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## State Water Resources Control Board

October 19, 2018

Kenneth A. Harris Jr., State Oil & Gas Supervisor  
Department of Conservation  
Division of Oil, Gas & Geothermal Resources  
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### **FINAL CONCURRENCE ON THE VOLUME I AQUIFER EXEMPTION PROPOSAL, EDISON OIL FIELD, KERN COUNTY**

Dear Mr. Harris:

State Water Resources Control Board (State Water Board) staff, in consultation with Central Valley Regional Water Quality Control Board staff (collectively Water Boards staff), have reviewed the Volume I aquifer exemption proposal provided by the Division of Oil, Gas and Geothermal Resources (DOGGR) on September 22, 2016 for the Edison Oil Field. The proposal seeks to expand the aquifer exemption for the Vedder Formation and Pyramid Hills Sands of the Freeman Jewett Formation, Main Wicker Sands of the Fruitvale Formation, and the Transition/Santa Margarita Formation within the Edison Oil Field for Class II injection. 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 March 7, 2018, State Water Board staff preliminarily concurred with the proposal to expand the aquifer exemption for the Vedder Formation and Pyramid Hills Sands of the Freeman Jewett Formation, Main Wicker Sands of the Fruitvale Formation, and the Transition/Santa Margarita Formation within the Edison Oil Field, pending the State's public comment process. On July 2, 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 August 2, 2018. The comment period closed on August 9, 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 Limitation on Underground Injection Control (UIC) Projects**

State Water Board staff concur with the exemption proposal for the Vedder Formation, Pyramid Hills Sands, and Main Wicker Sands with no limitation and with the proposal for the

Transition/Santa Margarita Formation with a limitation. To ensure the injection of fluids does not affect the quality of water that is, or may reasonably be, used for any beneficial use, fluids injected in the Transition/Santa Margarita Formation must be of similar or better quality than the existing groundwater in this area, as determined by Water Boards staff.

In conjunction with the evaluation of current and future UIC projects in the proposed exempted areas, 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 areas do not currently serve as sources of drinking water. No drinking water supply wells were identified as being completed within the proposed exempted areas. Water supply wells identified in proximity to the proposed exempted areas are completed in the Kern River, Chanac, and Santa Margarita Formations. In the area of these supply wells, the Vedder Formation, Pyramid Hills Sands, and Main Wicker Sands are vertically separated from the deepest water supply well by more than 1,300 feet and multiple vertical confining layers.

Consistent with 40 CFR § 146.4(b)(1), the proposed exempted areas will not in the future serve as sources of drinking water because they are hydrocarbon producing. In addition, as per PRC § 3131(a)(2), the injected fluids are not expected to affect the quality of water that is, or may reasonably be, used for any beneficial use because (1) the groundwater contained in the proposed exempted areas of the Vedder Formation, Pyramid Hills Sands, and Main Wicker Sands is not expected to be put to beneficial use because it contains petroleum hydrocarbons and elevated levels of boron and there is high quality water available in shallower formations, (2) the fluids injected into the Transition/Santa Margarita Formation will be of similar or better quality than the existing groundwater in the area, and (3) the injected fluids are expected to remain in the proposed exempted areas of each formation.

The requirement of PRC § 3131(a)(3) is also satisfied because the injected fluids are expected to remain within the proposed exempted areas due to the following geologic and hydraulic conditions:

#### **Vedder Formation and Pyramid Hills Sands**

Vertical containment is provided by the overlying, 750 feet thick Freeman Jewett Silt that consists of lower permeability silts. Lateral containment is provided by an inward hydraulic gradient from current production and by sealing faults along the northwest and southeast proposed exemption boundaries.

#### **Main Wicker Sands**

Vertical containment is provided by the overlying, 80 to 200 feet thick Fruitvale Shale that consists of lower permeability marine claystone and mudstone. Lateral containment is provided by an inward hydraulic gradient from current production and fluid migration up-dip (to the north) where the Main Wicker Sands pinch out to impermeable mudstones and claystones of the Fruitvale Formation. Permeability of the reservoir also decreases to the east, further limiting fluid migration eastward.

### **Santa Margarita Transition**

Vertical containment is provided by the overlying, 30 feet thick lower Chanac that consists of lower permeability siltstone and shale. Lateral containment is provided by an inward hydraulic gradient from current production and by a sand pinch-out to lower permeability siltstone and shale at the northern, southern, and western proposed exemption boundaries. A sealing fault provides horizontal confinement along the eastern proposed exemption boundary.

### **Conditions on Injection Projects**

Approval of Class II UIC projects involves a joint review by DOGGR and Water Boards staff. DOGGR and Water Boards staff will consider incorporating conditions into approvals of Class II injection projects. Potential conditions include, but are not limited to, the following:

1. Monitoring to demonstrate an inward hydraulic gradient in the exempted areas; and
2. Groundwater monitoring to demonstrate that injected fluids remain in the exempted areas (e.g., sentinel well monitoring). If a monitoring requirement is incorporated in a UIC project approval, the operator must submit a work 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](mailto:john.borkovich@waterboards.ca.gov).

Sincerely,



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Chief Deputy Director

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