13 December 2018

Dennis Walrath, Manager
McLennan Oil Company
11003 Artist Court
Bakersfield, California 93312

CERTIFIED MAIL
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NOTICE OF APPLICABILITY (NOA), CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD, ORDER NUMBER R5-2017-0036, WASTE DISCHARGE REQUIREMENTS FOR OIL FIELD DISCHARGES TO LAND, GENERAL ORDER NUMBER THREE, MCLENNAN OIL COMPANY, SECTION 32 LEASE, MIDWAY-SUNSET OIL FIELD, KERN COUNTY

McLennan Oil Company (McLennan) operates the Section 32 Lease, also referred to as the McLennan Fee Lease (Lease) in the Midway-Sunset Oil Field east of Highway 33. Two active unlined surface impoundments (ponds) are present at the lease and are used for the disposal of oil field produced wastewater (discharge). The ponds are in the west half of Section 32, T31S, R23E, MDB&M. Pond #1, referred to by McLennan as the "Production Pond," is 66 feet (ft.) by 30 ft., by 5 ft. deep. Pond #2, referred to by McLennan as the "Standby Pond," is 30 ft. by 12 ft., by 5 ft. deep. A recently constructed inactive pond, identified in the enclosed memorandum as Pond #3, is also present on the lease.

On 9 May 2017, Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff received a document, dated 5 May 2017, and titled *"Technical Report For General Order Number Three, McLennan Oil Company, Section 32 Lease..."* (Report). The Report was submitted as part of a Notice of Intent (NOI) for coverage under Order Number R5-2017-0036, Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Number Three (General Order Three). On 27 July 2017 Central Valley Water Board staff sent McLennan a letter containing comments on the review of the NOI.

On 24 October 2017, McLennan submitted a technical report, dated 24 October 2017, and titled *"Hydrogeologic Characterization Report…"* (Hydrogeologic Characterization Report). In response to the Central Valley Water Board staff letter dated 27 July 2017, McLennan's consultant (Amec Foster Wheeler Environment & Infrastructure, Inc.) submitted a letter dated a 14 November 2017 and titled *"Response to Review of General Order Three Notice of Intent…"* (Addendum).

This letter serves as formal notice that General Order Three is applicable to Pond #1 and Pond #2 on the Lease. General Order Number **R5-2017-0036-010** is hereby assigned to all produced wastewater discharges into Pond #1 and Pond #2. McLennan should become familiar with all of the requirements, time schedules, prohibitions, and provisions of General Order Three, and Monitoring and Reporting Program R5-2017-0036 (MRP).

Coverage of produced wastewater discharges into Pond #1 and Pond #2 is allowable under General Order Three because information provided in the NOA shows that Pond #1 and Pond #2 have received produced wastewater discharges during the 10 years prior to 26 November 2014.

The NOI and the Addendum did not seek coverage for Pond #3 under General Order Three. Pond #3 cannot be covered under General Order Three because it was constructed after, and had not received produced wastewater discharges prior to 26 November 2014. Coverage of discharges to ponds under General Order Three may only be permitted when it is documented that there had been a discharge flow to a pond during the 10 years prior to 26 November 2014 (paragraph 62, page 16, General Order Three).

McLennan may apply for coverage of produced wastewater discharges into Pond #3 by submitting a Report of Waste Discharge and obtaining Waste Discharge Requirements (WDRs). However, the pond will be considered a "new facility" and issuance of WDRs would require compliance with the requirements of the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). If McLennan does not intend to permit produced wastewater discharges into Pond #3 under WDRs, then a closure plan is needed. A request for pond closure plans or to separately permit this pond will be addressed in a separate letter.

This letter also serves as formal notice that Cleanup and Abatement Order No. R5-2016-0707 (CAO), issued on 28 January 2016 for ponds at the Section 32 Lease in the Midway-Sunset Oil Field, is hereby rescinded.

As stated in Water Code section 13263, all discharges of waste into waters of the state are privileges, not rights. General Order Three does not create a vested right for McLennan to continue the discharges of waste to the pond. 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 the provisions of General Order Three, as well as prohibit further discharge.

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 Three.

FACILITY SPECIFIC REQUIREMENTS

1. McLennan shall maintain exclusive control of the discharge and shall comply with all of the requirements and timelines of General Order Three and the MRP.

2. The required annual fee specified in the annual billing from the State Water Board shall be paid until coverage under General Order Three is officially terminated. McLennan must notify the Central Valley Water Board in writing to request termination.

3. Under Discharge Specifications, Item B.2., General Order Three states: *"The discharge flow shall not exceed actual maximum monthly average produced wastewater flow to the 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 maximum monthly produced wastewater production volume reported for the Lease was 554 barrels (bbls) or 23,268 gallons (gal) in July 2014. McLennan shall not exceed this monthly maximum discharge volume.

   Central Valley Water Board staff estimate that the "design capacity," at two feet of freeboard, is approximately 1,057 bbls for Pond #1 and is approximately 192 bbls for Pond #2. Two feet of freeboard is required and must be kept at all times. Any increase in discharge volume that would exceed the "design capacity" constitutes a facility expansion requiring an evaluation under the California Environmental Quality Act (CEQA).

4. McLennan shall not discharge produced wastewater outside of the ponds except for a permitted dust control use. If McLennan intends to apply for use of produced wastewater for dust control, a proposed management plan as described in Provision E.6 of General Order Three must be submitted at least **90 days** prior to the anticipated discharges.

5. **By 13 March 2019**, McLennan shall, pursuant to Provision E.3 of General Order Three, 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.

6. McLennan shall operate and maintain all ponds sufficiently to protect the integrity of containment and berms and prevent overtopping and/or structural failure. Discharges not authorized by the General Order and not described in the NOI should be reported to the Central Valley Water Board Fresno office. Discharge of wastes other than those described in the NOI is prohibited. If the method of waste disposal changes, McLennan must submit a Report of Waste Discharge (Form 200).

7. The Report states that *"In the rare event that solid waste is generated, it is disposed of off site in accordance with applicable laws and regulations."* The 14 November 2017 letter also states that "solids removed from the ponds are placed in bins that are hauled to a disposal facility under a bill of lading as non-hazardous waste." McLennan shall monitor the accumulation of solids in the ponds and if needed, clean out solids from the ponds as required by General Order Three Discharge Specifications B.16. McLennan shall characterize any solid waste generated in accordance with the Solid Waste Monitoring section of the MRP, and McLennan shall comply with General Order Three Solids Disposal Specifications D.1 though D.5.

8. **By 13 February 2019**, McLennan shall, pursuant to Provision E.4. of General Order Three, submit either:

    a. The results of a hydrogeological investigation demonstrating that there is no groundwater beneath the Facility discharge areas *and* that produced water and constituents associated with other approved wastes discharged at the Facility will not migrate into areas where there is groundwater with designated beneficial uses. Upon the written concurrence of the investigation results by the Executive Officer, this provision shall be considered satisfied,

    or

    b. If there is first encountered groundwater underlying the Facility or the Executive Officer does not concur with the results of the investigation in Provision E.4.a., above, the Discharger shall demonstrate that the natural background groundwater quality for the Facility meets the Sources of Drinking Water Policy exception criteria and/or parallel exception criteria outlined in the General Order and thus the current Basin Plan groundwater beneficial uses are eligible for de-designation in accordance with the compliance schedule provided in Tasks 1 through 10 of Provision 4.b.

The 24 October 2017 Hydrogeologic Characterization Report states that there is *"a thick, fine-grained layer beneath the site consisting of the Basal Alluvial Clay unit from the ground surface to about 350 feet bgs…"* and that it is *"…underlain by the Tulare Formation."* The Hydrogeologic Characterization Report also states that *"the first saturated sands beneath the site occurs in the upper portion of the Tulare Formation at a depth of about 900 feet bgs and are saturated with oil and water."*

As described in the enclosed 13 December 2018 Central Valley Water Board staff Memorandum, staff have reviewed boring logs and geophysical logs that are available on the California Division of Oil, Gas, and Geothermal Resources' Well Finder website. These logs indicate that that coarser sediments are present in the alluvium. The available geophysical logs also indicate that fluids may be present at depths shallower than 900 ft. below ground surface (bgs). Some of the geophysical logs indicate that first encountered fluids may be in the alluvium and at approximately 290 ft. to 450 ft. bgs. Additional analysis is needed to ascertain the depth and quality of first encountered fluids. Accurate descriptions of the alluvial sediments is also needed.

For Provision 4 of General Order Three to be fully satisfied, McLennan must either make the demonstration that there is no groundwater beneath the Lease and that the discharge will not migrate to areas containing water with beneficial uses; or, obtain a Basin Plan Amendment. If the discharger opts to obtain a Basin Plan Amendment, the discharger will have to follow the prescribed time schedule. The time schedule requires McLennan to complete certain tasks by certain dates as described in General Order Three.

The NOI reports that, *"The berms around the ponds are above the surrounding grade, so there is no storm water to manage."* 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 Lease 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 requirements. Failure to comply with the requirements in General Order Three and the MRP could result in an enforcement action as authorized by provisions of the California Water Code. A copy of General Order Three 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/r5-2017-0036.pdf.

The MRP includes monitoring and reporting of chemicals and additives. McLennan 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 McLennan 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, McLennan may request the 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.

McLennan 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

McLennan 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. The Geotracker site Global I.D. number that is associated with this NOA is T10000008034.

In addition documents that are less than 50 MB shall be sent via electronic mail to: centralvalleyfresno@waterboards.ca.gov. Documents that are 50 MB or larger shall be transferred to a disk and mailed to the Central Valley Water Board office at 1685 E Street, Fresno, CA 93706.

Please review the enclosed memorandum for more information. If you have any questions regarding this matter, please contact Zachary Jarvie of this office at (559) 445-5455 or at zachary.jarvie@waterboards.ca.gov.

for

Patrick Pulupa
Executive Officer

Enclosures: 13 December 2018 Memorandum
1 March 1991 Standard Provisions
General Order Three

cc: Cameron Campbell, District Deputy, Division of Oil Gas and Geothermal Resources, Bakersfield (NOA and Memorandum only, Via Email)
William Pipes, Principle Geologist, Amec Foster Wheeler Environment and Infrastructure, Inc., Fresno
Keith Nakatani, Oil and Gas Program Manager, Clean Water Action (NOA and Memorandum only, Via Email)
Andrew Grinberg, National Campaigns Special Projects Manager, Clean Water Action (NOA and Memorandum only, Via Email)
Bill Allayaud, California Director of Government Affairs, Environmental Working Group (NOA and Memorandum only, Via Email)

TO: Clay Rodgers
Assistant Executive Officer

W. Dale Harvey
Supervising Engineer
RCE No. 55628

FROM: Michael L. Pfister
Senior Engineering Geologist
PG No. 5946

Zachary J. Jarvie
Engineering Geologist

PROFESSIONAL GEOLOGIST
Michael Lance Pfister
No. 5946
Exp. 9/30/20
Br.
STATE OF CALIFORNIA

DATE: 13 December 2018

SUBJECT: NOTICE OF APPLICABILITY (NOA), CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD, ORDER NUMBER R5-2017-0036, WASTE DISCHARGE REQUIREMENTS FOR OIL FIELD DISCHARGES TO LAND, GENERAL ORDER NUMBER THREE, MCLENNAN OIL COMPANY, SECTION 32 LEASE, MIDWAY-SUNSET OIL FIELD, KERN COUNTY

McLennan Oil Company (McLennan) operates the Section 32 Lease, also referred to as the McLennan Fee Lease (Lease) in the Midway-Sunset Oil Field East of Highway 33. Two unlined surface impoundments (ponds) are used for the disposal of oil field produced wastewater (discharge). Available aerial imagery also show that a third pond, that does not appear to have been utilized, was constructed between October 2016 and June 2017. The ponds are in the west half of Section 32, T31S, R23E, MDB&M. This memorandum provides a summary and evaluation of the information provided for coverage of the ponds under Order Number R5-2017-0036, Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Number Three (General Order Three).

BACKGROUND INFORMATION

General Order Three regulates oil field produced wastewater discharges where: 1) produced wastewater exceeds 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); and 2) there is no first encountered groundwater or first encountered groundwater is of poor quality and does not support beneficial uses as identified in the Basin Plan as municipal and domestic supply (MUN), or agricultural supply (AGR), or industrial service supply (IND) or industrial process supply (PRO).

SUBMITTED INFORMATION AND RECENT REGULATORY HISTORY

On 19 February 2015, Central Valley Water Board staff inspected the ponds. As a result of this inspection, a Notice of Violation (NOV) was issued by Central Valley Water Board staff on 7 April 2015 for discharges into ponds without waste discharge requirements (WDRs). The inspection report attached to the NOV stated that the operator *"…is planning to propose a third pond (pond 3) for additional storage capacity."*

On 1 April 2015, Central Valley Water Board staff issued *"California Water Code Directive Pursuant to Section 13267"* (13267 Order), which required that McLennan *"collect representative samples of wastewater within each of the ponds."* In response, a report dated 21 August 2015, and titled *"Mclennan Oil, Response To RWQCB Section 13267 Order…"* (13267 Report) was prepared and submitted by Environmental Consultants Inc. (EnviroTech). The 13267 Report contained analytical results from samples collected on 17 April 2015.

On 28 January 2016, Central Valley Water Board staff issued Cleanup and Abatement Order R5-2016-0707 (CAO) to McLennan. In response to the CAO, Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec) prepared a submittal dated 29 March 2016 and titled *"Hydrogeologic Characterization Work Plan, McLennan Oil Company Section 32 Lease …"* (Work Plan).

On 9 May 2017, Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff received a Notice of Intent (NOI), dated 5 May 2017, for coverage under Order Number R5-2017-0036, Waste Discharge Requirements General Order for Oil Field Discharges to Land, General Order Number Three (General Order Three). The NOI included a copy of Form 200 *"Application/Report of Waste Discharge…"*, and application fee, and a Technical Report, dated 5 May 2017, and titled *"Technical Report For General Order Number Three, McLennan Oil Company, Section 32 Lease..."* (Technical Report). The Technichal Report was authored by Amec and signed and stamped by Howard D. Barlow, a state of California licensed Professional Engineer.

A Central Valley Water Board staff letter dated 27 July 2017 stated that the NOI did not contain all the information required of General Order Three and requested that the "Proposed Further Work" activities, described in the Work Plan be completed. It was identified that the activities proposed in the Work Plan may provide some of the information needed in a revised NOI technical report.

On 24 October 2017, McLennan submitted a technical report, dated 24 October 2017 and titled *"Hydrogeologic Characterization Report…"* (Hydrogeologic Characterization Report), and authored by Amec and signed and stamped by William V. Pipes, a state of California licensed Professional Geologist. In response to the Central Valley Water Board staff letter dated 27 July 2017, McLennan's consultant submitted a letter dated a 14 November 2017 and titled *"Response to Review of General Order Three Notice of Intent…"* (Addendum). The Addendum was also authored by Amec, and signed by William V. Pipes. The Addendum referenced, and contained in its appendices, the 24 October 2017 Hydrogeologic Characterization Report.

POND CHARACTERISTICS

Numbering of the ponds in previous Central Valley Water Board letters has varied. The ponds are identified in the Technical Report as the "Standby Pond" and the "Production Pond." The pond dimensions reported by McLennan has varied. Pond names, dimensions, coordinates, and contents are listed in **Table 1**, below. The information in Table 1 is sourced from the 24 October 2017 Hydrogeologic Characterization Report and from aerial imagery available on GoogleEarth. Pond #3 is not identified in the NOI or in the Addendum documents. Pond #3 is west of and abuts Pond #1. The available aerial imagery indicates that Pond #3 was constructed between October 2016 and June 2017, and that a preexisting depression was present. The dimensions for Pond #3 are estimates based on the aerial imagery.

Table 1 Pond Information for the Section 32 Lease.

Pond I.D.(s)	Dimensions (ft.)			Coordinates in decimal degrees	Pond Contents
	Length	Width	Depth	Latitude, Longitude	
Pond #1 (Production Pond)	66	30	5	35.18834, -119.53149	Contains oil and water discharged from wash tank
Pond #2 (Standby Pond)	30	12	5	35.18603, -119.53162	Contains oil and water discharged from stock tank
Pond #3 (Additional Pond)	74	35	?	35.18843, -119.53171	No evidence of discharge.

The Hydrogeologic Characterization Report in the Addendum indicates that the Production Pond (Pond #1) receives produced waste water discharges from the wash tank, and that the Standby Pond (Pond #2) receives produced water from the stock tank that inadvertently enters the stock tank with oil from the wash tank.

The 5 May 2017 Technical Report states that, *"estimates for the Production Pond below 2 feet of freeboard: surface area is 2,125 square feet, depth is 11 feet, and volume is 23,375 cubic feet"* and that *"estimates for the Standby Pond: surface area is 595 square feet, depth is 7 feet, and volume is 4,165 cubic feet."* These dimensions and volumes are not consistent with the pond dimensions that are reported in the Hydrogeologic Characterization Report or as indicated by aerial imagery. Based on the pond dimensions provided in the Hydrogeologic Characterization Report, Central Valley Water Board staff estimate that the holding capacity with two feet of freeboard is approximately 5,940 cubic ft. or 1,057 bbls for Pond #1; and, 1,080 cubic ft. or 192 bbls for Pond #2.

DISCHARGE CHARACTERISTICS

Flow Volumes

The Technical Report dated 5 May 2017 states that, *"The highest wastewater flow into the ponds occurred in July 2014 at 554 barrels."*

Under Discharge Specifications, Item B.2., General Order Three 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."* During this time frame, records from the California Division of Oil Gas and Geothermal Resources (DOGGR) indicate that the 554 barrel (bbl) volume, reported above, is the maximum monthly volume of produced wastewater and discharge.

The Technical Report dated 5 May 2017 provided a water balance showing excess capacity for historical discharges to the ponds. Produced wastewater must not over top and flow outside of the ponds. General Order Three requires that a minimum of two feet of freeboard must be maintained at all times. The monthly discharges, up to and including the above noted maximum monthly volume cannot be used to justify a violation of the General Order's requirements. The General Order prohibits all wastewater discharges outside of the ponds. Wastewater is not used or permitted for dust control on the Leases.

Waste Constituents

The 13267 Report dated 21 August 2015 contained analytical results from a produced wastewater sample collected on 17 April 2015. The sample results are summarized in **Table 2**, below. Units of measurement are milligrams per liter (mg/L), micrograms per liter (µg/L), and picocuries per liter (pCi/L).

Table 2 Selected data from produced wastewater sample collected on 17 April 2015.

Sample Source	Section 32 Lease, *"Pond 1"*	
Lab Sample ID	1504196-01	
Constituents of Salinity	**Concentration**	**Units**
Total Dissolved Solids (TDS)	38,000	mg/L
Chloride	22,000	mg/L
Boron	46	mg/L
Volatile Organic Compounds (VOC), and Polynuclear Aromatic Hydrocarbons (PAH)		
Benzene	160	µg/L
Ethylbenzene	205	µg/L
Naphthalene	20.7	µg/L
Toluene	160	µg/L
Total Xylenes	957	µg/L
Radioactivity		
Gross Alpha	8.99 ± 8.57	pCi/L
Radium-226	4.19 ± 0.608	pCi/L
Radium-228	0.000 ± 0.795	pCi/L
Uranium	0.000 ± 0.346	pCi/L

With regards to chemicals or additives used in oil exploration and production, the Technical Report dated 5 May 2017 states: *"Chemical use on the property is based upon production requirements that are unpredictable. It has been typical that when chemicals are needed they are introduced into a well to solve a problem. These problems and associated chemicals include: a corrosion inhibitor to prevent corrosion found on tubing, rods, and pumps; an emulsion breaker to prevent foaming of heavy oil that prevents production; and a surfactant to treat the inadequate separation of produced oil and water. Chemicals are deployed into the well through two principal means: by use of a small tank with an attached pump that introduces a small amount of the chemical as the pump jack operates, and by injecting a quantity of chemical into the well casing in a single event. Volumes are variable but a surfactant might average 150 gallons/quarter, corrosion inhibitor 150 gallons/quarter, and an emulsion breaker 75 gallons/quarter. There is no discernable seasonal variation in chemical use."*

With regards to hazardous waste generation, the Technical Report dated 5 May 2017 states: *"There are no hazardous wastes produced at the facility. If such waste were to be produced, it will be disposed of in accordance with state and federal laws and will not be commingled with wastewater."*

Dust Control

Provision E.6 of General Order Three states: *"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 Provision also states: *"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 Technical Report dated 5 May 2017 states: *"A management plan is in preparation and will be submitted under separate cover within 90 days of any discharge."*

Solid Waste

Regarding the disposal of solid wastes, the Technical Report dated 5 May 2017 states: *"In the rare event that solid waste is generated, it is disposed of off site in accordance with applicable laws and regulations."* In response to comments in the 27 July 2017 Central Valley Water Board staff letter, the 14 November 2017 Addendum states that *"solids removed from the ponds are placed in bins that are hauled to a disposal facility under a bill of lading as non-hazardous waste."*

Discharge Specifications, Item B.16., of General Order Three requires that the Discharger monitor the accumulation of solids within the ponds and as necessary remove them to maintain adequate treatment storage and capacity. General Order Three's Section D., titled *"Solids Disposal Specifications"* includes handling and storage requirements for solids removed.

HYDROGEOLOGIC CHARACTERIZATION REPORTED IN ADDENDUM

The ponds overlie the Division of Oil Gas and Geothermal Resources 1973-74 Production Limits boundaries for specified formation within the Midway-Sunset Oil Field.

The Hydrogeologic Characterization Report states: *"… the site is located within the Tulare Formation oil-bearing zone. No known natural recharge sources of groundwater are available as evident by the absence of hydraulic gradient beneath the Section 32 Lease (Figure 8). Water quality is naturally poor in the Tulare Formation due to the influx of oil and connate water from underlying formations and the isolation of the Tulare Formation groundwater reservoir from the hydrologic cycle."*

The Hydrogeologic Characterization Report states: "The Section 32 Lease is located within Midway Valley, which is situated in the southwest portion of the San Joaquin Valley." The Hydrogeologic Characterization Report also states that the Midway-Sunset Oil Field (*"MSOF"*), "…*is bordered by several other oil fields that include the McKittrick Oil Field to north, the Buena Vista Oil Field and Elk Hills Oil Field to the east, and the Los Lobos Oil Field to the south. The MSOF abuts the Temblor Range to the west. The closest agriculture land use is located over 10 miles east of the Section 32 Lease (Figure 1)."*

The Hydrogeologic Characterization Report states: *"One of the prominent features of the alluvium beneath the MSOF and at the Section 32 Lease is that it is made up entirely of unsaturated sediments (referred to as 'air sands'). Wastewater at the Section 32 Lease is contained in the oil field by the Basal Alluvial Clay and confined by the anticlinal structure to the east."* The Hydrogeologic Characterization Report states that *"… a significant portion of the water evaporates (up to 38 percent) and the remainder infiltrates beneath the ponds."* The

Hydrogeologic Characterization Report also states that *"the first saturated sands beneath the site occurs in the upper portion of the Tulare Formation at a depth of about 900 feet bgs and are saturated with water and/or oil."* The alluvium in which the ponds are positioned are described as *"a thick, fine-grained layer beneath the site consisting of the Basal Alluvial Clay unit from the ground surface to about 350 feet bgs…"* and *"…underlain by the Tulare Formation."*

The Hydrogeologic Characterization Report states: *"Regionally, the groundwater potentiometric surface in the Tulare Formation is relatively flat with an elevation of approximately 300 feet above mean sea level that occurs from the northern to the southern portion of the MSOF and stretches from about Highway 33 on the west to the portions of Buena Vista Valley on the east (Uribe & Associates, 1992). Since the potentiometric surface of groundwater in the Midway Valley has no gradient, groundwater does not flow in the MSOF area, including in the vicinity of the Section 32 Lease (Figures 6 and 8)."*

STAFF REVIEW OF HYDROGEOLOGIC CHARACTERIZATION AND PROVISION 4 OF GENERAL ORDER THREE

Provision 4 of General Order Three requires that McLennan either: 1) demonstrate that *"…there is no groundwater beneath the Facility discharge areas and that produced wastewater and constituents associated with other approved wastes discharged at the Facility will not migrate into areas that there is groundwater with designated beneficial uses,"* or 2) comply with the timeline outlined in General Order Three Provision 4.b. and obtain a Basin Plan amendment to de-designate the beneficial uses of underlying groundwater.

Central Valley Water Board staff have examined geologic logs of wells within approximately one half-mile of the ponds. These well logs are available to view on the DOGGR's Well Finder website. In general, the sediments in the area surrounding the ponds are logged as sands from the ground surface to approximately 100 to 200 ft. bgs, with an interval of "sand and clay" below this. Variability between the logs exist, and some logs show sand and clay at the surface and some do not note clay above 900 ft. bgs. This is not consistent with McLennan's consultant's description in the Hydrogeologic Characterization Report that indicates that underlying sediments consist of a 350 ft. of "Basal Alluvial Clay unit." This needs to be assessed.

The Hydrogeologic Characterization Report states that *"the first saturated sands beneath the site occurs in the upper portion of the Tulare Formation at a depth of about 900 ft. bgs and are saturated with water and/or oil."* The Hydrogeologic Characterization Report also states that *"groundwater occurs regionally, including beneath the Section 32 Lease in he Tulare Formation at an elevation of about 300 feet…"* and that *"… the source of which is connate due to the lack of recharge in the valley."* I have reviewed geophysical logs available on DOGGR's well finder website. The logs reviewed, the log date, and the likely depth interval of the first occurrence of groundwater are as follows: 1) API 02905598, 18 May 1944, resistivity and spontaneous potential (SP) log deflections indicate fluids with high resistivity in a sandy zone between about 350 and 400 ft. bgs; 2) API 02905648, 11 February 1965, resistivity and SP log deflections indicate fluids with high resistivity in a sandy zone between about 450 and 500 ft. bgs (the conductivity log also suggests this); 3) API 02905692, 3 April 1944, resistivity and SP log deflections indicate fluids with high resistivity in a sandy zone between about 290 and 310 and

about 350 to 400 ft. bgs; 4) API 02913241, 16 June 1962, resistivity and SP log deflections indicate fluids with high resistivity in a sandy zone between about 290 and 320 and about 370 to 420 ft. bgs; 5) API 02938101, 6 December 1940, resistivity and SP log deflections indicate fluids with high resistivity in a sandy zone between about 350 to 400 ft. bgs. Analysis of the nearby geologic and geophysical logs indicates that groundwater may be first encountered in underlying alluvium at depths of approximately 290 ft. to 450 ft. bgs.

The McLennan consultant's interpretation associated with the first occurrence of saturated sands at 900 ft. bgs are not consistent with publicly available geophysical logs and boring logs reviewed by Central Valley Water Board staff. Additional analysis is needed to ascertain accurately the depth interval where first encountered fluids are present, and what the quality of first encountered fluids are.

SUMMARY

An analysis of nearby geophysical logs indicates that first encountered fluids may be in the alluvium at approximately 290 ft. to 450 ft. bgs. This is shallower than the approximately 900 ft. bgs depth to first encountered fluids that is indicated by the NOI and Addendum documents. Additional analysis is needed. This needs to include actual descriptions of the alluvial sediments.

Based on information submitted with the NOI and Addendum, coverage under General Order Three appears appropriate for Pond #1 (Production Pond) and for Pond #2 (Standby Pond) on the Lease. Pond #3 which was not identified in the NOI and was constructed between October 2016 and June 2017 cannot be covered under General Order Three.

Provision 4 of General Order Three must still be satisfied. Specifically, McLennan must either demonstrate that that there is no groundwater beneath the pond and that the discharge will not migrate to areas with groundwater of beneficial use; or, obtain a Basin Plan Amendment. If McLennan opts to pursue a Basin Plan Amendment, then McLennan shall follow the time schedule outlined in General Order Three. The time schedule requires McLennan to complete specific tasks by specific dates.

If McLennan does not choose to pursue a Basin Plan Amendment, and instead chooses to demonstrate that first encountered fluids are hydrocarbons and that the discharge will not migrate to waters of beneficial uses, then that demonstration must be provided by **13 February 2019**. Hydrogeological information that supports the demonstration must be provided.

The Technical Report dated 5 May 2017 anticipates that produced wastewater will be used for dust control. Provision E.6 of General Order Three requires that wastewater discharges for purposes of dust control "… shall not occur without Executive Officer written approval of the management plan."

Based on these conditions, as per Title 23, California Code of Regulations, section 2200, the discharge shall be given a TTWQ (threat to water quality) and CPLX (complexity rating) of

3C. McLennan is responsible for annual fees associated with this rating unless conditions or regulatory policies change.