
State Water Resources Control Board

January 31, 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
ken.harris@conservation.ca.gov

FINAL CONCURRENCE ON THE PHASE 1 AQUIFER EXEMPTION PROPOSAL, LOWER TULARE FORMATION BELOW THE AMNICOLA CLAYSTONE, ELK HILLS 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 Phase 1 aquifer exemption proposal provided on June 16, 2016 by the Division of Oil, Gas and Geothermal Resources (DOGGR) for the Tulare Formation in the Elk Hills Oil Field (Enclosure A). 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. Based on this review, State Water Board staff only concur with the exemption proposal for the Lower Tulare Formation, below the Amnicola Claystone (concurrence area). In conjunction with the evaluation of current and future Class II underground injection control (UIC) projects in the concurrence area, DOGGR and Water Boards staff will consider incorporating conditions, as described below, into UIC project approvals.

Public Comment Process

On June 13, 2017, State Water Board staff preliminarily concurred with the exemption proposal pending the State's public comment process. On September 11, 2017, 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 October 24, 2017. The comment period closed on October 24, 2017. DOGGR and State Water Board staff have reviewed and responded in writing to the comments received during the comment period and public hearing.

State and Federal Exemption Criteria

As required by PRC § 3131(a)(1) and 40 CFR § 146.4(a), the concurrence area does not currently serve as a source of drinking water. Consistent with 40 CFR §146.4(c), the concurrence area contains groundwater with concentrations of total dissolved solids (TDS) between 3,000 and 10,000 milligrams per liter (mg/L), and is not reasonably expected to supply a public water system due to the poor quality of the water in the concurrence area (7,168 to 20,000 mg/L TDS, as provided in the proposal). 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 concurrence area is not expected to be put to beneficial use (for the reason described above), and (2) the injected fluids are expected to remain in the concurrence area.

The requirement of PRC § 3131(a)(3) is also satisfied because a detailed technical review has demonstrated that the injected fluids are expected to remain in the concurrence area due to a combination of geologic conditions and operational controls. Vertical containment is provided by the overlying Amnicola Claystone, which contains approximately 75 to 100 feet of lower permeability claystone, and the underlying San Joaquin Formation, which consists of lower permeability shales and siltstones. Lateral containment is achieved through operational controls limiting the migration of injected fluids to the concurrence area.

Water source wells used for oil production were identified within the concurrence area, but have been inactive for years. Other inactive water supply wells were identified within a mile of the concurrence area; however, these wells were completed in shallower formations and they have approximately 1,300 to 1,800 feet of vertical separation from the bottom of the wells to the top of the Amnicola Claystone.

The proposal also seeks exemption of the Tulare B zone of the Tulare Formation (between the deeper Amnicola Claystone and the shallower Tulare or Basal Alluvial Clay). The Tulare B zone in the proposed exempted area contains groundwater with TDS concentrations between 4,485 and 8,720 mg/L (as provided in the proposal) and has no oil production. The Tulare B zone is relatively shallow and a portion of the zone contains first encountered groundwater. The geologic structure in the western portion of the proposed exempted area exposes the Tulare B zone at the ground surface. Injection of produced water from deeper geologic formations, which contain significantly higher concentrations of TDS (e.g. 27,000 mg/L TDS in the Stevens zone) into the Tulare B zone may negatively impact groundwater that may reasonably be used for a beneficial use. By permitting injection of produced water in the Tulare B zone, future groundwater users would first encounter water that may be either unusable or significantly more costly to treat.

State Water Board staff do not concur with the exemption proposal for the Tulare B zone because the information provided to date does not demonstrate that the requirement of PRC § 3131(a)(2) is satisfied (that the injection of fluids will not affect the quality of water that is, or may reasonably be, used for any beneficial use). Staff also have concerns about the reliability of the groundwater flow model presented in the proposal to demonstrate that the requirement of PRC § 3131(a)(3) is satisfied (that the injected fluid will remain in the portion of the aquifer that would be exempted). Additional details regarding the analysis of the proposal to exempt the Tulare B zone in the Phase 1 area are available in Enclosure B. State Water Board staff would reconsider the proposal to exempt the Tulare B zone if future additional empirical information demonstrates that the requirements of PRC § 3131(a)(2-3) are met.

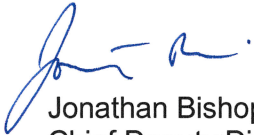
Conditions on Injection Projects

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

- 1) Requiring that injection occur at a minimum distance from the concurrence area boundary to ensure containment; and
- 2) Requiring monitoring to validate that the injected fluids remain in the concurrence area.

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

cc: Pamela Creedon
Executive Officer
Central Valley Regional Water Quality Control Board
pamela.creedon@waterboards.ca.gov

Bill Bartling
Deputy, Inland District
Department of Conservation
Division of Oil, Gas & Geothermal Resources
bill.bartling@conservation.ca.gov

Enclosure A

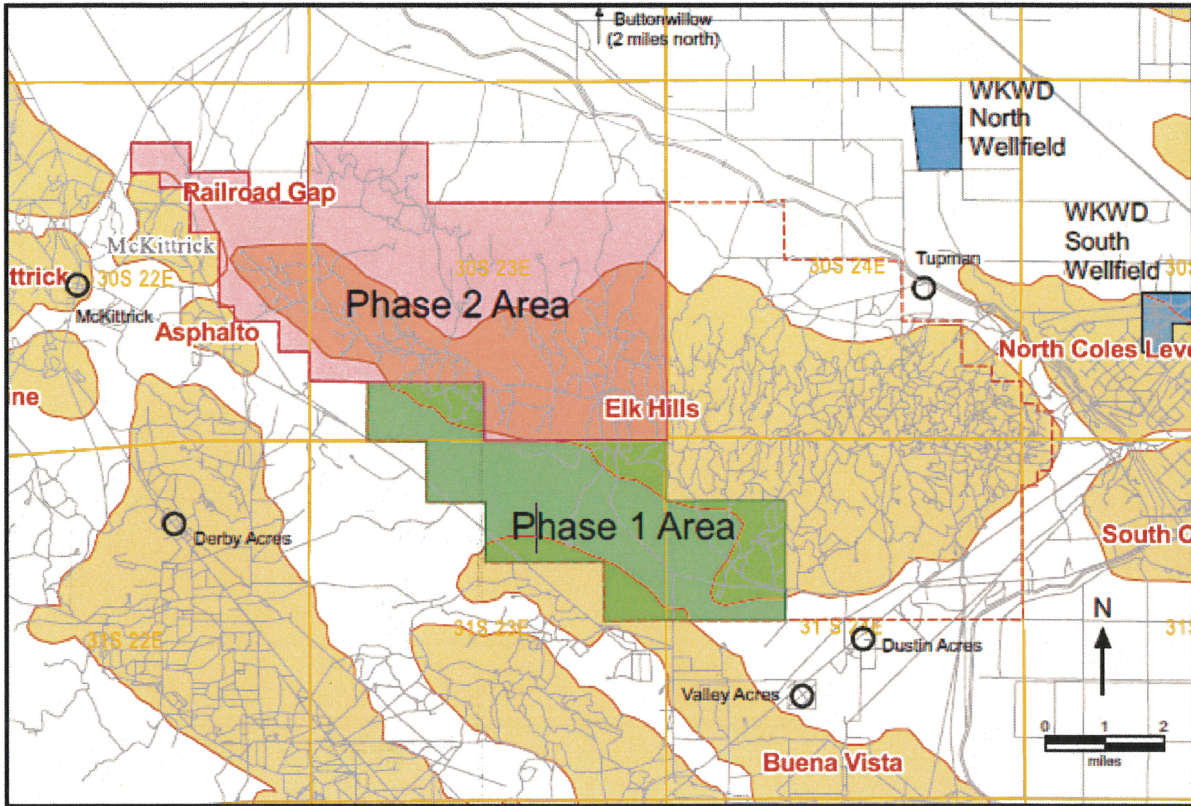


Figure 2. Area map of the Elk Hills Administrative Boundary showing the Phase 1 and Phase 2 aquifer exemption areas.


Tulare Formation Aquifer Exemption Application, Elk Hills Field

Source: *Elk Hills Oil Field, Phase 1 Area, Tulare Formation Aquifer Exemption Application, June 16, 2016*

Enclosure B

State Water Resources Control Board

TO: Jonathan Bishop
Chief Deputy Director
State Water Resources Control Board

FROM: John Borkovich 
Groundwater Monitoring Section Chief
Division of Water Quality

DATE: June 13, 2017

**SUBJECT: PHASE 1 AND PHASE 2 AQUIFER EXEMPTION PROPOSALS FOR THE
TULARE B ZONE OF THE ELK HILLS OIL FIELD**

This memorandum documents the rationale for staff's recommendation that the State Water Resources Control Board (State Water Board) not concur with proposals to exempt portions of the Tulare B zone of the Tulare Formation (between the Amnicola Claystone and the Tulare or Basal Alluvial Clay) at the Elk Hills Oil Field in Kern County.

1. Background

On June 16, 2016 and August 23, 2016, the Division of Oil, Gas, and Geothermal Resources (DOGGR) submitted the Phase 1 and Phase 2 aquifer exemption proposals, respectively, for the Elk Hills Oil Field to State Water Board staff. These proposals call for exempting portions of the Tulare B and the Lower Tulare zones to enable permitting of Class II injection under the federal Safe Drinking Water Act (SDWA). California Resources Corporation (CRC), the operator of the Elk Hills Oil Field, is seeking the exemptions in order to facilitate the permitting of disposal of produced water extracted from deeper geologic formations. CRC does not produce oil from the Tulare Formation at the Elk Hills Oil Field.

On February 17, 2017, State Water Board staff issued a letter preliminarily concurring with the Phase 1 exemption proposal for the Lower Tulare zone, but not the Tulare B zone. Representatives from DOGGR, the State Water Board, the Central Valley Regional Water Quality Control Board, (Central Valley Regional Board), the US Environmental Protection Agency (US EPA), CRC, and the Western States Petroleum Association (WSPA) met at the DOGGR District office in Bakersfield on March 23, 2017. CRC and WSPA representatives expressed concerns about the basis of the State Water Board preliminary determination that the Phase 1 aquifer exemption proposal for the Tulare B zone did not meet the requirements of Public Resources Code (PRC) § 3131. Specifically, they posed questions about staff's preliminary determinations that groundwater in the Tulare B zone of the Phase 1 area may reasonably be used for a beneficial use and that injection of fluids in the zone would negatively affect the quality of that groundwater.

FELICIA MARCUS, CHAIR | THOMAS HOWARD, EXECUTIVE DIRECTOR

2. Regulatory Framework

PRC § 3131 sets out the role of the State Water Board in the review of aquifer exemption proposals:

(a) To ensure the appropriateness of a proposal by the state for an exempted aquifer determination subject to any conditions on the subsequent injection of fluids, and prior to proposing to the United States Environmental Protection Agency that it exempt an aquifer or portion of an aquifer pursuant to Section 144.7 of Title 40 of the Code of Federal Regulations, the division shall consult with the appropriate regional water quality control board and the state board concerning the conformity of the proposal with all of the following:

(1) Criteria set forth in Section 146.4 of Title 40 of the Code of Federal Regulations.

(2) The injection of fluids will not affect the quality of water that is, or may reasonably be, used for any beneficial use.

(3) The injected fluid will remain in the aquifer or portion of the aquifer that would be exempted.

(b) Based on the consultation pursuant to subdivision (a), if the division and the state board concur that an aquifer or portion of an aquifer may merit consideration for exemption by the United States Environmental Protection Agency, they shall provide a public comment period and, with a minimum of 30 days public notice, jointly conduct a public hearing.

(c) Following review of the public comments, and only if the division and state board concur that the exemption proposal merits consideration for exemption, the division shall submit the aquifer exemption proposal to the United States Environmental Protection Agency.

Section 146.4 of Title 40 of the Code of Federal Regulations (CFR) provides, in relevant part:

An aquifer or a portion thereof which meets the criteria for an "underground source of drinking water" in §146.3 may be determined under §144.7 of this chapter to be an "exempted aquifer" for Class I-V wells if it meets the criteria in paragraphs (a) through (c) of this section.

(a) It does not currently serve as a source of drinking water; and

(b) It cannot now and will not in the future serve as a source of drinking water because:

(1) It is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible.

(2) It is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical;

(3) It is so contaminated that it would be economically or technologically impractical to render that water fit for human consumption; or

(4) It is located over a Class III well mining area subject to subsidence or catastrophic collapse; or

(c) The total dissolved solids content of the ground water is more than 3,000 and less than 10,000 mg/L and it is not reasonably expected to supply a public water system.

Given the respective administrative roles and substantive expertise of the entities involved in the aquifer exemption review process, the State Water Board and regional water quality control boards are uniquely positioned to evaluate the requirement of PRC § 3131(a)(2), that the "injection of fluids will not affect the quality of water that is, or may reasonably be, used for any beneficial use." State Water Board staff assessed the exemption proposals under the full range of criteria set out in PRC § 3131 and 40 CFR § 146.4.

3. Analysis of the Tulare B Zone Aquifer Exemption Proposals

Analysis under PRC § 3131(a)(2)

PRC § 3131(a)(2) requires aquifer exemption proposals to conform with the requirement that, "The injection of fluids will not affect the quality of water that is, or may reasonably be, used for any beneficial use." The injection of fluids (produced water) is expected to negatively affect the quality of the groundwater in the Tulare B zone. CRC asserts, however, that the groundwater contained in the Tulare B zone in and around the areas proposed for exemption will not reasonably be used for any beneficial use. This assertion is based on information submitted by CRC. As explained below, staff's judgment is that the submitted information is not sufficient to support CRC's assertion.

CRC's Assessment of Beneficial Use

CRC presented the following information in its Phase 1 and Phase 2 aquifer exemption applications:

- "Tulare groundwater in the Elk Hills south flank area has: 1) a concentration of lead that exceeds the primary MCL for drinking water; 2) TDS, chloride, and sulfate concentrations in excess of secondary drinking water MCLs in every groundwater analysis; 3) boron, strontium, and sodium concentrations in excess of regulatory thresholds for human health, agricultural uses, and/or livestock watering; and 4) iron concentrations that are variable but exceed the secondary drinking water MCL in some analyses." (Phase 1 Tulare Formation Aquifer Exemption Application, 4-11; Phase 2 Tulare Formation Aquifer Exemption Application, 4-12.)
- "The West Kern Water District ... has provided the DOGGR with a letter stating that the Tulare Formation within the Elk Hills aquifer exemption area does not currently serve as a source of drinking water and would not reasonably be expected to supply a public

water system.” (Phase 1 Tulare Formation Aquifer Exemption Application, 4-15; Phase 2 Tulare Formation Aquifer Exemption Application, 4-16.)

- In a study conducted on behalf of a power company seeking to designate “groundwater” (without reference to the geologic formation or zone at issue) in the McKittrick Oil Field as “Class III water, defined as groundwater not a source of drinking water” in order to facilitate waste disposal, a consultant found that “treating this groundwater would cost about 12 to 70 times the current potable water treatment cost per household.” (Phase 1 Tulare Formation Aquifer Exemption Application, 4-17; Phase 2 Tulare Formation Aquifer Exemption Application, 4-20.) A more recent study undertaken by a consultant to CRC found, based on the McKittrick Oil Field study, that “the economics of the earlier study were relatively comparable and that the cost to treat Tulare groundwater in the Elk Hills Oil Field for use as drinking water would still be economically infeasible.” (Phase 1 Tulare Formation Aquifer Exemption Application, 4-18; Phase 2 Tulare Formation Aquifer Exemption Application, 4-21.)

State Water Board Assessment of Beneficial Use

Tulare B Zone Water Quality

Water Boards staff disagree that the groundwater contained in the Tulare B zone in and around the areas proposed for exemption may not reasonably be used for a beneficial use. The most likely future beneficial uses of the groundwater at issue are for municipal and domestic supply and agricultural water supply (irrigation and stock watering). CRC asserts in its application, based on limited water quality data, that the groundwater in the area at issue contains between 4,485 and 8,720 milligrams per liter (mg/L) total dissolved solids (TDS). (DOGGR August 9, 2016 Submittal, Table 7A.) CRC also presented analytical data indicating that some constituents exceed secondary maximum contaminant levels or health advisory levels for human consumption. (DOGGR August 9, 2016 Submittal, Table 8A.)

The groundwater in the Tulare B zone in the areas adjacent to existing and historic produced water disposal sites may contain lower concentrations of TDS and other noted constituents than represented in the water quality data provided because (1) the water quality analytical data presented is from well samples collected in close proximity to produced water disposal sites following the initiation of disposal, and (2) a number of the wells sampled are screened across both the Tulare B zone and the Lower Tulare, which contains poorer quality (higher TDS or salinity) groundwater than the Tulare B zone.

CRC acknowledges that higher salinity produced water has replaced lower salinity groundwater in the vicinity where the samples were collected. “An additional low pressure region in the Upper Tulare was created by a group of water source wells that were active from the mid 1980’s to early 2000’s. During this time, higher salinity produced water replaced lower salinity Tulare water that was withdrawn by the source wells.” (Phase 1 Tulare Formation Aquifer Exemption Application, 2-2.) CRC notes that the produced water injected in the Tulare B zone contains high concentrations of TDS and other constituents, “Water produced in association with oil and gas production is derived primarily from the Shallow Oil Zone and the Stevens sand. Where sampled at the injection sites, TDS averages 28,000 mg/L TDS at UIC Permit No. 22800002 in the Phase 1 area [and 27,000 mg/L at UIC Permit No. 22800022 in the Phase 2 area]. Concentrations of TDS, chloride, and iron in the injectate significantly exceed the secondary MCLs for drinking water, and boron exceeds regulatory thresholds for human health, agricultural

uses, and livestock watering, shown in red in Table 11.” (Phase 1 Tulare Formation Aquifer Exemption Application, 4-12.) These data suggest that the water quality data presented by CRC for the Tulare B zone may overstate TDS and other constituent levels in the zone.

Table 7A in DOGGR’s August 9, 2016 submittal is the source of the 4,485 to 8,720 mg/L TDS range. Five of six of the samples referenced were taken in 1993, over ten years after the initiation of underground disposal of produced water in the same area of the oil field. The sixth and highest TDS result came from a sample collected in 1988. However, it is notable that CRC indicated that this sample was taken from a well screened across both the Tulare B zone and Lower Tulare. This is significant because the Lower Tulare contains groundwater with TDS concentrations greater than those in the Tulare B zone, so it is reasonable to conclude that the TDS level is higher due to blending with Lower Tulare water. Therefore, a more representative TDS range would exclude these data, resulting in concentrations of 4,485 to 6,142 mg/L TDS that would be more representative.¹ The same logic applies to other constituents noted in CRC’s submittal. Based on our review of the submitted information, the sample data presented may not be representative of water quality in the Tulare B zone because it has likely been blended with groundwater and/or produced water from deeper geologic zones containing concentrations of TDS and other constituents in excess of groundwater in the Tulare B zone.

Beneficial Use of Groundwater in the Tulare B Zone

The groundwater in the Tulare B zone in the area at issue may reasonably be used for a beneficial use for a number of reasons. With average annual rainfall between six and seven inches, the Elk Hills Oil Field is located in an arid climate zone. Accordingly, there is limited surface water supply in the area; water users in the area depend predominantly on available groundwater and deliveries from the State Water Project via the California Aqueduct (State Water Project water is limited, fully allocated by contract, and subject to diminution during dry years or service outages). It is reasonable to expect that future land users would seek water supplies from groundwater from shallow geologic formations because installing wells and extracting groundwater from shallower formations is less costly than pulling water from deeper formations. The Tulare B zone is relatively shallow in the area (0 - 1,300 feet below ground surface), is the first encountered groundwater zone in portions of the area, and may contain higher quality groundwater than the Tulare A zone (above the Tulare or Basal Alluvial Clay).²

¹ An independent review by staff indicates that a more accurate range may be 4,230-4,680 mg/L TDS, which is a result of excluding analytical data from other sampling wells that appear to be screened across the Tulare B zone and Lower Tulare as well as outlier results from the remaining well screened exclusively in the Tulare B zone.

² “Resistivities of water-saturated clean sands (R_o) provide qualitative indications of formation water quality. A compilation of R_o values within the alluvium and Tulare Formation is presented for Union Oil wells 1B-20G (figure 10) and 71-20G (figure 11). R_o trends are similar for both wells, and suggest relatively poor water quality above the Tulare clay. Water quality immediately below the Tulare clay improves drastically, but decreases with depth. Below the Amnicola clay, water quality decreases significantly.” (Geology and Geohydrology of the Tulare Formation, 7G/18G Produced Water Disposal Area, South Flank NPR-1, United States Department of Energy Naval Petroleum Reserves in California, 18 (Milliken, 1992).

While the population of the immediate vicinity is currently limited, population growth in the area has been significant. According to the U.S. Census Bureau, the population of the closest town, Taft, has more than doubled in the past 50 years. Over the same time period, Bakersfield's population has increased by a factor of five. Like many areas in California, increased population has expanded the footprint of human development in the form of residential and commercial areas. When oil production at the Elk Hills Oil Field ceases, which it is expected in the next 50 to 100 years, the area may be utilized and/or developed for other uses, such as residences, commercial ventures, agriculture, and grazing.³

As population and the scope of development expand, the demand for water will grow. As noted above, future land users may reasonably use water contained in the Tulare B zone. State Water Board staff disagrees with the conclusion that this groundwater will not be used due to the cost of the water in comparison to other supply. Recurring drought, sustained increased demand for water, insufficient supply, usage restrictions, and curtailed allocations are common conditions in California, especially in this arid region. Future users may not be able to access water supplies from the current sources (e.g., the State Water Project or the West Kern Water District). Even if sufficient supply were available, it is common practice for land users (e.g., home owners, irrigators, and grazers) to use groundwater to augment their water supply and employ systems to treat the water.

While the groundwater in the Tulare B zone may require treatment or blending prior to use, it is reasonable to expect land users will take these steps given current and potential future conditions. Water with concentrations of TDS between 4,485 and 6,142 mg/L and elevated levels of constituents, such as boron, chloride, and sulfate, could be blended with fresher water to use for irrigation or stock watering. In fact, some crops can tolerate water with TDS concentrations in excess of 5,000 mg/L. As noted, CRC presented limited analytical data on the water quality of the Tulare B zone, and it is possible that salinity and other constituent levels in portions of the zone in the areas at issue could be lower. If this is the case, less imported water would be required for blending, and some of the water could potentially be applied directly to crops.

In addition, water treatment technology exists for treating water with similar or even significantly higher concentrations of salts than the Tulare B zone. By CRC's estimates, it would cost 12 to 70 times the current potable water treatment cost to treat the water in the Tulare B zone to drinking water standards. Notably, this estimate is based on a study from a neighboring oil field, with a potentially poorer water quality profile. Moreover, the cited study makes no reference to the specific geologic formation or zone of focus, but simply refers to "groundwater."⁴ While a

³ CRC has presented evidence that portions of the surface area of the Elk Hills Oil Field are subject to a conservation easement. However, the majority of the field is not subject to the easement, including portions of heightened concern where the Tulare B is exposed at ground surface. Conservation easements are subject to modification and the State Water Board is concerned with protecting the quality of water of beneficial use over a period of time that could foreseeably exceed the term of the relevant conservation easements.

⁴ Based on industry usage, "groundwater" likely refers to the shallowest source of groundwater. In the McKittrick Oil Field, this may be the Tulare A zone. As noted above, the groundwater in the Tulare A zone may be of poorer quality than the Tulare B zone. As such, the cost of treatment of Tulare B zone groundwater could be lower than Tulare A zone groundwater, and CRC may overestimate treatment costs.

given individual land user may not possess the resources to treat the water, a collection of users or water district may apply treatment technology to make use of the groundwater in the Tulare B zone. Furthermore, treatment technology is continually improving and it is reasonable to expect that the difference between the local market price of water and the cost of treatment will shrink over time. Of course, the complete absence of available water could lead future users to accept substantially higher costs for water treatment.

For the foregoing reasons, State Water Board staff concludes that the groundwater in the Tulare B zone in and around the areas at issue may reasonably be used for beneficial use in the future.

Analysis under PRC § 3131(a)(3)

PRC § 3131(a)(3) requires aquifer exemption proposals to conform with the requirement that, "The injected fluid will remain in the aquifer or portion of the aquifer that would be exempted." CRC presented results from a groundwater flow model to demonstrate that the injectate will remain in the proposed exempted areas. However, CRC did not provide sufficient information to allow Water Boards staff to fully evaluate the model's assumptions, conclusions, and limitations. In addition, CRC's model was developed with limited empirical data and makes assumptions about hydrologic conditions and future use that are inconsistent with Water Boards staff views. For example, CRC's application indicates that the injectate will migrate from the injection zone to areas of lower pressure located up dip. While a portion of the injectate may migrate up dip, it would also be expected to migrate down dip and down plunge based on the relative densities of the formation water and the injectate. The density of water is correlated with the concentration of total dissolved solids; water containing relatively greater concentrations of total dissolved solids possesses a higher density. CRC's injectate contains significantly higher concentrations of total dissolved solids than the formation water. As a result of the difference in densities, and regardless of continued injection, the fluids injected into the Tulare B zone will migrate down dip and down plunge, and may escape the proposed exempted areas.

Based on the available information, Water Boards staff has significant concerns about the reliability of the model's conclusions. CRC has not demonstrated that the injected fluid will remain in the proposed exempted areas. Given the number of uncertainties regarding containment of the injection fluids CRC would, at a minimum, need to substantiate its model with multiple points of verifiable empirical data demonstrating the Tulare B zone aquifer exemption proposals meet the requirement of PRC § 3131(a)(3).

4. Staff Recommendation

Staff has reviewed CRC's application to exempt portions of the Tulare B zone in the Phase 1 and Phase 2 areas. CRC has asserted that groundwater in the Tulare B zone will not be put to beneficial use. After reviewing the proposal, staff concludes that this water may reasonably be used for beneficial use in the future and that the requirement of PRC § 3131(a)(2) is not satisfied because injection of poorer quality water from deeper geologic formations from which CRC produces oil will negatively impact this groundwater. Staff finds that:

- Groundwater in portions of the Tulare B zone may be of higher quality than what was reported by CRC;

- Future land development in and around the oil field should be expected following the decommissioning of the field;
- Due to the scarcity of water in an arid region, future land users may reasonably be expected to seek groundwater from the Tulare B zone because it is relatively shallow;
- Water from the Tulare B zone may reasonably be used in the future for certain purposes without treatment or with blending or treatment; and
- Future land users may reasonably be expected to treat the water from the Tulare B zone.

While staff has not fully evaluated CRC's containment arguments under PRC § 3131(a)(3), preliminary review of the data has raised significant concerns regarding the reliability of CRC's conclusions. It is the recommendation of staff that the State Water Board not concur with the aquifer exemption proposals for the Tulare B zone in the Phase 1 and Phase 2 areas.

Please let me know if you have any questions regarding this matter.