

MINUTE ITEM

This Calendar Item No. C34
No. 37
to 0 at 6-5-77
meeting.

INFORMATIVE
CALENDAR ITEM

34.

5/79
Thompson

REVIEW OF PILOT SCALE DEMONSTRATION OF
CAUSTIC WATERFLOODING TECHNIQUES
FOR ENHANCED OIL RECOVERY

The State Lands Commission, at its September 1976 meeting, approved a request by the City of Long Beach to enter into a cost-sharing contract with the United States Energy and Development Administration (ERDA) to conduct a pilot scale demonstration of caustic waterflooding techniques for enhanced oil recovery in Fault Block VII of the Long Beach Unit.

Under the terms of the contract, the City and the Federal Government agreed to share in \$11.6 million of the demonstration costs on a 60/40 basis respectively, and the parties will share similarly in any incremental oil production as established under the proposed order issued to approve this as a tertiary recovery project. As of the end of March, 18 months after the start of the project, total expenditures were \$8,159,665.

All preflush injection facilities are in place. The caustic injection portion of the plant is awaiting a final decision on the type and amount of alkaline materials to be used. Injection of softened water containing some salt was begun in the northern row of pilot area injectors and one southern row well. Caustic slug injection, which was expected to have begun in March, was again delayed and is not expected to begin before January, 1980. This is about 9 months later than originally planned.

Eleven more comparison core flood tests were begun; of these, 7 were completed. Tests now in progress are expected to assist in determining the optimum salt content and volume for the preflush. Additional core flood tests are planned to determine the desirability of using sodium silicate as well as sodium hydroxide as one of the alkaline agents during the flood.

The produced water hardness study was completed. Although the pilot project will inject caustic and softened fresh water, fieldwide expansion of the flood would require the use of treated produced brine as the injection fluid. The study reviewed the 2 most attractive processes to condition the produced water; chemical precipitation with caustic and ion exchange.

- A 57, 58
- S 27, 31

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Routine well work, testing and surveying of the area wells continued. Downhole mechanical failures continue to necessitate extensive cost expenditures and delays in the project. One producer was redrilled and the redrill of an injector was begun.

Because of the discouraging results obtained in laboratory core floods with "entrapment" mechanism, a decision was reached to delete this caustic-only injection phase from the project. The preflush will be followed instead by alkaline-salt injection.

A formal application and an extension of it were submitted to the Office of Fuels Regulation, Economic Regulatory Agency of DOE, by the City of Long Beach for treatment of the pilot as a tertiary recovery project, with suitable crude price incentives. The Proposed Decision and Order of the DOE with respect to this project has been issued. A 30-day period is now running under which any interested party may file written comments or objections. Monthly production levels without the caustic flood have been established through 1993. The incremental oil above these levels could be sold for free market price. The DOE currently proposes to recommend to Congress that such oil not be subject to the proposed excise tax.

The staff will continue to inform the Commission, semiannually, regarding the status of this enhanced oil recovery project.