
Central Valley Regional Water Quality Control Board

30 June 2017

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REVISED MONITORING AND REPORTING PROGRAM ORDER NO. 98-205, HATHAWAY, LLC, KERN-TULARE WATER DISTRICT, JASMIN RANCHOS MUTUAL WATER COMPANY, QUINN LEASE, JASMIN OIL FIELD, KERN COUNTY

Enclosed are Revised Monitoring and Reporting Program Order No. 98-205 (MRP) and a response to comments prepared by Kern-Tulare Water District regarding the draft MRP. The MRP is for Waste Discharge Requirements Order No. 98-205 that regulates the reuse of produced wastewater for irrigation.

This MRP requires Hathaway, LLC, Kern-Tulare Water District, and Jasmin Ranchos Mutual Water Company to perform specific produced wastewater and groundwater monitoring at specific frequencies. New requirements for submitting monitoring and compliance reports are included in this MRP. Failure to comply with the MRP will subject you to enforcement actions, including the potential assessment of civil liability.

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff made the draft MRP available, as a courtesy, to Hathaway, LLC, Kern-Tulare Water District, and Jasmin Ranchos Mutual Water Company on 26 May 2017. On 14 June 2017, Kern-Tulare Water District submitted comments on behalf of Jasmin Ranchos Mutual Water Company and Hathaway, LLC regarding the draft MRP. Enclosed is a response, prepared by Central Valley Water Board staff, to the comments received. Comments or suggestions that were found to be appropriate by Central Valley Water Board staff were incorporated in this MRP.

Program Order No. 98-205

Hathaway, LLC, Kern-Tulare Water District, and Jasmin Ranchos Mutual Water Company

Jasmin Oil Field, Quinn Lease

Kern County

If you have any questions regarding this matter, please contact Joshua Mahoney of this office at (559) 444 – 2449 or via email at Joshua.Mahoney@waterboards.ca.gov.



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Enclosures

cc: Julie Macedo, Office of Enforcement, State Water Resources Control Board
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**Regional Water Quality Control Board
Central Valley Region**

**Response to Written Comments for the Quinn Lease,
Revised Monitoring and Reporting Program Order No. 98-205**

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff made the draft Revised Monitoring and Reporting Program Order No. 98-205 (MRP) available, as a courtesy, to Hathaway, LLC (Hathaway), Kern-Tulare Water District (Kern-Tulare), and Jasmin Ranchos Mutual Water Company (Jasmin Water Company) on 26 May 2017. On 14 June 2017, Central Valley Water Board staff received a redline document of the draft MRP and comment letter (hereafter jointly referred to as Comments) via electronic mail. Comments regarding the draft MRP were prepared by Kern-Tulare on behalf of Hathaway and Jasmin Water Company.

Comments from Kern-Tulare are summarized in the appropriate sections below, followed by responses from Central Valley Water Board staff. Based on the comments, Central Valley Water Board staff has made some changes to the final MRP. Staff also made a few changes to improve clarity. Where specific changes are presented below, additions are in bold text and deletions are in ~~strikeout~~.

KERN-TULARE WATER DISTRICT (KERN-TULARE)

COMMENT No. 1: The Comments state that Hathaway has two years of quarterly produced wastewater sample results that have not yielded significant changes in water quality at Discharge 001. Hathaway requests a reduction of the monitoring frequency at Discharge 001 from quarterly to semi-annual.

RESPONSE: Paragraph seven in the introduction of the MRP states that the Discharger may request a reduction in the monitoring frequency, or minimize the list of constituents, via the submittal of a technical report that adequately demonstrates a reduction in the monitoring frequency is appropriate based on a statistically significant number of sampling events. The Central Valley Water Board has not received a technical report demonstrating that a reduction in the monitoring frequency is appropriate. No changes have been made to the MRP in response to this comment.

COMMENT No. 2: Kern-Tulare requests that the flowrate monitoring frequency for Discharges 002 and 003 is changed from daily to monthly.

RESPONSE: Central Valley Water Board staff does not object to the proposed change. Flowrate monitoring at Discharges 002 and 003 has been changed to monthly.

COMMENT No. 3: Kern-Tulare requests that the monitoring frequency for Discharges 002 and 003 is changed from varies to semi-annual.

RESPONSE: See response to Comment No. 1.

COMMENT No. 4: Kern-Tulare requests that monitoring and reporting requirements for the proposed Guzman Reservoir are included in the MRP.

RESPONSE: The proposed Guzman Reservoir has not been approved by the Central Valley Water Board and, therefore, will not be included in the final MRP. On 13 April 2017, Central Valley Water Board staff met with representatives from Hathaway and Kern-Tulare to discuss the Report of Waste Discharge for the proposed Guzman Reservoir and the draft MRP. At the conclusion of the meeting, Clay Rodgers (Assistant Executive Officer) stated that the

Antidegradation Analysis was incomplete and water quality results were required with method detection limits equal to drinking water standards for all non-detectable results. No changes have been made to the MRP in response to this comment.

COMMENT No. 4: The Comments state that the Irrigation Water Monitoring section of the MRP is redundant to monitoring requirements for Discharge 002.

RESPONSE: Central Valley Water Board staff does not agree that the Irrigation Water Monitoring section of the MRP is redundant to the monitoring requirements for Discharge 002. Central Valley Water Board staff made the following changes to Page 12 of the MRP to provide additional clarity to reporting requirements in response to this comment.

Irrigation Water Reporting:

- 1. Irrigation Water Monitoring data shall be summarized in a separate table that provides a tabular summary of current and historical results for Hathaway, LLC, Jasmin Ranchos Mutual Water Company, and Kern-Tulare Water District as specified on pages 5 and 6.**

COMMENT No. 5: The Comments state that monthly monitoring requirements for crop acreage is unrealistic. Kern-Tulare requests that the monitoring frequency for crop acreage be changed to annually to coincide with their current management practice.

RESPONSE: Central Valley Water Board staff does not object to changing the monitoring frequency for crop acreage from monthly to annually. In response to this comment, Central Valley Water Board staff has changed the monitoring frequency for crop acreage and made the following change to Page 13 of the MRP.

Fourth Quarter Monitoring Reports

Irrigation Water Reporting:

- 3. Individual aerial maps for Hathaway, Kern-Tulare Water District, and Jasmin Ranchos Mutual Water Company shall identify the crop(s) grown at each parcel within their respective service territory. Parcels that have changed crop type during the calendar year shall be noted by the submittal of two aerial maps for each Discharger, one aerial map for January and a second aerial map for December.**

COMMENT No. 6: Kern-Tulare requests the groundwater monitoring frequency to be changed from quarterly to semi-annual.

RESPONSE: See response to Comment No. 1.

COMMENT No. 7: Kern-Tulare requests that the groundwater contour map requirement be removed from the Groundwater Reporting section of the MRP.

RESPONSE: Groundwater contour maps provide critical data to assess quarterly groundwater variations and determine groundwater flow. No changes have been made to the MRP in response to this comment.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM NO. 98-205
FOR
HATHAWAY, LLC,
JASMIN RANCHOS MUTUAL WATER COMPANY, AND
KERN-TULARE WATER DISTRICT
QUINN LEASE, JASMIN OIL FIELD
KERN COUNTY

This Revised Monitoring and Reporting Program (MRP) supersedes the Revised Monitoring and Reporting Program Order No. 98-205 dated 25 January 2016 and is required pursuant to Water Code section 13267.

Hathaway, LLC, Jasmin Ranchos Mutual Water Company, and Kern-Tulare Water District (hereinafter jointly referred to as 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 a sample location 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 groundwater samples, produced wastewater samples, identification of chemicals associated with petroleum exploration and production, and tracking the application of recycled materials (blended produced wastewater); in order to determine if the Discharger is in compliance with applicable laws, regulations, and policies.

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 applicable provisions of the **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.

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 the monitoring frequency or to minimize the list of constituents. The proposal must include adequate technical justification for reduction in monitoring frequency.

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.

A complete list of substances which are tested for and reported on by the testing laboratory shall be provided to the Central Valley Water Board. All chromatograph peaks must be reported with the analytical results. 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 and results included in monitoring reports. 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.

Since Waste Discharge Requirements Order No. 98-205 was adopted on 23 October 1998, the facility configuration was modified to the following: one oil/water separation tank, two Wemco units, seven unlined surface impoundments (ponds), Jasmin Ranchos Mutual Water Company's Reservoir, and Kern-Tulare Water District's Big Four Reservoir. The Discharger proposed the current configuration to Central Valley Water Board staff, which was verbally confirmed.

PRODUCED WASTEWATER MONITORING

Water 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.

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

The Discharger shall monitor the volume and quality of produced wastewater at the Quinn Lease. A representative sample of produced wastewater shall be collected from the last pond at the Quinn Lease. 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 ¹	ac-ft/day ²	Metered ³	Continuous
Table I – Produced Wastewater Monitoring	Varies	Grab	Varies

¹ Individual volumes shall be monitored and all locations where produced wastewater is discharged to land shall be defined in each monitoring report.

² Acre feet per day.

³ Metered or alternatively calculated by the Discharger based on pump efficiencies, weir observations, or well tests.

Discharge 002

Produced wastewater and blending water are mixed in the Jasmin Ranchos Mutual Water Company Reservoir prior to distribution to cropland for irrigation. A monitoring station shall be established opposite of the inlet at the Jasmin Ranchos Mutual Water Company Reservoir that provides a representative sample of blended produced wastewater used for irrigation. Monitoring of the Jasmin Ranchos Mutual Water Company Reservoir for Discharge 002 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Inlet			
Produced Wastewater ¹	ac-ft/m ²	Metered ³	Monthly
Blended Produced Wastewater ¹	ac-ft/m ²	Metered ³	Monthly
Blending Water ¹	ac-ft/m ²	Metered ³	Monthly
Total Volume	ac-ft/m ²	Calculated	Monthly
Outlet ⁴			
Jasmin Ranchos Mutual Water Company	ac-ft/m ²	Metered ³	Monthly
Other	ac-ft/m ²	Metered ³	Monthly
Blending Ratio ⁵	-	Calculated	Monthly
Table II – Water Quality Monitoring	Varies	Grab	Varies

¹ Individual volumes shall be monitored and all sources of water defined in each monitoring report (e.g., petroleum production leases, irrigation well names, and surface water sources).

² Acre-feet per month.

³ Metered or alternatively calculated by the Discharger based on pump efficiencies or weir observations.

⁴ Individual volumes shall be monitored and all locations where blended produced wastewater is discharged to land shall be defined in each monitoring report.

⁵ The blending ratio shall be calculated using the sum of blending water and produced wastewater that are mixed.

Discharge 003

Under Provision C.4 of Waste Discharge Requirements Order No. 98-205, Kern-Tulare Water District is permitted to receive produced wastewater upon submittal of a written agreement to the Central Valley Water Board between Kern-Tulare Water District and Hathaway, LLC. The Central Valley Water Board received a copy of the signed agreement on 14 January 2016.

The Discharger shall monitor the volume and quality of produced wastewater discharged to Kern-Tulare Water District's Big Four Reservoir. The Discharger shall establish a monitoring station at the Big Four Reservoir that provides a representative sample of blended produced wastewater used for irrigation. Monitoring at Big Four Reservoir for Discharge 003 shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Inlet			
Produced Wastewater ¹	ac-ft/m ²	Metered ³	Monthly
Blending Water	ac-ft/m ²	Metered ³	Monthly
Total Volume	ac-ft/m ²	Calculated	Monthly
Outlet			
Jasmin Ranchos Mutual Water Company Reservoir	ac-ft/m ²	Metered ³	Monthly
Kern-Tulare Water District's Irrigation Deliveries	ac-ft/m ²	Metered ³	Monthly
Total Blended Produced Wastewater	ac-ft/m ²	Calculated	Monthly
Blending Ratio ⁴	-	Calculated	Monthly
Table II – Water Quality Monitoring ⁵	Varies	Grab	Quarterly

¹ Individual volumes shall be monitored and all sources of water defined in each monitoring report (e.g., petroleum production leases, irrigation well names, and surface water sources).

² Acre-feet per month.

³ Metered or alternatively calculated by the Discharger based on pump efficiencies or weir observations.

⁴ The blending ratio shall be calculated using the sum of blending water and produced wastewater that are mixed and used for irrigation.

⁵ Water samples for Discharge 003 may not be required if the Discharger can demonstrate that the quality of blended produced wastewater from the Jasmin Ranchos Mutual Water Company Reservoir is representative of the water quality in the Big Four Reservoir. The introduction of blending water or chemicals at the Big Four Reservoir shall require the collection and analysis of a water sample to characterize the quality of blended produced wastewater used for irrigation across Kern-Tulare Water District.

CHEMICAL AND ADDITIVE MONITORING

The Discharger shall monitor all chemicals and additives used during petroleum exploration, production, and/or treatment that have the potential to be in produced wastewater used for irrigation. Chemical and additive monitoring shall include at least the following:

<u>Requirement</u>	<u>Frequency</u>
A list of all chemicals and additives used.	Quarterly
The volume and mass of each chemical and additive used in gallons and kilograms.	Quarterly
A list of the leases and/or facilities where the chemicals and additives are being used.	Quarterly
Safety data sheets for each chemical and additive.	Annually

SOLID WASTE MONITORING

The Discharger shall monitor the generation and use of solid wastes, including sludge, generated at the Quinn Lease, Jasmin Ranchos Mutual Water Company Reservoir, and Big Four Reservoir from

activities, such as tank or pond maintenance. Solid waste volumes, disposal methods, disposal facilities, and analytical results from waste characterization shall be reported in the subsequent quarterly and annual monitoring reports.

The Discharger shall provide the volumes and destination, including facility permit numbers, for all solid wastes, including hazardous wastes that are disposed of off-site.

The disposal of solid waste on-site requires the submittal of a Solid Waste Management Plan for review and approval by the Central Valley Water Board. At a minimum, the Solid Waste Management Plan shall include the following:

1. Sampling frequencies,
2. Average volume of solid waste generated annually,
3. Solid wastes criteria for on-site disposal (e.g., non-hazardous and not within 100 feet of surface waterways),
4. Disposal method(s) and procedures,
5. Disposal location(s), and
6. Reporting requirements.

Prior to the disposal of solid wastes on-site, the Solid Waste Management Plan must be approved, in writing, by the Central Valley Water Board. Modifications to the Solid Waste Management Plan need to be submitted in an addendum report that requires written approval by the Central Valley Water Board prior to implementation. On-site solid waste monitoring shall consist of the reporting requirements specified in the approved Solid Waste Management Plan.

IRRIGATION WATER MONITORING

Monitoring reports shall include all relevant information pursuant to the discharge of blended produced wastewater to land for irrigation. Individual monitoring for the Jasmin Ranchos Mutual Water Company, Kern-Tulare Water District, and Hathaway, LLC shall include at least the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>	<u>Frequency</u>
Volume ¹ of Produced Wastewater	ac-ft/m ²	Metered	Monthly
Volume ¹ of Blending Water	ac-ft/m ²	Metered	Monthly
Blending Ratio ³	-	Calculated	Monthly
Area of Cropland Receiving Blended Water ⁴	Acres	Calculated	Annually

¹ Individual volumes shall be monitored and all sources of water defined in each monitoring report (e.g., oil extraction wells, petroleum leases, irrigation well names, and surface water sources).

² Acre-feet per day.

³ Individual blending ratios shall be calculated using the sum of blending water and produced wastewater that are mixed and used for irrigation.

⁴ Monitoring reports shall include the following for each water provider: total area of the water district and total land that blended produced wastewater is used for irrigation.

GROUNDWATER WELL SURVEY

The Discharger shall conduct a well survey to identify all water supply wells within one-mile of the petroleum treatment facility at the Quinn Lease, Jasmin Ranchos Mutual Water Company Reservoir, and Kern-Tulare Water District's Big Four Reservoir. **Within 90 days** of the signature date of this MRP, the Discharger shall submit a single technical report that includes at least the following:

1. The location and designated use for all water supply wells within one mile of these system components.
2. Analytical results for all domestic water supply wells within 0.25 miles of these system components. Analytical results shall consist of the constituents identified in Table II of this MRP.

GROUNDWATER MONITORING WELL NETWORK INSTALLATION

If an appropriate groundwater monitoring system is not in place at the Quinn Lease, Jasmin Ranchos Mutual Water Company Reservoir, and Kern-Tulare Water District's Big Four Reservoir prior to issuance of this MRP, a Monitoring Well Installation and Sampling Plan (MWISP) shall be submitted **by 1 March 2018**. If the Discharger demonstrates, in the MWISP, that the wastes discharged to the ponds cannot affect the quality of 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.

At a minimum, the MWISP shall include the information below.

General Information:

1. 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.
2. 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.
3. Rationale for the number of proposed monitoring wells, their locations and depths, and identification of anticipated depth to groundwater.
4. Local permitting information (as required for drilling, well seals, boring/well abandonment).
5. Drilling details, including methods and types of equipment for drilling and logging activities. Equipment decontamination procedures (as appropriate) should be described.
6. Health and Safety Plan.

Proposed Drilling Details:

1. Drilling techniques.
2. Well logging method.
3. Proposed Monitoring Well Design - all proposed well construction information must be displayed on a construction diagram or schematic to accurately identify the following:
4. Well depth.
5. Borehole depth and diameter.
6. Well construction materials.

7. Casing material and diameter – include conductor casing, if appropriate.
8. Location and length of perforation interval, size of perforations, and rationale.
9. Location and thickness of filter pack, type and size of filter pack material, and rationale.
10. Location and thickness of bentonite seal.
11. Location, thickness, and type of annular seal.
12. Surface seal depth and material.
13. Type of well cap(s).
14. Type of well surface completion.
15. Well protection devices (such as below-grade water tight-vaults, locking steel monument, bollards, etc.).

Proposed Monitoring Well Development:

1. Schedule for development (not less than 48 hours or more than 10 days after well completion).
2. Method of development.
3. Method of determining when development is complete.
4. Parameters to be monitored during development.
5. Method for storage and disposal of development water.

Proposed Surveying:

1. How horizontal and vertical position of each monitoring well will be determined.
2. The accuracy of horizontal and vertical measurements to be obtained.
3. The California licensed professional (licensed land surveyor or civil engineer) to perform the survey.

Proposed Groundwater Monitoring:

1. Schedule (at least 48 hours after well development).
2. Depth to groundwater measuring equipment (e.g., electric sounder or chalked tape capable of ± 0.01 -foot measurements).
3. Well purging method, equipment, and amount of purge water.
4. Sample collection (e.g., bottles and preservation methods), handling procedures, and holding times.
5. Quality assurance/quality control (QA/QC) procedures (as appropriate).
6. Analytical procedures.
7. Equipment decontamination procedures (as appropriate).

Proposed Schedule:

1. Fieldwork.
2. Laboratory analyses.
3. Report submittal.

MONITORING WELL INSTALLATION COMPLETION REPORT

Within **90 days** of installation of the groundwater monitoring system, a Monitoring Well Installation Completion Report (MWICR) shall be submitted. At a minimum, the MWICR shall summarize the field activities as described below.

General Information:

1. Brief overview of field activities including well installation summary (such as number, depths), and description and resolution of difficulties encountered during field program.
2. 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.
3. 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.
4. Period of field activities and milestone events (e.g., distinguish between dates of well installation, development, and sampling).

Monitoring Well Construction:

1. Number and depths of monitoring wells installed.
2. Monitoring well identification (i.e., numbers).
3. Date(s) of drilling and well installation.
4. Description of monitoring well locations including field-implemented changes (from proposed locations) due to physical obstacles or safety hazards.
5. Description of drilling and construction, including equipment, methods, and difficulties encountered (such as hole collapse, lost circulation, need for fishing).
6. Name of drilling company, driller, and logger (site geologist to be identified).
7. As-built 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.).
8. All depth to groundwater measurements during field program.
9. Field notes from drilling and installation activities (i.e., all subcontractor dailies, as appropriate).
10. Construction summary table of pertinent information such as date of installation, well depth, casing diameter, screen interval, bentonite seal interval, and well elevation.

Monitoring Well Development:

1. Date(s) and time of development.
2. Name of developer.
3. Method of development.

4. Methods used to identify completion of development.
5. Development log: volume of water purged and measurements of temperature, pH and electrical conductivity during and after development.
6. Disposition of development water.
7. Field notes (such a bailing to dryness, recovery time, number of development cycles).

Monitoring Well Survey:

1. Identify coordinate system or reference points used.
2. Description of measuring points (i.e., ground surface, top of casing, etc.).
3. Horizontal and vertical coordinates of well casing with cap removed.
4. Name, license number, and signature of California licensed professional who conducted survey.
5. Surveyor’s field notes.
6. Tabulated survey data.

GROUNDWATER MONITORING

The Discharger shall collect and analyze water samples from the groundwater monitoring system at the Quinn Lease, Jasmin Ranchos Mutual Water Company Reservoir, and Big Four Reservoir. After measuring water levels and prior to collecting samples, each groundwater 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 first encountered groundwater. 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. Alternative methods for collecting groundwater samples may be submitted to the Central Valley Water Board for review and approval.

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
Table II – Water Quality Monitoring	Varies	Grab	Quarterly

¹ Recorded to one hundredth of a foot

Within 30 days of notification that permission to sample a well(s) is revoked or a well(s) is damaged, the Discharger shall submit for review and approval by Central Valley Water Board staff a report that either: (1) demonstrates that a reduction in the number of monitoring wells 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.

FACILITY MONITORING

Markers shall be in place with calibrations indicating the water level at design capacity and available operational freeboard. The freeboard shall be monitored at the ponds and reservoir to the nearest tenth of a foot monthly and results included in the quarterly report.

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: oil booms; drainage control systems; slope failure; 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 completed within 30 days of the inspection.

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. Therefore, monitoring reports are due as follows:

First Quarter Monitoring Report:	1 May
Second Quarter Monitoring Report:	1 August
Third Quarter Monitoring Report:	1 November
Fourth Quarter Monitoring Report:	1 February

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.**

The following information is to be included on all monitoring reports, as well as report transmittal letters:

Hathaway, LLC, Jasmin Ranchos Mutual Water Company, and Kern-Tulare Water District
Quinn Lease, Jasmin Oil Field
Waste Discharge Requirements Order No. 98-205
GeoTracker Site Global ID: T10000007320

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 practical quantitation limit (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 pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the 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.

Frequently asked questions 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 website. 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, at a minimum, the following:

Produced Wastewater Reporting:

Discharge 001

1. Tabular summary of current and historical results as specified on page 2.
2. For each month of the quarter, calculation of the maximum daily flow, average daily flow, and total monthly flow.
3. For each sample of Boron, the Discharger shall calculate the 12-month rolling average of the discharge using the current value for that month averaged with the historical values for the previous 11 months.

Discharge 002

1. Tabular summary of current and historical results as specified on page 3.
2. For each sample of Boron, the Discharger shall calculate the 12-month rolling average of the discharge using the current value for that month averaged with the historical values for the previous 11 months.
3. Every month, the Discharger shall calculate the average monthly, quarterly, and annual blending ratio using available flow data for each water provider from the respective calendar year.

Discharge 003

1. Tabular summary of current and historical results as specified on pages 3 and 4.
2. For each sample of Boron, the Discharger shall calculate the 12-month rolling average of the discharge using the current value for that month averaged with the historical values for the previous 11 months.

Chemical and Additive Reporting:

1. Tabular summary of current and historical results as specified on page 4.

Solid Waste Reporting:

1. Tabular summary of current and historical results as specified in the approved Solid Waste Management Plan.

Irrigation Water Reporting:

1. Irrigation Water Monitoring data shall be summarized in a separate table that provides a tabular summary of current and historical results for Hathaway, LLC, Jasmin Ranchos Mutual Water Company, and Kern-Tulare Water District as specified on pages 5 and 6.

Groundwater Reporting:

1. Tabular summary of current and historical results as specified on pages 9 and 10.
2. A groundwater contour map with the depth to groundwater for that respective quarter. The contour map shall include groundwater direction for the Quinn Lease, Jasmin Ranchos Mutual Water Company Reservoir, and Big Four Reservoir. The map shall also include the locations of monitoring wells, system components, and application areas of blended produced wastewater used for irrigation.

- 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:

Facility Information:

1. The names and general responsibilities of all persons employed to operate the produced water treatment systems.
2. The names and telephone numbers of persons to contact regarding the Facility for emergency and routine situations.
3. 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, tasks undertaken in response to the spills, and the results of the tasks undertaken.

5. A summary of all leases and facilities that generated produced wastewater that was discharged to Jasmin Ranchos Mutual Water Company Reservoir and Big Four Reservoir.
6. A summary (i.e., flow diagram, or description) that clearly illustrates all processes and locations for produced wastewater during extraction, treatment, storage, and disposal.
7. A map of the following:
 - Facility(s) within the oil field,
 - Facility(s)/lease(s) boundaries,
 - Produced wastewater distribution network, and
 - Distribution network for blended produced wastewater.

Produced Wastewater Reporting:

1. Tabular summary of current and historical total annual flow for Produced Wastewater Monitoring as specified on pages 2 and 3.

Irrigation Water Reporting

1. Tabular summary of the current and historical average annual blending ratios.
2. Tabular summary of current and historical crops that were irrigated with blended produced wastewater and the crops respective acreage within the service territory of each water provider.
3. Individual aerial maps for Hathaway, LLC, Kern-Tulare Water District, and Jasmin Ranchos Mutual Water Company shall identify the crop(s) grown at each parcel within their respective service territory. Parcels that have changed crop type during the calendar year shall be noted by the submittal of two aerial maps for each Discharger, one aerial map for January and a second aerial map for December.

Chemical and additive reporting:

1. Safety Data Sheets for all chemicals and additives that are identified in quarterly monitoring reports for that respective calendar year.
2. Tabular summary of current and historical annual volume and mass for all chemicals and additives.
3. Summary that identifies if any chemicals and additives were detected in blended produced wastewater used for irrigation or groundwater.

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.

This monitoring and reporting program shall be effective on the signature date below.

Ordered by: Clay L. Rodgers
for PAMELA C. CREEDON, Executive Officer
30 June 2017

(Date)

Table I – Produced Wastewater Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u> ¹⁰	<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 Organic Carbon (TOC)	mg/L	Quarterly	415.3	Quarterly
Total Suspended Solids (TSS)	mg/L	Quarterly	160.2	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>PAHs</u> ⁴	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)	o/oo ⁶	Semi-annual ⁷	900.0	Semi-annual
Deuterium (Hydrogen 2, ² H, or D)	o/oo	Semi-annual	900.0	Semi-annual

Table I – Produced Wastewater Monitoring (continued)

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Radionuclides</u>				
Radium-226	pCi/L ⁸	Semi-annual	SM ⁹ 7500-Ra	Semi-annual
Radium-228	pCi/L	Semi-annual	SM 7500-Ra	Semi-annual
Gross Alpha particle (excluding radon and uranium)	pCi/L	Semi-annual	SM 7110	Semi-annual
Uranium	pCi/L	Semi-annual	200.8	Semi-annual
<u>Constituents of Concern</u>				
Lithium	mg/L	Semi-annual	200.7	Semi-annual
Strontium	mg/L	Semi-annual	200.7	Semi-annual
Iron	mg/L	Semi-annual	200.8	Semi-annual
Manganese	mg/L	Semi-annual	200.8	Semi-annual
Antimony	mg/L	Semi-annual	200.8	Semi-annual
Arsenic	mg/L	Semi-annual	200.8	Semi-annual
Barium	mg/L	Semi-annual	200.8	Semi-annual
Beryllium	mg/L	Semi-annual	200.8	Semi-annual
Cadmium	mg/L	Semi-annual	200.8	Semi-annual
Chromium (total)	mg/L	Semi-annual	200.8	Semi-annual
Chromium (hexavalent)	mg/L	Semi-annual	7196A	Semi-annual
Cobalt	mg/L	Semi-annual	200.8	Semi-annual
Copper	mg/L	Semi-annual	200.8	Semi-annual
Lead	mg/L	Semi-annual	200.8	Semi-annual
Mercury	mg/L	Semi-annual	7470A	Semi-annual
Molybdenum	mg/L	Semi-annual	200.8	Semi-annual
Nickel	mg/L	Semi-annual	200.8	Semi-annual
Selenium	mg/L	Semi-annual	200.8	Semi-annual
Silver	mg/L	Semi-annual	200.8	Semi-annual
Thallium	mg/L	Semi-annual	200.8	Semi-annual
Vanadium	mg/L	Semi-annual	200.8	Semi-annual
Zinc	mg/L	Semi-annual	200.8	Semi-annual
<u>Oil Production and Process Chemicals and Additives</u> ¹⁰	µg/L	Quarterly	As Appropriate ¹¹	Quarterly

¹ Degrees Fahrenheit

² Micromhos per centimeter

³ Milligrams per liter

⁴ Polycyclic aromatic hydrocarbons

⁵ Micrograms per liter

⁶ Parts per thousand

⁷ Two times per year

⁸ Picocuries per liter

⁹ Standard Methods

¹⁰ The Discharger shall provide analytical results for all chemicals and additives used (both in the current quarter and historically) in the production and or processing of all oil and wastewater discharged into surface impoundments or used for irrigation 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.

¹¹ Appropriate analytical methods may be proposed by the Discharger but are subject to the approval of the Assistant Executive Officer.

Table II – Water Quality Monitoring

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method¹⁰</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) ⁴	mg/L	Quarterly	160.2	Quarterly
Total Organic Carbon (TOC) ⁴	mg/L	Quarterly	415.3	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly	120.1	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>Oil and Grease</u>	mg/L	Quarterly	1664A	Quarterly
<u>Volatile Organic Compounds</u>				
Full Scan	µg/L	Quarterly	8260B	Quarterly
<u>PAHs⁵</u>	µg/L ⁶	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	µg/L	Quarterly	418.1	Quarterly
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)	o/oo ⁷	Quarterly	900.0	Quarterly
Deuterium (Hydrogen 2, ² H, or D)	o/oo	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium-226	pCi/L ⁸	Quarterly	SM ⁹ 7500-Ra	Quarterly
Radium-228	pCi/L	Quarterly	SM 7500-Ra	Quarterly
Gross Alpha particle (excluding radon and uranium)	pCi/L	Quarterly	SM 7110	Quarterly
Uranium	pCi/L	Quarterly	200.8	Quarterly

Table II – Water Quality Monitoring (continued)

<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<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 Additives</u> ¹⁰	µg/L	Quarterly	As Appropriate ¹¹	Quarterly

¹ Degrees Fahrenheit

² Micromhos per centimeter

³ Milligrams per liter

⁴ TSS and TOC are not required for groundwater samples

⁵ Polycyclic aromatic hydrocarbons

⁶ Micrograms per liter

⁷ Parts per thousand

⁸ Picocuries per liter

⁹ Standard Methods

¹⁰ The Discharger shall provide analytical results for all chemicals and additives used (both in the current quarter and historically) in the production and or processing of all oil and wastewater discharged into surface impoundments or used for irrigation 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.

¹¹ Appropriate analytical methods may be proposed by the Discharger but are subject to the approval of the Assistant Executive Officer.