CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 5-01-247

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

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

1. The City of Delano (hereafter City or Discharger) submitted a Report of Waste Discharge (RWD), dated 5 September 2000, for an expansion of its wastewater treatment facility (WWTF). The WWTF currently has a design capacity of 4.4 million gallons per day (mgd) and provides sewage service for industry and about 35,500 residents. The WWTF is on Lytle Avenue about ½mile north of Garces Highway in Sections 8 and 9, T25S, R25E, MDB&M, as shown on Attachment A, a part of this Order. The Discharger owns and operates the WWTF.

2. Waste Discharge Requirements (WDRs) Order No. 90-270, adopted by the Board on 28 September 1990 for the Discharger, prescribes requirements for a monthly average daily discharge of 4.4 mgd and includes water recycling requirements.

3. The WWTF treatment system consists of headworks, screening, grit removal, an aerated grit chamber, three primary clarifiers, two biofilters, three secondary clarifiers, two sludge digesters, a sludge thickener, 1.6 acres of sludge drying beds, and six storage ponds. The six effluent storage ponds collectively provide a storage volume of 1,450 acre-feet. The Discharger allows septage haulers to discharge septage to an unlined drying bed and applies the dried septage to land. The WWTF flow diagram is depicted in Attachment B, a part of this Order.

4. Effluent from the unlined storage ponds is recycled on 465 acres of City-owned farmland (hereafter Use Area). In 1991, the City entered into a long-term contract to sell excess treated wastewater to the Sandrini Brothers, who until recently, recycled effluent on a 640-acre farm. Due to the recent deaths of the Sandrini Brothers, the farm land has been divided into two different farms that put the 1991 contract in jeopardy. Attachment C, a part of this Order, shows the location of the Use Area and that of privately-owned effluent reuse areas.

5. As described in its RWD, the Discharger proposes to expand the capacity of the WWTF to 7.2 mgd with the addition of a screening compactor, an influent pump in the headworks, a new primary clarifier, two new biofilters, a new secondary clarifier, a new anaerobic digester, 5.6 acres of new sludge drying beds, and a new storage pond. The expanded WWTF will consist of a septage receiving station, headworks with screening compaction, an aerated grit chamber, four primary clarifiers, four biofilters, four secondary clarifiers, three sludge digesters, a sludge thickener, 7.2 acres of sludge drying beds, and seven storage

ponds. The proposed new treatment facilities will be within the 5-acre WWTF site, and the new sludge beds and storage pond will be on the north portion of the City's 160-acre industrial site.

6. The City will continue recycling effluent on its 454-acre Use Area, as depicted in Attachment C, and plans to purchase additional land and to secure long-term contracts with local farmers to irrigate using the WWTF's effluent. The expansion will include the addition of 965 acres of Use Area of which 460 acres will be purchased by the City and the remaining will be owned by individual farmers.

7. Order No. 90-270 is subject to and due for periodic review and does not reflect the current WWTF. The purpose of this Order is to rescind the previous Order and update waste discharge requirements, in part, to ensure the discharge is consistent with Board plans and policies, to prescribe the requirements that are effective in protecting existing and potential beneficial uses of receiving waters, and to reflect the Discharger's proposed expansion.

Facility Description and Current Discharge

8. Self-monitoring data from September 1999 to July 2000 characterize the discharge as follows:

Constituent / Parameter	Units	Influent	Effluent	% Removal
Monthly Average Daily Flow	mgd	4.28	4.28	N/A
Settleable Solids	mL/L	8.0	0.1	N/A
BOD_5[1]	mg/L	125	28	78
TSS[2]	mg/L	125	36	71
EC[3]	ìmhos/cm		735	N/A

[1] 5-day, 20°C biochemical oxygen demand
[2] Total Suspended Solids
[3] Conductivity at 25°C

9.From 1995 to 1999, the total nitrogen concentration in WWTF effluent ranged from 4.0 mg/L to 7.0 mg/L.

10. Self-monitoring reports from 1999 to 2000 indicate that winter flows are not higher than summer flows, demonstrating insignificant inflow and infiltration to the collection system during winter months.

11. The WWTF receives influent from residential, commercial, and industrial sources. The City's significant users include two prisons; a 500-bed hospital; and Paramount Citrus, a citrus packing plant that seasonally discharges about 0.1 mgd to the WWTF.

12. The Board issued the Discharger a notice of violation, dated 23 February 2000, for exceeding the monthly average daily discharge flow limit of 4.4 mgd during the month of September 1999; exceeding the suspended solids effluent limit; failing to preclude public access to the Use Area; failing to apply wastewater to the Use Area at agronomic rates; failing to keep ditches and sumps free of marginal vegetation; failing to dispose of sludge in a manner approved by the Executive Officer and in compliance

with Title 27, California Code of Regulations (CCR), section 20005 et seq.; failing to submit monitoring reports at the required frequency; failing to calibrate flow meters annually; and failing to inform the Board of a wastewater spill. The Discharger's planned expansion of the WWTF will address some of these issues.

13. The City obtains its source water from nine wells. Two existing wells and new well sites in the City will require treatment to remove DBCP, most likely using carbon filters. Other than this contaminant, source water quality meets recommended secondary drinking water standards for salinity constituents, as indicated by the City's 2000 Annual Water Quality Report. Excerpts of this report are presented below.

Constituent / Parameter	Units	Value
EC	µmhos/cm	450
Total Dissolved Solids	mg/L	270
Sodium	mg/L	80
Chloride	mg/L	42
Nitrate **(as N)**	mg/L	3

14. On average, the EC of WWTF effluent is about 300 µmhos/cm higher than source water EC.

15. The Discharger currently dewaters sludge by discharging it to 1.6 acres of unlined sludge drying beds, then disposes of it on 60 acres of City-owned fields adjacent to the WWTF. A farmer leases the fields to grow sudan and alfalfa and applies 1 to 1.5 tons of biosolids per acre every four years. The Discharger proposes to modify the existing sludge drying beds to substantially reduce their permeability (i.e., through soil cement lining) and construct an additional 5.6 acres of compacted sludge drying beds. The Discharger plans to discontinue its current practice of drying untreated septage in a sludge drying bed and applying it to land.

16. The Discharger is not required to obtain coverage under an NPDES general industrial storm water permit because all storm water runoff is diverted into existing storm water retention basins, kept separate from the wastewater stream, and does not discharge to a water of the United States.

Recycling

17. Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. California Department of Health Services (DHS), which has primary state-wide responsibility for protecting public health, has established statewide criteria in Title 22, CCR, 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 existing regulations.

18. The 1988 Memorandum of Agreement (MOA) between DHS and the State Water Resources Control Board on the use of recycled water establishes basic principles relative to the agencies and the regional boards. 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.

19. The Discharger recycles WWTF effluent on a 454-acre City-owned parcel and sold excess effluent to the Sandrini Brothers for recycling on a 640-acre parcel adjacent to the WWTF until recently. Order No. 90-270 requires the Discharger submit Annual Land Management Reports, but the Discharger only submitted a report for its 1994 recycling operations. The Sandrini Brothers never submitted reports for their recycling operations. Title 22 requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards. The City has yet to submit an engineering report to DHS pursuant to Title 22 for on-site water recycling operations. By letter dated 28 June 2001, the Board requested the Discharger submit a Title 22 report by 1 October 2001.

20. Title 22 section 60304(d) allows for the use of undisinfected secondary recycled water for prescribed applications involving certain food and seed crops, subject to various restrictions. Because undisinfected secondary recycled water would represent a potential public health threat if food or seed crops were directly or indirectly exposed to the undisinfected recycled water, it is imperative that the restrictions outlined with the identified uses under section 60304(d) are strictly complied with. If a recycler cannot provide the necessary assurances that applicable restrictions can be complied with at all times, it is appropriate for the Board to either require a higher level of treatment (i.e., disinfection) or restrict applications of undisinfected secondary recycled water to crops not intended for human consumption (e.g., fodder and fiber crops).

21. The current City-owned Use Area is planted in cotton and alfalfa and the privately-owned Use Area has been planted in alfalfa, cotton, cherries, pistachios, and table grapes (the Sandrini Brothers passed effluent through sand filters prior to irrigating the table grapes). According to the City's water balance, crops in the proposed Use Area will include cotton, alfalfa, wheat, almonds, and pistachios. As described in Finding No. 20, it is appropriate to restrict the Use Area to fodder and fiber crops.

22. According to the *Western Fertilizer Handbook*, the annual nitrogen uptake by the proposed Use Area crops are 180 lbs/acre for cotton, 480 lbs/acre for alfalfa, 175 lbs/acre for wheat, and 200 lbs/acre for almonds. The nitrogen uptake of pistachios is assumed to be the same as almonds, 200 lbs/acre.

23. At the current maximum permitted capacity of 4.4 mgd, the hydraulic load to the existing Use Area is 4,100 acre-feet/year. The nitrogen load to the existing Use Area is about 140 lbs/acre/year using an annual average total nitrogen concentration of 7 mg/L. The hydraulic load to the proposed Use Area will be 5,900 acre-feet/year. The nitrogen load to the proposed City-owned Use Area and the privately-owned Use Area will be 100 lbs/acre/year and 69 lbs/acre/year, respectively, using an annual average total nitrogen concentration of 7 mg/L.

24. By letter dated 16 April 2001, the Board directed the Discharger to submit a Title 22 report for the existing and proposed use areas, apply for a Master Recycling Permit or individual water recycling requirements for each user of recycled water.

Surface Hydrology, Soils and Land Use

25. The WWTF and Use Area lie within the Tulare Lake Basin, specifically the North Kern Hydrologic Area (No. 558.80) as depicted on interagency hydrologic maps prepared by the California Department of Water Resources (DWR) in 1986. Areal topography indicates a slope of about 1 foot per 2500 feet toward the west.

26. The area is characterized by warm, dry summers and cool, wet winters. The average annual rainfall is 7.95 inches, 85 percent of which occurs between November and April. The average annual evapotranspiration rate is 52 inches per year.

27. The City of Delano is midway between the eastern edge of the San Joaquin Valley floor and Tulare Lake's historic shoreline. Surface water drainage is to the valley floor. Specifically, runoff in the Delano environs travels in a northwesterly direction to the Tulare Lake bed. Nearby drainage basins are the Poso Creek and Rag Gulch watersheds, which originate in the Greenhorn Mountain area in the southern Sierra Nevada mountains east of Delano. The Friant-Kern Canal is about seven miles to the east and the Alpaugh Irrigation District Canal is about nine miles to the west. Lake Woollomes, seven miles east of the WWTF, is a storage facility for the Friant-Kern Canal. The canals convey surface water for irrigation.

28. Federal Emergency Management Agency maps indicate the WWTF and Use Area are within a 100-year floodplain. The City indicates it will design treatment and storage facilities to mitigate any impacts from a 100-year flood. Protective features include flood-proofing structures to two feet above the natural grade and constructing earthen dikes to protect critical non-structural facilities.

29. Areal soils consist of sandy clay and sand. Soils within the WWTF site and Use Area include Garces silt loam, Garces silt hard substratum, and Kimberlina fine sandy loam. Permeability of the soils is considered moderate.

30. According to the City's consultant, the percolation rate beneath the storage pond is 0.006 feet per day. Approximately 300 acre-feet percolate beneath the storage ponds each year. At average annual flow rates of 4.4 mgd and 6 mgd, the percolation rate beneath the storage ponds is approximately 6 percent and 4.4 percent of the total wastewater flow, respectively.

31. Areal groundwater is approximately 15 to 17 feet below ground surface and appears to flow southwesterly, according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by DWR in Spring 1997.

32. The City installed four wells in 1987 to monitor first encountered groundwater in the WWTF vicinity: one upgradient and the rest downgradient. Attachment D, a part of this Order, shows the location of the four

monitoring wells. Monitoring Well 1 (MW-1) is upgradient from the WWTF treatment works, but in the northeast corner of the WWTF's effluent storage pond area, MW-2 is southwest of MW-1 and upgradient from a portion of the Discharger's Use Area, MW-3 is east of MW-2 and within the sewage treatment works area, and MW-4 is east of MW-3 and downgradient from a portion of the Discharger's Use Area. The Discharger's self-monitoring reports indicate that groundwater depth at the WWTF is about 14 feet below ground surface. Annual monitoring well data indicates groundwater levels beneath the WWTF have risen about six feet between 1991 and 2000. Annual groundwater monitoring indicates groundwater degradation in the vicinity of the WWTF. A 1999 sample from each well revealed EC as high as 2,500 µmhos/cm and nitrate (as N) as high as 32 mg/L in the downgradient wells. The Discharger indicated these values may be inaccurate, as it reports it has not been purging the wells adequately prior to sampling. By letter dated 28 June 2001, the Board requested the Discharger to resample wells using proper sampling techniques and analyze the samples for general minerals and nitrogen compounds. The table below shows the ranges of nitrate, EC, and pH in the monitoring wells from 1991 to 2000.

			WWTF and Use Area Wells		
Constituent	Units	Upgradient MW-1	Downgradient MW-2	Downgradient MW-3	Downgradient MW-4
Nitrate **as N**	mg/L	0.38 - 15	0.27 - 24	7.5 - 32	3.8 - 20
EC	µmhos/cm	120 - 1790	780 - 2200	220 - 4200	190 - 2800
pH	mg/L	7.0 - 8.3	7.3 - 8.3	7.2 - 8.1	7.0 - 8.1

33. The City retained a consultant (BSK) to sample groundwater monitoring wells on 19 June 2001. The resulting data indicates groundwater passing under the WWTF is degraded from salinity and polluted with nitrates, iron, manganese, and sulfate. The table below summarizes the analytical results of the June 2001 sampling event.

Constituent	Units	MCL[1]	MW-1	MW-2	MW-3	MW-4
Alkalinity	mg/L as $CaCO_3$	(none)	230	340	450	310
Boron	mg/L	(none)				
Chloride	mg/L	250[2]				
EC	µmhos/cm	900[2]	1,200	1,000	2,100	2,000
Hardness	mg/L as $CaCO_3$	(none)	420	200	860	560
Iron	mg/L	0.3[3]	0.58	0.19	0.43	0.43
Manganese	mg/L	0.010[3]	0.010	< 0.010	0.070	< 0.010
Nitrate	mg/L as N	10[4]	9.5	nondetect	27	6.8
Sodium	mg/L	(none)	110	170	200	280
Sulfate	mg/L	250	100	77	360	450
TDS[5]	mg/L	500[2]	820	700	1,400	1,500

Constituent	Units	MCL[1]	MW-1	MW-2	MW-3	MW-4

[1] Maximum contaminant level (MCL) for waters designated for municipal use as specified in Title 22, California Code of Regulations, section 64431 et seq.
[2] Recommended secondary MCL (Title 22, section 64449, table 64449-B)
[3] Secondary MCL, (Title 22, section 64449, table 64449-A)
[4] Primary MCL (Title 22, section 64431, table 64431)
[5] Total dissolved solids

34. Elevated levels in groundwater sampled from MW-3 of alkalinity, hardness, nitrate, sulfate, and TDS suggest that the WWTF operation has impacted groundwater.

35. BSK's monitoring well data is consistent with the City's data. This suggests that the City's past monitoring data accurately characterizes shallow groundwater quality.

36. The area surrounding the WWTF is zoned as Residential-Agricultural and includes agricultural and vacant land. Crops in the Delano area include orchard fruits, grapes, almonds, cotton and corn. Domestic drinking wells in the vicinity are about 400 feet deep. Farmers only flood irrigate crops and they use a mixture of canal water and groundwater.

Basin Plan and Regulatory Considerations

37. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the Basin, and incorporates by references plans and policies adopted by the State Water Resources Control Board. These requirements implement the Basin Plan.

38. Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters from other parts of the State. The Basin Plan encourages recycling on irrigated crops wherever feasible and indicates that evaporation of recycleable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water.

39. The Basin Plan identifies existing and potential beneficial uses of the Valley Floor Waters as agricultural supply; industrial service supply; industrial process supply; water contact recreation; noncontact water recreation; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.

40. The Basin Plan identifies existing and potential beneficial uses of area groundwater as municipal, domestic, agricultural, industrial service, and industrial process supply.

41. Section 13050(h) of the California Water Code defines water quality objectives as "... the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention or nuisance within a specific area."

42. The Basin Plan establishes numerical and narrative water quality objectives for surface and groundwaters within the Basin, and recognizes that water quality objectives are achieved primarily through the Board's adoption of waste discharge requirements and enforcement orders. Where numerical water quality objectives are listed, these are the limits necessary for the reasonable protection of beneficial uses of the water. Where compliance with narrative water quality objectives is required, the Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives to maintain existing and anticipated beneficial uses of waters in the subject area.

43. The Basin Plan identifies numerical water quality objectives for waters designated as municipal supply. These are the maximum contaminant levels (MCLs) specified in the following provisions of Title 22, CCR: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of section 64431, Table 64444-A (Organic Chemicals) of section 64444, and Table 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of section 64449. The Basin Plan's incorporation of these provisions by reference is prospective, and includes future changes to the incorporated provisions as the changes take effect. The Basin Plan requires the application of objectives more stringent than MCLs as necessary to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses, whether the use is domestic drinking water supply, agricultural supply, or some other use.

44. The Basin Plan contains narrative water quality objectives for chemical constituents in and toxicity of groundwater that address constituents in the discharge that are potentially harmful to beneficial uses. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in plants or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect beneficial uses. Guidelines for identifying the quality of irrigation water necessary to sustain various crops were compiled by Ayers and Westcot in 1985 *(Food and Agriculture Organization of the United Nations — Irrigation Drainage Paper No. 29)*. The Basin Plan recognizes these Guidelines for providing relevant numerical criteria to evaluate compliance with the previously described narrative water quality objectives. The Guidelines are intended for use in estimating the potential hazards to crop production associated with long term use of the particular water being evaluated. The Guidelines divide water quality characteristics as having "No Problem – Increasing Problems – Severe Problems" based on large numbers of field studies and observations, and carefully controlled greenhouse and small plot research. In general, crops sensitive to sodium or chloride are most sensitive to foliar absorption from sprinkler applied water. Bicarbonate has been a problem when fruit crops or nursery crops are sprinkler irrigated during periods of very low humidity and high evaporation. The following table contains numerical criteria adapted from the Guidelines for protection of a range of crops under various circumstances, but the most stringent is not necessarily the concentration that assures no adverse affect on any nonagricultural beneficial use:

Problem and Related Constituent	Extent of Problem: No Problem	Extent of Problem: Increasing Problems
Salinity of irrigation water (EC, µmhos/cm)	< 700	700 – 3,000
Salinity of irrigation water (TDS, mg/L)*	< 450	450 – 1,800
Specific Ion Toxicity		
from ROOT absorption		
Sodium (mg/L)	< 69	69 – 207
Chloride (mg/L)	< 142	142 – 355
Boron (mg/L)	< 0.5	0.5 – 2.0
from FOLIAR absorption		
Sodium (mg/L)	< 69	> 69
Chloride (mg/L)	< 106	> 106
Miscellaneous		
NH_4-N (mg/L) (for sensitive crops)	< 5	5 – 30
NO_3-N (mg/L) (for sensitive crops)	< 5	5 – 30
HCO_3 (mg/L) (only with overhead sprinklers)	< 90	90 – 520
pH	normal range = 6.5 – 8.4	

* Assumes an EC:TDS ratio of 0.6:1

45. The existing and anticipated beneficial uses of area groundwater for agricultural supply include irrigation of crops sensitive to salt and boron, though some protection is afforded by not irrigating by sprinklers. Based on climate, soil type, and water quality, other crops sensitive to salt and boron might be capable of being grown in the area, and changing market conditions could drive a change in cropping patterns, but neither is expected to necessitate greater protection than crops already identified.

46. According to the Guidelines, reductions in crop yields are not evident when irrigating stone fruit, almonds, and grapes with water having an EC of less than 1,000 µmhos/cm. The UC Cooperative Extension states that boron sensitive crops (e.g., plums and peaches) may show injury when irrigated with water with boron ranging from 0.5 to 1.0 mg/L and reductions in crop yields when irrigated with water with boron ranging from 1.0 to 2.0 mg/L. Bicarbonate has been a problem when fruit crops or nursery crops are sprinkler irrigated during periods of very low humidity and high evaporation.

47. To maintain the beneficial uses of flood irrigation of crops sensitive to salt, it is necessary that area groundwater have EC values of 1,000 µmhos/cm or less, and low concentrations of salt, chloride, and sodium.

48. Sodium and chloride can cause foliar damage to crops that are sprinkler irrigated. Trees, vines, and woody species are the most susceptible. To protect crops near the WWTF that could be sprinkler irrigated (e.g., plums), the applied water should not contain values of sodium or chloride above 115 and 175 mg/L, respectively, according to *Agricultural Salinity Assessment and Management*, published by the American Society of Civil Engineers. Even though these values are higher than those recommended by the Guidelines (i.e., 69 mg/L for sodium and 106 mg/L for chloride), it is appropriate to consider them

as water quality objectives and apply them as maximum possible groundwater limitations in this Order as background groundwater quality appears to be in this range, and method of irrigation will adequately protect crops as additional information is collected that validates or amends this.

49. As explained in the attached Information Sheet, this Order implements water quality objectives established as necessary to maintain existing and anticipated beneficial uses of area groundwater for the production of crops that are sensitive to salt (i.e., sodium and chloride). The numerical values reflect the highest tolerable level of quality necessary to sustain sprinkler application, as these are more restrictive than for flood irrigation. These objectives include EC (1,000 µmhos/cm), and the following expressed as mg/L: chloride (175), sodium (115), boron (0.7), and TDS (600). It is reasonable to conclude that the drinking water level of nitrate-nitrogen of 10 mg/L is adequately protective of existing and anticipated agricultural land uses.

50. Since the expanded WWTF will have a permitted capacity greater than five mgd, pursuant to Title 23, CCR, section 2233, the Discharger must establish a pretreatment program to protect the WWTF from upset as well as protect sludge quality and groundwater quality underlying the WWTF and Use Area. The pretreatment program must conform with Title 40, Code of Federal Regulations (CFR), Part 403.

51. The discharge authorized herein and the treatment and storage facilities associated with the discharge, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, CCR, section 20380 et seq. (hereafter Title 27).

52. California Water Code (CWC) section 13267 authorizes the Board to require anyone who discharges waste that could affect the quality of water, as the Discharger does, to furnish, under penalty of perjury, technical and monitoring program reports.

53. California Department of Water Resources 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), and any more stringent standards adopted by the Discharger or county pursuant to CWC section 13801, apply to all monitoring wells.

54. In the process of crop irrigation, evaporation and crop transpiration remove water from and result in accumulation of residual salts in the soil root zone. These salts would retard or inhibit plant growth except for a fraction of irrigation water applied to leach the harmful salt from the root zone. The leached salts eventually enter ground water and concentrate above the uppermost layer of the uppermost aquifer. As this is the general condition throughout the agricultural Tulare Lake Basin, water supply wells for all beneficial uses typically are constructed to extract groundwater from below this level.

55. Infiltration from effluent storage ponds results in wastewater intersecting and accumulating on and in the uppermost layer of the uppermost groundwater until dispersed horizontally and vertically into the main mass of the aquifer. Compliance with the various water quality objectives necessary to protect present and future beneficial uses within the aquifer should be determined by water representative of the

uppermost zones. Site-specific studies to determine the appropriate zones and geographical locations should be conducted by the Discharger subject to Executive Officer approval.

56. The use of municipal wastewater for irrigation at agronomic rates will have a comparable impact on groundwater as fresh water extracted and used for irrigation of the same crop with separate wastewater infiltration. Beneficial reuse of wastewater conserves freshwater resources and is encouraged by the Basin Plan and agronomic application rates of wastewater cause comparable impact as widespread freshwater irrigation practices. Accordingly, benefits of groundwater monitoring in wastewater reuse areas do not justify the cost, provided the rates of wastewater applications do not exceed reasonable agronomic rates.

Degradation

57. State Water Resources Control Board (SWRCB) Resolution No. 68-16 (hereafter Resolution 68-16 or the "Antidegradation" Policy) requires the Board in regulating the discharge of waste to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with 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 the Board's policies (e.g., quality that exceeds water quality objectives).

58. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until a valley wide drain is constructed to carry salts out of the basin. Until the drain is available, the Basin Plan describes numerous salt management recommendations and requirements. The latter includes the requirement that discharges to land from wastewater treatment facilities not have an EC greater than source water plus 500 µmhos/cm. Accordingly, the Basin Plan allows for salinity degradation and focuses on controlling the rate of increase. The role of increase for the Hydrographic Unit (including North Kern Hydrologic area) is the greatest. The Basin Plan limits discharges to areas that recharge to good quality groundwaters to have an EC of 1,000 µmhos/cm, a chloride concentration of 175 mg/L, and boron content of 1.0 mg/L.

59. The Board finds that some degradation of groundwater beneath the WWTF and Use Area is consistent with Resolution 68-16 provided that:

- the degradation is confined to a specified area
- the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures
- the degradation is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order

- the degradation does not result in water quality less than that prescribed in the Basin Plan

60. Some degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater facility after effective source control, treatment, and control is consistent with maximum benefit to the people of California. The technology, energy, water recycling, and waste management advantages of municipal utility service for the City of Delano 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. When allowed, the degree of degradation allowed depends upon many factors (i.e., background water quality, the waste constituent, the beneficial uses and most stringent water quality objective, source control measures, and waste constituent treatability).

Treatment and Control Practice

61. The WWTF described in Finding No. 5 provides treatment and control of the discharge that incorporates:

- technology for secondary treatment of municipal wastewater
- biosolids handling and treatment for reuse
- sludge drying beds engineered for low permeability (part of WWTF expansion)
- concrete treatment structures
- recycling of wastewater on cropped properties
- an operation and maintenance (O&M) manual
- staffing to assure proper operation and maintenance

62. The Discharger's past on-site sludge and septage discharges caused or contributed to cause groundwater degradation for nitrates and other waste constituents. As part of its WWTF expansion project, the Discharger plans to construct engineered drying beds (i.e., through soil cement lining) that exhibit soil permeabilities of 10^{-6} cm/sec. Further, the Discharger has employed poor groundwater monitoring practices and does not monitor use of recycled water on City-owned and privately-owned farmland to assure compliance with Title 22 regulations. Therefore, the Discharger manages the discharge in a manner that may not constitute BPTC as used in Resolution 68-16. While the Discharger has been monitoring the uppermost layer of upper groundwater in a network comprised of four wells since 1987, the Discharger reports that the groundwater monitoring data collected to date may not be representative of first encountered groundwater because of improper sampling techniques. Recently submitted data, purportedly collected using proper techniques, shows groundwater pollution with nitrates and degradation by salinity constituents. The evaluation of the vertical and horizontal extent of groundwater pollution due, in part, to the Discharger's WWTF, and implementation of corrective measures will be addressed in a

separate enforcement action. Nevertheless, the existing impacts on area groundwater and the appropriate level of degradation that complies with Resolution 68-16 have not been evaluated.

63. This Order establishes schedules of tasks to (1) evaluate BPTC for each major treatment, storage, and disposal component of the WWTF, (2) implement a pretreatment program; and (3) characterize groundwater for waste constituents specified in this Order's Monitoring and Reporting Program.

64. This Order establishes groundwater limitations 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 means that where the stringency of the limitations for the same waste constituent differs according to beneficial use, the most stringent applies as the governing limitation for that waste constituent. This Order contains tasks for assuring that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved. Accordingly, the discharge is consistent with the antidegradation provisions of Resolution 68-16. Based on the results of the scheduled tasks, the Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution 68-16.

65. 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.

CEQA

66. Draft Mitigated Negative Declaration. The Discharger submitted a draft mitigated negative declaration (MND), dated 5 September 2000, for expanding its WWTF in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and State CEQA guidelines. The draft MND described the proposed WWTF expansion, the environmental settings, possible environmental impacts, and mitigation measures. By letter dated 6 October 2000, the Board advised the Discharger it must comply with Board-adopted waste discharge requirements and enclosed comments to the RWD.

67. Final Mitigated Negative Declaration. The Discharger submitted a final MND, dated 19 March 2001, addressing Board comments to the draft MND. By letter dated 16 April 2001, the Board advised the City to revise the final MND to indicate that the sludge drying beds will be lined.

68. Revised Final Mitigated Negative Declaration. On 13 June 2001, the City recirculated a revised final MND for the Delano WWTF expansion. The revised MND indicates that new and existing sludge drying beds will be modified to minimize percolation. By letter dated 11 July 2001, the Board advised the City to further revise the MND to indicate additional mitigation measures may be needed if groundwater sampling and testing results reveal the WWTF has polluted groundwater.

69. On August 6 2001, the City of Delano certified an MND in accordance with CEQA and State CEQA guidelines. The Board has reviewed this document and concurs with its findings and mitigation measures.

General Findings

70. Section 13263 of the CWC authorizes the Board to prescribe discharge requirements that implement the Basin Plan and other applicable plans and take into consideration other factors, including the factors in CWC section 13241, which includes economic considerations. The State Water Resources Control Board, however, has held that a regional board need not specifically address section 13241 factors when implementing existing water quality objectives in waste discharge requirements because the factors were already considered in adopting water quality objectives. These waste discharge requirements implement adopted water quality objectives. Therefore, no additional analysis of the section 13241 factors is required

71. The Board considered all the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, in establishing the following conditions of discharge.

72. The Board consulted with DHS and the Kern County Health Department, and considered their recommendations regarding public health aspects for water recycling on the agricultural land.

73. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

74. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Waste Discharge Requirements Order No. 90-270 is rescinded and that, pursuant to CWC sections 13263 and 13267, the City of Delano, 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 at the Wastewater Treatment Facility and associated Use Area:

[Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.]

A. Discharge Prohibitions

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

2. Bypass or overflow of untreated or partially-treated waste is prohibited, except as allowed in Provision E.2 of Standard Provisions and Reporting Requirements.

3. Discharge of waste classified as 'hazardous,' as defined in section 2521(a) of Title 23, CCR, section 2510 et seq., or 'designated,' as defined in CWC section 13173, is prohibited.

4. Recycling of effluent to areas without Board-adopted water recycling requirements or waiver of said requirements is prohibited.

5. Cross-connections between any potable water supply and piping containing recycled water is prohibited. As such, no physical connection shall exist between recycled water piping and any domestic water supply well, or between recycled water piping and any irrigation well that does not have an air gap or reduced pressure principle device.

6. Discharge of septage to land (e.g., sludge drying beds) is prohibited.

B. Discharge Specifications

1. **Until Provision G.8 is satisfied**, the average daily discharge to storage ponds shall not exceed 4.4 mgd.

2. **After Provision G.8 is satisfied**, the average daily discharge to storage ponds shall not exceed 6.0 mgd during all months except August, when the average daily discharge shall not exceed 7.2 mgd.

3. **After Provision G.9 is satisfied**, the average daily discharge to storage ponds shall not exceed 7.2 mgd.

4. The monthly average EC of the discharge shall not exceed the flow-weighted average EC of the source water plus 500 µmhos/cm, or a total of 900 µmhos/cm, whichever is less. The flow-weighted average for the source water shall be a moving average for the most recent twelve months.

5. The discharge shall not have a pH less than 6.0 or greater than 9.0.

6. The discharge to storage ponds shall not exceed the following limits:

Constituent	Units	Monthly Average[1]	Daily Maximum
Settleable Solids	mL/L	0.2	1.0
BOD_5	mg/L	40	80
TSS	mg/L	40	80

[1] Average value for all samples collected within a calendar month.

7. The arithmetic mean of BOD_5 and of total suspended solids in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of the values of influent samples collected at approximately the same times during the same period (80 percent removal).

8. Objectionable odors originating at the WWTF shall not be perceivable beyond the limits of the waste treatment areas and effluent storage ponds at an intensity that creates or threatens to create nuisance conditions.

9. As a means of discerning compliance with Discharge Specification B.8, the dissolved oxygen content in the upper zone (one foot) of wastewater in all ponds shall not be less than 1.0 mg/L.

10. Ponds shall be managed to prevent breeding of mosquitoes. In particular:

    a. An erosion control plan should assure 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, and herbicides.

    c. Dead algae, vegetation, and 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.

11. Freeboard shall never be less than two feet in any pond (measured vertically).

12. As a means of discerning compliance with Discharge Specification B.11, the Discharger shall install and maintain in each pond permanent markers with calibration indicating the water level at design capacity and available operational freeboard. Upon the Discharger's written request, specific WWTF ponds may be exempt from this requirement. Such exemptions shall be subject to the Executive officer's written approval.

13. The WWTF shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year frequency.

14. The Discharger shall preclude public access to the waste treatment and effluent storage facilities through methods such as fences, signs, or other acceptable means.

15. Storage 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.

16. On **15 November** of each year, available storage capacity in storage ponds shall be at least equal to the volume necessary to comply with Discharge Specification B.15.

17. 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. Water Recycling Specifications

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

1. Use of recycled water as permitted by this Order shall comply with all the terms and conditions of the most current Title 22 provisions.

2. All users of recycled water shall provide for appropriate backflow protection for potable water supplies as specified in Title 17, CCR, section 7604, or as specified by DHS.

3. Recycled water shall remain within the permitted Use Area (as defined in Finding No. 6).

4. Use of recycled water shall be limited to flood irrigation of fodder, fiber, seed crops, and of crops such as wine grapes that undergo extensive commercial, physical, or chemical processing before human consumption.

5. Application of wastewater, biosolids, and commercial fertilizer to use areas shall be at reasonable agronomic rates considering the crop, soil, climate, and irrigation management system in accordance with the use area management plan required under Provision G.7 of this Order, subject to Executive Officer approval. The annual nutrient loading of use areas, including the nutritive value of organic and chemical fertilizers and of the recycled water shall not exceed the crop demand.

6. The Discharger shall maintain the following setback distances from areas irrigated with recycled water:

Setback Distance (feet)	To
25	Property Line
30	Public Roads
50	Drainage courses
100	Irrigation wells
150	Domestic wells

7. The perimeter of use areas shall be graded to prevent ponding along public roads or other public areas.

8. Areas irrigated with recycled water shall be managed to prevent breeding of mosquitoes. More specifically:

   a. All applied irrigation water must infiltrate completely within a 48-hour period.

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

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

9. Recycled water shall be managed to minimize runoff onto adjacent properties not owned or controlled by the Discharger.

10. Recycled water used for irrigation shall be managed to minimize erosion.

11. Recycled water shall be managed to minimize contact with workers.

12. If recycled water is used for construction purposes, it shall comply with the most current edition of *Guidelines for Use of Recycled Water for Construction Purposes*. Other uses of recycled water not specifically authorized herein shall be subject to the approval of the Executive Officer and shall comply with Title 22.

13. Public contact with recycled water shall be precluded through such means as fences, signs, or acceptable alternatives. Signs with proper wording (shown below) of a size no less than four inches high by eight inches wide shall be placed at all areas of public access and around the perimeter of all areas used for effluent disposal or conveyance to alert the public of the use of recycled water. All signs shall present the international symbol similar to that shown in Attachment E and present the following wording:

RECYCLED WATER - DO NOT DRINK

AGUA DE DESPERDICIO RECLAMADA - POR FAVOR NO TOME

D. Sludge Specifications

Sludge in this document means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screening material generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the WWTF. Biosolids refers to sludge that has undergone sufficient treatment and testing to qualify for reuse pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land recycling.

1. Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant operation.

2. Treatment and storage of sludge generated by the WWTF shall be confined to the WWTF property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate Groundwater Limitations.

3. Any storage of residual sludge, solid waste, and biosolids on property of the WWTF 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.

4. Residual sludge, biosolids, and solid 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, WWTF, 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.

5. Use of biosolids as a soil amendment shall comply with General Biosolids Order (State Water Resources Control Board Water Quality Order No. 2000-10-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*). The Discharger must file a complete Notice of Intent for each biosolids use project to be eligible for coverage under the General Biosolids Order. Alternatively, use of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a regional water quality control board.

6. Use and disposal of biosolids should comply with the self-implementing federal regulations of 40 CFR 503, which are subject to enforcement by the U.S. Environmental Protection Agency (EPA), not the Board. If during the life of this Order the State accepts primacy for implementation of 40 CFR 503, the Board may also initiate enforcement where appropriate.

E. 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 which create a fire or explosion hazard in the treatment works;

   b. Wastes which 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 which 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 which 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 form 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.

3. The Discharger shall be responsible for the performance of all pretreatment requirements contained in 40 CFR Part 403 and shall be subject to enforcement actions, penalties, fines, and other remedies by the EPA, Board, or other appropriate parties, as provided in the Clean Water Act (CWA), as amended, for noncompliance.

4. The Discharger shall enforce the requirements promulgated under sections 307(b), (c), (d), and 402(b) of the CWA. The Discharger shall cause industrial users subject to federal categorical standards to achieve compliance no later than that date specified in those requirements or, in the case of a new industrial user, upon commencement of the discharge.

5. Within 60 days of Board approval of the Pretreatment Program developed as required by Provision G.9, the Discharger shall comply fully with Pretreatment Requirements E.1, E.2, E.3, and E.4 and perform the pretreatment functions required in 40 CFR 403, including, but not limited to:

   a. Implementing the necessary legal authorities as provided in 40 CFR 403.8(f)(1);

   b. Enforcing the pretreatment requirements under 40 CFR 403.5 and 403.6;

   c. Implementing the programmatic functions as provided in 40 CFR 403.8(f)(2);

   d. Providing the requisite funding and personnel to implement the pretreatment program as provided in 40 CFR 403.8(f)(3); and

   e. Publishing a list of industrial users which were in significant noncompliance and applicable pretreatment requirements as required by 40 CFR 403.8(f)(2)(vii).

f. Conducting inspections in accordance with provisions of 40 CFR 403.8(f)(1)(v) and 403.8(f)(2)(v) and ensuring compliance with pretreatment standards and requirements by (1) assessing and collecting, when appropriate, civil penalties and civil administrative penalties in accordance with Government Code sections 54740, 54740.5, and 54740.6, or (2) other equally effective means.

F. Groundwater Limitations

Release of waste constituents from any storage, treatment, or disposal component associated with the WWTF shall not, in combination with other sources of the waste constituents, cause groundwater under and beyond the WWTF and discharge area(s) to exceed any of the following:

1. Constituent concentrations specified below or natural background concentration, whichever is greater:

   a. Total coliform organisms of 2.2 MPN/100 mL.

   b. Total nitrogen in excess of 10 mg/L.

   c. For constituents identified in Title 22 (as described in Finding No. 43), the MCLs quantified therein.

2. Constituent concentrations listed below or natural background concentration, whichever is greater:

Constituent	Units	Limitation
Boron	mg/L	0.7
Chloride	mg/L	175
EC	µmhos/cm	1,000
Sodium	mg/L	115
Total Dissolved Solids[1]	mg/L	600

[1] A cumulative constituent comprised of dissolved matter consisting mainly of inorganic salts, small amounts of organic matter, and dissolved gases [e.g., ammonia, bicarbonate alkalinity, boron, calcium, chloride, copper, iron, magnesium, manganese, nitrate, phosphorus, potassium, sodium, silica, sulfate, total alkalinity]

3. Taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses, including but not limited to, ammonia (as N) in excess of 0.5 mg/L or natural background, whichever is greater.

4. Constituent concentrations identified as follows or natural background concentration, whichever is greater: toxic substances in concentrations that produce detrimental physiological responses in human,

plant, or animal life; or chemical constituents and pesticides in concentrations that adversely affect beneficial uses.

G. Provisions

1. The Discharger shall comply with *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as Standard Provision(s).

2. The Discharger shall comply with Monitoring and Reporting Program (MRP) No. 5-01-247 part of this Order, and any revisions thereto as ordered by the Executive Officer.

3. A copy of this Order, including its attachments and Standard Provisions, shall be kept at the WWTF for reference by operating personnel. Key operating personnel shall be familiar with its contents.

4. The Discharger shall use best practicable treatment and control, including proper operation and maintenance, to comply with terms of this Order.

5. **By 15 February 2002,** the Discharger shall submit a sludge management plan that satisfies the information requirements of Attachment F *Information Needs For Sludge Management Plan*. A California registered civil engineer experienced in sludge disposal must prepare and certify the sludge management plan. Following written approval of the sludge management plan from the Executive Officer, this Provision shall be considered satisfied.

6. **By 15 February 2002**, the Discharger shall submit written certification that it is either in compliance with Sludge Specifications D.2 and D.3 or that it has removed all biosolids from the existing stockpiles and disposed of them in accordance with Sludge Specifications D.4 and D.5.

7. **By 15 March 2002**, the Discharger shall submit a technical report describing a use area management plan that ensures wastewater, biosolids, and commercial fertilizer will be applied to use areas at reasonable agronomic rates considering the crop, soil, climate, and irrigation management system. The report shall describe the types of crops to be grown and harvested annually, crop water use, nitrogen uptake, and supporting data and calculations for monthly water and yearly nutrient balances. The technical report shall include a map showing locations of all domestic and irrigation wells that are within and near use areas, areas of public access, locations and wording of public warning signs, and setback distances from irrigation and domestic wells, property boundaries, and roads. A California registered civil engineer experienced in the design of wastewater treatment and recycling facilities shall prepare the report. Upon written acceptance of the technical report by the Executive Officer, this Provision will be satisfied.

8. Once the Discharger completes the WWTF expansion project (described in Finding No. 5), the Discharger shall submit a technical report certifying whether the expanded WWTF is capable of

consistently treating and disposing of 7.2 mgd of wastewater for the month of August and 6.0 mgd for all other months in full compliance with the terms of this Order. The technical report shall include hydrologic and nutrient balance calculations for the designated use areas. The report shall describe the type of crops grown in the designated use areas (e.g., pasture forage), crop water use, and amount of nitrogen utilized by the crop. Values of seasonal precipitation used in the hydrologic balance calculations shall be based on total annual precipitation in the area using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns. The report must include a monthly water balance with monthly storage requirements and must demonstrate that water recycling can be accomplished with accepted irrigation practices and in compliance with the terms and conditions of this Order. A California registered civil engineer or agricultural engineer, as appropriate, experienced in the design of wastewater treatment and disposal facilities must prepare and certify the report. Following written acceptance from the Executive Officer of the certification, this Provision will be considered satisfied.

9. For the WWTF to be permitted to discharge 7.2 mgd throughout the year, the Discharger shall submit a technical report certifying whether the expanded WWTF is capable of consistently treating and disposing of 7.2 mgd of wastewater in full compliance with the terms of this Order. The technical report shall include hydrologic and nutrient balance calculations for the designated use areas. The report shall describe the type of crops grown in the designated use areas (e.g., pasture forage), crop water use, and amount of nitrogen utilized by the crop. Values of seasonal precipitation used in the hydrologic balance calculations shall be based on total annual precipitation in the area using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns. The report must include a monthly water balance with monthly storage requirements and must demonstrate that water recycling can be accomplished with accepted irrigation practices and in compliance with the terms and conditions of this Order. A California registered civil engineer or agricultural engineer, as appropriate, experienced in the design of wastewater treatment and disposal facilities must prepare and certify the report. Following written acceptance from the Executive Officer of the certification, this Provision will be considered satisfied.

10. In addition to Pretreatment Provisions E.1 through E.5, the Discharger shall develop and implement a Pretreatment Program, subject to the approval of the Executive Officer. The Pretreatment Program shall become an enforceable condition of this Order. To satisfy this Provision, the Discharger shall comply with the following time schedule:

	Tasks	Compliance Date
a.	Submit the results of an industrial user survey.	**1 Feb 2002**
b.	Submit documentation for proposed Legal Authority and Control Mechanism implementation, an Enforcement Response Program, and a list of resource allotments for the Pretreatment Program.	**1 Jun 2002**

Tasks	Compliance Date
c. Submit a proposed Inspection Monitoring Program and Pretreatment Ordinance, which will implement the requirements of the Pretreatment Program.	**1 July 2002**
d. Submit a complete Pretreatment Program Package with request for Pretreatment Program Approval.	**1 Oct 2002**
e. Implement the approved Pretreatment Program.	**60 Days after Approval**

In performing the work in this Provision, the Discharger shall submit to the Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule 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 Board by letter when it returns to compliance with the time schedule.

11. **By 15 March 2002**, the Discharger shall complete a hydrogeologic investigation within the area affected and potentially affected by the WWTF and submit a technical report to the Executive Officer. The technical report, which shall be prepared and professionally certified by a geologist registered to practice in California, shall describe the underlying geology, existing wells (active and otherwise), local well construction practices and standards, well restrictions, and hydrogeology. The report shall recommend representative monitoring zones of the uppermost aquifer with consideration given to the Discharger's existing data and provide a detailed evaluation of the existing monitoring well network. The recommendations shall be reviewed and approved as appropriate by the Executive Officer.

12. **Within 90 days following Executive Officer approval of representative monitoring zones in accordance with Provisions G.11**, the Discharger shall submit a technical report proposing a modified groundwater monitoring network. The technical report shall consist of a Monitoring Well Installation Work Plan for a network that satisfies Attachment F, *Standard Monitoring Well Provisions for Waste Discharge Requirements.* The network shall include one or more background monitoring wells and sufficient number of wells to evaluate performance of BPTC measures and to determine compliance with this Order's Groundwater Limitations. These include monitoring wells immediately downgradient of every treatment, storage, and disposal unit that does or may release waste constituents to groundwater with the exception of wastewater Use Areas to which the Discharger applies effluent at reasonable agronomic rates. Monitoring wells shall comply with applicable Well Standards. Monitoring of wells constructed to yield representative samples

from approved monitoring zones within the uppermost aquifer in accordance with this Order's Monitoring and Reporting Program

shall comprise the representative zone monitoring program. Implementation of the Monitoring Well Installation Work Plan shall be subject to the prior approval of the Executive Officer.

13. The Discharger shall comply with the following compliance schedule in implementing the groundwater monitoring network approved by the Executive Officer in Provision G.12:

	Task	Compliance Date
a.	Implement Monitoring Well Installation Work Plan	150 days following Work Plan approval by Executive Officer
b.	Complete Monitoring Well Installation	60 days following Work Plan implementation
c.	Submit Monitoring Well Installation Report of Results	30 days following Project Completion
d.	Commence Groundwater Monitoring	30 days following Project Completion
e.	Submit technical report that characterizes natural background water quality in approved representative monitoring zones for all monitored constituents	365 days following completion of task 13.d

Technical reports submitted pursuant to this Provision shall be prepared and certified by a California registered civil engineer or geologist, and are subject to Executive Officer approval.

14. Compliance with Groundwater Limitations will be evaluated based on the approved representative zone monitoring program following completion of Provision G.13, task e. Should the Discharger fail to comply with the schedule to characterize natural background groundwater quality at the approved monitoring zone(s) by the date specified in Provision G.13, task e, the Board shall not consider the lack of natural background characterization as sufficient defense to enforcement for violations of Groundwater Limitations F.1 through F.4.

15. **By 15 April 2002**, the Discharger shall submit a written work plan in the form of a technical report that sets forth a schedule for a systematic and comprehensive technical evaluation of each major component of the WWTF's waste treatment and control to determine for each waste constituent best practicable treatment and control as used in Resolution 68-16. The technical report shall

contain a preliminary evaluation of each component and propose a time schedule for completing the comprehensive technical evaluation. A California registered civil engineer shall prepare and certify the technical report. The schedule to complete all

comprehensive technical evaluations shall be as short as practicable, and shall not exceed two years. Upon written determination of adequacy by the Executive Officer of the technical report, this Provision shall be considered satisfied.

16. By the schedule approved by the Executive Officer pursuant to Provision G.15, but no later than **15 October 2004**, the written comprehensive technical evaluation shall be submitted with the Discharger's written recommendations for WWTF modifications (e.g., component upgrade and retrofit), as necessary to achieve best practicable treatment and control (BPTC). The report shall include specific methods the Discharger proposes as a means to measure processes and assure continuous optimal performance of BPTC measures. A California registered civil engineer shall prepare and certify the comprehensive technical evaluations. The source of funding and proposed schedule for modifications shall be identified. The schedule shall be as short as practicable but in no case shall completion of the necessary improvement exceed four years past the Executive Officer's determination of the adequacy of the comprehensive technical evaluation submitted pursuant to this provision unless the schedule is reviewed and specifically approved by the Board. The adequacy of the component evaluation, recommended improvements, and schedule are subject to the Executive Officers review and determination.

17. The groundwater limitations set forth in this Order are not final and not an entitlement. **By 15 October 2004**, the Discharger shall submit a technical report that proposes specific numeric groundwater limitations for each waste constituent that reflects full implementation of BPTC and compliance with the most stringent applicable water quality objectives for that waste constituent. The report shall describe how these were determined considering actual data from compliance monitoring wells, impact reductions through full implementation of BPTC, reasonable growth, the factors in Water Code section 13241, State Water Resources Control Board Resolution No. 68-16, the Basin Plan, etc. The most stringent applicable water quality objective shall be interpreted based on the Regional Board policy entitled Application of Water Quality Objectives on pages IV-21 through IV-23 of the Basin Plan. Where the stringency of a proposed water quality objective can vary according to land use, the Discharger must provide documentation from similar third party government authorities that there is no potential for the more sensitive land use to occur, and the reason, if it wishes the Board to consider a proposed water quality objective, that provides protection for only less sensitive uses. The Board will consider the documentation and recommendation for the governing water quality objective, and it is this accepted value that will establish the maximum permissible groundwater limitation the Board will consider in Phase 2 evaluation. The Discharger should submit results of a validated groundwater model or other hydrogeologic information to support its proposal.

18. **By 15 October 2006**, the Discharger shall submit a written technical report on the overall status of compliance with implementation of BPTC and compliance with all groundwater limitations.

19. **By 1 March 2002**, the Discharger shall submit a report for Executive Officer approval outlining EPA test methods and detection limits for priority pollutants listed in Title 40, Code of Federal Regulations, Part 131.

20. Upon completion of tasks set forth in Provisions G.16 and G.17**,** the Board shall consider the evidence provided in determining whether the Discharger has justified BPTC and the appropriate final numeric groundwater limitations that comply with Resolution 68-16 and may revise this Order, including revision of Groundwater Limitation F.2.

21. At least **90 days prior** to termination or expiration of any lease, contract, or agreement involving designated use areas or offsite use of effluent used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

22. The Discharger shall not allow pollutant-free wastewater to be discharged into the WWTF collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means stormwater (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants.

23. The Discharger shall report to the Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986." If the Board determines that the toxic waste constituent had or has a reasonable potential to cause or contribute to violation of a water quality objective, the Board may reopen this Order and prescribe an effluent limitation for the constituent.

24. If the Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of a limit for groundwater, this Order may be enforced or, alternately, reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for the problem constituents.

25. 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 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 Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

26. 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 this office. 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 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. Transfer shall be approved or disapproved in writing by the Executive Officer.

27. The Board will review this Order periodically and will revise requirements when necessary.

I, GARY M. CARLTON, 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 19 October 2001.

Original signed by _____
GARY M. CARLTON, Executive Officer

Order Attachments:

Monitoring Standard Provisions
A. Location Map and Groundwater Monitoring Wells
B. Flow Diagram
C. Use Area And Other Effluent Reuse Areas
D. Monitoring Well Map
E. Recycled Water Sign Symbol
F. Information Needs for Sludge Management Plan
G. Standard Monitoring Well Provisions for Waste Discharge Requirements
H. Recommended Use Area Reporting Form
Information Sheet
Standard Provisions (1 March 1991 version) (separate attachment to Discharger only)

ams/jlk/fmc:10/19/2001 AMENDED

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 5-01-247
FOR
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

INFLUENT MONITORING

This Monitoring and Reporting Program (MRP) is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. Sample station locations are depicted on Attachment B. Changes to sample location shall be established with concurrence of Board's staff, and a description of the revised stations shall be submitted to the Board and attached to this Order. All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form.

The Discharger shall collect influent samples at the headworks of the treatment facility prior to any treatment of waste. Influent monitoring shall include at least the following:

Constituent	Units	Type of Sample	Sampling Frequency
Maximum Daily Flow	mgd	Continuous	Continuous
Average Daily Flow	mgd	Computed	Daily[1]
Monthly Average Flow	mgd	Computed	Monthly
Settleable Solids	mL/L	Grab	Daily[1]
pH	pH units	Grab	Daily[1]
BOD_5[3]	mg/L	24-hr Composite[4]	2/week[2]
Monthly Average BOD_5	mg/L	Calculated	Monthly
TSS[5]	mg/L	24-hr Composite[4]	2/week[2]
Monthly Average TSS	mg/L	Calculated	Monthly

1 Sample frequencies referenced hereafter in this program as daily shall not include weekends or holidays
2 On nonconsecutive days
3 Five-day, 20°C biochemical oxygen demand
4 24-hour composite sampling as referred to in this program shall be flow-proportioned.
5 Total suspended solids

EFFLUENT MONITORING

The Discharger shall collect effluent samples at a point in the system following treatment and before discharge to the storage ponds. Effluent samples shall be representative of the volume and nature of the discharge. Time of collection of a grab sample shall be recorded. Effluent monitoring shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency[1]
Settleable Solids	mL/L	Grab	Daily
pH	pH Units	Grab	Daily
BOD_5			
Concentration	mg/L	24-hr Composite	2/Week[2]
Monthly Average	mg/L	Calculated	Monthly
Percent Removal	%	Calculated	Monthly
Total Suspended Solids			
Concentration	mg/L	24-hr Composite	2/Week[2]
Monthly Average	mg/L	Calculated	Monthly
Percent Removal	%	Calculated	Monthly
Total Dissolved Solids (TDS) [2]	mg/L	24-hr Composite	2/Month[3]
EC[4]	µmhos/cm	24-hr Composite	2/Month[3]
Ammonia **(as N)**	mg/L	24-hr Composite	2/Month[3]
Nitrate **(as N)**	mg/L	24-hr Composite	2/Month[3]
Total Kjeldahl Nitrogen (TKN)	mg/L	24-hr Composite	2/Month[3]
Total Nitrogen	mg/L	Calculated	2/Month[3]
General Minerals[5]	mg/L	24-hr Composite	Semiannual[6]
Metals[7]	µg/L	24-hr Composite	Semiannual[6]
Priority Pollutants[8]	µg/L	Grab	Annual[9]

1 If results of monitoring a pollutant appear to violate discharge specifications, but monitoring frequency is not sufficient to validate violation (e.g., the monthly mean for BOD_5), or indicate a violation and potential upset of the treatment process, the frequency of sampling shall be increased to confirm the magnitude and duration of violation, if any, and aid in identification and resolution of the problem.

2 TDS referenced hereafter in this program shall be determined using EPA Method No. 160.1 for combined organic and inorganic TDS and EPA Method No. 160.4 for inorganic TDS or equivalent analytical procedures specified in 40 CFR Part 136.

3 In nonconsecutive weeks coincident with EC sampling

4 Conductivity at 25°C

5 General Minerals as referred to in this program shall include the constituents in the General Minerals Analyte List presented below.

6 April and October

7 Metals as referred to in this program shall include zinc, cadmium, lead, nickel, selenium, arsenic, molybdenum, mercury, and copper.

[8] The Discharger must submit a report for approval by 1 March 2002 outlining EPA test methods and detection limits for priority pollutants listed in Title 40, Code of Federal Regulations, Part 131).

[9] April, coincident with General Mineral analysis

General Minerals Analyte List

Alkalinity (as $CaCO_3$)	Carbonate (as $CaCO_3$)	Manganese
Aluminum	Chloride	Phosphate
Bicarbonate (as $CaCO_3$)	Hardness (as $CaCO_3$)	Potassium
Boron	Iron	Sodium
Calcium	Magnesium	Sulfate

General Minerals Sample Collection and Preservation: Any sample placed in an acid-preserved bottle must first be filtered through a 0.45 µm nominal pore size filter. If field filtering is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24-hours with a request (on the chain-of-custody form) to immediately filter then preserve the sample.

POND MONITORING

Storage ponds shall be sampled systematically for the parameters specified below. Freeboard shall be monitored on all storage ponds in use to the nearest one tenth of a foot. Pond monitoring shall include at least the following:

Constituent/Parameter	Units	Type of Sample	Sampling Frequency[1]
Dissolved Oxygen (DO)	mg/L	Grab[2]	Weekly[3]
Freeboard	feet[4]	Observation	Weekly

[1] If results of monitoring appear to violate discharge specifications, but monitoring frequency is not sufficient to validate violation or indicate a violation and potential upset of the treatment process (e.g., less than minimum dissolved oxygen concentration), the frequency of sampling shall be increased to confirm the magnitude and duration of violation, if any, and aid in identification and resolution of the problem

[2] Samples shall be collected at a depth of one foot from each pond in use, opposite the inlet, and analyzed for DO. Samples shall be collected between 0700 and 0900 hours. If DO results for any pond in use indicate noncompliance with the effluent limit, the Discharger shall implement corrective measures as specified in the O&M manual and monitor said pond daily until its DO stabilizes above 1.0 mg/L.

[3] After six months, the Discharger may request a reduction in pond DO monitoring frequency. Such request shall be made in writing and include a description of operation procedures the Discharger will implement to ensure compliance with Discharge Specifications D.8 and D.9. Upon written approval by the Executive Officer, the frequency may be reduced to an "as needed" basis.

[4] Freeboard shall be monitored to the nearest tenth of a foot

In addition, the Discharger shall inspect the condition of storage ponds 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 pond surface and their location; whether burrowing animals or insects are present; and the color of the ponds (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.). A summary of the entries made in the log during each month shall be submitted along with the monitoring report the following month. If the Discharger finds itself in violation of Discharge Specifications B.8, B.9, B.10, or B.11, the Discharger shall briefly explain the action taken or to be taken to correct the violation. The Discharger shall certify in each November monitoring report that it is in compliance with Discharge Specification B.15.

GROUNDWATER MONITORING

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

At least quarterly and concurrently with groundwater quality sampling, the Discharger shall measure the water level in each well as groundwater depth (in feet and hundredths) and as groundwater surface elevation (in feet and hundredths above mean sea level). The horizontal geodetic location for each monitoring well shall be provided where the point of beginning shall be described by the California State Plane Coordinate System, 1983 datum.

Samples shall be collected from approved monitoring wells and analyzed for the following constituents at the following frequency:

Constituent	Units	Type of Sample	Frequency
TDS	mg/L	Grab	Quarterly[1]
EC	µmhos/cm	Grab	Quarterly[1]
Ammonia **(as N)**	mg/L	Grab	Quarterly[1]
Nitrate **(as N)**	mg/L	Grab	Quarterly[1]
pH	pH units	Grab	Quarterly[1]
Total Coliform Organisms	MPN/100 mL	Grab	Quarterly[1]
Total Organic Carbon	mg/L	Grab	Quarterly[1]
TKN	mg/L	Grab	Quarterly[1]
Total Nitrogen	mg/L	Calculated	Quarterly[1]
General Minerals	mg/L	Grab	Quarterly[1]

[1] January, April, July and October

In reporting the results of the first sampling event performed pursuant to this program, the Discharger shall include a detailed description of the procedures and techniques for: (a) sample collection, including purging techniques, sampling equipment, and decontamination of sampling equipment; (b) sample preservation and shipment; (c) analytical procedures; and (d) chain of custody control.

WATER SUPPLY MONITORING

The supply water for the City of Delano shall be monitored as follows:

Constituent	Units	Measurement	Frequency
EC[1]	µmhos/cm	Grab	Quarterly[2]
TDS	mg/L	Grab	Once every 3 years[3]

[1] EC shall be reported as a flow-weighted average from all supply wells. Include copies of supporting calculations with monitoring reports.

[2] January, April, July and October

[3] Coincident with monitoring required by the California Department of Health Services

Following two years of sampling in the manner specified, the Discharger may, following written approval by the Executive officer, establish a sampling station where a representative sample of the City's water supply can be obtained.

PRETREATMENT MONITORING

Quarterly and annual pretreatment reports must be submitted in accordance with Provision E.7 of Standard Provisions and Reporting Requirements. The annual report shall be submitted by **28 February** of each year. The reports shall also describe progress towards correction of deficiencies noted during audit or pretreatment compliance inspections by the Board and/or EPA. Information required in the fourth quarterly report shall be included as part of the annual report. If none of the aforementioned conditions exist, a letter at the end of each quarter must be submitted, at a minimum, certifying that all industries are in compliance and no violations or changes to the pretreatment program have occurred during the quarter.

Signed copies of the reports shall also be submitted to the EPA Regional Administrator and the State Board at the following addresses, or as advised in writing subsequent to adoption of this Order:

Regional Administrator
U.S. EPA, Region 9

Pretreatment Program Manager
Division of Water Quality

Water Management Division (W-5-2)	State Water Resources Control Board
75 Hawthorne Street	P.O. Box 944213
San Francisco, CA 94105	Sacramento, CA 94244-2130

SLUDGE MONITORING

To ensure that discharges to the WWTF are not interfering with the treatment process, the Discharger shall collect a composite sample of sludge at least annually in accordance with EPA's *POTW SLUDGE SAMPLING AND ANALYSIS GUIDANCE DOCUMENT, AUGUST 1989,* and test for metals:

Arsenic	Copper	Nickel
Cadmium	Lead	Selenium
Molybdenum	Mercury	Zinc

Sampling records shall be retained for a minimum of five years. A log shall be kept of sludge quantities generated and of handling, application and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report. Prior to any disposal or land application of sewage sludge, or removal of sewage sludge from the WWTF, the monitoring and record keeping requirements of 40 CFR 503 shall be met.

USE AREA MONITORING

The type of crop(s) irrigated, amounts of water and/or recycled water applied to the crops(s) (in acre-feet) and amounts of biosolids and chemical fertilizers (in pounds of nitrogen per acre) shall be measured and reported to the Board quarterly in accordance with the following schedule:

Monitoring Period	Data Due
January – March	1 May
April – June	1 August
July – September	1 November
October - December	1 February

The Discharger shall utilize the form presented in Attachment H (or variation thereof subject to Board staff approval) for reporting the Use Area monitoring data.

REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring Reporting Program (MRP) and as required in the Standard Provisions and Reporting Requirements. All reports submitted in response to this MRP shall comply with the signatory requirements in Standard Provisions, General Reporting

Requirements B.3. Daily, twice weekly, weekly, twice monthly, and monthly monitoring data shall be reported in monthly monitoring reports. Monthly monitoring reports shall be submitted to the Board by the **1st day of second month following sampling**. Quarterly monitoring reports shall be submitted by **1st day of second month after the calendar quarter**.

In each monitoring report, the Discharger shall discuss the compliance record for the reporting period. If violations have occurred during the reporting period, the report shall also discuss the corrective actions taken and/or planned to bring the discharge into full compliance with this Order. Monitoring data and/or discussions submitted concerning WWTF performance must also be signed and certified by the chief plant operator. When reports contain laboratory analyses performed by the Discharger and the chief plant operator is not in the direct line of supervision of the laboratory, reports must also be signed and certified by the chief of the laboratory. 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. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the discharge monitoring report.

The Discharger may also be requested to submit an annual report to the Board with tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss any corrective actions the Discharger takes or plans to take to bring the discharge into full compliance with the waste discharge requirements.

By **1 February of each year**, the Discharger shall submit a written report to the Executive Officer containing the following:

1. The names, certificate grades, and general responsibilities of all persons in charge of wastewater treatment and disposal.
2. The names and telephone numbers of persons to contact regarding the WWTF for emergency and routine situations.
3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.4). Reports submitted concerning WWTF performance must also be signed and certified by the chief plant operator. When reports contain laboratory analyses performed by the Discharger and the chief plant operator is not in the direct line of supervision of the laboratory, reports must also be signed and certified by the chief of the laboratory.
4. A statement whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.
5. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the past five years.

6. The most recent City of Delano annual water supply report.

7. A summary of groundwater monitoring, including

   a. Hydrographs showing the groundwater elevation in each approved well for at least the previous five years or to the extent that such data are available, whichever is fewer. The hydrographs should show groundwater elevation with respect to the elevations of the top and bottom of the screened interval and be presented at a scale of values appropriate to show trends or variations in groundwater elevation. The scale for the background plots shall be the same as that used to plot downgradient elevation data;

   b. Graphs of the laboratory analytical data for all samples taken from each approved well within at least the previous five calendar years (as data become available). Each such graph shall plot the concentration of one or more waste constituents over time for a given monitoring well, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent, the scale for the background plots shall be the same as that used to plot downgradient data. Separate graphs shall show hydrologic equipotential gradients and equal concentration gradients for evaluated constituents.

   c. All monitoring analytical data obtained during the previous four quarterly reporting periods, presented in tabular form, as well as on 3.5" computer diskettes (or submitted separately via e-mail), either in MS-DOS / ASCII format or in another file format acceptable to the Executive Officer (e.g., Microsoft Excel).

   d. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned that may be needed to bring the Discharger into full compliance with the waste discharge requirements.

8. A summary of sludge monitoring, including

   a. Annual sludge production in dry tons and percent solids.

   b. A schematic diagram showing sludge handling facilities and solids flow diagram.

   c. A description of disposal methods, including the following information related to the disposal methods used at the WWTF. If more than one method is used, include the percentage of annual sludge production disposed of by each method.

      i. For **landfill disposal**, include: (a) the Order numbers of WDRs that regulate the landfill(s) used, (b) the present classifications of the landfill(s) used, and (c) the names and locations of the facilities receiving sludge.

      ii. For **land application**, include: (a) the locations of the site(s), and (b) the Order numbers of any WDRs that regulate the site(s).

      iii. For **incineration**, include: (a) the names and location of the site(s) where sludge incineration occurs, (b) the Order numbers of WDRs that regulate the site(s), (c) the disposal method of ash, and (d) the names and locations of facilities receiving ash (if applicable).

iv. For **composting**, include: (a) the location of the site(s), and (b) the Order numbers of any WDRs that regulate the site(s).

9. A summary of all recycled water operations for the previous water year (i.e., from October through September). The summary shall discuss total monthly water application; total wastewater recycled annually; total nutrient loading annually from applied wastewater, biosolids, and chemical fertilizers; and total estimated amount of nutrients removed through crop harvest. The summary shall also review the use area management plan (described in Provision G.7) and make recommendations regarding continuation or modification of the plan. In short, the summary shall present a mass balance relative to constituents of concern and hydraulic loading along with supporting data and calculations.

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

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

Original signed by
GARY M. CARLTON, Executive Officer

19 October 2001
(Date)

ams/jlk:fmc:10/19/01 AMENDED

INFORMATION SHEET

ORDER NO. 5-01-247
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

Background

The City of Delano owns and operates a wastewater treatment facility (WWTF) that provides sewage service for industry and about 35,500 residents. The WWTF currently consists of headworks, screening, grit removal, an aerated grit chamber, three primary clarifiers, two biofilters, three secondary clarifiers, two sludge digesters, a sludge thickener, 1.6 acres of sludge drying beds, and six effluent storage ponds. Waste Discharge Requirements (WDRs) Order No. 90-270, adopted by the Board on 28 September 1990, prescribes requirements for a monthly average daily discharge of 4.4 million gallons per day (mgd) of treated wastewater from the WWTF to unlined storage ponds. Order No. 90-270 does not reflect the configuration of the current WWTF.

The WWTF was originally designed for a capacity of 3.6 mgd with future expansion capabilities of 7.2 mgd. When the North Kern State Prison was built in 1990, the City expanded the WWTF by 0.8 mgd, bringing the WWTF to its current 4.4 mgd capacity.

Primary and secondary sludge is pumped from the clarifiers to a 30-foot-diameter gravity sludge thickener. Thickened sludge is sent through a primary and secondary digester. Supernatant is pumped to the headworks and recycled through the plant. Digested sludge is discharged to eight sludge drying beds, four of which are lined with asphalt and have 6" PVC underdrains designed to send leachate back to the headworks. The underdrain system is clogged and does not function properly. Each bed is filled up to about a depth of about two feet. After the sludge is dried, the Discharger temporarily stores dried sludge in unlined stockpiles onsite. The biosolids fall under Class B for pathogen reduction and are applied to sudan and alfalfa fields (40 and 20 acres) next to the WWTF, which the City owns and leases to a farmer. Biosolids are applied at a rate of about 1 to 1.5 tons/acre once every 4 years. The fields are not in an area accessible by the public. The Discharger accepts about 150 loads of septage each year and discharges septage to an isolated unlined sludge drying bed for drying. The Discharger commingles dried septage with biosolids. The Discharger screens and disposes of grit at the Shafter Landfill, which is regulated by Waste Discharge Requirements Order Number 00-156.

In May 1991, the City entered into a long-term agreement to sell excess effluent to the Sandrini Brothers. Since then, the City has been recycling effluent from the WWTF on 454 acres of City-owned farmland and selling its excess effluent to the Sandrini Brothers. Due to the recent deaths of the Sandrini Brothers, the City needs to expand its use area. The City will continue recycling effluent on its 454 acres of farmland, is in the process of purchasing more farmland, and plans to secure long-term contracts with several local farmers to irrigate with effluent. A water balance was performed to determine the amount of use area required. From the water balance, 965 acres of private farmland will be needed to recycle an average annual wastewater flow of 6 mgd in addition to the existing City-owned land. Field tests indicate the percolation rate under the ponds is 0.006

feet/day. Assuming an average annual wastewater inflow of 6 mgd at the expanded design flow, the amount of effluent percolating from the existing storage ponds will be approximately 300 acre-feet. The City has yet to submit a Report of Water Recycling for the current or proposed Use Areas pursuant to section 13522.5 of the California Water Code. It also has yet to submit a Title 22 Engineering Report to the California Department of Health Services for the current or proposed Use Areas pursuant to Title 22, CCR, section 60323.

The treatment facilities are within a 5-acre fenced site just north of the City's 160-acre industrial site. Surrounding the WWTF to the north and east are 454 acres of City-owned farmland used for recycling secondary effluent. In addition to the 454-acre City-owned farmland, effluent is also transported to a 640-acre, privately-owned farmland site south of Garces Highway.

The Discharger has characterized WWTF effluent total nitrogen to be 7 mg/L. Assuming an irrigation rate of 5.3 acre-feet for the City-owned land, the nitrogen loading will be 100 lbs/acre/year. Assuming an irrigation rate of 3.6 acre-feet for the private farmland, the nitrogen loading will be 69 lbs/acre/year.

Compliance History

On 23 February 2001, the Board issued the Discharger a Notice of Violation (NOV) for the following: exceeding the flow limit; failing to calibrate flow meters annually; exceeding the total suspended solids limit; failing to preclude public access to the use area; failing to apply wastewater to the use area at agronomic rates; failing to keep ditches and sumps free of marginal vegetation; failing to dispose of sludge in a manner approved by the Executive Officer and in compliance with Title 27, CCR, section 20005 et seq.; failing to submit monitoring results at the required frequency (since 1994, the City has not been submitting the Annual Land Management Reports); and failing to inform the Board of a wastewater spill. The NOV also cited the City in threatened violation for failing to adequately control weeds around the storage ponds, and threatening to degrade groundwater quality by storing sludge onsite for an inordinate amount of time. The NOV directed the City to submit a Report of Waste Discharge (RWD), including a technical report, describing how the City plans to modify the WWTF to accommodate flows at least for a 10-year planning period. By letter dated, 24 March 2000, the City responded by indicating that expansion plans for the WWTF were currently under way to increase capacity.

Proposed Expansion

The City submitted a RWD, dated 5 September 2000, in support of expanding its WWTF to an average day maximum month flow of 7.2 mgd capacity. After the proposed expansion the WWTF will consist of headworks, screening, grit removal, an aerated grit chamber, four primary clarifiers, four biofilters, four secondary clarifiers, three sludge digesters, a sludge thickener, 7.2 acres of sludge drying beds, and seven storage ponds. By letter dated 6 October 2000, staff indicated that the RWD was incomplete and should include a water and nutrient balances, a summary of existing groundwater monitoring data, the reclamation area, and descriptions of the City's source water supply, groundwater monitoring network, storm water management, sludge management, flood-proofing measures, and BPTC measures. By letter dated 13 March 2001, the City

submitted a letter addressing staff comments to the RWD. The City submitted the water and nutrient balances by letter dated 12 April 2001.

The proposed sludge handling for the expanded facility will remain the same except that the primary sludge will be processed directly through the anaerobic digesters, the secondary sludge will be pumped to the gravity sludge thickener, the existing sludge drying beds will be lined and 5.6 acres of new lined sludge dryings beds will be added for a total of 7.2 acres.

Groundwater Conditions

Regional groundwater flows to the southwest and the depth of water occurs about 15 to 17 feet below ground surface (bgs), according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by the California Department of Water Resources in Spring 1997. Soils in the WWTF vicinity and Use Area are classified as Garces silt loam, Garces silt hard substratum, and Kimberlina fine sandy loam and exhibit moderate infiltration rates. Areal topography indicates a slope of about 1 foot per 2500 feet toward the west. Irrigated agriculture has, over the years, increased the salinity of groundwater as it flows towards the trough of the Tulare Lake Basin. The City of Delano is approximately midway between the eastern edge of the San Joaquin Valley floor and its trough. The salinity would limit the types of crops that can be grown solely with area groundwater, except for augmentation with surface water. Groundwater used for municipal supply is extracted from below the level impacted by irrigated agriculture, at depths exceeding 400 feet below ground surface.

In 1987, the Discharger established a groundwater monitoring well network in the WWTF vicinity comprised of four monitoring wells: MW-1 is upgradient of the WWTF; MW-2 is downgradient of the ponds; MW-3 is downgradient of the ponds and the Use Area; and MW-4 is downgradient of the ponds, Use Area, WWTF, and sludge drying beds. The perforated screened interval of each monitoring well is as follows:

WWTF and Use Area	Well No.	Perforated Interval (feet bgs)
Upgradient	MW-1	32.5 – 52.5
Downgradient	MW-2	35- 55
	MW-3	28 - 48
	MW-4	38 - 58

The Discharger has been monitoring groundwater quality in these wells on an annual basis since 1987 for groundwater elevation, EC, pH, and nitrates. The Discharger's self-monitoring reports indicate that groundwater depth at the WWTF is about 14 feet bgs. Annual monitoring well data indicates groundwater levels beneath the WWTF have risen about six feet between 1991 and 2000. Annual groundwater monitoring data since 1987 shows that groundwater passing through downgradient wells has higher concentrations of nitrate-nitrogen and EC than background levels (i.e., as determined by upgradient well monitoring).

The Discharger indicates that the above values may inaccurately characterize area groundwater quality since it may not have purged the wells adequately prior to sampling. The City retained BSK to properly sample monitoring wells. The results from BSK indicate groundwater pollution with nitrogen, iron, and sulfate, and degradation from salinity components.

Land Use Near the Facility and Use Area

The City of Delano is about two miles east of the WWTF. The North Kern State Prison is to the north and another proposed state prison is to the west. The remaining area surrounding the WWTF is zoned as Residential-Agricultural and includes agricultural and vacant land. Crops in the Delano area include orchard fruits, grapes, almonds, cotton and corn.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The WWTF is in the North Kern Hydrologic Unit of the Tulare Lake Basin. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic supply in this instance), the procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

Nearby canals convey surface water for irrigation. The beneficial uses of the canals, Valley Floor Waters as identified in the Basin Plan, include industrial and agricultural supply, water contact and noncontact water recreation, warm fresh water habitat, preservation of rare and endangered species, and groundwater recharge.

The Basin Plan indicates that degradation of groundwater in the Tulare Lake Basin by salts is unavoidable without a plan for removing the salts from the Basin. In the absence of a valley wide drain to carry salts out of the valley, the Basin Plan indicates that the only other solution is to manage the rate of degradation by minimizing the salt loads to groundwater. The Board implements this policy, in part, by prescribing effluent salinity limits in waste discharge requirements for all discharges to land in the Basin. The Basin Plan's discharge salinity limit consists of narrative and numerical limits:

> "The incremental increase in salts from use and treatment must be controlled to the extent possible. The maximum EC shall not exceed the EC of the source water plus 500 µmhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources."

Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters from other parts of the State. The Basin Plan encourages recycling and does not consider disposal by evaporation and percolation or discharge to surface waters a permanent disposal solution when the potential exists for recycling. Further, the Basin Plan requires that project reports for new or expanded wastewater facilities shall include plans for wastewater recycling or the reasons why this is not possible.

The Basin Plan requires that "Facilities which discharge or are designed to discharge in excess of 1 million gallons per day must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both 5-day BOD and suspended solids."

Further, the California Department of Health Services (DHS) has established statewide recycling criteria in Title 22, California Code of Regulations (CCR), section 60301 et seq., (hereafter Title 22), and guidelines for use of recycled water. Revised water recycling criteria, which became effective on 2 December 2000, 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. Further, the revised Title 22 requires that all wastewater used for recycling receive, at a minimum, secondary treatment. The Basin Plan's secondary treatment performance standard meets the Title 22 minimum criteria.

The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA) in accordance with Title 14, CCR, section 15302.

Antidegradation

The antidegradation directives of section 13000 of the California Water Code require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation" Policy).

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Board to evaluate that fully characterizes:

- all waste constituents to be discharged, the background quality of the uppermost layer of the uppermost aquifer
- the background quality of other waters that may be affected
- the underlying hydrogeologic conditions
- waste treatment and control measures

- how treatment and control measures are justified as best practicable treatment and control
- the extent the discharge will impact the quality of each aquifer
- the expected degradation compared to water quality objectives

In allowing a discharge, the Board must comply with CWC section 13263 in setting appropriate conditions. The Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC section 13263(b)) and must consider other waste discharges and factors that affect that capacity. The applicable beneficial uses (agricultural, industrial, and domestic supply in this instance), procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity are set forth in the Basin Plan.

The discharge has been occuring for years. Certain waste constituents in municipal wastewater are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater. Some degradation for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of municipal wastewater service to the State far outweigh the environmental impact damage of a community that would otherwise be reliant on numerous concentrated individual wastewater systems. Economic prosperity of valley communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate increases in wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the maximum benefit to the people of the State.

Groundwater monitoring data at this site is insufficient to establish the most appropriate receiving water limits. In addition, as explained elsewhere in this information sheet, certain aspects of waste treatment and control practices may not have been met and, if not, are unlikely to be justified as representative of BPTC (e.g., unlined sludge drying beds). Reasonable time is necessary to gather specific information about the facility and the site to make informed, appropriate, long-term decisions. This proposed Order, therefore, establishes receiving water limitations to assure protection of the beneficial uses of waters of the State pending the completion of certain tasks and provides time schedules to complete specified tasks. The tasks provide that the Discharger is expected to identify, implement, and adhere to best practicable treatment and control as individual practices are reviewed and upgraded in this process. During this period, degradation may occur from certain constituents, but can never exceed water quality objectives (or background water quality should it exceed objectives) or cause nuisance.

Water quality objectives define the least stringent limits that could apply as water quality limitations for groundwater at this location, except where background quality unaffected by the discharge already exceeds the objective. The values below reflect water quality objectives that must be met to maintain specific beneficial uses of groundwater.

Constituent	Units	Value	Beneficial Use	Criteria or Justification
Ammonia	mg/L	0.5	MUN[1]	Taste and Odor[2]
Boron	mg/L	0.7	AGR[3]	Boron sensitivity[4]
Chloride	mg/L	106	AGR[3]	Chloride sensitivity on certain crops irrigated via sprinklers[4]
		142	AGR[3]	Chloride sensitivity on certain crops[4]
		250	MUN[1]	Recommended Secondary MCL[5]
		500	MUN[1]	Upper Secondary MCL[5]
Conductivity (EC)	µmhos/cm	700	AGR[3]	Salt sensitivity[4]
		900	MUN[1]	Recommended Secondary MCL[5]
		1,600	MUN[1]	Upper Secondary MCL[5]
Iron	mg/L	0.3	MUN[1]	Secondary MCL[6]
Manganese	mg/L	0.05	MUN[1]	Secondary MCL[6]
Nitrate as N	mg/L	10	MUN[1]	Primary MCL[7]
Nitrite as N	mg/L	1	MUN[1]	Primary MCL[7]
pH	pH Units	6.5 to 8.5	MUN	Secondary MCL[8]
Sodium	mg/L	69	AGR[3]	Sodium sensitivity on certain crops[4]
Total Coliform Organisms	MPN/100 mL	2.2	MUN[1]	Basin Plan
Total Dissolved Solids	mg/L	450	AGR[3]	Salt sensitivity[4]
		500	MUN[1]	Recommended Secondary MCL[5]
		1,000	MUN[1]	Recommended Upper MCL[5]
Total Trihalomethanes	µg/L	100	MUN	MCL[9]
Chloroform	µg/L	1.1	MUN[1]	Narrative Toxicity Criteria[10]
Bromodichloromethane	µg/L	0.27	MUN[1]	Narrative Toxicity Criteria[10]
Dibromochloromethane	µg/L	0.37	MUN[1]	Narrative Toxicity Criteria[10]
Bromoform	µg/L	4.3	MUN[1]	Narrative Toxicity Criteria[10]

[1] Municipal and domestic supply
[2] Council of the European Union, On the Quality of Water Intended for Human Consumption, Council Directive 98/83/EC (3 November 1998).
[3] Agricultural supply
[4] Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985)
[5] Title 22, CCR, section 64449, Table 64449-B
[6] Title 22, CCR, section 64449, Table 64449-A
[7] Title 22, CCR, section 64431, Table 64431-A
[8] United States Environmental Protection Agency
[9] Title 22, CCR, section 64439
[10] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment Cancer Potency Factor as a Drinking Water Level, *California Environmental Protection Agency Toxicity Criteria Database*

Sodium and chloride can cause foliar damage to crops that are sprinkler irrigated. Trees, vines, and woody species are the most susceptible. To protect crops near the WWTF that could be sprinkler irrigated (e.g., plums), the applied water should not contain values of sodium or chloride above 115 and 175 mg/L, respectively, according to *Agricultural Salinity Assessment and Management*, published by the American Society of Civil Engineers. Even though these values are higher than those recommended by the Guidelines (i.e., 69 mg/L for sodium and 106 mg/L for chloride), it is appropriate to use them as water quality objectives at this location because of salt concentrations apparent in area groundwater.

Municipal wastewater contains numerous dissolved inorganic waste constituents (i.e., salts, minerals) that together comprise total dissolved solids (TDS). Not every constituent is critical to beneficial use. Constituents that are critical are individually listed. The cumulative impact from these other constituents, along with the cumulative affect of the constituents that are individually listed, can be effectively controlled using TDS as a generic indicator parameter. Most dissolved inorganic substances in water are in the ionized form and so contribute to a solution's ability to carry an electrical current, or its "electrical conductivity" (EC). EC varies both with the number and type of ions the solution contains and is strongly temperature dependent. It is standard practice to report a solution's EC at 25° Celsius (this value is technically called "specific conductance"). Only ions can carry a current, however. Un-ionized species of weak acids or bases will not carry a current, nor will uncharged soluble organic materials, such as ethyl alcohol and glucose, even though these constituents comprise a portion of TDS. Although EC is affected by the nature of the various ions, their relative concentrations, and ionic strength of the water, EC measurements can give a practical estimate of the variations in a solution's dissolved mineral content. An empirical factor may be developed from simultaneous measurements of TDS and EC that allows for the rapid estimation of TDS from EC measurements.

Treatment Technology and Control

Given the character of municipal wastewater, secondary treatment technology is generally sufficient to control degradation of groundwater from decomposable organic constituents. Adding disinfection significantly reduces populations of pathogenic organisms, and reasonable soil infiltration rates and unsaturated soils can reduce them further. Neither organics nor total coliform, the indicator parameter for pathogenic organisms, should be found beneath groundwater in a well-designed, well-operated facility.

Municipal wastewater typically contains nitrogen in concentrations greater than water quality objectives, which vary according to the form of nitrogen. Degradation by nitrogen can be controlled by an appropriate secondary treatment system (e.g., oxidation ditch), tertiary treatment for nitrogen reduction, and agronomic reuse on harvested crops. The effectiveness varies, but generally best practicable treatment and control should be able to control nitrogen degradation at a concentration well below the water quality objectives. The Discharger's operation of the WWTF has resulted in an effluent with an average nitrogen concentration of 7 mg/L.

Waste constituents that are forms of salinity pass through the treatment process and soil profile and effective control of long-term affects relies upon effective source control and pretreatment measures. In the best of circumstances, long-term land discharge of treated municipal wastewater will degrade groundwater with salt (as measured by TDS and EC) and the individual components of salts (e.g., sodium, chloride). Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride tends to pass through both rapidly to groundwater. As chloride concentrations in most groundwaters in the region are much lower than in treated municipal wastewater, chloride is a useful indicator parameter for evaluating the extent to which effluent reaches groundwater.
Other indicator constituents for monitoring for groundwater degradation due to recharged effluent include total coliform bacteria, ammonia, total nitrogen, and total trihalomethanes (when the effluent is chlorinated). Chlorine disinfection of effluent causes formation of trihalomethanes, which are priority pollutants. Treatment to reduce these in wastewater generally has not been performed, and little is known at this point on the typical impact on groundwater. Total trihalomethanes (TTHMs) are chlorinated organic materials that are toxic at low concentrations. Common TTHMs include bromoform, bromodichloromethane, dibromochloromethane, and chloroform. While the State drinking water regulations (i.e., Title 22, CCR, section 64439) establish a maximum contaminant level for TTHMs of 100 µg/L, the actual concentrations at which THMs components are considered "toxic" to humans are much lower (e.g., chloroform's human health toxicity limit is 1.1 µg/L). The Basin Plan states that groundwaters "shall 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."

Boron is another TDS constituent that may occur in wastewater in concentrations greater than groundwater depending on the source water, to the extent residents use cleaning products containing boron, and whether any industrial dischargers utilize boron (e.g., glass production, cosmetics). Still other constituents in treated municipal waste that may pass through the treatment process and the soil profile include recalcitrant organic

compounds (e.g., ethylene glycol, or antifreeze), radionuclides, and pharmaceuticals. Hazardous compounds are not usually associated with domestic wastes and when present are reduced in the discharge to inconsequential concentrations through dilution with domestic waste, treatment, and the implementation of effective pretreatment programs.

A discharge of wastewater that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under conditions of low soil pH (i.e., below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Discharge of residual sludge to land may also lead to increases in groundwater alkalinity and hardness to concentrations that impair the water's beneficial uses and contribute to an overall increase in TDS. Overloading is preventable and does not constitute BPTC as used in Resolution 68-16. Elevated concentrations in groundwater compared to percolating effluent of dissolved iron and dissolved manganese, along with elevated alkalinity, and hardness are useful indicators to determine whether components of the WWTF with high-strength waste constituents, such as sludge handling facilities, are ineffective in containing waste. The elevated concentration of nitrogen and other waste constituents in groundwater passing under the WWTF's sludge drying beds indicates that the Discharger's solids handling operation has caused or contributed to groundwater pollution. A separate enforcement action will address this violation.

Title 27

Title 27, CCR, section 20380 et seq. ("Title 27"), contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent is acceptable.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have been conditionally exempted from Title 27, except for residual sludge and solid waste generated as part of the treatment process [section 20090(a) of Title 27]. The condition requires that the discharge not result in violation of any water quality objective in groundwater.

Treatment and storage facilities for sludge that are part of the WWTF are considered exempt from Title 27 under section 20090(a), under the condition that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed order, sludge that will not be subjected to further treatment by the WWTF) is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27, but only

if resulting degradation of groundwater is in accordance with the Basin Plan. This means, among other things, degradation of groundwater must be consistent with Resolution 68-16 and in no case greater than water quality objectives.

CEQA

On 5 September 2000, the City of Delano submitted a mitigated negative declaration pursuant to the California Environmental Quality Act (CEQA) and State CEQA guidelines. Staff reviewed this document and responded by letter dated 6 October 2000 indicating that the City must submit a Notice of Intent to comply with Waste Discharge Requirements Order No. 99-08-DWQ and prepare a Storm Water Pollution Prevention Plan. In the letter, staff enclosed comments to the RWD, which requested that the City provide: a water balance and annual nitrogen balance using 7.2 mgd, a description of how the WWTF will be designed and constructed to withstand a 100-year event, a thorough description of the City's current and proposed sludge management practices, a description of the City's source water supply and copies of the last two annual drinking water data, a summary of all groundwater monitoring data in a tabular or graphic format, and a detailed description of onsite storm water management. Staff requested the City submit a revised mitigated negative declaration (MND) including the existing and proposed recycling operations.

The Discharger submitted a final MND, dated 19 March 2001, addressing staff comments to the draft MND. Staff reviewed this document and responded by letter dated 16 April 2001 stating the final negative declaration should indicate that the sludge drying beds will be lined and recommending that the City re-evaluate its groundwater monitoring protocol. In the letter, staff requested the City submit a Title 22 report for the existing and proposed use areas; apply for either a Master Recycling Permit or individual water recycling requirements for each user of recycled water; and submit a Notice of Intent for coverage under the General Biosolids Order. The letter indicated that the tentative WDRs submitted for Board consideration prohibits the discharge of septage to land and includes recycling requirements that limit recycling to specific types of crops.

On 13 June 2001, the City recirculated a MND for the WWTF expansion in accordance with CEQA and State CEQA Guidelines. Board staff responded by letter dated 9 July 2001 indicating the proposed

Order will restrict the Use Area to fiber and fodder crops for nonhuman consumption and will prohibit the direct application of septage to sludge drying beds. Using the consultant's current water balance, staff also commented that the proposed Order will permit the WWTF to discharge up to 7.2 mgd for the month of August, and up to 6 mgd for all other months.

On August 6 2001, the City of Delano certified an MND in accordance with CEQA and State CEQA guidelines. Board staff reviewed this document and recommends the Board concur with its findings and mitigation measures.

PROPOSED ORDER TERMS AND CONDITIONS

As in other WDRs orders for municipal discharges recently adopted by the Board, the proposed Order implements a two-phased approach to setting final groundwater limitations. While the Board has determined that some degradation is in the public interest, it cannot yet determine how much due to incomplete data and evaluation of treatment and control measures. In Phase 1 of this 'implementation approach,' WDRs orders establish receiving water limitations that assure protection of the beneficial uses of groundwater pending the completion of certain tasks in accordance with a time schedule. In Phase 2, determination of site-specific groundwater limitations to be adopted in WDRs will depend upon the Board's evaluation of the results of the tasks. The numerical implementation of many Basin Plan narrative water quality objectives in Phase 1, in accord with the procedures prescribed in the Basin Plan, represents the threshold above which there will be adverse impacts on beneficial uses of groundwater (e.g., drinking water MCLs). Since the proposed Order implements existing water quality objectives, the Board is not required to undertake further consideration of the factors in Water Code section 13241, including economic considerations.

Discharge Prohibitions, Specifications and Provisions

The proposed Order prohibits the discharge of septage to land (e.g., sludge drying beds) as this does not reflect best practicable treatment and control. The effluent limits prescribed in the proposed Order for settleable solids, BOD_5, and total suspended solids (TSS) are based on the Basin Plan and are carried over from the previous Order.

The proposed Order carries over the previous Order's salinity limitation by requiring the monthly average effluent EC to remain less than the flow-weighted average EC of the source water plus 500 µmhos/cm, or a total of 900 µmhos/cm, whichever is less. The discharge specifications regarding dissolved oxygen and freeboard are consistent with Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

The Basin Plan requires municipal facilities discharging in excess of 1 mgd to provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both 5-day BOD and suspended solids. While the current Order prescribes a monthly average daily discharge limit of 40 mg/L for BOD and for TSS, it does not require 80 percent removal. The proposed Order's Discharge Specification B.7 implements the Basin Plan's 80 percent removal requirement. From January 2000 to August 2001, monthly average influent and effluent BOD and suspended solids concentrations indicate that percent removals range from 63 to 87 and average 75 for BOD and range from 57 to 81 and average 71 for suspended solids.

The proposed Order requires the Discharger to submit a use area management plan and technical reports regarding sludge management. It also imposes a new requirement that the Discharger implement a pretreatment program that follows the federal requirements. As the requirements are new, the proposed Order establishes a time schedule for program implementation where all submittals must be complete by October 2002.

The proposed Order requires the Discharger to comply with the provisions of Title 22. To ensure compliance with Title 22 and Board recycling policy, the proposed Order requires the Discharger to implement best management practices with respect to effluent reuse (e.g., to reuse effluent at reasonable agronomic rates considering the crop, soil, climate, and irrigation management plan).

The conditions for sludge, solid waste, and biosolids management proposed in the proposed Order are intended to assure that degradation resulting from the City's management of sludge is in accordance with the Basin Plan. The proposed Order requires that storage, use and disposal of biosolids comply with the self-implementing federal regulations of 40 CFR 503, which are subject to enforcement by the U.S. Environmental Protection Agency not the Board, and the Statewide General Order for the Discharge of Biosolids (Water Quality Order No. 2000-10-DWQ) (or any subsequent document which replaces Order No. 2000-10-DWQ).

The proposed Order prescribes groundwater limitations that reflect numerical and narrative water quality objectives (WQOs) for groundwater established in the Basin Plan. The proposed Order requires the discharge not to cause or contribute to exceedances of the groundwater limitations. Designated beneficial uses of area groundwater include municipal (MUN) and agricultural (AGR) supply. The Basin Plan states that "[w]ater quality objectives apply to all waters within a surface or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption." Groundwater WQOs include (1) chemical constituents (including pesticides and radioactivity), (3) salinity, (4) tastes and odors, and (5) toxicity. For groundwaters designated MUN, the Basin Plan establishes numerical WQOs for bacteria and chemical constituents. The latter consists of drinking water maximum contaminant levels (MCLs) in Title 22, sections 64431 (Inorganic Chemicals); 64431 (Fluoride); 64443 (Radioactivity) 64444 (Organic Chemicals); 64449 (Secondary MCLs – Consumer Acceptance Limits); and lead not to exceed 0.015 mg/L.

The total coliform organism limitation of 2.2 MPN/100 mL in Groundwater Limitation G.1.a is based on the Basin Plan's WQO (i.e., the concentration of TCO over any 7-day period shall be less than 2.2/100 mL). Groundwater Limitation F.1.b prescribes a value of 10 mg/L as total nitrogen to ensure that groundwater nitrate levels will remain at or below the Title 22 primary drinking water MCL for nitrate (45 mg/L as nitrate or 10 mg/L as N). The limitations for chemical constituents prescribed in Groundwater Limitation F.1.c reflect the Title 22 drinking water MCLs.
Groundwater Limitation F.2 prescribes limits for boron, chloride, EC, sodium, and TDS to protect existing and future beneficial uses of area groundwater for agriculture. The majority of area agriculture water supply is currently delivered via flood irrigation. Available information on uppermost groundwater quality indicates, for reasons potentially unrelated to the discharge, quality may not meet the criteria for high quality irrigation water. Accordingly, it may not be critical to maintain the conservative low salt concentrations in agricultural supply as some references recommend for sprinkler irrigation. Additionally, the Discharger has implemented best practicable control for salt constituents as its effluent EC is on average only 300 µmhos/cm higher than source water EC.

The proposed Order prescribes groundwater limitations that reflect water quality objectives for protecting the beneficial uses of area groundwater and requires the Discharger to conduct a BPTC evaluation of the discharge

(including source control, pretreatment, and treatment). Once it completes its BPTC evaluation, the Discharger may, at its discretion, propose for Board consideration site-specific, constituent-specific limits for salinity constituents (e.g., chloride, EC, sodium, and TDS). In the next Order regulating the discharge, the Board will evaluate the Discharger's justification of BPTC implementation and its proposed groundwater salinity limitations. It is possible upon further documentation and analysis that the discharge may be found not to be causing degradation from these waste constituents, but if it is the resulting degradation from salt can probably be found consistent with Resolution 68-16.

The last two groundwater limitations reflect narrative WQOs contained in the Basin Plan. Groundwater Limitation F.3 implements the Basin Plan's WQO for taste and odor. The taste threshold for ammonia, a waste constituent in municipal wastewater, is 0.5 mg/L. The limitation of 0.5 mg/L for ammonia ensures that this waste constituent will not adversely affect the beneficial use of area groundwater for human consumption. Lastly, Groundwater Limitation F.4 implements the Basin Plan's WQO for toxicity.

Monitoring Requirements

Section 13267 of the CWC authorizes the Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The proposed Order requires influent monitoring of settleable solids, pH, BOD_5, and TSS, and effluent monitoring of pH, BOD_5, TSS, settleable solids, TDS, EC, ammonia, nitrate, TKN, total nitrogen, general minerals, metals, and priority pollutants. Effluent monitoring of these constituents is necessary to check compliance with various discharge specifications. The proposed Order also includes groundwater, supply water, and sludge monitoring. The monitoring is necessary to evaluate groundwater quality and the extent of the degradation and pollution from the discharge. The proposed Order includes monitoring of recycling activities to check compliance with Title 22 and the terms and conditions of this Order. This Order contains influent and effluent monitoring of all constituents that required monitoring in the previous Order, except effluent dissolved oxygen, and adds influent monitoring for pH and effluent monitoring for TDS, total nitrogen, general minerals, metals. The addition of pH, TDS, general minerals, metals, priority pollutants, is to develop a more accurate characterization of the discharge, while the addition of total nitrogen monitoring is to quantify the amount of nitrogen loading. To determine if the Discharger is in compliance with Discharge Specification B.4, it is required to monitor its source water quarterly for EC. To determine the efficiency of the Discharger's operation, the Discharger is required to monitor influent daily for settleable solids and pH and twice weekly for BOD_5 and TSS. In order to adequately characterize its wastewater effluent, the Discharger is required to monitor daily for settleable solids, and pH; twice weekly for TSS, and BOD_5; and twice monthly for TDS, EC, and nitrogen constituents; and semiannually for general minerals and metals, and annually for priority pollutants. To monitor storage ponds for capacity constraints and potential nuisance conditions, the Discharger is required to monitor freeboard available and dissolved oxygen content weekly.

The proposed Order requires the Discharger to collect a composite sample of sludge at least annually, in accordance with EPA's *POTW SLUDGE SAMPLING AND ANALYSIS GUIDANCE DOCUMENT, AUGUST 1989,* and test for arsenic, cadmium, molybdenum, copper, lead, mercury, nickel, selenium, and zinc. The proposed Order requires the Discharger to submit an annual summary of sludge discharge operations.

The Title 27 zero leakage protection strategy relies heavily on extensive groundwater and unsaturated zone monitoring to increase a discharger's awareness of, and accountability for, compliance with the prescriptive and performance standards. With a high volume, concentrated, uncontained discharge to land, monitoring takes on even greater importance. The proposed Order includes monitoring of applied waste quality, application rates, and groundwater. With respect to recycling, the proposed Order requires the Discharger to submit quarterly monitoring reports on recycling activities, and to submit an annual summary report.

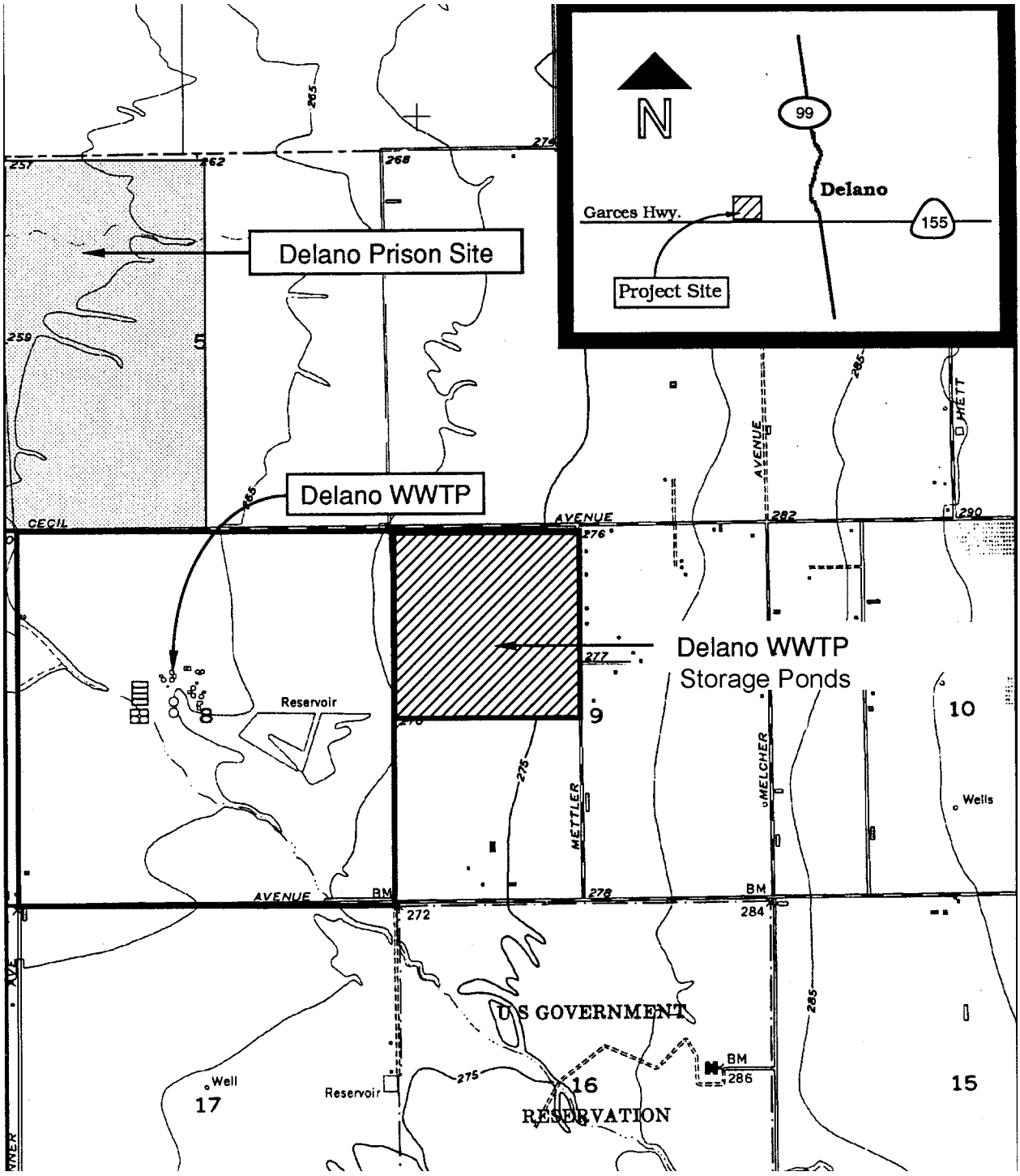
The proposed Order requires the Discharger to evaluate the uppermost aquifer for a representative zone against which groundwater limitations will be applied. The proposed Order requires installation of an effective monitoring network that includes wells in the uppermost aquifer. One or more wells will monitor the quality of groundwater unaffected by the discharge and serve as 'background'. The proposed Order requires the Discharger to evaluate the uppermost aquifer for a representative zone or zones for evaluation of compliance with groundwater limitations. The approved representative zones of the aquifer will be identified in the hydrogeologic investigation described in Provision G.11. Wells must be installed to measure the quality of water within these zones for comparison with Groundwater Limitations as part of the proposed Order. The proposed Order provides a schedule for proposing, then providing the monitoring network, for these representative zones. Until the network is installed, the Board cannot adequately evaluate compliance with Groundwater Limitations. Use of existing groundwater monitoring wells will continue for the purposes of monitoring the effects of the discharge on the uppermost layer of groundwater until an alternate network suitable for evaluating the effectiveness of BPTC and compliance with Groundwater Limitations is approved by the Executive Officer in accord with the process outlined in the proposed Order.

Reopener

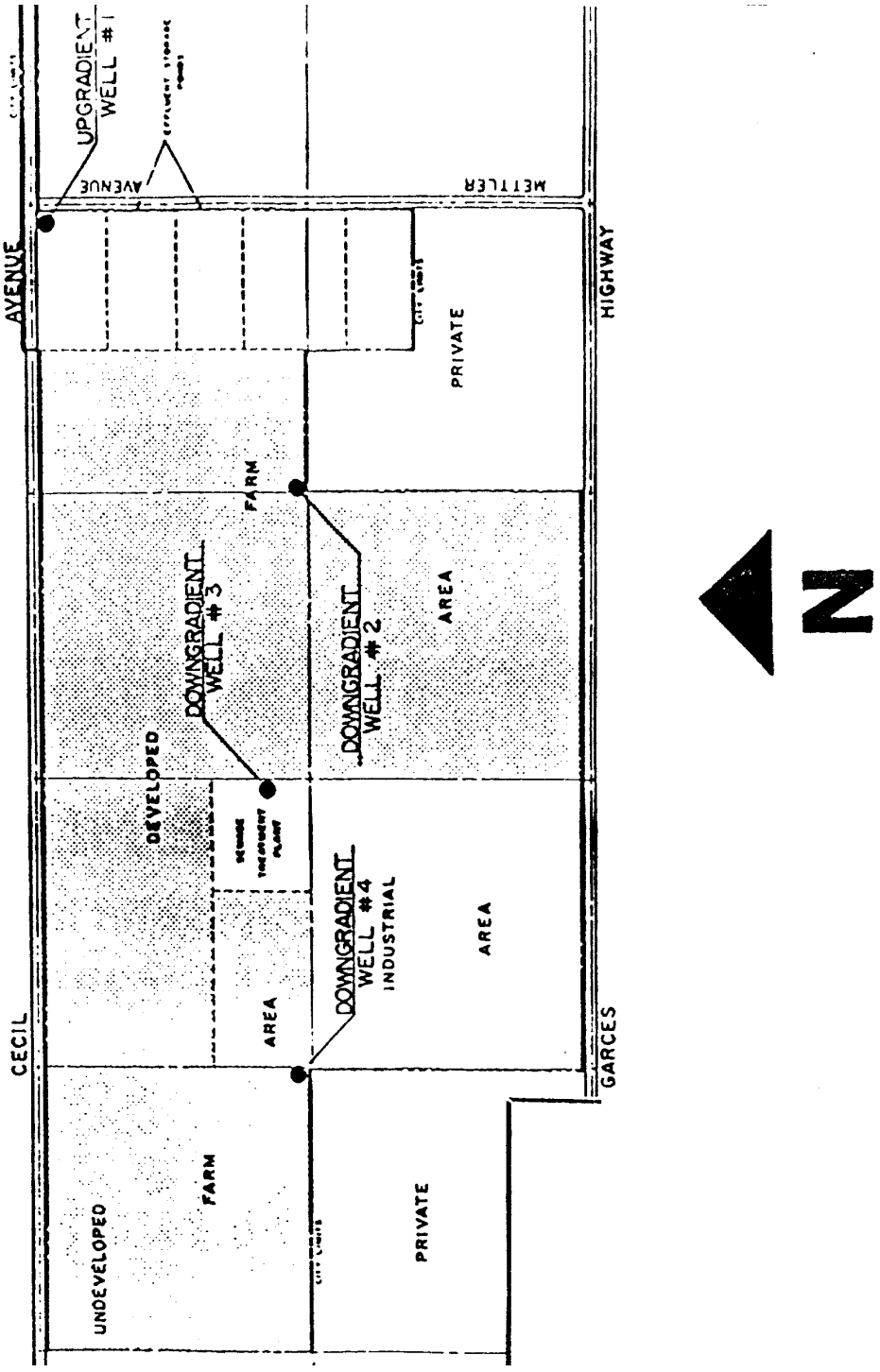
The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. However, information is presently insufficient to develop final effluent and groundwater limitations, so the proposed Order sets limitations for the interim while site-specific, constituent-specific limits are developed in conjunction with a BPTC evaluation, including source control and pretreatment. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible may that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and

regulations may change is not sufficient basis for reopening the Order. The CWC requires that waste discharge requirements implement all applicable requirements.

ams/jlk:fmc:10/19/01 AMENDED



ATTACHMENT A
LOCATION MAP
WASTE DISCHARGE REQUIREMENTS ORDER NO.
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY
Sections 8 and 9, T25S R25E, MDB&M, USGS 7.5' Delano Quadrangle



ATTACHMENT D
MONITORING WELL MAP
WASTE DISCHARGE REQUIREMENTS ORDER NO.
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

Sections 8 and 9, T25S R25E, MDB&M, USGS 7.5' Delano Quadrangle

WASTE DISCHARGE REQUIREMENTS ORDER NO.
FOR
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

ATTACHMENT F
INFORMATION NEEDS FOR SLUDGE MANAGEMENT PLAN

A. Wastewater Treatment Facility (WWTF)

1. Describe treatment processes at the wastewater treatment facility.
2. List significant industrial users (SIUs) that discharge to the wastewater treatment facility and describe how SIUs affect sludge production, sludge handling, and biosolids disposal.
3. Indicate whether the WWTF has an adopted source control ordinance or a pretreatment program, and if the latter whether the program is approved by the Board.
4. Indicate whether WWTF accepts septage and, if so, describe septage handling operation facilities.
5. Provide a WWTF site map showing:
    a. existing sludge handling facilities (e.g., sludge drying beds and sludge storage areas)
    b. abandoned sludge handling facilities (if applicable)
    c. location of groundwater monitoring wells, if any, and groundwater gradient.

B. Sludge Production

1. Provide a schematic diagram showing solids flow and sludge handling operations; include, where applicable, supernatant flow and handling operations.
2. Specify the quantity of sludge expected to annually accumulate in each wastewater treatment process, how it is quantified, and the expected removal frequency.
3. For sludge handling facilities with sludge drying beds:
    a. Describe number and size of sludge drying beds.
    b. Describe sludge drying bed construction (e.g., liner, leachate collection system).
    c. If sludge drying beds are not lined, thoroughly describe measures taken to ensure that area groundwater is not adversely affected by sludge drying operations.
    d. Indicate the expected frequency with which sludge will be applied to and removed from sludge drying beds.
4. Describe how biosolids are transferred to onsite biosolids storage facility (if applicable). If biosolids are removed directly from sludge drying beds, provide a plan that indicates when during the year you expect to dispose of biosolids and explain that whoever is responsible for disposing of your biosolids will be able to remove and dispose it at this time.

C. Biosolids Characterization

1. Describe proposed sampling procedures by indicating number of samples, sample locations, and sample composition. For reference consult *POTW Sludge Sampling an Analysis Guidance Document*, published by the EPA Publication No. 833-B-89-100.
2. Describe the methods proposed to meet the necessary levels of pathogen reduction (i.e., Class A or B according to 40 CFR 503.32) for the proposed method of sludge disposal.
3. Describe the methods proposed to meet vector reduction requirements, in accordance with 40 CFR Part 503.33.

D. Biosolids Storage

1. If on-site biosolids storage is used,
    a. Describe:
        i. Size of biosolids storage area
        ii. How frequently it will be used (emergency basis only or routine use)
        iii. Typical storage duration
        iv. Leachate controls
        v. Erosion controls
        vi. Run-on/runoff controls
    b. Indicate measures that will be taken to ensure that area groundwater is not adversely affected by the biosolids storage facility.
    c. For biosolids storage facilities that contain biosolids between 1 October and 30 April, describe how facilities are designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.
    d. Provide a map of showing setback distances from (where applicable)
        i. Property lines
        ii. Domestic water supply wells
        iii. Non-Domestic water supply wells
        iv. Public roads and occupied onsite residences
        v. Surface waters, including wetlands, creeks, ponds, lakes, underground aqueducts, and marshes
        vi. Primary agricultural drainage ways
        vii. Occupied non-agricultural buildings and off-site residences
        viii. Primary tributary to a waterway or reservoir used for domestic water supply

ix. Domestic surface water supply intake

E. Spill Response Plan

1. Emergency contacts and notification procedures
2. Personal protective equipment requirements
3. Response instructions for
   a. spill during biosolids transport
   b. storage facility failure
   c. when hazardous or other unauthorized material is found

F. Method of Disposal

1. Describe and provide the following information related to biosolids disposal method(s). If more than one method will be utilized, include the percentage of annual biosolids production expected to be disposed of by each method.
   a. Landfill Disposal
      i. Name(s) and location(s) of landfill(s).
      ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the landfill(s).
      iii. Present classification of the landfill(s).
      iv. Name and telephone number of the contact person at the landfill(s).

   b. Incineration
      i. Name(s) and location(s) of incineration site(s).
      ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the incineration site(s).
      iii. Method of disposal of ash from the incineration site(s).
      iv. Names and locations of facilities receiving ash from the incineration site(s), if applicable.
      v. Name and telephone number of the contact person at the incineration site(s).
   c. Composting
      i. Name(s) and location(s) of composting site(s).
      ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the composting site(s).

iii. Name and telephone number of the contact person at the composting site(s).

d. Land Application

i. Ownership of the site(s) where biosolids are applied.

ii. Assessor Parcel Numbers (APNs) of site(s) where biosolids are applied.

iii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the biosolids application site(s).

WASTE DISCHARGE REQUIREMENTS ORDER NO.
FOR
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

ATTACHMENT G
STANDARD MONITORING WELL PROVISIONS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a work plan containing at least the information specified in this document. Wells may be installed after the executive officer's approval of the work plan. Upon installation of the monitoring wells, the Discharger shall submit a report of results, as described below. A registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California must sign all work plans and reports.

Monitoring Well Installation Work Plan

A. General Information:
   - Monitoring well locations and rationale
   - Survey details
   - Equipment decontamination procedures
   - Health and safety plan
   - Topographic map showing any existing monitoring wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details: describe drilling and logging methods

C. Monitoring Well Design:
   - Casing diameter
   - Borehole diameter
   - Depth of surface seal
   - Well construction materials
   - Diagram of well construction
   - Type of well cap
   - Size of perforations and rationale
   - Grain size of sand pack and rationale
   - Thickness and position of bentonite seal and sand pack
   - Depth of well, length and position of perforated interval

D. Well Development:
   - Method of development to be used
   - Method of determining when development is complete
   - Method of development water disposal

E. Surveying Details: discuss how each well will be surveyed to a common reference point

F. Soil Sampling (if applicable):

Cuttings disposal method
Analyses to be run and methods
Sample collection and preservation method
Intervals at which soil samples are to be collected
Number of soil samples to be analyzed and rationale
Location of soil samples and rationale
QA/QC procedures

G. Well Sampling:
Minimum time after development before sampling (48 hours)
Well purging method and amount of purge water
Sample collection and preservation method
QA/QC procedures

H. Water Level Measurement:
The elevation reference point at each monitoring well shall be within 0.01 foot. Ground surface elevation at each monitoring well shall be within 0.1 foot. Method and time of water level measurement shall be specified.

I. Proposed time schedule for work.

Monitoring Well Installation Report of Results

A. Well Construction:
Number and depth of wells drilled
Date(s) wells drilled
Description of drilling and construction
Approximate locations relative to facility site(s)
A well construction diagram for each well must be included in the report, and should contain the following details:
Total depth drilled
Depth of open hole (same as total depth drilled if no caving occurs)
Footage of hole collapsed
Length of slotted casing installed
Depth of bottom of casing
Depth to top of sand pack
Thickness of sand pack
Depth to top of bentonite seal
Thickness of bentonite seal

Thickness of concrete grout

Boring diameter
Casing diameter
Casing material
Size of perforations
Number of bags of sand
Well elevation at top of casing
Depth to ground water
Date of water level measurement
Monitoring well number
Date drilled
Location

B. Well Development:
Date(s) of development of each well
Method of development
Volume of water purged from well
How well development completion was determined
Method of effluent disposal
Field notes from well development should be included in report.

C. Well Surveying: provide reference elevations for each well and surveyor's notes

D. Water Sampling:
Date(s) of sampling
How well was purged
How many well volumes purged
Levels of temperature, EC, and pH at stabilization
Sample collection, handling, and preservation methods
Sample identification
Analytical methods used
Laboratory analytical data sheets
Water level elevation(s)
Groundwater contour map

E. Soil Sampling (if applicable):
Date(s) of sampling

Sample collection, handling, and preservation method
Sample identification
Analytical methods used
Laboratory analytical data sheets

ATTACHMENT E
Symbol for Recycle Water Signs
WASTE DISCHARGE REQUIREMENTS ORDER NO.
CITY OF DELANO
WASTEWATER TREATMENT FACILITY
KERN COUNTY