

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

ORDER R5-2016-00XX

INFORMATION SHEET

FOR
OIL FIELD DISCHARGES TO LAND
GENERAL ORDER NUMBER ONE

APPLICABILITY

Waste Discharge Requirements General Order No. R5-2016-00XX (General Order) will apply to owners and/or operators (hereinafter referred to as “Dischargers”) of existing oil and gas production facilities that:

1. primarily discharge produced wastewater from oil and gas extraction operations to land, including but not limited to ponds, but that may also discharge produced wastewater to land for dust control and for construction activities, and may discharge road mix within Facility boundaries to enhance containment berms and roads;
2. meet the maximum oil field discharge salinity limits for electrical conductivity, chloride, and boron contained in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2015* (Basin Plan); and
3. began discharge of wastewater prior to **1 January 2015**.

This General Order will also apply to Dischargers proposing new oil and gas production facilities or expansion of existing facilities that would:

1. primarily discharge produced wastewater from oil and gas extraction operations to land, including but not limited to ponds, but that may also discharge produced wastewater to land for dust control and for construction activities, and may discharge road mix within Facility boundaries to enhance containment berms and roads;
2. meet the maximum oil field discharge salinity limits for electrical conductivity, chloride, and boron contained in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2015* (Basin Plan); and
3. began discharge of wastewater from **1 January 2015**.

Application of this General Order to new facilities or expansion of existing facilities is contingent upon the Discharger providing evidence of compliance with the requirements of the California Environmental Quality Act in the form of a certified Environmental Impact Report, Mitigated Negative Declaration, Negative Declaration, or other environmental document.

BACKGROUND

California ranks third in the U.S. in oil production. Based on 2014 data, approximately 74 percent of California's production occurs within the Central Valley. In most oil fields in California, the oil is comingled with formation water, which means that large quantities of water are extracted with the oil. Within the Central Valley, approximately 16 barrels of water are produced on average with each barrel of oil. Oil and gas production facilities separate the water from the oil. This separated water is called produced wastewater.

Oil and gas production facility components can include production wells, networks of pipelines, gas separators and dehydrators, oil and water separation units of various configurations and types (e.g. ponds, tank batteries, induced gas or air flotation tanks commonly referred to as WEMCOs), storage units, produced wastewater treatment systems, and disposal systems that can include evaporation and percolation. In some operations, produced wastewater is disposed of through underground injection wells permitted and regulated by California Department of Conservation's Division of Oil, Gas, and Geothermal Resources (DOGGR). In some operations produced wastewater is further treated and reused in steam and power generation or injected as steam or water into the hydrocarbon reservoir to enhance oil recovery. This type of reuse is also regulated by DOGGR. High quality produced wastewater may be reused to supplement agricultural water supplies. Other uses of produced wastewater of appropriate quality include oil field dust control and to aid in compaction on oil field construction projects. Sludge and solids removed from tanks are commonly mixed with soil and used as asphalt for roads within the oil fields. This General Order includes specific requirements to regulate these discharges and ensure they do not cause pollution or nuisance conditions.

Beginning in May 2014, the Central Valley Water Board began an effort to re-evaluate its Oil Field Program with respect to discharges to ponds. Central Valley Water Board staff identified and inspected oil field production facilities with ponds. Staff found that there are approximately 326 facilities with 1100 ponds that receive produced wastewater. Approximately 241 facilities are discharging to ponds without waste discharge requirements. Approximately 85 facilities are discharging to ponds under WDRs that are twenty years old or older.

In response to the re-evaluation, Central Valley Water Board staff has issued various information and enforcement orders requiring those discharging without WDRs and those discharging under old WDRs to characterize their discharge practices and to provide information to support ongoing discharges, if feasible.

RATIONALE FOR ISSUING A GENERAL ORDER AND OTHER CONSIDERATIONS

Water Code section 13263(i) describes the criteria that the Central Valley Water Board uses to determine whether a group of facilities should be regulated under a general order (as opposed to individual orders). These criteria include:

1. The discharges are produced by the same or similar types of operations,
2. The discharges involve the same or similar types of wastes,
3. The discharges require the same or similar treatment standards, and

4. The discharges are more appropriately regulated under general WDRs rather than individual WDRs.

The discharges that can be covered under this General Order meet the above listed requirements of 13263(i).

Pursuant to Water Code section 13263(a), this General Order must implement the Basin Plan including consideration of the beneficial uses of water, the water quality objectives reasonably required for protection of those beneficial uses, other waste discharges, and the need to prevent nuisance conditions. Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area (Water Code, section 13050(h)). Water quality objectives apply to all waters within a surface water or groundwater resource for which beneficial uses have been designated.

Pursuant to Water Code sections 13241 and 13263, the Central Valley Water Board, in establishing the requirements contained in this General Order, considered factors including, but not limited to, the following:

- a. Past, present, and probable future beneficial uses of water;
- b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- d. Economic considerations;
- e. The need for developing housing within the region(s); and
- f. The need to develop and use recycled water.

APPLICATION PROCESS

Dischargers seeking coverage under the General Order are required to file a Notice of Intent (NOI) (Equivalent to Report of Waste Discharge (RWD)), which includes the following:

1. A completed State Form 200, which is available at: http://www.waterboards.ca.gov/publications_forms/forms/docs/form200.pdf.
2. An application fee. Discharger's not operating under waste discharge requirements (WDRs) must submit an application fee that serves as the first annual fee. The fee is based on a threat to water quality (TTWQ) and Complexity (CPLX) rating of 3C and applicable surcharges as described in Title 23, California Code of Regulations (CCR), section 2200. The Dischargers with existing WDRs do not need to submit an application fee unless annual fees are due during the application process.
3. A technical report. The technical report shall describe the wastewater generation, treatment, storage, reuse and disposal activities. The technical report must be prepared by a California registered civil engineer or engineering geologist. Attachment C to the General Order, Information Needs Sheet, describes the information to be included in the technical

report. Applicants are advised to inquire with the Central Valley Water Board staff before performing investigations and/or preparing the technical report to ensure that the report will be complete.

After review of the NOI by Central Valley Water Board staff, the appropriate TTWQ and CPLX rating of the discharge will be determined and additional fees may be required. If the information in the NOI demonstrates that the coverage under the General Order is appropriate, the Central Valley Water Board's Executive Officer (Executive Officer) will authorize coverage under the General Order by issuing a Notice of Applicability (NOA). The NOA will describe appropriate monitoring and reporting requirements.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Water Quality Control Plans

The Basin Plan designates the beneficial uses of groundwater and surface waters within the Basin and specifies water quality objectives to protect those uses, and includes implementation plans for achieving water quality objectives. The Basin Plan also incorporates, by reference, plans and policies of the State Water Board.

Beneficial Uses of Surface Water and Groundwater

The beneficial uses of surface water, as identified in the Basin Plan, may include: municipal and domestic supply (MUN); agricultural supply (AGR); industrial process supply (IND); industrial service supply (PRO); hydro-power generation (POW); water contact recreation (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); migration of aquatic organisms (MIGR); spawning reproduction and/or early development (SPWN); wildlife habitat (WILD); navigation (NAV); rare, threatened, or endangered species (RARE); groundwater recharge (GRW); freshwater replenishment (FRSH); aquaculture (AQUA); and preservation of biological habitats of special significance (BIOL). Basin Plan Table II-1 (Page II-4) lists the surface water bodies of the Tulare Lake Basin and the designated beneficial uses of each of those specific surface water bodies. Where surface water bodies are not listed, the Basin Plan designates beneficial uses based on the waters to which they are tributary.

The Basin Plan identifies the beneficial uses of groundwater as MUN, AGR, IND, PRO, REC-1, and WILD. Basin Plan Table II-2 (Page II-5) lists the designated beneficial uses of groundwater for specific Detailed Analysis Units within the basin. Unless specifically de-designated, all groundwaters of the Basin have the designated beneficial uses of MUN, AGR, IND, and PRO.

Water Quality Objectives

Water quality objectives are listed separately for surface water and groundwater in Chapter III of the Basin Plan and are either numeric or narrative. The water quality objectives are implemented in the General Order consistent with the Basin Plan's *Policy for Application of Water Quality Objectives*, which specifies that the Central Valley Water Board "will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objectives." To

derive numeric limits from narrative water quality objectives, the Board considers relevant numerical criteria and guidelines developed and/or published by other agencies and organizations.

The primary constituents of concern (COCs) from discharges of waste from oil field facilities with respect to surface waters and groundwater are elevated concentrations of general minerals (especially electrical conductivity (EC), total dissolved solids, chloride, and boron), metals (i.e., arsenic), trace elements (i.e., boron, strontium, thallium, lithium, etc.), petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs, i.e., benzene, toluene, ethylbenzene, and xylenes [BTEX]), and radionuclides.

The Basin Plan requires waters designated as MUN to meet the State drinking water maximum contaminant levels (MCLs) specified in Title 22 for primary and secondary standards. Some applicable constituents and their MCLs are listed in Tables 1 through 6 below. These tables are limited to the constituents that have been detected in produced wastewater above either the primary or the secondary MCLs on at least one occasion:

Table – 1	
Title 22, Table 64431-A	
Maximum Contaminant Levels Inorganic Chemicals	
Chemical	Maximum Contaminant Level
Aluminum (µg/L)	1000
Antimony (µg/L)	6.0
Arsenic (µg/L)	10.0
Barium (µg/L)	1000
Beryllium (µg/L)	4.0
Cadmium (µg/L)	5.0
Chromium (µg/L)	50
Fluoride (µg/L)	2000
Mercury (µg/L)	2.0
Nickel (µg/L)	100
Nitrate (as NO ₃) (mg/L)	45
Nitrate + Nitrite (sum as nitrogen) (mg/L)	10
Selenium (µg/L)	50
Thallium (µg/L)	2.0

Table – 2	
Title 22, Tables 64442	
Maximum Contaminant Levels Radionuclides	
Chemical	Maximum Contaminant Levels (pCi/L)
Radium-226 and Radium-228 (combined)	5
Gross Alpha particle activity (excluding radon and uranium)	15

Uranium	20
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Table – 3	
Title 22, Table 64444-A Maximum Contaminant Levels Organic Chemicals	
Chemical	Maximum Contaminant Levels (µg/L)
(a) Volatile Organic Chemicals	
Benzene	1.0
Ethylbenzene	300
Tetrachloroethylene (PCE)	5.0
Toluene	150
Xylenes (m,p)	1750
(b) Non-Volatile synthetic Organic Chemicals	
Benzo(a)pyrene	0.2

Table – 4	
Title 22 - Table 64449-A Secondary Maximum Contaminant Levels Consumer Acceptance Contaminant Levels	
Chemical	Level
Iron (mg/L)	0.3
Manganese (mg/L)	0.05
Silver (mg/L)	0.1
Zinc (mg/L)	5.0

Table – 5			
Title 22, Table 64449-B Maximum Contaminant Levels Consumer Acceptance Contaminant Level Ranges			
Constituent, Units	Maximum Contaminant Level Ranges		
	Recommended	Upper	Short Term
Total Dissolved Solids, mg/L	500	1,000	1,500
or			
Specific Conductance, µS/cm	900	1,600	2,200
Chloride, mg/L.	250	500	600
Sulfate, mg/L	250	500	600

The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-

case basis, adopt numerical limitations in order to implement the narrative objective. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria.

Basin Plan Effluent Limits

On page IV-15, the Basin Plan states that the maximum salinity limits for wastewaters in unlined sumps overlying groundwater with existing and future probable beneficial uses are as follows:

Constituent	Maximum Limit
EC (µmhos/cm)	1000
Chloride (mg/L)	200
Boron (mg/L)	1

In 1982, the Central Valley Water Board amended the Basin Plan to allow discharges of oil field wastewater to exceed the above limits to facilitate use for irrigation and other beneficial uses where the exception would not cause an exceedance of a water quality objective. The Basin Plan, therefore, provides some flexibility to allow oil field wastewater exceeding Basin Plan salinity limits to be used for agricultural use in water short areas, provided the discharger first successfully demonstrates to the Central Valley Water Board that the increases will not cause exceedances of water quality objectives.

The Basin Plan states that discharges of oil field wastewater that exceed the above maximum salinity limits may be permitted to unlined sumps, stream channels, or surface waters if the discharger successfully demonstrates to the Central Valley Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.

The Basin Plan also includes separate limits for the White Wolf Subarea based on the class of irrigation water underlying the discharge. These limits are as follows.

Constituent/Irrigation Water Class	Class I	Class II
EC (µmhos/cm)	1000	2000
Chloride (mg/L)	175	350
Boron (mg/L)	1	2
Sodium (%)	60	75

In areas where groundwater would be Class I except for the concentration of a specific constituent, only that constituent can be allowed to exceed the specified limits for Class I water. In no case shall any constituent be greater than those limits specified for areas overlying Class II irrigation.

The White Wolf Subarea is defined as 64,000 acres within the valley floor, at the southern tip of the Tulare Lake Basin, about 20 miles south of Bakersfield. The subarea is bounded on the west by the San Emigdio Mountains, on the south and east by the Tehachapi Mountains, and on the north by the White Wolf Fault (Basin Plan page IV-15).

The Basin Plan criteria for mineral quality of irrigation water are described in following table.

Constituent	Class I	Class II	Class III
TDS (mg/l)	<700	700 - 2,000	>2,000
EC (µmhos/cm)	<1,000	1,000 - 3,000	>3,000
Chlorides (mg/l)	<175	175 – 350	>350
Sodium (percent base constituents)	<60	60 – 75	>75
Boron (mg/l)	<0.5	0.5 – 2	>2

The Basin Plan states all groundwaters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources. It acknowledges that the Tulare Lake Basin is closed and no proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. Accordingly, the water quality objectives for ground water salinity control the rate of increase.

The Basin Plan states the maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in Table III-4 for each hydrographic unit shown on Figure III-1 (Basin Plan Pages III-8 and 9).

Table – 6	
Table III-4 TULARE LAKE BASIN	
GROUND WATER QUALITY OBJECTIVES FOR SALINITY	
Hydrographic Unit	Maximum Average Annual Increase in Electrical Conductivity (µmhos/cm)
Westside (North and South)	1
Kings River	4
Tulare Lake and Kaweah River	3
Tule River and Poso	6
Kern River	5

These incremental increases objectives apply to the entire Hydrographic Unit, and not to point source discharges.

Oil Field Discharges and Proposed Discharge Limits

As mentioned above, the primary COCs associated with discharges of waste from oil field facilities include, but are not limited to, EC, total dissolved solids, chloride, some metals (i.e., arsenic), trace elements (i.e., boron, strontium, thallium, lithium, etc.), petroleum hydrocarbons, PAHs, VOCs, and radionuclides. With respect to EC, total dissolved solids, chloride and boron, and consistent with the Basin Plan, this General Order requires discharges to land to comply with the Basin Plan limits described above.

Oil field produced wastewater can contain metals exceeding MCLs, and particularly arsenic at concentrations exceeding the MCL of 10 µg/L. Whether those metals pose a threat to groundwater quality and designated beneficial uses depends on many factors including, but not limited to, discharge concentrations, discharge volumes, depth to groundwater, soil types and hydrogeology underlying the discharge location, and natural groundwater quality. Generally, most metals associated with oil field produced water discharges are relatively immobile in the alkaline soils associated with most Central Valley soils and are expected to attenuate as they percolate with produced water through the soil profile.

Specifically with respect to arsenic, studies conducted within the Central Valley indicate that arsenic migration to groundwater that would cause exceedances of water quality objectives is unlikely. Kennedy Jenks Consultants completed an arsenic soil-adsorption removal study using soil samples collected from the Famoso Basins in the Famoso area in 2011. The results were included in a technical report titled, *Cawelo Water District Famoso Basins Antidegradation Analysis*. The results indicate that arsenic, in concentrations of up to 120 µg/L, associated with the discharges will attenuate in the underlying soils and not adversely impact underlying groundwater. Similarly, other studies show that soil can remove significant amounts of arsenic. Given the above information, this General Order does not include effluent limits for metals associated with discharges to land at this time.

Oil naturally contains numerous organic compounds including BTEX and PAHs. It is the goal of the industry to separate for sale these compounds from the produced wastewater in which they are entrained. Some organic chemicals may be added to oil wells, to separation processes, or to treatment systems to enhance recovery efficiencies and final produced wastewater quality.

Generally, heavier organic compounds associated with oil production do not move readily through the soil and do not pose a significant threat to groundwater. It has also been well-documented in the literature, including a study published by the Lawrence Livermore National Laboratory in 1995 and several reports generated by the State Water Resources Control Board, that petroleum fuels naturally attenuate in the environment through adsorption, dispersion, dilution, volatilization, and biological degradation. This natural attenuation slows and limits the migration of dissolved petroleum plumes in groundwater. The biodegradation of petroleum, in particular, distinguishes petroleum products from other hazardous substances commonly found at commercial and industrial sites.

The limited existing data for produced water discharges that can be directly compared with groundwater monitoring results for support the notion that organics associated with petroleum production will not migrate to underlying groundwater in concentrations that exceed water quality objectives.

For these reasons, Central Valley Water Board staff does not recommend specific produced wastewater discharge limits to ponds for organic chemicals at this time.

Some geologic formations contain naturally occurring radionuclides. Radium-226 and radium-228, gross alpha-particle activity, and uranium have been detected in produced water in concentrations exceeding the primary MCLs. These detections have been limited to specific oil fields. Much like metals discussed above, these constituents do not generally move readily

through soils, and their threat to groundwater quality will vary based on site specific hydrogeology. For these reasons, Central Valley Water Board staff does not recommend specific produced wastewater discharge limits to ponds for radionuclides at this time.

This General Order includes a prohibition that narratively limits discharge waste constituent concentrations to those described in the Discharger's NOI and demonstrated through an appropriate Antidegradation Analysis to be protective of the beneficial uses of groundwater. In this way, the General Order limits the discharge concentrations of specific constituents to those shown to be protective of underlying groundwater and its associated beneficial uses.

As water quality data for produced wastewater and groundwater become available, the Central Valley Water Board staff will be evaluating the data for COCs and will update this General Order to include additional discharge limits if necessary to be protective of the future beneficial uses of the groundwater.

Title 27 of the California Code of Regulations

Title 27, California Code of Regulations, section 20005 et seq. (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste as defined by Water Code section 13173. Title 27 exempts certain activities from its provisions. Discharges regulated by this General Order are exempt from Title 27 pursuant to provisions that exempt wastewater under specific conditions. This exemption, found in section 20090 of Title 27 is described below:

* * *

(b) Wastewater - Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

- (1) The applicable RWQCB has issued WDRs, reclamation requirements, or waived such issuance;
- (2) The discharge is in compliance with the applicable water quality control plan; and
- (3) The wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste.

* * *

Therefore, the discharge authorized in this General Order is exempt from the requirements of Title 27 because: 1) The Central Valley Water Board is issuing general WDRs; 2) The discharge is in compliance with the Basin Plan, and; 3) The treated waste discharged to the pond(s) does not need to be managed as hazardous waste.

Resolution 68-16 (State Anti-degradation Policy)

State Water Board Resolution No. 68-16 (*Policy with Respect to Maintaining High Quality Waters of the State*) (Anti-degradation Policy) generally prohibits the Central Valley Water Board from authorizing activities that will result in the degradation of high-quality waters unless it has been shown that:

1. The degradation will not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives;
2. The degradation will not unreasonably affect present and anticipated future beneficial uses;
3. The discharger will employ Best Practicable Treatment or Control (BPTC) to minimize degradation; and
4. The degradation is consistent with the maximum benefit to the people of the state.

Under this General Order, discharges will not result in groundwater degradation that exceeds water quality objectives. Produced wastewater discharge quality with respect to EC, chloride and boron will be limited to the effluent limits authorized in the Basin Plan. Produced wastewater discharges may degrade underlying groundwater up to the Basin Plan maximum salinity limits, but will be prohibited from adversely impacting beneficial uses of groundwater or exceeding water quality objectives. The burden of establishing that water quality degradation is in conformance with Resolution 68-16, rests with the project proponent or Discharger.

With respect to surface waters, this General Order prohibits the discharge of oil field related wastes to surface waters or surface water drainages.

To assess compliance with the State Anti-degradation Policy, this General Order requires Dischargers to monitor discharges to groundwater. The requirements to monitor first encountered groundwater are met when the Dischargers perform individual groundwater monitoring or participate in a regional monitoring program. The purpose of monitoring is to confirm that the discharges are effectively controlled by management practices and to evaluate compliance with this General Order.

This General Order places restrictions on the discharge of produced wastewater from petroleum production. The terms and conditions of this General Order are designed to minimize groundwater quality degradation and to protect beneficial uses of waters of the state. Implementation of wastewater management practices, groundwater monitoring plans, and maintenance of waste containment features at produced wastewater disposal facilities will minimize groundwater quality degradation.

According to a report titled, "The Economic Contribution of the Oil and Gas Industry in Kern County," dated November 2015 and prepared by Kern Economic Development Foundation (KEDF), California's oil industry is mostly concentrated in the Central Valley. Kern County has been major oil producer since the 1890's when oil was first discovered on the west side of the county. The oil and gas industry in Kern County plays an important role in the economies of the county and the state and provides a significant portion of the country's domestic oil and gas production. According to the KEDF report, Kern County is the leading oil-producing county in

the nation, yielding 145 million barrels of oil and 132 billion cubic feet of natural gas annually. These amounts represent 71% of California's oil production, 66% of the State's total gas production, and 10% of the total United States oil production.

The KEDF report also states that the oil and gas industry is the number-one industry in Kern County in terms of gross domestic product and tax contributions. The benefit of the oil and gas industry; however, is by no means limited to Kern County. The industry generates significant regional economic activity. Extraction, production, refining, and petroleum product manufacturing result in high tradable products that are consumed domestically and are also exported. These efforts produce high revenues, create high-paying jobs that require moderate-to-high skill (i.e., jobs in technical and engineering occupations), and contribute significant tax revenue to all levels of government. Oil and gas cluster employment accounts for 1 in 7 jobs in the county.

Considering the economic significance of the Central Valley oil field industry as well as the important role Central Valley oil field facilities play in providing domestic oil production and reduction in foreign oil imports, the Central Valley Water Board finds that maintaining the Central Valley oil industry and particularly in Kern County is to the benefit of the people of the state. Thus, allowing regulated oil field facilities to degrade high quality waters up to the Basin Plan's maximum effluent salinity limits is consistent with maximum benefit to people of the State as long as that degradation does not result in detrimental impacts to beneficial uses over the long term.

Verifying that the State Anti-degradation Policy is satisfied

The primary method used to determine if water quality objectives and the requirements of the *State Anti-degradation Policy* are being met is effluent and groundwater quality monitoring. The General Order requires monitoring of natural background water quality and the water quality downgradient of the production facility area, particularly ponds.

Monitoring and Reporting Program R5-2016-xxxx (MRP) requires oil field operators to sample existing municipal or domestic water supply wells within one-mile radius of the property, and monitor first-encountered groundwater at their production facility. The purpose of requiring monitoring of water supply wells includes identifying the quality and trends of water being used near or within the oil field. The purpose of requiring monitoring of first-encountered groundwater is to evaluate current discharge practices in order to determine whether such practices are protective of groundwater quality at the most vulnerable point. Groundwater monitoring is necessary to: determine background groundwater quality; determine existing groundwater conditions near ponds and production facility areas; determine whether improved management practices need to be implemented; and confirm that discharge practices are not causing degradation that could adversely affect groundwater beneficial uses.

This General Order requires the Discharger to report any noncompliance that endangers human health or the environment or any significant noncompliance with the Prohibitions contained in the General Order within 24 hours of becoming aware of its occurrence. The General Order and its application process requires the Discharger to submit annual monitoring reports in a tabular form for all the effluent and groundwater monitoring data and domestic water supply well data, if applicable. Additionally, an annual assessment of groundwater monitoring is required to

delineate the lateral and vertical extent of adverse impacts on groundwater quality. The assessment must include an evaluation of the groundwater monitoring program's adequacy to assess compliance with the General Order, including whether the data provided are representative of conditions upgradient and downgradient of the production facility.

The Central Valley Water Board recognizes that monitoring the effectiveness of the oil field facilities' BPTC and their effect on groundwater is needed to verify that water quality is adequately protected and the intent of the Anti-degradation Policy is met.

The individual groundwater monitoring provisions and requirements are designed to measure water quality data over time in first-encountered groundwater. It is recognized that in many cases, a single set of groundwater monitoring data, or even monitoring data over a period of months or years, may not be sufficient to determine the effectiveness of existing wastewater discharge practices. Evaluating groundwater results over an extended period of time, in conjunction with gathering data regarding existing surface practices, is necessary to determine whether water quality is being protected or is being unreasonably impacted.

California Environmental Quality Act

The benchmark for evaluating whether this General Order will have impacts on the environment is the "environmental baseline." The environmental baseline normally consists of "a description of the physical environmental conditions in the vicinity of the project at the time...environmental analysis is commenced." (CCR, title 14, section 15125(a).) The receipt of a permit application (RWD) is one event that can be used to mark the beginning of the environmental review process and therefore an appropriate date for the environmental baseline. (*Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1278.)

The Central Valley Water Board's environmental analysis regarding the existing produced wastewater ponds and associated discharges that would be covered under this General Order began in 2015 with the issuance of Notices of Violation and other orders requiring owners/operators without WDRs to submit RWDs. For these facilities, the adoption of this General Order, which prescribes regulatory requirements for existing facilities in order to ensure the protection of groundwater resources, is exempt from the requirements of the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.) based on the following three categorical exemptions:

1. California Code of Regulations, title 14, section 15301 exempts the "operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features" from environmental review. Eligibility under the General Order is limited to oil field facilities that were existing facilities prior to 1 January 2015, and the General Order does not authorize the expansion of these facilities or operation of new facilities unless the Discharger demonstrates compliance with the provisions of CEQA in the form of a certified Environmental Impact Report, Mitigated Negative Declaration, or Negative Declaration or other appropriate CEQA or environmental documents.
2. California Code of Regulations, title 14, section 15302 exempts the "...replacement or reconstruction of existing structures and facilities where the new structure will be located on

the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced...”

3. California Code of Regulations, title 14, section 15304 exempts “... minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes...”

Facilities defined as “new” or “expanding” pursuant to this General Order must submit proof of compliance with the provisions of the CEQA in the form of a certified Environmental Impact Report, Mitigated Negative Declaration, or Negative Declaration, or other appropriate environmental documents together with a RWD and appropriate fee, to the Central Valley Water Board to qualify for coverage under this General Order.

Central Valley Salinity Alternatives for Long-Term Sustainability

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten achievement of water quality objectives in Central Valley surface waters and groundwaters. The General Order requires actions that will reduce salt and COCs loading and improve management practices to be protective of good groundwater quality. The Central Valley Water Board intends to coordinate all such actions with the CV-SALTS initiative. CV-SALTS may identify additional actions that need to be taken by existing wastewater production facilities and others to address COCs. The General Order may also be amended in the future to implement any policies or requirements established by the Central Valley Water Board as a result of the CV-SALTS process.

REQUIREMENTS OF THE OIL FIELD GENERAL ORDER

The following describes Prohibitions, Discharge Specifications, Groundwater Limitations, Solids Disposal Specifications, and Provisions are intended to protect the quality of surface water and groundwater.

Prohibitions

Dischargers wishing to obtain coverage under this General Order must submit a NOI to comply with the requirements of the General Order. The NOI must contain a detailed description of all discharges that will be regulated under the General Order. The General Order also requires Dischargers to submit a detailed technical report including an Antidegradation Analysis describing how the proposed discharge will meet BPTC requirements and demonstrating how discharges at the proposed volumes and concentrations will ensure maintenance of beneficial uses of underlying groundwater. The General Order prohibits discharges, other than those described in the NOI and approved in a NOA.

Discharges of waste other than produced wastewater from production wells to pond(s) are prohibited unless the Executive Officer approves the discharge in accordance with an appropriate management plan outlined in the Provisions section of the General Order.

Storm water that comes into contact with residual oil, produced wastewater, or oil field wastes may contain pollutants. This General Order prohibits the discharge of any wastes to surface waters or surface water drainages. It also prohibits discharges of storm water that has come into contact with oil field wastes.

The discharge of any fluids from wells that have undergone a “well stimulation treatment”, as defined by CCR, title 14, section 1761 (including hydraulic fracturing, acid fracturing, and acid matrix stimulation) is prohibited

The General Order strictly prohibits the discharge of hazardous and designated wastes.

Operation or discharge of produced wastewater to ponds that could impact nearby water supply wells is prohibited in the General Order unless the Discharger can demonstrate that there will be no impact to the municipal or domestic water supply well.

To ensure that all wastes are properly treated and contained, the General Order prohibits the bypass of treatment and the discharges related to overflow of ponds.

The General Order prohibits the collection, treatment, discharge or disposal of wastes that could result in the creation of nuisance or pollution conditions.

Discharge Specifications

The Dischargers as part of the General Order application process will provide in the NOI the maximum design flow of the produced wastewater production facility and its treatment and disposal system. The discharge flow limit authorized in the NOA will be based on this design flow.

Ponds are required to be free of oil or be netted to preclude the entry of wildlife (CCR, title 14, section 1778 (d)).

The General Order sets maximum effluent salinity limits for discharges of wastewater to ponds and for produced wastewater within ponds (outside of the White Wolf Subarea) for EC of 1000 micro-mhos per centimeter ($\mu\text{mhos/cm}$), chloride concentration of 200 mg/L and boron concentration of 1 mg/L as the following 12-month rolling averages. For White Wolf Subarea the discharge of wastewater to ponds and within ponds shall not exceed the EC of 1000 $\mu\text{mhos/cm}$, chloride concentration of 175 mg/L, boron concentration of 1 mg/L, and percent sodium of 60 as the following 12-month rolling averages.

The General Order restricts the public contact with wastes to such means as fences or other acceptable alternatives (CCR, title 14, section 1770 (b) through (b)(4)).

The General Order requires all the conveyance, treatment, storage, and disposal systems including pond, tank battery, and other components of oil and gas production wastewater discharge facility, to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency. By 1 October of each year the available capacity in ponds is required to be sufficient to capture seasonal precipitation and production facility wastewater design flow.

The Discharger is required to operate and maintain all ponds with two feet of freeboard using a staff gauge unless a California registered civil engineer certifies that the operation of ponds less than two feet is adequate and will not impact the integrity of the ponds.

The General Order requires the ponds and containment structures be managed and operated to prevent breeding of vectors. Specifically ponds must be managed to minimize the accumulation of dead algae, vegetation, and debris on the pond surface; minimize growth of weeds and vegetation; and control pond erosion to limit vector breeding sites.

The General Order also allows the Discharger to use the produced wastewater generated from the production facility wells for dust control and construction activities as long as it is consistent with an approved management plan. The application rates are limited to those that are reasonable rates to preclude creation of a nuisance conditions and unreasonable degradation of groundwater. Applied wastewater shall not be allowed to pond onsite or runoff from the site.

Groundwater Water Limitations

The General Order proscribes the discharge of produced wastewater from causing the groundwater to contain constituents in concentrations greater than the Basin Plan maximum salinity limits, which include EC level of 1000 $\mu\text{mhos/cm}$, chloride concentration of 200 mg/L and boron concentration of 1 mg/L.

Discharges of produced wastewater in the White Wolf Subarea shall not cause chloride concentrations to exceed 175 mg/L.

The discharges of produced wastewater shall not cause underlying groundwater to contain any constituents in concentrations that adversely affect beneficial uses of the groundwater.

Solids Disposal Specifications

The General Order defines oil field solids as the solid, semisolid, and liquid residues removed from treatment processes or accumulated in tanks, ponds, or other facility components. The General Order requires any handling and storage of solids to be controlled in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soil in a mass or concentration that will violate the groundwater limitations of the General Order.

The General Order requires solids removed from the facility to be managed and disposed of in a manner consistent with solids management plan approved by the Executive Officer. The removal of solids for reuse plans as road mix is restricted to within the lease area.

The General Order also requires solids to be tested prior to use as a road mix and demonstrated to be non-hazardous. Any proposed changes in solids use or disposal practices are required to be reported in writing to the Executive Officer at least 90 days in advance of the change and be pre-approved by the Executive Officer.

Provisions

The General Order requires compliance with the applicable sections of “Standard Provisions and Reporting Requirements for Waste Discharge Requirements,” dated 1 March 1991 (Standard Provisions) and compliance with “Monitoring and Reporting Program R5-2016-XXXX.” During application process, the NOAs issued will delineate the Standard Provisions that are applicable.

The General Order also requires the Discharger to install an acceptable flow metering or flow monitoring. An engineering alternative to flow metering may be used if approved in writing by the Executive Officer.

The General Order authorizes discharge of waste from oil field activities other than produced wastewater from production wells if the discharger can demonstrate through water quality data that the discharge of wastewater is similar, compatible, or better than the produced wastewater quality, and in addition, the discharge does not pose a threat to beneficial uses of the groundwater. The General Order also requires prior approval of these oil field related discharges to ponds by the Executive Officer.

The General Order allows the application of produced wastewater at the production facility for dust control or construction activities if it is consistent with an Executive Officer approved management plan. The management plan must contain: a) data characterizing the quality of the produced wastewater that will be applied; b) proposed application/use methods, application rates, and proposed frequencies of application; c) a scaled aerial photograph showing the leases proposed application areas with identified roads, ponds, production treatment facility, surface waters, and surface water drainages; d) proposed constituent loading rates; e) a list of all management practices to be implemented to ensure produced wastewater does not migrate from proposed application areas; and f) a demonstration that the discharges will be protective of water quality and will not adversely affect the beneficial uses of surface water or underlying groundwater. The management plan must be submitted to the Executive Officer at least 90 days prior to the anticipated discharges. Discharges shall not occur without Executive Officer written approval of the management plan.

The General Order requires the dischargers to submit a solids management plan for approval of the Executive Officer at least 180 days prior to any solids reuse. For dischargers already reusing solids for road mix, the General Order requires submittal of a solids management plan for approval by the Executive Officer within 60 days of receipt of the NOA for the Facility. The solids management plan is to include a complete characterization of the quality and quantity of the solids. For reuse of solids as road mix within the lease area, the solids management plan must contain: 1) a demonstration that the solids are not hazardous as defined by CCR Title 22, et seq., 2) a scaled aerial photograph showing the leases proposed application areas with identified roads, ponds, production treatment facility, surface waters, and surface water drainages; 3) proposed constituent loading rates; 4) a list of all management practices that will be implemented to ensure wastes will remain where processed and applied and will not migrate from the site; and 5) a demonstration that the discharges will be protective of water quality and will not adversely affect the beneficial uses of surface water or underlying groundwater.

For off-site disposal of solids, the solids management plan must contain: 1) the name of the recipient of the waste, 2) the location of the waste disposal site, and 3) the Central Valley Water Board Order Number for the disposal site.

How Will the Board Evaluate the Effectiveness of Discharge Practices?

The General Order requires monitoring of all activities that result in discharges to land specifically the Monitoring and Reporting Program R5-2016-xxxx requires:

- Extensive produced wastewater discharge monitoring
- Pond and facility monitoring
- Groundwater monitoring
- Solids monitoring
- Hydrogeological evaluation of the discharge facility, if applicable
- Annual reporting
- Noncompliance reporting
- Spill and release reporting

This monitoring will be reviewed and evaluated to determine compliance with the General Order. Discharges that do not comply with the requirements of the General Order will be subject to enforcement under the provisions of the California Water Code.