

AMMONIA PERMITTING OPTION
Proposed NPDES Permit Renewal
City of Manteca and Dutra Farms, Inc.
Wastewater Quality Control Facility

PERMIT OPTION: The Permit before the Central Valley Water Board regulates total ammonia nitrogen (as N) using the 1999 USEPA national recommended water quality criteria for the protection of aquatic life from the toxic effects of ammonia in freshwater (“1999 Criteria”).

The Board has the option of regulating total ammonia nitrogen (as N) using the 2013 USEPA national recommended water quality criteria (the “2013 Criteria”).

If the Board chooses the ammonia permitting option based on the 2013 criteria, the changes shown in underline/strikeout format in this document would be implemented and the effluent limitations for ammonia in the adopted NPDES permit would be established using the 2013 Criteria.

1. Limitations and Discharge Requirements - Section IV.A.1.a

- a. The Discharger shall maintain compliance with the effluent limitations specified in Table 4:

Table 4 Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	10	15	20	--	--
	lbs/day ¹	820	1,200	1,700	--	--
	lbs/day ²	1,500	2,200	3,000	--	--
pH	standard units	--	--	--	6.5	8.5
Total Suspended Solids	mg/L	10	15	20	--	--
	lbs/day ¹	820	1,200	1,700	--	--
	lbs/day ²	1,500	2,200	3,000	--	--
Non-Conventional Pollutants						
Ammonia Nitrogen, Total (as N) (1 April - 30 November)	mg/L	0.94 ³ 2.4	2.94 ³ 4	--	--	--
	lbs/day ¹	77470	240360	--	--	--
	lbs/day ²	140310	420640	--	--	--
Ammonia Nitrogen, Total (as N) (1 December - 31 March)	mg/L	1.82 ³ 6	4.34 ³ 7	--	--	--
	lbs/day ¹	150210	350390	--	--	--
	lbs/day ²	260380	630690	--	--	--
Nitrate Plus Nitrite (as N)	mg/L	10	15.3	--	--	--

¹ Based on an average dry weather flow of 9.87 million gallons per day (MGD). Effective immediately and until Executive Officer’s written approval of flow increase (Special Provisions VI.C.6.b).

² Based on an average dry weather flow of 17.5 MGD. Effective upon Executive Officer’s written approval of flow increase (Special Provisions VI.C.6.b).

³ Effective immediately and through 31 May 2025, the Discharger shall maintain compliance with the interim effluent average monthly limit of 1.1 mg/L between 1 April through 30 November.

2. Limitations and Discharge Requirements – Section IV.A.2.b

b. Ammonia Nitrogen, Total (as N). Effective immediately and through 31 May 2025, the Discharger shall maintain compliance with the interim effluent average monthly limit of 1.1 mg/L for the summer period, which is between 1 April through 30 November. During the 1 December through 31 March the final limits will apply.

3. Limitations and Discharge Requirements – Section VI.C.7.b

b. Compliance Schedule for Ammonia. This Order requires compliance with the final effluent limitations for ammonia by 31 May 2025. The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations:

<u>Task</u>	<u>Date Due</u>
<u>i. Submit and Implement Pollution Prevention Plan (PPP) for Ammonia in accordance with Water Code section 13263.3(d)(3).</u> <u>The PPP shall be prepared and implemented in accordance with attachment F, Section VI.B.3.a of the permit.</u>	<u>1 October 2015</u>
<u>ii. Annual Progress Reports.</u> <u>The progress reports shall detail what steps have been implemented towards achieving compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, funding resources, and recommendations for additional measures as necessary to achieve full compliance by 31 May 2025. If another report is due on the same date as a progress report, the reports can be combined into one submittal. The first Annual Progress Report is due 1 September 2015 and annually thereafter until final compliance.</u>	<u>1 September, annually, until final compliance</u>

Phase 1 - Aeration Basin Optimization Project

<u>1.i. Northside Aeration Basins.</u> <u>Complete project for performance optimization of the Northside aeration basins, as described in the Fact Sheet (Attachment F, Section VI.7.b), and submit report documenting project completion.</u>	<u>1 September 2015</u>
<u>1.ii Southside Aeration Basins.</u> <u>Complete project for performance optimization of the Southside aeration basins, as described in the Fact Sheet (Attachment F, Section VI.7.b), and submit report documenting project completion.</u>	<u>1 September 2017</u>
<u>1.iii. Assess Compliance with Final Ammonia Effluent Limits.</u> <u>Evaluate effluent monitoring data post optimization aeration projects described in Task 1.i and 1.ii. and assess compliance with final ammonia limits. Submit report summarizing the evaluation and indicate if the Discharger can comply with the final ammonia effluent limitations.</u> <u>If compliance with the final ammonia effluent limits is achieved through Phase 1 activities, upon written approval by the Executive Officer, implementation of Phase 2 and Phase 3 of this compliance schedule is not required.</u>	<u>1 September 2018</u>

Phase 2 – Dilution and/or Mussel Study (if necessary)

Dynamic Modeling Study and/or Freshwater Mussels Study.

Perform dynamic modeling study to determine assimilative capacity and available dilution and/or conduct site-specific freshwater mussels survey to determine presence/absence of freshwater mussels in the vicinity of the discharge.

2.i Study Work Plan. Submit a work plan for conducting dynamic modeling and/or site-specific freshwater mussels survey. **1 December 2018**

2.ii Submit final study. The final study shall be consistent with the work plan and include recalculated water quality-based effluent limits for ammonia based on dynamic modeling, dilution, and/or recalculated ammonia criteria. The final study shall also include an evaluation of facility performance and expected compliance with the recalculated effluent limits. **1 July 2020**

If the final study demonstrates recalculated effluent limitations may be appropriate and the Facility can consistently comply with the recalculated ammonia effluent limits, upon written approval by the Executive Officer, implementation of Phase 3 of this compliance schedule is not required.

Phase 3 – Alternate Upgrade Project (if necessary)

Alternate Upgrade Project. Plan, design, and construct alternate upgrade project to meet the final ammonia effluent limits.

3.i. Submit Work Plan **1 September 2020**

3.ii Investigate treatment alternatives. Submit report identifying preferred option for enhancing Facility to meet final ammonia effluent limits. **1 March 2021**

3.iii Implement selected treatment alternative. Secure funding, design and build selected option. Submit progress reports detailing project status. **1 September 2021**

1 September 2022

1 September 2023

1 September 2024

3.iv Complete Construction. Submit report demonstrating completion of construction. **31 December 2024**

Comply with final ammonia effluent limits. Submit report demonstrating the Facility can comply with the final ammonia effluent limits. **31 May 2025**

4. Attachment – F. Determining the Need for WQBEL's -Section IV.C.3.c.i

ii. Ammonia

- (a) **WQO.** ~~The 1999 USEPA National Ambient Water Quality Criteria (NAWQC) for the protection of freshwater aquatic life for total ammonia (the "1999 Criteria"), recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature.~~

~~The USEPA recently published national recommended water quality criteria for the protection of aquatic life from the toxic effects of ammonia in freshwater (the "2013 Criteria")¹. The 2013 Criteria is an update to USEPA's 1999 Criteria, and varies based on pH and temperature. Although the 2013 Criteria reflects the latest scientific knowledge on the toxicity of ammonia to certain freshwater aquatic life, including new toxicity data on sensitive freshwater mussels in the Family Unionidae, the species tested for development of the 2013 Criteria may not be present in some Central Valley waterways. The 2013 Criteria document therefore states that, "*unionid mussel species are not prevalent in some waters, such as the arid west ...*" and provides that, "*In the case of ammonia, where a state demonstrates that mussels are not present on a site-specific basis, the recalculation procedure may be used to remove the mussel species from the national criteria dataset to better represent the species present at the site.*" In August 2013, U.S. EPA updated its National Ambient Water Quality Criteria (NAWQC) for the protection of freshwater aquatic life for total ammonia.¹ The 2013 NAWQC for ammonia recommends acute (1-hour average; criteria maximum concentration or CMC) and chronic (30-day average; criteria continuous concentration or CCC) standards that vary based on pH and temperature. U.S. EPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. The 2013 NAWQC for ammonia takes into account data for several sensitive freshwater mussel species and non-pulmonate snails that had not previously been tested.~~

¹ *Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater*, published August 2013 [EPA 822-R-13-001]

U.S. EPA found that as pH and temperature increased, both the acute and chronic toxicity of ammonia increased for invertebrates. However, U.S. EPA found that only pH significantly influenced acute and chronic ammonia toxicity for fish. Therefore, the 2013 acute NAWQC for ammonia is primarily based on the ammonia effects on species in the genus *Oncorhynchus* (salmonids) at lower temperatures and invertebrates at higher temperatures. However, due to the significant sensitivity unionid mussels have to the chronic toxicity effects of ammonia, the 2013 chronic NAWQC for ammonia is determined primarily by the effects of mussels.

The 2013 ammonia NAWQC document states that “unionid mussel species are not prevalent in some waters, such as the arid west.” The 2013 ammonia NAWQC also states that, “In the case of ammonia, where a state demonstrates that mussels are not present on a site-specific basis, the recalculation procedure may be used to remove the mussel species from the national criteria dataset to better represent the species present at the site.” The 2013 ammonia NAWQC document, therefore, includes a recalculation procedure for acute and chronic criteria for waters where mussels are not present. The 2013 ammonia NAWQC also provides criteria for waters where *Oncorhynchus* species are not present and where protection of early life stages of fish genera is unnecessary.

A report prepared by The Nature Conservancy, *Sensitive Freshwater Mussel Surveys in the Pacific Southwest Region: Assessment of Conservation Status* (published August 2010), demonstrates the results of a strategic mussel study and survey conducted during 2008-2009. Results from the study around the locality of the Facility’s discharge are summarized in the table below. The study indicates mussels were historically present at several locations in the San Joaquin River. However, in the 2008-2009 survey, mussels were present only downstream of Windmill Cove (near Stockton). Therefore, the likelihood of mussels occurring in the San Joaquin River in the vicinity of the discharge is uncertain at this time and the site-specific ammonia criteria for waters where mussels are not present were used. San Joaquin River has a beneficial use of cold freshwater habitat (COLD) and the presence of salmonids and early fish life stages in the San Joaquin River is well-documented, therefore, the recommended ammonia criteria for waters where salmonids and early life stages are present were used.

Table F-20. Presence of Mussels in the San Joaquin River

<u>Water Body</u>	<u>Locality</u>	<u>Mussels Found Historically</u>	<u>Mussels Found in 2008-2009 Survey</u>
<u>San Joaquin River</u>	<u>14 miles N.E. of Fresno, CA</u>	<u>Anodonta</u>	<u>NA</u>
<u>San Joaquin River</u>	<u>Antioch, CA</u>	<u>Anodonta</u>	<u>NA</u>

<u>Water Body</u>	<u>Locality</u>	<u>Mussels Found Historically</u>	<u>Mussels Found in 2008-2009 Survey</u>
<u>San Joaquin River</u>	<u>Stevenson, CA</u>	<u>Anodonta</u>	<u>NA</u>
<u>San Joaquin River</u>	<u>Downstream of Windmill Cove¹</u>	<u>Anodonta Gonidea Margaritifera</u>	<u>Anodonta</u>
<u>San Joaquin River</u>	<u>Upper San Joaquin River</u>	<u>Gonidea</u>	<u>NA</u>

NA = Either not surveyed or not known if currently present.

¹ Approximately 13 miles downstream of the discharge.

The Central Valley Water Board issued a 3 April 2014 *California Water Code Section 13267 Order for Information: 2013 Final Ammonia Criteria for Protection of Freshwater Aquatic Life* (13267 Order) requiring the Discharger to either participate in an individual or group study to determine the presence of mussels or submit a method of compliance for complying with effluent limitations calculated assuming mussels present ~~using the 2013 Criteria~~. The Discharger submitted a letter to the Central Valley Water Board indicating their participation in the Central Valley Clean Water Association Freshwater Collaborative Mussel Study. ~~Studies are currently underway to determine how the latest scientific knowledge on the toxicity of ammonia reflected in the 2013 Criteria can be implemented in the Central Valley Region as part of a Basin Planning effort to adopt nutrient and ammonia objectives. Until the Basin Planning process is completed, the Central Valley Water Board will continue to implement the 1999 Criteria to interpret the Basin Plan's narrative toxicity objective.~~

The temperature of the effluent varies seasonally. Therefore, seasonal water quality criteria were calculated for the winter season (i.e., December through March) and the summer season (i.e., April through November). ~~The 1999 NAWQC for the protection of freshwater aquatic life for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the San Joaquin River has a beneficial use of cold freshwater habitat and the presence of salmonids and early fish life stages in the San Joaquin River is well-documented, the recommended criteria for waters where salmonids and early life stages are present were used.~~

~~Based on 815 effluent samples from May 2011—November 2013 the effluent pH ranged from 6.5—7.6. In order to protect against the reasonable worst-case short-term exposure of an organism, a pH value of 8.0 was used to derive the acute criterion. The resulting acute criterion is 5.62 mg/L.~~

The acute criterion was calculated for each day when paired temperature and pH were measured using effluent data. The 99.9th percentile of the observed acute criteria based on the paired data was established as the applicable acute criterion, or 1-hour CMC. The applicable acute criterion for the winter and summer seasons are 11.9 mg/L and 4.2 mg/L, respectively.

A chronic criterion was calculated for each day when paired temperature data and pH were measured using effluent data for temperature and pH. Rolling 30-day average criteria were calculated from effluent data using the criteria calculated for each day and the 99.9th percentile of the minimum observed 30-day average criteria was established as the applicable 30-day average chronic criterion, or 30-day CCC. The applicable 30-day CCC for the winter and summer seasons are 1.92 4.23 mg/L and 1.08 2.37 mg/L, respectively. The 4-day average concentration is derived in accordance with the U.S. EPA criterion as 2.5 times the 30-day CCC. Based on the 30-day CCC's of 1.92 4.23 mg/L and 1.08 2.37 mg/L, the 4-day average concentration that should not be exceeded for the winter and summer seasons are 4.80 10.6 mg/L and 2.70 5.93 mg/L, respectively.

- (b) **RPA Results.** The Facility is a POTW that treats domestic wastewater. Untreated domestic wastewater contains ammonia in concentrations that, without treatment, would be harmful to fish and would violate the Basin Plan narrative toxicity objective if discharged to the receiving water. Reasonable potential therefore exists and effluent limitations are required.

Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, "*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.*" For priority pollutants, the SIP dictates the procedures for conducting the RPA. Ammonia is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

U.S. EPA's September 2010 NPDES Permit Writer's Manual, page 6-30, states, "*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential*

through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available...A permitting authority might also determine that WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's discharging to contact recreational waters)." U.S. EPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data." With regard to POTW's, U.S. EPA recommends that, "POTW's should also be characterized for the possibility of chlorine and ammonia problems." (TSD, p. 50).

Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia in concentrations that produce detrimental physiological responses to human, plant, animal, or aquatic life would violate the Basin Plan narrative toxicity objective. Although the Discharger nitrifies the discharge, inadequate or incomplete nitrification creates the potential for ammonia to be discharged and provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC. Therefore, the Central Valley Water Board finds the discharge has reasonable potential for ammonia and WQBEL's are required.

- (c) **WQBEL's.** The Central Valley Water Board calculates WQBEL's in accordance with SIP procedures for non-CTR constituents, and ammonia is a non-CTR constituent. The SIP procedure assumes a 4-day averaging period for calculating the long-term average discharge condition (LTA). However, U.S. EPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day CCC. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day CCC was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day CCC, and 30-day CCC is then selected for deriving the average monthly effluent limitation (AMEL) and the average weekly effluent

limitation (AWEL). The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures. This Order contains a final AMEL and AWEL for ammonia (as N) of 1.8 ~~2.6~~ mg/L and 4.3 ~~4.7~~ mg/L, respectively, for the winter season and 0.94 ~~2.4~~ mg/L and 2.9 ~~4.4~~ mg/L, respectively, for the summer season.

- (d) **Plant Performance and Attainability.** ~~Based on 175 sample results for the effluent collected between May 2011 and April 2014, the maximum monthly average effluent ammonia concentration was 1.4 mg/L and the maximum weekly average effluent concentration was 2.2 mg/L, which did not exceed the applicable effluent limits. Based on the sample results for the effluent, the Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible. Based on the 175 sample results for the effluent collected between May 2011 and April 2014, the maximum monthly average ammonia concentration was 1.4 mg/L and the maximum concentration was 2.65 mg/L. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. The Discharger submitted an infeasibility analysis on 20 January 2015. As discussed in section IV.E of this Fact Sheet, a compliance schedule has been included in this Order.~~

5. Attachment – F. WQBEL Calculations -Section IV.C.4.e

Summary of Water Quality-Based Effluent Limitations at Discharge Point No. 001

Table F-20. Summary of Water Quality-Based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	10	15	20	--	--
	lbs/day ¹	820	1,200	1,700	--	--
	lbs/day ²	1,500	2,200	3,000	--	--
pH	standard units	--	--	--	6.5	8.5
Total Suspended Solids	mg/L	10	15	20	--	--
	lbs/day ¹	820	1,200	1,700	--	--
	lbs/day ²	1,500	2,200	3,000	--	--
Non-Conventional Pollutants						
Ammonia Nitrogen, Total (as N) (1 April - 30 November)	mg/L	<u>0.942.4</u>	<u>2.94.4</u>	--	--	--
	lbs/day ¹	<u>77470</u>	<u>240360</u>	--	--	--
	lbs/day ²	<u>140340</u>	<u>420640</u>	--	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Ammonia Nitrogen, Total (as N) (1 December - 31 March)	mg/L	1.82 ⁶	4.34 ⁷	--	--	--
	lbs/day ¹	150210	350390	--	--	--
	lbs/day ²	260380	630690	--	--	--
Diazinon and Chlorpyrifos	µg/L	³	--	⁴	--	--
Electrical Conductivity @ 25°C	µmhos/cm	1,000 ⁵	--	--	--	--
Methylmercury	grams/year	0.38 ⁶	--	--	--	--
Nitrate plus Nitrite (as N)	mg/L	10	15.3	--	--	--
Temperature	°F	--	--	20 ⁷	--	--
Total Coliform Organisms	MPN/100 mL	--	2.2 ⁸	23 ⁹	--	240

¹ Based on an average dry weather flow of 9.87 MGD. Effective immediately and until Executive Officer's written approval of flow increase (Special Provisions VI.C.6.b).

² Based on an average dry weather flow of 17.5 MGD. Effective upon Executive Officer's written approval of flow increase (Special Provisions VI.C.6.b).

³ Average Monthly Effluent Limitation

$$S_{AMEL} = \frac{C_{DM-AVG}}{0.08} + \frac{C_{CM-AVG}}{0.012} \leq 1.0$$

C_{DM-avg} = average monthly diazinon effluent concentration in µg/L.

C_{CM-avg} = average monthly chlorpyrifos effluent concentration in µg/L.

⁴ Average Weekly Effluent Limitation

$$S_{AWEL} = \frac{C_{DW-AVG}}{0.14} + \frac{C_{CW-AVG}}{0.021} \leq 1.0$$

C_{DW-avg} = weekly average diazinon effluent concentration in µg/L.

C_{CW-avg} = weekly average chlorpyrifos effluent concentration in µg/L.

⁵ Applied as an annual average effluent limitation.

⁶ The effluent calendar year annual methylmercury load shall not exceed 0.38 grams.

⁷ The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.

⁸ Applied as a 7-day median effluent limitation.

⁹ Not to be exceeded more than once in any 30-day period.

6. Attachment – F. Stringency of Requirements for Individual Pollutants -Section IV.D.5

Table F-22. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Average Dry Weather Flow	MGD	9.87 ² / 17.5 ³	--	--	--	--	DC
Conventional Pollutants							
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	10	15	20	--	--	TTC
	lbs/day ⁴	820	1,200	1,700	--	--	
	lbs/day ⁵	1,500	2,200	3,000	--	--	
	% Removal	85	--	--	--	--	CFR
pH	standard units	--	--	--	6.5	8.5	BP
Total Suspended Solids	mg/L	10	15	20	--	--	TTC
	lbs/day ⁴	820	1,200	1,700	--	--	
	lbs/day ⁵	1,500	2,200	3,000	--	--	
	% Removal	85	--	--	--	--	CFR
Non-Conventional Pollutants							
Ammonia Nitrogen, Total (as N) (1 April – 30 November)	mg/L	<u>0.942.1</u>	<u>2.94.4</u>	--	--	--	NAWQC
	lbs/day ⁴	<u>77170</u>	<u>240360</u>	--	--	--	
	lbs/day ⁵	<u>140310</u>	<u>420640</u>	--	--	--	
Ammonia Nitrogen, Total (as N) (1 December – 31 March)	mg/L	<u>1.82.6</u>	<u>4.34.7</u>	--	--	--	NAWQC
	lbs/day ⁴	<u>150210</u>	<u>350390</u>	--	--	--	
	lbs/day ⁵	<u>260380</u>	<u>630690</u>	--	--	--	
Diazinon and Chlorpyrifos	µg/L	6	--	7	--	--	TMDL
Electrical Conductivity @ 25°C	µmhos/cm	1,000 ⁸	--	--	--	--	PB
Methylmercury	grams/year	0.38 ⁹	--	--	--	--	TMDL
Nitrate plus Nitrite (as N)	mg/L	10	15.3	--	--	--	MCL
Temperature	°F	--	--	20 ¹⁰	--	--	TP
Total Coliform Organisms	MPN/100 mL	--	2.2 ¹¹	23 ¹²	--	240	Title 22
Acute Toxicity	% Survival	70 ¹³ /90 ¹⁴	--	--	--	--	BP
Chronic Toxicity	TUc	--	--	Narrative ¹⁵	--	--	BP

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	

- 1 DC – Based on the design capacity of the Facility.
 TTC – Based on tertiary treatment capability. These effluent limitations reflect the capability of a properly operated tertiary treatment plant.
 CFR – Based on secondary treatment standards contained in 40 C.F.R. part 133.
 BP – Based on water quality objectives contained in the Basin Plan.
 NAWQC – Based on U.S. EPA’s National Ambient Water Quality Criteria for the protection of freshwater aquatic life.
 TMDL – Based on the WLA in the applicable TMDL.
 PB – Based on treatment plant performance.
 MCL – Based on the Primary Maximum Contaminant Level.
 Title 22 – Based on DDW Reclamation Criteria, CCR, Division 4, Chapter 3 (Title 22).
- 2 Effective until the Discharger demonstrates compliance with Special Provision VI.C.6.b of this Order, the average dry weather flow shall not exceed 9.87 MGD.
- 3 Effective upon compliance with Special Provision VI.C.6.b of this Order, the average dry weather flow shall not exceed 17.5 MGD.
- 4 Based on an average dry weather flow of 9.87 MGD. Effective immediately and until Executive Officer’s written approval of flow increase (Special Provisions VI.C.6.b).
- 5 Based on an average dry weather flow of 17.5 MGD. Effective upon Executive Officer’s written approval of flow increase (Special Provisions VI.C.6.b).
- 6 Average Monthly Effluent Limitation

$$\text{SAMEL} = \frac{C_{D M-AVG}}{0.08} + \frac{C_{C M-AVG}}{0.012} \leq 1.0$$

$$C_{D M-avg} = \text{average monthly diazinon effluent concentration in } \mu\text{g/L.}$$

$$C_{C M-avg} = \text{average monthly chlorpyrifos effluent concentration in } \mu\text{g/L.}$$
- 7 Average Weekly Effluent Limitation

$$\text{SAWEL} = \frac{C_{D W-AVG}}{0.14} + \frac{C_{C W-AVG}}{0.021} \leq 1.0$$

$$C_{D W-avg} = \text{weekly average diazinon effluent concentration in } \mu\text{g/L.}$$

$$C_{C W-avg} = \text{weekly average chlorpyrifos effluent concentration in } \mu\text{g/L.}$$
- 8 Applied as an annual average effluent limitation.
- 9 The effluent calendar year annual methylmercury load shall not exceed 0.38 grams.
- 10 The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.
- 11 Applied as a 7-day median effluent limitation.
- 12 Not to be exceeded more than once in any 30-day period.
- 13 70% minimum of any one bioassay.
- 14 90% median for any three consecutive bioassays.
- 15 There shall be no chronic toxicity in the effluent discharge.

7. Attachment – F. 1. Satisfaction of Anti-Backsliding Requirements -Section IV.D.3

3. Satisfaction of Anti-Backsliding Requirements

The CWA specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in CWA sections 402(o) or 303(d)(4), or, where applicable, 40 C.F.R. section 122.44(l).

The effluent limitations in this Order are at least as stringent as the effluent limitations in Order R5-2009-0095, with the exception of effluent limitations for ~~ammonia~~, aluminum, copper, methylene blue active substances, and pH (instantaneous maximum only). The effluent limitations for these pollutants are less stringent than those in Order R5-2009-0095. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

- a. **CWA section 402(o)(1) and 303(d)(4).** CWA section 402(o)(1) prohibits the establishment of less stringent WQBEL's "except in compliance with Section 303(d)(4)." CWA section 303(d)(4) has two parts: paragraph (A) which applies to nonattainment waters and paragraph (B) which applies to attainment waters.
 - i. For waters where standards are not attained, CWA section 304(d)(4)(A) specifies that any effluent limit based on a TMDL or other WLA may be revised only if the cumulative effect of all such revised effluent limits based on such TMDL's or WLA's will assure the attainment of such water quality standards.
 - ii. For attainment waters, CWA section 303(d)(4)(B) specifies that a limitation based on a water quality standard may be relaxed where the action is consistent with the antidegradation policy.

The San Joaquin River is considered an attainment water for ~~ammonia~~, aluminum, copper, methylene blue active substances, and pH because the receiving water is not listed as impaired on the 303(d) list for these constituents². As discussed in section IV.D.4, below, relaxation of the effluent limits complies with federal and state antidegradation requirements. Thus, removal of the effluent limitations for aluminum, copper, and methylene blue active substances and relaxation of the effluent limitations for ~~ammonia and~~ pH from Order R5-2009-0095 meets the exception in CWA section 303(d)(4)(B).

² "The exceptions in Section 303(d)(4) address both waters in attainment with water quality standards and those not in attainment, i.e. waters on the section 303(d) impaired waters list." State Water Board Order WQ 2008-0006, Berry Petroleum Company, Poso Creek/McVan Facility.

8. Attachment – F. 1. 3. Antidegradation Policies -Section IV.D.4

4. Antidegradation Policies

- b. **Surface Water.** As discussed in section II.E of this II.E of this Fact Sheet, the Discharger is planning an upgrade and expansion project that would increase the design capacity of the Facility from 9.87 MGD to 17.5 MGD. Order R5-2009-0096 provided antidegradation findings and authorized an increase in the permitted average discharge flow to 17.5 MGD from the expanded Facility. This Order does not provide for an expansion from the previously authorized discharge rate of 17.5 MGD. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBEL's where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

This Order removes effluent limitations for aluminum, copper, and methylene blue active substances based on updated monitoring data demonstrating that the effluent does not cause or contribute to an exceedance of the applicable water quality criteria or objectives in the receiving water. Additionally, this Order relaxes the instantaneous maximum effluent limitation for pH to be consistent with the Basin Plan objective ~~and relaxes the effluent limitations for ammonia based on updated pH and temperature data used to calculate the applicable 1999 NAWQC criteria for the protection of aquatic life.~~ The removal and relaxation of WQBEL's for these parameters will not result in an increase in pollutant concentration or loading, a decrease in the level of treatment or control, or a reduction of water quality. Therefore, the Central Valley Water Board finds that the relaxation of the effluent limitations does not result in an allowed increase in pollutants or any additional degradation of the receiving water. Thus, the removal and relaxation of effluent limitations is consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution No. 68-16.

9. Attachment – F. Interim Effluent Limitations -Section IV.E

- 3 **Compliance Schedule for Ammonia Nitrogen Total (as N).** The effluent limitations for ammonia are more stringent based on the updated 2013 USEPA National Ambient Water Quality Criteria for ammonia. The Discharger has complied with the application requirements in paragraph 4 of the State Water Board's Compliance Schedule Policy, and the Discharger's application demonstrates the need for additional time to implement actions to comply with the new limitations, as described below. Therefore, compliance schedules for compliance with the effluent limitations for ammonia are established in this Order.

Compliance schedules for ammonia are necessary because the Discharger must implement actions, including design and construction of nitrification facilities to comply with the more stringent permit limitations. The Discharger has made diligent efforts to quantify pollutant levels in the discharge and the sources of the pollutants in the waste stream. The Discharger is currently implementing additional source control efforts and measurements through their Pretreatment and Pollution Prevention Program, optimization of the aeration basins performance by replacing inefficient aeration blowers, electrical gear that is past its service life, and the air diffuser panels. The Discharger is expecting that the optimization of the aeration basins performance alone may increase the ammonia removal enough to ensure compliance with the final ammonia limits.

The Discharger needs time to design, fund, and construct the necessary facilities to achieve compliance with the effluent limitations for ammonia and the compliance schedules and interim milestones in this Order are as short as possible given the type of improvement proposed and industry experience with the time typically required to implement such tasks at similar facilities.

Interim performance-based limitations have been established in this Order. The interim limitations were determined as described in section IV.E.2, below, and are in effect until the final limitations take effect. The interim limits are applicable during the summer periods only from **1 April through 30 November**. The interim numeric effluent limitations and source control measures will result in the highest discharge quality that can reasonably be achieved until final compliance is attained.

- 4. Interim Limits for Ammonia Nitrogen Total (as N).** The interim effluent limitation for ammonia consists of a statistically-calculated performance-based average monthly effluent limitation (AMEL) derived using sample data provided by the Discharger. Based on 175 effluent samples from May 2011 through April 2014, the interim effluent limitation was developed using the 97.22th percentile assuming a lognormal distribution of the dataset, which represents one exceedance in 3-years. The interim AMEL is 1.1 mg/L (as N)

10. Attachment – F. Compliance Schedules -Section VI.B.7

7. Compliance Schedules

In general, an NPDES permit must include final effluent limitations that are consistent with CWA section 301 and with 40 C.F.R. section 122.44(d). There are exceptions to this general rule. The State Water Board's Resolution 2008-0025 "Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits" (Compliance Schedule Policy) allows compliance schedules for new, revised, or newly interpreted water quality objectives or criteria, or in accordance with a TMDL. All compliance schedules must be as short as possible, and may not exceed 10 years from the effective date of the adoption, revision, or new interpretation of the applicable water quality objective or criterion, unless a TMDL allows a longer schedule. Where a compliance schedule for a final effluent limitation exceeds 1 year, the Order must include interim numeric effluent limitations for that constituent or parameter, interim requirements and dates

toward achieving compliance, and compliance reporting within 14 days after each interim date. The Order may also include interim requirements to control the pollutant, such as pollutant minimization and source control measures.

In accordance with the Compliance Schedule Policy and 40 C.F.R. section 122.47, a discharger who seeks a compliance schedule must demonstrate additional time is necessary to implement actions to comply with a more stringent permit limitation. The discharger must provide the following documentation as part of the application requirements:

- Diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts;
- Source control efforts are currently underway or completed, including compliance with any pollution prevention programs that have established;
- A proposed schedule for additional source control measures or waste treatment;
- Data demonstrating current treatment facility performance to compare against existing permit effluent limits, as necessary to determine which is the more stringent interim, permit effluent limit to apply if a schedule of compliance is granted;
- The highest discharge quality that can reasonably be achieved until final compliance is attained;
- The proposed compliance schedule is as short as possible, given the type of facilities being constructed or programs being implemented, and industry experience with the time typically required to construct similar facilities or implement similar programs; and
- Additional information and analyses to be determined by the Regional Water Board on a case-by-case basis.

Based on information submitted with the infeasibility analyses, the ROWD, SMR's, and other miscellaneous submittals, it has been demonstrated to the satisfaction of the Central Valley Water Board that the Discharger needs time to implement actions to comply with the new effluent limitations for methylmercury and ammonia.

11. Attachment – F. Compliance Schedules -Section VI.B.7.b

b. **Ammonia.** The effluent limitations for ammonia are more stringent than the limitations previously implemented. These new limitations are based on a new 2013 ammonia USEPA NAWQC and is a new interpretation of the Basin Plan's narrative toxicity objective. The Discharger has complied with the application requirements in paragraph 4 of the Compliance Schedule Policy, and the Discharger's infeasibility analysis demonstrates the need for additional time to implement actions to comply with the new limitations. Therefore, a compliance schedule for compliance with final effluent limitations for ammonia is established in this Order.

A compliance schedule is necessary because the Discharger must implement actions, including design and construction of facilities to provide Facility upgrades, to comply with the more stringent effluent limitations.

The Discharger has made diligent efforts to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and has documented the results of those efforts. The Discharger has collected routine monitoring for ammonia (once per week). The source of ammonia is from domestic sewage.

The compliance schedule is as short as possible. The Discharger needs time to design, fund, and construct the necessary facilities to achieve compliance with the effluent limitations for ammonia, and the compliance schedules and interim milestones in this Order are as short as possible given the type of facilities being constructed and industry experience with the time typically required to construct similar facilities.

The Discharger is participating in the Central Valley Clean Water Association's Freshwater Mussel Collaborative Study for Wastewater Treatment Plants (Group Study), a collaborative study representing a coalition of Central Valley POTWs. The CVCWA Freshwater Mussel Special Project members include 41 agencies. The Group Study will characterize the current state of knowledge regarding freshwater mussels, develop field study guidance to conduct site-specific mussels surveys, and evaluate policy and permitting issues. The information obtained through the Group Study could result in changes in how the ammonia criteria are calculated and may result in changes to the ammonia effluent limits.

In anticipation of more stringent ammonia effluent limitations resulting from the new 2013 USEPA ammonia criteria, the Discharger is implementing a project to optimize the aeration basins to improve ammonia removal. The Aeration Basin Optimization Project includes the replacement of the diffusers in the aeration basins to improve oxygen transfer efficiency. The replacement of the diffusers in the northside aeration basins is nearing completion in the summer 2015 and the replacement in the southside aeration basins is scheduled to be complete summer 2017. The Discharger expects the Aeration Basin Optimization Project will result in more consistent ammonia removal and compliance with the final ammonia effluent limits. However, in the event consistent compliance with the ammonia effluent limits cannot be achieved, the Discharger plans to conduct a dynamic modeling study and/or site-specific freshwater mussels study in an effort to recalculate the ammonia effluent limits.

AMMONIA PERMITTING OPTION
Proposed NPDES Permit Renewal
City of Manteca and Dutra Farms, Inc.
Wastewater Quality Control Facility

12. Attachment – G. SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum, Total Recoverable	µg/L	14 ¹	490 ¹	200	750 ²	--	--	--	--	200	No ³
Ammonia Nitrogen, Total (as N)	mg/L	2.65	0.2	1.08 2.37	4.2 5.62 ²	1.08 2.37 ⁴	--	--	--	--	Yes
Bis (2-ethylhexyl) Phthalate	µg/L	2.9	2	1.8	--	--	1.8	5.9	--	4	Inconclusive ³
Copper, Total Recoverable	µg/L	6	3.4	8.2	12	8.2	1,300	--	10.4	1,000	No
Chloride	mg/L	110	130	230	860 ²	230 ⁵	--	--	--	250	No
Chlorpyrifos	µg/L	<0.065	<0.065	0.015	--	--	--	--	0.015	--	No ³
Diazinon	µg/L	<0.062	<0.062	0.10	--	--	--	--	0.10	--	No ³
1,2-Diphenylhydrazine	µg/L	0.3	<1	0.04	--	--	0.04	0.54	--	--	Inconclusive ³
Electrical Conductivity @ 25°C	µmhos/cm	772 ¹	714 ¹	900	--	--	--	--	--	900	No
Heptachlor	µg/L	0.0054	<0.01	ND	0.52	0.0038	0.00021	0.00021	ND ⁶	0.01	Inconclusive ³
Iron, Total Recoverable	µg/L	44 ¹	830 ¹	300	--	--	--	--	300	300	No ³
Manganese, Total Recoverable	µg/L	16 ¹	149 ¹	50	--	--	--	--	50	50	No ³
Mercury, Total Recoverable	ng/L	2.71	7.18	50	--	--	50	51	--	2,000	No
Methylene Blue Active Substances	µg/L	53 ¹	9.9 ¹	500	--	--	--	--	--	500	No
Nitrate Nitrogen, Total (as N)	mg/L	12.8	4	10	--	--	--	--	--	10	Yes
Nitrite Nitrogen, Total (as N)	mg/L	0.79	0.2	1	--	--	--	--	--	1	No
Sulfate	mg/L	37 ¹	93 ¹	250	--	--	--	--	--	250	No
Total Dissolved Solids	mg/L	449 ¹	435 ¹	500	--	--	--	--	--	500	No

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
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General Note: All inorganic concentrations are given as a total recoverable.

MEC = Maximum Effluent Concentration

B = Maximum Receiving Water Concentration or lowest detection level, if non-detect

C = Criterion used for Reasonable Potential Analysis

CMC = Criterion Maximum Concentration (CTR or NTR)

CCC = Criterion Continuous Concentration (CTR or NTR)

Water & Org = Human Health Criterion for Consumption of Water & Organisms (CTR or NTR)

Org. Only = Human Health Criterion for Consumption of Organisms Only (CTR or NTR)

Basin Plan = Numeric Site-specific Basin Plan Water Quality Objective

MCL = Drinking Water Standards Maximum Contaminant Level

NA = Not Available

ND = Non-detect

Footnotes:

- (1) Represents the maximum observed average annual concentration for comparison with the Secondary MCL or site-specific objective.
- (2) U.S. EPA National Recommended Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, 1-hour average.
- (3) See section IV.C.3 of the Fact Sheet (Attachment F) for a discussion of the RPA results.
- (4) U.S. EPA National Recommended Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, 30-day average.
- (5) U.S. EPA National Recommended Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, 4-day average.
- (6) Persistent chlorinated hydrocarbon pesticides shall not be present in the water column at detectable concentrations.

13. Attachment – H. CALCULATION OF WQBEL’S

Aquatic Life WQBEL’s Calculations															
Parameter	Units	Criteria		Dilution Factors		Aquatic Life Calculations							Final Effluent Limitations		
		CMC	CCC	CMC	CCC	ECA Multiplier _{acute}	LTA _{acute}	ECA Multiplier _{chronic}	LTA _{chronic}	AMEL Multiplier ₉₅	AWEL Multiplier	MDEL Multiplier ₉₉	AMEL ¹	AWEL ²	MDEL ³
Ammonia Nitrogen, Total (as N) (1 April – 30 November)	mg/L	4.2 5.62	1.08 2.37	--	--	0.19	0.77 1.0	0.64	0.69 1.52	1.36 2.05	4.23	--	0.94 2.1	2.9 4.4	--
Ammonia Nitrogen, Total (as N) (1 December – 31 March)	mg/L	11.9 5.62	1.92 4.23	--	--	0.28	3.3 1.6	0.75	1.4 3.16	1.23 1.66	3.02	--	1.8 2.6	4.3 4.7	--
Chlorpyrifos	µg/L	0.03	0.02	--	--	0.32	0.01	0.53	0.01	1.55	2.68	--	0.01	0.02	--
Diazinon	µg/L	0.16	0.10	--	--	0.32	0.05	0.53	0.05	1.55	2.68	--	0.08	0.14	--

¹ Average Monthly Effluent Limitations are calculated according to Section 1.4 of the SIP using a 95th percentile occurrence probability.
² Average Weekly Effluent Limitations are calculated according to Section 1.4 of the SIP using a 98th percentile occurrence probability.
³ Maximum Daily Effluent Limitations are calculated according to Section 1.4 of the SIP using a 99th percentile occurrence probability.