

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 96-009

NPDES NO. CA0081311

WASTE DISCHARGE REQUIREMENTS
FOR
VALLEY WASTE DISPOSAL COMPANY

AND
CAWELO WATER DISTRICT
KERN FRONT OIL FIELD - CAWELO RESERVOIR B
KERN COUNTY

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

1. Valley Waste Disposal Company (VWDC), a California corporation, submitted an application on 1 December 1994 for reissuance of a permit to discharge wastewater under the National Pollutant Discharge Elimination System (NPDES). The discharge is presently governed by Waste Discharge Requirements Order No. 90-162 (NPDES No. CA0081311), adopted by the Board on 21 June 1990, and administratively extended.
2. The VWDC receives oil production wastewater at its Kern Front No. 2 treatment facility from companies operating oil wells in the Kern Front oil field. The companies conveying oil field produced water to VWDC for final treatment and disposal are: Berry Petroleum Company; Bellaire Oil Company; Oxy U.S.A., Inc.; and Stockdale Oil and Gas, Inc. The treatment facility is in the west half of Section 27, T28S, R27E, MDB&M, along the south side of James Road, as shown on Attachment A. Attachment A is attached hereto and made part of this Order by reference.
3. Oxy U.S.A., Inc.; Stockdale Oil and Gas, Inc.; and Berry Petroleum discharge approximately 2.14 mgd, 0.165 mgd, and 0.0002 mgd, respectively, of produced water to unlined channels, shown on Attachment B, that convey wastewater to VWDC. Attachment B is attached hereto and made part of this Order by reference. Over half of the wastewater discharged to the channels is lost through percolation, evaporation, and evapotranspiration before reaching VWDC. Bellaire Oil Company conveys all of its water to VWDC by pipe. A staff inspection on 15 June 1995 discovered evidence of toxicity in the channel discharges, as indicated by dead vegetation in the channel as well as staining caused by oil in the discharge. Staff requested Oxy U.S.A., Stockdale Oil and Gas, and Berry Petroleum to submit a Report of Waste Discharge for the discharges to the conveyance channels.

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4. Wastewater is treated for the removal of oil and grease and inorganic sediment. Two unlined ponds, in series, provide initial gravity separation. Floating oil and grease in the ponds is periodically skimmed and removed. A Wemco air flotation unit provides final polishing. The Wemco unit uses air flotation techniques combined with chemical coagulants and mechanical agitation to remove free oil and grease. After final polishing, wastewater is discharged to a concrete-lined storage pond then pumped to Reservoir B. The Wemco unit reportedly has a design treatment capacity of 4.3 mgd.

5. The VWDC conveys its treated wastewater from the storage pond through a 20-inch, 3.4 mile pipeline to the Cawelo Water District's Reservoir B. Reservoir B is an integral part of the Cawelo Water District's (CWD) water distribution system, which consists of 5.3 miles of lined canal and 38 miles of pipeline ranging in size from 15" to 60". Reservoir B is on the boundary between the Kern Uplands Hydrologic Area (No. 558.90) and the North Kern Hydrologic Area (No. 558.80) as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. Reservoir B supplies irrigation water used in the North Kern Hydrologic Area via the Distribution Canal.

6. Oil and grease removed by the Wemco unit is transferred to a collection sump. The sludge is then periodically removed with a vacuum truck and reportedly returned to the oil field operators. Occasionally the sludge is used as a road stabilizer on unimproved roads in the Kern Front oil field. VWDC has not submitted a sludge management plan.

7. The Discharger currently discharges approximately one mgd of produced water to Reservoir B. Based on 1995 monitoring data, the effluent exhibits the following water quality characteristics:

<u>Constituent</u>	<u>Units</u>	<u>Average¹ Value</u>	<u>Standard Deviation</u>
Conductivity ²	µmhos/cm	1063	56
Chloride	mg/l	68	2
Boron	mg/l	0.9	0.1
Oil and Grease	mg/l	12	3

¹ Value not flow-weighted

² Specific Electrical Conductance at 25°C, also "EC"

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8. Section 402(o)(1) of the Federal Clean Water Act states that permits may not contain effluent limitations less stringent than effluent limits in the previous permit. Allowed exceptions to the *Anti-Backsliding Rule* are contained in CWA § 402(o)(2). CWA § 402(o)(2) states that less stringent effluent limits may be used if a lower limit is necessary due to circumstances over which the Discharger has no control and for which there is no reasonably available remedy. When VWDC's previous permit, Order No. 90-162, was adopted, it was believed that boron concentrations in Kern Front oil field produced water would remain at or below the 0.8 mg/l effluent limit set in the Order. Since then, however, boron concentrations increased slightly due to hydrogeologic factors beyond VWDC's control. Accordingly, the Discharger requests a slightly higher effluent limit for boron in order to comply with its permit.
9. On 24 February 1995, the Board adopted Waste Discharge Requirements Order No. 95-031 (NPDES Permit No. CA0082295) for Texaco Exploration and Production, Inc. and Cawelo Water District. Order No. 95-031 allows Texaco to discharge up to 18 mgd (five-year average) of oil-field produced water from the Kern River oil field into Reservoir B. CWD is required to manage the water through management practices and blending to ensure protection of applicable beneficial uses.
10. Produced water from Texaco and VWDC discharged to Reservoir B is blended with water from other surface and ground water supplies of CWD to meet the receiving water limits set forth in this Order and Order No. 95-031. Through use of its Distribution Canal, CWD discharges reclaimed water to Poso Creek for recharge of its ground water basin in the winter months when irrigation demand is low.
11. The CWD's Reservoir B, Distribution Canal, and other facilities, may, for up to four weeks a year, be shut down for maintenance or emergency reasons. At such times, VWDC is unable to discharge to Reservoir B and instead diverts its wastewater to on-site storage ponds. The fourteen on-site storage ponds reportedly have 300 acre-ft (98 million gallons) of combined available storage capacity. Thirteen of the fourteen storage ponds are unlined. Stored wastewater not lost to percolation or evaporation is delivered to Cawelo's Reservoir B upon resumption of its operation.
12. The Water Quality Control Plan for the Tulare Lake Basin (hereafter Basin Plan) contains water quality objectives for all waters of the Basin.

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13. The CWD is in the North Kern Hydrologic Area (No. 558.80) in the South Valley Floor Hydrologic Unit, as defined on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The CWD is also in the Poso Study Area described in the Basin Plan.
14. The beneficial uses of Reservoir B and the Distribution Canal are agricultural (irrigation) water supply and ground water recharge.
15. The designated beneficial uses of Poso Creek are agricultural supply, water contact recreation, noncontact water recreation, warm and cold fresh water habitat, wildlife habitat, ground water recharge, and fresh water replenishment. The reach of Poso Creek below CWD does not support a fishery or provide a cold fresh water habitat. Approximately nine miles downstream of the CWD, Poso Creek is channelized. The channel flow is west to the Kern National Wildlife Refuge.
16. Based on USGS Professional Report 437B and interpretation by the CWD's consulting geologist, the Poso Creek recharge area extends across the district and can be characterized as sandy surface soils overlying over 550 feet of continental deposits. The continental deposits consist of sandy soils with several gravel layers, and exhibit high percolation rates. The recharge area covers the channelized course of Poso Creek, approximately 200 feet wide. Unless creek flows are entering the district at the upstream (Highway 65) gauging station in sufficient flows to exceed the considerable infiltrative and percolative ability of the recharge area, waters in Poso Creek are expected to recharge ground water or evaporate within the CWD. Hence, unless there is hydraulic continuity between the upstream gauge and the downstream (Highway 99) gauge, water quality need not be better than is necessary to protect uses that exist within the recharge area.
17. The beneficial uses of the underlying ground water are municipal and domestic, industrial, and agricultural supply.
18. The Basin Plan contains the following maximum effluent limits for industrial discharges to surface waters or stream channels:

<u>Constituent</u>	<u>Units</u>	<u>Concentration</u>
Conductivity	µmhos/cm	1000
Chloride	mg/l	200
Boron	mg/l	1.0

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19. The discharge slightly exceeds the above limits for conductivity. In 1982, the Board adopted Resolution 82-136, amending the Basin Plan to recognize that discharges from Valley Waste Disposal Company and other similar discharges should be allowed to exceed Basin Plan limits in order to allow reclamation for irrigation and other beneficial uses. The Basin Plan, therefore, provides flexibility in allowing agricultural use of oil field wastewater by allowing the above maximum salinity limits to be exceeded, provided the discharger successfully demonstrates to the Board the proposed discharge will neither substantially affect water quality nor cause a violation of water quality objectives.
20. The Basin Plan sets forth a plan to protect ground water in the closed Tulare Lake Basin by requiring that salinity increases be kept to a minimum through measures on controllable factors that are practicable and economically feasible. The objective is to control salinity from all sources so as to not increase conductivity in Tule River and Poso Study Areas by more than 6 $\mu\text{mhos/cm-year}$, or in the Kern River study area by more than 5 $\mu\text{mhos/cm-year}$.
21. On 1 August 1994, Texaco and CWD submitted a *Proposed CWD/TEPI-BPD Groundwater Recharge Project - Discharges Into Reservoir "B" and Poso Creek* (hereafter "Study") prepared by R. L. Schafer. The Study looked at the combined effect of 13.4 mgd of produced water from the Kern River Oil Field (Texaco produced water) and 0.82 mgd of produced water from the Kern Front oil field (VWDC water) on ground water impacts in the CWD with regards to salinity. The Study determined that the importation of 14.2 mgd of oil field produced water would increase conductivity by 2.3 $\mu\text{mhos/cm-year}$ throughout the 750-foot thick fresh water aquifer.
22. Oxy USA has indicated that it will be constructing a pipeline to convey wastewater to VWDC's facilities. As a result of the pipeline construction, flow entering the CWD from VWDC is expected to increase to 2.3 mgd or more. The percent fraction of VWDC water will increase from 1.4% to 3.7% of the total average annual imported surface supply of the CWD. Staff's assessment, using assumptions set forth in the Study, is that the average annual salt load in the CWD will increase from 1934 lbs/acre to 2085 lbs/acre.
23. On 31 August 1995, Texaco and CWD submitted a *Produced Water Reclamation Project - Ground Water Monitoring Program*. The ground water monitoring program proposes the long-term monitoring of 94 wells for measuring depths to ground water semi-annually, and the long-term monitoring of 54 wells annually for determination of ground water

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quality from which the electrical conductivity will be developed for annual comparison. If the results of the ground water monitoring show that Basin Plan objectives are exceeded, it may become necessary to reduce the flows allowed from the oil fields into the CWD.

24. The California Legislature enacted AB 3030 during the 1992 session, subsequently codified in California Water Code §10750, *et seq.* Water Code §10753 states, in part that:

"Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgement, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater Management Plan pursuant to this part within all or a portion of its service area."

Water Code § 60224 empowers the CWD to take any action needed for protection and preservation of ground water supplies within the District, including:

- The prevention of contaminants from entering District ground water supplies;
- The removal of contaminants from ground water supplies of the District;
- The location and characterizing of contaminants which may enter the ground water supplies of the District;
- The identification of parties responsible for contamination of ground water; and
- The performance of engineering studies.

25. The CWD adopted an official Ground Water Management Plan (Plan) on 21 July 1994. CWD has established a policy of efficient water use, conservation, and management. Action elements in the Plan include:

- Acquire and import available, supplemental surface water for crop irrigation and in-lieu ground water recharge.
- Continue the application for appropriation of Poso Creek water and develop Poso Creek as a groundwater recharge facility within the district.
- Facilitate conjunctive use operations by the importation and recharge or in-lieu use of supplemental water.
- Construct and operate District wells.
- Monitor well construction and abandonment as administered by Kern County.

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Monitoring elements in the Plan include:

- Semi-annual monitoring of ground water levels of wells within the CWD.
 - Semi-annual preparation of maps of equal elevation of water in wells.
 - Monitor ground water quality at 5-year intervals and prepare maps of conductivity, chloride, and boron concentrations.
 - Operate and maintain the Poso Creek gaging station above State Highway 65.
26. To sustain existing irrigated agriculture, CWD proposes to supplement its existing limited surface water supplies and over drafted ground water with reclaimed produced water from VWDC and Texaco as described herein. Through its Plan, CWD proposes to manage the project within its boundaries to meet Basin Plan objectives.
27. The District experiences seasonally fluctuating irrigation demands due to differing water needs of the diversified crops. These crops have differing sensitivities to boron, typically the determining constituent in whether receiving water limits can be met. While pistachio trees require boron, citrus trees are extremely sensitive to boron. The CWD proposes that finite ground water and surface water supplies not be required by the Board to dilute produced water for the sole purpose of meeting fixed receiving water limits when proper management by CWD will protect the water uses within the District, believing that such use would be a waste and unreasonable use of ground water.
28. The Texaco/CWD NPDES permit, Order No. 95-031, requires that receiving water limits to protect sensitive crops apply only when irrigation demand is significant. The discharge of reclaimed produced water to Poso Creek for ground water recharge is allowed to comply with less stringent produced water effluent limits provided CWD manages recharge so that recharge water infiltrates into the Poso Creek bed within the boundaries of the CWD. For the purposes of this Order, the Highway 99 gauging station is considered to be on the western boundary of the CWD.
29. The Board's anti-degradation policy is established by 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. The policy requires that where existing quality of water is better than quality established in policies such as the Basin Plan, such existing high quality will be maintained unless it has been demonstrated to the State that any change will be consistent with maximum benefit to people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies. Waste discharge requirements must require best practicable treatment or control of the discharge to assure control of degradation where it is allowed pursuant to this policy.

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30. On 1 June 1994, the US EPA, US Bureau of Reclamation, Water Resources Control Board, Department of Water Resources, Department of Health Services, Conference of Directors of Environmental Health, and Waste Reuse Association of California signed a *Statement of Support for Water Reclamation* and resolved that the agencies would reduce reclamation disincentives and regulatory constraints on water reclamation. The Board concurs with this statement and supports the efficient use of the State's limited water supplies provided the beneficial uses of water are maintained and water quality objectives are met.
31. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. By permitting the discharge as allowed herein, VWDC can more effectively operate in the Kern Front oil field and provide produced water to CWD for reclamation. Reclamation in CWD increases its irrigation water supply and reduces ground water usage under CWD. The discharge will not substantially affect water quality, will not unreasonably affect beneficial uses, and degradation as authorized herein is consistent with the Basin Plan. The permitted discharge and reclamation project are considered to benefit the people of the State.
32. Effluent limitations and toxic and pretreatment effluent standards established to Sections 208(b), 301, 302, 303(d), 304, 306, and 307 of the Clean Water Act and amendments thereto that are applicable to the discharge are specified herein.
33. The U.S. Environmental Protection Agency (USEPA) promulgated effluent limits for Oil and Grease concentrations in produced water discharges in 40 CFR 435.50, *Oil and Gas Extraction Point Source Category, Agricultural and Wildlife Water Use Subcategory*. The Oil and Grease (EPA 413.2) effluent limit prescribed in 40 CFR §435.52(a)(2) is 35 mg/l.
34. The USEPA and the Board have classified this discharge as a minor discharge.
35. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA), Public Resources Code Section 21000, et seq., in accordance with Section 13389 of the California Water Code.

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36. The Board notified the Discharger and interested agencies and persons of its intent to revise waste discharge requirements for this discharge, and provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
37. The Board, in a public meeting, heard and considered all comments pertaining to this modification.
38. This Order shall serve as an NPDES permit pursuant to Section 402 of the Clean Water Act, or amendments thereto, and shall take effect upon the date of signing by the Executive Officer, provided USEPA has no objections.

IT IS HEREBY ORDERED that Order No. 90-162 is rescinded and Valley Waste Disposal Company, and Cawelo Water District, their agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of reclaimed produced water other than as described above is prohibited.
2. The by-pass or overflow of reclaimed produced water from the treatment plant to surface waters is prohibited, except as allowed by Standard Provision A.13.
3. The discharge of waste pollutants into surface waters from any source other than produced water associated with production, field exploration, drilling well completion, or well treatment (i.e., drilling muds, drill cuttings, and produced sands) in the Kern Front oil field is prohibited.

B. Effluent Limitations

1. The maximum daily discharge flow shall not exceed 4.3 mgd.
2. Effluent discharged into Reservoir B or to VWDC's interim storage ponds shall not exceed the following limits:

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<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
Conductivity	$\mu\text{mhos/cm}$	1100	1200
Chloride	mg/l	80	100
Boron	mg/l	1.0	1.2
Oil and Grease	mg/l	--	35

C. Sludge Disposal

1. Collected sludges and other solids removed from liquid wastes shall be disposed of in a manner that is consistent with Title 23, CCR, Section 2510, et. seq. (Chapter 15) and approved by the Executive Officer
2. By 1 April 1996, the Discharger shall submit a sludge management plan estimating the volume of sludge generated by the Wemco treatment unit described in Finding No. 4 and specifying the method and location of sludge disposal or reuse.

D. Receiving Water Limitations

Receiving water limitations for surface water are based upon water quality objectives contained in the Basin Plan. As such they are a required part of this permit.

1. When irrigation deliveries are 50 mgd or greater, the discharge, in combination with other sources, shall not cause the following downstream of the Reservoir B outfall structure:
 - a. Conductivity (EC) to exceed 700 $\mu\text{mhos/cm}$.
 - b. The chloride concentration to exceed 106 mg/l.
 - c. The boron concentration to exceed 0.5 mg/l.
 - d. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the canal bottom.
 - e. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

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- f. Aesthetically undesirable discoloration.
 - g. Fungi, slimes, or other objectionable growths.
2. When CWD discharges reclaimed produced water into Poso Creek, and surface waters in the creek leave the CWD, the discharge shall not cause the following in Poso Creek :
- a. The receiving water limits in D.1., above, to be exceeded.
 - b. The normal ambient pH to fall below 6.5, exceed 8.3, or change by more than 0.3 pH units.
 - c. Concentrations of dissolved oxygen to fall below 5 mg/l.
 - d. Turbidity to increase more than 1 NTU when background levels are between 0 and 5 NTU, 20% over background levels when the background levels are between 5 and 50 NTU, 10 NTU when background levels are above 50 NTU, and 10% over background levels when the background level is greater than 100 NTU.
 - e. Deposition of material that causes a nuisance or adversely affects beneficial uses.
 - f. Contain concentrations of chemical constituents in amounts that adversely affect agricultural use.
 - g. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in Title 22 CCR; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
 - h. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.
 - i. Toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
 - j. Violations of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board pursuant to the Clean Water Act and regulations adopted thereunder.

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E. Ground Water Limitations

The discharge, in combination with other sources, shall not cause underlying ground water to contain waste constituents in concentrations statistically greater than background water quality, except for conductivity. In no case shall the discharge, in combination with other sources, cause underlying ground water to increase in conductivity by more than 30 $\mu\text{mhos/cm}$ over the five-year duration of this permit.

F. Provisions

1. Storage of wastewater in VWDC's storage ponds shall be limited to the minimum time necessary to complete maintenance on the District's distribution facilities.
2. To assure compliance with Receiving Water Limitations D.2.h. and D.2.i., the Discharger shall conduct *Chronic Toxicity Testing* sufficient to uncover any potential adverse affects of the discharge to Poso Creek on a minimum of three species. The species must include a vertebrate, an invertebrate, and a plant. The effluent shall be tested with standard dilution water or background water selected by the Discharger and approved by the Executive Officer. The testing shall determine whether reclaimed produced water discharged to Poso Creek will impact the survival, growth, or reproduction of the three species under conditions when Receiving Water Limitations D.2.h. and D.2.i. apply. A written report on test results and ability to assure compliance with Receiving Water Limitations D.2.h. and D.2.i. shall be submitted to the Board by **1 June 1996**. If results indicate unacceptable effluent toxicity under foreseeable receiving water conditions, a toxicity reduction evaluation (TRE) will be required. The TRE is a site-specific study conducted in a stepwise process to narrow the search for effective control measures for effluent toxicity, isolate the sources of the toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity. If the initial report determines a TRE is necessary, the Discharger shall implement the TRE **within 60 days** of completing the initial report.
3. The Discharger shall comply with the *Standard Provisions and Reporting Requirements (NPDES)*, dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provision(s)."
4. The Discharger shall comply with the attached Monitoring and Reporting Program No. 96-009, which is part of this Order, and any revisions thereto, as ordered by the Executive Officer.

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5. This Order expires on **1 January 2001**. The Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.
6. Prior to making any change in the discharge point, place of use, or purpose of use of the reclaimed produced water, the Discharger shall obtain approval of, or clearance from, the State Water Resources Control Board, Division of Water Rights.
7. In the event of any change in control or ownership of reclaimed produced water discharge 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 immediately be 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 legal name, the State of incorporation if a corporation, the name and 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 D.6. and state 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.

I, WILLIAM H. CROOKS, 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 26 January 1996.



WILLIAM H. CROOKS, Executive Officer

KDL:kd/fmc

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EFFLUENT MONITORING

Effluent samples shall be collected downstream from the treatment units and prior to discharge to Reservoir B. Effluent samples should be representative of the discharge. Time and date of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

<u>Constituent</u>	<u>Sampling Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Flow	mgd	Recording	Continuous 4.3 mgd
Conductivity	µmhos/cm	Recording	Continuous 1100/1200
Boron	mg/l	Grab	Weekly 1.0/1.2
Chlorides	mg/l	Grab	Weekly 8/100
Standard Minerals ¹	mg/l	Grab	Monthly
<u>Oil and Grease</u>	mg/l	Grab	Monthly 35

¹ Includes TDS, EC, Chloride, Sulfate, Nitrate, Bicarbonate Alkalinity, Carbonate Alkalinity, Calcium, Magnesium, Potassium, Sodium, pH, Hardness, Silica, Iron, Ammonia, Phosphate, and Boron

If the results of monitoring a pollutant appear to violate a monthly average effluent limit, the frequency of sampling must be increased to daily until compliance is verified. If effluent monitoring detects a pollutant at concentrations greater than a daily maximum limit, the Discharger shall resample and reanalyze the discharge immediately after receiving knowledge of the exceedance. The frequency of sampling must be increased to daily until compliance is verified.

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If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

<u>Sampling Station</u>	<u>Description</u>
1	At Lerdo Canal/Cawelo Pump Station B
2	Reservoir B outfall structure to Distribution Canal
3	Distribution pipe outfall to Poso Creek
4	Poso Creek-State Highway 65 gaging station
5	Poso Creek, 100 feet west of State Highway 99

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed below, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. Monitoring at Stations 3, 4, and 5 is not required unless discharge is occurring at Station 3 and measurable flow is passing, or anticipated to pass through Station 5. If another discharger (i.e., Texaco) conducts receiving water monitoring which is identical to, or exceeds the receiving water monitoring requirements specified herein, the Discharger may, at its discretion, submit the results of such monitoring in lieu of separate monitoring.

<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	mgd	Computed	Daily <i>if 50 then</i>
Conductivity	µmhos/cm	Grab	Weekly 700

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<u>Constituent</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Boron	mg/l	Grab	Weekly 15
Chlorides	mg/l	Grab	Weekly 106
Standard Minerals	mg/l	Grab	Monthly

REPORTING

Effluent and receiving water monitoring results shall be submitted to the Regional Board by the 20th day of the month following sample collection. In reporting the monitoring data, the Discharger shall arrange the data in tabular form. The data shall be summarized so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with this Order.

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 calculation and reporting of the values required in the discharge monitoring report.

By 30 January of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

- a. The names, telephone numbers, and general responsibilities of persons to contact regarding the wastewater discharge system for emergency and routine situations.
- b. 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.6.)
- d. An annual report with both tabular and graphical summaries of the monitoring data obtained during the previous year. If violations occurred, the report shall discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

MONITORING AND REPORTING PROGRAM
VALLEY WASTE DISPOSAL COMPANY
AND CAWELO WATER DISTRICT
KERN FRONT OIL FIELD - CAWELO RESERVOIR B
KERN COUNTY

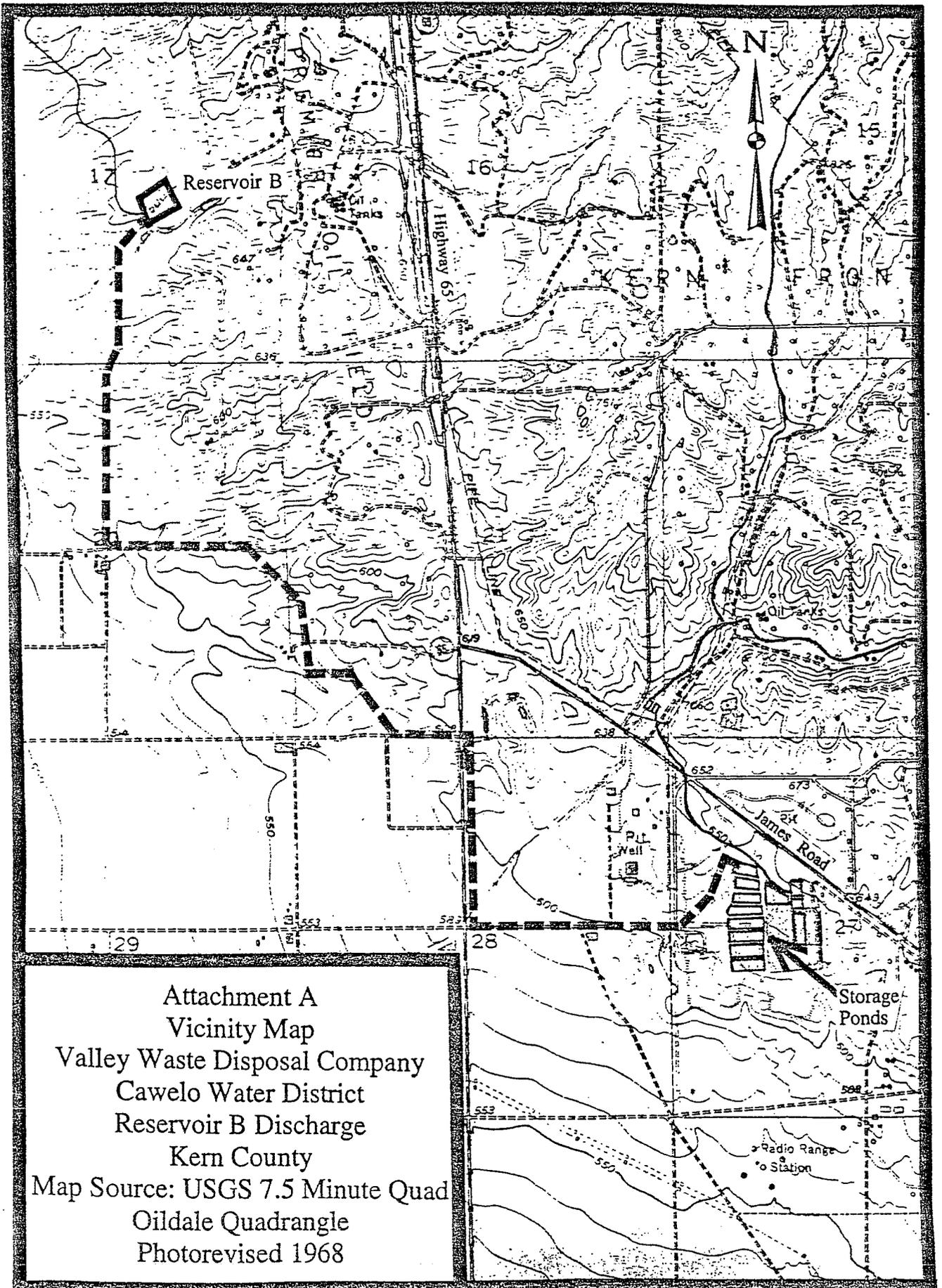
4

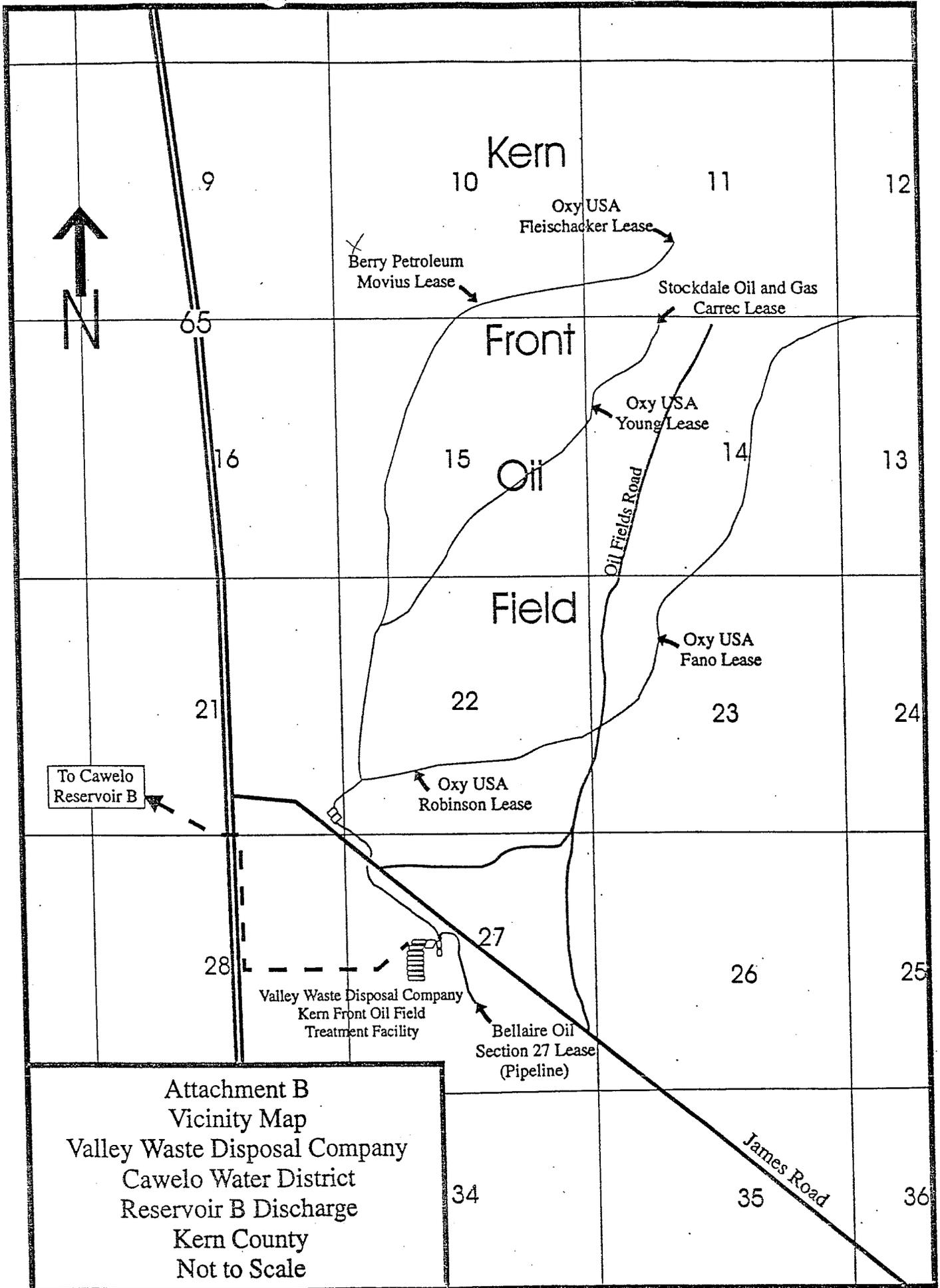
All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

Ordered by: William H. Crooks
WILLIAM H. CROOKS, Executive Officer

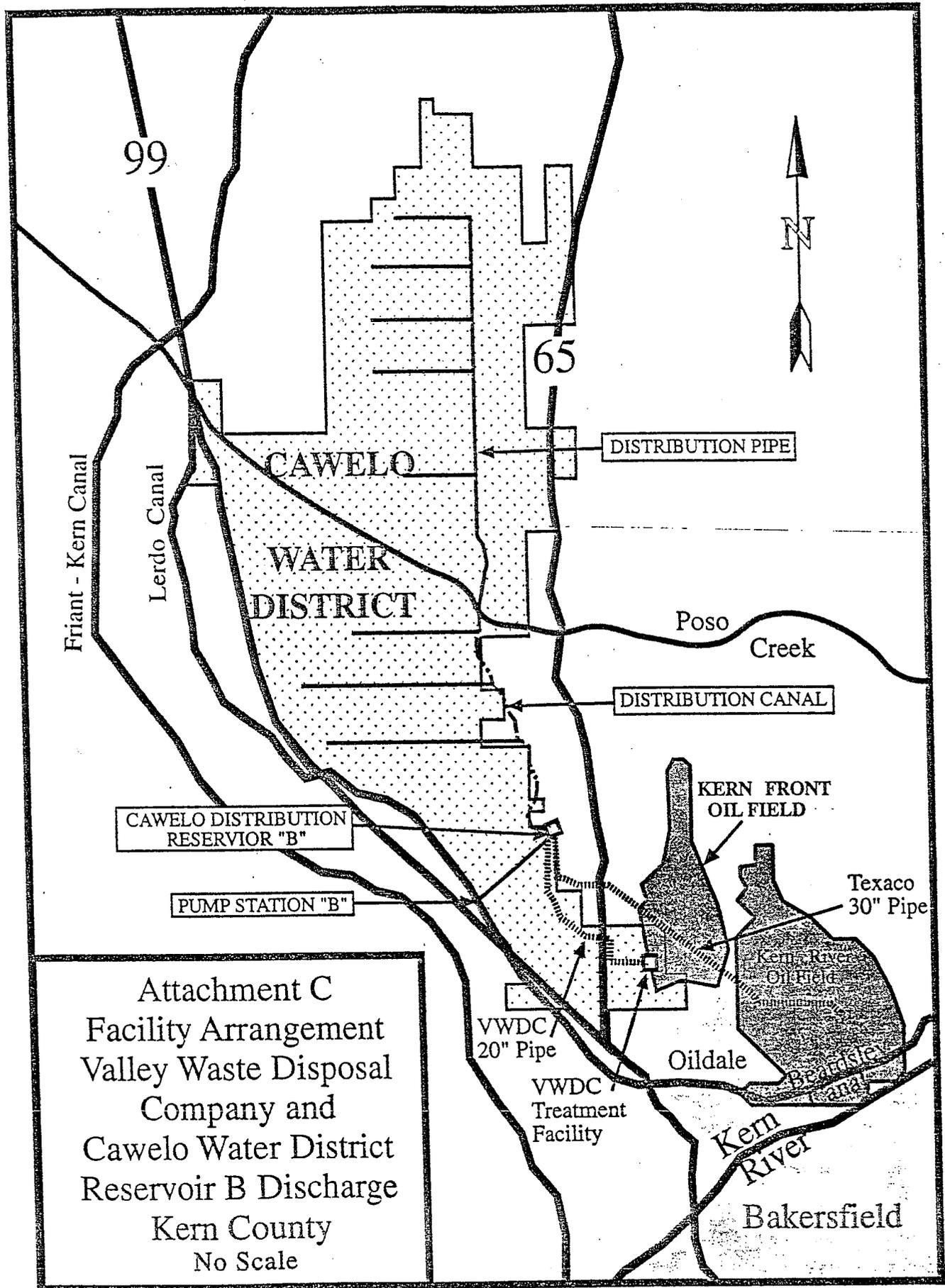
26 January 1996
(Date)

KDL:kd/fmc





Attachment B
 Vicinity Map
 Valley Waste Disposal Company
 Cawelo Water District
 Reservoir B Discharge
 Kern County
 Not to Scale



Attachment C
 Facility Arrangement
 Valley Waste Disposal
 Company and
 Cawelo Water District
 Reservoir B Discharge
 Kern County
 No Scale

INFORMATION SHEET

VALLEY WASTE DISPOSAL COMPANY AND CAWELO WATER DISTRICT KERN FRONT OIL FIELD - CAWELO RESERVOIR B KERN COUNTY

Valley Waste Disposal Company (VWDC) operates an oil field produced water reclamation facility serving oil field operators in the Kern Front oil field. The site is south of James Road and Oil Fields Road near Bakersfield. Produced water from the oil field is treated to remove oil, grease, and inorganic sediments and then conveyed to the Cawelo Water District (CWD) for reclamation on farm land, and for ground water recharge within the CWD. During periods when the District's water storage and conveyance facilities are shut down for maintenance, VWDC stores produced water in storage ponds on VWDC's property.

The Kern Front Oil Field encompasses an area of about 8.6 square miles (5,495 acres) in the eastern half of T28S, R27E, MDB&M, about 3 miles north of Oildale in Kern County. Discovered by Standard Oil Company in 1917, the field was developed by a number of different oil companies, and in 1929 the field reached a maximum oil production level of 4.5 million bbls/year. Production subsequently diminished to its current level of 2.2 million bbls/year. Like wells in other nearby oil fields such as the Kern River Oil Field, Poso Creek Oil Field, and Mount Poso Oil Field, wells in the Kern Front Oil Field produce large quantities of water commingled with recovered oil. In 1952 the ratio of produced water to bbls oil produced was about 5:1¹. In 1973 the ratio was about 8.5:1², and in 1994 the water to oil ratio was about 13.4:1.

For the oil companies, most of the produced water is a waste which must be disposed of. Of the 30 million (bbls) of water produced in the Kern Front oil field in 1994, about 7.3 million bbls was used for steam flood and cyclic steam injection. About 1.7 million bbls were disposed of by Class II (deep well) injection. A small amount was disposed of by surface infiltration ponds. Most of the water, about 20 million barrels in 1994, is disposed of by discharge into conveyance channels that parallel, and in some places, cross through, the natural drainage. Most of the water, roughly 1.3 mgd, discharged into the channel is lost through percolation, evaporation, and evapotranspiration. Water not lost to percolation, evaporation, and evapotranspiration ends up at Valley Waste Disposal Company for "final polishing" and conveyance to the Cawelo Reservoir B. Of the 2.3 mgd of produced water disposed of into the drainage channel, primarily by Oxy USA, Inc., and Stockdale Oil and Gas, Inc., about 1 mgd ultimately ends up in the Cawelo Water District (CWD) where it's used to supplement agricultural water supplies and augment ground water recharge in the District. Discussions with Oxy USA indicate that Oxy USA and Stockdale Oil and Gas plan to construct a pipeline to VWDC, although a definite timetable for construction has not been set by the Board.

¹ Division of Oil and Gas, *Summary of Operations, California Oil Fields*, Vol 38, No. 2, 1952, p. 31

² Division of Oil and Gas, *California Summary of Operations*, Vol 59, No. 2, 1973, p. 99

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Valley Waste Disposal Company (VWDC) was formed around 1932 to assist oil companies in managing their wastes. It began operating its Kern Front Oil Field facility in 1955 when it diverted the conveyance channel to a gravel pit on the south side of James Road in Section 27, T28S, R27E. The VWDC first became regulated by the Board when Waste Discharge Requirements, Order No. 74-233 was adopted by the Board in March 1974. Order No. 74-233 allowed for a maximum discharge of 0.84 mgd to 30 acres of percolation/evaporation ponds. In 1980 VWDC constructed a pipeline to the Cawelo Water District Reservoir B and submitted an application for a National Pollutant Discharge Elimination System (NPDES) permit. Waste Discharge Requirements Order No. 81-113, the first NPDES permit, then regulated VWDC's discharge to its percolation ponds and the discharge to the CWD Reservoir B. Order No. 81-113 was updated and renewed by Order No. 90-162. Order 90-162 regulates only the discharge to CWD. Most of the year VWDC conveys all its wastewater to the CWD, but VWDC's stores the water in ponds for up to four weeks a year when it is necessary to accommodate Reservoir B shutdown and related maintenance activities in the CWD.

In June 1970, the Department of Water Resources (DWR) submitted a "Report on Poso Creek Water Quality Evaluation, Kern County." The report looked at the effect of produced water discharges from the Mt. Poso, Poso Creek, Round Mountain, and Kern Front Oil Fields on the Poso Creek Basin. The quality of the oil field discharges from the various oil fields impacting the basin varied widely. Mt. Poso and Round Mountain produced water with chlorides of 500 to 1,100 mg/l. Discharges from the Poso Creek oil field produced chloride concentrations from 215 to 715 mg/l. Chloride concentrations from the Kern Front oil field ranged from 60 to 100 mg/l. In 1969, chlorides in oil field discharges (720 mg/l average) totaled 26,050 tons, corresponding roughly to 75,000 tons of salt. Measured chlorides in ground water samples from a few wells near the center of CWD indicated that chloride in ground water increased from less than 20 mg/l in 1916 to over 600 mg/l in 1969. This report served as a basis for a Board Resolution adopted by the Board on 23 November 1970. Resolution No. 71-122 limited the maximum EC, chloride, and boron concentration in oil field "waste waters discharged to Poso Creek or its tributaries and to... unlined sumps..." to 1000 μ mhos/cm, 200 mg/l, and 1.0 mg/l, respectively. The Board's implementation of Resolution No. 71-122 effectively stopped the discharge of oil field wastewater with high salt concentrations in the Poso Creek subarea.

Follow-up sampling by the CWD shows the impact of the high salt oil field discharges persisted in 1980. CWD's 1980 chloride concentration map shows a degraded area along Lerdo Highway with chloride concentrations exceeding 400 mg/l. Consequently, staff believes a chloride effluent limit of 80 mg/l (monthly average) and 100 mg/l (daily maximum) is appropriate for the discharge.

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The Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) contains water quality objectives for surface and ground waters in the Basin. The Basin Plan incorporates the Poso Creek policy (Resolution No. 71-122). The Basin Plan identifies the entire basin as being closed, meaning that salts discharged within the basin remain there. It recognizes that salt will increase over time and contains a strategy of controlled degradation as opposed to prevention, and establishes as an objective a maximum annual degradation rate no greater than 6 $\mu\text{mhos/cm-year}$ within the Poso Study Area (Hydrologic Area Nos. 558.70, 558.80, and 558.90). The VWDC discharge occurs in the Poso study area.

In 1982, the Board adopted Resolution 82-136, amending the Basin Plan and recognizing that discharges from Valley Waste Disposal Company and other similar discharges, should be allowed to exceed Basin Plan limits in order to allow reclamation for irrigation and other beneficial uses. The Basin Plan, therefore, provides flexibility in allowing agricultural use of oil field wastewater by allowing the salinity limits to be exceeded, provided the discharger successfully demonstrates to the Board the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives. Given the relatively small contribution to CWD's imported water deliveries, about 1.5%, VWDC's discharge to surface water does not threaten to substantially affect water quality nor cause a violation of water quality objectives and is thereby consistent with the Basin Plan.

Section 402(o)(1) of the Federal Clean Water Act states that permits may not contain effluent limitations less stringent than effluent limits in the previous permit. Allowed exceptions to the *Anti-Backsliding Rule* are contained in CWA § 402(o)(2). CWA § 402(o)(2) states, in part

"A permit... may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant if... information is available which was not available at the time of permit issuance...which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or ... a less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy."

When VWDC's previous permit, Order No. 90-162 was adopted, it was believed that boron concentrations in Kern Front oil field produced water would remain at or below the 0.8 mg/l effluent limit set in the Order. Since that time, however, boron concentrations have increased slightly due to hydrogeologic factors beyond VWDC's control. In this case an exception to the *Anti-Backsliding Rule* is allowed pursuant to CWA § 402(o)(2).

California Water Code § 60224 empowers the CWD to take any action needed for protection and preservation of ground water supplies within the District, including: the prevention of

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contaminants from entering District ground water supplies; the identification of parties responsible for contamination of ground water; and the removal of contaminants from ground water supplies of the District. Water Code §10750 empowers the CWD to adopt and implement a ground water management plan. On 21 July 1994, the CWD Board of Directors adopted an official Ground Water Management Plan which includes: conjunctive use of supplemental water supplies; Semi-annual monitoring of ground water levels in the CWD; and ground water quality monitoring.

CWD proposes to supplement its existing limited surface water supplies and over drafted ground water with a produced water reclamation project using treated Texaco and VWDC wastewater. The CWD proposes, through its Ground Water Management Plan, to use its legislated authority to manage the basin and manage the project within its boundaries to meet water quality objectives. Implementation of the project is in the economic interests of the Discharger and water users in the CWD. The CWD proposes to manage water in its district in such a manner as to meet ground water quality objectives (in particular, 6 $\mu\text{mhos/cm-year}$ max. degradation). The Ground Water Limitation set forth in the Order prohibits degradation at a rate greater than 30 $\mu\text{mhos/cm-year}$ over the five-year life of the permit. A ground water monitoring program to satisfy these information and management needs was submitted by Texaco and the Cawelo Water District in August 1995. The CWD proposes the long-term, semi-annual monitoring of 94 irrigation supply wells for measuring depths to ground water, and the long-term, semi-annual monitoring of 54 wells for determination of quality of groundwater from which the average electrical conductivity will be developed for annual comparison. Consequently, the project as proposed to be permitted is consistent with the Basin Plan.

In March 1985 the Board established that beneficial uses of water used for irrigated agriculture would be protected and quality would meet established policies if boron never exceeded 0.5 mg/l, if chlorides never exceeded 106 mg/l, and EC never exceeded 700 $\mu\text{mhos/cm}$ in the canals. These limits were based upon *Water Quality for Agriculture* by R.S. Ayers and D.W. Westcot of the Food and Agricultural Organization of the United Nations, 1976. Consequently these constituent concentrations were used as receiving water limits in the Texaco/ARCO/Chevron NPDES permits adopted by the Board in May 1992. This Order uses the same numbers (700/106/0.5) at the Reservoir B outfall structure to the Distribution Canal when irrigation demand is "significant"; i.e., during the eight months of the year when produced water and blending water combined is greater than 50 mgd. These numbers also apply at the point that Poso Creek crosses the western CWD boundary (Highway 99) in the reportedly rare instances when there is water in Poso Creek which leaves the District because it exceeds recharge capabilities.

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Water discharged to Poso Creek during times of low irrigation demand will infiltrate into the underlying ground water aquifer. The Basin Plan establishes the beneficial uses of Poso Creek to be agricultural supply, water contact recreation, non-contact water recreation, warm and cold fresh water habitat, wildlife habitat, ground water recharge, and fresh water replenishment. However, the particular portion of Poso Creek which traverses the CWD does not, for all practical purposes, support a fishery, provide cold fresh water habitat, provide water for water contact and noncontact water recreation, or support a wildlife habitat. Therefore, only water quality objectives pertaining to ground water recharge and agricultural supply uses should apply when the CWD discharges to Poso Creek. The limits and requirements contained in the proposed Order adequately protect applicable beneficial uses of water in Poso Creek.

KDL:kdl/fmc:1/25/96