OIL AND GAS DOCKET NO. 8A-0265976

THE APPLICATION OF OCCIDENTAL PERMIAN LTD. FOR AUTHORIZATION PURSUANT TO STATEWIDE RULE 36 TO INJECT FLUIDS CONTAINING HYDROGEN SULFIDE IN THE SOUTHEAST LEVELLAND UNIT, LEVELLAND FIELD, HOCKLEY COUNTY, TEXAS

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner

DATE OF HEARING: September 7, 2010

APPEARANCES:	**REPRESENTING:**
APPLICANT:	
John Soule Sandra Musallam	Occidental Permian Ltd.
OBSERVER:	
Kelli Kenney	Linn Operating, Inc.

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Occidental Permian Ltd. ("Oxy") requests authority pursuant to Statewide Rule 36 to inject fluids containing hydrogen sulfide ("H2S") into 38 injection wells (Nos. 4W, 5W, 6AI, 9W, 10W, 11W, 12W, 33W, 104W, 105W, 107W, 108W, 109W, 115W, 117W, 118W, 119W, 120W, 121W, 122W, 152W, 153W, 154W, 155W, 204, 211, 212, 213, 216, 217W, 218W, 320W, 321W, 356W, 357, 358, 359 & 365) on its Southeast Levelland Unit in the Levelland Field. This authority is sought as part of Oxy's proposal to conduct a miscible CO2 flood on a portion of the Southeast Levelland Unit. This is the first application for injection of H2S on the Southeast Levelland Unit.

Statewide Rule 36(c)(10)(A)(i) states that injection of fluids containing hydrogen sulfide will be allowed only after public hearing when "... injection fluid is a gaseous mixture, or would be a gaseous mixture in the event of a release to the atmosphere, and where the 100 ppm radius of exposure is in excess of 50 feet and includes any part of a public area except a public road; or, if the 500 ppm radius of exposure is in excess of 50 feet and includes any part of a public road; or if the 100 ppm radius of exposure is 3,000 feet or greater." There are several public roads in the area.

OIL AND GAS DOCKET NO. 8A-0265976

Notice of the application was sent to the Hockley County Clerk's office, Levelland City Clerk's office, surface owners and affected offsetting operators on April 15 or April 16, 2010. A protest was initially filed by Linn Operating, Inc., but the protest was withdrawn prior to the hearing. This application was unprotested and the examiner recommends approval.

DISCUSSION OF THE EVIDENCE

The Southeast Levelland Unit was formed in 1964. Currently, there are 206 producing wells and 134 injection wells in the Southeast Levelland Unit. Current production is approximately 1,350 barrels of oil per day (BOPD) and 43,500 barrels of water per day (BWPD). Water injection is approximately 47,000 BWPD. The area which is the subject of this application is in the north-central part of the Southeast Levelland Unit and covers approximately 1,100 acres. The producing interval is the San Andres formation between the depths of 4,550 feet and 5,100 feet. The native gas in the Levelland Field contains approximately 0.87% H2S.

The Southeast Levelland Unit is near several existing sour CO2 floods, including Oxy's Levelland Unit, immediately to the north, and Oxy's West RKM Unit (Slaughter Field), to the southwest. CO2 miscible floods typically result in substantial incremental oil recovery in the San Andres formation in the Levelland and Slaughter Fields. For the proposed Phase I project, Oxy estimates that the proposed CO2 flood will increase ultimate recovery by over 9,000,000 BO. Peak incremental production is expected to be approximately 1,200 BOPD.

Currently, gas from the Southeast Levelland Unit is being sent to the Slaughter gas plant for processing. After implementation of the proposed CO2 injection project, the gas will be sent to the Mallet CO2 recovery plant to extract the CO2 for re-injection. After the project is under way, it is expected that the H2S concentration of the produced gas from the project area will be only 0.64% H2S because the produced gas will be diluted by the injected CO2. The maximum H2S concentration of gas injected on the Southeast Levelland Unit is estimated to be 0.60%.

Because of the H2S content of the native gas in the Levelland Field, there are existing H2S production operations in the area and a Contingency Plan is already in place for those operations. This includes operation of an existing 18-inch gas gathering line which the Southeast Levelland Unit will tie-into and send produced gas from the CO2 flood to the Mallet CO2 recovery plant. The Form H-9 for the proposed Southeast Levelland Unit H2S injection operations, including the sour CO2 distribution line, was approved by the Commission's District Office on April 13, 2010. The maximum escape volume is 44,300 MCFD, which is based on a worst-case scenario event involving the CO2 distribution line. The distribution line will be a 14-inch pipeline that transports sour CO2 northeast from the Mallett CO2 recovery plant to an 8-inch connection that reduces to a 6-inch distribution trunkline. This 6-inch trunkline leads to 3-inch and 4-inch laterals which will supply the sour CO2 to the injection wells for this project.

The 100 parts per million (ppm) Radius of Exposure (ROE) is 3,316 feet and the 500 ppm ROE is 1,515 feet. There are six (6) public roads and three (3) public buildings (residences) within the 500 ppm ROE. Information explaining the characteristics of CO2 and H2S has been delivered to the residents within the radii of exposure. Residents have also been given specific instructions about procedures to follow in the event of an emergency.

The proposed H2S injection operations on the Southeast Levelland Unit meet all safety requirements of Statewide Rule 36. There will be automated emergency shut-down valves on the CO2 distribution line that will close whenever the pressure drops to a preset value. Manually operated block valves will be installed to isolate multi-well laterals from the main trunk lines. The injection system is designed for a maximum allowable operating pressure of 2,850 psi, while normal operating pressure will be 2,000 to 2,400 psi. All equipment used in this sour CO2 injection project will meet or exceed industry standards for H2S service, including ASTM, ANSI, API, NACE. The 38 wells proposed for conversion to sour CO2 injection operations meet all requirements of Statewide Rule 46.

The 38 wells that are the subject of this application are already permitted for water and CO2 injection. There is no evidence that the proposed addition of H2S will cause harm to usable-quality groundwater or other mineral bearing strata. The Form H-1 and H-1A injection well applications were submitted on April 15, 2010, and are being administratively reviewed by the Commission. The Form H-9 and Contingency Plan have been approved by the Commission's District Office and the requirements of Statewide Rule 36 pertaining to injection fluids containing H2S have been met.

FINDINGS OF FACT

1. Notice of these injection applications and hearing was provided to all persons entitled to notice at least ten (10) days prior to the date of the hearing.

2. The Southeast Levelland Unit was formed in 1964. Currently, there are 206 producing wells and 134 injection wells in the Southeast Levelland Unit.

3. The area which is the subject of this application is in the north-central part of the Southeast Levelland Unit and covers approximately 1,100 acres. The producing interval is the San Andres formation between the depths of 4,550 feet and 5,100 feet.

4. The 38 wells that are the subject of this application are currently permitted for water injection in conjunction with the ongoing waterflood project. The wells are also permitted for CO2 injection, as Oxy plans to conduct a miscible CO2 flood. This is the first application for injection of H2S on the Southeast Levelland Unit.

5. All but one of the 38 wells is permitted for fresh water injection. Use of fresh water is limited to make-up water, which will not be necessary often, if at all.

6. The proposed injection operations into the 38 wells that are the subject of this application will not endanger usable-quality water and the injected fluids will be confined to the San Andres formation between 4,550 feet and 5,100 feet.

7. The proposed CO2 injection is necessary to conduct a miscible CO2 flood on the Southeast Levelland Unit and will result in the recovery of over 9,000,000 barrels of oil that otherwise would not be recovered.

8. The native gas in the Levelland Field contains approximately 0.87% H2S. The maximum H2S concentration of gas injected on the Southeast Levelland Unit is estimated to be 0.60%.

9. The 500 parts per million (ppm) radius of exposure (ROE) for the project is 1,515 feet and the 100 ppm ROE is 3,316 feet. The radii of exposure are calculated based on the worst case scenarios with the maximum escape volumes and H2S concentrations.

10. The proposed injection operations meet the safety requirements of Statewide Rule 36 regarding warning marker provisions, security provisions, and materials and equipment.

11. The Contingency Plan for the proposed project has been approved by the Commission's District Office.

CONCLUSIONS OF LAW

1. Proper notice was timely given to all parties entitled to noticed pursuant to applicable statutes and rules.

2. All things have occurred and have been accomplished to give the Commission jurisdiction in this case.

3. Oxy has complied with the safety provisions of Statewide Rule 36 for injection of fluid containing H2S for the 38 wells that are the subject of this application.

4. Oxy has met its burden of proof and satisfied the requirements of the Railroad Commission's Statewide Rule 36.

OIL AND GAS DOCKET NO. 8A-0265976

EXAMINER'S RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiner recommends approval of the application of Occidental Permian Ltd. to inject fluids containing hydrogen sulfide into 38 injection wells on its Southeast Levelland Unit, in the Levelland Field, Hockley County, Texas.

Respectfully submitted,

Richard D. Atkins, P.E.
Technical Examiner