
Central Valley Regional Water Quality Control Board

17 February 2021

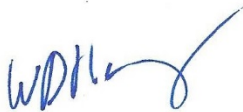
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INITIAL REVIEW OF CHEVRON NON-EXPANSION STEAMFLOOD INJECTION PROJECT 34000013, PHASE VED 771, KERN RIVER FORMATION, KERN RIVER OIL FIELD, KERN COUNTY

On 3 February 2021, the California Geologic Energy Management Division (CalGEM) provided the Central Valley Regional Water Quality Control Board staff (Staff) a non-expansion permit package from Chevron U.S.A. Inc., proposing to add five non-expansion steamflood injection wells and two cyclic steam injection wells to an existing underground injection control project, CalGEM Project Number 34000013, in the Kern River Oil Field.

Staff conducted its initial review of the non-expansion permit package and has questions and concerns that are described in the enclosed staff memorandum.

If you have any questions, please contact Alex Olsen at (559) 445-6076 or at alex.olsen@waterboards.ca.gov.




W. DALE HARVEY
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Enclosure: Staff Memorandum

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Central Valley Regional Water Quality Control Board

TO: Alex Olsen 
Senior Engineering Geologist
PG No. 8932

FROM: Robert J. Nelson
Water Resource Control Engineer

DATE: 17 February 2021

SUBJECT: INITIAL REVIEW OF CHEVRON NON-EXPANSION STEAMFLOOD INJECTION PROJECT 34000013, PHASE VED 771, KERN RIVER FORMATION, KERN RIVER OIL FIELD, KERN COUNTY

On 3 February 2021, Central Valley Regional Water Quality Control Board (Central Valley Water Board) received from the California Geologic Energy Management Division (CalGEM) a non-expansion permit package which included; an application (Application) submitted by Chevron U.S.A. Inc. (Operator); a CalGEM project data requirements checklist (Checklist); and a CalGEM memorandum for an Underground Injection Control (UIC) non-expansion project (Non-Expansion Project) within the Kern River Oil Field. The CalGEM memorandum states the Operator proposes to add five non-expansion steamflood injection wells and two cyclic steam injection wells to its current project injecting into the Kern River Formation. The Non-Expansion Project is in section 9 of township 29 south, range 28 east, Mount Diablo Base and Meridian (Project Area).

A 1982 Memorandum of Agreement (MOA) between CalGEM and the United States Environmental Protection Agency (US EPA) granted CalGEM primacy to administer the UIC program for Class II wells. A 2018 revised MOA between the State Water Resources Control Board (State Water Board) and CalGEM provides that CalGEM and the Water Boards (State Water Board and Regional Water Quality Control Boards) shall consult one another to ensure the protection of water quality.

CalGEM and the Water Boards are currently preparing a review process for non-expansion projects that may be shorter than the full review process for projects identified in the 2018 Revised MOA between CalGEM and the Water Boards. Although the non-expansion project review process has not been approved by CalGEM and the Water Boards, Central Valley Water Board staff (Staff) has conducted its initial review of the documents provided by CalGEM. Staff identified concerns and questions related to the Non-Expansion Project's potential to adversely impact water quality as presented below:

Initial Review Concerns and Questions – For the Operator

1. Page 5 in the Application states the current injection rate is 145,400 barrels of steam per day into 440 steam injectors. Staff observed that this cumulative injection rate and total number of injection wells has been included in application reports provided to Staff since the first non-expansion project received on 11 February 2019 (Phase VED 753). Staff request that an updated cumulative injection rate and the total number of injection wells for the Kern River Oil Field be provided. For future non-expansion project applications, an accurate current representation of these numbers needs to be provided.
2. Staff have the following comments and questions regarding Attachment 7 – *Heat Monitoring Plan* (Attachment 7) in the permit package:
 - A. Table 2 – “Fail” Well Monitoring Proposal (Table 2) in Attachment 7 lists the problem wells requiring monitoring and the offset temperature observation (T.O.) wells that will be used to conduct annual temperature surveys. Using the well coordinates from CalGEM’s WellSTAR database, T.O. well with American Petroleum Institute (API) 03039669 and T.O. well CR 1TO (API 03035760) are approximately 750 feet and 290 feet from problem wells Thomas 18 (API 02957322) and Crestmont 8 (API 02942114). These T.O. wells are located outside of the area of review (AOR) as shown in Figure 3 – *Map of TOW Monitoring Wells* (Figure 3) in Attachment 7. Figure 3 shows proposed injection wells to be closer to the problem wells than the monitoring wells are. Staff have the following questions:
 - 1) Why was the T.O. well with API 03039669 and T.O. well CR 1TO chosen for monitoring instead of T.O. wells closer to the problem wells? If closer T.O. wells are not currently available, then why is the installation of new T.O. wells not being proposed? Further explanation is needed.
 - 2) How will it be determined that fluids are not migrating vertically out of the injection zone through the problem wells if the T.O. wells are outside of the AOR and injection is occurring closer to the problem wells? CalGEM’s WellFinder database shows existing cyclic steam and steamflood injection wells near the T.O. well with API 03039669 and T.O. well CR 1TO. How will the temperature observations from the T.O. well with API 03039669 and T.O. well CR 1TO be differentiated from nearby injections? More information is needed.
 - B. Staff request a revised heat monitoring plan (Attachment 7) that resolves the following discrepancies:
 - 1) Attachment 7 states (PDF 171 in permit package) CalGEM’s review initially identified nine problem wells and that the Operator plans to abandon one active well, re-abandon two previously abandoned wells, and monitor the remaining six problem wells. However, Table 1: *CalGEM “fail” wells &*

Chevron Proposal lists only seven problem wells. The revised monitoring plan needs to identify all wells that require abandonment and monitoring.

- 2) Attachment 7 states (PDF 173 in permit package) that there are six problem wells shown in Table 2 that require monitoring. Additionally, Figure 3 in Attachment 7 shows six wells that require monitoring. However, only four wells that require monitoring are listed in Table 2. The narrative, tables, and figures in the revised heat monitoring plan should match with respect to the problem wells requiring abandonment and/or monitoring.
 - 3) Based on well coordinates from CalGEM's WellSTAR database, the distance between the T.O. wells that will be used to monitor problem wells Thomas 18 and Crestmont 8 is not 111 feet and 147 feet, but is more near 750 feet and 290 feet, respectively. The distances in Table 2 need to be re-verified.
 - 4) Table 2 appears to have the incorrect well name (TH 1TO) for T.O. well with API 03039669. The T.O. well names with their associated API's in Table 2 need to be re-verified.
3. Figure FA (5.3) *Steamchest Temperature (°F)* (page 29) in the Application shows the average temperature in the R sand. A red lined polygon is shown on the map but does not have the same shape as the AOR on other figures in the Application. Where is the area represented by the red lined polygon in relation to the Project Area? Also, the figure shows white boxes labeled with the maximum temperature. What T.O. wells (i.e., name, API) were used to collect this data? When was this data collected? When did the maximum temperature occur? A narrative on the purpose of the figure needs to be provided.

Initial Review Concerns and Questions – For CalGEM

Attachment 7 states that the Operator will run temperature logs annually in the offset T.O. wells and will upload the test results to CalGEM's WellSTAR database for review and approval. Staff is concerned with potential surface expressions occurring and fluids migrating to the Kern River and/or the nearby canal. The surface hole locations for problem wells Thomas 18 and Crestmont 3 are approximately 290 feet northwest and 325 feet west of the canal, respectively. Staff request that the non-expansion approval letter require the Operator to provide a report annually to CalGEM and the Water Boards that evaluates the data collected to ensure that no fluids are migrating out of the injection zone. Staff request that the report tabulate the data collected and list the data chronologically over the life of the project. The report and evaluation need to be prepared by an appropriate registered professional. Staff also request that the draft non-expansion approval letter be provided for Staff's review.

Responses to this initial review should be clearly labeled so Staff can identify that an individual response is from CalGEM or the Operator. A certification statement needs to

be provided for any response subject to the requirements of Business and Professions Code sections 6735, 7835, and 7835.1.