
Central Valley Regional Water Quality Control Board

21 May 2018

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NOTICE OF APPLICABILITY (NOA), CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD, ORDER NUMBER R5-2017-0035, GENERAL ORDER TWO, WASTE DISCHARGE REQUIREMENTS FOR OIL FIELD DISCHARGES TO LAND, AERA ENERGY LLC, DEHYDRATION PLANT 20, SOUTH BELBRIDGE OIL FIELD, KERN COUNTY

Aera Energy, LLC. (Aera) operates the Dehydration Plant 20 (Facility) in the South Belridge Oil Field, west of Highway 33. The Facility contains six surface impoundments (ponds) lined with High Density Polyethylene (HDPE). Four of the ponds are lined with two layers of HDPE separated by a drainage net and referred to by Aera as the Lined Pond System (LPS). Two of the ponds are lined with a single layer of HDPE and referred to by Aera as the Emergency Holding Ponds (EHP(s)). The ponds are in the northwest quarter of section 20, T28S, R21E, MDB&M.

On 12 December 2017, Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff received a letter dated 8 December 2017 containing a Notice of Intent (NOI) for coverage under Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Number Two, Order Number R5-2017-0035 (General Order Two). The NOI included a technical report titled, “*Technical Report for General Order Two, Dehydration Plant 20, Aera Energy LLC, South Belridge Oil Field, Kern County, California*” (Report).

The Report states, “*Dehydration Plant 20 serves Aera’s Diatomite Production for North Belridge and South Belridge. Diatomite oil is produced using both steam flood and water flood.*” The Report also states, “*Dehydration Plant 20, and its water plant, use Free Water Knockouts, Heater Treaters, clarifiers, induced gas floatation systems, and filters to separate and clean the water before the water is used for water flood or sent to disposal.*” The Report states, “*Produced water is brought in with production from the diatomite wells across the North Belridge and South Belridge oil fields. Produced water from Lost Hills 1 lease is also transported to Dehydration Plant 20 and combined with the produced fluids at the inlet of the Free Water Knock Outs. Oil is removed in Dehydration Plant 20 and the produced water is filtered before being pumped to the injection and disposal wells. Produced water from the filter plant can be diverted to the Dehydration Plant Emergency Holding Pits and then to the Lined Pond System.*”

Information, including figures and cross-sections, provided by Aera, shows the LPS is constructed with 60-mil primary HDPE liner on top of a 40-mil HDPE secondary liner separated by a drainage net. The Report states, "*The drainage net between the two liners is connected to a leachate collection and recovery sump.*" The Report shows the EHPs are constructed with a single 60-mil HDPE liner. The geophysical logs provided in the Report show the ponds are constructed in surface alluvium, overlying the Tulare Formation.

The Report states, "*The ponds associated with this application are not designed or operated for the discharge of fluids.*" The Report also states, "*The lined pond system (LPS) are used when an upset occurs in the produced water disposal process of the plant. If the disposal pumps go down, or an upset in the distribution line occurs, produced water from the facility is diverted to the LPS and Emergency Holding Ponds (EHP) for temporary holding. Diverting the water helps to alleviate the pressure and further protect the equipment and the environment. Once the upset is resolved, fluids are pumped back into the process stream at the front of the plant, reprocessed, and sent down the disposal distribution line.*" Therefore, this NOA does not limit the Facility to a maximum monthly discharge volume to the ponds as long as the combined total design capacity of the ponds provided in the Report (308,949 barrels with 2 feet freeboard) is not exceeded per discharge event.

This letter serves as a formal notice that General Order Two is applicable to the Facility. General Order Number **R5-2017-0035-004** is hereby assigned to all produced wastewater discharges into the ponds. Aera should become familiar with all of the requirements, time schedules, prohibitions, and provisions of General Order Two and Monitoring and Reporting Program R5-2017-0035 (MRP).

General Order Two regulates the discharge of produced wastewater into ponds. The "BL13 Dehy 20 LPS 4 Holding Pond West, BL14 Dehy 20 LPS 3 Holding Pond East, BL15 Dehy 20 LPS 2 Inlet Cell North, BL16 Dehy 20 LPS 1 Inlet Cell South, BL17 Dehy 20 EHP Overflow S-100C East, and BL18 Dehy 20 EHP Overflow S-100B West" are "ponds" based on the definition in General Order Two's Attachment A (Definition of Terms). As stated in Water Code section 13263, "all" discharges of waste into waters of the state are privileges, not rights. General Order Two does not create a vested right for Aera to continue the discharges of waste to the ponds. Failure to prevent conditions that create or threaten to create pollution or nuisance or cause degradation of ground water or surface water will be sufficient reason to modify, revoke, or enforce the provisions of General Order Two, as well as prohibit further discharge. The integrity of the ponds' liners needs to be maintained on an ongoing basis.

In 2006, the Central Valley Water Board, the State Water Resources Control Board (State Water Board), and regional stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. The CV-SALTS effort might effect changes to the Basin Plan that would necessitate the re-opening of General Order Two.

FACILITY SPECIFIC REQUIREMENTS

1. Aera shall maintain exclusive control of the discharge and shall comply with all of the conditions of General Order Two and the MRP.
2. Aera shall operate and maintain the ponds sufficiently to protect the integrity of containment and berms and prevent overtopping and/or structural failure. Discharges not authorized by General Order Two and not described in the NOI should be reported to Central Valley Water Board Fresno office. Discharges of wastes other than those described in the NOI are prohibited. If the method or nature of waste discharge to the pond changes, Aera must submit a Report of Waste Discharge (Form 200).
3. The required annual fee specified in the annual billing from the State Water Board shall be paid until coverage under General Order Two is officially terminated. Aera must notify the Central Valley Water Board in writing to request termination.
4. By **20 August 2018**, Aera shall, pursuant to Provision E.3 of General Order Two, submit written certification that acceptable flow meters have been installed at a location or locations to ensure the accurate measurement of all discharge flows. The certification shall be accompanied by: (1) a description of the flow metering devices installed, (2) a diagram showing their locations, and (3) evidence demonstrating that the devices were properly calibrated. An engineered alternative may be used if approved in writing by the Central Valley Water Board's Executive Officer.
5. AERA shall not discharge produced wastewater outside of the ponds except for a permitted dust control use. If Aera intends to apply for use of produced wastewater for dust control, a proposed management plan as described in Provision E.5 of General Order Two must be submitted **90 days** prior to the anticipated discharge.
6. By **20 July 2018**, Aera shall, pursuant to Provision E.6 of General Order Two, submit a solids management plan for approval by the Executive Officer. This plan shall include the information required by Provision E.6. Aera shall, also include the information described in General Order Two, Attachment B, Information Needs Sheet, Item B.8 (a. – c.).
7. By **20 July 2018**, Aera shall submit, pursuant to Provision E.7 of General Order Two, a work plan to demonstrate that the discharges of produced water from wells that have been stimulated do not contain well stimulation fluids in concentrations that could adversely affect beneficial uses of waters.
8. The MRP for General Order Two requires the submittal of a Monitoring Well Installation and Sampling Plan (MWISP) in accordance with specified time frames after the NOA is issued. The MWISP for a "small operator" is due 12 months after the NOA is issued. The Executive Officer may rescind the groundwater investigation and groundwater monitoring portions of General Order Two if Aera demonstrates that wastes discharged to the ponds cannot affect the quality of underlying groundwater. The demonstration must include a plan for periodic testing of the pond liner integrity.

9. Provide by **20 July 2018** the Construction Quality Assurance Reports (CQARs) for the engineered liners, if any were prepared. Alternatively, Aera shall submit by **20 July 2018** a written statement that CQARs were not prepared or why they are not available.
10. Item B.4, Attachment B, of General Order Two asks for a demonstration of the maximum monthly average effluent flow to each pond that occurred between 26 November 2004 and 26 November 2014 and the basis for the effluent flow limits. The Report states that the ponds are not designed or operated for discharge of fluids. The Report also states, "*The produced wastewater residence time in the ponds is on the order of days and the water is not allowed to accumulate in the ponds nor fill the ponds beyond their capacity.*" Therefore, this NOA does not limit the Facility to a maximum monthly discharge volume. However, the combined maximum design capacity of the ponds (309,949,000 barrels at two feet freeboard), as described in the Report, shall not be exceeded per discharge event. If discharge volumes increase, it will be considered a facility expansion. Any increase beyond the design capacity volume (per discharge event) constitutes a facility expansion requiring an evaluation under the California Environmental Quality Act (CEQA).
11. Item B.2.a, Attachment B, of General Order Two asks for a description of how and where in the production or wastewater stream chemical additives are used. The Report includes the product names, types, and volumes of the chemical additives used in 2016. Aera shall submit by **20 July 2018** information describing how and where in the production or wastewater stream chemical additives are used.
12. Item B.3.a, Attachment B, of General Order Two asks for the characterization of each wastewater stream type after production facility treatment, but prior to discharge to the ponds and within the ponds. The Report provides analytical data for one sample collected from one of the LPS ponds and no characterization of wastewater prior to discharge to the ponds. The NOI states, "*The Facility receives wastewater from production in North and South Belridge Oil Fields, Lost Hills 1 and Lost Hills 2 Leases in Lost Hills Oil Field, and a road mix facility.*" The Report does not provide analytical data for a sample collected from the waste stream of the reported road mix facility. Aera shall submit by **20 July 2018** analytical data of a sample collected from wastewater prior to discharge to the ponds and a sample characterizing the wastewater received from the reported road mix facility.

According to information provided with the NOI, the discharge is contained within the ponds. The NOI reports that, "*No Aera facilities in the South Belridge oil field have met the requirements for coverage under the Industrial Storm Water General Permit.*" Order Number 2014 0057-DWQ (NPDES General Permit CAS000001) specifies waste discharge requirements for discharges of storm water associated with industrial activities. If the conditions or regulatory policies change, the Facility may need coverage under NPDES General Permit CAS000001. There is not a need to obtain coverage under NPDES General Permit CAS000001 at this time.

The MRP requires extensive monitoring of the Facility and the discharge. Failure to comply with the requirements in General Order Two and the MRP could result in an enforcement action as authorized by provisions of the California Water Code. A copy of General Order Two and the MRP is included with the enclosures to this notice. A copy can also be found online at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/5-2017-0035.pdf.

The MRP includes monitoring and reporting of chemicals and additives. Aera should become familiar with those requirements. The Central Valley Water Board will review the MRP periodically and revise requirements when necessary.

The MRP can be modified if Aera provides sufficient data to support the proposed changes. If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after a statistically significant number of sampling events, AERA may request the MRP be revised by the Executive Officer to reduce the monitoring frequency or minimize the list of constituents. The proposal must include adequate technical justification for the revisions.

Aera must comply with the Central Valley Water Board's Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991 (Standard Provisions). A copy of the Standard Provisions is included with the enclosures to this notice. A copy can also be found online at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/std_provisions/wdr-mar1991.pdf.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review this action in accordance with Water Code section 13320 and CCR, title 23, division 3, chapter 6, section 2050 and those that follow. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Notice of Applicability, except that if the thirtieth day following the date falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day.

SUBMISSIONS

The Central Valley Water Board has gone to a paperless office system. All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically to the GeoTracker database <http://geotracker.waterboards.ca.gov/>.

GeoTracker Site Global ID: T10000011582 for the Section 20 Lease

Documents that are less than 50 MB should be emailed to: centralvalleyfresno@waterboards.ca.gov.

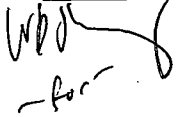
Aera Energy, LLC.
Notice of Applicability for General Order Two
Dehydration Plant 20
South Belridge Oil Field
Kern County

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21 May 2018

Documents that are 50 MB or larger should be transferred to a disk and mailed to the Central Valley Water Board office at 1685 E Street, Fresno, CA 93706.

Please review the attached memorandum for more information. If you have any questions regarding this matter, please contact Omar O. Erekat of this office at (559) 488-5382 or by email at omar.erekat@waterboards.ca.gov.



Pamela C. Creedon
Executive Officer

Enclosures: 21 May 2018 Memorandum
1 March 1991 Standard Provisions
General Order Two

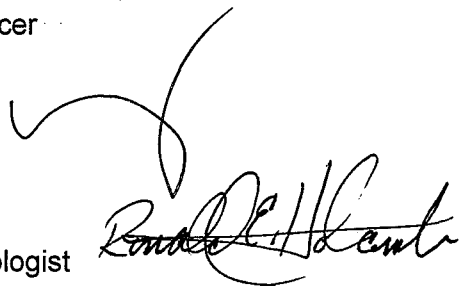
cc: William V. Pipes, PG, Amec Foster Wheeler Environment and Infrastructure, Fresno
Keith Nakatani, Oil and Gas Program Manager, Clean Water Action (NOA only, Via Email)

Central Valley Regional Water Quality Control Board

TO: Clay Rodgers
Assistant Executive Officer

W. Dale Harvey
Supervising Engineer
RCE No. 55628

FROM: Ronald E. Holcomb
Senior Engineering Geologist
PG No. 6725



Omar O. Erekat
WRC Engineer

DATE: 21 May 2018

SUBJECT: NOTICE OF APPLICABILITY, CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD, ORDER NUMBER R5-2017-0035, GENERAL ORDER TWO, WASTE DISCHARGE REQUIREMENTS FOR OIL FIELD DISCHARGES TO LAND, AERA ENERGY LLC, DEHYDRATION PLANT 20, SOUTH BELTRIDGE OIL FIELD, KERN COUNTY

Aera Energy LLC (Aera) operates the Dehydration Plant 20 (Facility) in the South Belridge Oil Field, west of Highway 33. Reportedly, the Facility utilizes six surface impoundments (ponds) lined with High Density Polyethylene (HDPE) for the temporary storage of oil field produced wastewater (discharge). The ponds are in the northwest quarter of section 20, T28S, R21E MDB&M. Aera identifies four of the ponds as "BL13 Dehy 20 LPS 4 Holding Pond West, BL14 Dehy 20 LPS 3 Holding Pond East, BL15 Dehy 20 LPS 2 Inlet Cell North, and BL16 Dehy 20 LPS 1 Inlet Cell South" and refers to them as the "Lined Pond System" (LPS). Aera identifies the other two ponds as "BL17 Dehy 20 EHP Overflow S-100C East and BL18 Dehy 20 EHP Overflow S-100B West" and refers to them as the "Emergency Holding Ponds" (EHP(s)).

On 12 December 2017, Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff (Staff) received a Notice of Intent (NOI) for coverage under Order No. R5-2017-0035, Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Two (General Order Two). The NOI includes a technical report titled "Technical Report for General Order Two, Dehydration Plant 20, Aera Energy LLC, South Belridge Oil Field, Kern County, California" (Report). The NOI did not include an application fee or a completed form 200. This memorandum provides a summary of the information provided for the Facility and identifies the ponds to be covered under General Order Two.

BACKGROUND INFORMATION

Six ponds are used for temporary holding of produced wastewater; the Report states, "The lined pond system (LPS) are used when an upset occurs in the produced water disposal process of

the plant. If the disposal pumps go down, or an upset in the distribution line occurs, produced water from the facility is diverted to the LPS and Emergency Holding Ponds (EHP) for temporary holding. Diverting the water helps to alleviate the pressure and further protect the equipment and the environment. Once the upset is resolved, fluids are pumped back into the process stream at the front of the plant, reprocessed, and sent down the disposal distribution line.” The Facility does not have waste discharge requirements (WDRs) and is not associated with a previously submitted report of waste discharge.

General Order Two regulates oil field wastewater discharges that exceed the maximum oil field discharge limits for electrical conductivity, chloride, and boron contained in the Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised July 2016 (Basin Plan).

Submitted Information and Recent Regulatory History

On 1 April 2015, Staff issued “*California Water Code Directive Pursuant to Section 13267*” (13267 Order), which required that Aera “*Collect representative samples of wastewater within each of the ponds.*” In response, Aera submitted on 16 June 2015 a technical report including analytical results of wastewater samples from a number of ponds. On 7 April 2016, Aera submitted an addendum containing information not provided in the initial 13267 technical report and clarifications requested by Staff.

Aera submitted on 8 May 2017, via email, a document dated 6 May 2017, and titled, “*Technical Report for General Order Number Three.*” The stated purpose of the technical report was to “*...fulfill the partial requirement of the Notice of Intent as stated in Attachment B of General Order Number Three.*” The technical report included information for the ponds at the Dehydration Plant 20 along with a number of ponds on multiple facilities within the South Belridge Oil Field. Staff comments regarding the review of the technical report and the Work Plan were conveyed in a letter dated 9 June 2017. The 9 June 2017 letter stated that there was a need to obtain separate permits for the ponds at the different facilities, and that the available information did not indicate that General Order Three was appropriate for regulating Aera’s ponds in the South Belridge Oil Field. As a result, Aera submitted the 12 December 2017 NOI.

POND CHARACTERISTICS

The Report contains a table that shows the depth, surface area, and holding capacity of each pond with 2 feet freeboard. The Report states: “*The total estimated capacity of the ponds, accounting for 2 feet of freeboard, is 308,949 bbls.*” The Report states: “*The LPS at Dehydration Plant 20 are constructed below surrounding grades and lined with two layers of high density polyethylene (HDPE) separated by a drainage net. The primary liner consists of 60 -mil HDPE and the secondary liner consists of 40-mil HDPE.*” The Report also states: “*The EHP at Dehydration Plant 20 are constructed below surrounding grades and lined with 60-mil HDPE.*” Appendix A of the Report contains drawings showing schematics of the ponds and a manufacturer specification sheet for the used HDPE liners.

Under Discharge Specifications, Item B.10., General Order Two states: “*Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation*

and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of overflow)."

DISCHARGE CHARACTERISTICS

Flow Volumes

The Report states, *"Water volume discharged to the LPS, inlet and main cells included, is measured upstream of the LPS. The monthly volumes from 2009 to present are summarized in attachment A.7.a Dehy 20 Produced Water Volumes to Lined Pond System provided in Appendix C. The average monthly discharge volume between 2009 and 2014 was 96,508 barrels (bbls). The maximum monthly volume discharged to the ponds was 869,584 bbls, which occurred in August 2012."* The Report also states: *"The discharge volumes for the EHP are summarized in attachment A.7.a Dehy 20 Discharge Volumes to Emergency Holding Ponds provided in Appendix C. The calculated maximum monthly average discharge volume for the EHP is 3,329 bbls. The calculated volume is based on data collected from August 2014 to July 2015. A factor was applied to estimate volume discharged in Aera Energy LLC's peak production year of 2006 using a factor of 1.51."*

Under Discharge Specifications, Item B.1., General Order Two states *"The discharge flow shall not exceed actual maximum monthly average produced wastewater flow to pond between 26 November 2004 and 26 November 2014. The discharge flow also shall not exceed the maximum design flow of the Facility's limiting unit as described by the technical data in the NOI."*

The Report states, *"The ponds at Dehydration Plant 20 are not designed or operated for long-term wastewater storage. The produced wastewater is put back through the system immediately after being discharged to the ponds. The produced wastewater residence time in the ponds is on the order of days and the water is not allowed to accumulate in the ponds nor fill the ponds beyond their capacity."* Therefore, the Facility is not limited to a maximum monthly flow volume to the ponds as long as the combined total design capacity of the ponds stated in the Report (308,949 barrels with 2 feet freeboard) is not exceeded per discharge event. Produced wastewater must not be allowed to over top and flow outside of the ponds. General Order Two prohibits produced wastewater discharges outside of the ponds.

Dust Control and Solid Reuse

With regards to the use of wastewater for dust control, the Reports states, *"Consistent with Provision E.5 of the General Order, Aera proposes to utilize produced water for dust suppression in the oil field covered by this NOI. Analytical data, along with a detailed management plan will be supplied for this use and no application of produced water to land will occur until the Executive Officer approves the management plan."*

With regards to the reuse of solids, the Report states: *"Consistent with Provision E.6 of the General Order, Aera proposes to continue to beneficially utilize solids generated from the oil field covered by this NOI along with other Aera properties consistent with the current practices. Analytical data, along with a detailed management plan, consistent with Provision E.6 and items*

B-8 (a-c) will be supplied to describe both the centralized road mix processing facility in South Belridge and the regional use of that product for the construction of roads and well pads throughout Aera’s operating properties.”

Waste Constituents

The Report states, “A wastewater sample was collected from Dehydration Plant 20 LPS on July 26, 2017.” The analytical results from this sampling event are provided in the Report. The sample results are summarized in **Table 1**, below.

Table 1 Selected constituent data from wastewater sample collected on 26 July 2017.

Constituents of Salinity	Concentration	Units
Total Dissolved Solids (TDS)	25,000	milligrams per Liter (mg/L)
Chloride	13,000	mg/L
Dissolved Boron	99	mg/L
Specific Conductance	37,700	µS/cm
Volatile Organic Compounds (VOC), and Polynuclear Aromatic Hydrocarbons (PAH)		
Benzene	1,500	micrograms per Liter (µg/L)
Ethylbenzene	220	µg/L
Isopropylbenzene	21	µg/L
p-isopropyltoluene	8.0	µg/L
n-Propylbenzene	24	µg/L
Toluene	2,500	µg/L
1,2,4-Trimethylbenzene	190	µg/L
1,3,5-Trimethylbenzene	39	µg/L
Total Xylenes	1,300	µg/L
Naphthalene *	120* / 61	µg/L
Pyrene	ND	µg/L
Phenanthrene	ND	µg/L
Radioactivity		
Gross Alpha	120± 114	picoCuries per Liter (pCi/L)
Radium-226	23.9 ± 9.61	pCi/L
Radium-228	18.4 ± 6.79	pCi/L
Total Uranium	ND	pCi/L

- * Naphthalene was analyzed for twice, and detected at a concentration of 120 µg/L with U.S. EPA method 8260 (VOCs), and detected at a concentration of 61 µg/L with U.S. EPA method 8270 (PAHs).

The Report states, "*Hazardous wastes are not typically generated in these fields. However, any generated wastes will be disposed of in accordance with both State and Federal laws and not commingled with wastewater.*" Discharge Specification B.15. of General Order Two requires that the discharger monitor the accumulations of solids within the ponds and as necessary, remove them. Additional General Order Two requirements for solids are listed under, Section D, titled "*Solids Disposal Specifications.*"

REGIONAL CHARACTERISTICS

With regards to the underlying soils, the Report states, "*The Dehydration Plant 20 ponds are located on the eastern flank of the South Belridge anticline, where the Diatomite Formation dips steeply to the northeast as shown on attachment E.11.b Sec 20 Cross Section Map provided in Appendix A. The Diatomite Formation is overlain by a thick interval of heavy-oil reservoirs in the Tulare Formation, which essentially encases the deeper Diatomite reservoir. The Tulare Formation is directly overlain by the Corcoran Clay Equivalent (CCE), a regional aquitard, above which are unconsolidated sediments in the Holocene alluvium.*" The Reports contains a number of geophysical logs for borings near the location of the ponds. The geophysical logs show a thin layer of alluvium separated from the top of the Tulare Formation by the Corcoran Clay Equivalent.

The Report also states, "*The depth of unsaturated soil (or depth to groundwater) beneath Dehydration Plant 20 is estimated to be between 60 and 110 feet below ground surface, based on depth-to-groundwater measurements collected in May 2017 from nearby wells 20J1 (about 0.4 mile southeast), 16D1 (about 1.1 miles north-northeast), and 21C1R (about 1 mile east).*" The Report also states, "*The depth to groundwater reported in May 2017 (wet season) for nearby monitoring wells 20J1, 16D1, and 21C1R was 108.36, 110.8, and 61.71 feet below ground surface, respectively.*"

The Report states, "*Protected groundwater is not present in the alluvium and the Tulare Formation beneath Dehydration Plant 20. Alluvium groundwater in the vicinity of Dehydration Plant 20 is dominated by historical produced water percolation pond practices that occurred from the late 1950s to 2006.*" The Report also states, "*Protected groundwater in the alluvium is found approximately 1.0 mile to the north-northwest in Section 18 (well MW-10) and about 1.2 miles to the northeast in Section 21 (well 21C1R), where alluvium groundwater monitoring wells have been installed as part of the pond closure monitoring programs. The wells are shown on attachment E.12.a, Alluvium Groundwater Map provided in Appendix A.*"

WATER BALANCE AND POND CAPACITY ANALYSIS REQUIREMENTS

The Report describes a combined design capacity of 308,949 barrels with 2 feet freeboard for the ponds, and an estimated a monthly discharge volume of 96,508 barrels. The Report provides a water balance capacity analysis that takes into account hydraulic loading rates, precipitation, evaporation rates, and outflows from the ponds. The analysis assumes no

percolation of wastewater beneath the ponds and concludes that the excess capacity equals the holding capacity of the ponds. Information provided by the Report indicates that pumping is the primary mode of wastewater removal.

SUMMARY AND POTENTIAL THREAT TO WATER QUALITY

The ponds are lined with HDPE liners. General Order Two requires groundwater monitoring as described in Monitoring and Reporting Program R5-2017-0035 (MRP) that accompanies General Order Two.

The MRP requires that a “*Monitoring Well Installation and Sampling Plan*” (MWISP) be submitted within specified time frames. However, the MRP states that, “*If the Discharger demonstrates that the wastes discharged to the ponds cannot affect the quality of underlying groundwater, the Executive Officer may rescind by signed letter all or part of the requirements to complete the groundwater investigation and groundwater monitoring portions of this Order.*” Any proposal to rescind this requirement will need to demonstrate that discharges to the ponds do not and will not pose a threat to water quality.

Based on the conditions described above, coverage under General Order Two appears to be appropriate for the ponds. As per Title 23, CCR, section 2200, the discharge shall be given a TTWQ (threat to water quality) and CPLX (complexity rating) of 3C. Aera is responsible for annual fees associated with this rating, unless conditions or regulatory policies change.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS

1 March 1991

A. General Provisions:

1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.
2. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.
3. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
 - a. Violation of any term or condition contained in this Order;
 - b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;
 - d. A material change in the character, location, or volume of discharge.
4. Before making a material change in the character, location, or volume of discharge, the discharger shall file a new Report of Waste Discharge with the Regional Board. A material change includes, but is not limited to, the following:
 - a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements.
 - b. A significant change in disposal method, location or volume, e.g., change from land disposal to land treatment.
 - c. The addition of a major industrial, municipal or domestic waste discharge facility.
 - d. The addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.

Waste Discharge to Land

5. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for public inspection at the offices of the Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.
6. The discharger shall take all reasonable steps to minimize any adverse impact to the waters of the state resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.
7. The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
8. The discharger shall permit representatives of the Regional Board (hereafter Board) and the State Water Resources Control Board, upon presentations of credentials, to:
 - a. Enter premises where wastes are treated, stored, or disposed of and facilities in which any records are kept,
 - b. Copy any records required to be kept under terms and conditions of this Order,
 - c. Inspect at reasonable hours, monitoring equipment required by this Order, and
 - d. Sample, photograph and video tape any discharge, waste, waste management unit, or monitoring device.
9. For any electrically operated equipment at the site, the failure of which would cause loss of control or containment of waste materials, or violation of this Order, the discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.
10. The fact that it would have been necessary to halt or reduce the permitted activity in Order to maintain compliance with this Order shall not be a defense for the discharger's violations of the Order.
11. Neither the treatment nor the discharge shall create a condition of nuisance or pollution as defined by the California Water Code, Section 13050.
12. The discharge shall remain within the designated disposal area at all times.

B. General Reporting Requirements:

1. In the event the discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the discharger shall notify the Board by telephone at **(916) 464-3291** [*Note: Current phone numbers for all three Regional Board offices may be found on the internet at http://www.swrcb.ca.gov/rwqcb5/contact_us.*] as soon as it or its agents

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have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within **two weeks**. The written notification shall state the nature, time and cause of noncompliance, and shall include a timetable for corrective actions.

2. The discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events.

This plan shall:

- a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.
- b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes of contingency plans.
- c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

The Board, after review of the plan, may establish conditions that it deems necessary to control leakages and minimize their effects.

3. All reports shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in 3a, 3b or 3c of this requirement if;
 - (1) the authorization is made in writing by a person described in 3a, 3b or 3c of this provision;
 - (2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a waste management unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - (3) the written authorization is submitted to the Board

Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of the those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

4. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. Failing to furnish the reports by the specified deadlines and falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the discharger.
5. The discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

Note: Current addresses for all three Regional Board offices may be found on the internet at http://www.swrcb.ca.gov/rwqcb5/contact_us or the current address if the office relocates.

C. Provisions for Monitoring:

1. All analyses shall be made in accordance with the latest edition of: (1) *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA 600 Series) and (2) *Test Methods for Evaluating Solid Waste* (SW 846-latest edition). The test method may be modified subject to application and approval of alternate test procedures under the Code of Federal Regulations (40 CFR 136).
2. Chemical, bacteriological, and bioassay analysis shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Board.

Unless otherwise specified, all metals shall be reported as Total Metals.

3. The discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to

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complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

Record of monitoring information shall include:

- a. the date, exact place, and time of sampling or measurements,
 - b. the individual(s) who performed the sampling of the measurements,
 - c. the date(s) analyses were performed,
 - d. the individual(s) who performed the analyses,
 - e. the laboratory which performed the analysis,
 - f. the analytical techniques or methods used, and
 - g. the results of such analyses.
4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.
 5. The discharger shall maintain a written sampling program sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the discharger shall be familiar with the sampling plan.
 6. The discharger shall construct all monitoring wells to meet or exceed the standards stated in the State Department of Water Resources *Bulletin 74-81* and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.22

D. Standard Conditions for Facilities Subject to California Code of Regulations, Title 23, Division 3, Chapter 15 (Chapter 15)

1. All classified waste management units shall be designed under the direct supervision of a California registered civil engineer or a California certified engineering geologist. Designs shall include a Construction Quality Assurance Plan, the purpose of which is to:
 - a. demonstrate that the waste management unit has been constructed according to the specifications and plans as approved by the Board.
 - b. provide quality control on the materials and construction practices used to construct the waste management unit and prevent the use of inferior products and/or materials which do not meet the approved design plans or specifications.
2. Prior to the discharge of waste to any classified waste management unit, a California registered civil engineer or a California certified engineering geologist must certify that the waste management unit meets the construction or prescriptive standards and performance goals in Chapter 15, unless an engineered alternative has been approved by the Board. In the case of an engineered alternative, the registered civil engineer or a certified engineering geologist must

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certify that the waste management unit has been constructed in accordance with Board-approved plans and specifications.

3. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the waste management units.
4. Closure of each waste management unit shall be performed under the direct supervision of a California registered civil engineer or a California certified engineering geologist.

E. Conditions Applicable to Discharge Facilities Exempted from Chapter 15 Under Section 2511

1. If the discharger's wastewater treatment plant is publicly owned or regulated by the Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to California Code of Regulations, Title 23, Division 4, Chapter 14.
2. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except diversions designed to meet variable effluent limits) is prohibited. The Board may take enforcement action against the discharger for by-pass unless:
 - a. (1) By-pass was unavoidable to prevent loss of life, personal injury, or severe property damage. (Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a by-pass. Severe property damage does not mean economic loss caused by delays in production); and
 - (2) There were no feasible alternatives to by-pass, such as the use of auxiliary treatment facilities or retention of untreated waste. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance; or
 - b. (1) by-pass is required for essential maintenance to assure efficient operation; and
 - (2) neither effluent nor receiving water limitations are exceeded; and
 - (3) the discharger notifies the Board ten days in advance.

The permittee shall submit notice of an unanticipated by-pass as required in paragraph B.1. above.

3. A discharger that wishes to establish the affirmative defense of an upset (see definition in E.6 below) in an action brought for noncompliance shall demonstrate, through properly signed, contemporaneous operating logs, or other evidence, that:

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- a. an upset occurred and the cause(s) can be identified;
- b. the permitted facility was being properly operated at the time of the upset;
- c. the discharger submitted notice of the upset as required in paragraph B.1. above; and
- d. the discharger complied with any remedial measures required by waste discharge requirements.

In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof.

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Board by **31 January**.
5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to disposal. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.
6. Definitions
 - a. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper action.
 - b. The monthly average discharge is the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging. This number is to be reported in gallons per day or million gallons per day.

Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges by the number of days during the month when the measurements were made.
 - c. The monthly average concentration is the arithmetic mean of measurements made during the month.
 - d. The "daily maximum" **discharge** is the total discharge by volume during any day.

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- e. The “daily maximum” **concentration** is the highest measurement made on any single discrete sample or composite sample.
- f. A “grab” sample is any sample collected in less than 15 minutes.
- g. Unless otherwise specified, a composite sample is a combination of individual samples collected over the specified sampling period;
 - (1) at equal time intervals, with a maximum interval of one hour
 - (2) at varying time intervals (average interval one hour or less) so that each sample represents an equal portion of the cumulative flow.

The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results.

7. Annual Pretreatment Report Requirements:

Applies to dischargers required to have a Pretreatment Program as stated in waste discharge requirements.)

The annual report shall be submitted **by 28 February** and include, but not be limited to, the following items:

- a. A summary of analytical results from representative, flow-proportioned, 24-hour composite sampling of the influent and effluent for those pollutants EPA has identified under Section 307(a) of the Clean Water Act which are known or suspected to be discharged by industrial users.

The discharger is not required to sample and analyze for asbestos until EPA promulgates an applicable analytical technique under 40 CFR (Code of Federal Regulations) Part 136. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and sludge sampling and analysis shall be performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto.

- b. A discussion of Upset, Interference, or Pass Through incidents, if any, at the treatment plant which the discharger knows or suspects were caused by industrial users of the system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any

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additional limitations, or changes to existing requirements, may be necessary to prevent Pass Through, Interference, or noncompliance with sludge disposal requirements.

- c. The cumulative number of industrial users that the discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.
- d. An updated list of the discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:
 - (1) Complied with baseline monitoring report requirements (where applicable);
 - (2) Consistently achieved compliance;
 - (3) Inconsistently achieved compliance;
 - (4) Significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);
 - (5) Complied with schedule to achieve compliance (include the date final compliance is required);
 - (6) Did not achieve compliance and not on a compliance schedule;
 - (7) Compliance status unknown.

A report describing the compliance status of any industrial user characterized by the descriptions in items (d)(3) through (d)(7) above shall be **submitted quarterly from the annual report date** to EPA and the Board. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

- e. A summary of the inspection and sampling activities conducted by the discharger during the past year to gather information and data regarding the industrial users. The summary shall include but not be limited to, a tabulation of categories of dischargers that were inspected and sampled; how many and how often; and incidents of noncompliance detected.

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- f. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:
- (1) Warning letters or notices of violation regarding the industrial user's apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations;
 - (2) Administrative Orders regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;
 - (3) Civil actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;
 - (4) Criminal actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
 - (5) Assessment of monetary penalties. For each industrial user identify the amount of the penalties;
 - (6) Restriction of flow to the treatment plant; or
 - (7) Disconnection from discharge to the treatment plant.
- g. A description of any significant changes in operating the pretreatment program which differ from the discharger's approved Pretreatment Program, including, but not limited to, changes concerning: the program's administrative structure; local industrial discharge limitations; monitoring program or monitoring frequencies; legal authority of enforcement policy; funding mechanisms; resource requirements; and staffing levels.
- h. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.
- i. A summary of public participation activities to involve and inform the public.
- j. A description of any changes in sludge disposal methods and a discussion of any concerns not described elsewhere in the report.

Duplicate signed copies of these reports shall be submitted to the Board and:

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

and

State Water Resource Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812

Revised January 2004 to update addresses and phone numbers

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

ORDER R5-2017-0035

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER

FOR
OIL FIELD DISCHARGES TO LAND

GENERAL ORDER NUMBER TWO

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

SCOPE OF GENERAL ORDER COVERAGE

1. This General Order applies to owners and/or operators (hereinafter referred to as “Dischargers”) of oil and gas production facilities (hereinafter referred to as Facilities or Facility) that:
 - a. primarily discharge produced wastewater from oil and gas extraction operations to land, including but not limited to produced wastewater disposal 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,
 - b. exceed the maximum oil field discharge 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
 - c. began discharge of wastewater to pond(s) prior to **26 November 2014**.

This General Order classifies such Facilities as “existing.”

2. The Board will notify Dischargers of coverage under the terms and conditions of this General Order by Executive Officer issuance of a Notice of Applicability as described in the application process below.
3. This General Order will provide coverage for discharge of oil field produced wastewater to ponds and to land for dust control and construction activities. This General Order does not provide coverage for oil field produced wastewater discharges for crop irrigation. This General Order also does not provide coverage for road mix and dust control applications to land where that is the only discharge to land. These separate discharges will be addressed under separate Central Valley Water Board order or waiver of waste discharge requirements (WDRs).

4. It is the intent of the Central Valley Water Board that Facilities regulated by outdated WDRs can also apply for coverage under this General Order.
5. For the purposes of this General Order, “produced wastewater” is formation water pumped from an oil or gas well and discharged to land. Produced wastewater may also include any water, precipitation, or rainfall runoff that contacts produced wastewater or residual oil field wastes in the Facility. See Attachment A for specific definitions of many of the terms used in this General Order.
6. There are approximately 326 Facilities with about 1,100 ponds within the Central Valley. Approximately 700 ponds are actively used. Not all of these facilities can meet the requirements of this General Order.

APPLICATION PROCESS

7. Dischargers seeking coverage under this General Order shall file a Notice of Intent (NOI) with the Central Valley Water Board within 30 days of the adoption date of this General Order. A NOI shall consist of the following:
 - a. A completed Form 200, which is available at:
http://www.waterboards.ca.gov/publications_forms/forms/docs/form200.pdf.
 - b. Dischargers that are not operating under existing WDRs shall submit an application fee that shall also serve as the first annual fee. The fee shall be 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, section 2200.
 - c. A technical report that describes the wastewater generation, treatment, storage, reuse and disposal activities. Submittal of the technical report containing complete information described in the attached *Information Needs Sheet* (Attachment B), which is hereby incorporated by reference as part of this General Order, will allow for an expedited review by Central Valley Water Board staff. Applicants are advised to inquire with Central Valley Water Board staff before performing investigations and/or preparing the technical report to ensure that the report will be complete.

Upon review of the NOI, Central Valley Water Board staff will determine the appropriate TTWQ and CPLX rating and additional fees may be required.

8. The NOI for the Facility seeking coverage under this General Order shall document the existing operations, which is defined as the actual maximum monthly average

produced wastewater discharge flow to ponds that occurred in the ten years immediately prior to 26 November 2014. Any increase in flow beyond this number constitutes an expansion requiring a CEQA evaluation. The use of the actual maximum monthly average produced wastewater discharge flow in the last ten years to define the existing operations accounts for fluctuations in oil and gas production and associated wastewater flows due to changes in economic conditions.

9. If the information in the NOI demonstrates that coverage under this General Order is appropriate, the Central Valley Water Board's Executive Officer (Executive Officer) will authorize coverage by issuing a Notice of Applicability (NOA). Coverage under this General Order will commence upon issuance of the NOA. The NOA will describe the appropriate monitoring and reporting requirements.
10. The Executive Officer may determine that the discharge would be better regulated by individual WDRs, a different general order, an enforcement order, or a National Pollutant Discharge Elimination System (NPDES) Permit in the case of discharges to waters of the United States. In these cases, the Executive Officer will notify the Discharger in writing of such a determination.

BACKGROUND INFORMATION

11. This General Order prescribes requirements for discharges of non-hazardous oil field produced wastewater to ponds and other low threat discharges to land in existing Facilities located in the Central Valley Region.
12. Existing 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. tank batteries, WEMCOs), storage units, produced wastewater treatment systems, and disposal systems that can include evaporation and percolation ponds. In some operations, produced wastewater is disposed through underground injection wells permitted and regulated by California Department of Conservation's Division of Oil, Gas, and Geothermal Resources (DOGGR). In most 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 (also regulated by DOGGR). High quality produced wastewater may also be reused to supplement agricultural water supplies. Other uses of produced wastewater (of appropriate quality) may include, but are not limited to, oil field dust control and as a compaction aid for construction activities on oil fields, and others as approved by the Executive Officer.

13. The Central Valley Water Board in 2014 began a reevaluation of its oil field program, particularly with respect to discharges to land. The evaluation included research and inspection of all known discharges to ponds. In 2015, the Central Valley Water Board issued orders under Water Code Section 13267 requiring oil field operators to submit information on their discharges to land. In 2015, the Central Valley Water Boards also issued orders under Water Code section 13304 to those discharging to ponds without valid waste discharge requirements. The orders required dischargers to submit information on the location, volume and quality of the discharge and to conduct hydrogeological site characterization to determine vertical and lateral extent of the impact of wastewater percolating to groundwater and to ascertain whether discharges threaten groundwater quality or threaten to cause pollution. This information was necessary to determine whether the discharge can be permitted by the Central Valley Water Board. This information may be suitable to support a notice of intent to comply with this General Order, another general order, or to support individual waste discharge requirements.
14. Discharges that would qualify for this General Order are those that exceed the Basin Plan salinity limits but, due to site specific conditions, will not substantially affect water quality nor cause a violation of water quality objectives in the groundwater.

BASIN PLAN AND BENEFICIAL USES

15. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Revised January 2015* (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board (State Water Board).
16. Pursuant to Chapter II of the Basin Plan, the beneficial uses of surface water may include:
 - a. municipal and domestic supply (MUN);
 - b. agricultural supply (AGR);
 - c. industrial process supply (PRO);
 - d. industrial service supply (IND);
 - e. hydro-power generation (POW);
 - f. water contact recreation (REC-1);
 - g. non-contact water recreation (REC-2);
 - h. warm freshwater habitat (WARM);
 - i. cold freshwater habitat (COLD);

- j. migration of aquatic organisms (MIGR);
- k. spawning reproduction and/or early development (SPWN);
- l. wildlife habitat (WILD);
- m. navigation (NAV);
- n. rare, threatened, or endangered species (RARE);
- o. groundwater recharge (GWR);
- p. freshwater replenishment (FRSH);
- q. aquaculture (AQUA); and
- r. preservation of biological habitats of special significance (BIOL).

Where surface water bodies are not specifically listed, the Basin Plan designates beneficial uses based on the waters to which they are tributary.

17. The beneficial uses of groundwater described in the Basin Plan include MUN, AGR, IND, PRO, REC-1, and WILD. Table II-2 of the Basin Plan lists the specific designated beneficial uses of groundwater within each Detailed Analysis Unit (DAU) of the Basin. Due to their sizes, the listed uses may not exist throughout the DAUs. In addition, some discharges do not fall within the DAUs. Further, the Basin Plan incorporates State Water Board Resolution No. 88-63, known as the State "Sources of Drinking Water Policy." Pursuant to this policy, all groundwater is designated as MUN (the use may be existing or potential) unless specifically exempted by the Central Valley Water Board and approved for exemption by the State Water Board. In addition, unless otherwise designated by the Central Valley Water Board, all groundwater in the Region is considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR), industrial supply (IND), and industrial process supply (PRO).
18. Pursuant to Water Code section 13263(a), this General Order must implement the Basin Plan, and the Central Valley Water Board must consider the beneficial uses of water, the water quality objectives reasonably required to protect 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.
19. 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 this 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 orders which will implement the narrative objectives." To derive numeric limits from

narrative water quality objectives, the Central Valley Water Board considers relevant numerical criteria and guidelines developed and/or published by other agencies and organizations.

20. Water quality objectives that apply to groundwater include, but are not limited to: (1) numeric objectives such as the chemical constituents objective (includes state drinking water primary and secondary maximum contaminant levels (MCLs) promulgated in California Code of Regulations (CCR), title 22, sections 64431, 64444, and 64449 applicable to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives.
21. California Code of Regulations, title 22, section 64449, *Table 64449-B Secondary Maximum Contaminant Levels-“Consumer Acceptance Contaminant Level Ranges”* contains recommended total dissolved solids (TDS), specific conductance (or EC), and chloride levels for drinking water of 500 mg/L, 900 µmho/cm, and 250 mg/L, respectively. The upper recommended TDS, EC, and chloride levels are 1000 mg/L, 1,600 µmhos/cm, and 500 mg/L, respectively. Groundwater with concentrations of TDS, EC, and chloride concentrations below the upper recommended levels is considered acceptable for municipal supply with respect to those constituents.
22. California Code of Regulations, title 22, section 64444, *Table 64444-A “Maximum Contaminant Levels for Organic Chemicals,”* indicates the primary MCLs for benzene, ethylbenzene, toluene, xylenes, benzo(a)pyrene, are 1.0 µg/L, 300 µg/L, 150 µg/L, 1750 µg/L, and 0.5 µg/L, respectively. Groundwater containing these constituents below the MCLs is considered acceptable for municipal supply.
23. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as Water Quality for Agriculture by Ayers and Westcot and similar references, indicate that yield reductions in nearly all crops are not evident when irrigating with water having an EC less than 700 µmhos/cm. There is, however, an eight- to tenfold range in salt tolerance for agricultural crops. It is possible to achieve full yield potential for some crops with waters having EC up to 3,000 µmhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.
24. Chapter III of Tulare Basin Plan under Water Quality Objectives for groundwater for salinity, states:

All ground waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources.

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 maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in [Basin Plan] Table III-4 for each Hydrographic Unit shown on [Basin Plan] Figure III-1.

25. The Basin Plan's implementation policy sets forth the following maximum limits for specific waste constituents for discharges of oil field wastewater to unlined ponds overlying groundwater with existing and future probable beneficial uses:

Constituent	Limitation
Electrical Conductivity (EC) (umhos/cm)	1000
Chloride (mg/L)	200
Boron (mg/L)	1

26. For the White Wolf subarea (consisting of 64,000 acres within the valley floor, at the southern tip of the Basin, about 20 miles south of Bakersfield, 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), the applicable constituent limits will be more or less restrictive depending on the class of underlying irrigation water as follows:

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

In areas where groundwater would be Class I except for the concentration of a specific constituent, only that constituent will 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 water.

27. The Basin Plan allows discharges of oil field wastewater that exceed the above maximum salinity limits to unlined ponds, 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.

28. This General Order prohibits the discharge of oil field waste constituents to ground and/or groundwater that creates, or threatens to create, a condition of pollution in groundwater.

STATE ANTIDegradation Policy (RESOLUTION 68-16)

29. This General Order implements the requirements of State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (hereafter, the State Antidegradation Policy), which requires that disposal of waste into high quality waters of the state be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state. The quality of some waters is higher than established by adopted policies, and that higher quality water shall be maintained to the maximum extent possible consistent with the State Antidegradation Policy.
30. The State Antidegradation Policy prohibits the Central Valley Water Board from authorizing the degradation of high-quality groundwater unless it has been shown that:
- a. The degradation is consistent with the maximum benefit to the people of the state,
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses,
 - c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives, and
 - d. The Discharger employs best practicable treatment or control (BPTC) to minimize degradation.
31. The primary waste constituents of concern (COCs) due to discharges of waste from oil field facilities with respect to surface waters and groundwater are elevated concentrations of general minerals (especially total dissolved solids, EC, and chloride), metals (e.g., arsenic), trace elements (e.g., boron, strontium, thallium, lithium, etc.), petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs, e.g., benzene, toluene, ethylbenzene, and xylenes [BTEX]), and radionuclides.

32. When issuing NOAs under this General Order, the Central Valley Water Board must assure that discharges to high quality waters implement BPTC as necessary to maintain the highest water quality consistent with maximum benefit to the people of the state. The NOI to obtain coverage under this General Order requires the Discharger to submit a technical report including a detailed Antidegradation Analysis that demonstrates control of COCs through the implementation of BPTC and that any degradation that will occur due to discharges authorize herein will not adversely affect the beneficial uses of groundwater. The technical report must also include a hydrogeological assessment that demonstrates that the proposed discharges of produced wastewater will not substantially affect water quality nor cause a violation of water quality objectives.
33. This General Order prohibits the discharge of oil field related wastes to surface waters or surface water drainages.
34. To assess compliance with the State Antidegradation Policy, this General Order requires Dischargers to monitor discharges to groundwater or demonstrate that the discharge cannot affect the quality of the underlying groundwater. The demonstration must be based on an analysis of appropriate hydrogeologic information. Absent such a demonstration, the requirements to monitor first encountered groundwater are met when the Dischargers perform individual groundwater monitoring or participate in a regional groundwater monitoring program as part of a group of Dischargers with several small facilities in similar hydrogeological areas. The purpose of monitoring is to demonstrate compliance with Resolution 68-16 and the requirements of this General Order.
35. This General Order provides small and medium operators (i.e., those that discharge 250 or fewer barrels per day and those that discharge 250 up to and including 1,000 barrels per day of produced wastewater to land, respectively) time schedules to comply with the groundwater monitoring requirements in the Monitoring and Reporting Program R5-2017-0035 (MRP). Given this General Order applies to discharges that will not substantially affect water quality nor cause a violation of water quality objectives in the groundwater, it is unlikely that the discharges will degrade groundwater during the time extension.
36. Limited degradation of groundwater by some waste constituents associated with produced wastewater, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the state. The economic prosperity of communities and associated industry derived from domestic petroleum production as well as the reduction in foreign petroleum imports are of maximum benefit to the people of the state and provide sufficient justification for allowing limited groundwater degradation that may occur pursuant to this General Order provided the terms of the applicable Basin Plan and

other applicable State Water Board and Central Valley Water Board policies are consistently met.

37. 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 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.

STATUTORY AND REGULATORY CONSIDERATIONS

38. Water Code section 13260(a) requires that any person discharging waste, or proposing to discharge waste, within the Central Valley Region, that could affect the quality of the waters of the state to file a report of that discharge with the Central Valley Water Board. An NOI meets this requirement.
39. The Central Valley Water Board generally regulates waste discharges by prescribing waste discharge requirements, which must implement the relevant water quality control plan. The Central Valley Water Board may prescribe general waste discharge requirements (i.e., this General Order) for a category of discharges if all the following criteria apply:
 - a. The discharges are produced by the same or similar operations.
 - b. The discharges involve the same or similar types of waste.
 - c. The discharges require the same or similar treatment standards.
 - d. The discharges are more appropriately regulated under general requirements than individual requirements.
40. Pursuant to Water Code sections 13241 and 13263, the Central Valley Water Board, in establishing the requirements contained herein, 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.

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

* * *

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

- (1) the applicable 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.

* * *

42. The discharge authorized herein is exempt from the requirements of Title 27 in accordance with Title 27, section 20090(b) because:
- a. The Central Valley Water Board is issuing general WDRs,
 - b. The discharge is in compliance with the Basin Plan, and
 - c. The treated waste discharged to the pond does not need to be managed as hazardous waste.
43. New regulations in CCR, title 14, concerning well stimulation treatment went into effect on 1 July 2015.
44. CCR title 14, section 1761(a) defines well stimulation treatment as treatment of a well designed to enhance oil and gas production or recovery by increasing the permeability of the formation. Examples of well stimulation treatments include hydraulic fracturing, acid fracturing, and acid matrix stimulation. Well stimulation treatment does not include routine well cleanout work; routine well maintenance; routine treatment for the purpose of removal of formation damage due to drilling;

bottom hole pressure surveys; routine activities that do not affect the integrity of the well or the formation; the removal of scale or precipitate from the perforations, casing, or tubing; a gravel pack treatment that does not exceed the formation fracture gradient; or a treatment that involves emplacing acid in a well and that uses a volume of fluid that is less than the Acid Volume Threshold for the operation and is below the formation fracture gradient.

45. CCR, title 14, section 1786(a) states:

Operators shall adhere to the following requirements for the storage and handling of well stimulation treatment fluids, additives, and produced waters from a well that has had a well stimulation treatment: ... (4) Fluids shall be stored in containers and shall not be stored in sumps or pits.

46. Pursuant to Senate Bill 4 (Pavley 2013), the California Natural Resources Agency commissioned the California Council on Science and Technology (CCST) to conduct an independent scientific assessment of well stimulation treatments, including hydraulic fracturing, in California. CCST's assessment concluded that produced water from stimulated wells may contain well stimulation chemicals or their reaction by-products and that reuse of produced water for irrigation of crops could be a mechanism for release of well stimulation chemicals to the environment.

47. This General Order contains a prohibition for the discharge of produced wastewater that contains well stimulation treatment fluids. A three-year time schedule is provided for the Discharger to either a) develop an alternate disposal method or b) demonstrate that the produced wastewater does not contain well stimulation treatment fluids in concentrations that could adversely affect beneficial uses of waters. Given the large number of wells that have received a well stimulation treatment over time and the large number of stimulated wells that discharge produced wastewater to land, a time schedule is necessary to allow the Discharger to fund, study, and implement appropriate compliance options.

48. This General Order does not authorize violation of any federal, state, or local law or regulation.

49. As stated in Water Code section 13263(g), the discharge of waste into waters of the state is a privilege, not a right, and this General Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution or nuisance or cause degradation will be sufficient reason to modify, revoke, or enforce this General Order, as well as prohibit further discharge.

50. In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and

accessible water adequate for human consumption, cooking, and sanitary purposes. Consistent with this policy, this General Order has requirements that prohibit discharges from causing a condition of pollution in waters that are suitable for the beneficial uses of municipal and domestic water supply.

51. This General Order is not a National Pollutant Discharge Elimination System Permit issued pursuant to the Federal Clean Water Act. Coverage under this General Order does not exempt a facility from the Clean Water Act. Any facility required to obtain such a permit must notify the Central Valley Water Board.
52. On 1 April 2014, the State Water Board adopted Order 2014-0057-DWQ (NPDES General Permit CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities. Order 2014-0057-DWQ became effective 1 July 2015 and requires all applicable industrial dischargers, including oil and gas Facilities, to apply for coverage by the effective date. However, storm water at Facilities may be captured and contained on-site or comingled with produced wastewater before being discharged to ponds or production containment areas (i.e., secondary containment) in accordance with this General Order. This General Order prohibits the discharge of wastes from leaving the pond area, secondary containment area, or entering waters of the United States.
53. This General Order clarifies that discharges of wastewater to secondary containment units are to be due to emergency events that are beyond the control of the Facility operator and that the discharges to the secondary containment are short term, limited duration, and cleaned up. Intermittent discharges that are of longer duration or more frequent would allow wastes to percolate and migrate below the bottoms of the containment units and threaten groundwater. Secondary containment structures used in this fashion would require regulation by the Board. Discharges of storm water containing pollutants to waters of state and waters of the United States would require regulation under waste discharge requirements or a National Pollutant Discharge Elimination Permit.
54. Water Code section 13267(b) states:

In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges or is suspected of having discharged or discharging, or proposes to discharge waste outside of its region that could affect the quality of water within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the report and the benefits to be

obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

55. The technical reports required by this General Order and the attached MRP are necessary to ensure compliance with these waste discharge requirements. The Discharger owns and/or operates the Facility that discharges the waste subject to this General Order.
56. The MRP requires extensive monitoring of the Facility, the wastewater, and the groundwater. The MRP can be modified if the Discharger provides sufficient data to support the proposed changes. Any modification of the MRP must be reviewed and approved by the Executive Officer.
57. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 74-81* (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal governed by this General Order.
58. The Findings of this General Order, attachments and details in the Information Sheet, and the administrative record of the Central Valley Water Board relevant to oil field facilities were considered in establishing the conditions of discharge.
59. In 2006, the Central Valley Water Board, the State Water Board, and regional stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. The CV-SALTS effort might effect changes to the Basin Plan that would necessitate the re-opening of this General Order.
60. Where the Discharger's efforts to improve the quality of the land discharge cannot meet Basin Plan maximum salinity limits, the Discharger may submit an application for an exception from water quality objectives related to salinity pursuant to Chapter IV, Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for Salinity, paragraph 8 of the Basin Plan. The application must provide justification as to why the exception would be necessary, a description of salinity reduction measures that the Discharger has undertaken or is proposing, and an evaluation of whether water conservation has had an impact

on the salinity of the discharge. The Discharger must participate in the CV-SALTS Program to qualify for an exception.

CALIFORNIA ENVIRONMENTAL QUALITY ACT AND PUBLIC NOTICE

61. The Central Valley Water Board is the lead agency with respect to the issuance of this General Order under applicable provisions of the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).
62. 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.” The CEQA Guidelines also contemplate that physical conditions at other points in time may constitute the appropriate baseline. (CCR, title 14, section 15125(a), *Cherry Valley Pass Acres and Neighbors v. City of Beaumont* (2010) 190 Cal. App. 4th 316, 336.)
63. The receipt of a permit application (report of waste discharge) is one event that can be used to mark the beginning of the environmental review process because it commences the development of an individual permit. Therefore, the date an application is received is appropriate for the environmental baseline. (*Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1278.) In the case of general permits, the permit development process begins when a permitting authority identifies the need for a general permit and collects data that demonstrate that a group or category of facilities has similarities that warrant a general permit.
64. In November 2014, the Board recognized the need to develop a general order to regulate produced wastewater discharges to ponds. Beginning in January 2015, the Board issued Notices of Violation (NOVs) to operators discharging to ponds without WDRs.
65. A rigid date for establishing the environmental baseline is not suitable for this General Order because oil and gas production and associated wastewater discharge flows have fluctuated over the last decade due to varying economic conditions. Accordingly, the environmental baseline shall be based on the existing operations, which is the actual maximum monthly average produced wastewater discharge flow to ponds during the 10 years prior to 26 November 2014.

66. This General Order is designed to enhance the protection of surface and groundwater resources, and its application to existing Facilities is exempt from the provisions of CEQA in accordance with the following categorical exemptions:
- a. California Code of Regulations, title 14, section 15301, which 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 existing Facilities and their existing operations as described in their NOIs. Any increase in flow beyond the existing operations constitutes an expansion requiring a CEQA evaluation.
 - b. 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.” This General Order may require covered oil field facilities to replace or reconstruct portions of their waste management systems to ensure compliance with the General Order’s requirements.
 - c. 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.” The General Order may require operators of covered Facilities to make improvements to their waste management systems that will result in only minor alterations to land, water, and/or vegetation.
67. The Central Valley Water Board has notified interested agencies and persons of its intent to issue this General Order for discharges of wastes from oil field production facilities and has provided them with an opportunity for a public hearing and an opportunity to submit comments.
68. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the proposal to regulate discharges of wastes from existing oil field facilities under this General Order.

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13263, and 13267 and in order to meet the provisions contained in Division 7 of the California Water Code and regulations and policies adopted thereunder, all Dischargers specified by the Central Valley Water Board, their agents, successors, and assigns shall comply with the following:

A. PROHIBITIONS

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Discharge of wastes other than those described in the NOI submitted for coverage under this General Order and as described in the resulting NOA issued by the Executive Officer is prohibited.
3. Discharge of waste to land, other than produced wastewater from production wells to ponds, is prohibited unless authorized by the Executive Officer in accordance with the requirements of Provisions E. 4, 5, and 6.
4. The discharge of fluids used in "well stimulation treatment," as defined by CCR, title 14, section 1761 (including hydraulic fracturing, acid fracturing, and acid matrix stimulation), to land is prohibited.
5. The discharge of produced wastewater from wells containing well stimulation treatment fluids is prohibited except as provided by Provision E.7.
6. Acceptance, treatment, or discharge of "hazardous waste," as defined in CCR, title 22, section 66261.1 et seq., is prohibited.
7. Treatment system bypass of untreated or partially treated waste is prohibited, except as allowed by section E.2 of Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991 and part of this General Order.
8. Produced wastewater overflow from ponds is prohibited.
9. Discharges of produced wastewater to ponds that could adversely impact any municipal or domestic supply well are prohibited.
10. The collection, treatment, storage, discharge or disposal of wastes at the Facility that results in the creation of a condition of pollution or nuisance is prohibited.

B. DISCHARGE SPECIFICATIONS

1. The discharge flow shall not exceed actual maximum monthly average produced wastewater flow to pond between 26 November 2004 and 26 November 2014. The discharge flow also shall not exceed the maximum design flow of the Facility's limiting unit as described by the technical data in the NOI.
2. The discharge shall remain within the permitted waste treatment/containment/disposal structures at all times, or in case of emergency, within secondary containment structures.
3. All ponds shall be operated and maintained to prevent wastes from concentrating to hazardous levels.
4. Public contact with wastes shall be precluded through such means as fences or other acceptable alternatives in accordance with CCR, title 14, section 1770 (b)(1) through (b)(4).
5. Ponds shall be free of oil or effectively netted to preclude the entry of wildlife in accordance with CCR, title 14, section 1778 (d).
6. The Discharger shall operate all systems and equipment to optimize the water quality of the discharge to ponds.
7. All conveyance, treatment, storage, and disposal systems including ponds, tank batteries, and other components of Facilities and their wastewater treatment and disposal facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
8. Objectionable odors shall not be perceivable beyond the limits of the property where the waste is generated, treated, and/or discharged at an intensity that creates or threatens to create nuisance conditions.
9. Pond berms shall be designed and maintained to prevent leakage caused by erosion, slope failure, or animal burrowing.
10. The Discharger shall operate and maintain all ponds sufficiently to protect the integrity of containment and berms and prevent overtopping and/or structural failure. Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of

- overflow). As a means of management and to discern compliance with this requirement, the Discharger shall install and maintain in each pond a permanent staff gauge or equivalent with calibration marks that clearly show the water level at design capacity and enable determination of available operational freeboard.
11. Produced wastewater treatment, storage, and disposal units shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration during the winter while ensuring continuous compliance with all requirements of this General Order. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.
 12. On or about 1 October of each year, available capacity shall at least equal the volume necessary to comply with Discharge Specifications B.7 and B.11.
 13. All ponds and containment structures shall be managed to prevent breeding of mosquitoes or other vectors. Specifically:
 - a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface;
 - b. Weeds shall be minimized through control of water depth, harvesting, or herbicides. All pesticide applications shall be done in compliance with labeling instructions and applicable laws and regulations;
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface; and
 - d. The Discharger shall consult and coordinate with the local Mosquito Abatement District to minimize the potential for mosquito breeding as needed to supplement the above measures.
 14. Newly reconstructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a pond) shall be designed and constructed under the supervision of a California registered civil engineer. A post-construction report by the California registered civil engineer that oversaw construction shall be submitted within **60 days** of completion of construction and shall certify that the berms and/or levees were constructed in accordance with design specifications and are suitable for the retention of wastewater.

15. The Discharger shall monitor the accumulation of solid waste in the wastewater treatment/storage/disposal units and ponds at least every five years, beginning in the year that the NOA is issued, and shall periodically remove solids as necessary to maintain adequate treatment, storage, and disposal capacity. Specifically, if the estimated volume of solids in any unit exceeds five percent of the permitted capacity, the Discharger shall complete solids cleanout within 12 months after the date of the estimate, or demonstrate that a lesser capacity is adequate.
16. Dischargers who are subject to this General Order shall implement BPTC to protect high quality water and to maintain compliance with applicable water quality objectives.
17. All precipitation and surface drainage (i.e., "run on") from outside the Facility, where it could come into contact with waste, shall be diverted away from the Facility or pond unless such drainage is fully contained.
18. Produced wastewater application rates, on the Facility property where the produced wastewater is generated for dust control or construction activities, shall be applied at the minimum hydraulic loading rates necessary to perform the intended purpose and shall be consistent with an approved management plan in accordance with Provision E.5.
19. Application of produced wastewater at the Facility property for dust control or construction activities shall be at reasonable rates to preclude creation of a nuisance and unreasonable degradation of groundwater or surface water. Applied wastewater shall not be allowed to pool onsite or runoff from the area intended for dust suppression.

C. GROUNDWATER LIMITATIONS

1. The discharge of produced wastewater, in combination with other sources, shall not cause groundwater to contain waste constituents in concentrations that exceed water quality objectives or adversely affect beneficial uses of groundwater as identified in the Basin Plan. If natural groundwater quality contains constituents in concentrations that exceed the water quality objectives identified in the Basin Plan, then the discharges authorized herein cannot cause the concentrations of those constituents in groundwater to increase.

D. SOLIDS DISPOSAL SPECIFICATIONS

Solids as used in this document means the solid, semisolid, and liquid residues removed during treatment processes or accumulated in tanks, ponds, or other Facility components.

1. Solids shall be removed from screens, tanks, ponds, and other treatment units as needed to ensure optimal operation and adequate storage capacity.
2. Any handling and storage of solids shall be controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soil in a mass or concentration that could violate the groundwater limitations of this General Order.
3. Solids from the Facility shall be managed in accordance with a solids management plan approved by the Executive Officer in accordance with Provision E.6. Handling and application practices shall be designed to ensure that oil field wastes do not migrate once placed.
4. Any proposed change in solids use, storage, or disposal practices shall be reported in writing to the Executive Officer at least 90 days in advance of the change and shall be pre-approved by the Executive Officer.
5. Road mix containing tank bottoms and oily materials (also referred to as solids) shall be non-hazardous (prior to mixing) and shall not be applied on roads where seasonal storm water flows across the road and potentially washes or erodes the road mix into any seasonal surface drainage course.

E. PROVISIONS

1. The Discharger shall comply with the applicable sections of "*Standard Provisions and Reporting Requirements for Waste Discharge Requirements*," dated 1 March 1991. This attachment and its individual paragraphs are referred to as "Standard Provisions," and are hereby incorporated by reference as part of this General Order. NOAs issued will delineate applicable sections of the Standard Provisions.
2. The Discharger shall comply with the MRP, hereby incorporated by reference as part of this General Order, and any revisions thereto as ordered by the Executive Officer. The submittal dates of Discharger self-monitoring reports shall be no later than the submittal date specified in the MRP.

3. **Within 90 days of receipt of the NOA** for the Facility, the Discharger shall submit written certification that it has installed acceptable flow metering at a location or locations to ensure the accurate measurement of all discharge flows. The certification shall be accompanied by: (1) a description of the flow metering devices installed, (2) a diagram showing their locations at the Facility, and (3) evidence demonstrating that the devices were properly calibrated. An engineered alternative may be used if approved in writing by the Executive Officer.
4. Discharges of wastes from oil field activities other than produced wastewater from production wells to land may be authorized by the Executive Officer if the Discharger can demonstrate with appropriate data and analyses that the discharge does not pose a threat to the beneficial uses of the groundwater.
5. Dischargers wishing to use produced wastewater at the Facility for dust control or in construction activities shall provide a proposed management plan for such activities. The management plan shall include:
 - 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. Proposed application areas shown on a scaled aerial photograph within the covered oil lease(s). The photograph shall show pertinent site features including roads, ponds, production and treatment facilities, surface waters, and surface water drainages;
 - d. Proposed constituent loading rates;
 - e. A list of all management practices that will be implemented to ensure applied produced wastewater will remain where applied and not produce runoff; 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.

6. Dischargers reusing solids for road mix, as described in Solids Disposal Specifications, shall submit a solids management plan for approval by the Executive Officer within **60 days** of receipt of the NOA for the Facility. Dischargers proposing to reuse solids for road mix shall submit a solids management plan for approval by the Executive Officer at least **180 days** prior to any solids reuse. The solids management plan shall include:

- a. A complete characterization of the quality and quantity of the solids.
- b. A demonstration that the solids are not hazardous as defined by CCR, title 22, section 66261.1 et seq.,
- c. Proposed application areas shown on a scaled aerial photograph within the covered oil lease(s). The photograph shall show pertinent site features including roads, ponds, production and treatment facilities, surface waters, and surface water drainages;
- d. Proposed constituent loading rates;
- e. A list of all management practices that will be implemented to ensure wastes will remain where processed and applied and not migrate from the location of application; 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.

New reuse shall not commence prior to obtaining the written approval of the solids management plan from the Executive Officer.

Solid wastes disposed off-site shall be transported to an appropriately permitted Facility. Solid waste volumes, disposal methods, disposal facilities, and analytical results from waste characterization shall be reported in accordance with the MRP.

7. If the Discharger accepts produced wastewater from wells that have been stimulated, it shall comply with Prohibition A.5 in accordance with the following compliance schedule:

<u>Task¹</u>	<u>Task Description</u>	<u>Due date²</u>
1.	a. Submit a Work Plan to conduct studies necessary to demonstrate that the discharges of produced wastewater from wells that have been stimulated do not contain well stimulation treatment fluids in concentrations that could adversely affect beneficial uses of waters. The Work Plan shall include, but is not limited to, a proposed monitoring program for wells that have been stimulated or are planned for stimulation, specific milestones to accomplish the proposed scope of work, and a schedule for compliance with Prohibition A.5. The Work Plan shall be reviewed and approved by the Executive Officer. <p style="text-align: center;">Or</p>	3 Months from Date of NOA

<u>Task¹</u>	<u>Task Description</u>	<u>Due date²</u>
	<p>b. Submit a Work Plan for an alternate disposal method for wastewater discharges from wells with a history of, or are planned to receive a “well stimulation treatment.” The Work Plan shall include, but is not limited to, permitting and construction schedules for disposal wells, specific milestones to accomplish the proposed scope of work, and a schedule for compliance with Prohibition A.5. The Work Plan shall be reviewed and approved by the Executive Officer.</p>	
2.	<p>The Discharger shall implement the Work Plan after the Work Plan has been approved by the Executive Officer and shall also provide progress reports toward compliance with this task every six months.</p> <p>By the end of the 36th month from the date the NOA is issued, the Discharger shall submit a technical report for review and approval by the Executive Officer. The technical report shall demonstrate compliance with Prohibition A.5. Upon written approval letter by the Executive Officer, this provision shall be satisfied.</p> <p>The Executive Officer may at its discretion modify this time schedule based on evidence that meeting the compliance date is infeasible through no fault of the Discharger, or when evidence shows that compliance by an earlier date is feasible.</p>	36 Months from Date of NOA¹
3.	<p>If the Discharger does not achieve compliance with Prohibition A.5 by the compliance date in Task 2, the Discharger must cease discharge(s) and submit a written certification that the discharges from the Facility have ceased.</p>	36 Months from Date of NOA

1. Where local geology and discharge quality is similar, Dischargers may work together as a group to submit required work plans, technical reports, and studies. The work plans, technical reports, and studies shall explicitly identify the areas and Dischargers covered by the group effort.
2. All the compliance due dates start from the issuance date of the NOA by the Executive Officer. For example if NOA was issued on 1 July 2017, the final task (Task 2 technical report) due date is on 1 July 2020.

8. In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain

- technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.
9. Pursuant to section 13264 of the Water Code, the Discharger shall submit a complete revised NOI or a complete Report of Waste Discharge (RWD) for an individual permit in accordance with the Water Code section 13260 at least 140 days prior to any material change or proposed change in the character, location, or volume of the discharge, including any expansion of the facility or development of any treatment technology.
 10. The Discharger shall comply with all conditions of this General Order, including timely submittal of technical and monitoring reports. On or before each report due date, the Discharger shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in termination of coverage under this General Order.
 11. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this General Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger when the operation is necessary to achieve compliance with the conditions of this General Order.
 12. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this General Order.
 13. At least 90 days prior to termination or expiration of any lease, contract, or agreement involving disposal or off-site use of effluent used to justify the capacity authorized herein and assure compliance with this General Order, the Discharger shall notify the Central Valley Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this General Order.

14. In the event of any change in control or ownership of the Facility, the Discharger must notify the succeeding owner or operator of the existence of this General Order and the NOA by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.
15. To assume coverage as a new Discharger under this General Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of coverage under the General Order. The request shall be made prior to the effective date of the new ownership or operator. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, and the name, address, and telephone number of the person(s) responsible for contact with the Central Valley Water Board. The request must also include a statement that the new owner or operator assumes full responsibility for compliance with this General Order and comply with the signatory paragraph of Standard Provisions section B.3. Failure to submit a complete request shall be considered an unauthorized discharge in violation of the Water Code. Upon approval of the transfer request, the Executive Officer will issue an NOA authorizing coverage under this General Order.
16. Dischargers with NOI coverage may/shall request termination of coverage under this General Order when either (a) operation of the Facility has been transferred to another entity, (b) the Facility has ceased operations, or (c) the Facility's operations have changed and are no longer subject to the General Order. Dischargers shall certify and submit a Notice of Termination (NOT) Letter to the Executive Officer approval. Until a valid NOT Letter is received and issuance of written Executive Officer approval letter, the Discharger remains responsible for compliance with this General Order and payment of accrued annual fees.
17. A copy of this General Order including the MRP, Information Sheet, and Attachments A and B, and Standard Provisions, shall be kept at the Facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
18. The Central Valley Water Board will review this General Order periodically and will revise requirements when necessary.
19. Coverage under this General Order is effective upon written notification by the Executive Officer (i.e., issuance of NOA) that this General Order applies to the Discharger.

20. If more stringent applicable water quality standards are adopted in the Basin Plan, the Central Valley Water Board may revise and modify this General Order in accordance with such standards.
21. This General Order may be reopened to address any changes in state plans, policies, or regulations that would affect the water quality requirements for the discharges and as authorized by state law. This includes regulatory changes that may be brought about by the CV-SALTS planning efforts.
22. Dischargers may apply for an exception from water quality objectives related to salinity pursuant to Chapter IV, Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for Salinity, paragraph 8 of the Basin Plan. The application must be made in accordance with Finding 60 of this General Order and the Discharger must participate in the CV-SALTS Program to qualify for an exception.
23. The Central Valley Water Board or the Executive Officer may revoke coverage under this General Order at any time and require the Discharger to submit a RWD and obtain individual waste discharge requirements.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this General Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this General Order may result in the assessment of Administrative Civil Liability by the Central Valley Water Board up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. In addition, where there is discharge, Central Valley Water Board can assess up to an additional \$10 per gallon multiplied by the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law. Civil liability may be imposed by the superior court for up to \$25,000 for each day of violation and in addition where there is discharge, up to an additional \$25 per gallon multiplied by the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and CCR, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this General Order, except that if the thirtieth day following the date of this General Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality
or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full true and correct copy of a General Order adopted by the California Regional Water Quality Control Board on 6 April 2017.

Original signed by

PAMELA C. CREEDON, Executive Officer

Attachments:

- A: Definitions
- B: Information Needs Sheet

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2017-0035
FOR
WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
OIL FIELD DISCHARGES TO LAND
GENERAL ORDER NUMBER TWO

This Monitoring and Reporting Program (MRP) is required pursuant to Water Code section 13267. The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP. Changes to sample location(s) shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer.

This MRP includes Monitoring, Record-Keeping, and Reporting requirements. Monitoring requirements include monitoring of discharges, of produced wastewater, solid waste, application of recycled materials (wastewater and solids), and groundwater to in order to determine if the Discharger is complying with the requirements of Waste Discharge Requirements General Order No. R5-2017-0035 (Order). All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with **Standard Provisions and Reporting Requirements for Waste Discharge Requirements**, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as a pH meter) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the State Water Board's Environmental Laboratory Accreditation Program. The Discharger may propose alternative methods for approval by the Executive Officer.

The MRP can be modified if the Discharger provides sufficient data to support the proposed changes. If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after a statistically significant number of sampling events, the Discharger may request this MRP be revised by the Executive Officer to reduce monitoring frequency or minimize the list of constituents. The proposal must include adequate technical justification for reduction in monitoring frequency.

Monitoring requirements include the periodic visual inspection of the facility to ensure continued compliance with the Order. The MRP also requires submittal of information regarding the use of all chemicals used during well drilling, installation, operation, and maintenance activities associated with each well generating waste materials (liquids and solids) that are discharged to land and regulated under this Order.

This MRP requires the Discharger to keep and maintain records for five years from the date the monitoring activities occurred and to prepare and submit reports containing the results of monitoring

specified below. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Central Valley Water Board.

FACILITY MONITORING

Permanent markers in ponds shall be in place with calibrations indicating the water level at design capacity and available operational freeboard (two feet minimum required). The freeboard shall be monitored monthly on all ponds to the nearest tenth of a foot.

Annually, prior to the anticipated rainy season, but **no later than 30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for: drainage control systems; slope failure; groundwater monitoring wells, or any change in site conditions that could impair the integrity of the waste management unit or precipitation and drainage control structures; and shall assess preparedness for winter conditions including, but not limited to, erosion and sedimentation control. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be **completed by 31 October**. Annual facility inspection reporting shall be **submitted by 30 November**.

The Discharger shall inspect all precipitation diversion and drainage facilities for damage **within 7 days** following major storm events (e.g., a storm that causes continual runoff for at least one hour) capable of causing flooding, damage, or significant erosion. The Discharger shall take photos of any problem areas before and after repairs. Necessary repairs shall be commenced **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Reporting Requirements of this MRP.

The Discharger shall monitor and record on-site rainfall data using an automated rainfall gauge, or subject to Executive Officer approval other acceptable gauge/monitoring arrangement, or a weather monitoring station within three miles of the facility. Data shall be used in establishing the severity of storm events and wet seasons for comparison with design parameters used for waste management unit design and conveyance and drainage design. Daily data and on-site observation shall be used for establishing the need for inspection and repairs after major storm events. Rainfall data shall be reported in the quarterly monitoring reports, as required by this MRP.

CHEMICAL AND ADDITIVE MONITORING

The Discharger shall provide the following for all chemicals and additives¹ used at all leases and facilities that discharge produced wastewater to land:

<u>Requirement</u>	<u>Frequency</u>
A list of all chemicals and additives used including chemical formulas and specific chemical names.	Quarterly
The volume of each chemical and additive used in gallons.	Quarterly
A list of the leases and facilities where the chemicals and additives are being used.	Quarterly
Material safety data sheets for each chemical and/or <u>additive</u> .	Annually

- ¹ Chemicals that are a part of trade secrets shall be kept confidential at the Central Valley Water Board. Documents containing trade secrets shall be properly marked on the cover, by the Discharger, prior to submitting the document to the Central Valley Water Board. Individuals that have received permission by the Discharger shall be granted access to view the files at the office.

PRODUCED WASTEWATER MONITORING

Produced wastewater (also referred to as effluent) samples shall be representative of the volume and nature of the discharges. The Discharger shall maintain all sampling and analytical results: date, exact place, and time of sampling; dates analyses were performed; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of five years.

A complete list of substances that are tested for and reported on by the testing laboratory shall be provided to the Central Valley Water Board. All peaks must be reported. In addition, both the method detection limit (MDL) and the practical quantification limit (PQL) shall be reported. Detection limits shall be equal to or more precise than USEPA methodologies. Analysis with an MDL greater than the most stringent drinking water standard that results in non-detection needs to be reanalyzed with the MDL set lower than the drinking water standard or at the lowest level achievable by the laboratory. All quality assurance/quality control (QA/QC) samples must be run on the same dates when samples were actually analyzed. Proper chain of custody procedures must be followed, and a copy of the completed chain of custody form shall be submitted with the report. All analyses must be performed by an Environmental Laboratory Accreditation Program (ELAP) certified laboratory.

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.

DISCHARGE 001

Produced wastewater samples shall be collected downstream from the treatment system and prior to discharge to land (roads, ponds, etc.) (Discharge 001). Produced wastewater monitoring for Discharge 001 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Flow	mgd	Metered ¹	Continuous
<u>Table I – Effluent Monitoring</u>	Varies	Grab	Varies

¹ In accordance to Order Provision E.3, instead of metering an engineered alternative may be used if approved in writing by the Executive Officer.

DISCHARGE 002

If ponds are used, produced wastewater samples shall be collected in the pond at the distal end of the system (Discharge 002), or if ponds are operated in parallel, in the pond that has contained produced wastewater for the longest period of time (i.e., longest retention time)(Discharge 002). Produced wastewater monitoring for Discharge 002 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Table I – Effluent Monitoring	Varies	Grab	Varies

SOLID WASTE MONITORING

Solid waste generated at the Facility from production related activities, such as tank or pond maintenance, shall be characterized for disposal. Non-hazardous solid wastes may be disposed on-site, as road or berm construction material, for instance, if such disposal does not pose a threat to water quality.

Hazardous waste (as defined in California Code of Regulations (CCR), title 22, section 66261.1) and designated wastes (as defined in California Water Code (CWC) section 13173) shall be properly disposed at a Facility permitted to accept the waste.

Solid wastes disposed off-site shall be transported to an appropriately permitted facility.

Solid waste volumes, disposal methods, disposal facilities, and analytical results from waste characterization shall be reported in the subsequent quarterly and annual monitoring reports.

GROUNDWATER WELL SURVEY

The Discharger shall conduct a well survey to identify all water supply wells within one-mile of the ponds that receive produced wastewater or other authorized discharges. The Discharger shall sample the identified domestic water supply wells and analyze the samples for the waste constituents listed in Table II of this MRP. If access to private property is requested and denied, a demonstration of that denial is required.

GROUNDWATER MONITORING

The Discharger shall operate and maintain a groundwater monitoring system that may include groundwater wells available around and downgradient of the Facility and within a reasonable distance from the produced wastewater disposal ponds. At a minimum the monitoring system needs to include three groundwater wells, with at least two wells located downgradient from the ponds' location that monitor first-encountered groundwater to identify any release at the earliest possible time. **If the Discharger demonstrates that the wastes discharged to the ponds cannot affect the quality of underlying groundwater, the Executive Officer may rescind by signed letter all or part of the requirements to complete the groundwater investigation and groundwater monitoring portions of this Order.**

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

The Discharger shall monitor groundwater wells for the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Depth to groundwater	Feet ¹	Measured	Quarterly
Groundwater elevation	Feet ¹	Calculated	Quarterly
<u>Table II – Groundwater Monitoring</u>	Varies	Grab	Quarterly

¹ Recorded to one hundredth of a foot

Within 30 days of notification that permission to locate or sample a well(s) is not granted or is revoked, the Discharger shall submit for review and approval by Central Valley Water staff a report that either: (1) demonstrates that a reduction in the number of monitoring well(s) will not impair the ability to clearly and accurately assess potential groundwater impacts, or (2) proposes the installation of a new monitoring well(s) to offset the well(s) that is no longer able to be sampled.

Groundwater Monitoring System

If an appropriate groundwater monitoring system is not in place prior to adoption of the Order, the discharger shall comply with the following monitoring well compliance time schedule:

Task	Task Description	Due Date		
		Small Operator ¹	Medium Operator ²	Large Operator ³
1	Submit a Monitoring Well Installation and Sampling Plan (MWISP) for review and approval by the Executive Officer	12 Months after NOA is issued	6 Months after NOA is issued	90 Days after NOA is issued
2	Complete installation of the groundwater monitoring system	In accordance with approved time schedule in MWISP		
3	Submit a Monitoring Well Installation Completion Report (MWICR)	90 Days after groundwater monitoring system is completed		

¹ A Small Operator discharges 250 or fewer barrels of wastewater per day to land.

² A Medium Operator discharges from 250 up to and including 1,000 barrels of wastewater per day to land.

³ A Large Operator discharges more than 1,000 barrels of wastewater per day to land.

At a minimum, the MWISP must contain all of the information listed below.

1. General Information:
 - a. Topographic map showing any existing nearby (about 2,000 feet) domestic, irrigation, and municipal supply wells and monitoring wells known to the Discharger, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features, as appropriate.
 - b. Site plan showing proposed well locations, other existing wells, unused and/or abandoned wells, major physical site structures, any waste handling facilities, irrigated cropland and pasture, and on-site surface water features.

- c. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater.
 - d. Local permitting information (as required for drilling, well seals, boring/well abandonment).
 - e. Drilling details, including methods and types of equipment for drilling and logging activities. Equipment decontamination procedures (as appropriate) should be described.
 - f. Health and Safety Plan.
2. Proposed Drilling Details:
 - a. Drilling techniques.
 - b. Well logging method.
 - c. Proposed Monitoring Well Design - all proposed well construction information must be displayed on a construction diagram or schematic to accurately identify the following:
 - d. Well depth.
 - e. Borehole depth and diameter.
 - f. Well construction materials.
 - g. Casing material and diameter – include conductor casing, if appropriate.
 - h. Location and length of perforation interval, size of perforations, and rationale.
 - i. Location and thickness of filter pack, type and size of filter pack material, and rationale.
 - j. Location and thickness of bentonite seal.
 - k. Location, thickness, and type of annular seal.
 - l. Surface seal depth and material.
 - m. Type of well cap(s).
 - n. Type of well surface completion.
 - o. Well protection devices (such as below-grade water tight-vaults, locking steel monument, bollards, etc.).
 3. Proposed Monitoring Well Development:
 - a. Schedule for development (not less than 48 hours or more than 10 days after well completion).
 - b. Method of development.
 - c. Method of determining when development is complete.
 - d. Parameters to be monitored during development.
 - e. Method for storage and disposal of development water.
 4. Proposed Surveying:
 - a. How horizontal and vertical position of each monitoring well will be determined.
 - b. The accuracy of horizontal and vertical measurements to be obtained.
 - c. The California licensed professional (licensed land surveyor or civil engineer) to perform the survey.
 5. Proposed Groundwater Monitoring:
 - a. Schedule (at least 48 hours after well development).
 - b. Depth to groundwater measuring equipment (e.g., electric sounder or chalked tape capable of ± 0.01 -foot measurements).
 - c. Well purging method, equipment, and amount of purge water.

- d. Sample collection (e.g., bottles and preservation methods), handling procedures, and holding times.
 - e. Quality assurance/quality control (QA/QC) procedures (as appropriate).
 - f. Analytical procedures.
 - g. Equipment decontamination procedures (as appropriate).
6. Proposed Schedule:
- a. Fieldwork.
 - b. Laboratory analyses.
 - c. Report submittal.

At a minimum, the MWICR shall summarize the field activities as described below.

1. General Information:
- a. Brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
 - b. Topographic map showing any existing nearby domestic, irrigation, and municipal supply wells and monitoring wells, utilities, surface water bodies, drainage courses and their tributaries/destinations, and other major physical and man-made features.
 - c. Site plan showing monitoring well locations, other existing wells, unused and/or abandoned wells, major physical site structures, any waste handling facilities, and on-site surface water features.
 - d. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).
2. Monitoring Well Construction:
- a. Number and depths of monitoring wells installed.
 - b. Monitoring well identification (i.e., numbers).
 - c. Date(s) of drilling and well installation.
 - d. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
 - e. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
 - f. Name of drilling company, driller, and logger (site geologist to be identified).
 - g. As-builts for each monitoring well with the following details:
 - i. Well identification.
 - ii. Total borehole and well depth.
 - iii. Date of installation.
 - iv. Boring diameter.
 - v. Casing material and diameter (include conductor casing, if appropriate).
 - vi. Location and thickness of slotted casing, perforation size.
 - vii. Location, thickness, type, and size of filter pack.
 - viii. Location and thickness of bentonite seal.
 - ix. Location, thickness, and type of annular seal.
 - x. Depth of surface seal.
 - xi. Type of well cap.

- xii. Type of surface completion.
 - xiii. Depth to water (note any rises in water level from initial measurement) and date of measurement.
 - xiv. Well protection device (such as below-grade water tight vaults, stovepipe, bollards, etc).
 - h. All depth to groundwater measurements during field program.
 - i. Field notes from drilling and installation activities (e.g., all subcontractor dailies, as appropriate).
 - j. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.
3. Monitoring Well Development:
- a. Date(s) and time of development.
 - b. Name of developer.
 - c. Method of development.
 - d. Methods used to identify completion of development.
 - e. Development log: volume of water purged and measurements of temperature, pH and electrical conductivity during and after development.
 - f. Disposition of development water.
 - g. Field notes (such a bailing to dryness, recovery time, number of development cycles).
4. Monitoring Well Survey:
- a. Identify coordinate system or reference points used.
 - b. Description of measuring points (i.e. ground surface, top of casing, etc.).
 - c. Horizontal and vertical coordinates of well casing with cap removed.
 - d. Name, license number, and signature of California licensed professional who conducted survey.
 - e. Surveyor's field notes.
 - f. Tabulated survey data.

REPORTING REQUIREMENTS

All monitoring results shall be reported in Quarterly Monitoring Reports which are due by the first day of the second month after the calendar quarter as follows:

First Quarter Monitoring Report (January – March):	1 May
Second Quarter Monitoring Report (April – June):	1 August
Third Quarter Monitoring Report (July – September):	1 November
Fourth Quarter Monitoring Report (October – December):	1 February
Facility Inspection Report (Completed by 30 October):	30 November

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory. Reports shall be submitted whether or not there is a discharge.

CENTRAL VALLEY REGION
MONITORING AND REPORTING PROGRAM R5-2017-0035
WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
OIL FIELD DISCHARGES TO LAND
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The following information is to be included on all monitoring reports, as well as report transmittal letters:

Discharger's name
Facility/Lease Name
Waste Discharge Requirements R5-2017-0035
Monitoring and Reporting Program R5-2017-0035
GeoTracker Site Global ID: XXXXXXXXXXXXX

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible for all historical and current data. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the MDL and the Reporting limit (RL) or PQL. If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL), but above the MDL, shall be reported and flagged as estimated.

If the Discharger monitors any constituent 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 quarterly monitoring reports. Such increased frequency shall be indicated on the quarterly monitoring reports.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. All monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

The Discharger shall submit electronic copies of all work plans, reports, analytical results, and groundwater elevation data over the Internet to the State Water Board Geographic Environmental Information Management System database (GeoTracker)
at http://www.waterboards.ca.gov/ust/electronic_submittal/index.shtml
A frequently asked question document for GeoTracker can be found
at http://www.waterboards.ca.gov/ust/electronic_submittal/docs/faq.pdf
Electronic submittals shall comply with GeoTracker standards and procedures, as specified on the State Water Board's web site. Uploads to GeoTracker shall be completed on or prior to the due date.

In addition, a copy of each document shall be sent via electronic mail to CentralValleyFresno@waterboards.ca.gov. Include a copy of the transmittal letter. Laboratory reports submitted in compliance with this MRP shall be accompanied by an Excel file that includes the analytical data found in the laboratory report. Excel files shall be either generated by the laboratory or compiled by the Discharger. At a minimum, the Excel file shall include the constituent name, sample location, sample name, sample date, analysis date, analytical method, result, unit, MDL, RL, and dilution factor.

A. All Quarterly Monitoring Reports shall include the following:

Facility reporting:

1. Monthly freeboard results as specified on MRP page 2.
2. The results of Facility inspections conducted during the quarter as specified on MRP page 2.
3. Rainfall data as specified on MRP page 2.

Chemical and Additive reporting:

1. The data required as specified on MRP page 2 and 3.

Produced Wastewater reporting:

1. Tabular summary of current and historical results of effluent discharges as specified on page 3 and 4.
2. For each month of the quarter, calculation monthly effluent flow and the historical monthly effluent flow for the last 12-months.
3. For each quarter, include a current and historical table for each effluent sample point for EC, boron, chloride, and sodium.

Solid Waste reporting:

1. The results of solid Waste monitoring specified on MRP page 4, including the nature, volume, and weight in dry tons of solid waste produced during the quarter.
2. Analytical results characterizing the solid waste, and particularly, whether the waste is hazardous as defined in CCR, title 22, section 66261.1).
3. The method of disposal and disposal locations of the solid wastes.
4. If wastes are hauled to a disposal facility, evidence that the disposal facility is properly permitted.

Groundwater reporting:

1. The results of groundwater monitoring specified on page 4 and 5.
2. For each monitoring well, a table showing constituent concentrations for current and historical concentrations.
3. A groundwater contour map based on groundwater elevations for that quarter. The map shall show the gradient and direction of groundwater flow under/around the facility and/or effluent disposal area(s). The map shall also include the locations of monitoring wells and wastewater storage and discharge areas.

B. Fourth Quarter Monitoring Reports, in addition to the above, by 1 February of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

Production Facility information:

1. The names and general responsibilities of all persons employed to operate the produced wastewater treatment systems.
2. The names and telephone numbers of persons to contact regarding the Facility for emergency and routine situations.
3. If field meters are used, then a statement certifying when the flow meters and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.4).

4. A summary of all spills/releases, if any, that occurred during the year at the production facility, tasks undertaken in response to the spills, and the results of the tasks undertaken.
5. A summary of the chemical and additive data collected under the Chemical and Additive Monitoring section, the required MSDS sheets, chemical formulas and specific chemical names, and a discussion of whether any of the chemicals or additives were found in effluent discharges.
6. A flow chart (i.e. diagram that clearly illustrates all processes that produced wastewater undergoes from well extraction to discharge to land) and map of the following:
 - Facility within the oil field,
 - Facility/Lease boundaries
 - Production and wastewater distribution network with all stock tanks, and transfer pipes, and discharge points to the ponds or land.
7. Annual report in tabular form for all the effluent and groundwater monitoring data and domestic water supply well data, if applicable.
8. Annual assessment of groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided are representative of conditions upgradient and downgradient of the Facility.
9. Annual assessment of groundwater monitoring to delineate lateral and vertical extend of impacts on groundwater quality.

Requesting Administrative Review by the State Water Board. Any person aggrieved by an action of the Central Valley Water Board that is subject to review as set forth in Water Code section 13320(a), may petition the State Water Board to review the action. Any petition must be made in accordance with Water Code section 13320 and California Code of Regulations, title 23, section 2050 and following. The State Water Board must receive the petition within thirty (30) days of the date the action was taken, except that if the thirtieth day following the date the action was taken falls on a Saturday, Sunday, or state holiday, then the State Water Board must receive the petition by 5:00 p.m. on the next business day. Copies of the laws and regulations applicable to filing petitions may be found on the internet at http://www.waterboards.ca.gov/public_notices/petitions/water_quality/index.shtml or will be provided upon request.

Modifications. Any modification to this Monitoring and Reporting Program shall be in writing and approved by the Assistant Executive Officer, including any extensions. Any written extension request by the Discharger shall include justification for the delay.

The Discharger shall implement the above monitoring program on the first day of the Executive Officer issuance of the NOA for coverage under the Order.

Ordered by:

Original signed by

PAMELA C. CREEDON, Executive Officer

6 April 2017

Table I – Effluent Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method⁹</u>	<u>Reporting Frequency</u>
<u>Field Parameters</u>				
Temperature	°F ¹	Quarterly	Meter	Quarterly
Electrical Conductivity	µmhos/cm ²	Quarterly	Meter	Quarterly
pH	pH units	Quarterly	Meter	Quarterly
<u>Monitoring Parameters</u>				
Total Dissolved Solids (TDS)	mg/L ³	Quarterly	160.1	Quarterly
Total Suspended Solids (TSS)	mg/L	Quarterly	160.2	Quarterly
Total Organic Carbon (TOC)	mg/L	Quarterly	415.3	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly	2510B	Quarterly
Boron, dissolved	mg/L	Quarterly	6010B	Quarterly
<u>Standard Minerals</u>				
Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Carbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Hydroxide Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Sulfate, dissolved	mg/L	Quarterly	300.0	Quarterly
Nitrate-N, dissolved	mg/L	Quarterly	300.0	Quarterly
Calcium, dissolved	mg/L	Quarterly	6010B	Quarterly
Magnesium, dissolved	mg/L	Quarterly	6010B	Quarterly
Sodium, dissolved	mg/L	Quarterly	6010B	Quarterly
Potassium	mg/L	Quarterly	6010B	Quarterly
Chloride	mg/L	Quarterly	300.0	Quarterly
<u>PAHs⁴</u>	µg/L ⁵	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	µg/L	Quarterly	418.1	Quarterly
<u>Volatile Organic Compounds</u>				
Full Scan	µg/L	Quarterly	8260B	Quarterly
<u>Oil and Grease</u>	mg/L	Quarterly	1664A	Quarterly
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)	pCi/L ⁶	Quarterly	900.0	Quarterly
Deuterium (Hydrogen 2, ² H, or D)	pCi/L	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium-226	pCi/L	Quarterly	SM ⁷ 7500-Ra	Quarterly
Radium-228	pCi/L	Quarterly	SM 7500-Ra	Quarterly
Gross Alpha particle (excluding	pCi/L	Quarterly	SM 7110	Quarterly

Table I – Effluent Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method⁹</u>	<u>Reporting Frequency</u>
radon and uranium) Uranium	pCi/L	Quarterly	200.8	Quarterly
<u>Constituents of Concern</u>				
Lithium	mg/L	Quarterly	200.7	Quarterly
Strontium	mg/L	Quarterly	200.7	Quarterly
Iron	mg/L	Quarterly	200.8	Quarterly
Manganese	mg/L	Quarterly	200.8	Quarterly
Antimony	mg/L	Quarterly	200.8	Quarterly
Arsenic	mg/L	Quarterly	200.8	Quarterly
Barium	mg/L	Quarterly	200.8	Quarterly
Beryllium	mg/L	Quarterly	200.8	Quarterly
Cadmium	mg/L	Quarterly	200.8	Quarterly
Chromium (total)	mg/L	Quarterly	200.8	Quarterly
Chromium (hexavalent)	mg/L	Quarterly	7196A	Quarterly
Cobalt	mg/L	Quarterly	200.8	Quarterly
Copper	mg/L	Quarterly	200.8	Quarterly
Lead	mg/L	Quarterly	200.8	Quarterly
Mercury	mg/L	Quarterly	7470A	Quarterly
Molybdenum	mg/L	Quarterly	200.8	Quarterly
Nickel	mg/L	Quarterly	200.8	Quarterly
Selenium	mg/L	Quarterly	200.8	Quarterly
Silver	mg/L	Quarterly	200.8	Quarterly
Thallium	mg/L	Quarterly	200.8	Quarterly
Vanadium	mg/L	Quarterly	200.8	Quarterly
Zinc	mg/L	Quarterly	200.8	Quarterly
<u>Oil Production and Process Chemicals and Additives⁸</u>	µg/L	Quarterly	As Appropriate ⁹	Quarterly

¹ Degrees Fahrenheit

² Micromhos per centimeter

³ Milligrams per liter

⁴ Polycyclic aromatic hydrocarbons

⁵ Micrograms per liter

⁶ Picocuries per liter

⁷ Standard Methods

⁸ The Discharger shall provide analytical results for all chemicals and additives used in the exploration, production, and/or processing of all oil and the treatment of produced wastewater discharged to land (e.g., ponds, roads, etc.) as described under the Chemical and Additive Monitoring section of the MRP for which there are ELAP approved analyses. For those constituents for which there are not ELAP approved analytical methods, the Discharger shall submit a technical report describing how it intends to address this issue.

⁹ Appropriate analytical methods may be proposed by the Discharger but are subject to the approval of the Assistant Executive Officer

Table II – Groundwater Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Groundwater Elevation</u>	feet & hundredths, MSL ¹	Quarterly		Quarterly
<u>Field Parameters</u>				
Temperature	°F ²	Quarterly	Meter	Quarterly
Electrical Conductivity	µmhos/cm ³	Quarterly	Meter	Quarterly
pH	pH units	Quarterly	Meter	Quarterly
<u>Monitoring Parameters</u>				
Total Dissolved Solids (TDS)	mg/L ⁴	Quarterly	160.1	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly	2510B	Quarterly
Total Organic Carbon (TOC)	mg/L	Quarterly	415.3	Quarterly
Boron, dissolved	mg/L	Quarterly	6010B	Quarterly
<u>Standard Minerals</u>				
Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Carbonate Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Hydroxide Alkalinity as CaCO ₃	mg/L	Quarterly	310.1	Quarterly
Sulfate, dissolved	mg/L	Quarterly	300.0	Quarterly
Nitrate-N, dissolved	mg/L	Quarterly	300.0	Quarterly
Calcium, dissolved	mg/L	Quarterly	6010B	Quarterly
Magnesium, dissolved	mg/L	Quarterly	6010B	Quarterly
Sodium, dissolved	mg/L	Quarterly	6010B	Quarterly
Potassium	mg/L	Quarterly	6010B	Quarterly
Chloride	mg/L	Quarterly	300.0	Quarterly
<u>PAHs</u> ⁵	µg/L ⁶	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	µg/L	Quarterly	418.1	Quarterly
<u>Volatile Organic Compounds</u>				
Full Scan	µg/L	Quarterly	8260B	Quarterly
<u>Oil and Grease</u>	mg/L	Quarterly	1664A	Quarterly
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)	pCi/L ⁷	Quarterly	900.0	Quarterly
Deuterium (Hydrogen 2, ² H, or D)	pCi/L	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium-226	pCi/L	Quarterly	SM ⁸ 7500-Ra	Quarterly

Table II – Groundwater Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
Radium-228	pCi/L	Quarterly	SM 7500-Ra	Quarterly
Gross Alpha particle (excluding radon and uranium)	pCi/L	Quarterly	SM 7110	Quarterly
<u>Constituents of Concern</u>				
Lithium	mg/L	Quarterly	200.7	Quarterly
Strontium	mg/L	Quarterly	200.7	Quarterly
Iron	mg/L	Quarterly	200.8	Quarterly
Manganese	mg/L	Quarterly	200.8	Quarterly
Antimony	mg/L	Quarterly	200.8	Quarterly
Arsenic	mg/L	Quarterly	200.8	Quarterly
Barium	mg/L	Quarterly	200.8	Quarterly
Beryllium	mg/L	Quarterly	200.8	Quarterly
Cadmium	mg/L	Quarterly	200.8	Quarterly
Chromium (total)	mg/L	Quarterly	200.8	Quarterly
Chromium (hexavalent)	mg/L	Quarterly	7196A	Quarterly
Cobalt	mg/L	Quarterly	200.8	Quarterly
Copper	mg/L	Quarterly	200.8	Quarterly
Lead	mg/L	Quarterly	200.8	Quarterly
Mercury	mg/L	Quarterly	7470A	Quarterly
Molybdenum	mg/L	Quarterly	200.8	Quarterly
Nickel	mg/L	Quarterly	200.8	Quarterly
Selenium	mg/L	Quarterly	200.8	Quarterly
Silver	mg/L	Quarterly	200.8	Quarterly
Thallium	mg/L	Quarterly	200.8	Quarterly
Vanadium	mg/L	Quarterly	200.8	Quarterly
Zinc	mg/L	Quarterly	200.8	Quarterly
<u>Oil Production and Process Chemicals and Additives⁹</u>	µg/L	Quarterly	As Appropriate ¹⁰	Quarterly

¹ Mean Sea Level

² Degrees Fahrenheit

³ Micromhos per centimeter

⁴ Milligrams per liter

⁵ Polycyclic aromatic hydrocarbons

⁶ Micrograms per liter

⁷ Picocuries per liter

⁸ Standard Methods

⁹ The Discharger shall provide analytical results for all chemicals and additives used in the exploration, production, and/or processing of all oil and the treatment of produced wastewater discharged to land (e.g., ponds, roads, etc.) as described under the Chemical and Additive Monitoring section of the MRP for which there are ELAP approved analyses. For those constituents for which there are not ELAP approved analytical methods, the Discharger shall submit a technical report describing how it intends to address this issue.

¹⁰ Appropriate analytical methods may be proposed by the Discharger but are subject to the approval of the Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2017-0035
INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR
OIL FIELD DISCHARGES TO LAND
GENERAL ORDER NUMBER TWO

ELIGIBILITY

Eligibility for coverage under Waste Discharge Requirements General Order No. R5-2017-0035 (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. exceed the maximum oil field discharge 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 to land prior to **26 November 2014**.

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. This means that large quantities of water are extracted with the oil. Within the Central Valley, on average approximately 16 barrels of water are produced 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. 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 ponds. In some operations, produced wastewater is disposed of through Class II 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 also 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 on

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.

This General Order provides small operators (i.e., those that discharge 250 or fewer barrels per day of produced wastewater to land) and medium operators (i.e., those that discharge 250 up to and including 1000 bbls per day of produced wastewater to land) extended time schedules to comply with the groundwater monitoring requirements described in the Monitoring and Reporting Program R5-2017-0035 (MRP). Implementing groundwater monitoring is a complicated and expensive endeavor. Dischargers of 1000 bbls per day or less have reported that additional time beyond 90 days is necessary to gather sufficient resources to prepare an appropriate Monitoring Well Installation and Sampling Plan (MWISP) to comply with the Groundwater Monitoring Requirements of MRP R5-2017-0035. The MRP provides small Dischargers an extra 275 days and medium Dischargers an extra 90 days to develop the MWISP. The extra time only extends for a short period the submittal date for the MWISP. It does not alleviate the need to comply with the Groundwater Monitoring Requirements of the General Order and MRP. Most of these facilities have been discharging for decades in the same or similar manner. Given this General Order applies to discharges that will not substantially affect water quality nor cause a violation of water quality objectives in the groundwater, it is unlikely that the small and medium discharges of 1000 bbls per day or less will significantly degrade groundwater during the time extension.

APPLICATION PROCESS

Dischargers seeking coverage under the General Order are required to file a Notice of Intent (NOI) within 30 days of the adoption of the General Order. This process is different from application process for an individual permit where the Report of Waste Discharge is filed (RWD).

A NOI 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.

The NOI for an oil and gas production facility seeking coverage under this General Order shall document the existing operations, which is defined as the actual maximum monthly average produced wastewater discharge flow to ponds that occurred in the ten years immediately to 26 November 2014.

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 Notice of Applicability (NOA). Coverage under the General Order will commence upon issuance of the 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 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 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 orders which will 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 waste constituents of concerns (COCs) due to 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 5 below. These tables are limited to the constituents that have been detected in produced wastewater above either the primary or secondary MCLs on at least one occasion:

Table – 1	
Title 22, Table 64431-A	
Maximum Contaminant Levels Inorganic Chemicals	
<i>Chemical</i>	<i>Maximum Contaminant Level</i>
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 + 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 Radionuclide	
Chemical	Maximum Contaminant Levels (pCi/L)
Radium-226 and Radium-228 (combined)	5
Gross Alpha particle activity (excluding radon and uranium)	15
Uranium	20
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			
	Maximum Contaminant Level Ranges		
Constituent, Units	Recommended	Upper	Short Term
Total Dissolved Solids, mg/L.....	500	1,000	1,500
or			
Specific Conductance, μ S/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

The Basin Plan sets specific effluent limits for oil field discharges to land for EC, chloride and boron. 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 (μ mhos/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 ($\mu\text{mhos/cm}$)	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 ($\mu\text{mhos/cm}$)	<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 waste COCs associated with discharges of waste from oil field facilities include, but are not limited to, electrical conductivity (EC), total dissolved solids, chloride, and boron, some metals (i.e., arsenic), some trace elements (i.e., 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 authorizes discharges to land that exceed the Basin Plan limits described above provided Dischargers can demonstrate through an appropriate, constituent-by-constituent analysis, that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.

Oil field produced wastewater can also contain metals exceeding MCLs, and particularly arsenic at levels 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 areas of the Central Valley 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 Famoso area in 2011. The results were included in a technical report titled, *Cawelo Water District Famoso Basins Antidegradation Analysis*. The results indicate that the arsenic associated with the discharges up to 120 ug/L 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 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 wastewater discharges that can be directly compared with groundwater monitoring results 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, 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 don't 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

California Code of Regulations, Title 27, section 20005 et seq. (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste, which includes designated waste, as defined by Water Code section 13173. 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 at Title 27, section 20090 is described below:

* * *

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

- (1) the applicable 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 in accordance with Title 27, sections 20090(b) 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*) (Antidegradation 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:

- a. 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;
- b. The degradation will not unreasonably affect present and anticipated future beneficial uses;
- c. The discharger will employ Best Practicable Treatment or Control (BPTC) to minimize degradation; and
- d. The degradation is consistent with the maximum benefit to the people of the state.

This General Order will only be issued to Dischargers that can demonstrate, through an appropriate technical report, that the implementation of BPTC, as necessary, will maintain the highest water quality consistent with maximum benefit to the people of the state. Specifically, in its NOI the Discharger must demonstrate through an appropriate antidegradation analysis that COCs will be controlled through the implementation of BPTC and that any degradation that may occur will not adversely affect the existing or potential beneficial uses of groundwater. The

technical report must include a hydrogeological assessment that demonstrates that the proposed discharges of wastes to land will not substantially affect water quality nor cause a violation of 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.

This General Order prohibits the discharge of oil field related wastes to surface waters or surface water drainages.

To assess compliance with the State Antidegradation Policy, this General Order requires Dischargers to monitor discharges to groundwater or demonstrate that the discharge cannot affect the quality of the underlying groundwater. The demonstration must be based on an analysis of appropriate hydrogeologic information. Absent such a demonstration, the requirements to monitor first encountered groundwater are met when the Dischargers perform individual groundwater monitoring or participate in a regional groundwater monitoring program as part of a group of Dischargers with several small facilities in similar hydrogeological areas. The purpose of monitoring is to demonstrate compliance with Resolution 68-16 and the requirements of 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 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.

The Kern Economic Development Foundation (KEDF) produced a report titled, *The Economic Contribution of the Oil and Gas Industry in Kern County* (Report), and dated November 2015. The Report indicates California's oil industry is mostly concentrated in the Central Valley and Kern County in particular. The Report states that Kern County's oil and gas industry plays an important role in both the county and state economies and provides as significant source of the state's and country's domestic oil and gas production and reduction in foreign oil imports. The Report indicates Kern County represents 71% of California's oil production and 10% of total U.S. oil production. Kern County produces 66% of the state's total gas production.

The KEDF report also states the oil and gas industry is the number one industry in Kern County in terms of gross domestic product and tax contributions. The industry produces high revenues, creates high wage jobs [Oil and gas extraction industry average annual salary was \$143,000 compared to county's average annual salary of \$41,000 in 2014], and contributes significant tax revenue to all levels of government. For 2014, the oil and gas industry accounted for 30% of Kern County's \$100 billion in property tax valuation. The oil and gas industry also reportedly accounts for 1 in 7 jobs in Kern County. Across oil and gas industry in 2014, there were approximately 50,000 direct, indirect, and induced energy related jobs in Kern County.

The oil and gas industry provides many similar benefits in Fresno, Kings, and Tulare Counties as well.

Limited degradation of groundwater by some waste constituents associated with discharges of produced wastewater, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the state. The economic prosperity of communities and associated industry derived from domestic petroleum production as well as the reduction in foreign petroleum imports are of maximum benefit to the people of the state and provide sufficient justification for allowing limited groundwater degradation that may occur pursuant to this General Order provided the terms of the applicable Basin Plan and other applicable State Water Board and Central Valley Water Board policies are consistently met.

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 groundwater monitoring of natural background water quality and the water quality downgradient of the production facility area and particularly ponds, unless it can be demonstrated that the discharger cannot adversely affect groundwater quality.

The MRP requires oil field operators to sample existing municipal or domestic water supply wells within one-mile radius of ponds that receive produced wastewater or other authorized discharges, 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 Dischargers 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 requires Dischargers 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 CEQA Guidelines also contemplate that physical conditions at other points in time may also constitute the appropriate baseline. (*Cherry Valley Pass Acres and Neighbors v. City of Beaumont* (2010) 190 Cal. App. 4th 316, 336.)

The receipt of a permit application (Report of Waste Discharge) is one event that can be used to mark the beginning of the environmental review process because it commences the development of an individual permit. Therefore, the date a permit application is received is appropriate for the environmental baseline. (*Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1278.) In the case of general permits, the permit development process begins when a permitting authority identifies the need for a general permit and collects data that demonstrate that a group or category of facilities has similarities that warrant a general permit.

The Central Valley Water Board began developing this General Order in 2015 with the issuance of Notices of Violation and other orders requiring owners/operators without WDRs to submit RWDs. However, a rigid date for establishing the environmental baseline is not suitable for this General Order because oil and gas production has fluctuated over the last decade due to varying economic conditions. Accordingly, the environmental baseline is based on a Discharger’s existing operations, which is the actual maximum monthly average produced wastewater discharge flow to ponds during the 10 years prior to 26 November 2014.

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 discharging produced wastewater to ponds prior to 26 November 2014, and their existing operations as described in their NOIs. Any increase in flow beyond the existing operations constitutes an expansion requiring a CEQA evaluation.

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...”

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 facility 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 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 subsequently approved in a NOA.

Discharges of wastes 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 fluids used in “well stimulation treatment”, as defined by CCR, title 14, section 1761 (including hydraulic fracturing, acid fracturing, and acid matrix stimulation), to land is prohibited. The General Order also contains a prohibition for the discharge of produced wastewater that contains well stimulation treatment fluids. A three-year time schedule is provided for the Discharger to either a) develop an alternate disposal method or b) demonstrate that the produced wastewater does not contain well stimulation treatment fluids in concentrations that could adversely affect beneficial uses of waters. Given the large number of wells that have received a well stimulation treatment over time and the large number of stimulated wells that discharge produced wastewater to land, a time schedule is necessary to allow the Discharger time to marshal funding, develop and complete appropriate studies, and to implement appropriate compliance options.

The General Order strictly prohibits the discharge of hazardous 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 in a manner that could result in the creation of nuisance or pollution conditions.

Discharge Specifications

The discharge flow for coverage under the General Order must not exceed actual maximum monthly average produced wastewater flow to pond between 26 November 2004 and 26 November 2014. The discharge flow also must not exceed the maximum design flow of the Facility’s limiting unit as described by the technical data in the NOI.

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 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.

This General Order clarifies that discharges to secondary containment units are to be due to emergency events that are beyond the control of facility operators and that the discharges to the secondary containment are short term, limited duration, and cleaned up. Intermittent discharges that are of longer duration or more frequent would allow wastes to percolate and migrate below the bottoms of the containment unit ponds and threaten groundwater. Secondary containment structures used in this fashion would require regulation by the Board. The General Order also proscribes discharges of storm water containing pollutants from secondary containment to waters of the state (both surface and groundwaters) and waters of the United States. Discharges of storm water containing pollutants to such waters would require regulation under waste discharge requirements or a National Pollutant Discharge Elimination Permit.

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 or other wastes from causing groundwater to contain constituents in concentrations that exceed water quality objectives. If natural groundwater quality already contains constituents in concentrations exceeding applicable water quality objectives, the discharge of produced wastewater or other wastes cannot cause those constituent concentrations to increase.

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 for solids to be tested prior to use as a road mix and shown 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 the MRP. During application process, the NOAs issued will delineate the Standard Provisions that are applicable.

The General Order also requires the Discharger to install acceptable flow metering or flow monitoring. An engineered 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 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) evidence that the wastes are being hauled to a properly permitted facility.

Evaluation of Discharge Practices

The General Order requires monitoring of all activities that result in discharges to land. Specifically, the MRP 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. The MRP can be modified if the Discharger provides sufficient data to support the proposed changes. Any modification of the MRP must be reviewed and approved by the Executive Officer.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT A

DEFINITION OF TERMS
FOR
ORDER R5-2017-0035

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR OIL FIELD DISCHARGES TO LAND
GENERAL ORDER NUMBER TWO

1. **Degradation** - Any measurable adverse change in water quality.
2. **Existing Operations** - The actual maximum monthly average produced wastewater discharged to land (e.g., pond) that occurred between 26 November 2004 to 26 November 2014 and does not exceed maximum design flow of the Facility approved during NOI process.
3. **Expansion** - Any activity that results in an increase in the volume of wastes or mass of wastes discharged to land (Also, see Standard Provisions sections A.3 and A.4).

“Expansion” does not include installation or modification of the Facility or equipment to achieve compliance with the requirements of this General Order so long as the modification or installation is sized to accommodate only the existing Facility flows.

4. **Field or Oil Field** - CCR title 14, section 1741(d) defines Field as “the same general surface area which is underlaid or reasonably appears to be underlaid by one or more pools.”

Also, CCR title 14, section 1760(f) defines Field as “the general surface area that is underlain or reasonably appears to be underlain by an underground accumulation of crude oil or natural gas, or both. The surface area is delineated by the administrative boundaries shown on maps maintained by the [State Oil and Gas] Supervisor.”

5. **Flowline** - CCR title 14, section 1760(g) defines Flowline as “any pipeline that connects a well with a gathering line or header.”

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DEFINITION OF TERMS
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6. **Freeboard** - Elevation difference between the produced wastewater (liquid) level in a pond and the lowest point of the pond embankment before wastewater can overflow.
7. **Hazardous Waste** - See definition in CCR, title 22, section 66261.3.
8. **High Quality Water** – Waters where a constituent is found at concentrations lower than the applicable water quality objective, are considered “high quality waters” under the antidegradation policy. It is important to note that water can still be considered a high quality water even when other constituents are found at concentrations higher (of worse quality) than the applicable water quality objectives.
9. **Operator** - CCR title 14, section 1741(j) defines as “any person drilling, maintaining, operating, pumping, or in control of any well.”
10. **Overflow** - The intentional or unintentional discharge from the Production Facility that is not authorized by this General Order.
11. **Pond** - Also referred to as “Surface Impoundment,” is any earthen structure, which may be lined/or unlined, used for the separation, treatment, storage, and/or disposal of produced wastewater. Oil and Gas Production Facility components that are not required to obtain coverage under the General Order are those that meet all of the following requirements:
 - a. small in size or volumes of produced wastewater received,
 - b. properly engineered and constructed to eliminate percolation (e.g., re-enforced concrete or other appropriately engineered liner),
 - c. operated to contain liquid for short periods of time, and
 - d. subject to proper ongoing operation and maintenance.
12. **Produced Wastewater or Wastewater** - The General Order refers to the water that is produced with production fluid from a production well as “wastewater,” which is commonly referred to as “produced water” in the oil industry. The General Order also uses the term “effluent” (after treatment).

CCR title 14, section 1760(r) defines “waste water,” as “produced water that after being separated from the produced oil may be of such quality that discharge requirements need to be set by a California Regional Water Quality Control Board.”
13. **Production Facility** - Also referred to as Facility. CCR title 14, section 1760(k) defines Production Facility as “any equipment attendant to oil and gas production

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DEFINITION OF TERMS
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or injection operations including, but not limited to, tanks, flowlines, headers, gathering lines, wellheads, heater treaters, pumps, valves, compressors, injection equipment, production safety systems, separators, manifolds, and pipelines that are not under the jurisdiction of the State Fire Marshal pursuant to section 51010 of the Government Code, excluding fire suppressant equipment.” See above for definition of “flowline.”

In general, includes all the surface equipment used to transfer, process or treat, or store oil and dispose of produced wastewater originating from production wells.

The term “Facility” includes those operations that collect and dispose of oil field produced wastewater from one or more operators.

14. **Secondary Containment** - An engineered containment used only during operational upsets or failures that are beyond the control of the Facility operator.

CCR title 14, section 1760(n) defines Secondary Containment as “an engineered impoundment, such as a catch basin, which can include natural topographic features, that is designed to capture fluid released from a production facility.” CCR, title 14, section 1773.1 requires the following conditions:

- (a) All production facilities storing and/or processing fluids, except valves, headers, manifolds, pumps, compressors, wellheads, pipelines, flowlines and gathering lines shall have secondary containment.
- (b) Secondary containment shall be capable of containing the equivalent volume of liquids from the single piece of equipment with the largest gross capacity within the secondary containment.
- (c) Secondary containment shall be capable of confining liquid for a minimum of 72 hours.
- (d) When not in use for rain water management, rain water valves on a secondary containment shall be closed and secured to prevent unauthorized use.
- (e) All damage to secondary containment shall be repaired immediately.
- (f) The requirements of this section are not applicable until six months after the effective date of this regulation.

For the purposes of this General Order, secondary containment does not include structures used to manage produced wastewater or other wastes during periods of routine maintenance or used to address a lack of adequate facility maintenance or treatment capacity or storage.

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DEFINITION OF TERMS

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WASTE DISCHARGE REQUIREMENTS GENERAL ORDER

OIL FIELD DISCHARGES TO LAND

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15. **Solid Wastes** – Viscous liquids, sludges, and solids collected from tank bottoms as oily sand and/or organic sludge waste collected from the surface of ponds are collectively referred to as “solid waste.”
16. **Storm Water** - Storm water runoff, snowmelt runoff, and surface runoff resulting from a storm or precipitation event.
17. **Waste** - Defined in Water Code section 13050(d) where it “includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.”

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT B

INFORMATION NEEDS SHEET
FOR
ORDER R5-2017-0035

WASTE DISCHARGE REQUIREMENTS GENERAL ORDER
FOR OIL FIELD DISCHARGES TO LAND
GENERAL ORDER NUMBER TWO

This Information Needs Sheet describes information needed to prepare a Notice of Intent (NOI) to obtain coverage under the General Order. A NOI shall consist of:

1. **State Form 200.** 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) need to submit an application fee that serves as the first annual fee. The initial fee shall be 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 characterize all waste generation, treatment, storage, reuse and disposal activities applicable to the specific Facility that will be covered under the General Order. The technical report shall be prepared by a California registered civil engineer or engineering geologist. 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 Central Valley Water Board staff review of the NOI, the staff will determine the appropriate TTWQ and CPLX rating 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 Notice of Applicability (NOA). The NOA will describe appropriate monitoring and reporting requirements and site specific information.

TECHNICAL REPORT PREPARATION

Please note the following tips to expedite the NOI preparation and facilitate Central Valley Water Board staff review process:

1. Providing the information in the same order as the listed below for technical report will help to expedite the NOI review process. Staff will use this as a checklist.

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2. If any of the information is missing or incomplete, the NOI will be deemed incomplete and the process (and your project) will be delayed until all of the required information is submitted. You will be notified in writing of the NOI status within 30 days of the NOI submittal. If the NOI is incomplete, the additional information that is required to complete the NOI will be specified in the notification.
3. All numerical data presented in tables and calculations performed using spreadsheets should be provided in digital form (MS Excel compatible spreadsheet) as well as hard copy.
4. If some of the information listed below can be found in a previous technical report prepared by a California registered professional, the NOI can incorporate the report as an appendix, but the NOI text must specify where in the report the required information can be found. However, if appended reports contain information that conflicts with the body of the NOI, it may cause further delays.

✓	A. Facility Information:
	1. Is this an existing or new oil and gas production facility or expansion or startup of existing facility with discharges of produced wastewater (effluent) to pond(s)?
	a. If this is an existing facility (began discharge to land prior to 26 November 2014), the Discharger can apply for coverage under the general orders and the facility is exempt from requirements of the California Environmental Quality Act (CEQA)(Pub. Resources Code, § 21000 et seq.). Therefore, the Discharger does not need to produce evidence of compliance with CEQA.
	b. If this is a new facility (did not begin discharge to land prior to 26 November 2014) or expansion or startup of an existing facility, the Discharger can apply for individual WDRs instead of coverage under the general orders.
	c. If the Discharger has questions about a. or b. or permitting in general contact Central Valley Water Board staff at (559) 445-5116 for guidance.
	2. Is this facility currently regulated under individual or general WDRs issued by the Central Valley Water Board?
	a. If so, provide the WDRs order number and a copy of the WDRs.
	b. If not, provide the name of the local agency that issued the current operating permit and the number of years ponds have been in use as a method of disposal.

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	<p>3. Provide a copy of any other permits that reference or relate to the discharge of oil field produced wastewater treatment, storage, disposal, and containment systems. This includes Use Permits and any other relevant permits (e.g., Division of Oil, Gas, and Geothermal Resources (DOGGR) disposal well permits, facility permits, etc.).</p>
	<p>4. Provide the following information for the oil and gas production facility and related treatment, storage, and/or disposal units:</p>
	<p>a. Section, Township, and Range.</p>
	<p>b. Street address of the facility (provide street name and distance from nearest cross street if there is no street number), if applicable.</p>
	<p>c. The approximate latitude and longitude of the facility and its components (treatment, storage tanks or tank battery, ponds, disposal wells, etc.).</p>
	<p>d. County and Assessor's Parcel Numbers, if applicable.</p>
	<p>5. Provide a detailed description of the facilities that generate wastewater, and all wastewater conveyance, treatment, and disposal systems. Use site plans and conceptual drawings as appropriate to illustrate locations and typical construction. Include all treatment processes. Provide the following maps, plans, and illustrations:</p>
	<p>a. A facility location map showing local topography; all wells (including producing, injectors, disposal, monitoring, and domestic/agricultural supply wells, etc.); the production, treatment, and disposal facility locations; and boundaries, streets, and surface water features (including natural drainages, seasonal streams, storm water drainage ditches, irrigation canals, and irrigation/tailwater ditches, etc.).</p>
	<p>b. A process flow schematic for the entire treatment, storage, and disposal system. Include existing and proposed flow monitoring devices and sampling locations proposed to determine compliance with the General Order.</p>
	<p>c. A scaled map for production, treatment, storage, disposal facility site plan and acreage. Identify the locations of all the containment structures.</p>
	<p>d. A scaled map showing the limits of all the production wastewater treatment, storage and disposal areas. If disposal methods include combination use of ponds or disposal wells or other methods, identify all the locations on the scaled map.</p>

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	6. For each wastewater treatment, storage, disposal pond, and containment structure, provide the following information:
	a. Identification (name) and function of the structures.
	b. Surface area, depth, and volumetric capacity at two feet of freeboard for the ponds.
	c. Height (relative to surrounding grade), crest width, interior slope, and exterior slope of each berm or levee.
	d. Materials used to construct each berm or levee (e.g., containment structures and ponds).
	e. Description of the engineered liner, if any. Include a copy of the Construction Quality Assurance (CQA) Report if one was prepared.
	f. Overflow prevention features for each structure.
	g. Operation and maintenance procedures for each structure.
	h. Storm water runoff management methods, applicable for each structure.
	7. Projected monthly water balances demonstrating adequate containment capacity in storage structures (e.g., ponds and secondary containments) for both the average rainfall year and the 100-year return period total annual precipitation, including consideration of at least the following:
	a. Base line wastewater production to the pond and any inflow sources, if applicable.
	b. A minimum of two feet of freeboard in each pond at all times (unless a registered civil engineer determines that a lower freeboard level will not cause overtopping or berm failure).
	c. Historical local pan evaporation (monthly average values).
	d. Local precipitation data with the 100-year return period annual total distributed monthly in accordance with mean monthly precipitation patterns.
	e. Disposal system hydraulic loading rates distributed monthly in accordance with expected seasonal variations based on evaporation rates.
	f. Projected long-term percolation rates (including consideration of percolation and the effects of solids buildup in unlined ponds or containment structures).

	<p>g. Submittal of a water balance capacity analysis demonstrating that the as-built hydraulic capacity of the facility (i.e., tank battery and pond storage capacity) is consistent with the flow limits based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.</p>
	<p>B. Wastewater Treatment, Storage, and Disposal Systems For The Facility:</p>
	<p>1. A description of all the sources and types of wastewater flowing into the treatment, storage, and disposal facility, including:</p>
	<p>a. A list of oil leases or individuals or entities that use the wastewater treatment, storage, and disposal system.</p>
	<p>b. The number of permitted active and idle production wells (which produce oil, water, or gas) for each oil lease or individual or entity and the associated total monthly fluid production for each type of fluid (oil, gas, and produced wastewater) for each lease since 2013, broken out into monthly flows.</p>
	<p>c. The method(s) of oil field reservoir drives (e.g., primary or enhanced oil recovery (EOR) drive such as steam flood, water flood, etc.).</p>
	<p>d. A list of wastewater treatment units that treat the produced wastewater that is discharged to ponds or to land.</p>
	<p>2. For any chemicals or additives used in the exploration and production of oil, and the treatment of produced wastewater, provide the following:</p>
	<p>a. A detailed accounting of all the chemicals and additives used that could enter the wastewater, the reservoir, and/or produced wastewater stream (e.g., acids, bases, salts, surfactants, emulsion breakers, etc.), and a description of how and where in the production or wastewater stream they are deployed. Calculate the volumes of each individual chemical and additive used on a quarterly basis and describe any seasonal variability in chemical usage.</p>
	<p>b. Report any hazardous wastes that may be generated at the facility and certify that all hazardous wastes will be disposed of in accordance with State and federal laws and will not be commingled with wastewater.</p>
	<p>3. Characterize each wastewater stream type that discharges to the oil and gas production facility using the constituent list provided in Table I of Monitoring and Reporting Program R5-2017-0035 including (but not limited to) the following:</p>
	<p>a. Produced wastewater after production facility treatment, but prior to discharge</p>

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	to the pond (effluent), and within pond.
	b. If the facility receives produced wastewater from other leases, or individuals, or entities, or properties or from different reservoirs, characterize each produced wastewater stream prior to mixing with other produced wastewaters and prior to treatment.
	c. Identify all other sources of wastes prior to mixing with produced wastewater and characterize each waste stream independently (e.g., reverse osmosis brine streams, steam generator blow down, etc.).
	4. Demonstrate maximum monthly average effluent flow to each pond that occurred between 26 November 2004 and 26 November 2014 and the basis for the effluent flow limits. Consider dry weather flows vs. peak flows and seasonal variations, if applicable. Include the technical basis for the flow limit (e.g., design treatment capacity; hydraulic capacity of system components; and demonstrated (historical) effluent storage/disposal capacity).
	5. A narrative description of treatment and storage system operation and maintenance procedures to be employed, including those associated with effluent storage and disposal.
	6. The names and contact numbers for production treatment facility operators and facility supervisors and the hours that the facility is staffed.
	7. Provide preventive and contingency measures for controlling spills and accidental discharges in production facility:
	a. Provide any spill prevention plans. The spill prevention plan should provide specific measures to effectively control any spills or failures in the production facility with supporting documents, a facility schematic, and flow diagrams that show that a spill to the secondary containment areas could only occur during emergency or catastrophic conditions.
	b. A description of proposed alarm notification systems, emergency wastewater storage facilities, secondary containment system, and other means of preventing treatment system bypass or failure during reasonably foreseeable overload conditions (e.g., peak flows, power failure, pipeline blockage, etc.). Consider both potential problems at the treatment, storage and disposal systems and within the conveyance systems (e.g., flow lines).

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	<p>c. Provide description of flood and frost protection measures (structural and operational) employed at the facility.</p>
	<p>8. Describe all solid wastes generated at the facility and discuss how they are handled and disposed of. Volumes, chemical and physical characteristics, and final disposition of each waste stream (e.g., land application, compost, landfill) must be described. If solid wastes are treated or disposed of on-site, a waste management plan for those wastes must be included. The waste management plan shall include the following:</p>
	<p>a. A description of solids generation rates, on-site treatment and handling systems, and short-term storage procedures.</p>
	<p>b. A description of measures to be used to control runoff or percolation from the solids as they are transferred, stored, and/or mixed, and a schedule that shows how and where all the solids will be land applied or removed from the site prior to the onset of the rainy season (1 October).</p>
	<p>c. Confirmation that solids removed for reuse within the lease area would be analyzed to indicate that they are non-hazardous. Handling and application practices that would ensure that solid wastes do not migrate once placed.</p> <p>Note: At least 180 days prior to any solid waste removal and disposal, the Discharger must submit a solids management plan for the Executive Officer's approval.</p>
	<p>d. See Provision E.6 of the General Order for additional information.</p>
	<p>9. If the Discharger plans to apply produced wastewater for dust control or construction activities at the facility, the Discharger shall submit a management plan that includes:</p>
	<p>a. Technical justification that the dust control or construction activities are best practicable treatment or control and protective of surface waters and groundwater, and a demonstration that discharges will not create nuisance or pollution conditions.</p>
	<p>b. Provide constituent of concern concentrations and loading rates, frequency of wastewater applications, wastewater runoff control measures in-place, and a detailed aerial map of the field and facility clearly identifying areas of wastewater applications including acreage, nearest water ways, and seasonal drainage courses.</p> <p>Note: The Discharger shall submit the management plan 90 days prior to the anticipated discharges and the Executive Officer approval of the plan should be prior to commencement of the wastewater application.</p>

	<p>c. See Provision E.5 of the General Order for additional information.</p>
	<p>10. If the Discharge Prohibition A.5 of the General Order applies to the Discharger for discharge of produced wastewater from wells that have been stimulated as defined by CCR title 14, section 1761; then the Discharger must satisfy the requirements of the General Order Provision E.7 by submitting a draft Work Plan to come into compliance with this prohibition. See Provision E.7 of the General Order for additional information.</p>
	<p>C. Antidegradation Analysis:</p>
	<p>1. An antidegradation analysis that evaluates the proposed discharge’s consistency with State Water Resources Control Board Resolution 68-16, <i>Policy with Respect to Maintaining High Quality Waters of the State</i>. This policy, known as the antidegradation policy, prohibits a regional board from allowing degradation of high quality water unless the Board makes specific findings. If the discharge is expected to degrade high quality waters, the Board must demonstrate that the degradation is consistent with the maximum benefit to the people of the state, that the discharge will not unreasonably affect present and anticipated beneficial uses of the water, that the discharge will not result in water quality less than that prescribed in applicable water quality control policies, and that the treatment system results in the “best practicable treatment or control” of the constituents of concern. In addressing the antidegradation policy, the NOI shall include:</p>
	<p>a. An identification of the beneficial uses of the groundwater in the vicinity of the discharge. Beneficial uses are designated in the applicable water quality control plan.</p>
	<p>b. An identification of the applicable water quality objectives (i.e., identify applicable Maximum Contaminant Levels or other waste concentration levels that cause odors or impair the taste of groundwater designated as suitable for municipal and domestic beneficial use, identify salinity thresholds that will be protective of groundwaters designated as suitable for agricultural use).</p>
	<p>c. An identification of waste constituents currently found in groundwater at concentrations lower (of better quality) than the applicable water quality objectives. Waters where a constituent is found at concentrations lower than the applicable water quality objective are considered “high quality waters” under the antidegradation policy. It is important to note that water can still be considered a high quality water even when other constituents are found at concentrations higher (of worse quality) than the applicable water quality objectives.</p>

	<p>d. An evaluation of how the proposed discharge may degrade groundwater that has been identified as a high quality water. The evaluation shall compare the concentrations of waste constituents in the discharge with the concentrations of these constituents in underlying groundwater and with applicable water quality objectives, and must be conducted on a constituent-by-constituent basis. Include in this evaluation waste constituents that may not be present in elevated concentrations in the discharge when applied to land, but may be released to groundwater as a result of the discharge (e.g., nitrate, iron, manganese, arsenic).</p>
	<p>e. When the above analysis finds that high quality waters will be degraded by the discharge, the following is also needed:</p>
	<p>(1) A justification why the degradation is consistent with the maximum benefit to the people of the state. It is appropriate to consider “important social and economic development” when evaluating whether the degradation is consistent with the maximum benefit to the people of the state.</p>
	<p>(2) With respect to the treatment or control measures that will be implemented, evaluate how these measures reduce the discharge’s potential to degrade groundwater and how these measures ensure that the discharge does not cause or contribute to existing conditions of groundwater degradation, where the degradation is due to controllable factors.</p>
	<p>(3) Include a description of additional control measures that <u>could</u> further reduce the degradation associated with the discharge, and discuss why it is or is not “practicable” to implement these measures at the site. This can include analysis relating the viability of the project to the expense of the pollution control technology (i.e., the project would not be economically viable if higher-cost treatment was required by the Board).</p>

	<p>D. Planned Changes in the Existing Facility or Discharge:</p>
	<p>1. Describe in detail any and all planned changes in the facility or discharge, addressing each of items listed in Section B above.</p>
	<p>E. Local and Site-Specific Conditions for Surface, Soil, and Groundwater: (Illustrate with maps as appropriate)</p>
	<p>1. Neighboring land uses.</p>
	<p>2. Typical crops grown (if agricultural area).</p>
	<p>3. Water supply sources, including agricultural, municipal, and domestic well(s) within one mile radius of where the ponds are located.</p>

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	4. Terrain and site drainage features.
	5. Nearest surface water drainage course.
	6. FEMA floodplain designation(s).
	7. Average Annual precipitation (inches).
	8. 100-year 365-day precipitation (inches).
	9. Reference evaporation (monthly and annual total).
	10. Pan evaporation (monthly and annual total).
	11. A description of the types and depths of soil underlying ponds, containment structures, and/or other effluent disposal areas. Include a copy of the geotechnical report and/or Natural Resources Conservation Service (NRCS) soil report. Include at least the following information:
	a. Depth of unsaturated soil when groundwater is closest to the surface.
	b. Soil types based on site-specific information, sampling locations (accurately measured and recorded), description and results of percolation tests or other tests used to estimate soil long-term infiltration and percolation rates. Include depth, thickness, and soil horizons. Soils must be described at a minimum of five feet below the bottom of any disposal unit. Provide information on soil types underlying ponds and/or wastewater application areas from the ground surface to the saturated zone. Soils information should include data from on-site borings, logged by a California registered geologist or civil engineer, and may include referenced data from published sources.
	c. Bedrock type and condition encountered in disposal area, if any.
	d. A scaled map depicting soil/rock types and test locations.
	12. Provide the following information about hydrogeology and groundwater:
	a. Stratigraphy, groundwater elevation and gradient, transmissivity, and influence of all recharge and pumping sources (site conceptual model).
	b. Elevation and gradient of first encountered groundwater at the facility.
	c. Depth to highest anticipated groundwater based upon onsite measurements taken during wet season.
	d. Shallow groundwater quality or first encountered groundwater for typical waste constituents, up and down gradient of disposal ponds. See Table II of General Order Monitoring and Reporting Program for constituent list to analyze.

	<p>e. Information on monitoring well locations, construction details, and locations of any geological features (e.g. aquitards, subterranean channels, faults) and aquifer characteristics.</p>
	<p>f. Summary of historical groundwater monitoring results (last 5 years for existing facilities).</p>
<p>F. Industrial Storm Water General Permit:</p>	
	<p>On 1 April 2014, the State Water Resources Control Board adopted Order 2014-0057-DWQ (NPDES General Permit CAS000001) (Industrial Storm Water General Permit) specifying waste discharge requirements for discharges of storm water associated with industrial activities. Order 2014-0057-DWQ became effective 1 July 2015 and required all applicable industrial dischargers to apply for coverage prior to the effective date. Because storm water at oil and gas production wastewater discharge facilities is captured and contained on-site or comingled with produced wastewater before being discharged to ponds or production containment areas (i.e., secondary containment), storm water will generally contain residual oil or produced wastewater. This General Order prohibits discharge from leaving pond areas or secondary containment areas and entering waters of the United States. See the following link for more information:</p> <p>http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/</p> <p>1. Many industrial facilities are required to obtain coverage under the Industrial Storm Water General Permit. Provide evidence that the facility is exempt from or has applied for coverage under the Industrial Storm Water General Permit.</p>
<p>G. Department of Water Resources Well Standards:</p>	
	<p>The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in <i>California Well Standards Bulletin 74-90</i> (June 1991) and <i>Water Well Standards: State of California Bulletin 94-81</i> (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to Water Code section 13801, apply to all monitoring wells.</p> <p>1. Provide information as to whether existing monitoring wells at the facility were constructed in accordance with the Department of Water Resources Well Standards.</p> <p>See the following link for more information:</p>

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	<p>http://www.dpla.water.ca.gov/sd/groundwater/california_well_standards/well_standards_content.html</p>
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