



DEPARTMENT OF CONSERVATION

DIVISION OF OIL, GAS AND GEOTHERMAL RESOURCES

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September 11, 2008

Mr. John McKenzie, Project Manager
San Luis Obispo County
Department of Planning & Building
County Government Center
San Luis Obispo, CA 93408



Re: Huasna Oil Field – Excelaron LLC Project on Mankins Ranch

Dear Mr. McKenzie:

The following comments by this Division pertain to the project modifications germane to oil field development within the Huasna oil field:

The Division of Oil, Gas, and Geothermal Resources (DOGGR) was granted primacy for Class II injection wells in 1983 from the United States Environmental Protection Agency (EPA). Approval of any injection of Class II fluids must be obtained from DOGGR before any subsurface injection or disposal project can begin. This includes all EPA Class II wells and air- and gas-injection wells. The operator requesting approval for such a project must provide the appropriate DOGGR District Deputy with any data that, in the judgment of the Supervisor, are pertinent and necessary for the proper evaluation of the proposed project.

The California Code of Regulations (CCR) §1724.6 and §1724.7 describe the project data requirements and approval process. CCR §1724.10 identifies the Division's requirements for operation and testing of Class II injection wells. Special requirements for cyclic steam wells are outlined in CCR § 1724.8.

The data required to be filed with the District Deputy for an injection project application includes the following, where applicable:

(a) An engineering study, including but not limited to:

- 1) Statement of primary purpose of the project.
- 2) Reservoir characteristics of each injection zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and original and residual oil, gas, and water saturations.
- 3) Reservoir fluid data for each injection zone, such as oil gravity and viscosity, water quality, and specific gravity of gas.

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- 4) Casing diagrams, including cement plugs, and actual or calculated cement fill behind casing, of all idle, plugged and abandoned, or deeper-zone producing wells within the area affected by the project, and evidence that plugged and abandoned wells in the area will not have an adverse effect on the project or cause damage to life, health, property, or natural resources.
- 5) The planned well-drilling and plugging and abandonment program to complete the project, including a flood-pattern map showing all injection, production, and plugged and abandoned wells, and unit boundaries.

(b) A geologic study, including but not limited to:

- 1) Structural contour map drawn on a geologic marker at or near the top of each injection zone in the project area.
- 2) Isopachous map of each injection zone or subzone in the project area.
- 3) At least one geologic cross section through at least one injection well in the project area.
- 4) Representative electric log to a depth below the deepest producing zone (if not already shown on the cross section), identifying all geologic units, formations, freshwater aquifers, and oil or gas zones.

(c) An injection plan, including but not limited to:

- 1) A map showing injection facilities.
- 2) Maximum anticipated surface injection pressure (pump pressure) and daily rate of injection, by well.
- 3) Monitoring system or method to be utilized to ensure that no damage is occurring and that the injection fluid is confined to the intended zone or zones of injection.
- 4) Method of injection.
- 5) List of proposed cathodic protection measures for plant, lines, and wells, if such measures are warranted.
- 6) Treatment of water to be injected.
- 7) Source and analysis of the injection liquid.
- 8) Location and depth of each water-source well that will be used in conjunction with the project.

(d) Copies of letters of notification sent to offset operators.

(e) Other data as required for large, unusual, or hazardous projects, for unusual or complex structures, or for critical wells. Examples of such data are: isogor maps, water-oil ratio maps, isobar maps, equipment diagrams, and safety programs.

(f) All maps, diagrams and exhibits required in Section 1724.7(a) through (e) shall be clearly labeled as to scale and purpose and shall clearly identify wells, boundaries, zones, contacts, and other relevant data.

Once the project application is deemed complete, DOGGR submits a public notice to the local newspaper. In a daily paper, the notice will run for three consecutive days which then begins the 15 days public comment period. DOGGR also submits a notification letter along with a draft project approval letter to the Regional Water Quality Control Board for comment.

Once a project is approved, operators must adhere to CCR §1724.10 for the filing, notification, operating, and testing requirements for underground injection projects. Those requirements are as follows:

- (a) The appropriate DOGGR District Deputy shall be notified of any anticipated changes in a project resulting in alteration of conditions originally approved, such as: increase in size, change of injection interval, or increase in injection pressure. Such changes shall not be carried out without DOGGR approval.
- (b) Notices of intention to drill, redrill, deepen, or rework, on current DOGGR forms, shall be completed and submitted to the DOGGR for approval whenever a new well is to be drilled for use as an injection well and whenever an existing well is converted to an injection well, even if no work is required on the well.
- (c) An injection report on a current DOGGR form or in a computerized format acceptable to the DOGGR shall be filed with the DOGGR on or before the 30th day of each month, for the preceding month.
- (d) A chemical analysis of the liquid being injected shall be made and filed with the DOGGR whenever the source of injection liquid is changed, or as requested by the Supervisor.
- (e) An accurate, operating pressure gauge or pressure recording device shall be available at all times, and all injection wells shall be equipped for installation and operation of such gauge or device. A gauge or device used for injection-pressure testing, which is permanently affixed to the well or any part of the injection system, shall be calibrated at least every six months. Portable gauges shall be calibrated at least every two months. Evidence of such calibration shall be available to the DOGGR upon request.
- (f) All injection piping, valves, and facilities shall meet or exceed design standards for the maximum anticipated injection pressure, and shall be maintained in a safe and leak-free condition.
- (g) All injection wells, except steam, air, and pipeline-quality gas injection wells, shall be equipped with tubing and packer set immediately above the approved zone of injection within one year after the effective date of this act. New or recompleted injection wells shall be equipped with tubing and packer upon completion or recompletion. Exceptions may be made when there is:
 - 1) No evidence of freshwater-bearing strata.
 - 2) More than one string of casing cemented below the base of fresh water.

- 3) Other justification, as determined by the district deputy, based on documented evidence that freshwater and oil zones can be protected without the use of tubing and packer.
- (h) Data shall be maintained to show performance of the project and to establish that no damage to life, health, property, or natural resources is occurring by reason of the project. Injection shall be stopped if there is evidence of such damage, or loss of hydrocarbons, or upon written notice from the DOGGR. Project data shall be available for periodic inspection by DOGGR personnel.
 - (i) To determine the maximum allowable surface injection pressure, a step-rate test shall be conducted prior to sustained liquid injection. Test pressure shall be from hydrostatic to the pressure required to fracture the injection zone or the proposed injection pressure, whichever occurs first. Maximum allowable surface injection pressure shall be less than the fracture pressure. The appropriate district office shall be notified prior to conducting the test so that it may be witnessed by a DOGGR inspector. The district deputy may waive or modify the requirement for a step-rate test if he or she determines that surface injection pressure for a particular well will be maintained considerably below the estimated pressure required to fracture the zone of injection.
 - (j) A mechanical integrity test (MIT) must be performed on all injection wells to ensure the injected fluid is confined to the approved zone or zones. An MIT shall consist of a two-part demonstration as provided in subsections (j) (1) and (2).
 - 1) Prior to commencing injection operations, each injection well must pass a pressure test of the casing-tubing annulus to determine the absence of leaks. Thereafter, the annulus of each well must be tested at least once every five years; prior to recommencing injection operations following the repositioning or replacement of downhole equipment; or whenever requested by the appropriate DOGGR district deputy.
 - 2) When required by subsection (j) above, injection wells shall pass a second demonstration of mechanical integrity. The second test of a two-part MIT shall demonstrate that there is no fluid migration behind the casing, tubing, or packer.
 - 3) The second part of the MIT must be performed within three (3) months after injection has commenced. Thereafter, water-disposal wells shall be tested at least once each year; waterflood wells shall be tested at least once every two years; and steamflood wells shall be tested at least once every five years. Such testing for mechanical integrity shall also be performed following any significant anomalous rate or pressure change, or whenever requested by the appropriate DOGGR district deputy. The MIT schedule may be modified by the district deputy if supported by evidence documenting good cause.
 - 4) The appropriate district office shall be notified before such tests/surveys are made, as a DOGGR inspector may witness the operations. Copies of surveys and test results shall be submitted to the DOGGR within 60 days.

(k) Additional requirements or modifications of the above requirements may be necessary to fit specific circumstances and types of projects. Examples of such additional requirements or modifications are:

- 1) Injectivity tests.
- 2) Graphs of time vs. oil, water, and gas production rates, maintained for each pool in the project and available for periodic inspection by DOGGR personnel.
- 3) Graphs of time vs. tubing pressure, casing pressure, and injection rate maintained for each injection well and available for periodic inspection by DOGGR personnel.
- 4) List of all observation wells used to monitor the project, indicating what parameter each well is monitoring (i.e., pressure, temperature, etc.), submitted to the DOGGR annually.
- 5) List of all injection-withdrawal wells in a gas storage project, showing casing-integrity test methods and dates, the types of safety valves used, submitted to the DOGGR annually.
- 6) Isobaric maps of the injection zone, submitted to the DOGGR annually.
- 7) Notification of any change in water disposal methods.

With regard to Haz7, DOGGR not only requires operators under CCR §1722(b) to maintain an oil spill contingency plan, but may also require blowout prevention and control plans for certain critical or high pressure wells.

Should you have any questions or require additional assistance with regard to oilfield operations and DOGGR requirements, please do not hesitate to contact our office.

Sincerely,



Bruce Hesson
Deputy Supervisor

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