

State Water Resources Control Board

June 4, 2018

Kenneth A. Harris Jr., State Oil & Gas Supervisor
Department of Conservation
Division of Oil, Gas & Geothermal Resources
801 K Street, MS 18-05
Sacramento, CA 95814-3530
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CONCURRENCE ON THE AQUIFER EXEMPTION PROPOSAL, UPPER CHANAC FORMATION OIL SANDS, KERN FRONT OIL FIELD, KERN COUNTY

Dear Mr. Harris:

State Water Resources Control Board staff, in consultation with Central Valley Regional Water Quality Control Board staff (collectively Water Boards staff), have reviewed the proposal provided on February 26, 2018 by the Division of Oil, Gas and Geothermal Resources (DOGGR) for the expansion of the existing aquifer exemption for the upper Chanac Formation oil sands within the Kern Front Oil Field (proposed exempted area). Water Boards staff assessed whether the proposal meets the criteria set forth in California Public Resources Code (PRC) section (§) 3131 and § 146.4 of Title 40 of the Code of Federal Regulations (CFR) and considered comments received during the public comment process.

Public Comment Process

On January 25, 2018, State Water Board staff preliminarily concurred with the proposal to expand the exemption of the upper Chanac Formation oil sands pending the State's public comment process. On March 15, 2018, DOGGR published notice of the exemption proposal and opened a public comment period. DOGGR and State Water Board staff held a joint public hearing to receive comments on the exemption proposal on April 16, 2018. The comment period closed on April 16, 2018. DOGGR and State Water Board staff have reviewed and responded in writing to the comments received during the comment period and public hearing.

Concurrence with Limitations on Underground Injection Control (UIC) Projects

State Water Board staff concur with the exemption proposal with limitations. To ensure injected fluids do not affect the quality of water that is, or may reasonably be, used for any beneficial use and remain in the proposed exempted area, the following limitations shall be incorporated in UIC project approvals:

- Injected fluids must be of similar or better quality than the existing groundwater in the proposed exempted area, as determined by Water Boards staff; and
- The UIC project zone of endangering influence shall not extend to the offset fault identified in Sections 3 and 34 (described below and shown on the enclosed map).

In conjunction with the evaluation of current and future UIC projects in the proposed exempted area, DOGGR and Water Boards staff will consider incorporating conditions, described below, into project approvals.

State and Federal Exemption Criteria

As required by PRC § 3131(a)(1) and 40 CFR § 146.4(a), the proposed exempted area does not currently serve as a source of drinking water. No water supply wells were identified as being completed within the proposed exempted area. Water supply wells were identified in proximity to the proposed exempted area. However, all of these wells are completed in shallower formations that are geologically and hydraulically isolated from the deeper proposed exempted area. At least 365 feet of vertical separation exists between the bottom of these water supply wells and the confining layer at the top of the upper Chanac Formation oil sands. Consistent with 40 CFR § 146.4(b)(1), the proposed exempted area will not in the future serve as a source of drinking water because it is hydrocarbon producing or contains hydrocarbons that are expected to be commercially producible.

Water is produced in connection with oil operations in the Kern Front Oil Field from the Chanac and Etchegoin Formations. The produced water is treated to remove hydrocarbon content and used to irrigate crops under Waste Discharge Requirements from the Central Valley Regional Water Quality Control Board. The requirement of PRC § 3131(a)(2), that the injected fluids not affect the quality of water that is, or may reasonably be, used for any beneficial use is satisfied because (1) the injected fluids will be of similar or better quality than the existing groundwater in the proposed exempted area, and (2) the injected fluids are expected to remain in the proposed exempted area.

The requirement of PRC § 3131(a)(3) is also satisfied because the injected fluids are expected to remain within the proposed exempted area due to a combination of geologic conditions and operational controls. Vertical containment is provided by the overlying, 2 to 40 feet thick lower permeability sand, siltstone, clay, and shale beds present above the upper Chanac Formation oil sands and by the 2 to 72 feet thick lower permeability shale beds below the upper Chanac Formation oil sands. A fault located in Sections 3 and 34 offsets the upper confining unit that could potentially allow injected fluids to migrate from the upper Chanac Formation into the overlying Etchegoin Formation. In the area of this offset fault, lateral and vertical containment will be maintained through operational controls limiting the migration of injected fluids to within the proposed exempted area and by an inward hydraulic gradient created by production activities.

Lateral containment for the proposed exempted area is provided by faults and a facies change on the east and northeast boundaries, and by an inward hydraulic gradient from current production. The faults and facies change provide containment, as demonstrated by the separation of areas of known commercial hydrocarbons and by geophysical log interpretations. The inward hydraulic gradient is documented by static fluid levels measured from idle wells in the production areas.

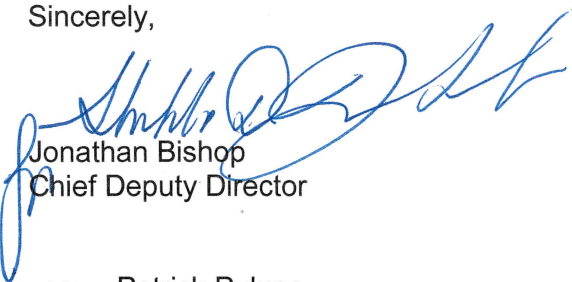
Conditions on UIC Projects

Approval of UIC projects involves a joint review by DOGGR and Water Boards staff. DOGGR and Water Boards staff may incorporate conditions into approval letters, as appropriate. Potential conditions include, but are not limited to, the following:

1. In cases where injection is proposed into the expanded exempt area where production has not been established (such as the proposed expansion on the west side of the field), verifying the presence of commercially producible hydrocarbons and demonstrating an inward hydraulic gradient; and
2. Requiring monitoring, which may include water quality testing, to confirm that injected fluids remain in the proposed exempted area, including the area around the offset fault in Sections 3 and 34. If a monitoring requirement is incorporated in a project approval, the operator must submit a plan to the Central Valley Regional Water Quality Control Board for consideration.

If you have any questions regarding this matter, please contact Mr. John Borkovich at (916) 341-5779 or john.borkovich@waterboards.ca.gov.

Sincerely,

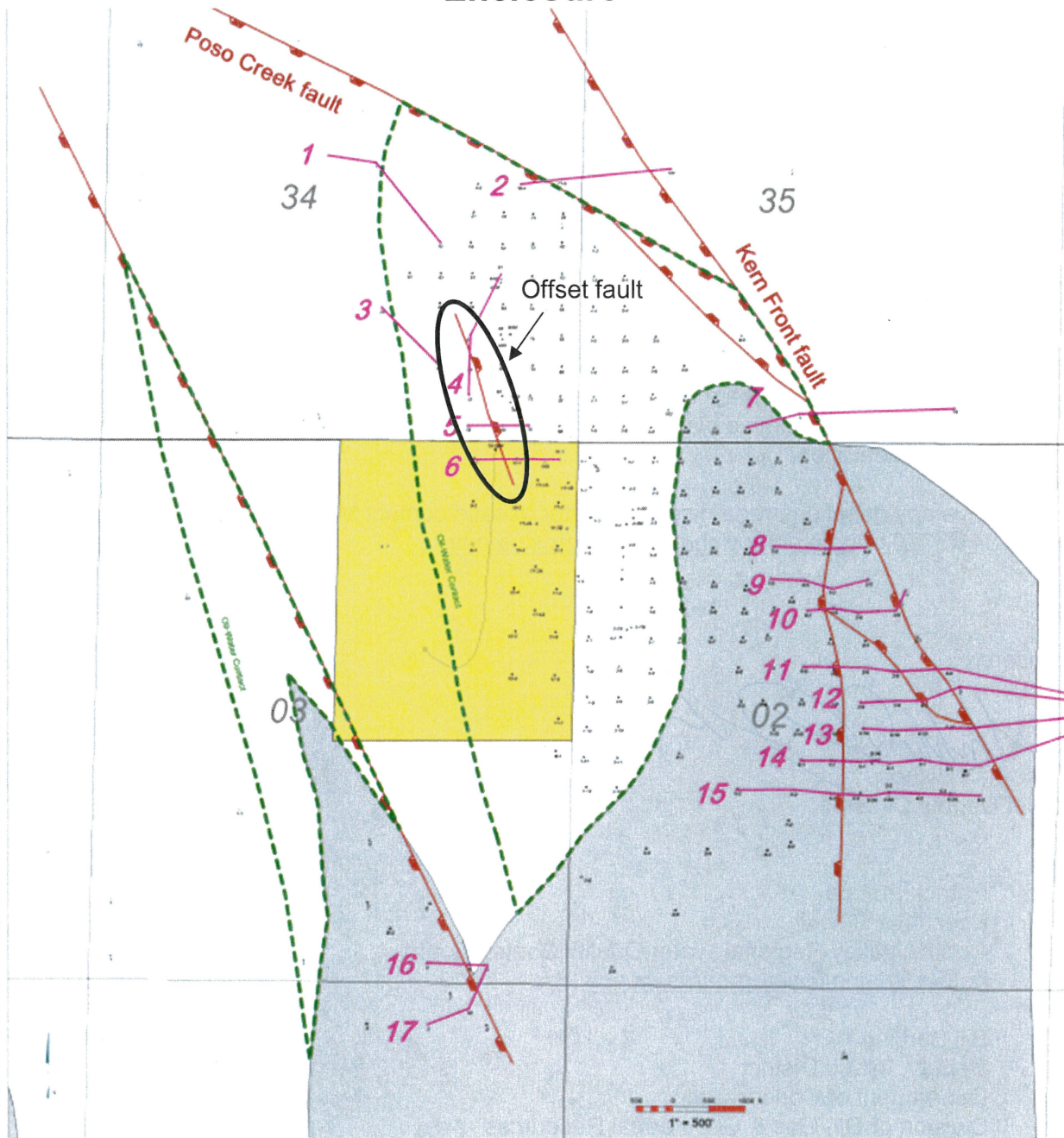


Jonathan Bishop
Chief Deputy Director

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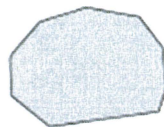
Enclosure



Kern Front Oil Field Proposed Aquifer Exemption - Chanac Fm. Supplementary Cross Section Index Map		
Lead: M. Varba Kern County, CA	Scale: 24.00 1270 4276 4000xM Date: March 2018	Date: March 2018

Proposed Aquifer Exemption Boundary

Hathaway LLC acreage



1973 Aquifer Exemption Boundary

Supplementary Structure Cross Sections

Faults

Source: Kern Front Oil Field, Upper Chanac Oil Sands Aquifer Exemption Application, 2/26/2018