

Monitoring Report Submittal Transmittal Form

Attn: Guy Childs (916) 464-4648
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Discharger: The Morning Star Packing Company, LP and Fred Gobel
Name of Facility: Williams Facility
WDRs Order Number: R5-2013-0144
WDID: 5A062005001
County: Colusa

I am hereby submitting to the Central Valley Water Board the following information:

Check all that apply:

Monthly Monitoring Report for the month of _____

1st / 2nd / 3rd / 4th (**circle one**) Quarterly Monitoring Report for the year of _____

1st / 2nd (**circle one**) Semi-annual Monitoring Report for the year 2015 _____

Annual Monitoring Report for the year _____

Water balance submittal.

Violation Notification

During the monitoring period, there were / were not (circle one) any violations of the WDRs.

- 1. The violations were: *(add extra pages as needed)*
- 2. Have the violations been corrected? Yes / No. If no, what will be done to correct the violations: *(add extra pages as needed)*

Certification Statement

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Signature:  Phone: 530-219-6892

Printed Name: Hilary Reinhard, PE Date: 10/31/15

Hilary Armstrong Reinhard, P.E., QSD, QSP
P.O. Box 365
Madison, CA 95653

October 31, 2015

Mr. Howard Hold, P.G.
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Subject: The Morning Star Packing Company, LP Water Balance Calculations

Dear Mr Hold:

The Central Valley Regional Water Quality Control Board (Water Board) performed an inspection of The Morning Star Packing Company, LP (Morning Star) facility located in Williams, CA. The inspection was followed by a Notice of Violation (NOV) dated September 11, 2015. In part, the NOV requested the following:

- 1. A revised water balance which accounts for all cooling water, freshwater, wastewater and storm water discharged as a result of operations at the Morning Star facility regulated under WDRs Order R5-2013-0144.*

Calculations for the facility are provided as attachments to this report. These calculations include a hydraulic water balance that provides the maximum water production rate from the facility, historical loading rates, and the projected constituent concentrations assuming various flows from the facility.

Hydraulic Loading

A water balance showing the hydraulic loading rate for the facility is included as **Attachment A**. The hydraulic loading calculation assumes that the entire 485 acres of land application area (LAA) is planted in pasture. Evapotranspiration rates for the crops were obtained from the Irrigation Training and Research Center (ITRC) website for Zone 12.

Because the facility operates during the summer months (July through the beginning of October) there is minimal rainfall that occurs. The small amount of precipitation that does occur does not produce run off from the facility.

The calculated theoretical maximum flow rate for the facility is 4,000,000 gallons. An additional 15 inches of fresh water (606 ac-ft) is required during the spring and early summer, prior to the processing season, to irrigate the crop.

Historical Loading Rates

Using the flow and constituent concentration information for the 2014 and 2015 processing seasons, the loading rates were modeled to assess if the acreage available was adequate for the washwater applications (**Attachment B**). A summary of the findings is provided in the table below.

Table 1. Historical Loading Rates

	2014	2015
Acres Available	600	485
Average Flow Rate (gal/day)	2,364,214	1,530,793
Average BOD (mg/L)	595	1,532
Average N (mg/L)	44	62
Maximum Monthly BOD Loading (lbs/acre-day)	20	40
Average BOD Loading (lbs/acre-day)	18	40
Average N Loading (lbs/acre)	135	161

These historical loading rates show that, if properly managed, the washwater can be applied to the current LAA without exceeding the nutrient loadings for the crops and no additional LAA needs to be acquired at the current time. Additionally, modifications to the processing facility that will be implemented prior to the 2016 processing season are expected to reduce the nutrient loadings for 2016.

Constituent Concentrations

The facility anticipates that the total pounds of tomatoes and juice lost in the washwater stream will be less than or remain at the levels lost during the 2015 processing season. Planned modifications to the facility that will be implemented prior to the 2016 season will improve the efficiency of the processing. Attachment C provides the expected constituent concentrations for a variety of average daily flow rates from the facility assuming the total amount of tomato solids remains the same.

During the 2015 processing season, approximately 1.9 million pounds of BOD and approximately 77,000 pounds of nitrogen were produced. The projected

wastewater constituent concentrations, assuming that the total output (in pounds) remains constant as the flow increases and decreases, are provided in Table 2.

Table 2. Projected Constituent Concentrations based on Flow Rate

Flow Rate	BOD	N
Gallons/day	mg/L	mg/L
1,530,793	1,532	62
1,000,000	2,345	95
1,500,000	1,563	63
2,000,000	1,173	48
2,500,000	938	38
3,000,000	782	32
3,500,000	670	27
4,000,000	586	24
4,500,000	521	21
5,000,000	469	19

If you have any questions regarding these calculations, please feel free to contact me.

Respectfully,



Hilary A. Reinhard, P.E.



The Morning Star Packing Company
Land Application Area
Hydraulic Loading Budget
Pasture - 100 Year Rainfall

DATA:

Month	Number of Days per Month	Working Days per Month	100 Year		ET
			Rainfall (in/month)	Evaporation (in/month)	Pasture (in/month)
January	31	0	7.97	1.35	0.41
February	28	0	6.38	2.23	0.88
March	31	0	4.40	4.13	2.81
April	30	0	2.45	5.94	3.86
May	31	0	0.66	8.32	4.12
June	30	0	0.49	9.29	5.77
July	31	22	0.07	10.03	6.77
August	31	31	0.17	8.58	6.39
September	30	30	0.83	6.43	4.32
October	31	15	1.96	4.35	2.86
November	30	0	5.80	2.19	1.08
December	31	0	7.04	1.02	0.95
Total	365	98	38.22	63.86	40.22

Washwater Production = **4,000,000** gpd

Pasture Area = **485** acres
 Crop Rooting Depth = **5** ft
 Crop Rootzone AWHC = **10.80** inch

STORAGE POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent Exported (gal/month)	Effluent to Ponds (gal/month)	Monthly Available (gal/month)	Cumulative Available (gal/month)
January	0	0	0	0	392,000,000
February	0	0	0	0	392,000,000
March	0	0	0	0	392,000,000
April	0	0	0	0	392,000,000
May	0	0	0	0	392,000,000
June	0	0	0	0	392,000,000
July	88,000,000	0	88,000,000	88,000,000	88,000,000 *
August	124,000,000	0	124,000,000	124,000,000	212,000,000
September	120,000,000	0	120,000,000	120,000,000	332,000,000
October	60,000,000	0	60,000,000	60,000,000	392,000,000
November	0	0	0	0	392,000,000
December	0	0	0	0	392,000,000
Total	392,000,000	0	392,000,000	392,000,000	

* Start at 0 Stored July 1st

RECLAMATION AREA:

Month	Cumulative Available (gal/month)	Pasture 485 acres		Irrigation Application Efficiency = 70%		Soil Moisture Start (in)	Soil Moisture End (in)	Percolation & Leaching > 10.8 in		
		Effluent Applied (gal)	Effluent Applied (in)	Effective Rainfall (in)	Fresh Irrigation (in)				Gross Crop Need (in)	
January	392,000,000	0	0.00	6.95	0.00	0.59	10.80	17.16	6.36	
February	392,000,000	0	0.00	5.46	0.00	1.26	10.80	15.00	4.20	
March	392,000,000	0	0.00	2.61	0.00	4.01	10.80	9.40	0.00	
April	392,000,000	0	0.00	0.00	4.00	5.51	9.40	7.89	0.00	
May	392,000,000	0	0.00	0.00	4.00	5.89	7.89	6.00	0.00	
June	392,000,000	0	0.00	0.00	4.00	8.24	6.00	1.76	0.00	
July	88,000,000	88,000,000	6.68	0.00	3.00	9.67	1.76	1.77	0.00	
August	212,000,000	124,000,000	9.42	0.00	0.00	9.13	1.77	2.06	0.00	
September	332,000,000	120,000,000	9.11	0.00	0.00	6.17	2.06	5.00	0.00	
October	392,000,000	60,000,000	4.56	1.18	0.00	4.09	5.00	6.65	0.00	
November	392,000,000	0	0.00	4.91	0.00	1.54	6.65	10.02	0.00	
December	392,000,000	0	0.00	6.08	0.00	1.36	10.02	14.74	3.94	
Total		392,000,000	29.77	27.19	15.00	57.46			14.50	
Percent of Total =		1,203.0	ac-ft	1,098.9	606.3	2,322.3	ac-ft		586.0	ac-ft
		41%		38%	21%					

**The Morning Star Packing Company
Washwater Reclamation - Land Application
Water & Constituent Loading
2014 with 100 Year Rainfall**

DATA:

Month	Number of Days per Month	Working Days per Month	100 Year		ET Oats/Sudan (in/month)	BOD Ave. Applied (mg/l)	Nitrogen Ave. Applied (mg/l)
			Rainfall (in/month)	Evaporation (in/month)			
January	31	0	7.97	1.35	0.38		
February	28	0	6.38	2.23	0.83		
March	31	0	4.40	4.13	2.21		
April	30	0	2.45	5.94	2.47		
May	31	0	0.66	8.32	2.93		
June	30	0	0.49	9.29	5.45		
July	31	22	0.07	10.03	7.07	585	44
August	31	31	0.17	8.58	5.11	585	44
September	30	30	0.83	6.43	0.45	585	44
October	31	15	1.96	4.35	0.55	585	44
November	30	0	5.80	2.19	0.93		
December	31	0	7.04	1.02	1.00		
Total	365	98	38.22	63.86	29.38	585	44.0

Effluent Production = **2,364,214** gpd

Oats/Sudan Area = **600.0** acres
 Crop Rooting Depth = **5** ft
 Crop Rootzone AWHC = **10.80** inch

STORAGE POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Monthly Available (gal/month)	Cumulative Available (gal/month)
January	0	0	219,806,607
February	0	0	219,806,607
March	0	0	219,806,607
April	0	0	219,806,607
May	0	0	219,806,607
June	0	0	219,806,607
July	35,761,504	35,761,504	35,761,504*
August	75,406,939	75,406,939	111,168,443
September	72,751,982	72,751,982	183,920,425
October	35,886,182	35,886,182	219,806,607
November	0	0	219,806,607
December	0	0	219,806,607
Total	219,806,607	219,806,607	<i>* Start at 0 Stored July 1st</i>

RECLAMATION AREA:

Month	Cumulative Available (gal/month)	Oats/Sudan		600.0 acres		Irrigation Application Efficiency = 70%			
		Effluent Applied (gal)	Effluent Applied (in)	Effective Rainfall (in)	Fresh Irrigation (in)	Gross Crop Need (in)	Soil Moisture Start (in)	Soil Moisture End (in)	Percolation & Leaching > 10.80 in
January	219,806,607	0	0.00	6.95	0.00	0.54	5.00	11.41	0.61
February	219,806,607	0	0.00	5.46	0.00	1.19	5.00	9.27	0.00
March	219,806,607	0	0.00	2.61	0.00	3.16	5.00	4.45	0.00
April	219,806,607	0	0.00	0.00	4.00	3.53	4.45	4.92	0.00
May	219,806,607	0	0.00	0.00	10.00	4.19	4.92	10.73	0.00
June	219,806,607	0	0.00	0.00	12.00	7.79	5.00	9.21	0.00
July	35,761,504	35,761,504	2.20	0.00	12.00	10.10	5.00	9.10	0.00
August	111,168,443	75,406,939	4.63	0.00	4.00	7.30	5.00	6.33	0.00
September	183,920,425	72,751,982	4.47	0.00	1.40	0.64	5.00	10.23	0.00
October	219,806,607	35,886,182	2.20	1.18	3.00	0.79	5.00	10.59	0.00
November	219,806,607	0	0.00	4.91	0.00	1.33	5.00	8.58	0.00
December	219,806,607	0	0.00	6.08	0.00	1.43	5.00	9.65	0.00
Total		219,806,607	13.50	27.19	46.40	41.99			0.61
Percent of Total =		674.6	13.50	1,359.5	2,320.0	2,099.5			30.5
		15%		31%	53%				

BOD Loading		Nitrogen Loading	
Total Weight (lbs/month)	Loading Applied (lbs/ac/day)	Available Total (lbs/month)	0.0 mg/l Applied (lbs/ac/month)
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
174,569	9	13,130	22
368,097	20	27,686	46
355,137	20	26,711	45
175,178	9	13,176	22
0	0	0	0
0	0	0	0
1,072,981	18 Ave.	80,703	135 Total

**The Morning Star Packing Company
Washwater Reclamation - Land Application
Water & Constituent Loading
2015 - 100 Year Rainfall**

DATA:

Month	Number of Days per Month	Working Days per Month	100 Year		ET Oats/Sudan (in/month)	BOD Ave. Applied (mg/l)	Nitrogen Ave. Applied (mg/l)
			Rainfall (in/month)	Evaporation (in/month)			
January	31	0	7.97	1.35	0.38		
February	28	0	6.38	2.23	0.83		
March	31	0	4.40	4.13	2.21		
April	30	0	2.45	5.94	2.47		
May	31	0	0.66	8.32	2.93		
June	30	0	0.49	9.29	5.45		
July	31	22	0.07	10.03	7.07	1,535	62
August	31	31	0.17	8.58	5.11	1,535	62
September	30	30	0.83	6.43	0.45	1,535	62
October	31	15	1.96	4.35	0.55	1,535	62
November	30	0	5.80	2.19	0.93		
December	31	0	7.04	1.02	1.00		
Total	365	98	38.22	63.86	29.38	1,535	62.2

Effluent Production = **1,530,793** gpd

Oat/Sudan Area = **485** acres
 Crop Rooting Depth = **5** ft
 Crop Rootzone AWHC = **10.80** inch

STORAGE POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Monthly Available (gal/month)	Cumulative Available (gal/month)
January	0	0	150,017,714
February	0	0	150,017,714
March	0	0	150,017,714
April	0	0	150,017,714
May	0	0	150,017,714
June	0	0	150,017,714
July	33,677,446	33,677,446	33,677,446 *
August	47,454,583	47,454,583	81,132,029
September	45,923,790	45,923,790	127,055,819
October	22,961,895	22,961,895	150,017,714
November	0	0	150,017,714
December	0	0	150,017,714
Total	150,017,714	150,017,714	150,017,714

* Start at 0 Stored July 1st

RECLAMATION AREA:

Month	Cumulative Available (gal/month)	Oat/Sudan 485 acres		Irrigation Application Efficiency = 70%					
		Effluent Applied (gal)	Effluent Applied (in)	Effective Rainfall (in)	Fresh Irrigation (in)	Gross Crop Need (in)	Soil Moisture Start (in)	Soil Moisture End (in)	Percolation & Leaching > 10.8 in
January	150,017,714	0	0.00	6.95	0.00	0.54	10.80	17.21	6.41
February	150,017,714	0	0.00	5.46	0.00	1.19	10.80	15.07	4.27
March	150,017,714	0	0.00	2.61	0.00	3.16	10.80	10.25	0.00
April	150,017,714	0	0.00	0.00	4.00	3.53	10.25	10.72	0.00
May	150,017,714	0	0.00	0.00	4.00	4.19	10.72	10.53	0.00
June	150,017,714	0	0.00	0.00	1.00	7.79	10.53	3.74	0.00
July	33,677,446	33,677,446	2.56	0.00	6.00	10.10	3.74	2.20	0.00
August	81,132,029	47,454,583	3.60	0.00	4.00	7.30	2.20	2.50	0.00
September	127,055,819	45,923,790	3.49	0.00	0.00	0.64	2.50	5.35	0.00
October	150,017,714	22,961,895	1.74	1.18	0.00	0.79	5.35	14.82	4.02
November	150,017,714	0	0.00	4.91	0.00	1.33	10.80	14.38	3.58
December	150,017,714	0	0.00	6.08	0.00	1.43	10.80	15.45	4.65
Total	150,017,714	11.39	27.19	19.00	41.99	22.93	22.93	22.93	22.93
Percent of Total =	460.4	20%	1,098.9	47%	767.9	33%	1,697.1	926.8	926.8

BOD Loading		Nitrogen Loading	
Total Weight (lbs/month)	Loading Applied (lbs/ac/day)	Available Total (lbs/month)	0.0 mg/l Applied (lbs/ac/month)
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
431,363	29	17,479	36
607,830	40	24,630	51
588,223	40	23,835	49
294,111	20	11,918	25
0	0	0	0
0	0	0	0
1,921,527	40 Ave.	77,862	161 Total

Settling Pond N 17,109 lbs
 Total Nitrogen Loading 94,971 lbs
 Total Nitrogen Loading 196 lbs/acre
 Crop Nitrogen Uptake 440 lbs/acre
 Nitrogen Balance 0.4