CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0062

WASTE DISCHARGE REQUIREMENTS

FOR
BAKER COMMODITIES, INC.
KERMAN RENDERING PLANT
FRESNO COUNTY

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

1. On 24 September 2012, Baker Commodities, Inc., submitted a Report of Waste Discharge (RWD) that describes an existing rendering operation and the discharge of rendering wastewater to land near the City of Kerman in Fresno County. Baker Commodities, Inc., submitted additional information to complete the RWD on 21 December 2012. The Executive Officer ordered Baker Commodities, Inc., to submit the RWD pursuant to Water Code section 13267 to obtain sufficient information to update existing Waste Discharge Requirements Order 95-245.

2. Baker Commodities, Inc. (hereafter "Baker" or "Discharger"), owns and operates the facility that generates the waste and the land to which waste is discharged and is responsible for compliance with these Waste Discharge Requirements (WDRs).

3. The Kerman Rendering Plant ("Plant") is at 16801 West Jensen Avenue near Kerman in Fresno County. The Plant and land application areas (LAAs) are within Sections 22 and 23, T14S, R17E, MDB&M. Attachment A and Attachment B (incorporated herein and made part of this Order) map the vicinity and onsite details, respectively. Attachment B lists current Fresno County Assessor's Parcel Numbers (APNs) for the 41-acre Plant property and 537 acres of LAAs.

4. WDRs Order 95-245, adopted by the Central Valley Water Board on 27 October 1995, prescribes requirements for the discharge. Order 95-245 allows a monthly average wastewater flow of up to 0.032 mgd, discharge to unlined ponds, and land application to 541 acres. Many of the findings in Order 95-245 are projections based on the limited information available at the time of adoption of the Order. Anticipated conditions, including wastewater and groundwater quality, are inaccurate. Wastewater flow estimates in the WDRs were very low, resulting in immediate and continuous violation of the effluent flow limit upon its adoption. Order 95-245 is rescinded and replaced with this Order.

Facility and Discharge

5. Baker renders up to 696 tons per day of farm animal carcasses (primarily bovine) for production of protein and bone meals, tallow, and feeding fats. Baker serves large and small farms in the region, restaurants (grease trap waste), and butcher shops and other meat processing operations. Baker brings some carcasses from its plant in Hanford (Tulare County), regulated by a separate Order, which only processes hides.

6. Sources of wastewater include: condensed moisture from the raw material; boiler blowdown; reverse osmosis reject; and storm water and wash water from the paved unloading area. The reverse osmosis unit treats a portion of the supply water to make up water lost to daily boiler blowdown. Attachment C, incorporated herein and made part of this Order, is a process flow diagram for the Plant waste streams.

7. All wastewater streams are pumped from a sump at the edge of the loading area into large holding tanks to regulate flow through wastewater treatment units. The treatment units include three skimmers and a cavitation air flotation unit. Baker adds polyacrylamide flocculant to increase removal efficiency. Skimmed material is sent back through the rendering process. Settled solids are collected in bins onsite for pickup by a waste management service (see Finding 8 regarding the fate of solid waste).

8. Settled solids are primarily magnets and grass from raw material stomach contents. Ranchers and dairy farmers orally administer magnets to calves to prevent inflammation and other problems associated with the animals ingesting wire, nails, and other metallic objects while grazing. Baker contracts with a waste management service to haul solid waste on a regular basis for offsite disposal at the Kettleman Hills Landfill (regulated by WDRs Order R5-2006-0122 and Special Order R5-2011-0065).

9. Prior to installation of the cavitation air flotation unit in 2011, the BOD concentration in the discharge to the pond system averaged over 10,000 mg/L in some years, with peaks of over 30,000 mg/L. Effluent BOD from the cavitation air flotation unit (pond influent) is now generally less than 6,000 mg/L.

10. Since the 1960s, Baker discharged wastewater to three unlined ponds west of the Plant. Baker discontinued discharging to the ponds in September 2010, when it initiated discharge to a new, lined pond system. The unlined ponds still exist and contain the waste solids that accumulated over the period of operation.

11. The RWD indicates that the new pond system was designed for nitrogen removal in the two initial ponds (primarily by ammonia volatilization) and the third and final pond is used for effluent storage. The record includes a final Construction Quality Assurance (CQA) Report, provided to staff electronically on 26 March 2014, describing construction of the ponds and liners. The new ponds are lined with a 45-mil, flexible reinforced polypropylene geomembrane (fPP-R), underlain by a geosynthetic clay liner (GCL) placed over the compacted subgrade. Baker hired a contractor to perform electric leak location in general accordance with ASTM D7002-03 on 23 and 24 June 2010. The volume of each pond in the series with two feet of freeboard is 18 million gallons, 8.7 million gallons, and 17 million gallons, respectively.

12. The Plant produces wastewater that is high in salinity, nitrogen, and biochemical oxygen demand (BOD). Table 1 presents average wastewater analytical results for samples collected in 2012 and 2013.

Table 1. Average Wastewater Quality (2012 through 2013)

	Units	Initial Pond Influent	Final Pond Effluent
Biochemical Oxygen Demand (BOD)	mg/L	3,340	1,050
Nitrate as nitrogen	mg/L	< 0.2	< 0.1
Total Kjeldahl Nitrogen	mg/L	213	563
Specific Conductance	umhos/cm	3,320	5,920
Total Dissolved Solids	mg/L	1,690	1,470
Calcium	mg/L	54[1]	73[2]
Magnesium	mg/L	11[1]	17[2]
Sodium	mg/L	215[1]	345[2]
Potassium	mg/L	82[1]	170[2]
Chloride	mg/L	197[1]	295[2]
Bicarbonate	mg/L	540[1]	3,220[2]
Sulfate	mg/L	158[1]	< 3.0[2]

[1] Average of three samples.
[2] Average of two samples.

13. All storm water at the Plant is diverted to the wastewater sump adjacent to the raw material collection area in the southwest corner of the Plant property.

14. Wastewater is drained by gravity from the effluent storage pond to a sump prior to being pumped into the irrigation system standpipe. Each of nine irrigation wells has a flow meter and variable frequency drive to control flow. Flow is directed by manual valves to particular checks in each LAA where wastewater is applied by flood irrigation. The Central Valley Water Board file does not include any analytical data to characterize the quality of irrigation well water.

15. The water balance submitted with the RWD was used to model storage and disposal capacity and utilized an estimated 100-year return frequency wet year, assuming at least two feet of freeboard will remain in the wastewater pond. The model indicates the storage pond (Pond 3 with approximately 120 days of storage at the proposed wastewater flow) and LAAs provide sufficient storage and disposal capacity to accommodate the wastewater flow allowed by this Order.

16. The two onsite supply wells, FW-1 and FW-3, will be identified as SPL-001 and SPL-003, respectively, to ensure format consistency for electronic data submittal into the State Water Board's California Integrated Water Quality System, which may be required at a future date. The wells represent the quality of deeper groundwater, as opposed to first-encountered groundwater. Baker's previous well FW-2 was replaced by FW-3 in 2012 due to the presence of uranium at 49 picocuries (pCi/L), above the Maximum Contaminant Level of 20 pCi/L. At the end of 2012, Baker installed FW-3 to a depth of approximately 600 feet in order to draw better quality water. Baker typically uses FW-3 exclusively. Well FW-1, installed to a depth of about 280 feet, is available as a backup well, though uranium has

been present in samples as high as 58 pCi/L. Table 2 presents the most recent analytical results for one sample from each well.

Table 2. Water Supply Well Quality

	Units	FW-1[1]	FW-3[2]
pH	std.	7.65	8.7
Nitrate as nitrogen	mg/L	3.8	1.7
Specific Conductance	umhos/cm	1,160	210
Total Dissolved Solids	mg/L	750	140
Calcium	mg/L	72	4
Magnesium	mg/L	4	3
Sodium	mg/L	106	6
Potassium	mg/L	9	4
Chloride	mg/L	118	50
Bicarbonate	mg/L	210	110
Sulfate	mg/L	51	4

[1] Also identified as SPL-001. Sample collected 8/15/2012.
[2] Also identified as SPL-003. Sample collected 1/22/2013.

17. According to the RWD, 60 percent of the wastewater is condensate from moisture cooked out of the raw material, which is expected to contribute minimal salinity to the discharge. The Plant's supply water is not a major source of salinity either, especially since Baker began using its newly-installed well in January 2013. Baker uses some chemicals at the Plant, including sulfuric acid and soda ash (sodium carbonate). The change in concentration of salts (about a 10 mg/L increase in sodium, bicarbonate, and sulfate) resulting from the reported usage of these chemicals is insignificant compared to the primary source of wastewater salinity: the fluids and paunch manure from the Plant feedstock (carcasses).

18. Domestic wastewater is discharged separately to an on-site septic tank/leachfield regulated by Fresno County.

Site-Specific Conditions

19. The Plant and LAAs are at an elevation of approximately 200 feet. The climate is arid, with hot summers and mild winters. The rainy season generally extends from November through March. Occasional rains occur during the spring and fall months, but summer months are dry. Average annual precipitation and evaporation (Class 'A' pan) in the area are about 6.3 inches and 63 inches, respectively, according to information published by the California Department of Water Resources (DWR). The California Irrigation Management Information System (CIMIS) database reports an annual average reference evapotranspiration (ETo) of 59 inches for the Westland Water District monitoring station.

20. The Natural Resource Conservation Service (NRCS) classifies most of the soil in the vicinity of the Plant and downgradient as Fresno sandy loam or Fresno fine sandy loam, with land capability classification of III-s. It is not prime farmland. According to NRCS, soil characteristics severely restrict the crops that can be grown economically in the area. These soils are described as a granitic alluvium with a duripan layer, very slightly to moderately saline, and somewhat poorly drained. Water holding capacity is very low.

21. Based on pesticide use permits from the Fresno County Department of Agriculture for 2012, most of the land within a 5-mile radius is planted with almonds, grapes, and peaches, which are irrigated primarily with groundwater.

22. According to Federal Emergency Management Agency (FEMA) Map Number 06019C2075H, revised 18 February 2009, the Plant and LAAs are outside of the 100-year and 500-year return frequency flood zones.

Groundwater Considerations

23. The Plant and LAAs are in the Raisin Hydrologic Area (No. 551.20) of the South Valley Floor Hydrologic Unit, as depicted on hydrologic maps prepared by State Water Resources Control Board in August 1986.

24. Regional groundwater underlying the area is first encountered at about 100 feet below ground surface (bgs) and flows southwest according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by DWR in Spring 2010.

25. Published groundwater data from the Department of Water Resources and the United States Geological Survey includes groundwater quality data for wells in the area dating back to the 1950s. Data for wells within about five miles generally show specific conductance (EC) in the range of 250 umhos/cm to 750 umhos/cm, with a few wells over 1,000 umhos/cm (e.g., samples from one upgradient well measured about 1,600 umhos/cm in 1973 and 2,100 umhos/cm in 1979). DWR Bulletin 130-63 (published in 1963) for the Central Valley includes a map showing lines of equal EC in groundwater representing "the quality of water from the principal pumped zone in the valley." While published data shows that groundwater in the principal pumped zone was good quality, with EC less than about 750 umhos/cm underlying the Plant, this is not necessarily representative of first encountered groundwater. The data also does not provide information specific to the Baker Plant site.

26. Baker installed an onsite groundwater monitoring well network of three wells in 1995 (MW-1, MW-2, and MW-3). In April 2012, Baker installed six additional groundwater monitoring wells. Table 3 presents average analytical results from eight samples collected from each monitoring well from 2012 through 2013.

Table 3. Groundwater Monitoring Well Quality (2012 through 2013)

	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7[2]	MW-8	MW-9
Nitrate[1]	mg/L	15	34	37	92	61	36	18	31	32
EC	umhos/cm	1,320	2,040	1,550	2,220	2,040	1,620	1,410	1,580	1,540

	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7[2]	MW-8	MW-9
TDS	mg/L	843	1,350	985	1,470	1,340	1,030	906	1,000	964
Calcium	mg/L	154	242	117	198	229	163	144	138	148
Magnesium	mg/L	44	75	34	72	72	33	34	46	58
Sodium	mg/L	53	57	163	226	104	130	96	140	133
Potassium	mg/L	13	13	13	21	20	17	14	14	21
Chloride	mg/L	127	315	159	188	251	197	190	158	160
Bicarbonate[3]	mg/L	435	433	440	694	491	424	370	498	460
Sulfate	mg/L	103	169	81	70	149	93	102	94	86
Iron[4]	mg/L	< 0.2	3.7	< 0.2	22	11	46	1.4	1.3	41
SAR[5]		1.0	0.8	3.4	3.5	1.5	2.4	1.9	2.6	2.3

1 As nitrogen.

2 The average values presented for MW-7 include analytical results for the first sample from MW-7, collected 4/18/2012, which report waste constituent concentrations of about half the concentrations reported for the rest of the samples from MW-7.

3 Bicarbonate as $CaCO_3$.

4 Samples were not filtered prior to preservation or analysis.

5 Sodium Adsorption Ratio (not adjusted for elevated bicarbonate concentrations).

27. Samples from MW-1 represent groundwater quality upgradient of Baker's discharges of waste. The EC in MW-1 has been relatively stable at around 1,300 umhos/cm. The concentration of chloride has been decreasing in samples from MW-1, from about 200 mg/L in 1996 to about 100 mg/L in 2013. The concentration of nitrate in the well has been increasing recently, from about 10 mg/L as nitrogen in 2002 to about 15 mg/L as nitrogen in 2013. Based on the groundwater gradient, the increase in nitrate concentrations in MW-1 does not appear to be caused by Baker's discharge.

28. Samples from groundwater monitoring well MW-4 represent groundwater influenced by seepage of high-strength waste from Baker's unlined ponds. Historic discharges to the ponds, reportedly used from 1965 through 2010, were poorer quality than wastewater discharged to the new pond system. On average from 1995 through 2010, samples from the discharge to the unlined ponds had BOD over 9,000 mg/L, total nitrogen over 1,000 mg/L, and EC over 4,700 umhos/cm. As a result, Baker's discharge to the unlined ponds has caused significant localized groundwater degradation with sodium, chloride, and bicarbonate, and pollution of groundwater with EC, TDS, and nitrate.

29. In a Notice of Violation issued in 2006, staff notified Baker that it had exceeded its effluent flow limit and effluent limits for inorganic TDS (exceeded 330 mg/L over source water) and caused groundwater EC and TDS to exceed upper secondary MCLs, and caused groundwater pollution with nitrate. Staff issued another NOV in 2007 for the same and additional violations of the WDRs, including a spill of grease when the old ponds overflowed onto adjacent LAAs.

30. The unlined ponds have caused and may continue to cause groundwater to be polluted until Baker properly disposes of the accumulated solids in the ponds in a manner consistent with

Solids Disposal Specifications E.1 and E.2 of this Order. Baker has discontinued its discharge to the ponds, but has not closed them.

31. Prior to completion of the lined ponds, Baker noted in annual self-monitoring reports that it overloaded LAAs with nitrogen (e.g., applied an average of 763 lbs/acre/year in 2009 and 923 lbs/acre/year in 2010) and caused groundwater degradation with salt and nitrate. Analytical results from samples collected from MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, and MW-9 above show groundwater quality downgradient of the LAAs has been degraded with sodium, and to the point of pollution with EC, TDS, nitrate, and chloride.

32. The lateral extent of degradation due to Baker's historic discharges has not been fully defined, but it appears to extend offsite to the west and south. Samples from groundwater monitoring wells at the downgradient boundary of the site (e.g., MW-6) contain nitrate concentrations above the MCL.

33. Table 3 of Finding 26 presents iron concentrations above the MCL for iron of 0.3 mg/L in some wells. Since the samples were not filtered prior to preservation or analysis, the results likely represent dissolution of metals from soil in the sample during acidification at the laboratory. This Order requires samples analyzed for metals to be filtered prior to analysis for proper characterization of dissolved iron concentrations in groundwater.

Basin Plan, Beneficial Uses, and Regulatory Considerations

34. The *Water Quality Control Plan for the Tulare Lake Basin,* Second 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.

35. The Plant and LAAs are in Detailed Analysis Unit 235 within the Kings Basin hydrologic unit. The Basin Plan designates the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, and industrial service and industrial process supply, contact water recreation, and non-contact water recreation.

36. The discharge is to cropland, where drainage is expected to be contained onsite. Natural surface drainage is by sheet flow to James Bypass of the Fresno Slough, which discharges to the San Joaquin River. The designated beneficial uses of Valley Floor Waters are agricultural and industrial service and process supply; water contact and non-contact water recreation; wildlife and warm freshwater habitat; groundwater recharge; and preservation and enhancement of rare, threatened, and endangered species.

37. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. 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.

38. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until a mechanism to carry salts out of the basin is established. To limit the degradation, the Basin Plan establishes several salt management requirements, including:

    a. Industrial dischargers shall be required to limit the increase in EC of a point source discharge to surface water or land to a maximum of 500 umhos/cm. A lower limit may be required to assure compliance with water quality objectives.

    b. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 umhos/cm, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L. As indicated in Findings 26 and 27, groundwater upgradient of the Plant has an EC of about 1,300 umhos/cm and chloride concentration of about 130 mg/L. As such, the effluent limit for EC does not apply, but the effluent limit for chloride does apply to the discharge. The concentration of boron in receiving water is unknown, but the discharge does not threaten to exceed 1.0 mg/L with wastewater concentrations of about 0.1 mg/L.

39. The Basin Plan allows an exception to the EC limit of source water plus 500 umhos/cm when the discharger technically demonstrates that allowing a greater net incremental increase in EC will result in lower mass emissions of salt and in conservation of water, provided that beneficial uses are protected. Baker has reportedly implemented water saving measures that result in lower mass emissions of salt at the Plant. However, Baker has not submitted sufficient technical justification to warrant the exception, including a demonstration that beneficial uses of receiving groundwater will be protected.

40. 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.

41. In the absence of specific numerical water quality limits, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective. Crop irrigation (AGR) is generally the beneficial use of groundwater most sensitive to saline waste constituents. 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 umhos/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 umhos/cm if sufficient additional water (leaching fraction) is provided to maintain soil salinity within the tolerance of the crop.

42. The list of crops in Finding 21 is not intended as a definitive inventory of crops that are or could be grown in the area affected by the discharge, but it is representative of current and historical agricultural practices in the area. The most salt-sensitive crops are not currently

grown in the area, likely due to soil characteristics. Most of the land within a 5-mile radius is planted with almonds, grapes, and peaches, which are irrigated primarily with groundwater. Based on guidelines for irrigation of these crops in *Water Quality for Agriculture* by Ayers and Westcot and *Agricultural Drainage Water Management in Arid and Semi-Arid Areas* by Mass and Grattan, the appropriate AGR-based goals for irrigation water EC, sodium, chloride, and bicarbonate are 1,000 umhos/cm, 115 mg/L, 175 mg/L, and 122 mg/L, respectively.

43. The Basin Plan prohibits use of surface water or groundwater to dilute wastes for the primary purpose of meeting waste discharge requirements, where reasonable methods for treating the wastes exist. Blending of wastewater with surface water or groundwater to promote beneficial reuse of wastewater in water short areas may be allowed where the Central Valley Water Board determines such reuse is consistent with all other policies set forth or referenced in the Basin Plan.

44. The crop water requirement for crops grown on Baker's property surrounding the Plant exceeds the wastewater flow. Therefore supplemental irrigation water is required to maintain a successful crop. On an annual basis, the water balance Baker submitted as part of its RWD indicates wastewater represents only about six percent of the irrigation water requirement at the maximum proposed flow.

45. The Basin Plan addresses both water quality issues and potential nuisance conditions associated with discharges of waste. The maximum BOD loading rate that can be applied to land without leaching of metals or creating nuisance conditions can vary significantly depending on soil conditions and operation of the land application system. *Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency (USEPA Publication 625/3-77-0007), cites BOD loading rates for irrigation purposes in the range of 36 to 100 lbs/acre/day to prevent nuisance, but indicates that 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 loading rates. There are few studies that have attempted to determine maximum BOD loading rates for protection of groundwater quality. Those that have are not readily adapted to varying soil, groundwater, and climate conditions that are prevalent throughout the region.

Antidegradation Analysis

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

   a. 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;

   b. The discharger employs best practicable treatment or control (BPTC) to minimize degradation;

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

d. The degradation is consistent with the maximum benefit to the people of the State.

47. In order to reduce the potential degradation of groundwater quality from percolation of high-strength wastewater, Baker treats and stores wastewater in lined ponds to limit percolation. This Order requires Baker to perform an electric leak location survey of the ponds every five years to demonstrate empirically that the ponds are constructed to sufficiently limit percolation. Provision G.7 requires that the Discharger install sufficient monitoring wells upgradient and downgradient of the lined ponds to monitor groundwater degradation from potential seepage.

48. As described in Finding 44, wastewater will be diluted with large amounts of onsite irrigation well water prior to land application. Baker's irrigation well water quality has not been characterized. Provisions G.8 and G.9 require Baker to address the issue of inadequate characterization of the discharge as part of proper salinity and nutrient management. To date, Baker has submitted sufficient information to address consistency with the Antidegradation Policy.

49. Constituents of concern in the discharge (those with the greatest potential to affect beneficial uses of receiving water) include nitrogen, organics, and salts. However, the discharge as regulated by these WDRs, is not expected to cause groundwater to exceed water quality objectives because:

a. Receiving groundwater nitrate concentrations are currently about 13 mg/L as nitrogen upgradient of discharges from the Plant. The record shows upgradient concentrations less than the MCL of 10 mg/L as nitrogen from monitoring in the 1990s. From quarterly monitoring from 2012 through 2013, the average total nitrogen concentration of effluent from the final wastewater pond is 563 mg/L. Seepage of wastewater from the wastewater pond bottoms would likely cause groundwater pollution with nitrate (cause it to contain concentrations of nitrate above 10 mg/L as nitrogen), if the pond liners allow excessive percolation. As described in Finding 47, this Order includes provisions to ensure the ponds were installed and Baker continues to operate them in a manner that sufficiently limits percolation.

   Discharge to the LAAs has potential to degrade groundwater with nitrate and adversely affect beneficial uses of groundwater, if not properly managed. The wastewater nitrogen loading to the LAAs at the proposed wastewater flows, assuming wastewater will be blended with irrigation well water at the same ratio for all crops, for alfalfa and cotton would be 448 lbs/acre/day and 428 lbs/acre/day, respectively. Alfalfa can take up to 480 lbs/acre/year of nitrogen from the soil while cotton is expected to take up no more than 105 lbs/acre/year, resulting in overloading of the 112 acres of LAAs where cotton is grown by over 300 lbs/acre/year.

   The RWD reports that Baker could control the flow of wastewater to each LAA to ensure no particular area is overloaded. It also indicates that denitrification that occurs in the LAA soils may result in an additional 30-percent loss of applied nitrogen to the atmosphere as nitrogen gas.

   Because proposed nitrogen loading from wastewater appears to be at or above the uptake rate for the proposed wastewater flow rate, Provision G.9 of this Order requires

Baker to prepare and implement a Nutrient Management Plan to ensure actual loading will not exceed agronomic uptake rates for nitrogen. Depending on the quality of irrigation well water, and given some denitrification in the soil, Baker can manage the nitrogen loading rates in the LAAs to ensure groundwater degradation with nitrate is minimal and will not adversely affect the beneficial uses of groundwater.

b. With regard to organic material (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. When insufficient oxygen is present below the ground surface, anaerobic decay of the organic matter can create reducing conditions that convert metals that are naturally present in the soil as relatively immobile (oxidized) forms to more mobile reduced forms. With a BOD concentration averaging over 1,000 mg/L, the undiluted wastewater has potential to cause organic overloading of the soil. However, blending with irrigation well water allows Baker to sufficiently spread the wastewater across large areas. The instantaneous BOD loading (loading to an area in one day) due to the discharge as proposed could be as high as 250 pounds per acre per day with a 30-day resting period. With proper irrigation management, Baker can limit instantaneous BOD loading to no more than 150 lb/acre/day. The cycle average loading is expected to be less than 50 pounds per acre per day, which is consistent with EPA recommendations described in Finding 45. Nuisance conditions are not expected and potential groundwater degradation due to organic loading at these rates is minimal.

c. For salinity, with an average EC of nearly 6,000 umhos/cm, sodium and chloride about 300 mg/L, and bicarbonate over 3,000 mg/L prior to blending with irrigation well water, wastewater from the Plant has potential to degrade groundwater with saline waste constituents and adversely affect designated beneficial uses of groundwater. Based on the mixed volumes from Baker's water balance calculations, the blended discharge has potential to exceed the EC of upgradient groundwater (1,300 umhos/cm) if the irrigation water EC is above 1,000 umhos/cm. Provision G.9 of this Order requires Baker to characterize the irrigation water and blended water quality as part of its Nutrient Management Plan.

Baker does not currently meet the applicable Basin Plan effluent limit for salinity that limits the increase in EC of the discharge to land to a maximum of 500 umhos/cm over the source water EC. Baker's supply water EC is about 200 umhos/cm, which results in a discharge limit of no more than about 700 umhos/cm. Baker is required to meet this limit, which is below the recommended secondary MCL for EC of 900 umhos/cm and is less than underlying groundwater EC upgradient of discharge areas. Meeting this limit (discharge EC no more than 500 umhos/cm over source water) is expected to result in no increase in groundwater EC, and minor degradation with specific ions (i.e., sodium, potassium, bicarbonate, etc.) that does not adversely affect beneficial uses of groundwater.

50. Social, economic, and environmental considerations contribute to the assessment of whether degradation that meets all other conditions of the Antidegradation Policy is also consistent with the maximum benefit to the people of the State. In the Central Valley, which houses the majority of California's confined animal population, the Discharger's operation provides the service of sanitary disposal of animal carcasses and byproducts of animal processing with minimal generation of solid waste. Rendering is the only allowable method

currently available in California for confined animal facilities to dispose of animal mortalities. The Plant also provides 45 full time jobs and supports employment of those who provide ancillary services including transportation of finished products.

Treatment and Control Practices

51. The Discharger and this Order implement treatment and control of the discharge that incorporates:

    a. A discharge limit for EC of no more than the EC of the source water plus 500 umhos/cm and the concentration of chloride in the discharge is limited to no more than 175 mg/L.

    b. Water conservation measures (i.e., recirculating boiler feed water) that result in a lower mass discharge of salt;

    c. Mechanical solids removal (i.e., skimming, cavitation air flotation, and grit settling);

    d. Organic loading rates Land Application Areas unlikely to cause unacceptable groundwater degradation;

    e. Installation of lined wastewater ponds to limit percolation of high-strength waste;

    f. Implementation of the Salinity Control Plan to reduce the salinity of the discharge required by Provision G.8; and

    g. Application of nitrogen at agronomic rates through implementation of the Nutrient Management Plan required by Provision G.9.

Antidegradation Conclusions

52. This Order includes provisions to limit groundwater degradation and establishes groundwater limitations that do not allow the discharge to further degrade groundwater with constituents of concern. Limited degradation of groundwater quality by some of the typical waste constituents associated with discharges from a rendering plant, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the State.

53. This Order is consistent with the Antidegradation Policy since: (a) the Discharger has or will implement BPTC to minimize degradation, (b) the limited degradation allowed by this Order will not unreasonably affect present and anticipated future beneficial uses of groundwater, or result in water quality less than water quality objectives, and (c) the limited degradation is consistent with the maximum benefit to people of the State.

Water Reuse

54. The Basin Plan encourages the reuse of wastewater and identifies crop irrigation as a reuse option where the opportunity exists to replace an existing or proposed use of fresh water with wastewater.

California Environmental Quality Act

55. On 9 February 2007, the San Joaquin Valley Air Pollution Control District certified a Mitigated Negative Declaration for an increase in processing capacity of the Facility from 18.9 tons of raw material per hour (454 tons per day) to 29 tons per hour (696 tons per day). Increasing the production capacity also increased the volume of wastewater generated and the associated nitrogen and salt loading to the discharge area. In collaboration with Central Valley Water Board staff, the Air District included mitigation measures to limit environmental impacts associated with the project to less than significant.

56. The mitigation measures for the project, which Baker has largely completed, include: use of reverse osmosis to replace an ion exchange unit; additional treatment to remove suspended and floating solids from wastewater; a feasibility study to analyze alternative wastewater treatment scenarios; an evaluation of irrigation practices (and implementation of improvements); a revised Report of Waste Discharge delineating the comprehensive management of Plant wastewater and storm water (implementing cost-effective wastewater treatment measures for preservation of beneficial uses of local surface and groundwater); new lined ponds for wastewater treatment and storage; installation of additional groundwater monitoring wells; and design of wastewater improvements based on a higher wastewater flow rate.

57. Baker has not expanded or altered operations beyond the scope of the project description for which the Air District completed an environmental review and certified the Mitigated Negative Declaration as described in Findings 55 and 56. The adoption of this Order for an existing facility is exempt from the requirements of the California Environmental Quality Act in accordance with California Code of Regulations, title 14, section 15301.

Other Regulatory Considerations

58. Based on the assessed threat to water quality and complexity (California Code of Regulations, title 23, § 2200), the discharge is classified 2A as defined below:

    a. Category 2 threat to water quality: "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."

    b. Category A complexity, defined as: "Any discharge of toxic wastes; any small volume discharge containing toxic waste; any facility having numerous discharge points and groundwater monitoring; or any Class 1 waste management unit."

59. 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 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.

…

60. The discharge authorized herein is exempt from the requirements of Title 27 because:

a. The Central Valley Water Board is issuing WDRs.

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

c. The treated effluent discharged to the ponds does not need to be managed as hazardous waste.

61. 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 that could contact waste becomes part of the wastewater stream and all other storm water is allowed to percolate on-site and does not discharge into a water of the United States. The Discharger is, therefore, not required to obtain coverage under NPDES General Permit CAS000001.

62. 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.

63. The technical reports required by this Order and the attached Monitoring and Reporting Program R5-2014-0062 are necessary to ensure compliance with these waste discharge requirements. The Discharger owns and operates the Plant that discharges the waste subject to this Order.

64. 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.

65. The California Department of Water Resources set standards for the construction and destruction of groundwater wells, 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.

Public Notice

66. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated herein and made part of this Order, were considered in establishing the following conditions of discharge.

67. The Discharger 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.

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

IT IS HEREBY ORDERED that Waste Discharge Requirements 95-245 is rescinded, and that Baker Commodities, Inc., its 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 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 at a location or in a manner different from that described in the Report of Waste Discharge and Findings herein is prohibited.

B. Effluent Limitations

1. The 12-month rolling average EC of the discharge shall not exceed the 12-month flow weighted average EC of the source water plus 500 umhos/cm. Compliance with this effluent limitation shall be determined monthly based on representative samples from location EFF-002, as identified in MRP R5-2014-0062.

2. The discharge (EFF-002) shall not contain chloride in a concentration exceeding 175 mg/L.

C. Discharge Specifications

1. The discharge from the Plant shall not exceed a monthly average flow of 0.192 mgd.

2. 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.

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

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

5. The discharge shall remain within the permitted wastewater ponds, conveyance structures, and the LAAs at all times.

6. The Plant and wastewater ponds 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 wastewater ponds or the LAAs at an intensity that creates or threatens to create nuisance conditions.

8. The discharge of wastewater shall be distributed uniformly on adequate acreage in compliance with the Discharge Specifications.

9. The ponds and open containment structures shall be managed to prevent breeding of mosquitoes.

10. The Discharger shall periodically monitor solids accumulation in the wastewater ponds and shall remove solids to maintain adequate storage capacity.

D. LAA Specifications

1. Crops shall be grown in the LAAs. Crops shall be selected based on nutrient uptake, consumptive use of water, and irrigation requirements to maximize nutrient and salt uptake.

2. Application of waste constituents to the 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 the LAAs, including the nutritive value of organic and chemical fertilizers and of the wastewater, shall not exceed the annual crop demand.

3. Hydraulic loading of wastewater and irrigation water shall be at reasonable agronomic rates designed to minimize the percolation of wastewater and irrigation water below the root zone (i.e., deep percolation).

4. The BOD loading to the LAAs calculated as a cycle average and as instantaneous load, as determined by the methods described in the attached Monitoring and Reporting Program, shall not exceed 50 pounds per acre per day and 150 pounds per acre per day, respectively.

5. The resulting effect of the discharge on soil pH shall not exceed the buffering capacity of the soil profile.

6. The Discharger shall not discharge process wastewater to the LAAs when soils are saturated (e.g., during or after significant precipitation).

7. Any irrigation runoff shall be confined to the LAAs and shall not enter any surface water drainage course or storm water drainage system.

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

9. Irrigation pipelines shall be flushed with fresh water after wastewater application as often as needed to ensure continuous compliance with Discharge Specification C.7.

10. The LAAs shall be managed to prevent breeding of mosquitos. More specifically:

    a. All applied irrigation water must infiltrate completely within 48-hours;

    b. Ditches not serving as wildlife habitat shall be maintained free of emergent, marginal, and floating vegetation; and

    c. Low-pressure and unpressurized pipeline and ditches accessible to mosquitos shall not be used to store wastewater.

E. Solids Disposal Specifications

1. Any drying, handling, and storage of solids at the Plant shall be temporary, and controlled and contained in a manner that precludes the development of nuisance odor conditions and minimizes leachate formation and infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations of this Order. Solids removed from the wastewater ponds or treatment units shall be disposed of offsite at a facility permitted to accept the waste, or in accordance with a technical report (including a thorough characterization of the solids and assessment of potential groundwater degradation resulting from disposal) prepared by a civil engineer licensed in California and approved by the Executive Officer.

2. Any proposed change in solids use or disposal practices shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

F. Groundwater Limitations

1. Release of waste constituents associated with the discharge shall not cause or contribute to groundwater containing concentrations of waste constituents in excess of concentrations specified below or background water quality, whichever is greater.

   a. Nitrate (as nitrogen) of 10 mg/L;

   b. Sodium of 115 mg/L; and

   c. For constituents identified in Title 22, concentrations quantified as MCLs specified therein.

G. Provisions

1. The Discharger shall comply with Monitoring and Reporting Program R5-2014-0062, which is incorporated herein and made 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.

2. 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 a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provisions."

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

4. The Discharger shall install and maintain a representative groundwater monitoring well network consistent with applicable well standards described in Finding 65 of this Order.

5. The Discharger shall operate and maintain all wastewater storage units 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 Provision, the Discharger shall install and maintain in each pond permanent markers with calibration that indicates the water level at design capacity and enables determination of available operational freeboard.

6. On or about **1 October** of each year, available wastewater storage capacity shall at least equal the volume necessary to comply with Provisions G.5.

7. **By 5 December 2014**, the Discharger shall provide an evaluation of the effectiveness of the existing groundwater monitoring well network to monitor any effects that discharge of wastewater to the lined ponds might have on underlying groundwater. If the evaluation concludes that additional groundwater monitoring wells are required, the Discharger shall also provide a Groundwater Monitoring Well Installation Work Plan describing a plan for installation of additional groundwater monitoring wells. The additional monitoring well locations, construction, and number of wells shall be chosen to provide sufficient information to assess groundwater conditions upgradient and downgradient of the lined wastewater ponds. The work plan shall include a time schedule for implementation of the work and collection of the first round of samples from each well (in accordance with MRP R5-2014-0062), which shall be completed by **no later than 5 June 2015**.

8. **By 5 June 2015**, the Discharger shall submit a Salinity Control Plan in the form of a technical report for Executive Officer approval describing measures Baker will implement to reduce wastewater salinity by source reduction and/or treatment, which shall include at a minimum:

    a. a thorough characterization of sources of salinity, including EC and specific ions (e.g., sodium, chloride, bicarbonate, etc.), detailing the effects of each source on the concentration/mass of salt in the wastewater and final blended discharge;

    b. a description (including the effectiveness, feasibility, and relative costs) of any additional source control (i.e., segregation of high-salinity waste) and treatment methods that could be used to further reduce the salinity of the discharge to the maximum extent feasible;

    c. documentation of the selection process identifying the particular measures Baker will implement to reduce the salinity of the discharge, including the specific criteria used for selection; and

    d. a detailed description of the tasks, cost, and time required to investigate and implement each key element of the Salinity Control Plan.

9. **By 5 December 2014**, the Discharger shall submit a Nutrient Management Plan, which shall include at a minimum:

    a. a description of the LAAs and storage facilities;

    b. a description of how wastewater is or will be uniformly blended with supplemental irrigation supply water and evenly distributed to the LAAs;

    c. a description of the types of crops to be grown with their water, nutrient, and salt uptake rates and the required leaching fraction;

    d. supporting data (including analytical data from wastewater and irrigation water monitoring) and calculations for monthly and annual water, nutrient, and salt balances, including the mass of water, nutrients, and salt expected to leach below the root zone;

e. specific management practices that will ensure wastewater, irrigation water, and commercial fertilizers are applied at agronomic rates optimized to limit groundwater degradation;

f. a coordinated sampling and analysis plan for monitoring soils, wastewater, and plant tissue to verify the nutrient and salt balance; and

g. a description of the system of daily record keeping.

10. 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.

11. 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 work plans 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.

12. 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.

13. 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.

14. 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.

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

16. 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.

17. 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.

18. In the event of any change in control or ownership of the plant, 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.

19. 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 Water Code. 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.

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

21. If the Central Valley Water Board determines that the discharge has a reasonable potential to cause or contribute to an exceedance of a water quality objective, or to create a condition of nuisance or pollution, this Order may be reopened for consideration of additional requirements.

22. 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 objectives are to be interpreted for the protection of agricultural use. If new information or evidence indicates that groundwater limitations different than those prescribed herein are appropriate, this Order will be reopened to incorporate such limits.

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

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.

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 6 June 2014.

Original signed by:

____
PAMELA C. CREEDON, Executive Officer

Order Attachments:
- A. Vicinity Map
- B. Site Map
- C. Process Flow Diagram

Monitoring and Reporting Program R5-2014-0062
Information Sheet
Standard Provisions (1 March 1991)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2014-0062

FOR
BAKER COMMODITIES, INC.
KERMAN RENDERING PLANT
FRESNO COUNTY

This Monitoring and Reporting Program (MRP) is required pursuant to Water Code section 13267.

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP. Changes to sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with ***Standard Provisions and Reporting Requirements for Waste Discharge Requirements***, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as pH) may be used, provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program. The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after at least 12 sampling events, the Discharger may request this MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

A glossary of terms used within this MRP is included on page 12.

Monitoring Location Name	Monitoring Location Description
EFF-001	Location where a representative sample of the wastewater can be obtained after the grease and grit removal treatment operations and prior to discharge to the wastewater pond system.
EFF-002	Location where a representative sample of the wastewater can be obtained after all treatment units and prior to discharge to the land application areas (LAAs).
PND-001 through PND-003	Lined ponds 1 through 3 in order of wastewater flow.
SPL-001 and SPL-003 (SPL-ALL)[1]	Water supply wells for Plant operations. SPL-ALL represents a flow-weighted average of all the Plant water supply wells
IW-001 through IW-007 (IW-ALL)	Irrigation water supply wells. IW-ALL represents a flow-weighted average of all the irrigation water supply wells.
MW-001 through MW-009[2]	Groundwater monitoring wells.
LAA-001 through LAA-008	Land application areas where crops are irrigated with effluent (EFF-002) blended with irrigation water (IW-001 through IW-007)
SS-001 through SS-004[2]	Soil sampling locations.

1 Historically labeled FW-1 through FW-3.
2 Including additional locations not limited to those listed herein.

POND INFLUENT MONITORING (EFF-001)

Pond influent samples shall be collected at monitoring location EFF-001, as described above. Pond influent monitoring shall include at least the following:

Frequency	Constituent/Parameter	Units	Sample Type
Continuous	Flow	mgd	Meter
Weekly	pH	pH Units	Grab
Weekly	EC	umhos/cm	Grab
Weekly	12-Month Running Average EC[1,2]	umhos/cm	-
Monthly[4]	BOD_5	mg/L	Grab
Monthly[4]	TSS	mg/L	Grab
Monthly[4]	Nitrate as nitrogen	mg/L	Grab
Monthly[4]	Nitrite as nitrogen	mg/L	Grab
Monthly[4]	TKN	mg/L	Grab
Monthly[4]	Ammonia as nitrogen (NH_3-N)	mg/L	Grab
Monthly[4]	Total Nitrogen[1]	mg/L	-
Monthly[4]	TDS	mg/L	Grab

Frequency	Constituent/Parameter	Units	Sample Type
Monthly[4]	FDS	mg/L	Grab
Quarterly	General Minerals[3]	mg/L	Grab

1 Calculated value.
2 The EC readings for the current month averaged with EC readings for the previous 11 months.
3 Samples analyzed for metals shall be filtered with a 0.45 micron filter prior to preservation, digestion, and analysis.
4 Samples shall be collected monthly for 12 months and then quarterly therafter.

POND EFFLUENT MONITORING (EFF-002)

Effluent samples shall be collected at monitoring location EFF-002, as described above. Effluent monitoring shall include at least the following:

Frequency	Constituent/Parameter	Units	Sample Type
Continuous	Flow	mgd	Meter
Weekly	pH	pH Units	Grab
Weekly	EC	umhos/cm	Grab
Weekly	12-Month Running Average EC[1,2]	umhos/cm	-
Monthly[4]	BOD_5	mg/L	Grab
Monthly[4]	TSS	mg/L	Grab
Monthly[4]	Nitrate as nitrogen	mg/L	Grab
Monthly[4]	Nitrite as nitrogen	mg/L	Grab
Monthly[4]	TKN	mg/L	Grab
Monthly[4]	Ammonia as nitrogen (NH_3-N)	mg/L	Grab
Monthly[4]	Total Nitrogen[1]	mg/L	-
Monthly[4]	TDS	mg/L	Grab
Monthly[4]	FDS	mg/L	Grab
Monthly[4]	General Minerals[3]	mg/L	Grab

1 Calculated value.
2 The EC readings for the current month averaged with EC readings for the previous 11 months.
3 Samples analyzed for metals shall be filtered with a 0.45 micron filter prior to preservation, digestion, and analysis.
4 Samples shall be collected monthly for 12 months and then bimonthly thereafter.

POND MONITORING (PND-001 THROUGH PND-003)

Permanent markers (e.g., staff gages) shall be placed in the pond. The markers shall have calibrations indicating water level at the design capacity and available operational freeboard. Wastewater pond monitoring shall include at least the following:

Frequency	Constituent/Parameter	Units	Sample Type
Weekly[1]	DO	mg/L	Grab
Weekly	Freeboard	Feet[2]	Grab

Frequency	Constituent/Parameter	Units	Sample Type
Annually[3]	Solids Depth[4]	Feet[2]	Grab
1/Five Years[5]	Liner Leak Detection[6]	Feet[2]	Grab

[1] If offensive odor is detected by or brought to the attention of Baker, the Discharger shall monitor the potential source pond at least daily until dissolved oxygen > 1.0 mg/L.

[2] To nearest tenth of a foot.

[3] In October.

[4] Thickness of settled solids at the bottom of the pond.

[5] The first leak detection monitoring shall be completed during 2015.

[6] Leak detection monitoring shall be conducted in accordance with American Society of Testing and Materials (ASTM) Methods D7002 (known as the "Water Puddle Method") or D7007 (known as the "Dipole Method"), or an alternative approved by the Executive Officer.

The Discharger shall inspect the condition of the wastewater pond weekly and record visual observations in a bound Pond Monitoring Log. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether grease, dead algae, vegetation, scum, or debris are accumulating on the pond surface and their location; whether burrowing animals or insects are present; and the color of the reservoirs (e.g., dark green, dull green, yellow, gray, tan, brown, etc.). A summary of the entries made in the log shall be included in the subsequent monitoring report.

SUPPLY WATER MONITORING (SPL-001, SPL-003, SPL-ALL, IW-001 THROUGH IW-007, AND IW-ALL)

Samples of Plant supply water (SPL) and irrigation supply water (IW) shall be collected prior to any treatment and prior to entering the water distribution system. Plant source water and irrigation source water shall be monitored independently as follows:

Frequency	Constituent/Parameter	Units	Sample Type
Monthly	Flow	mgd	Meter
Monthly	EC	umhos/cm	Grab
Monthly	Flow-weighted EC[1]	umhos/cm	-
Monthly	12-Month Running Average EC[2]	umhos/cm	-
Annually	General Minerals	mg/L	Grab

[1] If water is from more than one source (e.g., both Plant supply wells or multiple irrigation wells), the flow-weighted average shall be the sum of EC results for grab samples from each source multiplied by the flow from that source over the period, divided by the total flow from all sources over the same period.

[2] The flow-weighted EC results for the current month averaged with flow-weighted EC results for the previous 11 months.

LAA MONITORING (LAA-001 THROUGH LAA-008)

The Discharger shall perform the following routine monitoring and loading calculations for each of the land application areas (LAAs). In addition the Discharger shall keep a bound LAAs Monitoring log of routine monitoring observations of the LAAs, for example: areas of ponding, unhealthy crops, grease residues, broken irrigation pipes, odors and/or flies within the LAAs. Data shall be collected and presented in tabular format and shall include the following:

Frequency	Constituent/Parameter	Units	Sample Type
Daily	Application location	n/a	n/a
Daily	Application area	acres	n/a
Daily	Wastewater flow	mgd	Meter
Daily	Irrigation well water flow	mgd	Meter
	Hydraulic loading		
Daily	wastewater loading[1]	inches/day	-
Daily	supplemental irrigation[1]	inches/day	Meter
Daily	precipitation	Inches/day	Rain gage[2]
	BOD loading rate[3]		
Daily	day of application[1]	lbs/acre	-
Daily	cycle average[1]	lbs/acre-day	-
	Nitrogen loading		
Monthly	from wastewater[1,4]	lbs/acre	-
Monthly	from irrigation well water[1,4]	lbs/acre	-
Monthly	from fertilizer[1]	lbs/acre	-
Annually	Cumulative nitrogen loading[1]	lbs/acre-year	-
Monthly	Salt loading[1,4]	lbs/acre	-
Annually	Cumulative Salt loading[1]	lbs/acre-year	-

[1] Calculated value.

[2] National Weather Service data from the nearest weather station is acceptable.

[3] Loading rates to be calculated using the applied volume of wastewater, acreage covered, and the BOD concentration result from the most recent sampling event prior to discharge. The BOD loading rate shall be divided by the number of days between applications to determine cycle average.

[4] Nitrogen and salt loading shall be calculated using the total applied volume of water, acreage covered, and the flow-weighted average concentrations of total nitrogen and FDS for the time month. Total nitrogen concentrations used for calculation shall be the results of analyses of samples collected during the reporting month. FDS concentrations used for calculations shall be the result of the most recent sampling event prior to discharge.

SOILS MONITORING (SS-001 THROUGH SS-004)

Representative locations shall be established for soil profile sampling. At least three locations shall be selected to represent LAAs soils. At least one sample location shall be selected to represent background soil conditions. The Discharger shall submit proposed sample locations to the Central

Valley Water Board for written staff approval before collecting samples. Soil samples shall be collected as follows:

Frequency	Constituent/Parameter	Units	Sample Type
Annually	Soil pH	pH Units	Grab[1]
Annually	Electrical Conductivity	µmhos/cm	Grab[1]
Annually	Nitrate	mg/kg	Grab[1]
Annually	Ammonia	mg/kg	Grab[1]
Annually	TKN	mg/kg	Grab[1]
Annually	Total Nitrogen	mg/kg	Grab[1]
Annually	Soil Organic Matter	% by dry weight	Grab[1]
Once[3]	Cation Exchange Capacity	meq/100g[2]	Grab[1]

[1] Samples shall be collected at 6 inches, 2 feet, 4 feet, and 6 feet. If refusal is encountered at a depth shallower than 6 feet using standard soil sampling techniques, the deepest soil samples shall be collected at the depth of refusal.
[2] Milliequivalents per 100 grams.
[3] During the first round of soil samples collected following adoption of this Order.

GROUNDWATER MONITORING

After measuring water levels and prior to collecting samples, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging is typically from 3 to 5 volumes of standing water within the well casing and screen, or additionally the filter pack pore volume.

Upon completion of groundwater monitoring well installation and development, the Discharger shall monitor all wells in its Groundwater Monitoring Well Network, and any additional wells installed pursuant to this Order, for the following:

Frequency	Constituent/Parameter	Units	Sample Type
Quarterly[6]	Depth to groundwater	feet[1]	Measured
Quarterly[6]	Groundwater Elevation[2]	feet[3]	-
Quarterly[6]	pH	pH Units	Grab
Quarterly[6]	EC	umhos/cm	Grab
Quarterly[6]	Nitrate as nitrogen	mg/L	Grab
Quarterly[6]	Nitrite as nitrogen	mg/L	Grab
Quarterly[6]	TKN	mg/L	Grab
Quarterly[6]	Ammonia as nitrogen	mg/L	Grab
Quarterly[6]	Total Nitrogen[2]	mg/L	-
Quarterly[6]	TDS	mg/L	Grab
Quarterly[6]	SAR[2]	mg/L	-
Quarterly[6]	Total Organic Carbon	mg/L	Grab

Frequency	Constituent/Parameter	Units	Sample Type
Quarterly[6]	General Minerals	mg/L	Grab
Annually[4]	Metals[5]	mg/L	Grab

[1] To nearest hundredth of a foot.
[2] Calculated value.
[3] To nearest hundredth of a foot above Mean Sea Level.
[4] In July.
[5] Metals analysis shall include: aluminum, arsenic, copper, iron, lead, manganese, molybdenum, nickel, uranium, vanadium and zinc.
[6] Samples shall be collected quarterly from each groundwater monitoring well until the data set for a well contains a minimum of 12 valid sample results. Once the data set contains 12 valid sample results, the frequency of sample collection for that well shall be reduced to semiannually. If the data set for any groundwater monitoring well already contains 12 valid sample results collected within the last five years, the frequency of sample collection for that well shall be semiannually.

REPORTING

All monitoring results shall be reported in **Quarterly Monitoring Reports** which are due by the first day of the second month after the calendar quarter. Therefore, monitoring reports are due as follows:

First Quarter Monitoring Report:	**1 May**
Second Quarter Monitoring Report:	**1 August**
Third Quarter Monitoring Report:	**1 November**
Fourth Quarter Monitoring Report:	**1 February**

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory.

The following information is to be included on all monitoring and annual reports, as well as report transmittal letters, submitted to the Central Valley Water Board:

Discharger: Baker Commodities, Inc.
Facility: Kerman Rendering Plant
MRP: R5-2014-0062
Contact Information (telephone number and email)

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the Reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3.

All monitoring reports that involve planning, investigation, evaluation or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

At any time henceforth, the State or Central Valley Regional Water Board may notify the Discharger to electronically submit monitoring reports using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html) or similar system. Until such notification is given, the Discharger shall submit hard copy monitoring reports, with tabulated electronic data in American Standard Code for Information Interchange (ASCII) format on attached digital media (e.g., compact disc) with Annual Monitoring Reports.

A. All Quarterly Monitoring Reports shall include the following:

Wastewater Reporting

1. The results of Pond Influent Monitoring, Pond Effluent Monitoring, and Pond Monitoring specified on pages 2, 3, and 4.

2. For each month of the quarter, calculation of the maximum daily flow, monthly average flow, and cumulative annual flow.

3. For each month, calculation of the 12-month rolling average EC of the discharge using the EC values for that month averaged with EC values for the previous 11 months. The report shall compare the result to the concurrent 12-month rolling average EC of the source water.

4. For each month of the quarter, calculation of the monthly average percent removal of BOD_5 and TSS exhibited in effluent compared to the pond influent wastewater samples.

5. A summary of the notations made in the Pond Monitoring Log and LAAs Monitoring Log during each quarter. The entire contents of the log do not need to be submitted unless requested by Central Valley Water Board staff.

Supply Water Reporting

1. The results of Supply Water Monitoring specified on page 4. Results intended to represent Plant supply water as a whole shall be labeled SPL-ALL. Results intended to represent irrigation supply water as a whole shall be labeled IW-ALL. Otherwise, results shall be labeled according to the individual sample locations (e.g., SPL-003 or IW-004).

2. For each month of the quarter, calculation of the flow-weighted 12-month rolling average EC of the source water using monthly flow data and the source water EC values. The calculation shall be performed for Plant supply water and irrigation supply water independently.

LAA Reporting

1. The results of the routine monitoring and loading calculations specified on pages 5.

2. For each month of the quarter, calculation of the monthly hydraulic load for wastewater and supplemental irrigation water in millions of gallons to each discrete irrigation area.

3. A summary of the notations made in the LAA Monitoring log during each quarter. The entire contents of the log do not need to be submitted unless requested by Central Valley Water Board staff.

Groundwater Reporting

1. The results of Groundwater Monitoring specified on page 6 and 7.

2. For each monitoring well, a table showing parameters/constituent concentrations for at least five previous years, if available, up through the current sampling period.

3. A groundwater contour map based on groundwater elevations for each sampling event. The map shall show the gradient and direction of groundwater flow under/around the ponds and LAAs. The map shall also include the locations of monitoring wells, ponds, and LAAs. The map shall be certified by a licensed professional engineer or geologist.

4. Groundwater contour maps based on the results of laboratory analyses of groundwater samples for nitrate, sodium, and EC for each sampling event. Each map shall present estimated lines of equal constituent concentration or conductivity in groundwater within the groundwater monitoring well network. The maps shall also include the locations of monitoring wells and wastewater discharge areas. The maps shall be certified by a licensed professional engineer or geologist.

B. Fourth Quarter Monitoring Reports, in addition to the above, shall include the following:

Plant Information

1. The names, certificate grades, and general responsibilities of all persons in charge of wastewater treatment and disposal.

2. The names and telephone numbers of persons to contact regarding the Plant for emergency and routine situations.

3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4).

4. A statement whether the current operation and maintenance manual, sampling plan, and contingency plan, reflect the Plant as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.

5. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the previous five calendar years.

6. A summary and discussion of the compliance record for the reporting period. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with this Order.

Soils Reporting

1. The results of Soils Monitoring specified on pages 5 and 6.

2. For each soil boring, a table showing sample depth and parameters/constituent concentrations for at least five previous years, if available, up through the current sampling period.

LAAs Reporting

1. The type of crop(s) grown in each of the LAAs, planting and harvest dates, yield in tons or bushels, and the quantified nitrogen and fixed dissolved solids uptakes (as estimated by technical references or, preferably, determined by representative plant tissue analysis).

2. The monthly and annual discharge volumes during the reporting year expressed as million gallons and inches.

3. A monthly water balance for the reporting year that includes:

   a. Monthly average ETo (reference evapotranspiration) – Information sources include California Irrigation Management Information System (CIMIS) http://www.cimis.water.ca.gov/

   b. Monthly crop uptake

      i. Crop water utilization rates are available from a variety of publications available from the local University of California Davis extension office.

      ii. Irrigation efficiency – Frequently, engineers include a factor for irrigation efficiency such that the application rate is slightly greater than the crop utilization rate. A conservative design does not include this value.

c. Monthly average precipitation – this data is available at http://www.cimis.water.ca.gov/ or at http://www.ncdc.noaa.gov/data-access/land-based-station-data/.

d. Monthly average and annual average discharge flow rate.

e. Monthly estimates of the amount of wastewater percolating below the root zone (i.e., amount of wastewater applied in excess of crop requirements).

4. A summary of daily and cycle average BOD loading rates.

5. The total pounds of nitrogen applied to the LAAs, as calculated from the sum of the monthly loadings, and the total annual nitrogen loading rate to the LAAs in lbs/acre/year.

6. The total pounds of fixed dissolved solids (FDS) that have been applied to the LAAs, as calculated from the sum of the monthly loadings, and the total annual FDS loading rate to the LAAs in lbs/acre/year.

7. A summary of the notations made in the LAAs monitoring log during the year. The entire contents of the log do not need to be submitted unless requested by Central Valley Water Board staff.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Original signed by:

Ordered by: ___________________________________
PAMELA C. CREEDON, Executive Officer

6 June 2014
(Date)

GLOSSARY

BOD_5	Five-day biochemical oxygen demand
CBOD	Carbonaceous BOD
DO	Dissolved oxygen
EC	Electrical conductivity at 25° C
FDS	Fixed dissolved solids
NTU	Nephelometric turbidity unit
TKN	Total Kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
Continuous	The specified parameter shall be measured by a meter continuously.
24-Hour Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots.
Daily	Samples shall be collected at least every day.
Twice Weekly	Samples shall be collected at least twice per week on non-consecutive days.
Weekly	Samples shall be collected at least once per week.
Twice Monthly	Samples shall be collected at least twice per month during non-consecutive weeks.
Monthly	Samples shall be collected at least once per month.
Bimonthly	Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months.
Quarterly	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.
Semiannually	Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October.
Annually	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.
mg/L	Milligrams per liter
mL/L	milliliters [of solids] per liter
ug/L	Micrograms per liter
umhos/cm	Micromhos per centimeter
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters
General Minerals	Analysis for General Minerals shall include at least the following:

Alkalinity	Chloride	Sodium
Bicarbonate	Hardness	Sulfate
Calcium	Magnesium	TDS
Carbonate	Potassium	Nitrate

General Minerals analyses shall be accompanied by documentation of cation/anion balance.

INFORMATION SHEET

R5-2014-0062
BAKER COMMODITIES, INC.
KERMAN RENDERING PLANT
FRESNO COUNTY

BACKGROUND

At its Kerman Rendering Plant (Plant), Baker Commodities, Inc. (Baker), renders farm animal carcasses (primarily bovine) for production of protein and bone meals, tallow, and feeding fats. The Plant is reportedly one of only four rendering plants in California that handle animal mortalities, which is the only lawful disposal option under most circumstances. Baker serves large and small farms in the area, restaurants (grease trap waste), and butcher shops and other meat processing operations. Baker brings some carcasses from its plant in Hanford, which only processes hides.

The Central Valley Water Board first adopted WDRs for discharge of wastewater from the Plant in 1970. WDRs Order 95-245 currently regulates the discharge, limiting wastewater discharge flow to no more than 0.032 mgd and prohibiting degradation of groundwater quality. Many of the findings in Order 95-245 are projections based on limited data available at the time of adoption of the Order. Anticipated wastewater quality was overestimated while wastewater flow rates were underestimated, resulting in waste constituent loading to the ponds and land application areas (LAAs) far exceeding the description in the findings of the WDRs. Baker discharged in excess of the 0.032-mgd flow limit almost continuously since adoption of the 1995 Order.

When Baker added a third cooker in 2007, it increased its rendering capacity by 50 percent. Baker concurrently installed an additional 10,000-gallon skimmer for a total of three in series, and began using a reverse osmosis system in lieu of ion exchange for boiler water treatment. Baker discontinued use of its undersized, unlined pond system when it installed lined wastewater ponds in 2010 and significantly improved the BOD removal efficiency of its wastewater treatment system in 2011 by adding a 0.316-mgd cavitation air flotation unit.

When prompted with a 13267 order, Baker submitted an updated RWD for wastewater flows up to 0.192 mgd in 2012. The current WDRs are out of date and need to be updated.

FACILITY AND DISCHARGE

Raw material is stockpiled in a paved loading area. Plant staff uses heavy equipment to load the material into a crusher which feeds three cookers. Boiler steam provides heat while a machine presses out oils. The remaining dry solids are finely shredded until they pass through a shaker screen. The finished products are kept in covered storage onsite before being hauled offsite by truck.

Wastewater consists of the following waste streams: condensed moisture from the raw material; boiler blowdown; reverse osmosis reject; and storm water and wash water from the paved truck unloading area. The reverse osmosis unit only treats the portion of Plant supply water used for boiler makeup.

All wastewater streams are pumped from a sump into large holding tanks to regulate flow through wastewater treatment units, including three skimmers and a cavitation air flotation unit (polyacrylamide flocculant added to increase removal efficiency). Skimmed material is sent back through the rendering process. Settled solids (primarily grass from raw material stomach contents) are collected in a bin and hauled to Kettleman Hills Landfill by a waste management company on a regular basis. After skimming and cavitation air flotation treatment, wastewater is pumped to three large, lined ponds in series. The first two ponds, designed for BOD removal and ammonia volatilization, are maintained at static water levels while the wastewater level in the third pond, designed for effluent storage, varies. Magnetic flow meters record wastewater flow into and out of the pond system. Wastewater is blended with water from onsite irrigation wells and distributed to approximately 537 acres of cropped land application areas (LAAs).

Wastewater

According to the RWD, 60 percent of the wastewater flow is condensate from the raw material, which is nearly pure water. However, the Plant still produces wastewater that is high in salinity, nitrogen, and biochemical oxygen demand (BOD). The source of these waste constituents is almost exclusively the fluids and paunch manure from the Plant feedstock (carcasses). The table below presents average wastewater analytical results for samples collected in 2012 and 2013.

	Units	Initial Pond Influent	Final Pond Effluent
Biochemical Oxygen Demand (BOD)	mg/L	3,340	1,050
Nitrate as nitrogen	mg/L	< 0.2	< 0.1
Total Kjeldahl Nitrogen	mg/L	213	563
Specific Conductance	umhos/cm	3,320	5,920
Total Dissolved Solids	mg/L	1,690	1,470
Calcium	mg/L	54[1]	73[2]
Magnesium	mg/L	11[1]	17[2]
Sodium	mg/L	215[1]	345[2]
Potassium	mg/L	82[1]	170[2]
Chloride	mg/L	197[1]	295[2]
Bicarbonate	mg/L	540[1]	3,220[2]
Sulfate	mg/L	158[1]	< 3.0[2]

[1] Average of three samples.
[2] Average of two samples.

Monthly EC monitoring shows nearly a doubling of EC (from 3,300 umhos/cm to 5,900 umhos/cm) from influent to effluent. The size of the pond system, with a total surface area of nearly 10 acres and a total hydraulic residence time of more than a year at recent flow rates, results in high evaporative losses and concentration of waste constituents. Evaporation does not appear to be the only factor driving the increase in EC. Monthly BOD monitoring shows an average 70 percent BOD removal rate (from average 3,340 mg/L to 1,050 mg/L) in the ponds. A byproduct of aerobic biodegradation of the oxygen-demanding organic constituents is bicarbonate, which is very high (over 2,500 mg/L as $CaCO_3$) in the two effluent samples collected since installation of the ponds compared to pond influent samples (300 to 400 mg/L as $CaCO_3$). The increase in bicarbonate is responsible for a portion of the increase in wastewater EC through the ponds.

Quarterly monitoring for nitrogen constituents shows wastewater nitrogen is in the form of total Kjeldahl nitrogen (TKN), which is the sum of ammonia and organic nitrogen concentrations, but does not identify how much is ammonia. The data generally show higher nitrogen concentrations in pond effluent (563 mg/L average) compared to influent (213 mg/L average). It's unclear whether any nitrogen removal is occurring in the ponds, given unknown evaporation rates and limited analytical data.

The limited data available for wastewater sulfate appears to show sulfate reduction is occurring in the pond system. Microbes preferentially reduce nitrate (resulting in emission of nitrogen gas) under sulfate reducing conditions, but nitrogen in the form of ammonia or organic nitrogen remains. While the ponds appear to be functioning in terms of BOD removal, they are not optimized for nitrogen removal.

Source Water

Two onsite supply wells, FW-1 and FW-3 (for reporting purposes now identified as SPL-001 and SPL-003, respectively), provide source water to the Plant. Baker has only reported sample analytical results for specific ions in one sample from each well since 2012. The table below presents the results of the analyses.

	Units	FW-1[1]	FW-3[2]
pH	std.	7.65	8.7
Nitrate as nitrogen	mg/L	3.8	1.7
Specific Conductance	umhos/cm	1,160	210
Total Dissolved Solids	mg/L	750	140
Calcium	mg/L	72	4
Magnesium	mg/L	4	3
Sodium	mg/L	106	6
Potassium	mg/L	9	4
Chloride	mg/L	118	50
Bicarbonate	mg/L	210	110
Sulfate	mg/L	51	4

[1] Also identified as SPL-001. Sample collected 8/15/2012.
[2] Also identified as SPL-003. Sample collected 1/22/2013.

Baker's previous well FW-2 was properly abandoned in 2012 due to the presence of uranium at above the Maximum Contaminant Level (MCL). At the end of 2012, Baker installed and began using FW-3 exclusively. Well FW-1, installed to a depth of about 280 feet, is available as a backup well, though samples from FW-1 have contained uranium in concentrations above the MCL.

Treatment and Storage Ponds

The water balance submitted with the RWD was used to model storage and disposal capacity and utilized an estimated 100-year return frequency wet year, assuming at least two feet of freeboard will remain in the wastewater pond. The peak wastewater storage requirement is projected to be 12.6 million gallons. The storage pond (Pond 3) reportedly has capacity to hold more than 17 million gallons. The model indicates the final pond and LAAs provide sufficient storage and disposal capacity to accommodate the wastewater flow allowed by the proposed Order.

The RWD indicates that the new pond system was designed for nitrogen removal in the two initial ponds (primarily by ammonia volatilization) and the third and final pond is used for effluent storage. The record includes a final Construction Quality Assurance (CQA) Report, provided to staff electronically on 26 March 2014, describing construction of the ponds and liners. The new ponds are lined with a 45-mil, flexible reinforced polypropylene geomembrane (fPP-R), underlain by a geosynthetic clay liner (GCL) placed over the compacted subgrade. Baker hired a contractor to perform electric leak location in general accordance with ASTM D7002-03 on 23 and 24 June 2010. The volume of each pond in the series with two feet of freeboard is 18 million gallons, 8.7 million gallons, and 17 million gallons, respectively.

LAAs

Baker owns about 537 acres of cropland adjacent to the Plant. The RWD indicates that a contract farmer grows about 425 acres of alfalfa and 112 acres of cotton. Flood irrigation is manually controlled by valves at the end of each check. Checks are generally about 50-feet on center and 1,300 feet long. The contract farmer applies effluent from the final wastewater pond (Pond 3) to the crops in combination with supplemental water from seven onsite irrigation wells. Baker varies the particular LAA on which the crops are grown occasionally, but the crops have historically been limited to cotton and alfalfa.

No water quality data have been submitted for the irrigation wells, but they are expected to be similar in quality to the two older onsite source water wells, which would dilute the effluent and result in a better quality discharge. At the highest proposed annual effluent flow, the blended discharge to the LAAs would be about six percent wastewater (an average ratio of about 15:1, well water to wastewater). Before submitting changes to address Central Valley Water Board staff comments, Baker reported in the RWD that wastewater was diluted at an average ratio of 31:1 and the blended discharge was applied at an average of more than 10 inches per month.

GROUNDWATER CONDITIONS

Regional groundwater flow is generally away from the San Joaquin River (about 8 miles north of the Plant) and toward a large groundwater depression about 8 miles south of the Plant. Published groundwater data from the Department of Water Resources and the United States Geological Survey includes groundwater quality data for wells in the area dating back to the 1950s. Data for wells within about five miles generally show specific conductance (EC) in the range of 250 umhos/cm to 750 umhos/cm, with a few wells over 1,000 umhos/cm (e.g., samples from one upgradient well measured about 1,600 umhos/cm in 1973 and 2,100 umhos/cm in 1979). DWR Bulletin 130-63 (published in 1963) for the Central Valley includes a map showing lines of equal EC in groundwater representing "the quality of water from the principal pumped zone in the valley." While published data shows that groundwater in the principal pumped zone was good quality, with EC less than about 750 umhos/cm underlying the Plant, this is not necessarily representative of first encountered groundwater. The data also does not provide information specific to the Baker Plant site.

Samples from the onsite water supply wells likely represent the quality of deeper groundwater (FW-1 and FW-3 are reportedly about 280 feet deep and 600 feet deep, respectively). WDRs Order 95-245 referenced the quality of FW-1 to conclude that the quality of underlying groundwater is good quality, with an EC of 360 umhos/cm and a TDS of 280 mg/L. The quality of water produced from well FW-1 has since declined. In 2012, Baker submitted sample results showing an EC of about 600 umhos/cm and TDS of 420 mg/L for FW-1.

Baker installed an onsite groundwater monitoring well network of three wells in 1995 (MW-1, MW-2, and MW-3). In April 2012, Baker installed six additional groundwater monitoring wells. The reported overall groundwater gradient of 5 to 7 feet per thousand feet toward the southwest agrees well with regional elevation contour maps prepared by the Department of Water Resources.

Samples from MW-1 represent groundwater quality upgradient of Baker's discharges of waste. The EC in MW-1 has been relatively stable at around 1,300 umhos/cm. The concentration of chloride has been decreasing in samples from MW-1, from about 200 mg/L in 1996 to about 100 mg/L in 2013. The concentration of nitrate in the well has been increasing recently, from about 10 mg/L as nitrogen in 2002 to about 15 mg/L as nitrogen in 2013. Based on the groundwater gradient, the increase in nitrate concentrations does not appear to be caused by Baker's discharge. The table below presents average analytical results from eight samples collected from each monitoring well from 2012 through 2013.

	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7[2]	MW-8	MW-9
Nitrate[1]	mg/L	15	34	37	92	61	36	18	31	32
EC	umhos/cm	1,320	2,040	1,550	2,220	2,040	1,620	1,410	1,580	1,540
TDS	mg/L	843	1,350	985	1,470	1,340	1,030	906	1,000	964
Calcium	mg/L	154	242	117	198	229	163	144	138	148
Magnesium	mg/L	44	75	34	72	72	33	34	46	58
Sodium	mg/L	53	57	163	226	104	130	96	140	133
Potassium	mg/L	13	13	13	21	20	17	14	14	21
Chloride	mg/L	127	315	159	188	251	197	190	158	160
Bicarbonate[3]	mg/L	435	433	440	694	491	424	370	498	460
Sulfate	mg/L	103	169	81	70	149	93	102	94	86
Iron[4]	mg/L	< 0.2	3.7	< 0.2	22	11	46	1.4	1.3	41
SAR[5]		1.0	0.8	3.4	3.5	1.5	2.4	1.9	2.6	2.3

1 As nitrogen.

2 The average values presented for MW-7 include analytical results for first sample from MW-7, collected 4/18/2012, which report waste constituent concentrations of about half the concentrations reported for the rest of the samples in the dataset for MW-7.

3 Bicarbonate as $CaCO_3$.

4 Samples were not filtered prior to preservation or analysis.

5 Sodium Adsorption Ratio (not adjusted for elevated bicarbonate concentrations).

The data shows degradation of groundwater quality with sodium, chloride, bicarbonate, nitrate, TDS and EC. Degradation is particularly pronounced in groundwater monitoring well MW-4, the nearest monitoring well downgradient of the unlined ponds. Though the ponds have been out of service since the end of 2010, elevated concentrations of waste constituents in groundwater persist. Samples from MW-2 and MW-5 on the west side of the site typically contain concentrations chloride above the secondary MCL (250 mg/L).

Analytical results from samples collected from MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, and MW-9 above show groundwater quality downgradient of the LAAs has been degraded with sodium, and to the point of pollution with EC, TDS, nitrate, and chloride.

Baker has reported iron concentrations above the MCL for iron of 0.3 mg/L in some wells. Since the samples were not filtered prior to preservation or analysis, the results likely represent dissolution of metals from soil in the sample during acidification at the laboratory. The proposed Order requires samples analyzed for metals to be filtered prior to analysis for proper characterization of dissolved iron concentrations in groundwater.

The record also includes analytical results for samples from onsite water supply wells FW-1 and FW-2 (FW-2 now properly abandoned) that show uranium concentrations above the MCL at 49 and 58 pCi/L, respectively. Replacement well FW-3 notably has elevated concentrations of arsenic, reported at 14 ug/L (above the MCL of 10 ug/L). Groundwater contains naturally-occurring radionuclides and metals present in area soils.

According to a report prepared by the United States Geological Survey in 2009 entitled *Effects of Groundwater Development on Uranium: Central Valley, California, USA*, irrigated agriculture contributes significantly to mobilizing uranium and has, over the last 100 years, contributed to groundwater exceeding MCLs for uranium in many wells up and down the east side of the San Joaquin Valley. Summer irrigation means soils are in contact with water that is warm, oxygenated, and high in bicarbonate (from root respiration), all factors that increase uranium mobility. The uranium is naturally attracted to the positive surface charge of the soil particles, but in the presence of carbonates (i.e., bicarbonate) it forms uranyl carbonate, which reduces attraction to the soil and allows it to flow. Baker's discharge is very high in bicarbonate. Though this information does not quantify Baker's contribution to the Valley-scale problem of increasing uranium in groundwater, it supports the requirement to monitor groundwater for uranium and minimize effluent bicarbonate concentrations during implementation of a Salinity Control Plan.

COMPLIANCE HISTORY

Since adoption of WDRs Order 95-245, Baker has been in continuous violation of the effluent flow limit of no more than 0.032 mgd. Central Valley Water Board found in WDRs Order 95-245 that the projected nitrogen loading rate was 150 lbs/acre/year. Baker has since reported loading rates to the LAAs in excess of 900 lbs/acre/year. The unlined pond system was also substantially overloaded and poorly maintained to the extent that the BOD of pond effluent was occasionally higher than influent BOD concentrations as accumulated solids in the ponds presumably migrated out with effluent.

Historic discharges to the ponds, reportedly used from 1965 through 2010, were poorer quality than wastewater discharged to the new pond system. On average from 1995 through 2010, samples from the discharge to the unlined ponds were found to contain BOD over 9,000 mg/L, total nitrogen over 1,000 mg/L, and EC over 4,700 umhos/cm. As a result, Baker's discharge to the unlined ponds has caused significant localized groundwater degradation with sodium, chloride, and bicarbonate, and pollution of groundwater with EC, TDS, and nitrate.

In a Notice of Violation issued in 2006, staff notified Baker that it had exceeded its effluent flow limit and effluent limits for inorganic TDS (exceeded 330 mg/L over source water) and caused groundwater EC and TDS to exceed upper secondary MCLs, and caused groundwater pollution with nitrate. Staff issued another NOV in 2007 for the same and additional violations of the WDRs, including a spill of grease when the old ponds overflowed onto adjacent LAAs.

The unlined ponds have caused and may continue to cause groundwater to be polluted as precipitation enters the ponds and transmits accumulated waste to groundwater. Baker has discontinued its discharge to the ponds, but has not closed them.

Prior to completion of the lined ponds, Baker noted in annual self-monitoring reports that it overloaded LAAs with nitrogen (e.g., applied an average of 763 lbs/acre/year in 2009 and 923 lbs/acre/year in 2010) and caused groundwater degradation with salt and nitrate. As noted above, analytical results from samples collected from monitoring wells downgradient of the LAAs has been degraded with sodium, and to the point of pollution with EC, TDS, nitrate, and chloride.

The lateral extent of degradation due to Baker's historic discharges has not been fully defined, but it appears to extend offsite to the west and south. Samples from groundwater monitoring wells at the downgradient boundary of the site (e.g., MW 6) contain nitrate concentrations above the MCL.

REGULATORY CONSIDERATIONS

Basin Plan

The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition,* revised January 2004 (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State Water Resources Control Board (State Water Board). Pursuant to Water Code section 13263(a), these requirements must implement the Basin Plan.

The Plant is in Detailed Analysis Unit 235 within the Kings Basin hydrologic unit. The Basin Plan designates the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, and industrial service and industrial process supply, contact water recreation, and non-contact water recreation.

The Basin Plan includes a water quality objective for chemical constituents that requires waters designated as domestic or municipal supply to meet the MCLs specified in Title 22.
The Basin Plan indicates the greatest long-term problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. To limit degradation, the Basin Plan includes effluent limits for discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 umhos/cm, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L.

Very limited wastewater boron data show concentrations around 0.1 mg/L, less than the Basin Plan effluent limit of 1.0 mg/L. The chloride limit applies to the discharge. At about 1,300 umhos/cm, upgradient groundwater EC is higher than 1,000 umhos/cm. The Basin Plan effluent limit of 1,000 umhos/cm over good quality groundwater does not apply. However, discharge of wastewater above 1,300 umhos/cm could cause degradation above background groundwater EC.

The Central Valley Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established that, for industrial discharges to land, the Basin Plan limits the increase in EC of a point source discharge to a maximum of 500 umhos/cm over source water. Source water EC for the Plant is about 200 umhos/cm. With discharge to the ponds at an average EC of 3,100 umhos/cm above source water EC, Baker is far from meeting the limit. The Basin Plan allows two exceptions to the effluent limit, one for water conservation resulting in a reduction in the mass of salt discharged and one for disproportionately high EC caused by elevated organic matter constituents in food processing wastewater. The Plant is not a food processor and Baker has not demonstrated that allowing a greater net incremental increase in EC will result in a lower mass emission of salt and protection of beneficial uses of groundwater. Baker's discharge does not meet the criteria for either exception.

Based on maintenance purchases for the ion exchange unit from 2005, the reverse osmosis system prevents about 35,000 pounds of salt from entering the wastewater stream per year. However, relative to the total wastewater salt loading in the LAAs, which is generally still over 500,000 pounds per year, the reduction is minor and does not warrant exception from the Basin Plan limit on the incremental increase in EC.

WDRs Order 95-245 does not implement the Basin Plan effluent limit for EC of 500 umhos/cm over source water. Instead, the Order limits effluent fixed dissolved solids to no more than 330 mg/L over source water TDS. Baker has rarely met this effluent limit even though fixed dissolved solids (FDS) results appear to be significantly underrepresented in analytical results due to high bicarbonate concentrations (the test method results in volatilization of some bicarbonate as carbon dioxide). The sum of specific ions, including bicarbonate, is greater than the analytical result for FDS.

In the absence of specific numerical water quality limits, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective. Crop irrigation (AGR) is generally the beneficial use of groundwater most sensitive to saline waste constituents. 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 umhos/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 umhos/cm if sufficient additional water (leaching fraction) is provided to maintain soil salinity within the tolerance of the crop.

The most salt-sensitive crops are not currently grown in the area, likely due to soil characteristics. Most of the land within a 5-mile radius is planted with almonds, grapes, and peaches, which are irrigated primarily with groundwater. Based on guidelines for irrigation of these crops in Water Quality for Agriculture by Ayers and Westcot and Agricultural Drainage Water Management in Arid and Semi-Arid Areas by Mass and Grattan, the appropriate AGR-based goals for irrigation water EC, sodium, chloride, and bicarbonate are 1,000 umhos/cm (the recommended secondary MCL is lower at 900 umhos/cm), 115 mg/L, 175 mg/L, and 122 mg/L, respectively.

The Basin Plan prohibits use of surface water or groundwater to dilute wastes for the primary purpose of meeting waste discharge requirements, where reasonable methods for treating the wastes exist. Blending of wastewater with surface water or groundwater to promote beneficial reuse of wastewater in water short areas may be allowed where the Central Valley Water Board determines such reuse is consistent with all other policies set forth or referenced in the Basin Plan.

The crop water requirement for crops grown on Baker's property surrounding the Plant exceeds the wastewater flow. Therefore supplemental irrigation water is required to maintain a successful crop. On an annual basis, the water balance Baker submitted as part of its RWD indicates wastewater represents only about six percent of the irrigation water requirement at the maximum proposed flow.

The discharge is to cropland and any surface drainage would be to James Bypass of the Fresno Slough, which discharges to the San Joaquin River. The designated beneficial uses of Valley Floor Waters are agricultural and industrial service and process supply; water contact and non-contact water recreation; wildlife and warm freshwater habitat; groundwater recharge; and preservation and enhancement of rare, threatened, and endangered species.

Treatment and Control Practices

Baker implements treatment and control of the discharge that incorporates: reverse osmosis treatment of boiler feed water; mechanical solids removal (i.e., skimming and cavitation air flotation); organic loading rates consistent with EPA recommendations and unlikely to cause unacceptable groundwater degradation; application of nitrogen at agronomic rates; lined wastewater ponds to limit seepage; implementation of the Salinity Control Plan and Nutrient Management Plan required by the proposed Order.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "*Statement of Policy with Respect to Maintaining High Quality Waters in California*," or "Antidegradation Policy" require that waters of the State that are better quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Policy and procedures for complying with this directive are set forth in the Basin Plan.

Constituents of concern that have the potential to cause degradation include nitrogen, organic material, and salts. Specifically, BOD concentrations are high and the total nitrogen, TDS, sodium, chloride, and bicarbonate concentrations in wastewater are significantly higher than in groundwater. Baker has potential to cause degradation to the point of pollution, which past discharges from the Plant have already caused.

In order to reduce the potential degradation of groundwater quality from percolation of high-strength wastewater, Baker treats and stores wastewater in lined ponds to limit percolation and the proposed Order requires Baker to demonstrate empirically that the ponds are constructed to sufficiently limit percolation.

Wastewater will be diluted with large amounts of onsite irrigation well water prior to land application. Baker's irrigation well water quality has not been characterized, but the proposed Order requires characterization of the blended discharge as part of proper salinity and nutrient management.

Receiving groundwater nitrate concentrations are currently about 13 mg/L as nitrogen upgradient of discharges from the Plant. The record shows upgradient nitrate concentrations less than the MCL of 10 mg/L as nitrogen from initial monitoring of MW-1 in the 1990s. From quarterly monitoring from 2012 through 2013, the average total nitrogen concentration of effluent from the final wastewater pond is 563 mg/L. Seepage of wastewater from the wastewater pond bottoms would likely cause groundwater pollution with nitrate (contain concentrations of nitrate above 10 mg/L as nitrogen), if the pond liners were not designed to sufficiently limit percolation.

After blending with irrigation well water at more than 15:1 (well water to wastewater) to meet crop water requirements, the discharge is expected to be significantly diluted, but still has potential to degrade groundwater quality with nitrate without proper management. According to the RWD, the wastewater total nitrogen loading to the LAAs averages 330 lbs/acre/year at the proposed flow, which is less than the anticipated overall crop uptake of 400 lbs/acre/year, minimizing the potential for groundwater degradation with nitrate due to irrigation with effluent. However, the nitrogen loading calculations in the RWD are not entirely realistic.

The RWD uses the average of effluent total nitrogen concentrations from four effluent samples available at the time for a concentration of 417 mg/L. The average of 563 mg/L for the larger dataset of eight samples from 2012 to 2013 is more representative of effluent quality. Also, comparing the overall load of nitrogen to the overall uptake of nitrogen by different crops is inappropriate without a demonstration that the proposed discharge will not overload particular LAAs with nitrogen. In this case, assuming wastewater will be blended with irrigation well water at the same ratio across the LAAs to meet the water requirements of each crop, the nitrogen loading to alfalfa and cotton would be 448 lbs/acre/day and 428 lbs/acre/day, respectively. Alfalfa can take up to 480 lbs/acre/year of nitrogen from the soil while cotton is expected to take up no more than 105 lbs/acre/year, resulting in overloading of the 112 acres of LAAs where cotton is grown by over 300 lbs/acre/year.

The RWD does not take into account the additional nitrogen loading contribution from the irrigation water, which may be significant depending on the concentration of nitrate. Because proposed nitrogen loading from wastewater appears to be at or above the uptake rate for the proposed wastewater flow rate, provisions of the proposed Order requires Baker to prepare and implement a Nutrient Management Plan to ensure actual loading will not exceed agronomic uptake rates for nitrogen.

The average effluent flow rate from the final pond for 2012 and 2013 was 0.075 mgd, which is considerably less than the proposed flow rate of 0.140 mgd used to calculate the excessive loading rates described above. Baker is expected to have the opportunity to remedy potential nitrogen overloading issues in the LAAs before they occur.

With regard to organic material (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. When insufficient oxygen is present below the ground surface, anaerobic decay of the organic matter can create reducing conditions that convert metals that are naturally present in the soil as relatively immobile (oxidized) forms to more mobile reduced forms. With a BOD concentration averaging over 1,000 mg/L, the undiluted wastewater has potential to cause organic overloading of the soil. However, blending with irrigation well water allows Baker to sufficiently spread the wastewater across large areas.

Self-monitoring reports from 2012 report monthly average BOD loading rates to the LAAs that are typically less than 10 lbs/acre/day. Baker has not monitored discharge flow at sufficient frequency to calculate instantaneous BOD loads (loading to an area in one day) and has not provided cycle average BOD calculations (average BOD loading over an irrigation cycle). Based on irrigation scheduling recommendations from the University of California at Davis for alfalfa, the instantaneous BOD loading could be as high as 250 pounds per acre per day with about a 30-day resting period. With proper irrigation management, Baker can limit instantaneous BOD loading to no more than 150 lb/acre/day. The cycle average loading is expected to be less than 50 pounds per acre per day. Potential groundwater degradation due to organic loading at these rates is minimal.

For salinity, with an average EC of nearly 6,000 umhos/cm, concentrations of 345 mg/L sodium, 295 mg/L chloride, and bicarbonate over 3,000 mg/L prior to blending with irrigation well water, wastewater from the Plant has potential to degrade groundwater with saline waste constituents. Baker needs to empirically that the ponds are constructed to sufficiently limit percolation of waste constituents to groundwater. Blending with irrigation well water allows Baker to use wastewater to irrigate crops, which meets the Basin Plan conditions for permissible dilution of waste constituents with better quality water. Based on the mixed volumes from Baker's water balance calculations, the blended discharge has potential to exceed the EC of upgradient groundwater (1,300 umhos/cm) if the irrigation water EC is above 1,000 umhos/cm. Baker needs to characterize the irrigation water and blended water quality as part of its Nutrient Management Plan.

Baker does not currently meet the applicable Basin Plan effluent limit for salinity that limits the increase in EC of the discharge to land to a maximum of 500 umhos/cm over the source water EC. Baker's supply water EC is about 200 umhos/cm, which results in a discharge limit of no more than about 700 umhos/cm. Baker is required to meet this limit, which is below the recommended secondary MCL for EC of 900 umhos/cm and is less than underlying groundwater EC upgradient of discharge areas. Meeting this limit is expected to result in no increase in groundwater EC, and minor degradation with specific ions (i.e., sodium, potassium, bicarbonate, etc.) that does not adversely affect beneficial uses of groundwater.

Social, economic, and environmental considerations contribute to the assessment of whether degradation that meets all other conditions of the Antidegradation Policy is also consistent with the maximum benefit to the people of the State. In the Central Valley, which houses the majority of California's confined animal population, the Discharger's operation provides the service of sanitary disposal of animal carcasses and byproducts of animal processing with minimal generation of solid waste. Rendering is the only allowable method currently available in California for confined animal facilities to dispose of animal mortalities. The Plant also provides 45 full time jobs and supports employment of those who provide ancillary services including transportation of the finished products.

Though there is potential for the discharge to result in groundwater degradation, the proposed Order includes provisions to limit the potential for degradation and establishes groundwater limitations that do not allow the discharge to further degrade groundwater with constituents of concern. Limited degradation of groundwater quality by some of the typical waste constituents associated with discharges from a rendering plant, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the State.

The proposed Order is consistent with the Antidegradation Policy since: (a) the Discharger has or will implement BPTC to minimize degradation, (b) the limited degradation allowed by the proposed Order will not unreasonably affect present and anticipated future beneficial uses of groundwater, or result in water quality less than water quality objectives, and (c) the limited degradation is consistent with the maximum benefit to people of the State.

Title 27

Unless exempt, the release of designated waste is subject to full containment pursuant to Title 27 requirements. Here, the wastewater discharge is exempt from the requirements of Title 27 pursuant to the wastewater exemption found at Title 27, section 20090(b).

California Environmental Quality Act

On 9 February 2007, the San Joaquin Valley Air Pollution Control District certified a Mitigated Negative Declaration for an increase in processing capacity of the Facility from 18.9 tons (454 tons per day) of raw material per hour to 29 tons per hour (696 tons per day). Increasing the production capacity also increased the volume of wastewater generated and the associated nitrogen and salt loading to the discharge area. In collaboration with Central Valley Water Board staff, the Air District included the following mitigation measures for the project, to be completed by December 2008:

- A reverse osmosis unit will be constructed to replace the existing ion exchange unit. This will eliminate the chloride and total dissolved solids loading to wastewater from imported sodium chloride and/or magnesium chloride.

- An additional mechanical separator (skimmer) will be installed, sized to accommodate the increased wastewater flow. This will reduce the suspended and floating solids loading to the wastewater lagoons.

- A feasibility study will be completed to analyze alternative wastewater treatment scenarios. The results of the feasibility study will determine the most cost-effective treatment process and optimal configuration of the wastewater treatment components.

- An evaluation of irrigation practices will be completed and implemented for the reclamation area. The results of the evaluation will determine the most cost-effective irrigation practices, along with those measures needed to preserve beneficial uses of groundwater beneath the reclamation area.

- A revised Report of Waste Discharge will be prepared, delineating the comprehensive management of the facility's wastewater and storm water, implementation of cost-effective wastewater treatment measures, and preservation of beneficial uses of local surface and groundwater.

- Based on the results of the feasibility study and revised Report of Waste Discharge, new lined lagoons will be designed, constructed, and operated to treat and store wastewater.

- Additional groundwater monitoring wells will be installed to (1) characterize background water quality, (2) determine the nature and extent of groundwater impacts from the existing unlined wastewater lagoons, (3) detect any leakage from the newly-constructed lined wastewater lagoons, and (4) detect any impacts from wastewater application to the reclamation area.

- Accounting for periodic increases subsequent to installation of the third cooker, Baker Commodities proposes to design the wastewater improvements based on a flow rate up to 275,000 gallons per day (monthly average).

In 2007, Baker installed an additional 10,000-gallon skimmer for a total of three in series, and began using a reverse osmosis system in lieu of ion exchange for boiler water treatment. Baker installed lined wastewater ponds in 2010 and a 0.316-mgd cavitation air flotation unit in 2011.

Baker has yet to submit a feasibility study to analyze alternative wastewater treatment scenarios or an evaluation of irrigation practices. The proposed Order effectively requires the Discharger to implement the mitigation measures that remain to be completed.

Baker has not expanded or altered operations beyond the scope of the project description for which the Air District completed an environmental review and certified the Mitigated Negative Declaration in 2007. The adoption of the proposed Order for an existing facility is exempt from the requirements of the California Environmental Quality Act in accordance with California Code of Regulations, title 14, section 15301.

PROPOSED ORDER TERMS AND CONDITIONS

Discharge Prohibitions, Effluent Limitations, Discharge Specifications, and Provisions

The proposed Order prohibits discharge to surface waters and drainage courses and limits the flow of wastewater from the Plant (to the pond system) to no more than 0.192 mgd. The 12-month rolling average EC of the discharge is limited to no more than the 12-month flow weighted average EC of the source water plus 500 umhos/cm (reported on a monthly basis). The chloride concentration in of discharge is limited to no more than 175 mg/L.

The proposed Order also includes a provision requiring the Discharger to provide a technical report demonstrating that pond seepage of waste will not cause or contribute to groundwater containing concentrations of waste constituents in excess of groundwater limits. Additional provisions require the Discharger to prepare and implement a Salinity Control Plan and a Nutrient Management Plan, and installation of additional groundwater monitoring wells to improve monitoring of groundwater near the wastewater ponds.

To address the potential for the discharge to impact groundwater quality due to organic loading or the creation of nuisance conditions, the proposed Order will set a BOD cycle average and instantaneous loading limit to the LAAs of 50 lbs/acre/day and 150 lbs/acre/day, respectively.

In addition, application of waste constituents to the LAAs is limited to 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 the LAAs, including the nutritive value of organic and chemical fertilizers and of the wastewater, is not to exceed the annual crop demand.

Monitoring Requirements

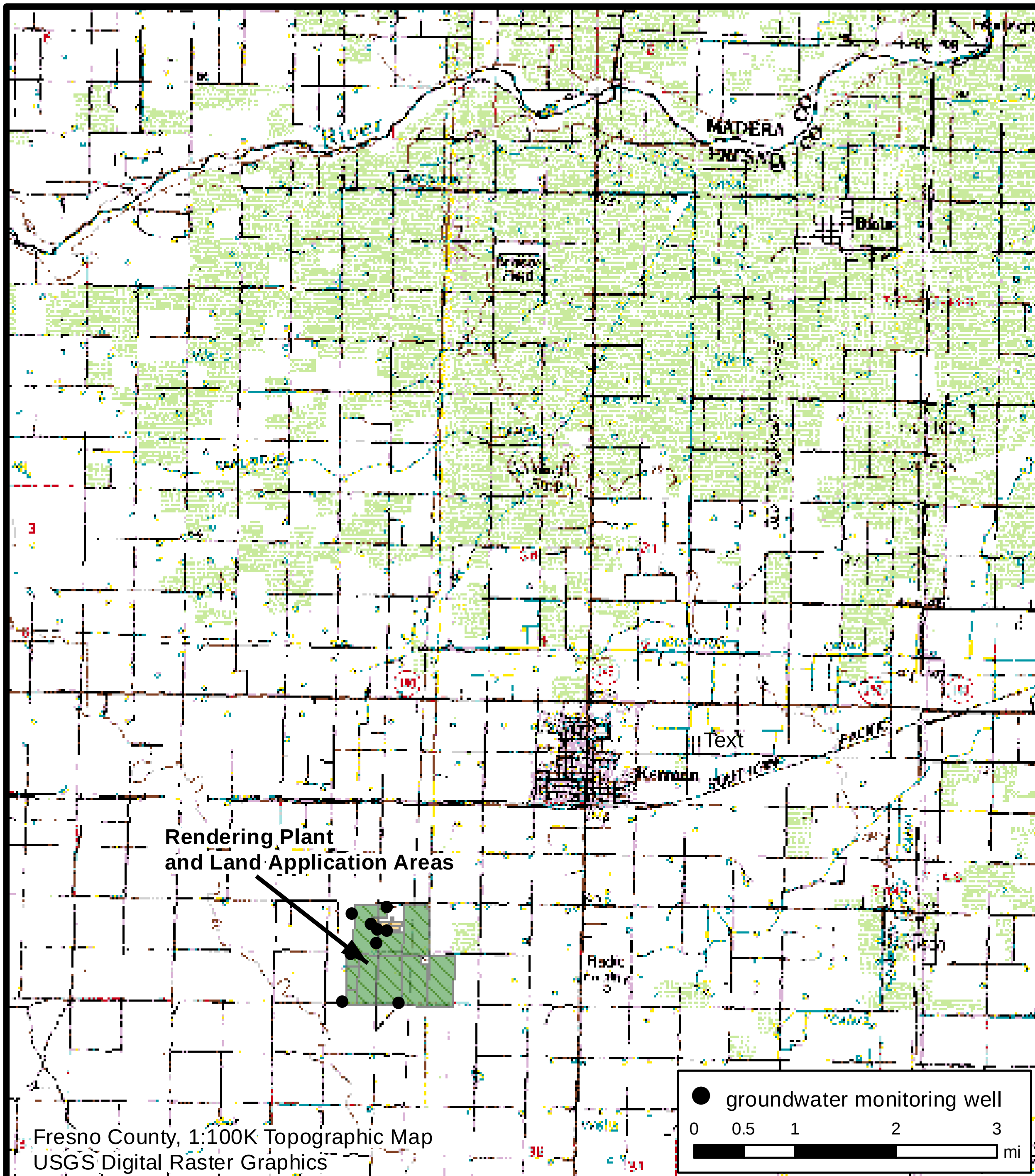
Water Code section 13267 authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the State. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Water Code section 13268 authorizes the assessment of administrative civil liability for failure to submit required monitoring and technical reports.

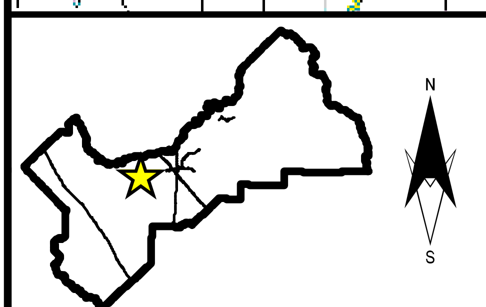
The proposed Order includes monitoring requirements for monitoring wastewater screening efficiency, effluent wastewater, pond operation, source water, soils in the LAAs, and groundwater quality through a groundwater monitoring well network. In addition, the proposed Order requires monitoring of the wastewater and solids loading calculations for organics, nutrients, and salts. The proposed Order requires leak detection monitoring due to the high strength of wastewater contained in the lined ponds.

This monitoring is necessary to characterize the discharge, and evaluate compliance with effluent limitations and discharge specifications prescribed in the Order.

Reopener

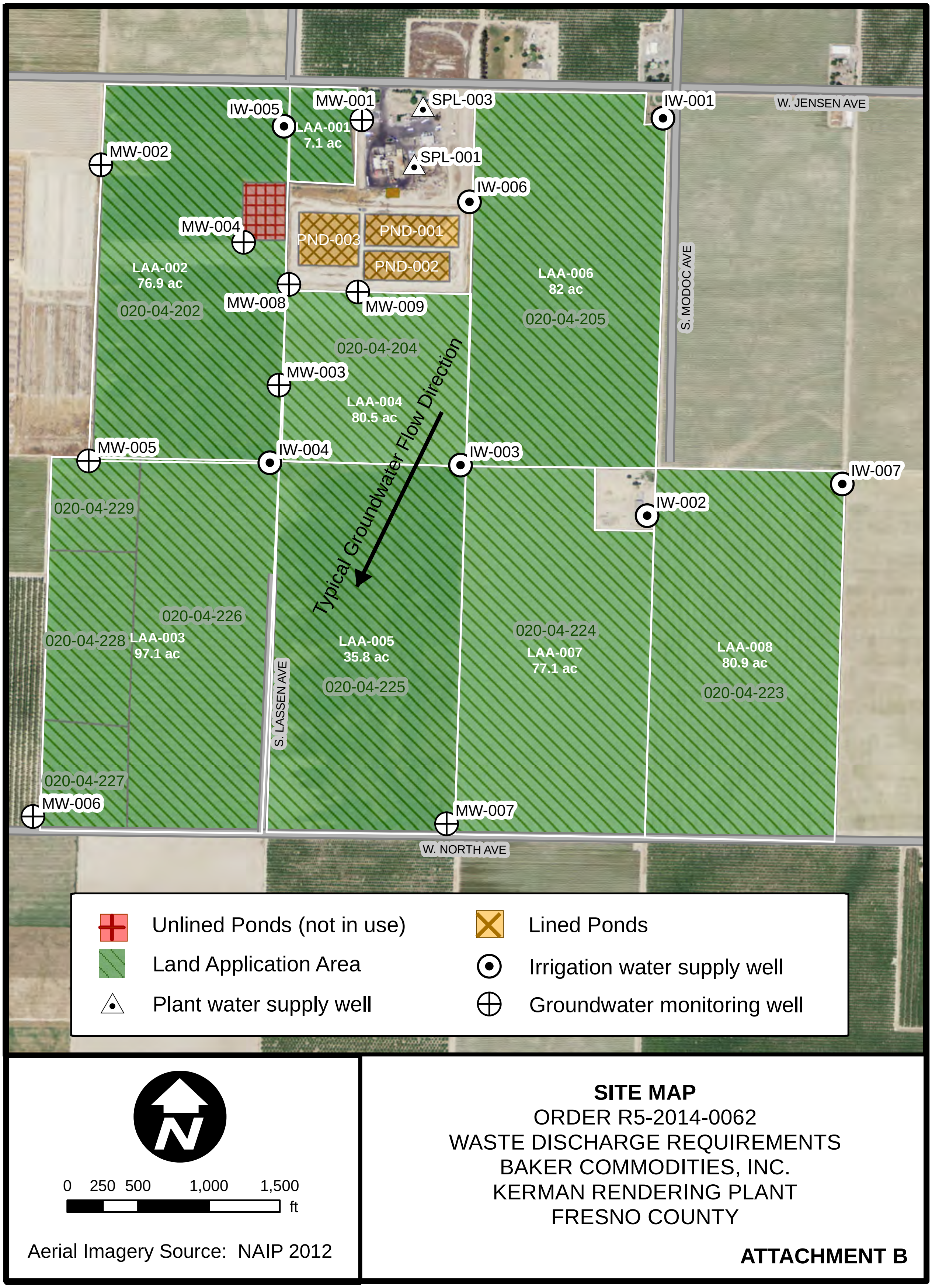
The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if new technical information is provided or if applicable laws and regulations change.





SITE MAP
ORDER R5-2014-0062
WASTE DISCHARGE REQUIREMENTS
BAKER COMMODITIES, INC.
KERMAN RENDERING PLANT
FRESNO COUNTY

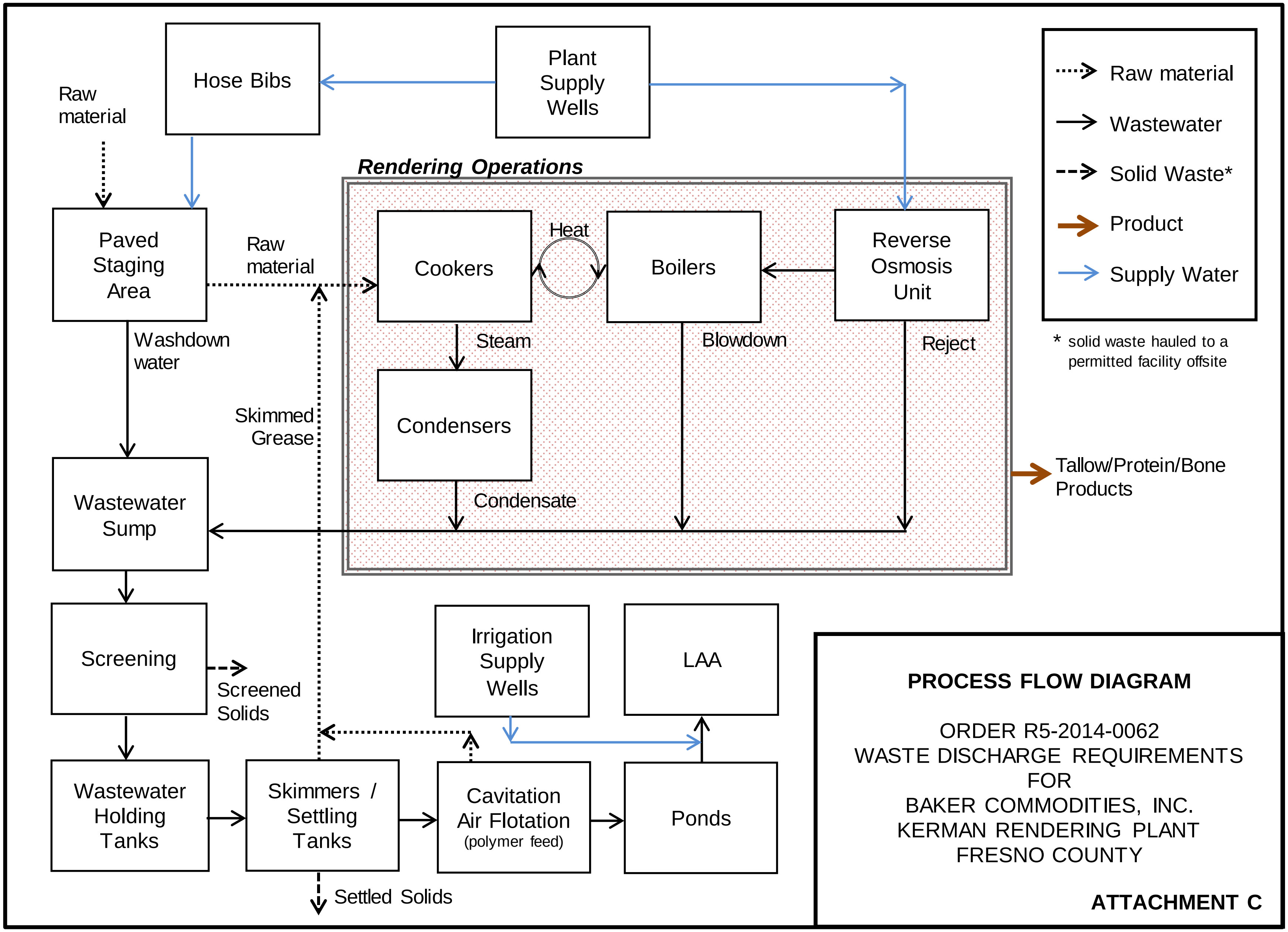
ATTACHMENT A



Aerial Imagery Source: NAIP 2012

SITE MAP
ORDER R5-2014-0062
WASTE DISCHARGE REQUIREMENTS
BAKER COMMODITIES, INC.
KERMAN RENDERING PLANT
FRESNO COUNTY

ATTACHMENT B



PROCESS FLOW DIAGRAM

ORDER R5-2014-0062
WASTE DISCHARGE REQUIREMENTS
FOR
BAKER COMMODITIES, INC.
KERMAN RENDERING PLANT
FRESNO COUNTY

ATTACHMENT C