding of mosquitoes. Specifically:

    a. An erosion control program shall be implemented to ensure 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.

    d. The Discharger shall consult and coordinate with the local Mosquito Abatement District to minimize the potential for mosquito breeding as needed to supplement the above measures.

13. Newly constructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a pond) shall be designed and constructed under the supervision of a California Registered Civil Engineer.

14. Wastewater contained in any unlined pond shall not have a pH less than 6.0 or greater than 9.0.

G. Land Application Area Specifications

1. Application of waste constituents to the land application areas (LAAs) shall be at reasonable agronomic rates to preclude creation of a nuisance or degradation of groundwater, considering the crop, soil, climate, and irrigation management system. The annual nutritive loading of each LAA, including the nutritive value of organic and chemical fertilizers and of the wastewater shall not exceed the annual crop demand.

2. Wastewater shall not be discharged to the LAAs when the soil is saturated or in a manner that causes wastewater to stand for greater than 48 hours.

3. Discharge of process wastewater to any LAA not having a fully functional tailwater/runoff control system is prohibited.

4. All tailwater and storm water shall be confined to the LAAs and shall not enter any surface water drainage course or storm water drainage, except that tailwater may be returned to the storage ponds.

5. Grazing of animals on the LAAs is prohibited.

6. Discharge of process wastewater to land overlying septic system leach lines or seepage pits is prohibited.

H. Solids Disposal Specifications

Sludge, as used in this document, means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screenings generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the WWTS.

1. Sludge and solid waste shall be removed from screens, sumps, ponds, and clarifiers as needed to ensure optimal plant operation.

2. Any handling and storage of residual sludge, solid waste, and biosolids at the WWTS shall be temporary (i.e., no longer than one year) and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate the groundwater limitations of this Order.

3. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27, division 2. Removal for further treatment, disposal, or reuse at disposal sites (i.e., landfills, WWTFs, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy this specification.

4. Any proposed change in sludge use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

I. Provisions

1. The following reports shall be submitted pursuant to CWC Section 13267 and shall be prepared as described in Provision K.5:

   a. **By 1 January 2013**, the Discharger shall submit a *Groundwater Limitations Compliance Assessment Plan*. The plan shall describe and justify the statistical methods used to propose groundwater concentration limits and compliance for the constituents listed in the Monitoring and Reporting Program. Compliance shall be determined annually based on an interwell statistical analysis that uses

methods prescribed in Title 27, section 20415(e)(7) and (8) to compare monitoring data collected at each down gradient well to background groundwater quality as measured in MW-5.

b. **By 1 April 2013**, the Discharger shall submit a *LAA Flow Meter Installation Report* that describes the installation of flow meters as needed to individually monitor flows from all sources to each LAA (i.e., Azevedo, Darling, and Heard properties). The report shall specify how daily wastewater flows to each check within a given LAA will be estimated if more than one check is to be irrigated at one time and how supplemental irrigation flows to each check will be measured or estimated.

c. **By 1 February 2014**, the Discharger shall submit a *Treatment System Performance Evaluation Report* that provides the following information:

   i. A summary of all flow, influent, and effluent monitoring data between the first date of operation of the new WWTS and 30 December 2013;

   ii. Identification of each upset event that occurred during that period, the cause of the upset, operational modifications made to correct the upset, and the duration of the upset event;

   iii. An evaluation of need for supplemental alkalinity (including typical range of dose rates and the criteria used to select the dose rate) and its effect on effluent FDS (specifying the expected range of incremental FDS increases associated with optimum nitrogen removal);

   iv. An evaluation of the Discharger's ability to comply with final effluent limits for salinity and nitrogen without additional treatment or control;

   v. Proposed final performance based effluent limits for BOD, total nitrogen, FDS, and chloride;

   vi. Evaluation of compliance with the groundwater limitations of this Order and temporal trends since adoption of WDRs, and;

   Proposed scope and implementation schedule for additional control (e.g., lining wastewater storage ponds) or treatment if needed to comply with the groundwater limitations. The schedule for implementation shall not extend beyond **1 December 2015**. If any proposed final effluent limitation is greater than the final limitation of this Order, the Discharger shall also submit a new *Report of Waste Discharge* that provides the information included in Attachment C, which is attached hereto and made part of this Order by reference and demonstrates that the proposed limit(s) will ensure compliance with the Basin Plan.

d. **By 1 December 2015**, unless the Executive Officer issues written approval to do otherwise pursuant to submittal of report specified in Provision I.1.c, the Discharger shall submit a *Wastewater Treatment Facility Upgrades Completion Report*. The report shall describe the completed improvements and provide all construction quality assurance reports (as applicable) associated with completion of the improvements proposed in the approved *Treatment System Performance Evaluation Report*.

e. **At least 120 days prior** to planned construction or use of any sludge drying and storage areas, the Discharger shall submit for approval an engineered design and operational plan of the sludge drying system. At a minimum, the design and operational plan shall include lining the ponds, annual sludge cleanout, and maintenance methods to avoid nuisance conditions. The report shall detail the design for sludge removal, drying, and disposal. The plan shall specifically describe the phasing of the project, measures to be used to control runoff or percolate from the sludge as it is drying, and a schedule that shows how all dried sludge will be removed from the site prior to the onset of the rainy season (**1 October**).

2. If groundwater monitoring results show that the discharge of waste is causing groundwater to violate any groundwater limitation contained in this Order, within **120 days** of the request of the Executive Officer, the Discharger shall submit a BPTC Evaluation Workplan that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of each component of the facility's waste treatment and disposal system to determine best practicable treatment and control for each waste constituent that exceeds a Groundwater Limitation. The workplan shall contain a preliminary evaluation of each component of the WWTS and effluent disposal system and propose a time schedule for completing the comprehensive technical evaluation. The schedule to complete the evaluation shall be as short as practicable, and shall not exceed one year.

3. If the quality of the TID process water supply changes significantly or reduced availability of higher quality TID water necessitates increased use of a lower quality water supply, the Discharge shall submit a new Report of Waste Discharge within 90 days. This Order may be reopened if the Report of Waste Discharge demonstrates that an unavoidable change in the process water supply quality makes compliance with the effluent and/or groundwater limitations of this Order infeasible and that the proposed limits will ensure compliance with the Basin Plan.

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' monthly average flow and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Central Valley Water Board by **31 January**.

5. In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly

stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.

6. The Discharger shall submit the technical reports and work plans required by this Order for consideration by the Executive Officer, and incorporate comments the Executive Officer may have in a timely manner, as appropriate. Unless expressly stated otherwise in this Order, the Discharger shall proceed with all work required by the foregoing provisions by the due dates specified.

7. The Discharger shall comply with Monitoring and Reporting Program R5-2012-0104, which is part of this Order, and any revisions thereto as ordered by the Executive Officer. The submittal dates of Discharger self-monitoring reports shall be no later than the submittal date specified in the MRP.

8. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

9. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports. On or before each report due date, the Discharger shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

10. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of this Order.

11. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.

12. As described in the Standard Provisions, the Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.

13. The Discharger shall report to the Central Valley Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."

14. The Discharger shall not allow pollutant-free wastewater to be discharged into the wastewater collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

15. At least **90 days** prior to termination or expiration of any lease, contract, or agreement involving disposal or recycling areas or off-site reuse of effluent, used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Central Valley Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

16. In the event of any change in control or ownership of the process facility or any LAA, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

17. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the CWC. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

18. A copy of this Order including the MRP, Information Sheet, Attachments, and Standard Provisions, shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

19. If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order or with the WDRs may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

20. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

I, PAMELA C. CREEDON, 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 4 October 2012.

- Original signed by -

PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2012-0104

FOR
DARLING INTERNATIONAL INC., OSCAR HEARD
AND VAL AND MARY AZEVEDO
DARLING INTERNATIONAL RENDERING PLANT
STANISLAUS COUNTY

The Monitoring and Reporting Program (MRP) describes requirements for monitoring the wastewater storage ponds, wastewater treatment system influent and effluent, land application areas, and groundwater. 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.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

WASTEWATER FLOW MONITORING

Wastewater flows shall be monitored as follows:

Parameter	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Treatment System Influent Flow[1]	gpd	Meter Reading	Daily	Monthly
Effluent Flow to Each LAA[2]	gpd	Meter Reading	Daily	Monthly

[1] Report as total daily flow from the primary DAF unit to the treatment system.
[2] Report as total daily flow from the storage ponds to each LAA (and to each irrigation check if the LAA has more than one).

TREATMENT SYSTEM INFLUENT MONITORING

Influent samples shall be collected at a point downstream of the primary DAF prior to biological treatment. At a minimum, the Discharger shall monitor the influent as follows:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
BOD_5 [1]	mg/L	Grab	Weekly	Monthly
Total Suspended Solids	mg/L	Grab	Weekly	Monthly
Total Nitrogen	mg/L	Grab	Weekly	Monthly

[1] 5-day, 20ºC Biochemical Oxygen Demand.

TREATMENT SYSTEM EFFLUENT MONITORING

Effluent samples shall be collected at a point downstream of the secondary DAF prior to discharge to the storage ponds. At a minimum, the Discharger shall monitor the effluent as follows:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
BOD_5 [1]	mg/L	Grab	Weekly	Monthly
Total Suspended Solids	mg/L	Grab	Weekly	Monthly
Total Nitrogen	mg/L	Grab	Weekly	Monthly
Fixed dissolved solids	mg/L	Grab	Weekly	Monthly
Chloride	mg/L	Grab	Weekly	Monthly
pH	pH units	Grab	Weekly	Monthly

[1] 5-day, 20ºC Biochemical Oxygen Demand.

WASTEWATER STORAGE POND MONITORING

The wastewater storage ponds shall be monitored as follows:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Freeboard	0.1 feet	Staff Gage	Weekly	Monthly
Dissolved Oxygen	mg/L	Grab	Weekly	Monthly
Odors	--	Observation	Weekly	Monthly

LAND APPLICATION AREA MONITORING

A. Daily Pre-Application Inspections

The Discharger shall inspect the land application areas at least **once daily** prior to and during irrigation events, and observations from those inspections shall be documented for inclusion in the monthly monitoring reports. The following items shall be documented for each check or field to be irrigated on that day:

a. Evidence of erosion;
b. Containment berm condition;
c. Condition of each standpipe and flow control valve (if applicable);
d. Proper use of valves;
e. Soil saturation;
f. Ponding;
g. Tailwater ditches and potential runoff to off-site areas;
h. Potential and actual discharge to surface water;
i. Odors that have the potential to be objectionable at or beyond the property boundary; and
j. Insects.

Temperature; wind direction and relative strength; and other relevant field conditions shall also be observed and recorded. The notations shall also document any corrective actions taken based on observations made. A copy of entries made in the log during each month shall be submitted as part of the Monthly Monitoring Report. If no irrigation with wastewater takes place during a given month, then the monthly monitoring report shall so state.

B. Routine Monitoring

The Discharger shall perform the following routine monitoring and loading calculations during all months when land application occurs, and shall present the data in the Monthly and Annual Monitoring Reports.

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Precipitation	0.1 in.	Rain Gauge [1]	Daily	Monthly, Annually
LAAs and individual checks receiving wastewater	--	Observation	Daily	Monthly, Annually
Hydraulic loading rate				
Wastewater	in.	Calculated [2]	Daily	Monthly, Annually
TID water	in.	Calculated [2]	Daily	Monthly, Annually
Nitrogen loading rate				
Wastewater	lb/ac/day	Calculated [2, 3]	Daily	Monthly, Annually
Supplemental water	lb/ac/day	Calculated [2, 3]	Daily	Monthly, Annually
Other sources (fertilizer, etc.)	lb/ac/mo	Calculated [2, 4]	Daily	Monthly, Annually
Fixed dissolved solids loading rate (wastewater plus TID water)	lb/ac/mo	Calculated [2, 3]	Monthly	Monthly, Annually

[1] Data obtained from the nearest National Weather Service rain gauge is acceptable.

[2] Rate shall be calculated for each irrigation check.

[3] Total nitrogen and FDS loading rates shall be calculated using the applied volume of wastewater, supplemental irrigation water, and actual application area using the specified method m in Section D (Mass Loading Limitations) of the WDRs.

[4] Loading rates for supplemental nitrogen shall be calculated using the actual load and the application area.

GROUNDWATER MONITORING

The current groundwater monitoring well network consists of MW-1R, MW-2R, MW-3R and MW-4 through MW-6. For the purpose of determining compliance with the Groundwater Limitations of the WDRs, MW-5 is designated as the background monitoring well and all other monitoring wells are compliance wells. Prior to construction of any new groundwater monitoring wells, the Discharger shall submit plans and specifications to the Central Valley Water Board for review and approval.

Prior to sampling, the groundwater elevations shall be measured. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected using standard EPA methods. Groundwater monitoring shall include, at a minimum, the following constituents:

Constituent	Units	Type of Sample	Sampling and Reporting Frequency
Depth to Groundwater [1]	0.01 feet	Measurement	Semiannually
Groundwater Elevation [1]	0.01 feet	Calculated	Semiannually
Gradient [1]	feet/feet	Calculated	Semiannually
Gradient Direction [1]	Degrees	Calculated	Semiannually
pH	pH units	Grab	Semiannually
Total dissolved solids	mg/L	Grab	Semiannually
Chloride	mg/L	Grab	Semiannually
Nitrate (as nitrogen)	mg/L	Grab	Semiannually
Standard minerals [2]	mg/L	Grab	Annually [5]
Metals [3,4]	µg/L	Grab	Annually [5]

[1] Groundwater elevations shall be determined based on depth-to-water measurements using a surveyed elevation reference point on the well casing.

[2] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, bromide, calcium, fluoride, magnesium, phosphate, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness as $CaCO_3$.

[3] Samples analyzed for metals shall be filtered prior to sample preservation using a 0.45-micron filter.

[4] At a minimum, the following metals shall be included: arsenic, copper, lead, iron, manganese, nickel, and zinc.

[5] Monitoring shall occur at least six months apart.

TURLOCK IRRIGATION DISTRICT LATERAL No. 5 WATER SUPPLY MONITORING

TID water shall be monitored at the on-site pump station with a sample representative of the typical water supply. TID water monitoring shall include at least the following.

Constituents	Units	Sampling and Reporting Frequency
Fixed Dissolved Solids	mg/L	Quarterly
Chloride	mg/L	Quarterly
Total Nitrogen	mg/L	Quarterly
pH	Std. units	Quarterly
Standard minerals	mg/L	Annually

[1] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, calcium, chloride, iron, magnesium, manganese, nitrogen, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

GROUNDWATER SUPPLY MONITORING

The facility groundwater supply wells shall be monitored as follows:

Constituents	Units	Sampling and Reporting Frequency
Fixed Dissolved Solids	mg/L	Quarterly
Chloride	mg/L	Quarterly
Total Nitrogen	mg/L	Quarterly
pH	Std. units	Quarterly
Standard minerals	mg/L	Annually

[2] Standard Minerals shall include, at a minimum, the following elements/compounds: boron, calcium, chloride, iron, magnesium, manganese, nitrogen, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., effluent, groundwater), sampling location, and the 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 at the locations specified in 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 California-registered professional and signed by the registered professional.

A. Monthly Monitoring Reports

Daily, weekly, and monthly monitoring data shall be reported in monthly monitoring reports. Monthly reports shall be submitted to the Central Valley Water 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. Results of wastewater flow, influent, effluent, and storage pond, land application area, Turlock Irrigation District water supply, and groundwater supply monitoring. Data shall be presented in a tabular format.
2. The cumulative volume of wastewater generated during the year to date;
3. Calculations of the average annual effluent chloride and FDS concentration for the calendar year to date.
4. Calculations of total nitrogen (year to date) and FDS (year to date) mass loading rates.
5. A comparison of monitoring data to the requirements of the WDRs and an explanation of any violation of those requirements.
6. Copies of LAA inspection logs.
7. If requested by staff, copies of laboratory analytical report(s).
8. A calibration log verifying calibration of all hand-held monitoring instruments.

B. Semi-Annual Monitoring Reports

Effective immediately, the Discharger shall establish a semiannual groundwater sampling and reporting frequency, such that samples are obtained approximately every six months. Semiannual monitoring reports shall be submitted to the Central Valley Water Board by the **1st day of the second month after the semiannual period** (e.g., the January-June semiannual report is due by August 1st). The Semiannual Monitoring Report shall include the following:

1. Results of groundwater monitoring.
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDRs, 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 locations monitored with reference to summary data tables, graphs, and appended analytical reports (as applicable).

5. Summary data tables of historical and current water table elevations and analytical results.
6. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells, surface water monitoring locations, and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.
7. Copies of laboratory analytical report(s) for groundwater monitoring.

C. Annual Report

An Annual Monitoring Report shall be submitted to the Central Valley Water Board by **1 February** each year. The Annual Monitoring Report shall include the following:

1. The results of the annual monitoring for Turlock Irrigation District water and groundwater supply monitoring.
2. Tabular and graphical summaries of all data collected during the year.
3. Tabular summaries of monthly and annual totals for wastewater flows, treated wastewater used for irrigation (hydraulic loading in gallons/acre and inches), total nitrogen (lbs/ac/yr), and fixed dissolved solids (lbs/ac/yr).
4. A statistical evaluation of groundwater quality and compliance with the Groundwater Limitations of the WDRs in accordance with the approved *Groundwater Limitations Compliance Assessment Plan* submitted pursuant to Provision I.1.a of the WDRs. Statistical analyses shall be presented for the following constituents: total dissolved solids, chloride, nitrate nitrogen, arsenic, iron, and manganese.
5. A digital database (Microsoft Excel) containing historic effluent, water supply and groundwater monitoring data.
6. A comprehensive evaluation of the effectiveness of the past year's wastewater application operation in terms of odor control and groundwater protection, including consideration of application management practices (e.g., waste constituent and hydraulic loadings, application cycles, drying times, and cropping practices), and groundwater monitoring data.
7. A summary of the crops removed from each LAA and yields (tn/ac). The summary shall include planting and harvest dates and crop type.
8. Estimated flows for the next calendar year.
9. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
10. Summary of information on the disposal of wastewater treatment sludge, including the results from any sludge monitoring required by the disposal facility.
11. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

12. Equipment maintenance and calibration records, as described in Standard Provision No. C.4.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall include a discussion of requirement violations 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 actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain a statement by the Discharger, or the Discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete, 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.

Ordered by: - Original signed by -
PAMELA C. CREEDON, Executive Officer
4 October 2012
(Date)

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS R5-2012-0104
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

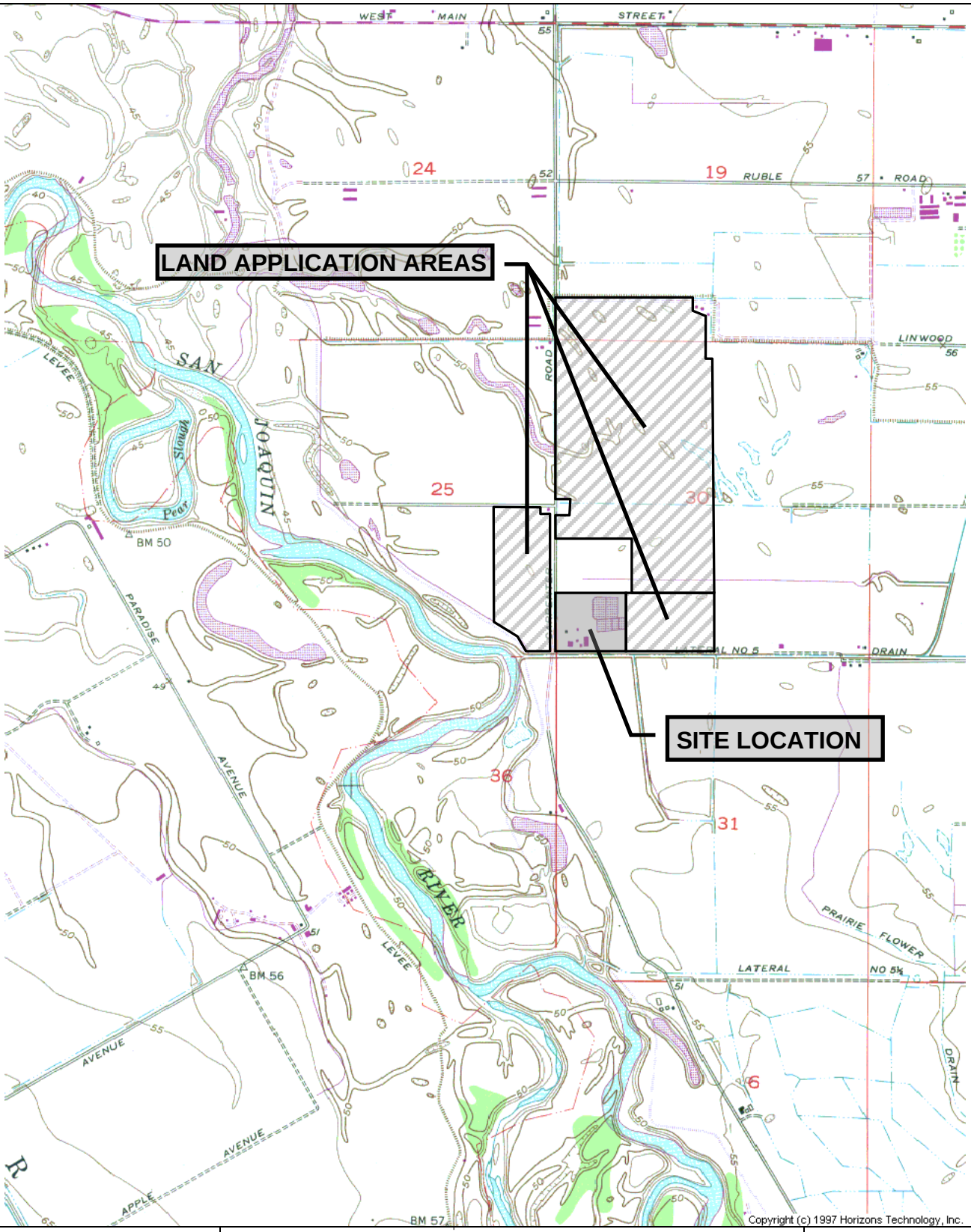
The water balance model shows that the facility provides the following capacity if at least six of the existing ponds are maintained for use as storage ponds:

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

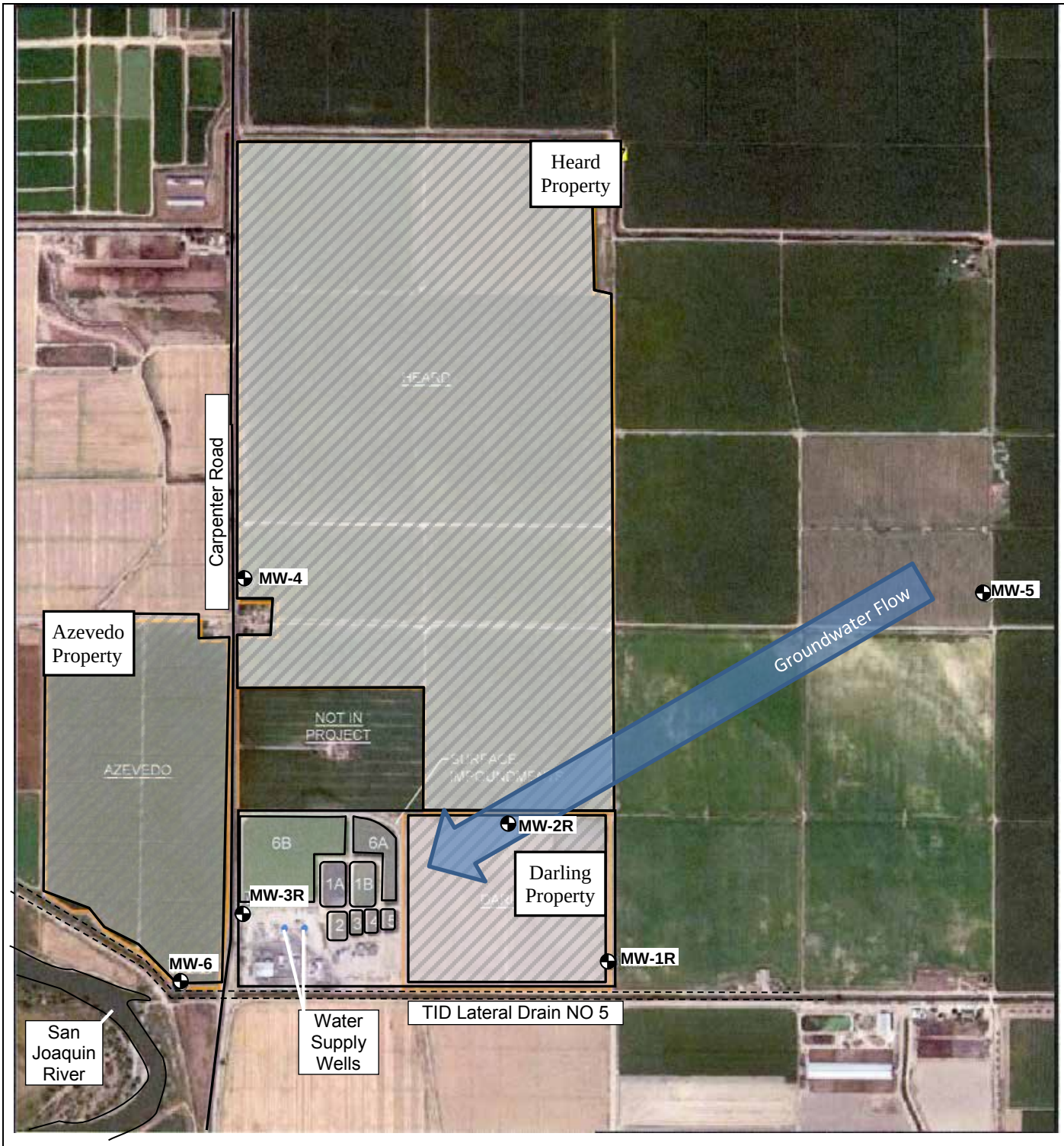
This Order contains interim and final effluent limits for BOD, total nitrogen, FDS and chloride and a mass loading rate for total nitrogen to the LAAs. This Order also contains groundwater limits that implement the Basin Plan groundwater water quality objectives for total coliform organisms and does 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.



Drawing Reference:	**SITE LOCATION**	
U.S.G.S. Crows Landing 7.5 Minute Quads	DARLING INTERNATIONAL, INC. 11946 CARPENTER ROAD STANISLAUS COUNTY	N W E S approx. scale 1 in. = 4,550 ft.



Drawing Reference:	**SITE PLAN**	
DJH Engineering April 2011 Report of Waste Discharge	DARLING INTERNATIONAL, INC. 11946 CARPENTER ROAD, CROWS LANDING STANISLAUS COUNTY	N W E S approx. scale 1 in. = 1,960 ft.

ORDER R5-2012-0104
ATTACHMENT C

TECHNICAL INFORMATION
FOR A REPORT OF WASTE DISCHARGE

For

Discharges to Land in the WDR (Non 15[1]) Program (Individual WDRs Only)

This document provides guidance for applying for individual waste discharge requirements only. If you believe that your discharge would be appropriately regulated under general waste discharge requirements or general waiver, please see the links below and contact Central Valley Water Board staff for guidance.

General WDRs: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/#General
Waivers: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/#Waivers

What is a Report of Waste Discharge?
A Report of Waste Discharge (ROWD) is an application for waste discharge requirements. A ROWD consists of the following:

1. A completed and signed Form 200, which can be down loaded from the internet at http://www.waterboards.ca.gov/publications_forms/forms/docs/form200.pdf.
2. A technical report prepared by a California registered Civil Engineer that presents the information listed in the table below.
3. For a new or previously unpermitted discharges, a check for the first annual fee made payable to the *State Water Resources Control Board*. Consult with staff to determine the required fee. There is no fee if you are applying for revised or updated WDRs because you are already subject to an annual permit fee. The current fee schedule can be viewed at the following link: http://www.waterboards.ca.gov/resources/fees/index.shtml#wdr

Compliance with the California Environmental Quality Act (CEQA)
Although not required as part of the ROWD, for new, previously unpermitted, or expanding/changing discharges, you must also submit a copy of any draft and final environmental review documents prepared to comply with the California Environmental Quality Act (CEQA).

If the local planning agency (city or county, as applicable) or another public agency has determined that the project (or expansion, changes, etc.) does not require any discretionary action by that agency, the Central Valley Water Board may be the lead agency for the purposes of CEQA, and you will be required to submit an Initial Study and pay all fees and other costs associated with the CEQA process unless the Board determines that the action falls within the scope of a categorical or statutory exemption. Fees associated with the filing of an Initial Study may include a California Department of

[1] The Non 15 Program regulates discharges to land that are exempt from Title 27 of the California Code of Regulations. See the following link for a brief explanation of Title 27 and exemptions that may be used: http://www.waterboards.ca.gov/water_issues/programs/land_disposal/waste_discharge_requirements.shtml

Fish and Game fee, County Clerk recording fees, and costs for publishing the CEQA Notice of Intent in a local newspaper. Consult with your local planning agency and Central Valley Water Board staff if you have any questions about CEQA. Additional information about CEQA is also available at the following link: http://opr.ca.gov/m_ceqa.php.

What is Required for the ROWD Technical Report?
Please note the following tips to expedite the ROWD review and waste discharge requirements development:

- Providing the information in the same order as the list below will help to expedite the ROWD review. Staff will use this as a checklist.
- If any of the information is missing or incomplete, the ROWD will be deemed incomplete and the process (and your project) will be delayed until all of the required information is submitted. You will be notified in writing of the ROWD status after it has been reviewed. If the ROWD is incomplete, we will specify the additional information that is required to complete the ROWD.
- All numerical data presented in tables and calculations performed using spreadsheets should be provided in digital form (MS Excel compatible spreadsheet) as well as hard copy.
- If some of the information listed below can be found in a previous technical report prepared by a registered professional, the ROWD can incorporate the report as an appendix, but the ROWD text must specify where in the report the required information can be found. However, if appended reports contain information that conflicts with the body of the ROWD, it may cause further delays.

	A. General Information
	1. Is this a new/proposed or existing facility?
	2. If this is an existing facility, is the discharge currently regulated under Waste Discharge Requirements (WDRs) issued by the Central Valley Water Board?
	a. If so, provide the WDRs order number.
	b. If not, provide the name of the local agency that issued the current permit.
	3. Provide a copy of any other permits that reference or relate to the wastewater disposal system. This includes Use Permits and Surface Mining and Reclamation Act (SMARA) reclamation plans, etc.
	4. Provide the following for the facility that generates the waste and the site where the waste is discharged:
	a. Street address (provide street name and distance from nearest cross street if there is no street number).
	b. The approximate latitude and longitude of the facility that generates the wastewater, wastewater treatment facilities, and wastewater land disposal areas.
	c. Township, Range, and Section.
	d. Assessor's parcel numbers.

	B. Wastewater Facility and Discharge Complete this section for both new/proposed facilities and existing facilities.
	1. A description of the sources and types of wastewater flowing into the system from:
	a. residential (population served and number of connections or equivalent dwelling units).
	b. commercial (number of connections by type).
	c. industrial (number of connections by type).
	2. Design influent flow rates (average daily, dry weather daily, peak hour, peak day, and peak month), and the design treatment capacity of the system with respect to each of these. For new/proposed facilities, provide the methods used to estimate these design parameters and copies of all calculations.
	3. For existing facilities, a summary table of monthly influent flow totals and monthly precipitation totals for the last five years. Explain any data gaps, outliers, and/or unusual circumstances that might affect measured flow rates. If sewer inflow and infiltration (I/I) contributes significantly to influent flow, provide an I/I analysis to project I/I as a function of total annual precipitation and/or groundwater level as appropriate.
	4. A detailed description of the facilities that generate wastewater, and all wastewater conveyance, treatment, and disposal systems. Use site plans and conceptual drawings as appropriate to illustrate locations and typical construction. Include all treatment processes. The following maps, plans, and illustrations are needed:
	a. A facility location map showing local topography, the facility location and/or boundaries, streets, and surface waters (including storm water drainage ditches, irrigation canals, and irrigation/tailwater ditches).
	b. A process flow schematic for the entire treatment and disposal system. Include existing and proposed flow monitoring devices and sampling locations proposed to determine compliance with the WDRs.
	c. A scaled treatment plant site plan.
	d. A scaled map showing the limits of all proposed wastewater treatment, storage and disposal areas.
	5. Characterization of the source water (the community or process water supply), influent wastewater quality (prior to treatment or discharge), and treated effluent quality. See Table 1 for a minimum list of constituents to be analyzed.
	6. For POTWs and domestic wastewater facilities, a description of the sewer system, sewer materials and age, and lift station details (type, location, capacity, backup systems, and alarm features). Discuss potential inflow and infiltration (I/I) rates in light of local groundwater conditions and sewer system materials/design. For industrial facilities, a description of the industrial wastewater collection and conveyance system.
	7. A description of proposed alarm systems, emergency wastewater storage facilities, and other means of preventing treatment system bypass or failure during reasonably foreseeable overload conditions (e.g., peak flows, power failure, sewer blockage). Consider both potential problems at the treatment system and within the conveyance system.

	8. Preventive and contingency measures for controlling spills and accidental discharges.
	9. Flood and frost protection measures (structural and operational) employed at the facility.
	10. For debris, grit and screenings, sludge, and biosolids the following:
	a. A description of solids generation rates, on-site treatment and handling systems, and short-term storage procedures.
	b. A description of solids disposal practices.
	c. For facilities that do not have continuous sludge wasting systems (i.e., where sludge accumulates in treatment and/or storage ponds), the frequency of assessing accumulated sludge volume, the date of the last sludge volume assessment, the date of the last sludge cleanout, and expected frequency of future sludge cleanout activities
	11. For each wastewater treatment, storage, or disposal pond and containment structure, provide the following information:
	a. Identification (name) and function of the pond.
	b. Surface area, depth, and volumetric capacity at two feet of freeboard.
	c. Height (relative to surrounding grade), crest width, interior slope, and exterior slope of each berm or levee.
	d. Materials used to construct each berm or levee.
	e. Description of engineered liner, if any. Include a copy of the Construction Quality Assurance (CQA) Report if one was prepared.
	f. Estimated steady state percolation rate for each unlined pond.
	g. Depth to shallow groundwater below the base and pond inverts.
	h. Overfilling/overflow prevention features.
	i. Operation and maintenance procedures.
	12. For subsurface disposal systems, provide the design basis and documentation demonstrating that the system has been designed in accordance with applicable regulations, codes, ordinances, and guidelines. If the design deviates from these requirements, provide justification in terms of system longevity, maintainability, and groundwater protection.
	13. If treated domestic effluent will be recycled for beneficial reuse or if wastewater will reused or land-applied[2], provide a complete description of the following:
	a. Ownership and contact information for each landowner[3].
	b. Effluent disinfection system.
	c. Effluent conveyance systems.

[2] Uses of recycled water that are limited to landscape irrigation (including golf courses) can be regulated under General WDRs issued by the State Water Board. See this webpage for more information: http://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/landscape_irrigation_general_permit.shtml.

[3] Landowners are typically named in WDRs as co-dischargers, and the WDRs may include separate requirements with which co-dischargers must comply.

	d. Water recycling/Land application areas (LAA) areas.
	e. Cropping plans.
	f. Planned operations (planting and harvest, irrigation method, irrigation frequency, irrigation amounts).
	g. Expected nutrient loadings (pounds per acre per year total nitrogen).
	h. Expected salt loadings (pounds per acre per year total dissolved solids).
	i. Tailwater management methods.
	j. Storm water runoff management methods.
	k. Setback distances from the edge of each recycling/land application area from the property boundary, public streets, occupied structures owned by others, and surface waters/surface water conveyances.
	l. Plans that illustrate items c, d, i, j, and k above
	14. If wastewater effluent will be recycled pursuant to Title 22 of the California Code of Regulations (e.g., if domestic wastewater is recycled to grow crops, irrigate landscaping, provide pasture for livestock, or for landscape or recreational impoundments, including reclamation sites owned by a POTWs, unless water is recycled solely for irrigation of landscaping at the POTW site) a Title 22 Engineering Report must be submitted to both the Central Valley Water board and California Department of Public Health[4].
	15. Projected monthly water balances demonstrating adequate containment capacity for both the average rainfall year and the 100-year return period total annual precipitation, including consideration of at least the following:
	a. For POTWs and private domestic wastewater facilities, initial baseline influent and I/I flows as well as baseline influent and I/I flows at full build out with an aging sewer system.
	b. A minimum of two feet of freeboard in each pond at all times (unless a registered civil engineer determines that a lower freeboard level will not cause overtopping or berm failure).
	c. Historical local evapotranspiration, pan evaporation, and lake evaporation data (monthly average values).
	d. Local precipitation data with the 100-year return period annual total distributed monthly in accordance with mean monthly precipitation patterns.
	e. Proposed recycling area/land application area/disposal system hydraulic loading rates distributed monthly in accordance with expected seasonal variations based on crop evapotranspiration rates.
	f. Projected long-term percolation rates (including consideration of percolation from unlined ponds and the effects of solids plugging on all ponds).
	16. Proposed flow limits and basis for the limits. Consider dry weather flows vs. peak flows and seasonal variations. Include the technical basis for the proposed flow limit (e.g., design

[4] To the extent this information is already presented in the Title 22 Engineering Report, the RWD may incorporate that report by reference. The Title 22 Engineering Report must also be submitted to the California Department of Public Health for review and approval.

	treatment capacity; hydraulic capacity of a main lift station, headworks, or other system element; and demonstrated effluent storage/disposal capacity).
	17. A narrative description of treatment system operation and maintenance procedures to be employed, including those associated with effluent storage and disposal.
	18. For POTWs, the level of operator certification and staffing; the names and grade levels of all certified operators, and the hours that the facility is manned.
	19. For privately owned domestic wastewater treatment facilities, the names and grade levels of all certified operators, and the hours that the facility is manned. If the facility does not have a certified operator, provide justification for not retaining one.
	C. Planned Changes in the Facility and Discharge (for existing facilities only)
	1. Describe in detail any and all planned changes in the facility or discharge, addressing each of items listed in Section B above.
	D. Local and Site-Specific Conditions (Illustrate with maps as appropriate)
	1. Neighboring land uses.
	2. Typical crops grown (if agricultural area).
	3. Irrigation water source(s) and volume and quality data (if agricultural area).
	4. Terrain and site drainage features.
	5. Nearest surface water drainage course.
	6. FEMA floodplain designation(s).
	7. Average Annual precipitation (inches)
	8. 100-year 365-day precipitation (inches)
	9. Reference evapotranspiration (monthly and annual total)
	10. Pan evaporation (monthly and annual total)
	11. A description of the types and depths of soil underlying ponds and/or effluent disposal areas (include a copy of the geotechnical report and/or NRCS soil report). Include at least the following:
	a. Depth of unsaturated soil when groundwater is closest to the surface.
	b. Soil types based on site-specific information, sampling locations (accurately measured and recorded), description and results of percolation tests or other tests used to estimate soil long-term infiltration rates. Include depth, thickness, and soil horizons. Soils must be described at a minimum of five feet below the bottom of any disposal unit.
	c. Bedrock type and condition encountered in disposal area, if any.
	d. A scaled map depicting soil/rock types and test locations.
	12. Provide the following information about hydrogeology and groundwater:
	a. Stratigraphy, groundwater elevation and gradient, transmissivity, and influence of all recharge and pumping sources (site conceptual model).
	b. Elevation and gradient of first groundwater at the facility
	c. Depth to highest anticipated groundwater based upon onsite measurements taken

	during wet season.
	d. Shallow groundwater quality for typical waste constituents, up/down gradient. (See Table 1)
	e. Information on monitoring well locations, construction details, and locations of any geological features (e.g. aquitards, subterranean channels, faults) and aquifer characteristics.
	f. Summary of historical groundwater monitoring results (last 5 years for existing facilities, 2 years for new/planned facilities).
	E. Antidegradation Analysis
	The State Water Resources Control Board Resolution No. 68-16 (the Antidegradation Policy) requires that the Central Valley Water Board maintain the high quality of waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in exceedances of one or more water quality objectives. If a discharge will degrade groundwater quality but will not cause an exceedance of one or more water quality objectives, the discharger must demonstrate that all practicable treatment or control measures have been implemented or will be implemented such that the Board can consider these measures to represent the "best practicable treatment or control" (BPTC) of the constituents of concern. Demonstrating that BPTC has been, or will be, implemented at the site can provide justification for the Board to allow the current level of degradation to continue or increase (as applicable), or for the Board to allow any degradation in the case of a new discharge. The Antidegradation Policy is incorporated into our Basin Plans, which also include implementation plans that we follow. See the following link for the Basin Plans and other important policy documents: http://www.waterboards.ca.gov/centralvalley/plans_policies/
	The Antidegradation Analysis must include the following:
	1. For existing facilities, whether the discharge has caused degradation. If so, for which constituents, to what degree, and whether the discharge has caused exceedance of a water quality objective.
	2. The potential for the discharge to degrade groundwater quality (for new discharges) or further degrade groundwater quality (for existing discharges, whether or not the discharge is expanding).
	The assessment must be made based on site-specific data and shall include the following items for each constituent listed in the effluent category on Table 1:
	a. Characterization of all waste constituents to be discharged that have the potential to degrade groundwater quality;
	b. Characterization of shallow groundwater quality (i.e., the uppermost layer of the uppermost aquifer) for typical waste constituents[5] upgradient and downgradient of the site and

[5] Include analyses for the following: total coliform organisms, total dissolved solids, fixed dissolved solids, electrical conductivity, nitrate nitrogen, total nitrogen, and major anions and cations.

	comparison to established water quality objectives [6] (include tabulated historical groundwater monitoring data and groundwater elevation contour maps for the last eight monitoring events);
	c. A description of the geology and hydrogeologic conditions of the site including groundwater elevation and gradient, transmissivity, influence of all known recharge and pumping sources, and subsurface conditions at the facility, including any proposed new disposal site or storage ponds;
	d. Groundwater degradation , if any, that has resulted from existing operations, other nearby discharges, or natural occurrences;
	e. The areal extent that the discharge has impacted or will impact the quality of the shallow groundwater, if any;
	f. The concentration found and/or expected increase in concentration in shallow groundwater for each constituent.
	g. If degradation has occurred or is expected to occur describe the following:
	i. Any facility design features and operational practices that reduce the potential for groundwater degradation (treatment or control). Such features might include salinity source control, other pollutant source control, advanced treatment, disinfection, concrete treatment structures, and pond lining systems, etc.
	ii. Additional treatment or control measures that could be implemented and a preliminary capital and annual operations and maintenance cost estimate for each.
	iii. How current treatment and control measures are justified as BPTC (i.e., what justifies not implementing additional measures);
	iv. How no water quality objectives will be exceeded; and
	v. Why allowing existing and/or anticipated degradation is in the best interest of the people of the state.
	F. Industrial Storm Water Permit
	The State Water Resources Control Board adopted Order 97-03-DWQ (NPDES General Permit CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. Many industrial facilities and some domestic wastewater treatment facilities are required to obtain coverage under this permit. Provide evidence that the facility is exempt or has applied for coverage under the Industrial Storm Water Permit. See the following link for more information: http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/
	G. General WDRs for Sanitary Sewer Systems.

[6] Compare to Basin Plan water quality objectives, including drinking water standards, agricultural water quality goals, etc.

	The State Water Resources Control Board adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Order 2006-0003-DWQ). The permit requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to obtain coverage. Provide evidence that the facility is exempt or has applied for coverage under the General WDRs for Sanitary Sewer Systems. See the following link for more information: http://www.waterboards.ca.gov/water_issues/programs/sso/index.shtml
	H. Department of Water Resources Well Standards
	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 Water Code section 13801, apply to all monitoring wells. Discuss whether existing monitoring wells at the facility were constructed in accordance with the Department of Water Resources Well Standards. See the following link for more information: http://wwwdpla.water.ca.gov/sd/groundwater/california_well_standards/well_standards_content.html

Table 1

The Report of Waste Discharge must characterize the groundwater (G), source water (S), treatment system influent (I), and effluent discharge (E) for, at minimum, the constituents indicated in the list below. The characterization must be based on a statistically significant number of representative samples as determined by an appropriately registered and/or licensed professional. All media must also be characterized for all additional waste constituents that may be in the discharge based on the facility processes employed but not listed below.

Constituent [1]	Units	Minimum Recommended Characterization Data			
		POTW/ Domestic	Food Processor	Sand and Gravel	Other Industry
Biochemical Oxygen Demand	mg/L	I, E	I, E		E
Chemical Oxygen Demand	mg/L	G, E	I, E		E
Settleable Matter	ml/L	E	E		E
Total Suspended Solids	mg/L	I, E	I, E		E
Total Dissolved Solids	mg/L	G, S, I, E	G, S, E	G	G, S, E
Fixed Dissolved Solids	mg/L		E		G, S, E
Electrical Conductivity	umhos/cm	G, S, I, E	G, S, I, E	G, S, I, E	G, S, I, E
Total Kjeldahl Nitrogen as N	mg/L	G, S, E	G, S, E		G, S, E
Ammonia Nitrogen as N	mg/L	G, S, E	G, S, E		G, S, E
Nitrate Nitrogen as N	mg/L	G, S, E	G, S, E		G, S, E
pH	pH Units	G, S, I, E	G, S, E	G, S, I, E	G, S, I, E
General Minerals[2]					
Alkalinity	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Hardness	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Bicarbonate	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Carbonate	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Calcium	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Magnesium	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Chloride	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Potassium	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Sodium	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Sulfate	mg/L	G, S, E	G, S, E	G, S, E	G, S, E
Metals[3]					
Aluminum	ug/L	E			E
Antimony	ug/L			S, E	

Constituent [1]	Units	Minimum Recommended Characterization Data			
		POTW/ Domestic	Food Processor	Sand and Gravel	Other Industry
Arsenic	ug/L	G, S, E	G, S, E	G, S, E	G, S, E
Barium	ug/L			S, E	
Beryllium	ug/L			S, E	
Boron	ug/L	G	G	G, S, E	G
Cadmium	ug/L			S, E	
Chromium (IV)	ug/L			S, E	
Chromium (III)	ug/L			S, E	
Total Chromium	ug/L	G	G	G, S, E	G
Cobalt	ug/L			S, E	
Copper	ug/L	E	E	S, E	E
Fluoride	ug/L			S, E	
Iron	ug/L	G, S, E	G, S, E	G, S, E	G, S, E
Lead	ug/L	E		S, E	E
Mercury	ug/L	E		S, E	E
Manganese	ug/L	G, S, E	G, S, E	G, S, E	G, S, E
Molybdenum	ug/L			S, E	
Nickel	ug/L			S, E	
Selenium	ug/L			S, E	
Silver	ug/L			S, E	
Thallium	ug/L			S, E	
Vanadium	ug/L			S, E	
Zinc	ug/L	E		S, E	E
Disinfection By-Products[4]	ug/L	G, E	E		E
Formaldehyde[5]	ug/L	G, E	E		E
Phenols[5]	ug/L	G, E			E
Priority Pollutants[6]	Various	G, E			E

[1] With the exception of wastewater samples, samples for metals analysis must first be filtered using a 0.45-micron filter. If filtering in the field is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain of custody form) to immediately filter then preserve the sample.

[2] General minerals analyses shall be accompanied by a cation/anion balance demonstrating complete analyses.

[3] Where constituents are analyzed as part of other suites of constituents, the results may be substituted to avoid redundant analyses (i.e., arsenic results collected to fulfill the metals suite requirements may also be used to fill the Priority Pollutant suite requirements provided appropriate detection limits are used.).

[4] If wastewater is disinfected using chlorination or chlorination is used in internal disinfection processes.

[5] If the facility accepts holding tank waste from RVs, boats, or portable toilets.

[6] The Discharger must determine which priority pollutants, if any, are likely to be present in the discharge at concentrations that might degrade groundwater quality, and must provide characterization data for those constituents.

17 October 2012

CERTIFIED MAIL
7010 0290 0000 8536 4490

William R. McMurtry
Darling International, Inc.
251 O'Conner Ridge Blvd, Suite 300
Irving, TX 75038

CERTIFIED MAIL
7010 0290 0000 8536 4483

Oscar Heard
10900 Carpenter Rd
Crows Landing, CA 95313

CERTIFIED MAIL
7010 0290 0000 8536 4476

Val and Mary Azevedo
938 Real Avenue
Newman, CA 95360

NOTICE OF ADOPTION
OF
ORDER R5-2012-0104

WASTE DISCHARGE REQUIREMENTS
FOR
DARLING INTERNATIONAL INC., OSCAR HEARD
AND VAL AND MARY AZEVEDO

DARLING INTERNATIONAL RENDERING PLANT
STANISLAUS COUNTY

Waste Discharge Requirements (WDRs) Order R5-2012-0104 for the Darling International Rendering Plant was adopted by the Central Valley Regional Water Quality Control Board on 4 October 2012.

Although the WDRs allow wastewater discharge to land, the discharge is a privilege not a right and may be revoked at any time. A copy of the Order must be maintained at the facility and must be accessible to anyone operating the wastewater system. Please note that the Provisions section of the WDRs requires submittal of certain technical reports by the dates provided in the Order. The required submittals include the items listed in the following table.

Required Reports	**Due Date**
Groundwater Limitations Compliance Assessment Plan	**1 January 2013**
LAA Flow Meter Installation Report	**1 April 2013**
Treatment System Performance Evaluation Report	**1 February 2014**
Wastewater Treatment Facility Upgrades Completion Report	**1 December 2015**
Engineered design and operational plan of sludge drying system[1]	**Within 120 days of the period specified[1]**

[1] Prior to planned construction or use of any sludge drying and storage areas.

In addition to technical reports required by the WDRs, the WDRs include a Monitoring and Reporting Program (MRP), which specifies monitoring and reporting requirements for you to implement. Please review the MRP closely so that you may establish appropriate sampling schedules and reporting protocols. The required monitoring report submittal dates are in the table below.

Required Monitoring Report	**Due Date**
Monthly Monitoring Reports	**1st day of second month following the sampling (the February Report is due by 1 April)**
Semi-Annual Monitoring Reports	**1st day of second month after the semiannual period (the January – June report is due by 1 August)**
Annual Monitoring Reports	**1 February of each year**

Please be advised that the monitoring reports must be submitted on time and complete. Monitoring reports must include all of the items described in the Reporting Section of the MRP. **The first monitoring report is due on 1 December 2012 and is to cover the month of October 2012.** Please attach the enclosed monitoring report cover letter to front of each of your monitoring reports.

To conserve paper and reduce mailing costs, a paper copy of the Order has been sent only to the Discharger. Interested parties are advised that the full text of this Order is available at: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/. Anyone without access to the Internet who needs a paper copy of the Order can obtain one by contacting Central Valley Water Board staff.

If you have any questions regarding submitting an updated report of waste discharge, or making changes to your permitted operations, please contact Robin Merod at (916) 464-4697 or rmerod@waterboards.ca.gov.

All compliance and enforcement questions should be directed to Guy Childs with the Compliance and Enforcement Section, at (916) 464-4648 or gchilds@waterboards.ca.gov. All technical reports and monitoring reports should be submitted to Mr. Childs by the compliance due date.

- Original signed by -

ANNE OLSON, P.E.
Senior Water Resource Control Engineer
Waste Discharge to Land Permitting Section

Enclosures : Order No. R5-2012-0104
Standard Provisions and Reporting Requirements for Waste Discharge Requirements, 1 March 1991
Monitoring Report Cover Letter

cc w/o enc: see next page

cc w/o enc: Patrick Pulupa, Office of Chief Counsel, State Water Board, Sacramento
Gordon Innes, State Water Board, Sacramento
Bella Bedal, Stanislaus County Environmental Health Department, Modesto
James Roth, Darling International, Inc., Crows Landing
Dan Hinrichs, P.E., DJH Engineering, Placerville, CA
Pat Behling, P.E., Pastor, Behling, & Wheeler, LLC, Round Rock, TX