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DARLING INTERNATIONAL INC.

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August 20, 2012

Mr. Robin Merod, Ph.D.
Water Resources Control Engineer
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

Re: Comments to Tentative Waste Discharge Requirements
Darling International Inc. - Turlock Facility, Stanislaus County

Dear Mr. Merod:

Darling International Inc. (Darling) has received the subject tentative waste discharge requirements (WDRs) from the Central Valley Regional Water Quality Control Board (RWQCB) for the Darling recycling facility located in Turlock, California (hereafter the "Facility"). Darling appreciates the opportunity to review and comment on the tentative WDRs and we thank the RWQCB for their efforts to date and for recognizing the significant investments Darling has made in this process.
Our comments to the tentative WDRs are presented below. Each comment is referenced to the applicable section of the WDRs and/or supporting documentation to facilitate your review.

Effluent Limitations – WDRs Page 19

As described in the WDRs, Darling upgraded its wastewater treatment system during 2010/2011 and placed the upgraded system into operation in December 2011. The upgraded system consists of biological nutrient removal (BNR) through aerobic and anoxic stages utilizing activated sludge, dissolved air flotation for final clarification, and sludge recycling. Treated effluent from the system is stored in the former surface impoundments prior to land application on the designated land application areas (LAAs).

Since the treated effluent from the upgraded system is land applied, the WDRs require Darling to submit a *Groundwater Limitations Compliance Assessment Plan* that describes the statistical methods that will be used to determine compliance each year with background groundwater quality (as measured in well MW-5). In addition, the WDRs establish effluent limitations for BOD_5, total nitrogen, fixed dissolved solids (FDS) and chloride in the treatment system effluent discharged to the impoundments prior to land application.

Darling concurs that a statistically derived comparison of groundwater quality data from monitoring wells downgradient of the land application areas to background groundwater quality is the most appropriate method for evaluating the potential effects to groundwater from the land applied wastewater over time. Darling also agrees that the treatment system effluent should be

monitored under the WDRs to ensure that agronomic loading rates are maintained on the LAAs; however, for effluent limitations to be included in the WDRs there needs to be a regulatory basis and if so, they must reflect realistic treatment system performance objectives.

Darling hereby requests that the RWQCB modify the effluent limitations in the WDRs as follows:

- BOD_5. BOD_5 serves as the primary carbon source for nitrification and denitrification and is consumed as part of the BNR process. In fact, depending on the mass of nitrogen to be removed, the treatment system is designed to provide an additional carbon source (in the form of methanol) if all of the BOD_5 is consumed before the design effluent total nitrogen concentrations are achieved. Darling monitors COD at various locations in the treatment system for process control purposes.

  In addition, BOD_5 is not a critical constituent for controlling land application loading rates for the wastewater. The WDRs recognize this fact on pages 12-13, which states that "*...the discharge does not have the potential to cause excessive BOD loading rates before other limits are reached. Therefore, this Order does not set a BOD loading limit*".

  Based on this information, Darling requests that the BOD_5 effluent limitation to be removed from the WDRs.

- Total Nitrogen. Total nitrogen is a key constituent for controlling agronomic loading to the LAAs and reducing total nitrogen levels in the wastewater was a primary design factor for the upgraded treatment system. The annual average treatment system design target for total nitrogen in the final effluent is 40 mg/L; however, the actual total nitrogen concentrations in the final effluent will vary above and below this value during the year due to seasonal variations in the influent loading and ambient temperatures which can degrade the quality of the raw materials recycled at the Facility. In addition, although the biological organisms used in BNR typically thrive and perform successfully under optimum conditions performance can be temporary influenced by the presence of inhibitory substances.

  The WDRs stipulate that the total nitrogen mass loading to each LAA shall not exceed the agronomic rate for the crop grown and Darling believes that this approach should be the primary focus of any nitrogen limitations stipulated in the WDRs. There does not appear to be an obvious benefit to the environment by adding nitrogen based effluent limitations in the WDRs for our treatment process nor does there appear to be a regulatory requirement for establishing such a limitation. As such Darling requests that the Effluent Limitation for total nitrogen be removed from the WDRs.

  If the RWQCB determines that an Effluent Limitation is required under the regulations, the Effluent Limitation for total nitrogen must take into account the agronomic rate for the crop that will receive the wastewater as well as the variability in effluent total nitrogen concentrations from the treatment system during the year. The attached Table 1 shows a nitrogen balance for the LAAs under the maximum wastewater flow limit established in Section B of the WDRs (117 MG/yr, which is more than double the current wastewater flow at the Facility). At this land application flow rate, an average annual total nitrogen

Effluent Limitation of 80 mg/L would not exceed the agronomic rates for the crops grown on the LAAs.

- FDS. In previous submittals to the RWQCB, Darling described the process and operational modifications implemented at the Facility since 2002 that have significantly reduced the concentration of FDS in the treated wastewater for land application. Most of the FDS present in the wastewater originates in the Turlock Irrigation District (TID) water used at the Facility and the well water from the on-site wells that serves as the source of boiler feed water. For example, historical FDS concentrations in the TID water have ranged as high as 853 mg/L (see Page 7 of WDRs).

  In addition, supplemental alkalinity (in the form of magnesium hydroxide) must be added to the BNR component of the upgraded treatment system to provide the necessary alkalinity to ensure effective overall nitrogen removal. The magnesium hydroxide addition also increases the FDS concentration of the wastewater. In the design of its upgraded treatment system Darling chose the Modified Ludzack-Ettinger process (MLE) because of its ability to produce its own alkalinity which limits the need for adding FDS creating chemicals. Magnesium hydroxide was also chosen for supplementing alkalinity where necessary because it has the least potential to add to the FDS profile in the final effluent and magnesium is a critical element to plant growth; essential for photosynthesis (as described in the Western Fertilizer Handbook). Potassium is another component of FDS in our Effluent that is a critical element to plant growth and the crop uptake for this compound is significant at 250-350 lbs/ac/yr. The majority of the compounds making up FDS are crop beneficial.

  Page 16 of the WDRs indicates that Darling has "*...implemented Best Practicable Treatment and Control (BPTC)...*" for "salinity control" at the Facility. As described above, FDS concentrations in the wastewater are a function of the FDS in the incoming TID and well water and the addition of supplemental alkalinity to remove nitrogen as part of the BNR process. The updated treatment system is not designed to remove FDS and

  Darling has no control over FDS concentrations in the TID water and well water. Because the upgraded treatment system has only been in operation since the end of 2011 there has not been an adequate length of time to develop a performance trend for FDS. Darling requests if there is a regulatory requirement for establishing an Effluent Limitation for FDS that the WDRs allow for the collection of 12 months of data before an FDS limitation for the effluent is established. This will allow for the appropriate performance based annual average concentration for FDS to be statistically determined.

- Chloride. Similar to FDS, Darling has implemented process and operational modifications at the Facility since 2002 that have significantly reduced the concentration of chloride in the treated wastewater for land application. Most of the chloride present in the wastewater also originates in the TID water and the well water from the on-site wells. For example, historical chloride concentrations in the TID water have ranged as high as 180 mg/L (see Page 7 of WDRs). The updated treatment system is not designed to remove chloride and Darling has no control over chloride concentrations in the TID water and well water.

As described above for FDS, Darling requests if there is a regulatory requirement for establishing an Effluent Limitation for chloride that the WDRs allow for the collection of 12 months of data before a chloride limitation for the effluent is established in the WDRs. This will allow for the appropriate performance based annual average concentration for chloride to be statistically determined.

It should also be noted that much of the historical reductions in FDS and chloride concentrations in the Facility wastewater are directly tied to increased use of water from the TID lateral as a substitute for higher FDS/chloride water from the on-site water wells. Due to ever changing demands for water in the area, there is no guarantee that water from the TID lateral will always be available to Darling in the quantities required, if at all. Darling requests that a provision be added to the WDRs stipulating that any FDS and chloride Effluent Limitations established for the Facility will be suspended/revisited in the event that future access to the TID water is restricted or eliminated.

Groundwater Limitations – WDRs Page 21

Groundwater Limitations are established in the WDRs and compliance with the limitations is determined based on comparison of downgradient well concentrations to background groundwater quality using approved statistical methods in the *Groundwater Limitations Compliance Assessment Plan*. Darling anticipates that the proposed Effluent Limitations described above will improve groundwater quality downgradient of the LAAs and the impoundments over time; however, Darling recognizes that the RWQCB may be concerned that utilizing Effluent Limitations that take into consideration crop uptake rates, etc. at the LAAs may not address potential releases to groundwater from the impoundments during periods when the effluent is stored prior to land application.

Groundwater quality downgradient of the impoundments is monitored under the WDRs using monitoring well MW-3R. If Groundwater Limitations continue to be exceeded in well MW-3R as of 24 months from the effective date of the WDRs, Darling will explore additional treatment and/or control measures to address the exceedences.

In addition, Darling requests that the total coliform limit be eliminated. Coliform bacteria are likely present in all irrigation water (TID) and the ground surfaces of the LAAs due to concentration of regional agricultural activities.

Residual Solids Prohibition – WDRs Page 19

Item 9 in Section A of the WDRs stipulate that "*application of residual solids to the land application areas is prohibited*". Darling requests that the prohibition against application of residual solids to the land application areas be deleted and replaced with language that allows the practice with the appropriate incorporation of the agronomic loading in the total LAAs nitrogen balance.

Monitoring and Reporting Program

Darling requests that the Monitoring and Reporting Program for the Facility be modified as follows:

- Wastewater Flow Monitoring

  1) Treatment system flow will be measured at the point the final effluent leaves the treatment system, rather than measuring the influent flow entering the treatment system. Darling will install a totalizing flow meter at a point downstream of the secondary DAF prior to discharge to the storage ponds.

  2) Effluent flow to the LAAs will be measured using a totalizing flow meter installed on the pump(s) used to transfer water from the storage system to the LAAs. For each transfer event, flow meter readings will be recorded prior to beginning pumping and after pumping has been completed and the LAAs that received the water during the event will be noted. The RWQCB recognizes there are no flow measuring devices on individual checks within the individual LAAs.

- Treatment System Influent Monitoring

  1) Darling requests that the treatment system influent monitoring requirements be deleted. Darling will collect influent samples on an as needed basis to assist in optimizing treatment system operation; however, since treatment system influent data is not used to evaluate compliance with any WDRs requirements, performance of influent monitoring under the Monitoring and Reporting Program is not required,

- Treatment System Effluent Monitoring

  1) Remove total suspended solids (TSS) monitoring requirements. Effluent from the treatment system will have low TSS concentrations and the WDRs do not establish any limitations for TSS.

  2) Please refer to previous comments related to BOD5, Nitrogen, and FDS.

  3) The "sample type" for all constituents listed under this section is shown as "grab". Darling requests that the sample type be changed to "grab or composite" for all constituents except pH. pH samples will be grab samples.

- Land Application Area Monitoring

  1) The requirements for daily inspections of the LAAs and daily calculations of hydraulic and nitrogen loading rates seem administratively burdensome without providing significant benefit. Darling requests that the LAA inspections and loading calculations be performed on a monthly basis during those months when land application is being performed. Darling will monitor precipitation on a daily basis as

presented in the WDRs.

2) Clarify that the hydraulic loading rates for TID water to the LAAs will be estimated since no means of measuring the volume of TID water sent to each LAA is available.

- Groundwater Monitoring

1) Add FDS to the constituent list. Sampling and reporting for FDS will be semiannually.

2) Remove TDS from the constituent list. TDS monitoring is not included as part of any other monitoring under the WDRs.

- Turlock Irrigation District Lateral No. 5 Water Supply Monitoring

1) Darling requests that sampling for FDS, chloride, total nitrogen, and pH be changed to a quarterly basis and reporting for these constituents be changed to a semiannual basis.

General Information Corrections

Darling requests that the RWQCB correct the following items that are incorrectly listed in the WDRs, Monitoring and Reporting Program, Information Sheet, and related documents. It is assumed that the RWQCB will incorporate any comments that reference one of the documents to the other documents as necessary.

- WDRs Item 8, Page 2 and other Sections, Information Sheet. As previously communicated to the RWQCB, the existing impoundments are clay lined rather than unlined as discussed under this item. The impoundments were also incorrectly identified as "unlined" in the current WDRs for the Facility. Darling has exposed the bottom of several of the ponds and confirmed the existence of a clay liner.

- WDRs Item 25, Page 6. 40 mg/L total nitrogen is the design annual average effluent concentration for the updated treatment system, not the "upper estimate of new treatment plant effluent" as listed in the footnotes.

- WDRs Item 5, Page 2. The last sentence should read "These raw materials are recycled into fats and proteins which are sold into the animal feed, fertilizer, oleo chemical, and biofuel markets".

- WDRs Item 15, Page 4. As described previously in this letter, constituent concentrations in the treatment system effluent (total nitrogen, FDS, etc.) will vary depending on seasonal variations, treatment system upsets, changes in TID water quality and related causes. To account for these issues, Darling has requested that the Effluent Limitations for these parameters be modified as detailed above. Accordingly, Darling requests that the third column in the table under this item (entitled "After Installing new WWTS") be deleted.

- WDRs Section F, Item 11, Page 22. Darling requests that this item be eliminated. The storage ponds cannot be emptied until after the summer crop harvest and prior to winter crop planting, since it is necessary to have the stored water available for the initial irrigation of the winter crop. This may occur after October 1.

- WDRs Section I, Item 1.c. Darling requests that the October 1 date for sludge applications should be changed to read "Apply sludge prior to planting of the winter crop".

- WDRs Section I, Item 2. Change the first sentence in this section to read "If *the conclusions of the Annual Monitoring Report* show that the discharge of waste is causing groundwater to violate any groundwater limitation *as defined in Section E of this Order*, within 120 days...

Please do not hesitate to contact me at 972-281-4409 if you have any questions or comments. Thank you for your assistance on this project.

Sincerely,

William R. McMurtry
VP of Environmental Affairs

Enclosure

CC: Jim Roth, DII
Don DeSmet, DII
Mike Molini, DII
Neil Katchen, DII
Pat Behling, PBW
Dan Hinrichs, DJHE

TABLES

Table 1

Darling International Inc. - Turlock Facility
Nitrogen Land Application Rates
Darling Effluent - 80 mg/L Total Nitrogen

Assumptions:

Total Darling WW Effluent:	117	MG/year
Total Water Applied:	4.5	ft/yr
Total Water Applied:	1.47	MG/ac/yr
WW Total N Conc:	80	mg/L
TID Total N Conc:	46	mg/L
Plant Nitrogen Uptake:	575	lb/ac/yr (Western Fertilizer Handbook, corn (silage) and sorghum sudan)
Nitrogen Irrigation Loss:	15	percent
Allowable N loading:	**661**	**lb/ac/yr**

Property	Acreage	Total Water Applied (MG/yr)	Wastewater N Applied		TID Water N Applied		Total N Applied (lb/ac/yr)
			(MG/yr)	(lb/ac/yr)	(MG/yr)	(lb/ac/yr)	
Darling	40	58.6	12.7	212	46.0	440.9	652.4
Heard	255	373.9	80.9	212	293.0	440.9	652.4
Azevedo	74	108.5	23.5	212	85.0	440.9	652.4
			117.0	**MG/yr**			

Notes:

1) Assumes total water volume applied to each property is approximately 4.5 ft/ac/year (1.47 MG/ac/year)