CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-0014

WASTE DISCHARGE REQUIREMENTS

FOR
KEENAN FARMS, INC.
KETTLEMAN CITY PISTACHIO PROCESSING FACILITY
KINGS COUNTY

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

1. On 1 July 2014, Erwin Engineering submitted an *Addendum to 1998 Report of Waste Discharge* (RWD) on behalf of Keenan Farms, Inc. (hereafter Discharger or Keenan), that requests an increase in the discharge of pistachio processing wastewater to land application areas adjacent Keenan's pistachio processing facility (Facility).

2. Keenan Farms, Inc., owns and operates the Facility that generates the waste and the land application areas and is responsible for compliance with these Waste Discharge Requirements (WDRs).

3. The Facility is at 31510 Plymouth Avenue, about five miles northwest of the community of Kettleman City in Kings County (Section 28, T21S, R18E, MDB&M), as shown on Attachment A, which is attached hereto and made part of this Order by reference. The Facility occupies Assessor Parcel Numbers (APNs) 036-180-057-000 and 036-180-056-000. The pistachio processing season is short, typically averaging about 40 days a year from early September through mid-October.

4. Order 93-049, adopted by the Central Valley Water Board on 26 March 1993, prescribes WDRs for the discharge. Order 93-049 allows a daily average wastewater flow of up to 0.258 million gallons per day (mgd), a daily maximum of 0.345 mgd, and an annual volume of 7.74 million gallons per year to a 2.75 acre wastewater retention pond. Erwin Engineering submitted RWDs on behalf of Keenan in 1995 and 1998 requesting flow increases to 0.5 mgd and 1.31 mgd, respectively and for the discharge to be recycled on up to 217 acres of farmlands planted with pistachios. The discharge of wastewater during the 2013 processing season averaged 1.43 mgd, which exceeds the flow of 1.31 mgd requested in the 1998 RWD.

5. Order 93-049 does not reflect Keenan's current discharge of pistachio processing wastewater to land, and Keenan is requesting an increase in the volume of the discharge. Therefore, Order 93-049 will be rescinded and replaced with this Order.

Existing Facility and Discharge

6. Central Valley Water Board staff inspected the Facility in April of 2014. During the inspection, Keenan representatives informed staff that Facility wastewater was directed to a sump that had been formed by constructing an earthen berm at the northwest corner of the retention pond and installing a prefabricated steel sump. The sump covers about 0.1 acres of the 2.75 acre retention pond. Wastewater is discharged via a pump from the lined sump to approximately 45 acres of shallow, unlined checks for solids removal. Central Valley Water Board staff observed that the 45 acres of unlined checks were subdivided into around 21 smaller checks, each about two acres in size. Keenan representatives stated that wastewater flows across the checks and "very little" wastewater exits the checks and is applied to the 217 acre land application area. The majority of the wastewater percolates into the subsurface soils within the checks.

7. Review of aerial photographs on Google Earth shows the 45-acre area was an orchard in 1994, but by 2002 the orchard had been removed and eight checks had been constructed. Additional checks are visible photographs from 2002 through 2006, and by 2009 the 45-acre disposal area appears in its current configuration. The entire retention pond appears to be in use in the 1994 aerial photograph, but the 2002 aerial photograph depicts an open trench leading to a small depression (no berm) in the northwest corner. The open trench and small depression is visible in aerial photographs through 2006, and the sump with an earthen berm first appears in a June 2009 aerial photograph.

8. The Keenan Facility property contains a single family residence that serves as an office building, a hulling unit, a storage building and warehouse, storage silos for pistachio drying and storage, a retention pond that is no longer used, a lined sump, unlined checks, and a land application area consisting of orchards planted with pistachios, as shown on Attachment B, which is attached hereto and made part of this Order by reference.

9. Pistachio processing wastewater is generated from the washing and hulling of raw pistachios. The pistachios are delivered to the Facility in bottom dump trailers, offloaded, and sent to a pre-cleaner to remove leaves, twigs, and branches. The pistachios are then conveyed to a huller and then on to a wash tank for washing and rinsing. Following washing, the pistachios are conveyed to dryers and then onto silos for storage. The pistachios are then sorted and sized for packaging. Keenan sells the pistachios as a raw agricultural product or roasts them. The raw pistachios are sold in bulk packages, while the roasted pistachios are packaged and sold in a variety of consumer packages. Keenan processed 22 million pounds of pistachios in 2013.

10. Wastewater generated during pistachio processing gravity flows through a pipeline to the sump in the 2.75 acre wastewater retention pond, from where it is pumped to the 45-acres of unlined checks. The volume of wastewater discharged to the checks/land application areas from 2009 to 2013 is summarized in the following table.

Table 1 - Effluent Flow Data

	Annual Totals		Duration	Daily Volume
Year	Acre Feet	Million Gallons	Days	mgd
2009	68.6	22.4	32	0.70
2010	123.4	40.2	37	1.09
2011	127.6	41.6	37	1.12
2012	128.4	41.9	42	1.00
2013	184.2	60.0	42	1.43

11. Monitoring and Reporting Program (MRP) Order 93-049 requires analyses for biochemical oxygen demand (BOD), electrical conductivity (EC), total dissolved solids (TDS), total Kjeldahl nitrogen (TKN), nitrate as nitrogen, and total nitrogen monitoring. Analytical results presented in self-monitoring reports (SMRs) since 2011 are presented below:

Table 2 - Effluent Results

Date	Potassium mg/L[1]	pH s.u.[2]	BOD mg/L[1]	Electrical Conductivity umhos/cm[3]	Total Dissolved Solids mg/L[1]	Total Kjeldahl Nitrogen mg/L[1]	Nitrate as Nitrogen mg/L[1]
9/23/11	230	6.9	73	460	294	29	13.0
9/29/11	540	5.5	2100	1920	1229	109	4.2
10/14/11	570	5.1	2500	1870	1197	79	6.7
10/18/11	310	5.2	1600	1320	845	79	2.4
9/14/12	109	5.7	400	840	538	43	12.0
9/21/12	250	5.3	1100	1190	762	87	1.1
9/26/12	1210	5.3	3200	3740	2394	188	8.7
10/4/12	920	5.0	2600	3520	2253	108	3.1
9/5/13	291	5.2	1200	1630	1043	51	1.0
9/13/13	310	5.5	1300	1650	1056	115	3.7
9/19/13	1248	5.3	5900	5300	3392	195	5.2
9/26/13	880	4.7	4400	4200	2688	238	11.0
Averages	**572**	**5.4**	**2198**	**2303**	**1474**	**110**	**6.0**

1. mg/L = milligrams per liter
2. s.u. = Standard pH units
3. umhos/cm = Micromhos per centimeter

The data shows considerable variation within a processing season with the results lower in the beginning then increasing in strength as the processing season goes into full production. The effluent BOD, EC, TDS results are high, while the pH of the discharge is low.

12. Soil sampling has shown that the low effluent pH does not appreciably affect the site's alkaline soils.

13. A sample collected by Central Valley Water Board staff during an September 2014 inspection was analyzed for TDS and FDS and additional constituents. The TDS was 5,400 mg/L, while the FDS was 1,700 mg/L. The results indicate the wastewater contains a significant amount of dissolved organic material.

14. Table 3 presents Central Valley Water Board staff calculated loading rates using the 2011 through 2013 self-monitoring data.

Table 3 - Land Application Area Loading Rates (45 acres)

Year	Total Nitrogen (lbs/ac/yr)	Potassium (lbs/ac/yr)	TDS (lbs/ac/yr)	BOD (lbs/ac/day)
2011	625	3,185	6,870	327
2012	877	4,828	11,542	337
2013	1,726	7,592	22,766	848

The loading rates indicate that discharges to the 45 acres of checks threaten to pollute underlying groundwater with nitrate as nitrogen and TDS.

15. The results of soil samples collected from within one of the orchards proposed for use as a land application area and from within the retention pond from 1993 to 1996 (no orchard samples in 1996) are presented below. Soil samples from the orchard were collected at two feet below the ground surface (bgs), and samples from the retention pond were collected at depths of two, five, and ten feet bgs. The average soil results are summarized in the following table.

Table 4 - Soil Analytical Results

Area	Depth	EC	Potassium	Total Nitrogen
	feet bgs	umhos/cm	mg/kg[1]	mg/kg[1]
Orchard	2	863 (730 – 1,040)	300 (290 – 315)	191 (13 – 510)
Ret. Pond	2	1,775 (1,430 – 2,500)	2,603 (1,110 – 3,640)	458 (360 – 625)
	5	1,522 (1,050 – 1,880)	2,513 (2,125 – 2,952)	344 (177 – 535)
	10	1,515 (1,200 – 1,900)	1,803 (270 – 3,272)	263 (80 – 525)

1. mg/kg = milligram per kilogram.

The soil results indicate the salts from the discharge are migrating down through the soils.

16. The soil results in Finding 15 combined with the loading rates in Finding 14, indicate that the discharge to unlined ponds and checks threatens to exacerbate existing groundwater degradation/pollution, as discussed in the Groundwater Conditions section below, with salts and nitrate as nitrogen.

17. Solids are discharged with the wastewater to the sump, where some of the solids (pistachio hulls, twigs, and leaves) float out of the wastewater, and then on to the checks where the remaining pistachio solids settle out of the wastewater. The solids are removed from the checks at the end of the season and are spread onsite or are exported to another farming operation to be used as a soil amendment.

Proposed Discharge

18. The July 2014 RWD proposes the discharge of pistachio processing wastewater at a daily average flow of 2.0 mgd, with a daily maximum flow of 2.6 mgd, to the lined sump, then on to the unlined checks, and then to a 400-acre land application area planted with pistachios, as shown in Attachment B. The proposed annual discharge volume is 80 million gallons.

19. The July 2014 RWD proposes two potential methods/alternatives for the removal of solids. The first is the current process of removing the solids with the sump and the unlined checks. The second proposed method would be to screen the wastewater prior to discharge to the sump and then the checks. The screened solids would then be spread on Keenan acreage or exported to a neighboring farm. Both methods of solids removal propose to use the unlined checks where the majority of the wastewater will be lost to percolation prior to being reused on the adjacent land application areas. As described in Finding 16 above, continued use of the unlined checks threatens to pollute or exacerbate pollution of underlying groundwater.

20. Central Valley Water Board staff used the data contained in the SMRs from 2011 through 2013 and calculated loading rates for discharge at the proposed average daily discharge of 2.0 mgd to 400 acres. The estimated loadings are presented below.

Table 5 - Land Application Area Loading Rates (400 acres)

Year	Total Nitrogen (lbs/ac/yr)	Potassium (lbs/ac/yr)	TDS (lbs/ac/yr)	BOD (lbs/ac/day)
2011	70	358	773	37
2012	99	543	1,298	38
2013	194	854	2,561	95

The calculations indicate that if the discharge is distributed evenly to the 400-acre land application area, constituent loading rates will be much lower and at levels that should be protective of the underlying groundwater.

Other Considerations for Food processing Waste

21. Excessive application of food processing wastewater to land can create objectionable odors, soil conditions that are harmful to crops, and possibly unreasonable degradation of the underlying groundwater. It is reasonable to expect some attenuation of various waste constituents that percolate below the root zone within the vadose (unsaturated) zone. Specifically, excess nitrogen can be mineralized and denitrified by soil microorganisms, organic constituents (measured as both BOD and volatile dissolved solids) can be oxidized, and the cation exchange capacity of the soil may immobilize some salinity constituents.

22. Food processing wastewater may contain elevated concentrations of TDS resulting from the fruit and vegetable products or materials used for production. Typically, a percentage of the TDS is organic, which will generally decompose into its component elements of carbon, hydrogen, and oxygen that can be utilized by plants and microorganisms in the soil. In contrast, the fixed dissolved solids (FDS), is primarily that

portion of the TDS that consists of inorganic constituents, which can accumulate in the soil. Excessive salts may leach to groundwater where they could degrade groundwater quality. Growing and harvesting crops provides a means to remove some of these constituents, particularly calcium, magnesium, potassium, phosphorus, nitrate, and ammonia.

23. Calculated total nitrogen loading rates using effluent results from 2011 through 2013 for the discharge to 400 acres range from 70 to 194 lbs/ac yr. The 194 lbs/ac/yr is slightly higher than the 188 lbs/ac/yr of nitrogen that pistachio trees can utilize (Meyers, 2008). TDS loading ranges from 773 lbs/ac/yr to 2,561 lbs/ac/yr. However, as discussed in Finding 13, wastewater contains a high percentage of organic dissolved solids and only a small portion of the reported TDS result in effluent is comprised of FDS. The resulting salt loading of the discharge is less as the discharge contains high concentrations of organic dissolved solids. Potassium loading ranges from 358 to 854 lbs/ac/yr, which is greater than the 160 to 200 lbs/ac/yr the pistachio trees can utilize annually (Meyers, 2008). However, potassium fixes or adheres to finer grained soils in the vadose zone such as vermiculite clays. With the depth to water at about 350 feet bgs, the presence of interbedded clays in the underlying lithology, the short duration of the discharge, and even application of wastewater over 400 acres of land, at the loading proposed, it would be unlikely that the potassium in the wastewater would significantly degrade underlying groundwater.

24. Typically, irrigation with high strength wastewater can result in high BOD loading on the day of application. It is a common practice to follow a BOD loading event with a number of days without application (resting periods) so that soil biochemical processes will consume the applied BOD. If the rate of oxygen transfer into the soil is not adequate, anaerobic or reducing conditions may result and lead to nuisance odor conditions. When insufficient oxygen is present below the ground surface, anaerobic decay of organic matter can cause dissolution and leaching of some metals (primarily iron, manganese, and arsenic). The over application of high strength wastewater can also result in saturated soil conditions that prevent CO_2 generated by soil microbes from venting to the atmosphere, resulting in increases in groundwater alkalinity that can degrade groundwater quality and contribute to groundwater TDS. Excessive BOD loading over extended periods may impact beneficial uses.

25. The maximum BOD loading rate that can be applied to land without creating nuisance conditions or leaching of metals can vary significantly depending on soil conditions and operation of the land application system. *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 either the mechanisms of BOD consumption in soils, or the actual 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.

26. The California League of Food Processor's (CLFP) Manual of Good Practice for Land Application of Food Processing/Rinse Water proposes risk categories associated with particular BOD loading rate ranges as follows:

    a. Risk Category 1: (less than 50 lbs/acre/day; depth to groundwater greater than 5 feet) Indistinguishable from good farming operations with good distribution important.

    b. Risk Category 2: (less than 100 lbs/acre/day; depth to groundwater greater than 5 feet) Minimal risk of unreasonable groundwater degradation with good distribution more important.

    c. Risk Category 3: (greater than 100 lbs/acre/day; depth to groundwater greater than 2 feet) Requires detailed planning and good operation with good distribution very important to prevent unreasonable degradation, as well as use of oxygen transfer design equations that consider site specific application cycles and soil properties and special monitoring.

    The Manual of Good Practice recommends allowing a 50 percent increase in the BOD loading rates in cases where sprinkler irrigation is used, but recommends that additional safety factors be used for sites with heavy and/or compacted soils.

27. Although it has not been subject to a scientific peer review process, the Manual of Good Practice provides science-based guidance for BOD loading rates that, if fully implemented, may be considered management practices to help prevent groundwater degradation due to reducing conditions.

28. The cycle average BOD loading rates for the proposed discharge to the 400 acre land application area of less than 100 lbs/ac/day should not threaten the underlying groundwater quality. This Order contains Land Application Area Specification D.2 that limits the daily cycle average BOD loading rate to 150 lbs/ac/day.

Site-Specific Conditions

29. The Kettleman area is characterized by hot, dry summers and cool 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 pan evaporation rates in the discharge area are about 8.3 inches and 65 inches, respectively, according to information published by the California Department of Water Resources (DWR). The 25-year, 24-hour precipitation event for the area around the facility is approximately 2 inches, according to National Weather Service data for the Fresno County area near the facility (Mendota).

30. The natural land surface in the vicinity of the Facility slopes gently to the northeast, but the landscape has been altered by leveling for farming activities over time. The Facility, as depicted on the United States Geological Survey (USGS) La Cima 7.5 minute topographic map, is at about 340 feet above mean sea level with the elevation decreasing to about 275 feet above mean sea level at the northeastern corner of the proposed 400-acre land application area.

31. According to the Federal Emergency Management Agency map number 06031C0410C; the northern and western portions of the western land application area, the Facility itself, and all but the northeastern corner of the eastern land application area are within a Zone A (no baseline determined) 100-year flood plain. However, the discharge of pistachio processing wastewater typically occurs only in September and October, which is before the typical rainy season for the region making it unlikely a flood event would happen when wastewater is being discharged.

32. According to the Web Soil Survey published by the United States Department of Agriculture Natural Resources Conservation Service, soils in the vicinity of the Facility, checks, and the western land application areas are comprised entirely of Wasco sandy loam, while the eastern land application area is comprised of almost equal percentages of the Wasco sandy loam and the Kimberlina fine sandy loam.

33. Both the Wasco sandy loam and the Kimberlina fine sandy loam are described as well drained, having moderate available water storage, and listed as prime farmland if irrigated. The Wasco sandy loam is listed as a Class 2e soil. Class 2 soils have only moderate limitations that reduce the choice of crops and the “e” designation shows the main hazard is the risk of erosion unless close-growing plant cover is maintained. The Kimberlina fine sandy loam is described as Class 2s soil. Soils with an “s” designation have limitations related to the soil being “shallow, droughty, or stony.”

34. Supply water is provided by two sources: surface water is provided by the Westlands Water District, and groundwater is supplied from an on-site supply well (Well 304). The Westlands Water District water is the primary water source and is used for domestic and production purposes. Well 304 is used for production and irrigation purposes. Well 304 is 970 feet deep below the ground surface (bgs) and is screened from 450 feet bgs to the base of the well at 970 feet bgs. Samples collected in 2014 for both sources of supply water are shown in the following table. The values for the maximum contaminant levels (MCLs) are shown with a lesser value over a larger value and represent the “recommended” MCL on top with the “upper” MCL shown below. Results shown in bold exceed the MCL for the given constituent.

Table 6 - Supply Water Results

Source	Electrical Conductivity umhos/cm[1]	Total Dissolved Solids mg/L[2]	Chloride mg/L[2]	Sulfate mg/L[2]	Nitrate as Nitrate mg/L[2]	Potassium mg/L[2]
Westlands	710	410	130	71	<0.1	3.9
Well 304	**1,300**	**920**	63	**490**	2.5	2.1
MCL	900/1600	500/1000	250/500	250/500	45	na

1. umhos/cm = micromhos per centimeter.
2. mg/L = milligrams per liter.

35. The results from Well 304 exceed the MCLs for EC, TDS, and sulfate, but the results are typical of groundwater quality for the region as discussed in Findings 54 through 57.

36. The land use in the vicinity of the Facility is primarily agricultural with some industrial facilities in the vicinity of the site. An onion shipping and distribution facility operated by Dalena Farms is about a mile west of the Facility at 32914 Plymouth Avenue. The community of Kettleman City is about five miles southeast of the Facility and Interstate 5 is about 4 miles due east of the Facility. The California Aqueduct borders the Keenan property to the north and east.

Basin Plan, Beneficial Uses, and Regulatory Considerations

37. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*, revised January 2004 (the "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.

38. The Facility and land application areas are in Detailed Analysis Unit (DAU) No. 244 within the Westside Basin hydrologic unit. The beneficial uses of underlying groundwater as set forth in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply.

39. The Facility is in the South Valley Floor Hydrologic Unit, specifically the Westland Water District Hydrologic Area (No. 551.10) as depicted on hydrologic maps prepared by State Water Resources Control Board in August 1986.

40. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as MUN to meet the State drinking water MCLs specified in Title 22 of the California Code of Regulations. 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. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Toxicity objective, in summary, 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. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.

42. 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.

43. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an EC less than 700 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 the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

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

45. The Basin Plan also states that the water quality objectives contained therein do not require improvement over naturally occurring background groundwater quality. The baseline for determining background water quality is generally the quality as of 1968. If background water quality exceeded objectives since 1968, then background water quality becomes the objective.

46. Many surface waters and local groundwater supplies have been degraded with salt. In some areas, the high salinity is naturally occurring, but in many areas it is due to the acts of man. In 2006, the Central Valley Water Board, the State Water Board, and stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program.

47. 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 there is a long-term solution to the salt imbalance. Until then, the Basin Plan establishes several salt management requirements, including:

    a. The incremental increase in salt from use and treatment must be controlled to the extent possible. The maximum EC of the effluent discharged to land shall not exceed

the EC of the source water plus 500 umhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources.

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 boron content of 1.0 mg/L.

48. The Basin Plan allows for an exception for food processing industries that exhibit a disproportionate increase in EC in the discharge over the EC of the source water due to unavoidable concentrations of organic dissolved solids. Keenan's discharge qualified for the exception when 93-049 was adopted, and current analytical results indicate the discharge is still high in organic dissolved solids and the discharge qualifies for this Basin Plan EC exemption.

49. Another exception to the EC limit for industrial wastewaters may be permitted for industrial sources 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. The RWD did not address the Basin Plan exception related to water conservation for the discharge from the Facility, so the exception would not currently apply to Keenan's discharge to the land application areas.

50. Some salts are plant macronutrients (e.g., nitrogen, potassium, and phosphorus) and the threat to groundwater quality posed by these salts can be minimized through controlled use to irrigate crops at agronomic rates for these nutrients. Because nitrate and nitrate precursors are common constituents in food processing wastewater, either treatment to reduce the nitrogen content or reuse for crop irrigation are important methods to prevent exceedance of the water quality objective for nitrate in groundwater.

51. Many surface waters and local groundwater supplies have been degraded with salt. In some areas, the high salinity is naturally occurring, but in many areas it is due to the acts of man. In 2006, the Central Valley Water Board, the State Water Board, and stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. Until the program culminates in Basin Plan amendments that address the region-wide salinity issues, it may not be reasonable to require dischargers to take extraordinary measures to eliminate salt from wastes discharged to land. However, the Board expects that all regulated dischargers will make a concerted effort to reduce salinity through source control, containment, and conventional treatment to the maximum practical extent.

Groundwater Conditions

52. Groundwater in the area occurs in unconfined and confined aquifers. Generally, the unconfined first encountered groundwater is of poor water quality, with better quality water found beneath the confining layer known locally as the Corcoran Clay. A 1957

groundwater report by the USGS called *Ground-Water Conditions in the Mendota-Huron Area Fresno and Kings Counties, California*, characterizes groundwater quality in the area. It describes groundwater in the unconfined aquifer, above the Corcoran Clay, as generally containing high concentrations of calcium and magnesium sulfate, with a TDS of about 3,000 mg/L.

53. The Facility is outside the area described in *Lines of Equal Elevation of Water in Wells, Unconfined Aquifer, published by the Department of Water Resources* (DWR). The Discharger has no groundwater monitoring wells onsite, but does have an on-site supply well screened both above and below the Corcoran Clay. The depth to water in Well 304 in February 2014 was 351 feet bgs, and the results of a supply well sample collected in 2014 are presented in Finding 34.

54. Groundwater quality beneath the Facility is of generally poor quality for EC, chloride, and sulfate as illustrated by the results of samples collected from Keenan's former onsite supply well named the Olive Well. The results shown in bold exceed the MCL. The depth of the Olive Well was 1,050 feet bgs with a 600- foot well screen from 450 feet bgs to 1,050 feet bgs. It was screened both above and below the Corcoran Clay and drew water from both aquifers and was destroyed in 1998.

Table 7 - Former Onsite Well (Olive Well) Results

	EC	Sodium	Nitrate as Nitrogen	Chloride	Sulfate	Boron
Date	umhos/cm	mg/L	mg/L	mg/L	mg/L	ug/L
August 1989	**2060**	10.4	**19**	4.8	na	600
July 2008	**2600**	260	**14**	**280**	**930**	700

The EC results are greater than the "upper" Secondary MCL of 1,600 umhos/cm in both of the sampling events and the result of the sample collected in July 2008 exceeds even the "short term" MCL of 2,200 umhos/cm. The sulfate result in 2008 exceeds the short term MCL of 600 mg/L, and the 2008 chloride result exceeds the recommended MCL of 250 mg/L. The nitrate as nitrogen results exceed the MCL of 10 mg/L. The 2008 results for EC, sodium, chloride, and sulfate all increased when compared to the 1989 results, and the results from the Olive well are higher than historic (1951 and 1968) groundwater results from samples collected from nearby wells as discussed, in the following Findings.

55. A review of regional groundwater data from nearby United States Geological Survey (USGS) wells found 27 USGS wells and three "drains" within a five mile radius of the Keenan facility. Depth to water information was not available, but the well's depths were listed as ranging from 300 feet to 2,444 feet bgs. Only two of the 27 USGS wells are listed as being installed above the Corcoran Clay. Well 360305200004101 is about 1.5 miles south of the Facility and well 360536119575901 is about 1.75 miles east of the facility. Analytical results for samples collected from each well in 1951 and 1968 are summarized in the following table. The results in bold exceed the MCLs.

Table 8 – USGS Well Results (Completed above the Corcoran Clay)

Well Number	Date Sampled	Depth feet bgs	EC umhos/cm	TDS mg/L	Sodium mg/L	Sulfate mg/L	Boron ug/L
360305200004101	8/13/51	350	**1,270**	**830**	200	**440**	440
" "	7/15/68		**1,310**	**836**	200	**570**	800
360536119575901	8/14/51	300	**913**	**618**	190	**300**	150
" "	7/15/68		891	**585**	160	**290**	640

56. Eight of the wells are/were within two miles of the Facility. The data is primarily from one or two sampling events conducted in August 1951 and July 1968 and the results provide a good look at the historical groundwater quality of the area. The USGS data indicates these wells extend below the Corcoran Clay, but are actually screened both above and below the Corcoran Clay.

Table 9
USGS Well Results (Completed above and below the Corcoran Clay)

Well Number	Date Sampled	Depth feet bgs	EC umhos/cm	TDS mg/L	Sodium mg/L	Sulfate mg/L	Boron ug/L
360359120031701	1968	900	**955**	**635**	150	**320**	370
360409120025201	1968	1,937	874	**597**	150	**300**	470
360355120023601	1968	875	**986**	**662**	160	**310**	430
360305120004701	1951	1,400	**1,270**	**830**	170	**350**	200
360631120021401	1951	1,165	**1,250**	**809**	140	**450**	800
360609120011301	1951	1,306	**1,000**	**658**	150	**350**	100
360357120004101	1951	1,196	**1,230**	**822**	170	**470**	400
360403120004201	1968	825	**1,330**	**867**	180	**430**	290

57. The 1951 and 1968 groundwater data shows that nearly all of the wells contain EC, TDS, and sulfate results in excess of the respective MCLs for each constituent and indicate that issues with groundwater quality have been present in the area since at least 1951. However, as described in Findings 54 through 56 above, the results from Keenan's former Olive supply well have EC, sodium, and sulfate results that are about double the concentrations observed in nearby wells in 1951 and 1968, and the Olive supply well degraded substantially from 1989 to 2008 with respect to EC.

58. The information in Findings 14, 15, 54 through 56 above indicate the concentrated discharge to the 45-acres of unlined checks may have contributed to degradation/pollution of the underlying groundwater. This Order contains Discharge Prohibition A.7 that prohibits discharge to unlined storage and disposal systems, and Provision F.13 that requires Keenan to either line the sump and checks or otherwise modify its treatment and disposal systems to ensure that discharges will not cause or contribute to underlying groundwater pollution.

Antidegradation Analysis

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

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

c. The Discharger employs best practicable treatment or control (BPTC) to minimize degradation, and

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

60. Constituents of concern that have the potential to cause degradation of high quality waters include, in part, organics, nutrients, and salts. However, the discharge is not expected to cause groundwater to exceed water quality objectives because:

a. Organic loading rates using the existing data for a discharge to 400 acres are within the 36 to 100 lbs/ac/day range recommended in USEPA Publication 625/3-77-0007 to reduce the potential for the formation of nuisance conditions, and the proposed discharge is not anticipated to degrade groundwater due to organic loading. BOD loading is estimated to add about 95 lbs/ac/day with application at a seven day cycle average. The discharge with a BOD loading rate of 95 lbs/ac/day and a minimum seven day cycle average will prevent organic overloading of the land application area such that the discharge authorized should not contribute to underlying groundwater degradation from organic loading. This Order contains Land Application Area Specification D.2 that limits the daily cycle average BOD loading rate to 150 lbs/ac/day.

b. For nitrogen, this Order limits the application of wastewater to agronomic rates for both nutrient and hydraulic loading. Total nitrogen loading estimates indicate the discharge will add about 203 lbs/ac/yr of nitrogen to the land application areas planted with pistachio trees that can utilize about 188 lbs/ac/yr of nitrogen. This Order contains Provisions F.11 and F.12 that requires Keenan to submit a Nutrient Management Plan and a Wastewater Management Plan to assess and implement measures to ensure nitrogen is applied at agronomic rates. The discharge should not contribute to an increase of nitrogen in groundwater.

c. For salinity, the Basin Plan allows for an exception to the effluent EC limits contained therein for food processing industries that exhibit a disproportionate increase in EC in the discharge over the EC of the source water due to unavoidable concentrations of organic dissolved solids. Keenan's discharge qualified for this exception in 1993 when WDR order 93-049 was adopted, and the results of a sample collected during the 2014 processing season by Central Valley Water Board staff indicate the discharge still qualifies for the exception as the TDS result (5,400 mg/L) is significantly higher than the EC result (2,400 umhos/cm). This Order contains Provision F.11 that requires Keenan to submit a Salinity Management Plan that requires Keenan to evaluate salinity sources in its discharge and provide recommendations for alternatives that will add less salt to the discharge. This Order also contains Provision F.13 that requires Keenan to submit a Wastewater Management Plan to assess and implement measures to ensure wastewater does not threaten the underlying groundwater quality. Additionally, this Order requires

wastewater analyses for additional constituents including FDS and general minerals that are not part of the current Monitoring and Reporting Program.

d. For potassium, with an average concentration of about 572 mg/L, the potassium load from the discharge at 80 million gallons will be about 850 lbs/acre/year. This exceeds the general agronomic rate for potassium of about 200 lbs/acre/year for pistachio trees. However, potassium readily binds to soil, and crops can and will take up more potassium than required, if available, with no reduction in yield. There are no specific water quality objectives set for potassium other than the overall objectives set for TDS and EC.

Treatment and Control Practices

61. The Discharger provides or will provide treatment and control of the discharge that incorporates:

a. Application of wastewater to the land application area at agronomic rates,

b. Proper lining of storage and settling structures,

c. Application of wastewater at rates that will not allow wastewater to stand for more than 48 hours,

d. Resting periods between wastewater applications,

e. At least daily inspection of the land application area during times of discharge,

f. Appropriate solids disposal practices,

g. Preparation of a Salinity Management Plan to evaluate potential methods to reduce the salinity of its discharge,

h. Preparation of Nutrient Management Plan to evaluate the nutrient load of the discharge and how to best manage its application, and

i. Preparation of a Wastewater Management Plan that ensures the wastewater is spread evenly over the 400 acre land application area.

62. These Treatment and Control Practices are reflective of BPTC of the discharge.

Antidegradation Conclusions

63. This Order contains Discharge Specifications B.2 that limits the average daily discharge to 2.0 mgd during the processing season (early September July through mid-October) and includes a daily maximum of 2.6 mgd. This Order also contains Land Application Area Specifications D.1 and D.2 that limit the discharge to agronomic rates for the types of crops grown and limits the cycle BOD loading to 150 lbs/ac/day, respectively. This Order contains Provisions F.11, F.12, and F.13 that require the Discharger to prepare Salinity, Nutrient, and Wastewater Management Plans respectively. The application of wastewater to the 400-acre land application area from a lined sump and/or retention pond, or with the screening of solids prior to the direct discharge of wastewater to the land application areas (without using the unlined sump and/or checks) at the loading

rates authorized by this Order, will not cause unreasonable groundwater degradation with BOD, nitrate as nitrogen, or salts.

64. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State and, therefore, sufficient reason exists to accommodate growth and limited groundwater degradation around the Facility, provided that the terms of the Basin Plan are met. Degradation of groundwater by some of the typical waste constituents released with discharge from a pistachio processor after effective source reduction, treatment, and control, and considering the best efforts of the Discharger and magnitude of degradation, is of maximum benefit to the people of the State. Keenan contributes to the economic prosperity of the region by directly employing about 90 workers during the approximately seven week pistachio processing season and another 110 employees in the finishing plant for approximately six months each year. Keenan employs about 70 workers year round. Keenan also provides incomes for numerous surrounding pistachio growers and associated trucking firms, and provides a tax base for local and county governments. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State and, therefore, sufficient reason to accommodate growth and limited groundwater degradation provided terms of the Basin Plan are met.

Designated Waste and Title 27

65. California Code of Regulations, title 27 (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste, which includes designated waste, as defined by Water Code section 13173. However, Title 27 exempts certain activities from its provisions. Discharges regulated by this Order are exempt from Title 27 pursuant to a provision that exempts wastewater under specific conditions. This exemption, found at Title 27, section 20090, is described below:

> (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 regional water quality control board has issued WDRs, reclamation requirements, or waived such issuance;
>
> (2) The discharge is in compliance with 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.

66. The discharge authorized herein is exempt from the requirements of Title 27 in accordance with Title 27, section 20090(b) because:

a. The Central Valley Water Board is issuing WDRs,

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

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

67. The discharges to the unlined checks do not meet the requirements of Title 27 section 20090, subsections (a) or (b). Provision F.13 of this Order requires the Discharger to demonstrate how it will modify its disposal operations to meet the preconditions for exemption from Title 27 or how the Discharger will line its wastewater disposal systems to comply with the containment requirements of Title 27.

General Findings

68. Based on the threat and complexity of the discharge, the facility is determined to be classified as 2B 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 B complexity, defined as: "Any discharger not included [as Category A] that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal) or any Class 2 or Class 3 waste management units."

69. Water Code section 13267(b) states:

> In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached Monitoring and Reporting Program R5-2015-0014 are necessary to ensure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

70. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal governed by this Order.

71. The action to adopt waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality (CEQA), in accordance with the California Code of Regulations, title 14, section 15301 (existing facilities). There will be

no significant expansion as a result of the proposed discharge (no new structures or land identified for use) when compared to the last RWD submitted in 1998.

72. The earliest CEQA document in the record is a 1980 *Notice of Exemption, Administrative Approval No. 1910* issued by Kings County for the Keenan Farms facility. Kings County granted the exemption based on the proposed project not affecting the environment. The record also contains a 1984 *Initial Study/Negative Declaration, Administrative Approval No. 2094* for additions to the existing facility that concludes the proposed project does not have any significant adverse environmental impacts, and there would be no expansion of the previous existing use. The latest CEQA document in the record is a 1992 *Initial Study/Negative Declaration, Administrative Approval No.92-20* circulated by Kings County for the construction of two storage tanks and a new warehouse. Kings County concluded that the proposed activities at the existing pistachio processing storage facility would not affect the environment.

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

Public Notice

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

75. 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.

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

IT IS HEREBY ORDERED that WDRs Order 93-049 is rescinded except for purposes of enforcement, and, pursuant to Water Code sections 13263 and 13267, the Discharger, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

2. Bypass of untreated wastes, except as allowed by Provision E.2 of Standard Provisions and Reporting Requirements, is prohibited.

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

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

5. The discharge of pistachio processing wastewater to a septic system is prohibited.

6. Discharge of pistachio processing wastewater at a location or in a manner different from that described in the Findings of this Order is prohibited.

7. Discharge of pistachio processing wastewater to unlined ponds, sumps, or checks is prohibited.

8. Discharge of domestic wastewater to the retention pond, land application areas, or any surface waters is prohibited.

B. Discharge Specifications

1. The Discharger shall measure the volume of the wastewater discharged to the sump and/or retention pond and the volume of wastewater discharged to the land application area. The volume shall be determined at FM-01 and FM-02 as described in Monitoring and Reporting Program R5-2015-0014.

2. During the processing season (typically early September through mid-October), the monthly average daily discharge flow to the land application area shall not exceed 2.0 mgd with a daily maximum of 2.6 mgd and an annual volume not to exceed 80 mgd.

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

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

5. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of groundwater limitations.

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

7. All open containment/settling structures shall be managed to prevent breeding of mosquitoes. Specifically:

a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface.

b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.

c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

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

8. All conveyance, treatment, storage, and land application areas shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

9. Objectionable odors shall not be perceivable beyond the limits of the property where the waste is generated, treated, and/or discharged at an intensity that creates or threatens to create nuisance conditions.

10. As a means of discerning compliance with Discharge Specification B.9, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for three consecutive weekly sampling events. If the DO in any single pond is below 1.0 mg/L for three consecutive sampling events, the Discharger shall report the findings to the Regional Water Board in writing within 10 days and shall include a specific plan to resolve the low DO results within 30 days.

C. Solids Specifications

Sludge, as used in this document, means the solid, semisolid, and liquid organic matter removed from wastewater treatment, settling, and storage vessels or ponds. Solid waste refers to solid inorganic matter removed by screens and soil sediments from washing of unprocessed pistachios. Residual solids means organic food processing byproducts such as culls, pulp, stems, leaves, and seeds that will not be subject to treatment prior to disposal or land application.

1. Any handling and storage of solids and sludge shall be temporary, and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations of this Order.

2. Collected screenings, sludge, and other solids removed from the liquid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) operated in accordance with valid WDRs issued by a regional water quality control board will satisfy this specification.

3. Any proposed change in solids disposal practices shall be reported to the Executive Officer in writing at least **90 days** in advance of the change. Screenings (solids removed from the parabolic screens) may be land applied to the disposal area provided that, at least **60 days** prior to application, the Discharger submits a loading analysis that demonstrates the land application of solids will not cause an exceedance of any specification or groundwater limitation of this Order.

D. Land Application Area Specifications

1. Application of waste constituents to the 400-acre land application areas shall be at reasonable agronomic rates to preclude creation of a nuisance or unreasonable degradation of groundwater, considering the crop, soil, climate, and irrigation management system. The annual nutritive loading of the land application areas, including the nutritive value of organic and chemical fertilizers and of the wastewater shall not exceed the annual crop demand, except for potassium.

2. The discharges to the land application areas will not exceed a BOD daily cycle average loading rate of 150 lbs/ac/day at any time. Compliance with this limit shall be determined by using the average of the last two weeks (weekly sampling frequency) effluent BOD monitoring results.

3. Wastewater shall not be discharged to the land application area in a manner that causes wastewater to stand for greater than 48 hours after irrigation ceases.

4. Wastewater shall be applied to the land application area with appropriate resting periods and the typical cycle period is reported to be seven days (wastewater applied day one, no further application through day seven).

5. Any irrigation runoff shall be confined to the land application area and shall not enter any surface water drainage course or storm water drainage system.

6. The perimeter of the land application area shall be graded to prevent ponding along public roads or other public areas and prevent runoff onto adjacent properties not owned or controlled by the Discharger.

7. The volume of wastewater applied to the land application area on any single day shall not exceed reasonable agronomic rates based on the vegetation grown, pre-discharge soil moisture conditions, and weather conditions.

8. Hydraulic loading of wastewater and supplemental irrigation water including precipitation shall be at reasonable agronomic rates designed to:

   a. Maximize crop nutrient uptake;

   b. Maximize breakdown of organic waste constituents in the root zone; and

   c. Minimize the percolation of waste constituents below the root zone.

9. The irrigation with wastewater shall be managed to minimize erosion within the land application area.

10. The land application areas shall be managed to prevent breeding of mosquitoes. In particular:

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

    b. Tailwater ditches shall be maintained essentially free of emergent, marginal, and floating vegetation; and

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

11. No physical connection shall exist between wastewater and any domestic water supply or domestic well, or between wastewater piping and any irrigation well that does not have an air gap or reduce pressure principle device.

E. Groundwater Limitations

1. Release of waste constituents from any treatment unit, storage unit, delivery system, or land application area associated with the Facility shall not cause or contribute to groundwater containing concentrations of constituents identified below, or natural background quality, whichever is greater.

    a. Nitrate as nitrogen of 10 mg/L.

    b. For constituents identified in Title 22, the MCLs quantified therein.

F. Provisions

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991 (Standard Provisions), which are hereby incorporated into and are an enforceable part of this Order.

2. The Discharger shall comply with Monitoring and Reporting Program (MRP) R5-2015-0014, which is hereby incorporated into and is an enforceable part of this Order, and any revisions thereto as adopted by the Central Valley Water Board or approved by the Executive Officer.

3. The Discharger shall keep at the Facility office copies of this Order including its MRP, Information Sheet, attachments, and Standard Provisions, for reference by operating personnel. Key operating personnel shall be familiar with its contents.

4. 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 when the operation is necessary to achieve compliance with the conditions of this Order.

5. All technical reports and work plans required herein 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 a person registered to practice in California pursuant to California Business and Professions Code Sections 6735, 7835, and 7835.1. As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work. All reports required herein are required pursuant to Water Code section 13267.

6. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter 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.

7. In the event of any change in control or ownership of land or waste treatment and storage facilities presently owned or controlled by the Discharger, the Discharger shall 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.

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

consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

9. 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.

10. 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.

11. **By 6 August 2015**, the Discharger shall submit a Salinity Management Plan, with salinity source reduction goals and an implementation time schedule for Executive Officer approval. The control plan shall identify any additional methods that could be used to further reduce the salinity of the discharge to the maximum extent feasible, include an estimate on load reductions that may be attained through the methods identified, and provide a description of the tasks, cost, and time required to investigate and implement various elements in the salinity control plan. The Discharger shall implement the plan in accordance with the approved schedule.

12. **By 6 August 2015**, the Discharger shall submit a Nutrient Management Plan for the land application areas for Executive Officer approval. At a minimum the Plan must include procedures for monitoring the land application area including daily records of wastewater applications and acreages, an action plan to deal with objectionable odors and/or nuisance conditions, a discussion on blending of wastewater and supplemental irrigation water, supporting data and calculations for monthly and annual water and nutrient balances, and management practices that will ensure wastewater, irrigation water, commercial fertilizers and soil amendments are applied at agronomic rates, and in a manner that distributes the wastewater over the entire acreage of the land application area.

13. The Discharger shall comply with WDRs Order R5-2015-0014, Groundwater Limitations E, and the requirements of California Code of Regulations, Title 27 in accordance with the following compliance schedule:

Task	Task Description	Due date
a.	Submit a technical report including: i. A work plan and proposed time schedule for implementing modifications to Facility treatment, disposal, and delivery system that would qualify for exemption from Title 27, section 20090 (b). The work plan shall provide for compliance with the California Environmental Quality Act and include a Report of Waste Discharge for any proposed structural modifications to the Facility ii. A work plan with a Report of Waste Discharge and a time schedule for constructing modifications to the unlined checks to meet the containment requirements of Title 27. The technical report and the work plan, RWD and schedules shall be subject to the approval of the Executive Officer.	**6 August 2015**
b.	Implement the approved work plan and time schedule required by Task a.	**In accordance with the approved schedule, but by no later than 8 February 2016**
c.	Submit a technical report demonstrating complete implementation of the approved work plan and schedule. Upon receipt of written concurrence of Executive Officer approval of the technical report, this provision shall be considered satisfied.	**In accordance with the approved schedule, but by no later than 8 August 2017**

14. If the Central Valley Water Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of an objective for groundwater, this Order may be reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for the problem constituents.

15. 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.

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

17. 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 that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board on 6 February 2015.

PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2015-0014
FOR
KEENAN FARMS, INC.
KETTLEMAN CITY PISTACHIO PROCESSING FACILITY
KINGS COUNTY

This Monitoring and Reporting Program (MRP) is required pursuant to California Water Code (CWC) 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 months of monitoring, 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 10.

The Discharger shall monitor the following locations to demonstrate compliance with the requirements of this Order:

Monitoring Point Name	Monitoring Location Description
FM-01 and FM-02	Location where the volume/flow of wastewater from the facility can be measured prior to discharge to the wastewater lined sump/checks (FM-01) and the location where the volume/flow of wastewater can be measured prior to discharge to the land application areas (FM-02).
EFF-01	Location where a representative water quality sample of the facility wastewater can be obtained prior to discharge to the lined sump/checks or land application areas.
SW-1 and SW-304	Location where a representative sample of the facilities surface water supply (SW-1) can be obtained. If Keenan uses its own groundwater supply well (SW-304) as a supplemental source of irrigation/process water then it shall, collect a representative sample from SW-304. If more than one both sources are used during the processing season, the results shall also be presented as a flow weighted average of the wells used.

EFFLUENT MONITORING

The Discharger shall monitor the volume of wastewater discharged to the wastewater retention pond at FM-01 and the volume of wastewater discharged to the land application areas at FM-02. Upon completion of Provision F.13, the Discharger may discontinue monitoring the volume of the effluent discharged to the lined checks/ponds at FM-01, but shall continue to monitor the volume of effluent discharged to the land application areas at FM-02**.** The Discharger shall monitor effluent at EFF-01 for the constituents listed below. The wastewater samples shall be representative of the volume and nature of the discharges. Time of collection of the samples shall be recorded. Wastewater monitoring shall include at least the following:

Frequency[1]	Constituent/Parameter	Units	Sample Type
Continuous	Flow	mgd	Meter
Daily	pH	pH Units	Grab
Daily	Electrical Conductivity	umhos/cm	Grab
Weekly	Total Dissolved Solids	mg/L	Grab
Weekly	Fixed Dissolved Solids	mg/L	Grab
Weekly	Biochemical Oxygen Demand	mg/L	Grab
Weekly	Nitrate as Nitrogen	mg/L	Grab
Weekly	Nitrite as Nitrogen	mg/L	Grab
Weekly	Ammonia as Nitrogen	mg/L	Grab
Weekly	Total Kjeldahl Nitrogen	mg/L	Grab
Weekly	Total Nitrogen	mg/L	Grab
Monthly[2]	General Minerals	mg/L[2]	Grab

1. The frequency listed is for the discharge during the processing season which typically occurs from early September through mid-October.
2. Twice during the processing season.
3. mg/L or ug/L, as appropriate.

POND MONITORING

Effluent pond monitoring (lined sump/retention pond and/or lined checks) shall include at least the following:

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

[1] Measured between 8:00 and 9:00 am on the day of sample collection

[2] DO sample collected from within the upper one foot of all wastewater ponds containing effluent opposite the pond inlets.

The Discharger shall inspect the condition of the wastewater contained in the lined sump/retention pond and/or the lined checks once per week and write visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether dead algae, vegetation, scum, or debris are accumulating on the wastewater retention pond surface and their location; whether burrowing animals or insects are present; and the color of the pond water (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.).

SOURCE WATER MONITORING

The Discharger shall collect source water samples at SW-1 and/or SW-304, or from any other sources used, and analyze them for the constituents specified in the following table. If the source water is from more than one source (surface and/or groundwater), the results shall also be presented as a flow weighted average of all the sources used.

Frequency	Constituent/Parameter	Units	Sample Type
Annually	EC	mg/L	Grab/Computed average
Annually	TDS	TDS	Grab/Computed average
Annually	Nitrate as Nitrogen	mg/L	Grab/Computed average
Annually	Nitrite as Nitrogen	mg/L	Grab/Computed average
Annually	Ammonia as Nitrogen	mg/L	Grab/Computed average
Annually	Total Kjeldahl Nitrogen	mg/L	Grab/Computed average
Annually	Total Nitrogen	mg/L	Grab/Computed average
Annually	General Minerals	mg/L	Grab/Computed average

LAND APPLICATION AREA MONITORING

The Discharger shall monitor the land application areas daily while wastewater is being discharged and monthly during non-application periods. The volume of the effluent applied will be monitored at FM-02. The monitoring report shall identify the volume of the effluent applied, the specific parcels to which it is applied, the acreage to which it is applied, and the type of crops grown on each parcel. This information shall be submitted as part of the annual monitoring report in addition to a map that shows the specific parcels that received Plant effluent.

In addition, the Discharger shall perform the following monitoring and loading calculations for each land application area. If supplemental irrigation water is used, samples shall be collected

from the irrigation well (SW-304 or any other irrigation well used)). The data shall be collected and presented in both a graphical (map) and tabular format and shall include the following:

Frequency	Constituent/Parameter	Units	Sample Type
Daily	Application area	Acres	n/a
Daily	Wastewater flow	Gallons	Metered
Daily	Wastewater loading	Inches/day	Metered
Daily	Supplemental irrigation	Inches/day	Metered
Daily	Precipitation	Inches	Rain gage[1]
Monthly	Total Hydraulic loading[2]	Inches/acre-month	Calculated
BOD Loading[3]			
Daily	Day of application	lbs/ac/day	Calculated
Cycle	Cycle average	lbs/ac/day	Calculated cycle average
Nitrogen loading[4]			
Annual	From wastewater	lbs/ac/yr	Calculated
Annual	From fertilizers	lbs/ac/yr	Calculated
Annual	From supplemental irrigation water	lbs/ac/yr	Calculated
Salt loading[4]			
Annual	From wastewater	lbs/ac/yr	Calculated
Annual	From supplemental irrigation water	lbs/ac/yr	Calculated

1. National Weather Service or CIMIS data from the nearest weather station is acceptable.
2. Combined loading from wastewater, irrigation water, and precipitation.
3. Loading rates to be calculated using the applied volume of wastewater, applied acreage, and average of the four most recent concentrations for BOD. The BOD loading rate shall be divided by the #days between applications to determine cycle average.
4. Nitrogen and salt loading shall be calculated using the applied volume of wastewater, applied acreage, and average of the four most recent results for total nitrogen and FDS.

In addition, the Discharger shall inspect the application areas and evidence of erosion, field saturation, runoff, or the presence of nuisance conditions (i.e., flies, ponding, etc.) shall be noted in field logs and included as part of the annual monitoring report.

SOIL MONITORING

The Discharger shall establish, with Central Valley Water Board staff concurrence, a suitable number of monitoring locations within the land application area and at least three locations to represent background conditions in areas that are cropped in a manner similar to land application area, but that do not receive applications of pistachio processing wastewater. The annual soil sampling shall be conducted one to two months prior to the start of pistachio processing season and the annual discharge of wastewater to the land application areas. The samples shall be collected and analyzed for the following constituents.

Frequency	Constituent/Parameter	Units	Sample Type
Annually	Soil pH	pH units	4 feet[1]
Annually	Sodium	mg/kg	4 feet[1]
Annually	Chloride	mg/kg	4 feet[1]

Annually	EC	umhos/cm	4 feet[1]
Annually	Nitrate as nitrogen	mg/kg	4 feet[1]
Annually	Total Kjeldahl Nitrogen	mg/kg	4 feet[1]

1. Samples to be analyzed shall be collected at 6-inches, 2, and 4 feet below the ground surface.

REPORTING

All monitoring results shall be tabulated and submitted in an **Annual Report,** which shall be due by no later than 1 February of the year following the processing season (i.e., 2015 monitoring shall be due 1 February 2016).

The Central Valley Water Board has gone to a Paperless Office System. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence shall be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB should be mailed to: centralvalleyfresno@waterboards.ca.gov. Documents that are 50MB or larger should be transferred to a disc and mailed to the appropriate regional water board office, in this case 1685 E Street, Fresno, CA, 93706.

To ensure that your submittals are routed to the appropriate staff, the following information block should be included in any email used to transmit documents to this office:

Program: Non-15, WDID: 5D162022001, Facility Name: Keenan Farms, Inc. Kettleman Facility, Order: R5-2015-0014.

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, and 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.

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.

A. Annual Monitoring Reports shall include the following:

Wastewater Reporting:

1. The results of effluent monitoring specified on page 2.
2. For each processing season, calculation of the daily average flows and the maximum daily flow from the wastewater stream.
3. For each processing season, calculation of the daily average EC of the discharge.
4. A summary of daily BOD loading rates.

Pond Monitoring Reporting

1. The results of the monitoring specified on page 3.

Source Water Reporting

1. For each processing season, the results of the source water monitoring specified on page 3. Results must include supporting calculations.

Land Application Area Reporting

1. The results of the monitoring and reporting and loading calculations specified on pages 3 and 4.
2. For each processing season that wastewater is applied to the land application areas, calculation of the hydraulic load for wastewater and supplemental irrigation water in millions of gallons and/or acre-feet to each discrete irrigation area.
3. A summary of the notations made in the land application areas log during each week of the processing season. The entire contents of the log do not need to be submitted.
4. For each processing season, calculation of the daily BOD cycle average using the BOD results for the processing season.
5. The type of crop(s) grown, planting and harvest dates, and the quantified nitrogen and fixed dissolved solids uptakes (determined by representative plant tissue analysis). Include any soil and/or tissue sampling results.
6. The monthly and annual discharge volumes during the reporting year expressed as million gallons and inches.
7. A monthly balance for the reporting year that includes:

a. Monthly average ET_0 (observed 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 http://www.ncdc.noaa.gov/oa/climate/online/ccd/nrmlprcp.html.

d. Monthly average and annual average discharge flow rate.

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

9. The total pounds of nitrogen applied to the land application areas from all sources (wastewaters, fertilizers, and irrigation waters) as calculated from the sum of the monthly loading to the land application areas in lbs/ac/yr.

10. The total pounds of FDS that have been applied to the land application areas, as calculated from the sum of the monthly loadings to the land application areas in lbs/ac/yr.

Solids Reporting

1. Annual production of totals solids (excluding trash and recyclables) in dry tons or cubic yards.

2. A description of disposal methods, including the following information related to the disposal methods used. If more than one method is used, include the percentage disposed of by each method.

   a. For landfill disposal, include: the name and location of the landfill, and the Order number of WDRs that regulate it.

   b. For land application, include: the location of the site, and the Order number of any WDRs that regulate it.

   c. For incineration, include: the name and location of the site where incineration occurs, the Order number of WDRs that regulate the site, the disposal method of ash, and the name and location of the facility receiving ash (if applicable).

   d. For composting, include: the location of the site, and the Order number of any WDRs that regulate it.

   e. For animal feed, include: the location of the site, and the Order number of any WDRs that regulate it.

Soils Reporting

1. The results of soil monitoring specified on pages 4 and 5. The analytical results should be presented in tabular form and include depth of sample. If no sample is collected at a specified depth it should be noted in the table along with the reason no sample was collected.

2. A site map showing the location of each sampling point. The map shall also include the locations of all monitoring wells and wastewater storage and/or discharge areas.

Facility Information:

1. The names and general responsibilities of all persons in charge of wastewater handling and disposal.
2. The names and telephone numbers of persons to contact regarding the Facility for emergency and routine situations.
3. A statement certifying when the flow meters 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, nutrient management plan, and contingency plan, reflect the Facility as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.
8. A summary of any changes in processing that might affect waste characterization and/or discharge flow rates.

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

Ordered by: _____

PAMELA C. CREEDON, Executive Officer

_____

(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	Unless otherwise specified or approved, samples shall be a flow-proportioned composite consisting of at least eight aliquots.
Daily	Samples shall be collected 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
µg/L	Micrograms per liter
µmhos/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	

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

INFORMATION SHEET

ORDER R5-2015-0014
KEENAN FARMS, INC.
KETTLEMAN CITY PISTACHIO PROCESSING FACILITY
KINGS COUNTY

Keenan Farms, Inc., owns and operates a pistachio processing facility at 31510 Plymouth Road about five miles northwest of the community of Kettleman City in Kings County. Keenan has operated the facility since 1980. The discharge of wastewater is seasonal and is limited to about 40 days a year, typically from early September to mid-October. The depth to groundwater is about 350 feet below the ground surface (bgs) and first encountered groundwater is generally of poor quality with respect to electrical conductivity (EC), total dissolved solids (TDS), and sulfate. Erwin Engineering Inc. (Erwin), Keenan's consultant, submitted a report of waste discharge (RWD) on behalf of Keenan in 2014 in support of increasing the volume of wastewater discharged to land.

Background
The discharge is regulated by waste discharge requirements (WDRs) Order 93-049 which allows for the discharge at the following limits.

Effluent Limits – Flow: 0.345 million gallon per day (mgd) daily maximum limit
0.258 30-day average limit
7.74 million gallon annual limit
pH: between 6.5 and 9.5 s.u.
Dissolved Oxygen: >1.0 milligrams per liter (mg/L)

Erwin submitted a RWD in 1992 to describe the discharge of pistachio processing wastewater and to provide documentation so the Board could issue WDRs. Order 93-049 was adopted in March 1993 and allowed the discharge of pistachio processing wastewater to an unlined 2.75 acre retention pond. The 1992 RWD indicates the wastewater was screened before discharge. Pistachio processing solids (hulls, twigs, leaves, etc.) were to be dried and then spread on about 100 acres of farmlands owned by Keenan as a soil amendment.

Reported nitrogen, potassium, and biochemical oxygen demand (BOD) loading rates to the pond were high:

- Nitrogen – 3,100 pounds per acre per year (lbs/ac/yr)
- Potassium – 18,900 lbs/ac/yr
- BOD – 800 pounds per acre per day (lbs/ac/day)

At the request of the Central Valley Water Board, Erwin prepared and submitted a 1995 RWD requesting the WDRs be updated to allow an increase in the daily average flow to 0.50 mgd. The wastewater would be discharged to the pond and then to 217 acres of orchards. The solids would be pumped directly to the retention pond and allowed to settle out there. The

entire area of the pond is not used in the process. The pond was sloped to the north to allow wastewater to collect in a steel lined sump constructed at the northern end of the pond, and a berm was constructed to contain the wastewater within the sump area.

Proposed loading rates from the 1995 RWD were based on having 217 acres for disposal of the wastewater, and the results are shown below.

- Nitrogen – 175 lbs/ac/yr
- Potassium – 433 lbs/ac/yr
- BOD – 55 lbs/ac/day

In 1998 Erwin submitted another RWD requesting an increase in the daily average flow to 1.31 mgd, and an increase in the seasonal or annual discharge to 32.75 million gallons a year to the 217 acre land application area. Erwin included updated loading estimates:

- Nitrogen – 158 lbs/ac/yr
- Potassium – 607 lbs/ac/yr
- BOD – 93 lbs/ac/day

Around 2000 the Discharger, without notifying the Board, installed about 45 acres of unlined checks that are subdivided into around 21 smaller checks that are each about 2 acres in size. Wastewater is discharged to the sump in the retention pond, and then to the checks. There are 10 checks on the eastern side and 11 on the west side of the area. From the checks, wastewater is supposed to be discharged to the land application areas via a drip system, or "when the solids get too high," flood irrigation. During an inspection of the Facility in April 2014, a considerable amount of pistachio processing solids were observed in the eastern portion of the checks where the wastewater first enters. The amount of pistachio solids decreased in the checks as one moved to the west. The discharge is not spread over the entire acreage available for the recycling of wastewater, as described in the RWD. Rather, it is discharged to the 45 acres of checks and allowed to percolate into the vadose zone.

Central Valley Water Board staff calculated loading rates using the 2011 through 2013 self-monitoring data for the discharge of wastewater to 45 acres and the results are included in the following table:

Year	Total Nitrogen (lbs/ac/yr)	Potassium (lbs/ac/yr)	TDS (lbs/ac/yr)	BOD (lbs/ac/day)
2011	625	3,185	6,870	327
2012	877	4,828	11,542	337
2013	1,726	7,592	22,766	848

The loading rates indicate that the discharge of pistachio processing wastewater to the 45 acres of checks threatens to pollute the underlying groundwater with nitrate as nitrogen and TDS.

Existing Facility and Discharge

The 1998 RWD proposed reusing an average of 1.31 mgd to 217 acres of land application areas. MRP Order 93-049 requires BOD, EC, TDS, total Kjeldahl nitrogen (TKN), nitrate as nitrogen, and total nitrogen monitoring. Analytical results since 2011 are presented below:

Effluent Results

Date	Potassium	pH	BOD	EC	TDS	TKN	Nitrate as nitrogen
		s.u.	mg/L	umhos/cm[1]	mg/L	mg/L	mg/L
9/23/11	230	6.9	73	460	294	29	13.0
9/29/11	540	5.5	2100	1920	1229	109	4.2
10/14/11	570	5.1	2500	1870	1197	79	6.7
10/18/11	310	5.2	1600	1320	845	79	2.4
9/14/12	109	5.7	400	840	538	43	12.0
9/21/12	250	5.3	1100	1190	762	87	1.1
9/26/12	1210	5.3	3200	3740	2394	188	8.7
10/4/12	920	5.0	2600	3520	2253	108	3.1
9/5/13	291	5.2	1200	1630	1043	51	1.0
9/13/13	310	5.5	1300	1650	1056	115	3.7
9/19/13	1248	5.3	5900	5300	3392	195	5.2
9/26/13	880	4.7	4400	4200	2688	238	11.0
Averages	572	5.4	2198	2303	1474	110	6.0

1. umhos/cm = micromhos per centimeter.

The data indicates considerable variability in the results within each processing season and that the effluent EC, TDS, BOD, and potassium results are high. The results also show that the effluent results increased in 2013 when compared to the results of 2011 and 2012.

Proposed Discharge

The Discharger submitted a July 2014 RWD requesting an increase in the average daily flow limit to 2.0 mgd, with a daily maximum of 2.6 mgd to a land application area comprised of 400 acres of farmland planted with pistachio trees. The seasonal discharge is estimated to be 80 million gallons and the Discharger is proposing to reuse wastewater on 400 acres of land owned by Keenan and currently cropped with pistachios. Using the proposed volumes discharged to 400 acres and the average 2011 through 2013 analytical results indicates the following loadings for the 2011 through 2013 processing seasons.

Year	Total Nitrogen (lbs/ac/yr)	Potassium (lbs/ac/yr)	TDS (lbs/ac/yr)	BOD (lbs/ac/day)
2011	70	358	773	37
2012	99	543	1,298	38
2013	194	854	2,561	95

The loading estimates are considerably lower than those presented for the discharge to 45 acres. Considering the depth to groundwater of about 350 feet bgs, and the variable lithology of the underlying deposits, the discharge would be unlikely to reach and then degrade the underlying

groundwater if applied evenly over the 400 acres. Nitrogen loading at 194 lbs per acre is only slightly higher than the 188 lbs/ac/yr that the orchards can remove, but the depth to groundwater minimizes the potential for nitrogen to degrade the underlying groundwater. BOD loading at less than 100 lbs/ac/day should not cause degradation of the underlying groundwater. Potassium loading will exceed the ability of the pistachio trees to remove potassium from the soils and potassium may accumulate in the vadose zone. However, potassium readily binds to soil, and crops can and will take up more potassium than required, if available, with no reduction in yield. There are no specific water quality objectives set for potassium other than the overall objectives set for EC. Considering the depth to water of about 350 feet bgs, the presence of interbedded clays in the underlying lithology, the short duration of the discharge, and the discharge of wastewater spread evenly over 400 acres of land, the proposed discharge will minimize the likelihood that potassium will cause significant degradation of groundwater. FDS or salt loading at about 900 lbs/ac/yr is not expected to be a problem.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004 (the "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 of California Water Quality Control Board. The Keenan facility is in the Westside Basin hydrologic unit and the beneficial uses for the groundwater are municipal and domestic supply, agricultural supply, and industrial service supply. The beneficial uses for the surface water in the area of the Keenan facility (Valley Floor Waters) are agricultural supply, industrial process and service supply, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, rare and endangered species habitat, and groundwater recharge.

The Tulare Lake Basin Plan contains effluent limits for EC that recognize that the incremental increase in salt from use and treatment must be controlled to the extent possible. The maximum EC of the effluent discharged to land shall not exceed the EC of the source water plus 500 umhos/cm. 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 boron content of 1.0 mg/L. The Tulare Lake Basin Plan does allow for exceptions to the EC limit for industrial wastewater such as food processing wastewater that shows a "disproportionate increase in the EC of the discharge over the EC of the source water due to unavoidable concentrations of organic dissolved solids." Keenan does not monitor its discharge for fixed dissolved solids, but a wastewater sample was collected in 2014 by Central Valley Water Board staff and analyzed for TDS and FDS along with other constituents. The sample had a TDS result of 5,400 mg/L, a FDS result of 1,700 mg/L, and an EC result of 2,400 umhos/cm, indicating the discharge is high in organic dissolved solids and that Keenan's discharge qualifies for the exception.

Source Water

Supply water is provided to the Keenan facility by two sources: surface water is provided by the Westlands Water District, and groundwater is supplied by an onsite supply well. The Westlands Water District water is the primary water source and is used for domestic and production

purposes. The onsite supply well (Well 304) is used for production and irrigation purposes. Well 304 is 970 feet deep and is screened from 450 feet bgs to the base of the well at 970 feet bgs. A sample was collected from the Well 304 in February 2014. Results from 2014 for both sources of supply water are shown in the following table. Results shown in bold exceed the MCL.

Supply Water Results

Source	EC umhos/cm	TDS mg/L	Chloride mg/L	Sulfate mg/L	Nitrate as N mg/L	Potassium mg/L
Westlands	710	410	130	71	<0.1	3.9
Well 304	**1,300**	**920**	63	**490**	2.5	2.1
MCL	900/1600	500/100	250/500	250/500	45	na

Groundwater Conditions

The receiving water is groundwater and the depth to water and the direction of groundwater flow data for the area is limited. The depth to water in an onsite supply well (Well 304) was 351 feet bgs on 13 February 2014, but this well is not set in first encountered groundwater. It is set both above and below the Corcoran Clay confining layer. The depth to the top of the Corcoran Clay in this area is about 700 feet bgs. The upper unconfined aquifer is comprised of interbedded sands, silts, clays, and gravels. The finer-grained units act as aquitards or semi-confining layers that restrict the vertical flow of groundwater to the lower portions of the unconfined aquifer.

Groundwater quality beneath the facility is of generally poor quality for EC, chloride, and sulfate as illustrated by the results of samples collected from Keenan's former onsite well (Olive Well) as summarized below. The results shown in bold exceed the MCLs for EC, nitrate as nitrogen, chloride, and sulfate. The depth of the Olive Well was 1,050 feet bgs with a 600 foot well screen from 450 feet bgs to 1,050 feet bgs. It was screened both above and below the Corcoran Clay and drew water from both aquifers. It was destroyed in 2008.

Former Onsite Well (Olive Well) Results

Date	EC umhos/cm	Sodium mg/L	Nitrate as N mg/L	Chloride mg/L	Sulfate mg/L	Boron ug/L
August 1989	**2060**	10.4	**19**	4.8	na	600
July 2008	**2600**	260	**14**	**280**	**930**	700

Regional groundwater data on the United States Geological Survey (USGS) Water Quality Portal web site was available for 27 USGS wells and three "drains" within a five mile radius of the Keenan facility. Depth to water information was not available, but the well depths were listed as ranging from 300 feet to 2,444 feet bgs. Only two of the 27 USGS wells appear to have been installed above the Corcoran Clay. Well 360305200004101 is/was about 1.5 miles south of the facility and well 360536119575901 is/was about 1.75 miles east of the facility. Analytical results for samples collected from each well in 1951 and 1968 are summarized in the following table. The results in bold exceed the MCLs for the respective constituents.

USGS Historical Groundwater Data - Wells completed above the Corcoran Clay

Well Number	Depth feet bgs	Date Sampled	EC umhos/cm	TDS mg/L	Nitrate as N mg/L	Sodium mg/L	Sulfate mg/L	Chloride mg/L	Boron ug/L
360305200004101	350	8/13/51	**1,270**	**830**	na	200	**440**	76	440
" "		7/15/68	**1,310**	**836**	2.48	200	**570**	170	800
360536119575901	300	8/14/51	**913**	**618**	na	190	**300**	32	150
" "		7/15/68	891	**585**	0.271	160	**290**	13	640

Eight additional wells are or were within two miles of the Keenan facility. The data is primarily from one or two sampling events conducted in August 1951 and July 1968 and the results provide a good look at the historical groundwater quality of the area. The USGS data indicates these wells extend below the Corcoran Clay, but are actually screened both above and below the Corcoran Clay.

USGS Historical Groundwater Data - Wells completed below and above the Corcoran Clay

Well Number	Depth feet bgs	Date Sampled	EC umhos/cm	TDS mg/L	Nitrate as N mg/L	Sodium mg/L	Sulfate mg/L	Chloride mg/L	Boron ug/L
360359120031701	900	1968	**955**	**635**	na	150	**320**	51	370
360409120025201	1,937	1968	874	**597**	0.361	150	**300**	27	470
360355120023601	875	1968	**986**	**662**	0.045	160	**310**	55	430
360305120004701	1,400	1951	**1,270**	**830**	na	170	**350**	49	200
360631120021401	1,165	1951	**1,250**	**809**	na	140	**450**	32	800
360609120011301	1,306	1951	**1,000**	**658**	na	150	**350**	36	100
360357120004101	1,196	1951	**1,230**	**822**	na	170	**470**	51	400
360403120004201	825	1968	**1,330**	**867**	5.65	180	**430**	82	290

The results are similar to those of the two wells installed above the Corcoran Clay with EC, TDS, and sulfate all typically in excess of their respective MCLs. Boron results are high, with one being in excess of the Agricultural Water Quality goal of 700 ug/L.

Shallow groundwater with high EC levels is present to the northeast of the Keenan facility. According to the DWR maps, *Lemoore/Corcoran 2000, Areas of Shallow Groundwater* and *Lemoore/Corcoran 2001, Electrical Conductivity in Shallow Groundwater*, shallow groundwater with EC results as high as 4,000 umhos/cm are present approximately two miles to the northeast of the facility.

Compliance History

The current discharge exceeds the flow limit of 0.258 mgd in Order 93-049, but has generally been within the ranges requested in the RWDs. The flows in 2013 averaged 1.43 mgd, which exceeds the requested flow of 1.31 mgd from the 1998 RWD. As discussed previously, the discharge has been to about 45-acres of checks, not the 136 or 217 acres reported in the annual reports or RWD. The MRP requires the analyses of the effluent samples for total

inorganic dissolved solids in addition to testing for TDS. Analytical results for total inorganic dissolved solids have not been provided, but the discharge was monitored for volatile dissolved solids (VDS) from 1996 through 2003. VDS analyses were discontinued in 2004 and have not been included since. The Discharger submits one SMR annually for each processing season in accordance with the MRP.

Antidegradation

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

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

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

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

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

As stated previously, groundwater quality in the region is generally poor for EC, chloride, and sulfate. Keenan proposes to discharge its wastewater to 400 acres of orchards that will be used as land application areas. However, Keenan also proposes to continue discharges to the unlined checks. This Order requires Keenan to modify its system (e.g., line the retention pond and checks to Title 27 standards), or implement other measures to keep wastewater in the unlined checks from percolating to groundwater.

For salinity, the Basin Plan contains an EC limit exception for food processors that exhibit a disproportionate increase in the EC of the discharge over the EC of the source water due to unavoidable concentrations of organic dissolved solids. Chloride concentrations in the wastewater vary considerably with a range from 30 to 355 mg/L and have averaged about 185 mg/L since 2012. This Order requires Keenan to submit a Salinity Management Plan and evaluate potential methods to reduce the salt load in its discharge. Boron is part of the current effluent analytical suite, and has averaged about 0.55 mg/L since 2012.

Nitrogen loading is anticipated to be less than 200 lbs/ac/yr (194 lbs per acre using 2013 results and 400 acres for reuse) and is only slightly higher than the 188 lbs/ac/yr that the orchards can remove. However, when one considers the depth to groundwater being on the order of 350 feet bgs and the presence of interbedded silts and clays in the underlying lithology, the potential for nitrogen to degrade the underlying groundwater is low. Organic BOD loading at less than 100 lbs/ac/day should not cause degradation of the underlying groundwater. Potassium loading will again greatly exceed the ability of the pistachio trees to remove potassium from the soils, but as discussed above, with the depth to water being about 350 feet bgs, the presence of interbedded clays in the underlying lithology, the short duration of the discharge, and the discharge of wastewater spread evenly over 400 acres of land, will minimize the likelihood that

potassium will cause significant degradation of groundwater. FDS or salt loading at about 900 lbs/ac/yr is not expected to be a problem.

The Order establishes effluent limits and groundwater limits for the Keenan pistachio facility compliance with which will prevent any unreasonable threat to present or anticipated beneficial uses or groundwater quality that exceeds water quality objectives set forth in the Basin Plan.

Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impacts on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

For the foregoing reasons, this Order satisfies all four elements of Resolution 68-16.

Title 27
Title 27 of the California Code of Regulations, section 20005 et seq (Title 27) contains regulations to address certain discharges to land.

Unless exempt, release of designated waste is subject to full containment pursuant to Title 27 requirements. Title 27 Section 20090(b) exempts discharges of designated waste to land from Title 27 containment standards and other Title 27 requirements provided the following conditions are met:

a. The applicable regional water board has issued waste discharge requirements, or waived such issuance;

b. The discharge is in compliance with the applicable basin plan; and

c. The waste is not hazardous waste and need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.

Because of the threat to underlying groundwater from the discharge of pistachio processing wastewater to the 45 acres of unlined checks for the settling of solids, the unlined checks are not exempt from Title 27 requirements. This Order requires Keenan to implement measures to obtain an exemption in accordance with Title 27 section 20090 (b), or line the checks to Title 27 containment standards.

Proposed Order Terms and Conditions

Discharge Prohibitions, Effluent Limitations, Discharge Specifications, and Provisions
The proposed Order would prohibit discharge to surface waters and water drainage courses.

The proposed Order would prescribe discharge specifications that limit the BOD loading to 150 lbs/ac/day.

The proposed Order requires monitoring of the discharge for pH, BOD, EC, TDS, FDS, TKN, nitrite as nitrogen, nitrate as nitrogen, ammonia, total nitrogen, and general minerals. The Order also requires daily inspections of the land application areas.

The proposed Order would require the Discharger to submit and implement Salinity and Nutrient Management Plans.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedance of these objectives or natural background water quality, whichever is greatest.

The proposed Order requires Keenan to implement measures to obtain exemption in accordance with Title 27 section 20090 (b), or line the sump and/or checks to Title 27 containment standards to ensure that the discharge is not degrading the underlying groundwater.

Monitoring Requirements
Section 13267 of the CWC 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. Water Code Section 13268 authorizes assessment of civil administrative liability where appropriate.

The proposed Order includes effluent, source water, land application area monitoring, and possibly groundwater monitoring. The monitoring is necessary to evaluate the extent of the potential degradation from the discharge.

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. The proposed Order would set limitations based on the information provided thus far. If applicable laws and regulations change, or once new information is obtained that will change the overall discharge and its potential to impact groundwater, it may be appropriate to reopen the Order.

SITE VICINITY MAP

ORDER R5-2015-0014
WASTE DISCHARGE REQUIREMENTS
FOR
KEENAN FARMS, INC.
KETTLEMAN CITY FACILITY
KINGS COUNTY

0 4 8 12 16 20
Approximate Scale in Miles

N
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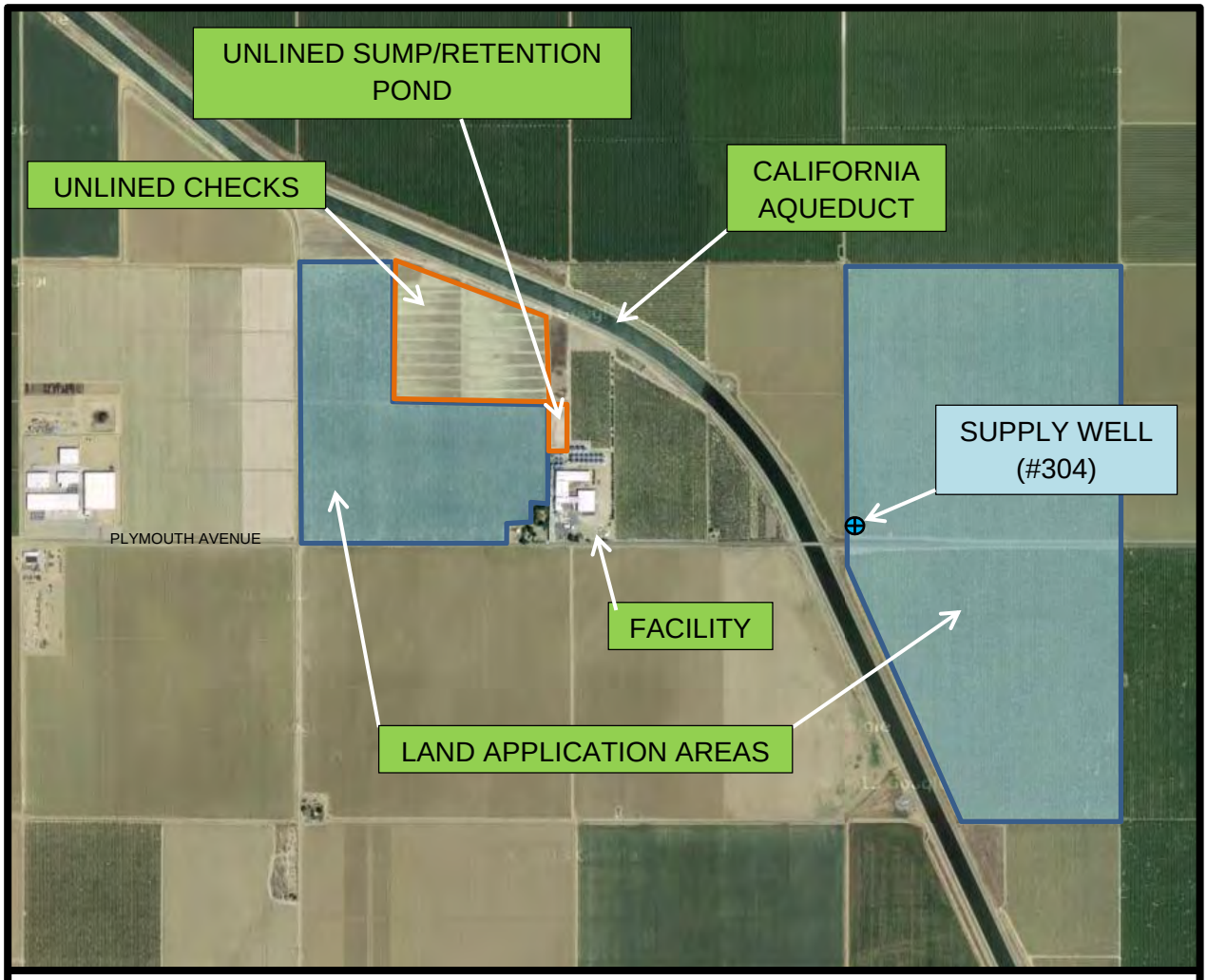
ATTACHMENT A



SITE MAP

ORDER R5-2015-0014
WASTE DISCHARGE REQUIREMENTS
FOR
KEENAN FARMS, INC.
KETTLEMAN CITY FACILITY
KINGS COUNTY

0 ¼ ½ ¾ 1.0
Approximate Scale in Miles

N W E S

ATTACHMENT B