DEPARTMENT OF CONSERVATION
Managing California's Working Lands
DIVISION OF OIL, GAS, & GEOTHERMAL RESOURCES

CALIFORNIA Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

July 31, 2015

Mr. Michael Montgomery
United State Environmental Protection Agency – Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Re: July 31, 2015 Submittal of Review Information for Category 2 Wells

Dear Mr. Montgomery:

The Division of Oil, Gas, and Gas and Geothermal Resources (Division) and the State Water Resources Control Board (State Water Board) have concluded their initial review of the Category 2 wells as identified in the compliance schedule outlined in our February 6, 2015 letter to Jane Diamond. For reference, the Category 2 wells are those Class II enhanced oil recovery wells permitted to inject into non-exempt aquifers. The State identified 5,625 wells that fit these criteria, and created two subgroups: (1) wells associated with an Underground Injection Control (UIC) project (2,021 wells) (Attachment 1), and (2) wells not associated with a UIC project (3,604 wells) (Attachment 2).

As you know, the State has employed a risk-based approach to reviewing these wells to help assure early determination of potential risks to groundwater with a current beneficial use. As described below, the overwhelming majority of the wells at issue appear to present a low risk.

The vast majority of the injection wells under consideration (5,475 of 5,625 wells total) are associated with thermal-enhanced oil recovery operations (steam flood and cyclic steam wells). In the process of creating steam for use in enhanced oil recovery, water is first treated to greatly reduce total dissolved solids (TDS), and other dissolved components. Steam is injected into a hydrocarbon reservoir to reduce in-place oil viscosity. Because the water used has been pretreated before injection into the oil-bearing reservoir, the threat to any underground source of drinking water (USDW) is greatly reduced.

Both steam flood and cyclic steam operations employ much smaller volumes of water than water flooding and waste disposal. Therefore, the zone of endangering influence is very small for thermal operations. Moreover, cyclic steam wells use an even smaller quantity of water than steam flood wells. In our analysis, 4,780 of the 5,475 thermal wells are cyclic steam wells. For these reasons, the State has determined that no further analysis of thermal wells is required at this time. The State

may review these wells at a later date if they are within an aquifer for which an exemption is requested.

The State has conducted further review to evaluate potential impacts to groundwater of current beneficial use for the remaining 150 non-thermal wells. Of these 150 wells, 126 are no longer classified as injection wells and are not injecting fluids, and thus do not warrant additional action at this time. The remaining 24 are capable of injecting fluids. These 24 non-thermal injection wells consist of 19 water flood wells, four waste disposal wells, and one pressure maintenance well.

The State has conducted a comprehensive review of available data for water supply wells in the vicinity of these 24 non-thermal wells and is considering issuing orders to well operators under Water Code section 13267 requiring the collection of additional information. The criteria used to assess whether these 24 wells pose a potential risk to groundwater with a current beneficial use are whether the injection zone water quality is less than 10,000 milligrams per liter TDS and whether the well (1) has an injection depth of less than 1,500 feet below ground surface, or (2) is within 500 vertical feet and one mile horizontally of the screened portion of an identified water supply well.

Based on data collected by the operator as a result of these orders, we will determine if there is a potential risk to groundwater with a current beneficial use, and will take appropriate action to address these risks.

Please find attached spreadsheets identifying the wells at issue. If you have any questions, please contact us.

Sincerely,

Steve Bohlen
State Oil and Gas Supervisor
Division of Oil, Gas and Geothermal Resources

Sincerely,

Jonathan Bishop
Chief Deputy Director
State Water Resources Control Board

Attachments

cc: Cliff Rechtschaffen, Senior Advisor, Governor's Office
John Laird, Secretary, California Natural Resources Agency
Matthew Rodriquez, Secretary, California Environmental Protection Agency
David Bunn, Director, California Department of Conservation