

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2009-_____

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF BAKERSFIELD
WASTEWATER TREATMENT PLANT NO. 2
KERN COUNTY

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

1. The City of Bakersfield ([Discharger](#)) owns and operates Wastewater Treatment Plant No. 2 ([WWTP No. 2](#)), an existing wastewater treatment facility ([WWTF](#)) that serves the incorporated and unincorporated areas of central, east, northeast, and southeast Bakersfield that are generally east of Highway 99. WWTP No. 2 is west of Mt. Vernon Avenue, about 2.5-miles south of State Route 58, and about 2 miles north of Panama Lane in the southeastern quadrant of Section 9, Township 30 S, Range 28 East, Mount Diablo Base & Meridian, Kern County, as shown on [Attachment A](#), which is attached hereto and made part of this Order by reference.
2. The Discharger submitted a Report of Waste Discharge ([RWD](#)) including an Engineering Report in August 2004 in support of a proposed effluent storage expansion and an increase in the discharge of wastewater from WWTP No. 2 to about 5,476 acres of farmland mostly south of the WWTF. The Discharger submitted another RWD in April 2006 in support of reducing the farmland for recycling to 4,196 acres, but still maintaining the proposed monthly average dry weather discharge of 25 million gallons per day ([mgd](#)). In its comments to Tentative Waste Discharge Requirements ([WDRs](#)), the Discharger now says the entire 5,476 acres will remain available for wastewater recycling.
3. In May 1996, the Discharger submitted a RWD along with a technical report dated August 1996 in support of an increase in the monthly average dry weather discharge up to 25 mgd. In response, the Central Valley Water Board adopted the existing WDRs Order No. 97-104 in June 1997 as well as Cease and Desist Order ([CDO](#)) 97-105. The CDO was issued with a time schedule for the Discharger to become compliant with effluent limits in the WDRs. In order to be compliant with the CDO, the Discharger was required to expand and upgrade WWTP No. 2 by January 2000, submit monthly status reports documenting the progress of the expansion activities, and comply with the effluent limits following the expansion activities.
4. In September 2000, the Discharger completed an expansion of the WWTF to increase the daily flow capacity of the plant to 25 mgd. The expansion consisted of adding one additional primary clarifier, three trickling filters, three secondary clarifiers, two sludge digesters with methane recovery and cogeneration systems, and associated pumping equipment. In 2004, an effluent storage expansion project was completed that converted

the four aerated lagoons to one storage pond and expanded another storage pond for a total of nine storage ponds with a capacity of about 6,190 acre feet.

5. Order No. 97-104 is no longer adequate because it does not reflect the current conditions at WWTP No. 2, the expansion project completed in 2000, and the current disposal/recycling practices. The Discharger is now compliant with the terms of CDO 97-105.

Existing Wastewater Treatment Plant

6. The existing treatment system consists of: a headworks, three primary clarifiers, three trickling filters, three secondary clarifiers, nine storage ponds with a capacity of about 6,190 acre feet, four sludge digesters with methane recovery and a cogeneration system (currently only three are in use), and eighteen sludge drying beds.
7. In wet periods when the disposal areas cannot accept the wastewater, effluent is stored in the nine effluent storage ponds at WWTP No. 2. The ponds were constructed with a compacted soil base to minimize percolation of wastewater to the underlying groundwater. The influent flow into WWTP No. 2 since 2005 averaged 14.9 mgd, or about 46 acre feet per day. Influent to WWTF decreased in 2009 through May to an average of 13.6 mgd or about 42 acre feet per day. The current capacity of the storage ponds is about 6,192 acre feet, which would provide about 81 days of storage at 25 mgd and about 135 days at the current average flow rate of 14.9 mgd.
8. Solids removed by the bar screens and materials collected from the grit chamber are disposed of at a sanitary landfill.
9. The RWD and self-monitoring data from January 2007 to June 2009 characterize the flows from WWTP No. 2 as follows:

Monthly Average Flow	14.5 mgd
Design Flow (daily dry weather average)	25.0 mgd
Peak Flow	50 mgd
Highest Monthly Average Flow	15.7 mgd

10. Self-monitoring data from January 2007 to June 2009 characterize the quality of the discharge as follows:

<u>Constituent/Parameter</u>	<u>Units¹</u>	<u>Influent</u>	<u>Effluent</u>	<u>% Removal²</u>
Conventional Pollutants				
BOD ⁴	mg/L	449	34	93
TSS ⁵	mg/L	509	28	95

(continued next page)

<u>Constituent/Parameter</u>	<u>Units</u> ¹	<u>Influent</u>	<u>Effluent</u>	<u>% Removal</u> ²
Salts				
Chloride	mg/L	NS ³	78	--
Sodium	mg/L	NS ³	83	--
EC ⁶	µmhos/cm	NS ³	750	--
TDS ⁷	mg/L	NS ³	413	--
Nitrogen				
Nitrate as Nitrogen	mg/L	NS ³	6.0 ⁸	--
Metals				
Arsenic	µg/L	NS ³	2.0	--
Lead	µg/L	NS ³	1.62	--
Copper	µg/L	NS ³	20	--

¹ mg/L = milligrams per liter; µmhos/cm = micromhos per centimeter; µg/L = micrograms per liter

² Percent removal, -- = No data available

³ Not sampled (NS)

⁴ 5-day biochemical oxygen demand (BOD)

⁵ Total suspended solids (TSS)

⁶ Electrical conductivity at 25°C (EC)

⁷ Total dissolved solids (TDS)

⁸ Data reported as Nitrate. Converted to nitrate as nitrogen by dividing by a factor of 4.5.

⁹ Calculated by adding nitrate as nitrogen and total Kjeldahl nitrogen (TKN)

11. The EC of WWTP No. 2 effluent is typically about 370 micromhos per centimeter ([µmhos/cm](#)) greater than source water, which is well below the Basin Plan limit of 500 µmhos/cm plus the EC of the source water. Self monitoring data from January 2007 through May 2009 indicates that the effluent EC concentrations have not exceeded 500 µmhos/cm plus the EC of the source water.
12. The Discharger has a pretreatment program and submits quarterly reports. The United States Environmental Protection Agency approved the Discharger's initial pretreatment program in October 1985 and the State and Regional Water Boards received authority to administer the pretreatment regulations on 25 September 1989. The Discharger's 2007 Annual Pretreatment Report states that 618 inspections were conducted in 2007 that led to 234 sampling events. Based on the observations during the Discharger's inspections and the sample results, the Discharger issued nine notices of violation for exceeding various pretreatment limits.
13. Effluent is recycled to a multi-parcel disposal area located mostly south of WWTP No. 2 as shown in [Attachment A](#). The disposal areas are divided into northern (T30S, R28E) and southern (T31S, R28E) disposal areas. The disposal area is comprised of 23 parcels containing 5,476 acres of farmland for the recycling of wastewater. The WWTP is the farm's only water source. The wastewater is held in the storage ponds until needed for

irrigation. In 2006, approximately 2,500 of the 5,476 acres were in production with about 1,872 acres planted with alfalfa, 659 acres in grain, and 32 acres in corn. Secondary Disinfected Recycled Water is also used at the City of Bakersfield Green Waste Facility.

Sludge Management and Biosolids Disposal

14. Sludge as used herein means the solid, semisolid, and liquid residues generated during the treatment of industrial and domestic sewage in a municipal wastewater treatment facility. Sludge includes solids removed during primary, secondary, or advanced wastewater treatment processes, but not grit or screening material generated at the headworks. Biosolids as used herein means sludge that has undergone treatment and subsequently been tested and shown to be capable of being beneficially useful and legally used pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land reclamation.
15. Sludge and scum is pumped from the primary clarifiers to three digesters. The Discharger currently dries sludge generated during the treatment process in the 18 onsite unlined sludge drying beds.
16. The Discharger land applies biosolids generated from WWTP No. 2 at its disposal area adjacent to the south and east of WWTP No. 2. The Discharger prepares Annual Land Management reports that document the amount of, and to which fields biosolids are applied. Biosolids discharged to the disposal area are regulated by this Order.

Sanitary Sewer Overflows

17. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the plant. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, pipes, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities.
18. On 2 May 2006, the State Water Resources Control Board (State Water Board) adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems General Order No. 2006-003-DWQ (General Order). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with the order. The Discharger's collection system is greater than one mile in length; therefore the General Order is applicable. The Discharger submitted a Notice of Intent (NOI) for coverage under the general permit was submitted to the State Water Resources Control Board in August 2008.

Water Recycling

19. Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. California Department of Public Health (DPH), which has primary statewide responsibility for protecting public health, has established statewide criteria in Title 22, California Code of Regulations, Section 60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses. Revisions of the water recycling criteria in Title 22 became effective on 2 December 2000. The revised Title 22 expands the range of allowable uses of recycled water, establishes criteria for these uses, and clarifies some of the ambiguity contained in the previous regulations.
20. A 1988 Memorandum of Agreement (MOA) between DPH (then called the Department of Health Services) and the State Water Resources Control Board on the use of recycled water establishes basic principles relative to the agencies and the regional water boards. Under terms of the MOA, the Board implements Title 22 and DPH recommendations for the protection of public health. In addition, the MOA allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to the use of recycled water in California.
21. Title 22 requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards. The Discharger has submitted an engineering report for reclamation of its secondary treated wastewater. Additional evaluation of the potential impacts to the underlying groundwater is necessary as required by [Provision H.16](#).

Site-Specific Conditions

22. WWTP No. 2 is in an arid climate characterized by hot dry summers and mild winters. The rainy season generally extends from November through March. Occasional rains occur during the spring and fall months, but summer months are dry. Average annual precipitation and evaporation in the discharge area are about 6 inches and 58 inches, respectively, according to information published by the California Department of Water Resources.
23. According to the USDA Natural Resources Conservation Service (USDA/NRCS) *Soil Survey, Kern County, Southwest Part*, soils in the vicinity of WWTP No. 2 consist primarily of the Kimberlina fine sandy loam, the Panoche clay loam, the Weedpatch clay loam, and the Garces silt loam.
24. Permeability of the Kimberlina soil is moderate with high available water capacity. The Kimberlina fine sandy loam is described as a Class I soil. Class I soils have few limitations and are suited for a wide range of irrigated crops including almonds, alfalfa, cotton and grapes.

25. Permeability of the Panoche clay loam is moderately slow with moderate to high available water capacity. The Panoche clay loam is described as a Class II s-6 soil. Class II soils have moderate limitations and are reportedly suitable for salt tolerant crops such as cotton, alfalfa, barley sorghum, and sugar beets.
26. The Weedpatch clay loam and the Garces silt loam units are described as a Class III s soils. Class III soils have severe limitations that reduce the choice of crops grown or require special conservation practices. The 's' designates the soil as shallow, droughty, or stony.
27. WWTP No. 2 itself is not within a 100-year floodplain according to Federal Emergency Management Agency Map 06029C2325E. The disposal area located in T30S, R28E, Section 28; a portion of T30S, R28E, Section 22; and all of the disposal areas in T31S, R28E are located within a 100-year flood plain according to Federal Emergency Management Agency Map 06029C2325E. However, because of berms and tailwater control ditches, the disposal areas are islands which are not part of the 100-year flood zone.
28. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System general industrial storm water permit for WWTP No. 2 because all storm water runoff is retained onsite and does not discharge to a water of the United States.
29. Land use in the vicinity of WWTP No. 2 is primarily agricultural, industrial, rural residential, with suburban housing projects encroaching from the north, west, and east. The primary crops grown within five miles of the treatment plant include grain and hay crops, pasture crops such as alfalfa, field crops such as cotton, vineyards, almonds, and native vegetation according to land use maps prepared by the Department of Water Resources. Irrigation water is supplied primarily by surface water.

Groundwater Considerations

30. Since 1982, the Discharger has maintained a groundwater monitoring network consisting of a combination of piezometers, groundwater monitoring wells, and domestic/irrigation supply wells (also called City Wells) to monitor groundwater quality. Available groundwater data dating back to 1952 indicates groundwater quality varies considerably, both seasonally and by location.
31. Various constituents in groundwater both upgradient and downgradient of WWTP No. 2 exceed water quality objectives. However, the cause of the poor water quality does not appear to be attributable to the operation or discharge from WWTP No. 2. Available data indicates water quality in the unconfined aquifer is highly variable. EC concentrations in the supply wells range from about 500 $\mu\text{mhos/cm}$ to over 6,000 $\mu\text{mhos/cm}$; chloride concentrations range from about 30 mg/L to about 1,120 mg/L; and sodium concentrations range from about 43 mg/L to 660 mg/L. Groundwater data as far back as

1952 (prior to WWTP No. 2) indicate electrical conductivity (EC) concentrations up to 1,300 $\mu\text{mhos/cm}$ downgradient of where WWTP No. 2 is now.

32. Because background water quality exceeds the recommended consumer acceptance contaminant level for EC of 900 $\mu\text{mhos/cm}$ in Title 22 of the California Code of Regulations, this level is not appropriate for setting as a groundwater limit. The more appropriate limit is the upper limit of 1,600 $\mu\text{mhos/cm}$.
33. The Corcoran Clay is present beneath the southern disposal areas, but not beneath WWTP No. 2 or the northern disposal areas. This results in groundwater occurring in two main aquifers (a discontinuous perched zone and an unconfined aquifer) in the vicinity of WWTP No. 2 and the northern disposal areas, and in three main aquifers (a confined aquifer in addition to the perched and unconfined aquifers) beneath the southern disposal areas.
34. The Discharger currently monitors the shallow or discontinuous perched zone and the unconfined aquifer. It does not appear that the confined zone is directly monitored, although available well construction information indicates some of the wells used to monitor the unconfined aquifer may be set into both the confined and unconfined aquifers. Due to the depth to confined aquifer, the presence of the e-clay where the confined aquifer is present, and the effluent quality, it would not appear that monitoring of the confined aquifer is warranted.
35. The unconfined aquifer is monitored using about 56 domestic/irrigation wells (supply wells) of which 20 are monitored by the Discharger (also called City Wells) and 36 are monitored by the Kern Delta Water District; and 6 groundwater monitoring wells owned by the Kern Sanitation Authority (KSA).
36. The KSA conventional monitoring wells (KSA1 through KSA6) range from 150 to 220 feet in depth and have 40-foot screened intervals. The depth to groundwater in the KSA wells in 2007 ranged from about 106 to 162 feet bgs. Based on the KSA wells, the direction of groundwater flow at WWTP No. 2 is somewhat variable due to the mounding caused by the existing storage/percolation basins, but is predominantly to the east/southeast.

Source Water Quality

37. Water is supplied to the WWTP No. 2 service area by up to approximately 87 wells and is of good to excellent quality. The 12-month weighted average for 2007 was 378 $\mu\text{mhos/cm}$. The City of Bakersfield provides Consumer Confidence Reports to residents that show water quality results for the Bakersfield area. The following table includes excerpts of the City of Bakersfield's 2007 Annual Water Quality Report. These values are averages of all of the wells supplying water for the City of Bakersfield, not just those that supply water in the area serviced by WWTP No. 2, and hence, the average EC value is slightly different than that calculated for WWTP No. 2, but within the range reported.

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Average</u>	<u>Range</u>
Chloride	mg/L	21	6–82
Sodium	mg/L	31	14–97
EC	µmhos/cm	290	160–730
Nitrate (as NO ₃)	mg/L	4.8	ND–23
TDS	mg/L	178	98–450

Basin Plan, Beneficial Uses, and Water Quality Objectives

38. The *Water Quality Control Plan for the Tulare Lake Basin, 2nd Edition*, (hereafter Basin Plan) designates beneficial uses, establishes numerical and narrative water quality objectives, contains implementation plans and policies for protecting all waters of the basin, and incorporates by reference plans and policies of the State Water Board. Pursuant to Section 13263(a) of the California Water Code (CWC), these waste discharge requirements implement the Basin Plan.
39. Water in the Tulare Lake Basin is in short supply, requiring importation of surface water from other parts of the State. The Basin Plan encourages recycling on irrigated crops wherever feasible and indicates that evaporation of recyclable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace existing uses or proposed use of fresh water with recycled water.
40. WWTP No. 2 is in Detailed Analysis Unit (DAU) No. 254 within the Kern County Basin. The Basin Plan designates the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, industrial process and service supply, water contact recreation, and wildlife habitat.
41. WWTP No. 2 is in the South Valley Floor Hydrologic Unit and the Kern Delta Hydrologic Area. The Basin Plan designates the beneficial uses of surface water (Valley Floor Waters) as agricultural supply; industrial process and service supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.
42. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as domestic or municipal supply to meet the applicable MCLs specified in Title 22. The Basin Plan recognizes that the Regional 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.
43. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Tastes 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.

44. The Basin Plan identifies the greatest long-term water quality problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has been accelerated due to man's activity. 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 salts from use and treatment must be controlled to the extent possible or limited to a maximum of 1,000 $\mu\text{mhos/cm}$. The maximum EC shall not exceed the EC of the source water plus 500 $\mu\text{mhos/cm}$. 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 groundwaters shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.
45. The list of crops in [Finding 29](#) is not intended as a definitive inventory of crops that are or could be grown in the area affected by the discharge, but is representative. Crops sensitive to salt and boron are currently not being grown in the area.
46. The Basin Plan requires municipal wastewater treatment facilities that discharge to land to comply with treatment performance standards for BOD and TSS. Facilities that preclude public access and are greater than one (1) mgd must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both BOD₅ and TSS.

Antidegradation

47. State Water Board Resolution 68-16 (the Antidegradation Policy) requires that the Central Valley Water Board, in regulating the discharge of waste, must maintain the high quality of waters of the state until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in Central Valley Water Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 also requires that waste discharged to high quality water be required to meet WDRs that will result in the best practicable treatment or control of the discharge. Resolution 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that the groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for an increased volume or concentration of waste.
48. 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 impact 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 the terms of the Basin Plan are met.

49. For salinity, the Basin Plan contains effluent limits (EC of SW + 500 μ mhos/cm, 1,000 μ mhos/cm max). Background groundwater quality (based on City Well No. 2) is approximately 500 μ mhos/cm, while effluent concentrations average about 740 μ mhos/cm indicating degradation might occur from percolation of wastewater. However, data as far back as 1951 indicates EC concentrations as high as 1,300 μ mhos/cm in wells downgradient of WWTP No. 2 indicating the elevated EC concentrations downgradient of WWTP No. 2 existed prior to the construction of the plant.

50. Sodium exceeds the most stringent agricultural limit of 69 mg/l for spray irrigated salt sensitive crops. Background sodium concentrations (based on City Well No. 2) are about 40 mg/L, while sodium concentrations in effluent average about 81 mg/L indicating some degradation could occur. However, review of various reports (USDA, *Soil Survey of Kern County: Northwestern Part*; Ayers and Westcott, *Water Quality for Agriculture*; Asano, *Wastewater Reclamation and Reuse*) and land use maps showing crops grown in the region, indicates soils in the area are not conducive to growing salt-sensitive crops, and that salt sensitive crops are not grown in the area.

Ayers and Westcott indicate sodium concentrations up to 70 mg/L have no restrictions for salt-sensitive crops and concentrations from 70 to 210 mg/L have only slight to moderate restrictions. The average sodium concentration in effluent from WWTP No. 3 has been about 83 mg/L since 2007 and was about 78 mg/L in 2008. Based on this information and the information presented in [Findings 24 through 26](#), the sodium concentration in the discharge will not unreasonably affect the receiving groundwater's present and anticipated beneficial uses for agricultural or drinking water or result in groundwater quality exceeding water quality objectives.

51. In general, the current discharge will have less impact on water quality than the previously permitted discharge, as summarized below.

- a. Nitrate as nitrogen concentrations are less than the Primary MCL of 10 mg/L;
- b. EC values average about 750 μ mhos/cm, which is less than the Secondary MCL of 900 μ mhos/cm;
- c. Sodium concentrations average about 80 mg/L, which does not restrict usage for the area's agriculture or as a drinking water source.

52. This Order establishes new groundwater limits for WWTP No. 2 that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that

exceeds water quality objectives set forth in the Basin Plan. This Order contains requirements for a groundwater assessment for assuring that the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

Treatment and Control Practices

53. WWTP No. 2 provides treatment and control of the discharge that incorporates:
- a. Alarms and operational procedures to minimize and prevent bypass or overflow;
 - b. Secondary treatment of up to 25 mgd of wastewater;
 - c. Recycling of wastewater on crops and landscaping;
 - d. Odor control;
 - e. An Industrial Pretreatment program;
 - f. Appropriate biosolids disposal practices; and
 - g. The use of certified operators to ensure proper operation and maintenance.

Other Regulatory Considerations

54. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in Title 40, Code of Federal Regulations, Part 503, Standards for the Use or Disposal of Sewage Sludge, which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to EPA.
55. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells, as described in the *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 CWC Section 13801, apply to all monitoring wells.
56. The Discharger treats the wastewater to secondary treatment standards and reduces nitrates to less than primary drinking water standards and the effluent is stored for reuse by irrigation of crops, which will provide further reduction in pollutants (primarily nitrates). The effluent EC (750 $\mu\text{mhos/cm}$) is similar to background water quality, which ranges from 500 to 6,000 $\mu\text{mhos/cm}$. The discharge should not cause groundwater to exceed the upper consumer acceptance contaminant level for EC of 1,600 $\mu\text{mhos/cm}$, which is the appropriate groundwater limitation given the background groundwater quality and agriculture in the area. The pond bottoms have been compacted to minimize seepage. For these reasons, the discharge is exempt from *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq., (Title 27).

CEQA

57. In 1990, the Discharger adopted a Negative Declaration for a plant expansion project in September 1990 in accordance with the California Environmental Quality Act. In September 2000, the Discharger completed an expansion of the WWTF to increase the daily flow capacity of the plant to 25 mgd. In 2004, an effluent storage expansion project was completed, that allowed the Discharge of to 5,476 acres of nearby farmland.
58. This Order implements measures necessary to mitigate any adverse impacts to groundwater from WWTP No. 2 to less than significant levels, including:
- [Effluent Limit B.4](#), which stipulates waste constituents cannot be released or discharged in a concentration or mass that causes violation of the Order's groundwater limitations.
 - [Effluent Limit B.1](#), which establish effluent limitations consistent with the Basin Plan's performance standards.
 - [Provision H.12](#), which requires the Discharger to comply with the effluent total nitrogen limitation of 10 mg/L ([Effluent Limitation B.2](#)), or alternatively, the Discharger shall submit a design report and performance demonstration for the storage ponds.

General Findings

59. Based on the threat and the complexity of the discharge, the facility has been determined to be classified 2-A as defined below:
- Category 2 threat to water quality, defined as, "Those discharges of waste that could impair the designated beneficial use of the receiving water, cause short term violation of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."
 - Category A complexity, defined as, "Any discharges of toxic wastes, any small volume discharge containing toxic waste or having numerous discharge points or groundwater monitoring, or and Class 1 waste management unit."
60. Pursuant to CWC 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.
61. The Regional Water Board will review this Order periodically and will revise requirements when necessary.
62. California Water Code Section 13267(b) states that: "In conducting an investigation specified in subdivision (a), the Regional Water Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having

discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

63. The technical reports required by this Order and the attached Monitoring and Reporting Program No. [R5-2009-____](#) are necessary to assure compliance with these waste discharge requirements. The Discharger operates the Facility that discharges the waste subject to this Order.

Public Notice

64. 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.

65. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

66. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that Waste Discharge Requirements Order No. 97-104 is rescinded and that, pursuant to Sections 13263 and 13267 of the CWC, the City of Bakersfield and its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC 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 or overflow 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 Section 2521(a) of Title 23, California Code of Regulations, Section 2510 et seq., is prohibited. Discharge of waste classified as ‘designated,’ as defined in California Water Code Section 13173, in a manner that causes violation of groundwater limitations, is prohibited.

B. Effluent Limitations

1. The discharge to the storage ponds and/or the disposal areas shall not exceed the following limitations:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD ¹	mg/L	40	80
TSS	mg/L	40	80

¹ Five-day biochemical oxygen demand

The arithmetic mean of BOD and TSS in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of the values for influent samples collected at the same times during the same period (80 percent removal).

2. The monthly average concentration of total nitrogen in the discharge shall not exceed 10 mg/L, or alternatively, the Discharger shall submit a design report and performance demonstration for effluent contained in the storage ponds. The performance demonstration shall establish that the pond design will be protective of groundwater quality and that seepage from the ponds will not contribute to nitrogen or EC (TDS) in groundwater exceeding groundwater limitations.
3. The 12-month rolling average EC of the discharge shall not exceed the 12-month rolling average EC of the source water plus 500 μ mhos/cm. Compliance with this effluent limitation shall be determined monthly.
4. 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.

C. Discharge Specifications

1. The monthly average discharge flow shall not exceed 25 mgd.
2. All conveyance, treatment, storage, and disposal units shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
3. Public contact with effluent shall be precluded through such means as fences, signs, or acceptable alternatives.
4. Objectionable odors shall not be perceivable beyond the limits of WWTP No. 2 property at an intensity that creates or threatens to create nuisance conditions.
5. Effluent disposal ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration

during the winter. 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.

6. On or about **1 October** of each year, available disposal pond storage capacity shall at least equal the volume necessary to comply with [Discharge Specification C.5](#).
7. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - a. An erosion control plan should assure that coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, and herbicides.
 - c. Dead algae, vegetation and other debris shall not accumulate on the water surface.
 - d. Vegetation management operations in areas in which nesting birds have been observed shall be carried out either before or after, but **not during**, the April 1 to June 30 bird nesting season.

D. Recycling Specifications

The following specifications apply to use areas under the ownership or control of the Discharger. Other use areas are covered by separate water recycling requirements.

1. Recycled water shall be managed in conformance with the regulations contained in Title 22, Division 4, Chapter 3, CCR.
2. Use of Secondary Recycled Water shall be limited to flood irrigation of fodder, fiber, seed crops not eaten by humans or for grazing of non-milking cattle and shall comply with the provisions of Title 22.
3. All reclamation equipment, pumps, piping, valves, and outlets shall be appropriately marked to differentiate them from potable facilities. All reclamation distribution system piping shall be purple or adequately wrapped with purple tape.
4. Recycled water controllers, valves, and similar appurtenances shall be affixed with recycled water warning signs, and shall be equipped with removable handles, locking mechanisms, or some other means to prevent public access or tampering. The contents of the signs shall conform to Title 22, CCR, Section 60310. Quick couplers and sprinkler heads, if used, shall be of a type, or secured in a manner, that permits operation only by authorized personnel. Hose bibs that the public could use shall be eliminated.

5. Public contact with recycled water shall be controlled using signs and/or other appropriate means. All areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording: "RECYCLED WATER – DO NOT DRINK, AGUA DE DESPERDICIO RECLAMADA – NO TOME" Each sign shall display an international symbol similar to that shown in [Attachment B](#) which is attached hereto and made part of this Order by reference.
6. Recycled water shall not be allowed to escape from the authorized use areas by airborne spray or by surface flow except in minor amounts such as that associated with good irrigation practices.
7. Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.
8. Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.
9. Workers shall be educated regarding proper hygienic procedures to ensure personal and public safety.
10. Potable water mains shall be separated by a clear horizontal distance of at least four feet from, and a clear vertical distance of at least one foot above, any parallel pipeline conveying disinfected tertiary recycled water, and shall be separated by a clear vertical distance of at least one foot above any crossing pipeline conveying disinfected tertiary recycled water, except as may be otherwise allowed or approved under DPH regulatory requirements or DPH design guidance documents. All separation distances shall be measured from the nearest outside edge of each pipe. Vertical separation distances shall apply wherever the horizontal separation distance is eleven feet or less.
11. Potable water supply piping and recycled water piping shall not have any cross-connections. Supplementing recycled water with potable water shall not be allowed except through an air-gap separation or, if approved by the DPH, a reduced pressure principle backflow device.
12. Application of recycled water to recycled water use areas shall not exceed the nitrogen or hydraulic loading reasonably necessary to satisfy the nitrogen or water uptake needs of the use area considering the plant, soil, climate, and irrigation management system (i.e., generally accepted agronomic rates).
13. Areas irrigated with recycled water shall be managed to prevent breeding of mosquitoes. More specifically:
 - a. All applied irrigation water must infiltrate completely within 48 hours.

- b. Ditches receiving irrigation runoff not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.
 - c. Low-pressure and un-pressurized pipelines and ditches, which are accessible to mosquitoes, shall not be used to store recycled water.
14. Excessive irrigation with recycled water that results in excessive runoff of recycled water, or continued irrigation of recycled water during periods of rain is prohibited. Overspray or runoff associated with normal sprinkler use shall be minimized.
15. The Discharger shall maintain the following setback distances from areas where Secondary Recycled Water is impounded or irrigated with:

<u>Setback Distance (feet)</u>	<u>To</u>
15	Property Line
20	Public Roads
50	Drainage courses
100	Irrigation wells
150	Domestic wells

16. Any irrigation runoff shall be confined to the recycled water use area, and shall not enter any surface water drainage course or stormwater drainage system unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

E. Sludge Specifications

- 1. Sludge and solid waste shall be removed from screens, sumps, aeration basins, ponds, clarifiers, etc. as needed to ensure optimal plant operation.
- 2. Any handling and storage of residual sludge, solid waste, and biosolids on property of WWTP No. 2 shall be temporary (i.e., no longer than two years) 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.
- 3. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27.
- 4. Biosolids shall comply at the time of application with either Class A or Class B pathogen reduction standards as listed in 40 CFR 503.
- 5. Biosolids shall comply with one of the vector attraction reduction standards as listed in 40 CFR 503.33.

6. Biosolids shall not be applied to land in amounts which cause the following cumulative loadings to be exceeded:

<u>Constituent</u>	<u>Cumulative Loadings</u>	
	<u>Kilograms per hectare</u>	<u>Pounds per acre</u>
Arsenic	41	37
Cadmium	39	35
Copper	1500	1338
Lead	300	267
Mercury	17	15
Nickel	420	374
Selenium	100	89
Zinc	2800	2498

7. Biosolids shall not be applied during periods of heavy rainfall or when the ground is saturated.
8. If applied to land, Biosolids shall be fully incorporated into the soil and tillage practices shall minimize the erosion of soil from the application site by wind, storm water, recycled water, or irrigation water.
9. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy this specification.
10. Other use of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a regional water quality control board or State Water Board or a local (e.g., county) program authorized by a regional water quality control board. In most cases, this means the General Biosolids Order (State Water Board Water Quality Order No. 2004-12-DWQ, "General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities"). For a biosolids use project to be authorized by the General Biosolids Order, the Discharger must file a complete Notice of Intent and receive a Notice of Applicability for each project.

11. Any proposed change in sludge use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

F. Pretreatment Requirements

1. The Discharger shall implement the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:
 - a. Wastes that create a fire or explosion hazard in the treatment works;
 - b. Wastes that will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;
 - c. Solid or viscous wastes in amounts that cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;
 - d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;
 - e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the treatment works is designed to accommodate such heat;
 - f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
 - g. Pollutants that result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and
 - h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.
2. The Discharger shall implement the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:
 - a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or
 - b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

G. Groundwater Limitations

1. Release of waste constituents from any treatment or storage component associated with WWTP No. 2 shall not cause or contribute to groundwater:
 - a. Containing concentrations of constituents identified below, or background quality, whichever is greater.
 - (i) Nitrate as nitrogen of 10 mg/L.
 - (ii) Electrical Conductivity of 1,600 μ mhos/cm.
 - (iii) Total Coliform Organisms of 2.2 MPN/100 mL.
 - (iv) For constituents identified in Title 22, the Primary and Secondary MCLs quantified therein.
 - b. Containing taste or odor-producing constituents, toxic substances, or any other constituents, in concentrations that cause nuisance or adversely affect beneficial uses.

H. Provisions

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as Standard Provisions(s).
2. The Discharger shall comply with Monitoring and Reporting Program (MRP) No. [R5-2009-____](#), which is part of this Order, and any revisions thereto as adopted by the Regional Water Board or approved by the Executive Officer. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger self-monitoring reports.
3. The Discharger shall keep at WWTP No. 2, a copy 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 not allow pollutant-free wastewater to be discharged into the Facility collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means storm water (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants.
5. The Discharger must 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 include adequate laboratory controls and

appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of the Order.

6. 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 persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with sections 415 and 3065 of Title 16, CCR, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). 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.
7. 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 Regional 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 Regional Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.
8. 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 appropriate Regional Water Board office.
9. To assume operation 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 address and telephone number of the persons responsible for contact with the Regional 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 California Water Code. If approved by the Executive Officer, the transfer request will

be submitted to the Regional Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

10. As a means of discerning compliance with [Discharge Specification C.4](#), 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 days. Should the DO be below 1.0 mg/L during a weekly sampling event, the Discharger shall take all reasonable steps to correct the problem and commence daily DO monitoring in all affected ponds until the problem has been resolved. If unpleasant odors originating from affected ponds are noticed in developed areas, or if the Discharger receives one or more odor complaints, the Discharger shall report the findings in writing within 5 days of that date and shall include and a specific plan to resolve the low DO results to the Regional Water Board within 10 days of that date.
11. The pH of the discharge shall not be less than 6.5 or greater than 8.3 pH units for more than three consecutive sampling events. In the event that the pH of the discharge is outside of this range for more than three consecutive sampling events, the Discharger shall submit a technical evaluation in its monthly SMRs documenting the pH of the discharge to the reclamation area, and if necessary demonstrate that the effect of the discharge on soil pH will not exceed the buffering capacity of the soil profile.
12. By **30 April 2011**, the Discharger shall comply with the effluent total nitrogen limitation of 10 mg/L ([Effluent Limitation B.2](#)), or alternatively, the Discharger shall submit a design report and performance demonstration for the storage ponds. The performance demonstration shall establish that the pond design will be protective of groundwater quality and that seepage from the ponds will not contribute to nitrogen or EC (TDS) in groundwater exceeding groundwater limitations. This provision will be considered satisfied following written acknowledgement from the Executive Officer.
13. The Discharger shall maintain and operate all ponds sufficient to protect the integrity of containment levees and prevent overtopping or overflows. Unless a California civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically). As a means of management and to discern compliance with this Provision, the Discharger shall install and maintain in each pond permanent markers with calibration that indicates the water level at design capacity and enables determination of available operational freeboard.
14. The Discharger shall submit the technical reports and work plans required by this Order for Regional Water Board staff consideration and incorporate comments they may have in a timely manner, as appropriate. The Discharger shall proceed with all work required by the following provisions by the due dates specified.

15. **By 5 June 2010**, the Discharger shall, for each separately owned parcel where wastewater and/or biosolids are applied for irrigation or soil amendment purposes, develop and implement management practices that control nutrient losses and describe these in a Nutrient Management Plan, which shall include at a minimum:
 - (a) a description of the disposal area and storage facilities;
 - (b) a description of the types of crops to be grown and their water and nutrient uptake rates;
 - (c) supporting data and calculations for monthly and annual water and nutrient balances;
 - (d) management practices that will ensure wastewater, irrigation water, and commercial fertilizers are applied at agronomic rates;
 - (e) a coordinated sampling and analysis plan for monitoring soils, wastewater, and plant tissue to verify the nutrient balance; and
 - (f) a system of record keeping.

16. **By 5 June 2010**, the Discharger shall submit a report that evaluates the existing groundwater monitoring network for its adequacy of monitoring potential impacts to first encountered groundwater of the unconfined groundwater monitoring network. Should additional wells be required, the report shall recommend additional wells to provide adequate coverage of the unconfined aquifer beneath WWTP No. 2 and the disposal areas. **By 3 April 2010**, the Discharger shall submit a work plan to evaluate the increasing concentrations observed in well KSA2.

17. **By 5 June 2010**, the Discharger shall conduct a salinity evaluation and submit a salinity minimization plan to identify and implement measures to reduce the salinity in discharge to the extent feasible. The salinity minimization plan shall include a time schedule to implement the identified measures.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on _____.

PAMELA C. CREEDON, Executive Officer

Order Attachments:

- Monitoring and Reporting Program
- A. Vicinity Map and Disposal Area Map
- B. International Symbol for Recycled Water
Standard Provisions (1 March 1991)

JSP/DKP 10/28/09